Honeywell

MAXON

OVENPAK® LE
low emissions, high performance gas burners

TECHNICAL INFORMATION

- Burns any clean fuel gas
- Operates on low gas supply pressures
- Provides clean combustion with low NOx and CO levels
- Compact burner design provides quick and easy installation
- Balanced pressure design for easy commissioning and adjustment
- Visible ignition action speeds commissioning and maintenance
- High turndown for exceptional process control

EAC

EN
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Contents

1 Application

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

The gas flows through the nozzle, then along the inside of the burner cone where combustion air is rapidly mixed with the fuel. This produces a very wide turndown range and a highly stable flame under a variety of operating conditions. Fuel and air pressures for the burner are balanced (always equal). This unique design provides simple operation and adjustment throughout the operational range of the burner. The balanced pressure feature also makes the OVENPAK LE Burner resistant to firing chamber pressure fluctuations.

1.1 Typical emissions

OVENPAK LE Burners produce low levels of NOx and CO over a wide range of operation without sacrificing turndown or operational flexibility.

The OVENPAK LE utilizes advanced mix combustion to effectively suppress the formation of prompt NOx. CO emissions are held at low levels through effective ratio control with minimal excess air.

Exact emissions performance may vary in your application. Contact MAXON for information on installation-specific estimates and guaranteed values. No guarantee of emissions is intended or implied without specific, written guarantee from MAXON.

1.2 Application examples

OVENPAK LE burner applications may include:

- Air heating in ovens and dryers
- Paint finishing lines
- Paper machines
- Textile machines
- Food baking ovens
- Coffee roasters
- Grain dryers
- Other air heaters

2 Certification

Eurasian Customs Union

EAC

The products OVENPAK LE meet the technical specifications of the Eurasian Customs Union.

3 Function

3.1 Description

The gas flows through the nozzle, then along the inside of the burner cone where combustion air is rapidly mixed with the fuel.

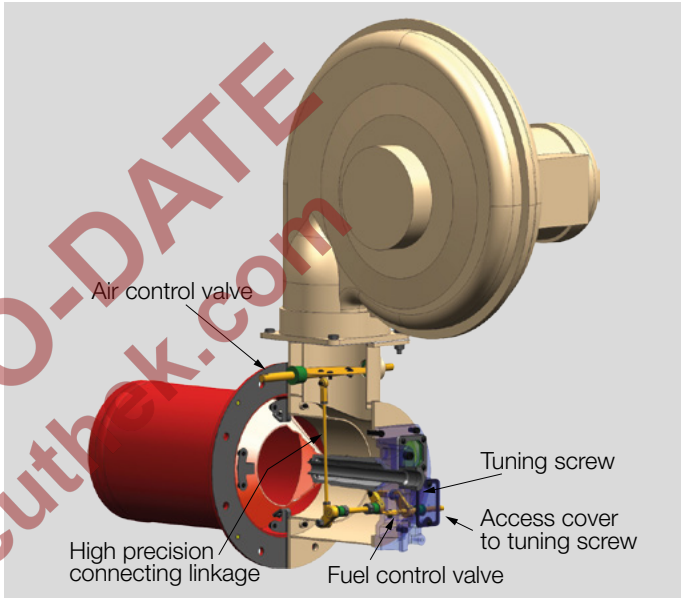
Fuel and air pressures for the burner are balanced (always equal). The balanced pressure feature also makes the OVENPAK LE Burner resistant to firing chamber pressure fluctuations.

The OVENPAK LE burner is available in several versions. Packaged burners contain integral combustion air blower with non-sparking paddle wheel-type impeller and linked air and fuel control valves to maintain the gas-air ratio over the full operating range.

EB versions include an internal air control valve designed to be connected to an external fuel control valve. The EB version may also be ordered with no control valves.

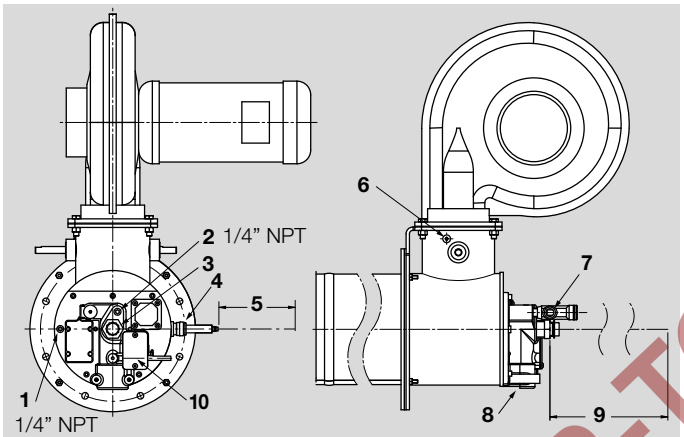
The OVENPAK LE burner includes a pilot, spark ignitor, stainless steel discharge sleeve, mixing cone, and provision for a flame sensor.

Emissions

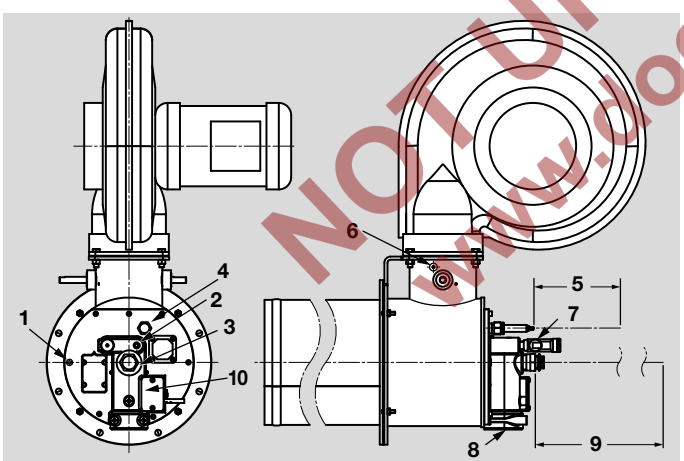


Burner emissions can be controlled by adjusting the regulator at high fire position, and by adjusting the ratio tuning screw at lower firing position.

3.2 Part designations OPLE5–45



OPLE5–25

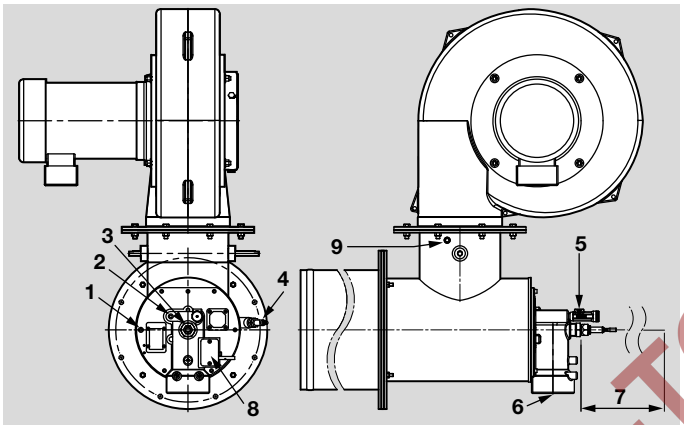


OPLE30–45

Legend OPLE5–45

1 Air test port 1/4" NPT
2 Gas test port 1/4" NPT
3 Flame rod or flame scanner (optional)
4 Spark ignitor
5 Spark ignitor removal
6 Air pressure switch test port 1/8" NPT
7 Pilot gas inlet 3/8" NPT
8 Gas inlet
9 Removal of optional flame rod
10 Tuning screw

3.3 Part designations OPLE70

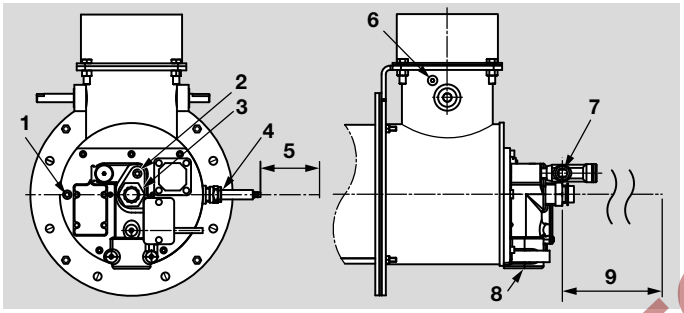


OPLE70

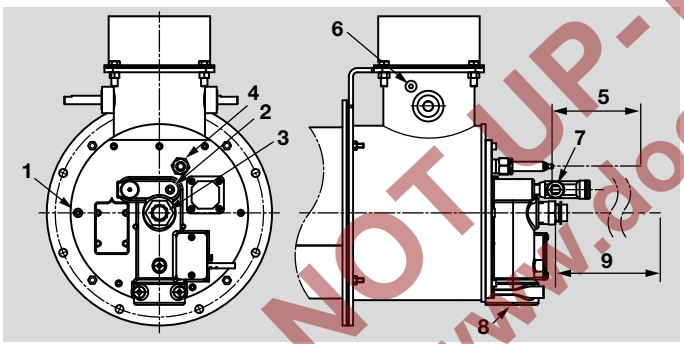
Legend

1 Air test port 1/4” NPT
2 Gas test port 1/4” NPT
3 Flame rod or UV scanner (optional)
4 Spark ignitor
5 Pilot gas inlet 3/8” NPT
6 Gas inlet
7 30” required for removal of optional flame rod
8 Tuning screw
9 Air pressure switch test port 1/8” NPT

3.4 Part designations OPLE EB40, OPLE EB65



OPLE EB40

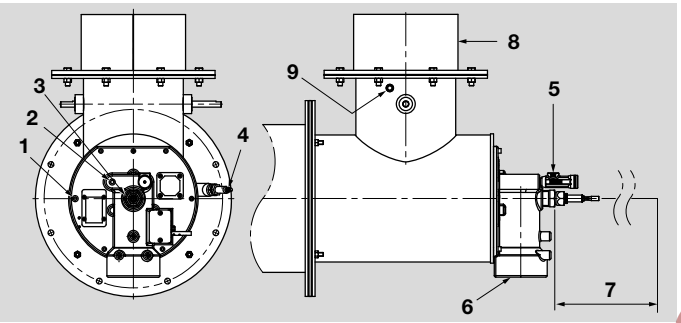


OPLE EB65

Legend

1 Air test port 1/4” NPT
2 Gas test port 1/4” NPT
3 Flame rod or flame scanner (optional)
4 Spark ignitor
5 Spark ignitor removal
6 Air pressure switch test port 1/8” NPT
7 Pilot gas inlet 3/8” NPT
8 Gas inlet
9 Removal of optional flame rod

3.5 Part designations OPLE EB100



OPLE EB100

Legend

1 Air test port 1/4” NPT
2 Gas test port 1/4” NPT
3 Flame rod or UV scanner (optional)
4 Spark ignitor
5 Pilot gas inlet 3/8” NPT
6 Gas inlet 3” NPT
7 760 mm required for removal of optional flame rod
8 Optional companion flange
9 Air pressure switch test port 1/8” NPT

4 Selection

The OVENPAK LE burner is a nozzle mixing burner for use on a wide variety of industrial applications. The burner utilizes advanced, rapid mixing to produce low levels of NOx and CO while maintaining high turndown and operational flexibility.

The OVENPAK LE burner is available in several versions. Packaged burners contain an integral combustion air blower and internally linked control valves to maintain the gas-air ratio over the full operating range. EB (external blower) burners are equipped with an air inlet adapter and are designed for remote blower applications. EB versions include independent internal fuel and air valves designed to be connected externally to a parallel positioning fuel-air ratio control system. The EB version may also be ordered with no internal fuel and air valves.

The OVENPAK LE burner includes a combustion air blower with non-sparking paddle wheel-type impeller, pilot, spark ignitor, stainless steel discharge sleeve, mixing cone and provision for a flame safeguard sensor.

OVENPAK LE burners feature a unique balanced pressure design with equal fuel pressures and air pressures. This feature provides easy set-up and verification. In addition, balanced supply pressures provide resistance to fluctuations or upsets in the firing chamber pressure. During upsets, the burner's ratio will be maintained for stability and emissions control.

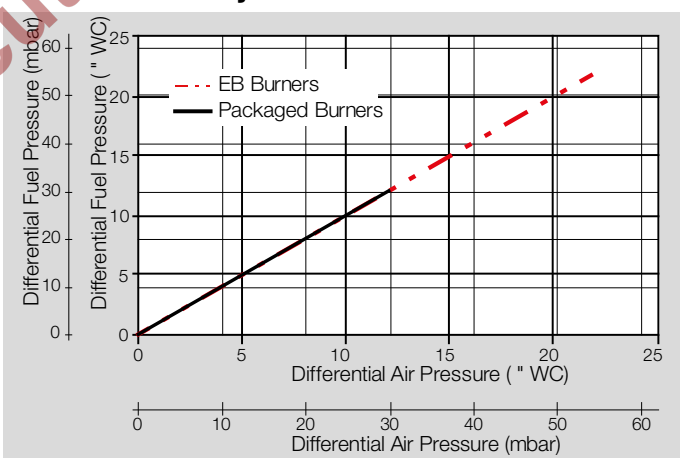
MAXON OVENPAK LE burner can be used in all direct fired air heating applications. It combines flexibility and stability with high turndown and low NOx/CO emissions. It can be used in all air heating applications that require low NOx firing and allow excess combustion air. Consult installation instructions under "Burner mounting" for mounting and insulating requirements.

OVENPAK LE burners can be fired into tubes up to 8500 Btu/h/in^2 [3860 kW/m^2] of tube cross sectional area. The OVENPAK LE may also be used for indirect applications up to 1500° F [815° C].

4.1 Fuels

Standard OVENPAK LE burners are designed for low NOx firing of natural gas only. Optional versions are available to fire propane/LPG. When firing propane, butane or other alternate fuels, higher NOx will be produced. Contact MAXON for expected influence on emissions.

4.2 Pressure adjustments



4.3 Typical burner data OPLE5–70 (imperial)

Fuel: natural gas at 60 °F with 1000 Btu/ft³ HHV - sg = 0.6[1)]
Combustion air: 60 °F - 21 % O_2 - 50 % rel. humidity - sg = 1.0[1)]
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel, and gas quality.

		OPLE5	OPLE10	OPLE13	OPLE15	OPLE25
Maximum capacity[2)]	kBtu/h	500	1,000	1,350	1,600	2,500
Minimum capacity[3)]	kBtu/h	22	30	27	32	50
Maximum turndown		22:1	33:1	50:1	50:1	50:1
High fire gas pressure differential[4)]	"wc	2.5	8.1	6	8.5	8.4
Combustion air pressure differential	"wc	2.5	8.1	6	8.5	8.4
Combustion air volume[6)]	CFM	146	263	293	347	570
Fan motor-power	hp	0.25	1	0.5	1.5	2
Pilot capacity[5)]	kBtu/h	15	20	27	32	50
Approximate inlet gas pressure required	"wc	3.5	10.5	7.6	10.6	14.0

		OPLE30	OPLE35	OPLE40	OPLE45	OPLE70
Maximum capacity[2)]	kBtu/h	3,150	3,500	4,000	4,480	7,000
Minimum capacity[3)]	kBtu/h	63	70	80	90	200
Maximum turndown		50:1	50:1	50:1	50:1	35:1
High fire gas pressure differential[4)]	"wc	8.8	10.5	7	9.2	12
Combustion air pressure differential	"wc	8.8	10.5	7	9.2	12
Combustion air volume[6)]	CFM	728	809	892	1004	1617
Fan motor-power	hp	3	3	3	5	7.5
Pilot capacity[5)]	kBtu/h	63	70	80	90	90
Approximate inlet gas pressure required	"wc	10.4	13.0	10.0	15.0	13.0

1) sg (specific gravity) = relative density to air (density air = 0.0763 lb/ft³(st))
2) Capacity displayed assumes blower operation on 60 Hz electrical supply. Gross output will be reduced by 17 % if operated on 50 Hz. Fuel and air pressures should be reduced by 30 % while motorpower will reduce 40 % with 50 Hz operation.
3) Minimum capacity may be affected by fuel and application parameters.
4) Gas pressure displayed for natural gas or propane. Propane pressures shown require use of optional propane nozzle.
5) Pilot gas pressure at adjustable gas orifice should be 4–8" wc.
6) Combustion air defined at standard temperature and pressure.

4.4 Typical burner data OPLE5–70 (metric)

Fuel: natural gas at 15 °C with 10.9 kWh/m³- sg = 0.6[1)]
Combustion air: 15 °C - 21 % O_2 - 50 % rel. humidity - sg = 1.0[1)]
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel, and gas quality.

		OPLE5	OPLE10	OPLE13	OPLE15	OPLE25
Maximum capacity[2)]	kW	146	293	400	470	730
Minimum capacity[3)]	kW	6	9	8	9.4	14.6
Maximum turndown		22:1	33:1	50:1	50:1	50:1
High fire gas pressure differential[4)]	mbar	6.2	20.2	15	21.2	20.8
Combustion air pressure differential	mbar	6.2	20.2	15	21.2	20.8
Combustion air volume[6)]	m³/h	248	447	498	590	968
Fan motor-power	hp	0.25	1	0.5	1.5	2
Pilot capacity[5)]	kW	4	6	8	8	15
Approximate inlet gas pressure required	mbar	8.7	26.2	18.9	26.4	34.9

		OPLE30	OPLE35	OPLE40	OPLE45	OPLE70
Maximum capacity[2)]	kW	925	1025	1170	1315	2050
Minimum capacity[3)]	kW	18.5	20.5	23.4	26.4	58
Maximum turndown		50:1	50:1	50:1	50:1	35:1
High fire gas pressure differential[4)]	mbar	22	26.1	17.4	23	30
Combustion air pressure differential	mbar	22	26.1	17.4	23	30
Combustion air volume[6)]	m³/h	1237	1375	1516	1706	2747
Fan motor-power	hp	3	3	3	5	7.5
Pilot capacity[5)]	kW	18	20	23	26	26
Approximate inlet gas pressure required	mbar	25.9	32.4	24.9	37.4	32.4

1) sg (specific gravity) = relative density to air (density air = 1.293 kg/m³)
2) Capacity displayed assumes blower operation on 60 Hz electrical supply. Gross output will be reduced by 17 % if operated on 50 Hz. Fuel and air pressures should be reduced by 30 % while motorpower will reduce 40 % with 50 Hz operation.
3) Minimum capacity may be affected by fuel and application parameters.
4) Gas pressure displayed for natural gas or propane. Propane pressures shown require use of optional propane nozzle.
5) Pilot gas pressure at adjustable gas orifice should be 10-20 mbar.
6) Combustion air defined at standard temperature and pressure.

4.5 Typical burner data OPLE EB40, OPLE EB65 and OPLE EB100 (imperial)

Fuel: natural gas at 60 °F with 1000 Btu/ft^3 HHV - sg = 0.6[1)]
Combustion air: 60 °F - 21 % O_2 - 50 % rel. humidity - sg = 1.0[1)]
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel, and gas quality.

		OPLE EB40	OPLE EB65	OPLE EB100
Chamber pressure	"wc	-0.5	-0.5	-0.5
Maximum capacity	kBtu/h	4,000	6,500	10,000
Minimum capacity[2)]	kBtu/h	40	40	400
Maximum turndown		100:1	100:1	100:1
High fire gas pressure differential[3)]	"wc	22.5	19.5	21
Combustion air pressure differential[6)]	"wc	22.5	19.5	21
Combustion air volume[4)]	CFM	950	1,545	2290
Pilot capacity[5)]	kBtu/h	65	65	90
Inlet air pressure differential[7)]	"wc	27.0	21.0	25
Approximate inlet gas pressure required[8)]	"wc	38	27	25

1) sg (specific gravity) = relative density to air (density air = 0.0763 lb/ft^3(st)
2) Minimum capacity may be affected by fuel and application parameters.
3) Gas pressure displayed for natural gas or propane. Propane pressures shown require use of optional propane nozzle.
4) Combustion air defined as standard temperature and pressure.
5) Pilot gas pressure at adjustable gas orifice should be 4–8 "wc.
6) Combustion air differential pressure to be measured between burner test connection and combustion chamber
7) Inlet combustion air differential pressure to be measured between burner inlet and combustion chamber
8) For EB versions, valid only for the case where the burner has internal controls

4.6 Typical burner data OPLE EB40, OPLE EB65 and OPLE EB100 (metric)

Fuel: natural gas at 15 °C with 10.9 kWh/Nm^3 - sg = 0.6[1)]
Combustion air: 15 °C - 21 % O_2 - 50 % rel. humidity - sg = 1.0[1)]
Stated pressures are indicative. Actual pressures are a function of air humidity, altitude, type of fuel, and gas quality.

		OPLE EB40	OPLE EB65	OPLE EB100
Chamber pressure	mbar	-1.0	-1.0	-1.0
Maximum capacity	kW	1170	1900	2928
Minimum capacity[2)]	kW	12	12	117
Maximum turndown		100:1	100:1	100:1
High fire gas pressure differential[3)]	mbar	56	48	52
Combustion air pressure differential[6)]	mbar	56	48	52
Combustion air volume[4)]	m^3/h	1610	2620	3890
Pilot capacity[5)]	kW	19	19	26
Inlet air pressure differential[7)]	mbar	67	52	62.3
Approximate inlet gas pressure required[8)]	mbar	94.7	67.3	62.5

1) sg (specific gravity) = relative density to air (density air =1.293 kg/m^3)
2) Minimum capacity may be affected by fuel and application parameters.
3) Gas pressure displayed for natural gas or propane. Propane pressures shown require use of optional propane nozzle.
4) Combustion air defined as standard temperature and pressure.
5) Pilot gas pressure at adjustable gas orifice should be 10–20 mbar.
6) Combustion air differential pressure to be measured between burner test connection and combustion chamber
7) Inlet combustion air differential pressure to be measured between burner inlet and combustion chamber
8) For EB versions, valid only for the case where the burner has internal controls

4.7 Flame development

The OVENPAK LE creates stout, thoroughly mixed flames with short lengths. Burner flames remain consistent across most burner sizes.

Burner size	Flame diameter [inches]	Flame length[1)] [inches]	Flame diameter [mm]	Flame length[1)] [mm]
OPLE5	5	7	127	178
OPLE10	5	7.5	127	190
OPLE13	9	20	230	500
OPLE15	9	20	230	500
OPLE25	9	20	230	500
OPLE30	11	24	280	600
OPLE35	11	24	280	600
OPLE40	11	24	280	600
OPLE45	11	24	280	600
OPLE70	11	18	280	458
OPLE EB40	9	20	230	500
OPLE EB65	11	24	280	600
OPLE EB100	11	24	280	600

1) Flame length indicated is measured from the end of the discharge sleeve.

4.8 Cross velocities

Cross velocities up to 3000 ft/min [15 m/s] can be allowed over the OVENPAK LE flame. Contact MAXON for assistance for cross velocity over the flame in excess of 3000 ft/min [15 m/s], or for processes with high moisture content.

4.9 SLATE Actuators

SLATE actuator is configurable for all packaged and external blower burner models. The OVENPAK LE can be configured with a commercial SLATE low torque (150 in/lb.) actuator in a NEMA 1 enclosure and with a industrial SLATE low torque (150 in/lb.) actuator in a NEMA 4 enclosure.

4.9.1 SLATE Control Panel Options

SLATE Control Panel Options Standard, configurable control panel options are available for customers to utilize in conjunction with optional SLATE actuators.

Please contact MAXON for these and our unique engineered solutions to fit your needs.

5 Type code

OPLE	Packaged burner
5	max 0.5 MBtu/h
10	max 1.0 MBtu/h
13	max 1.3 MBtu/h
15	max 1.5 MBtu/h
25	max 2.5 MBtu/h
30	max 3.0 MBtu/h
35	max 3.5 MBtu/h
40	max 4.0 MBtu/h
45	max 4.5 MBtu/h
70	max 7.0 MBtu/h
D	Direct spark
S	Standard pilot
R	Flame rod
U	Provision for UV scanner
S	Standard mixing cone
N	Natural gas
P	Propane
C	Short sleeve 310SS
H	High temperature sleeve
R	Refractory lined sleeve 310SS
S	Standard sleeve 310SS
1	Oven wall gasket needed
0	No oven wall gasket needed
1	Blower voltage 230/460/3/60, right motor position
2	Blower voltage 575/3/60, right motor position
3	Blower voltage 115/1/60, right motor position
4	Blower voltage 230/460/3/60, left motor position
5	Blower voltage 575/3/60, left motor position
6	Blower voltage 115/1/60, left motor position
A	No connecting bracket and linkage
B	SMARTLINK CV
C	SMARTLINK MRV
D	Honeywell Mod CB and L only
E	CB and L w/Honeywell Mod Motor
F	CB and L w/Honeywell WP Mod Motor
I	SMARTLINK DS DC CV
J	SLATE LTA Commercial MRV
K	SLATE LTA Industrial MRV
A	No position switch
B	Omron low position switch
C	Omron hi/lo position switch
D	T'mechanique low position switch
E	T'mechanique W.Prf hi/lo pos switch
F	Filter assembly
L	Silencer assembly
N	No filter or silencer
S	Filter/silencer assembly

OPLE EB	External blower
40	max 4.0 MBtu/h
65	max. 6.5 MBtu/h
100	max. 10 MBtu/h
D	Direct spark
S	Standard pilot
R	Flame rod
U	Provision for UV scanner
S	Standard mixing cone
N	Natural gas
P	Propane
C	Short sleeve 310SS
H	High temperature sleeve
R	Refractory lined sleeve 310SS
S	Standard sleeve 310SS
1	Oven wall gasket needed
0	No oven wall gasket needed
E	External control valves
I	Internal control valves
A	No connecting bracket and linkage
B	SMARTLINK MRV
E	SLATE LTA Commercial MRV
F	SLATE LTA Industrial MRV
0	No position switch
B	Omron low position switch
C	Omron hi/lo position switch
D	T'mechanique low position switch
E	T'mechanique W.Prf hi/lo pos switch
0	No flange needed
1	Flange needed

6 Feature selection guide

A table for selecting the correct product is available at www.docuthek.com

7 Project planning information

7.1 Maximum capacities

All OVENPAK LE burners can be fired at higher than maximum capacities if sufficient combustion air and fuel gas is provided to the burner. EB burners may be overfired up to 15% over cataloged capacities with an adequate combustion air blower. Burner emissions will be affected by overfiring. Fuel pressure will increase in kind to maintain balance pressure design on EB burners.

7.2 Process back pressure

Standard packaged OVENPAK LE burners with integrated fan can accept static chamber pressures between -5" wc and +5" wc [-12.5 mbar and +12.5 mbar]. The unique balanced pressure design provides resistance to unstable application pressures. During system upsets, the burner's output capacity will be impacted but the air-fuel ratio and stability will be maintained. The capacity of packaged burners will be affected by chamber pressure.

EB burners with external valves retain the balanced pressure design at the burner nozzles. Process pressures for EB burners should be limited to +5 psi to -5 psi [+350 mbar to -350 mbar]. Care should be taken when selecting external air and fuel valves to closely match the pressure drops at full flow.

7.3 Blower orientation

Blower should be positioned only with the motor parallel to the burner-oven flange. Altering blower position is not recommended as turndown and emissions will be affected.

See illustrations under page 26 (Dimensions) for proper orientation.

7.4 Pipe train

For proper air-to-fuel ratio, do not exceed 4" wc [10 mbar] pressure drop between the burner inlet and the regulator. Higher pressure drops will impact turndown and emissions.

7.5 Process temperature

The construction of the burner allows operation in all applications with process temperatures from ambient up to 1000° F [525° C].

7.6 Piloting and ignition

All OVENPAK LE burners are equipped with a self-piloted design. Pilots shall be used only for ignition of the main flame (interrupted). Use of a standing (continuous) pilot will reduce burner turndown and negatively impact emissions. Use minimally 5000 V/200 VA ignition transformers for sparking of the spark ignitor. Optional ignition equipment for hazardous locations is available as well as high energy ignitors for direct ignition.

Start the burner at low fire settings only. Direct spark ignition of standard OVENPAK LE burners is possible. Ignitor should spark to the cone only. Arc should be easily visible through the observation window for verification of ignition and maintenance.

Locate one pilot gas valve as close as possible to the pilot burner gas inlet to have fast ignition of the pilot burner.

7.7 Ratio control

Burner should be modulated between low and high fire position settings only. Overtraveling can damage internal linkage. Low and high fire stops are intended as visual indicators only. They should not be used as the low or as the high fire hard stops.

Packaged burners with internal linkage should have no more than 4" wc [10 mbar] pressure drop in the fuel train from the regulator to burner inlet.

OVENPAK LE burners may operate with excess air levels of 5–40 %. Best NOx emissions will be produced with 35–40 % excess air. CO emissions will be influenced by ratio and a variety of other factors. See "Expected emissions" for more information.

7.8 Typical ignition sequence

- Pre-purge of burner and installation, according to the applicable codes and the installation's requirements.
- Combustion air control valve shall be in the minimum position to allow minimum combustion air flow to the burner.
- Pre-ignition (typically 2 seconds sparking in air).
- Open pilot gas and continue to spark the ignitor (typically 5 seconds).
- Stop sparking, continue to power the pilot gas valves and start flame check. Trip burner if no flame from here on.
- Check pilot flame stability (typical 5 seconds to prove stable pilot).
- Open main gas valves and allow enough time to have main gas in the burner (typical 5 seconds + time required to have main gas in the burner).
- Close the pilot gas valves.
- Release to modulation (allow modulation of the burner).

Above sequence shall be completed to include all required safety checks during the start-up of the burner (process and burner safeties).

7.9 Flame supervision

OVENPAK LE flames shall be supervised by flame scanners or flame rods allowing verification of both pilot flame and main flame. (It is not possible to distinguish main and pilot flame.)

Scanners are mounted on the burner back plate and look through the fuel nozzle.

Pay attention to possible pick-up of strange flames (if any in the furnace).

7.10 Combustion air control and piping

OVENPAK LE EB burners require combustion air control valves with high turndown (to guarantee correct air flow at minimum capacity). Air control valves shall be properly sized. Typically, the air control valve diameter shall be smaller than the burner air inlet. Combustion air piping to the burner shall be done in such a way that the air flow to the burner will not disturb the flame. One diameter straight pipe length is recommended at the blower air inlet. Location of air control valves directly on the burner inlet is not possible.

Packaged burners and fans will be shipped disassembled. Blower orientation other than depicted under "Dimensions and weights" is not recommended.

7.11 Expected emissions

Packaged burner emissions can be controlled by adjusting the regulator at high fire position, and by adjusting the tuning screw at lower firing position. The fine tuning screw is located below the metal access plate under the viewport at the backplate of each burner. This screw is only intended to allow fine tuning of the NOx and CO production at midfire. No more than 2 turns of the screw should be utilized in either direction. EB burners do not include an internal air and gas linkage or a tuning screw.

Typical NOx for OVENPAK LE burners firing natural gas with 40% excess air is approximately 1/2 to 1/3 the NOx of conventional burners.

CO highly depends on the installation's lay-out and can be reduced if sufficient dwell time after the flame is allowed. CO can generally be controlled below most known standards and regulatory requirements. Consult MAXON for correct application information.

Exact emissions performance may vary in your application. Contact MAXON for information on installation-specific estimates and guaranteed values. No guarantee of emissions is intended or implied without specific, written guarantee from MAXON.

7.12 Discharge sleeves

Discharge sleeve should be selected based on the process conditions. Several materials and length configurations are available.

Discharge sleeves	Discharge sleeve material	Application conditions
Standard	309/310 SS (1.4828/1.4841)	<700° F [400° C] direct fired
High temperature sleeve (optional)	253 MA (1.4333)	700° F-1000° F [400° C–550° C] direct fired
Short sleeve (optional)	310 SS (1.4841)	<1000° F [550° C] indirect fired
Refractory lined sleeve (optional)	310 SS (1.4841) and castable refractory	up to 1500°F [815°C] indirect fired

8 Technical data

OVENPAK LE burners can be fired into tubes up to 8500 Btu/h/in^2 [3860 kW/m^2] of tube cross sectional area. The OVENPAK LE may also be used for indirect applications up to 1500° F [815° C].

Standard packaged OVENPAK LE burners with integrated fan can accept static chamber pressures between -5" wc and +5" wc [-12.5 mbar and +12.5 mbar].
Process pressures for EB burners should be limited to +5 psi to -5 psi [+350 mbar and -350 mbar].

Pipe train: For proper air-to-fuel ratio, do not exceed 4" wc [10 mbar] pressure drop between the burner inlet and the regulator.

The construction of the burner allows operation in all applications with process temperatures from ambient up to 1000° F [525° C].

Piloting and ignition: Use minimally 5000 V/200 VA ignition transformers for sparking of the spark ignitor.

Packaged burners with internal linkage should have no more than 4" wc pressure drop in the fuel train from the regulator to burner inlet.
OVENPAK LE burners may operate with excess air levels of 5–40%. Best NOx emissions will be produced with 35–40% excess air.

Cross velocities: Cross velocities up to 3000 ft/min [15 m/s] can be allowed over the OVENPAK LE flame. Contact MAXON for assistance for cross velocity over the flame in excess of 3000 ft/min [15 m/s], or for processes with high moisture content.

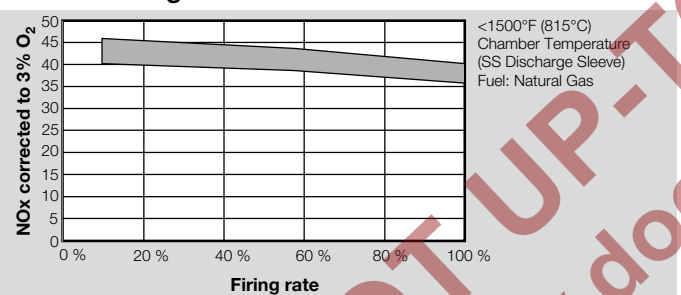
Fuels: Standard OVENPAK LE burners are designed for low NOx firing of natural gas only. Optional versions are available to fire propane/LPG. When firing propane, butane or other alternate fuels, higher NOx will be produced. Contact MAXON for expected influence on emissions.

8.1 Performance Graphs

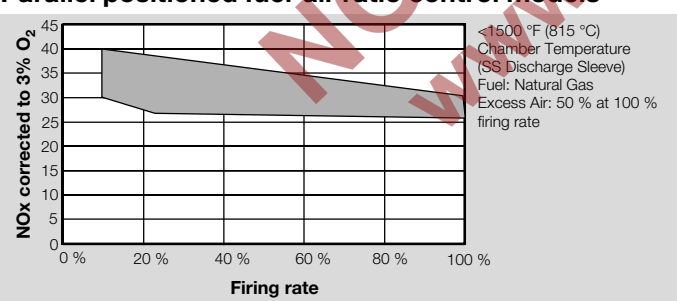
Emissions data based on internal linkage fuel-air ratio control, corrected to 3% O_2. Emissions from the burner are influenced by:

1. Fuel type
2. Combustion air temperature
3. Firing rate
4. Chamber conditions
5. Percent excess air

Internal linkage fuel-air control models



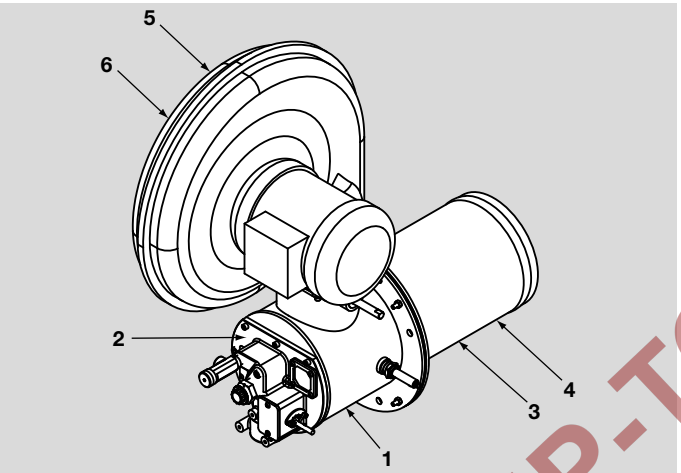
Parallel positioned fuel-air ratio control models



To achieve sub 30 ppm NOx corrected to 3% O_2, excess air need be increased from what is standard on the internal linkage burners. For packaged sizes 13, 15, 35, 40 and 45 the maximum capacity must be reduced by up to 12 % to accommodate the packaged blower volume limitation for the added excess air requirement.

Excess air will need to increase as firing rate decreases from 100 % of cataloged maximum capacity.

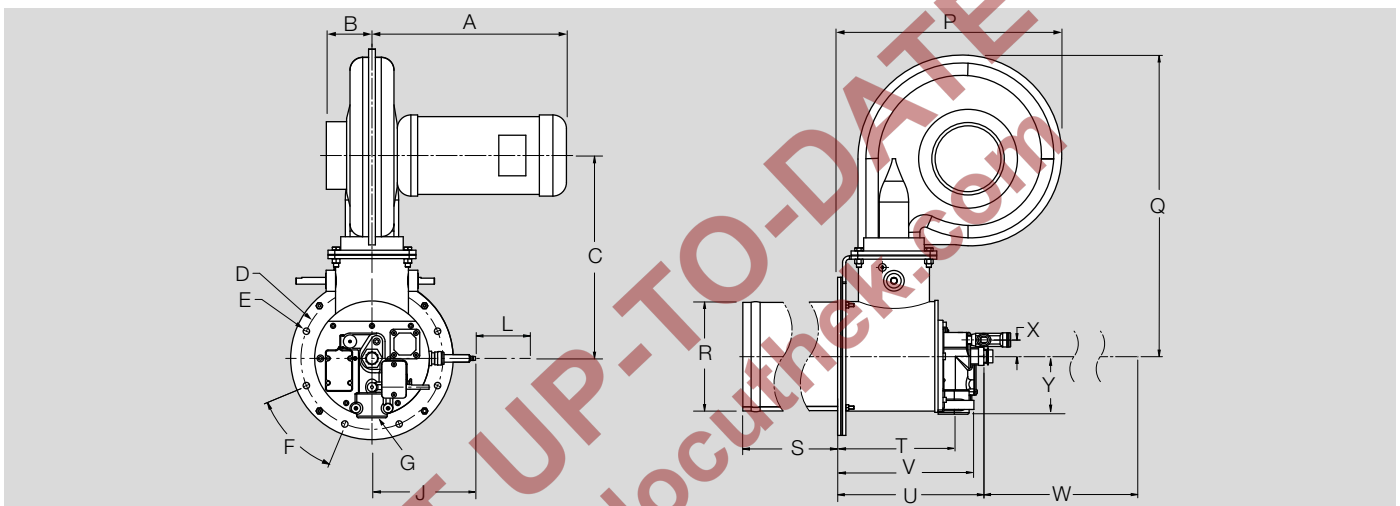
8.2 Materials of Construction



Item number	Burner part	Material
1	Housing	1010 steel (1.1121)
2	Back plate	Cast iron
3	Mixing cone (inside discharge sleeve)	310 Stainless steel (1.4841)
4	Nozzle (inside discharge sleeve)	Cast iron
5	Impeller (inside fan case)	Aluminum
6	Fan case	Aluminum / steel

9 Dimensions

9.1 OPLE5–25 (imperial)

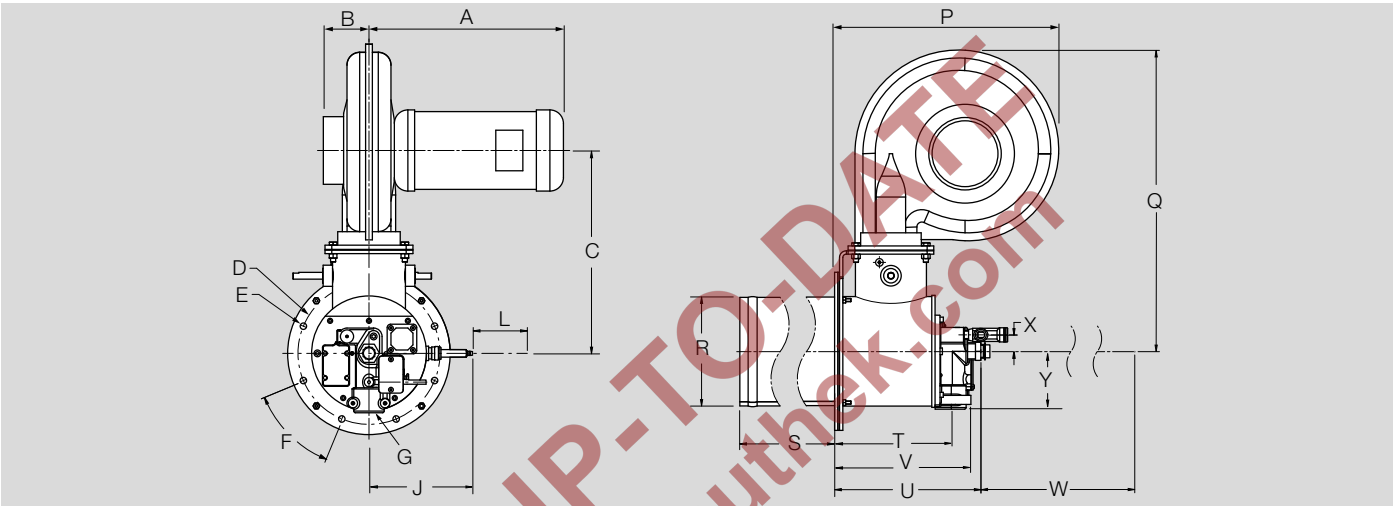


Dimensions in inches unless stated otherwise

Model	A	B	C	D	E	F	G	J	L	P
OPLE5	12.50	3.63	16.56	10.5	0.475	45°	1-1/4" NPT	7.65	4.0	20.67
OPLE10	12.50	3.63	16.56	10.5	0.475	45°	1-1/4" NPT	7.65	4.0	20.67
OPLE13	14.38	3.38	15.00	10.5	0.475	45°	1-1/4" NPT	7.65	4.0	17.01
OPLE15	14.1	3.38	16.56	10.5	0.475	45°	1-1/4" NPT	7.65	4.0	20.67
OPLE25	12.50	3.63	16.56	10.5	0.475	45°	1-1/4" NPT	7.65	4.0	20.67

Model	Q	R	R Ref.lined	S Std.	S Short	S Ref.lined	T	U	V	W	X	Y	Weight lbs
OPLE5	26.70	6.30	12.12	12.0	4.38	7.875	8.94	11.10	10.34	18.5	1.250	4.39	101
OPLE10	26.70	6.30	12.12	12.0	4.38	7.875	8.94	11.10	10.34	18.5	1.250	4.39	101
OPLE13	22.87	8.30	12.12	12.0	4.63	7.875	8.94	11.10	10.34	18.5	1.250	4.39	101
OPLE15	26.70	8.30	12.12	12.0	4.63	7.875	8.94	11.10	10.34	18.5	1.250	4.39	101
OPLE25	26.70	8.30	12.12	12.0	4.63	7.875	8.94	11.10	10.34	18.5	1.250	4.39	101

9.2 OPLE5–25 (metrisch)

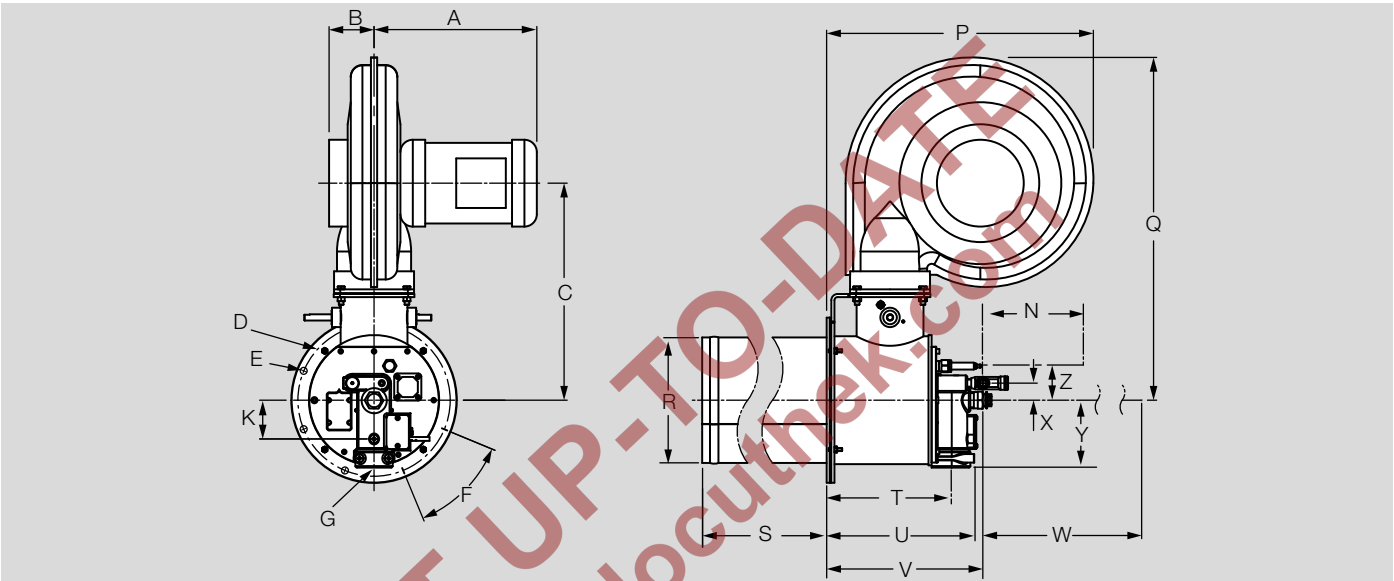


Dimensions in mm unless stated otherwise

Dimensions in mm unless stated otherwise										
Model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**J**	**L**	**P**
OPLE5	318	92	421	267	12	45°	1-1/4" NPT	194	102	525
OPLE10	318	92	421	267	12	45°	1-1/4" NPT	194	102	525
OPLE13	365	86	381	267	12	45°	1-1/4" NPT	194	102	432
OPLE15	358	86	421	267	12	45°	1-1/4" NPT	194	102	525
OPLE25	318	92	421	267	12	45°	1-1/4" NPT	194	102	525

Dimensions in mm unless stated otherwise													
Model	**Q**	**R**	**R Ref.lined**	**S Std.**	**S Short**	**S Ref.lined**	**T**	**U**	**V**	**W**	**X**	**Y**	**Weight kg**
OPLE5	678	160	308	305	111	200	227	282	263	470	32	112	45.8
OPLE10	678	160	308	305	111	200	227	282	263	470	32	112	45.8
OPLE13	581	211	308	305	118	200	227	282	263	470	32	112	45.8
OPLE15	678	211	308	305	118	200	227	282	263	470	32	112	45.8
OPLE25	678	211	308	305	118	200	227	282	263	470	32	112	45.8

9.3 OPLE30–45 (imperial)

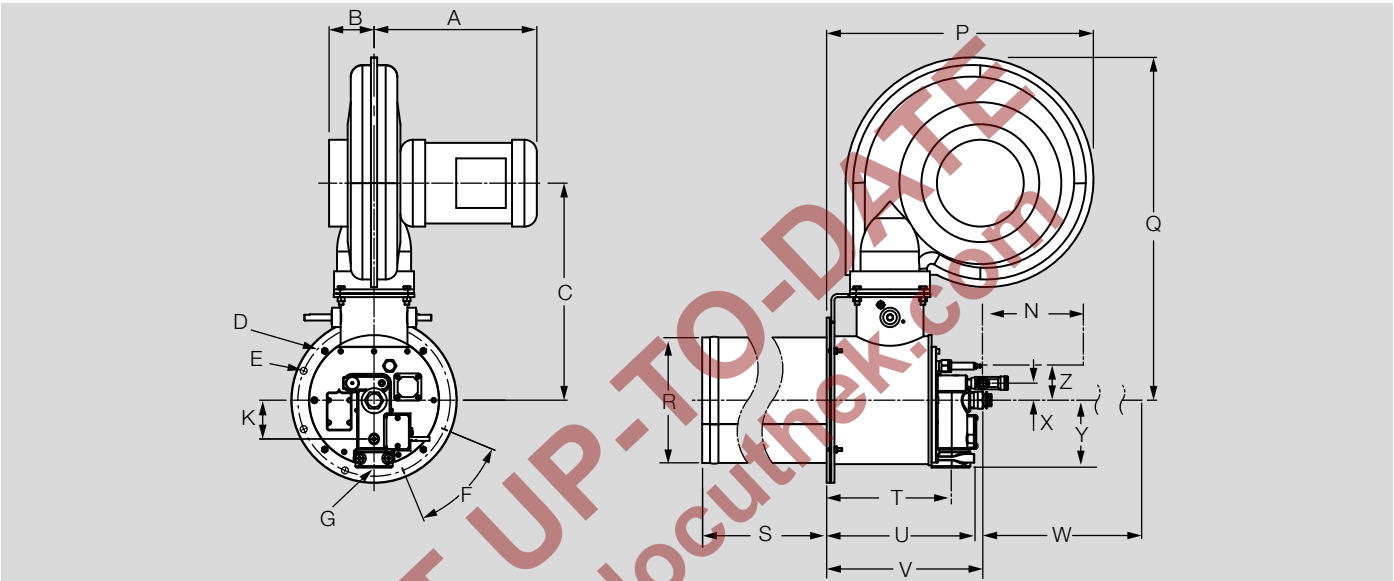


Dimensions in inches unless stated otherwise

Model	A	B	C	D	E	F	G	P	Q	R
OPLE30	13.13	3.63	17.50	12.312	0.475	45°	2” NPT	21.51	27.64	10.24
OPLE35	14.63	3.75	17.75	12.312	0.475	45°	2” NPT	21.51	27.86	10.24
OPLE40	14.63	3.75	17.75	12.312	0.475	45°	2” NPT	21.51	27.86	10.24
OPLE45	16.00	4.25	18.69	12.312	0.475	45°	2” NPT	23.42	29.06	10.24

Model	S Std.	S Short	Ref. lined	T	U	V	W	X	Y	Z	Weight lbs
OPLE30, OPLE35, OPLE40, OPLE45	16.0	8.75	7.875	10.08	11.90	12.59	24.5	1.38	5.44	2.75	180

9.4 OPLE30–45 (metric)

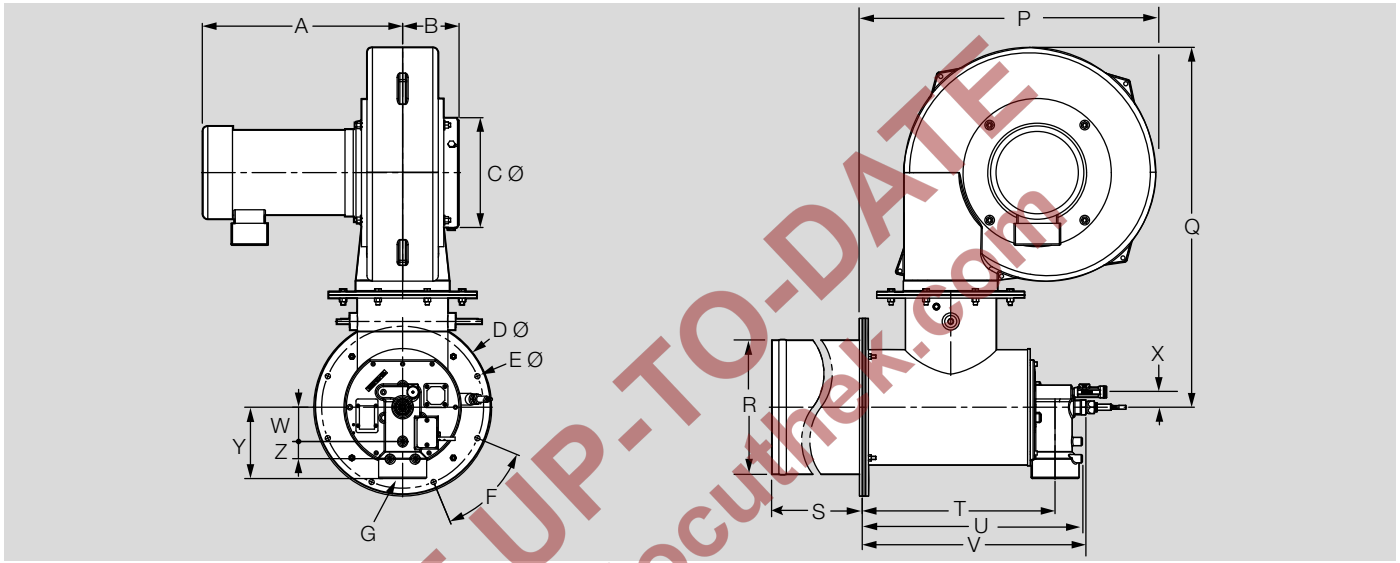


Dimensions in mm unless stated otherwise

Model	A	B	C	D	E	F	G	P	Q	R
OPLE30	334	92	445	313	12	45°	2” NPT	546	702	260
OPLE35	372	95	451	313	12	45°	2” NPT	546	708	260
OPLE40	372	95	451	313	12	45°	2” NPT	546	708	260
OPLE45	406	108	475	313	12	45°	2” NPT	595	738	260

Model	S Std.	S Short	Ref. lined	T	U	V	W	X	Y	Z	Weight kg
OPLE30, OPLE35, OPLE40, OPLE45	406	222	200	256	302	320	622	35	138	70	81.6

9.5 OPLE70 (imperial)

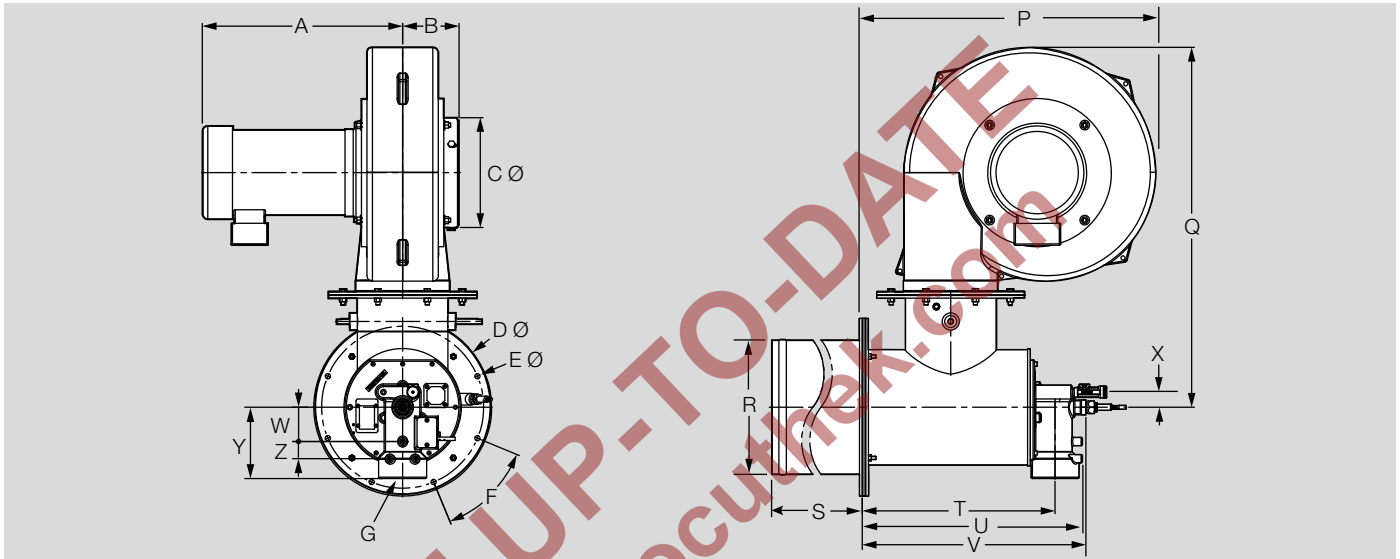


Dimensions in inches unless stated otherwise

Model	A	B	C	D	E	F	G	P	Q	R Ø	R Ø Ref. lined
OPLE70	18.25	5.14	10.0	16.19	0.47	45°	3” NPT	26.75	32.79	12.33	16.21

Model	S Std.	S Short	S Ref. lined	T	U	V	W	X	Y	Z	Weight lbs
OPLE70	23.12	11.75	11.75	17.56	20.07	20.38	3.12	1.38	6.5	1.56	245

9.6 OPLE70 (metric)

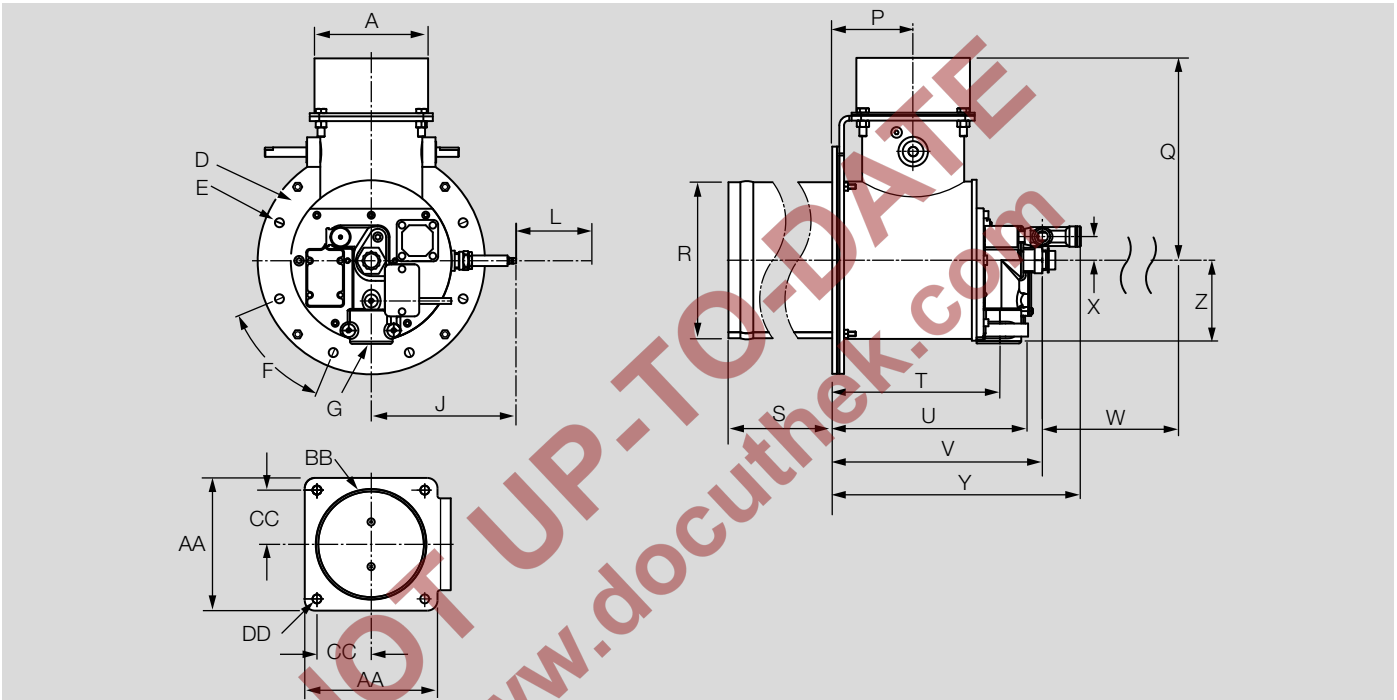


Dimensions in mm unless stated otherwise

Model	A	B	C	D	E	F	G	P	Q	R Ø	R Ø Ref. lined
OPLE70	464	130	254	411	12	45°	3" NPT	680	832	313	412

Model	S Std.	S Short	S Ref. lined	T	U	V	W	X	Y	Z	Weight kg
OPLE70	587	298	298	446	510	518	79	35	165	40	111.1

9.7 OPLE EB40 (imperial)

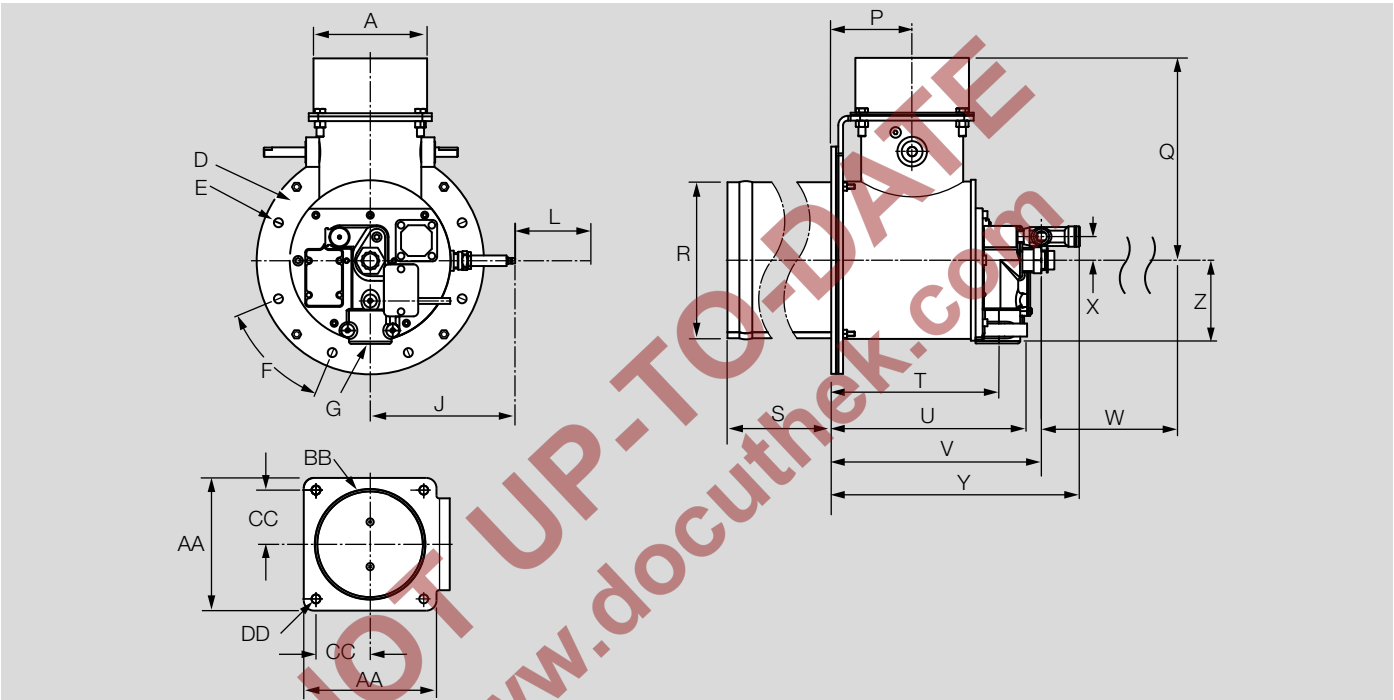


Dimensions in inches unless stated otherwise

Model	A	D	E	F	G	J	L	P	Q	R	S Std.	S Short	S Ref. lined
EB40	6.0	10.50	0.475	45°	1-1/4" NPT	2.375	4.0	4.0	10.89	8.36	12.0	4.63	7.875

Model	T	U	V	W	X	Y	Z	AA	BB	CC	DD	Weight lbs
EB40	8.94	10.34	11.10	18.5	1.25	13.13	4.39	6.50	5.18	2.65	0.438	45

9.8 OPLE EB40 (metric)

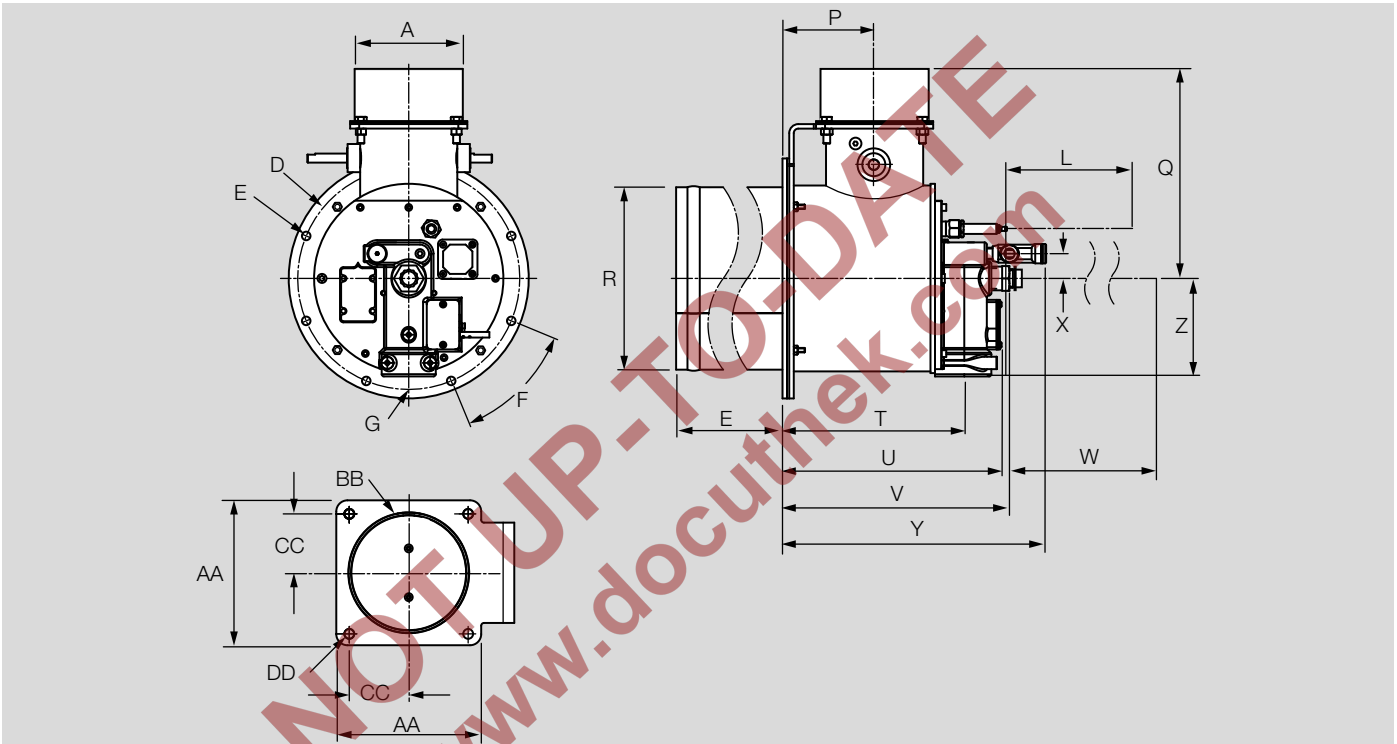


Dimensions in mm unless stated otherwise

Model	A	D	E	F	G	J	L	P	Q	R	S Std.	S Short	S Ref. lined
EB40	152	267	12	45°	1-1/4" NPT	60	102	102	277	212	304	18	200

Model	T	U	V	W	X	Y	Z	AA	BB	CC	DD	Weight kg
EB40	227	263	282	470	32	334	112	165	132	67	11	20

9.9 OPLE EB65 (imperial)

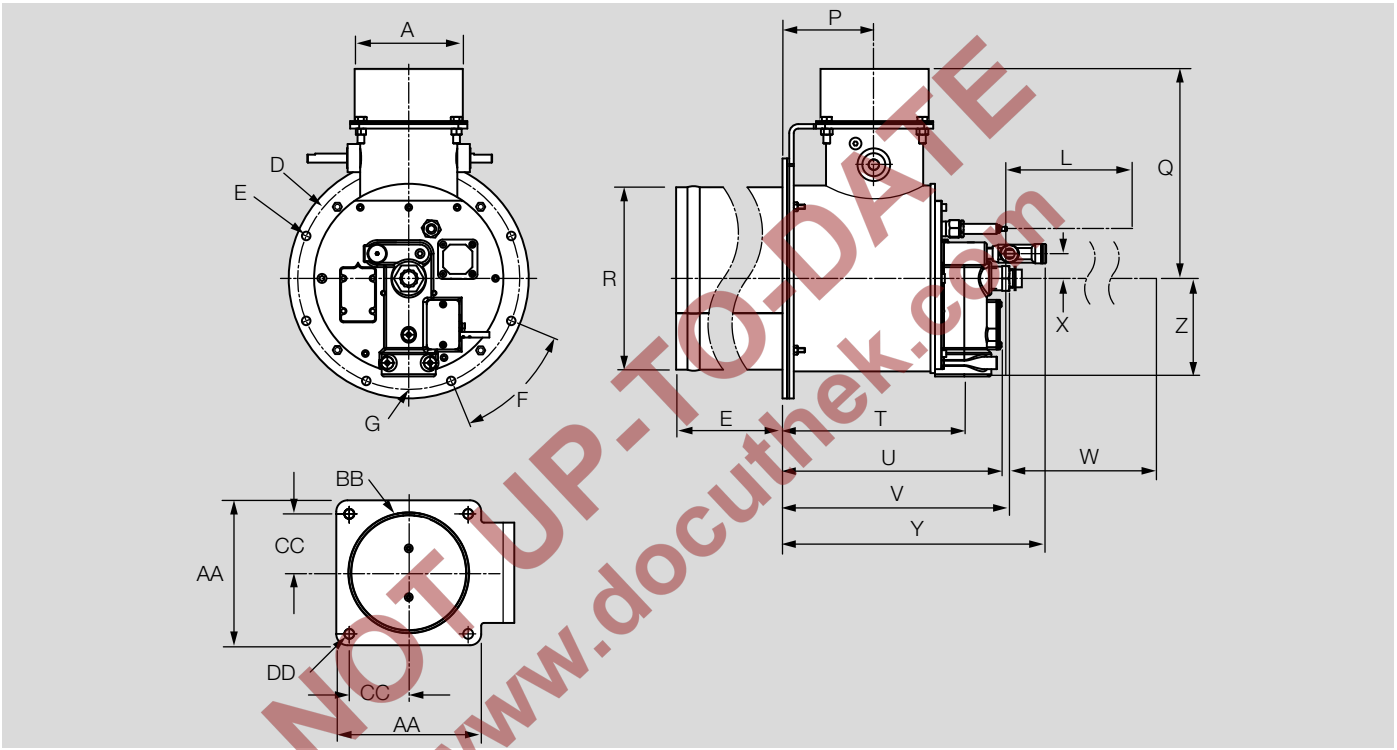


Dimensions in inches unless stated otherwise

Model	A	D	E	F	G	H	L	P	Q	R	S Std.	S Short	S Ref. lined
EB65	6.0	12.31	0.475	45°	2" NPT	2.375	7.0	5.11	11.62	10.24	16.0	8.75	7.875

Model	T	U	V	W	X	Y	Z	AA	BB	CC	DD	Weight lbs
EB65	10.08	11.90	12.59	24.5	1.38	14.62	5.44	6.50	5.18	2.65	0.438	65

9.10 OPLE EB65 (metric)

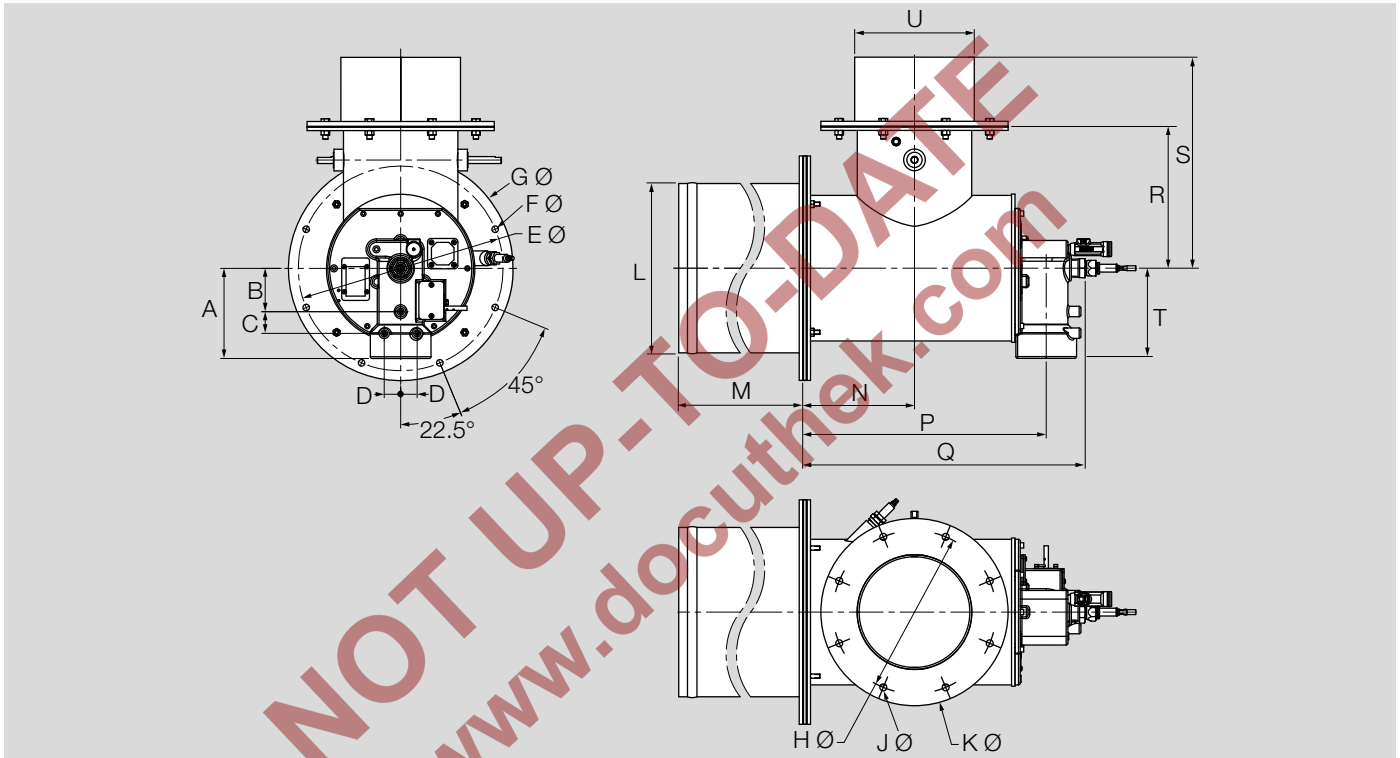


Dimensions in mm unless stated otherwise

Model	A	D	E	F	G	H	L	P	Q	R	S Std.	S Short	S Ref. lined
EB65	152	313	12	45°	2" NPT	60	178	130	295	260	406	222	200

Model	T	U	V	W	X	Y	Z	AA	BB	CC	DD	Weight kg
EB65	256	302	320	622	35	371	138	165	132	67	11	30

9.11 OPLE EB100 (imperial)

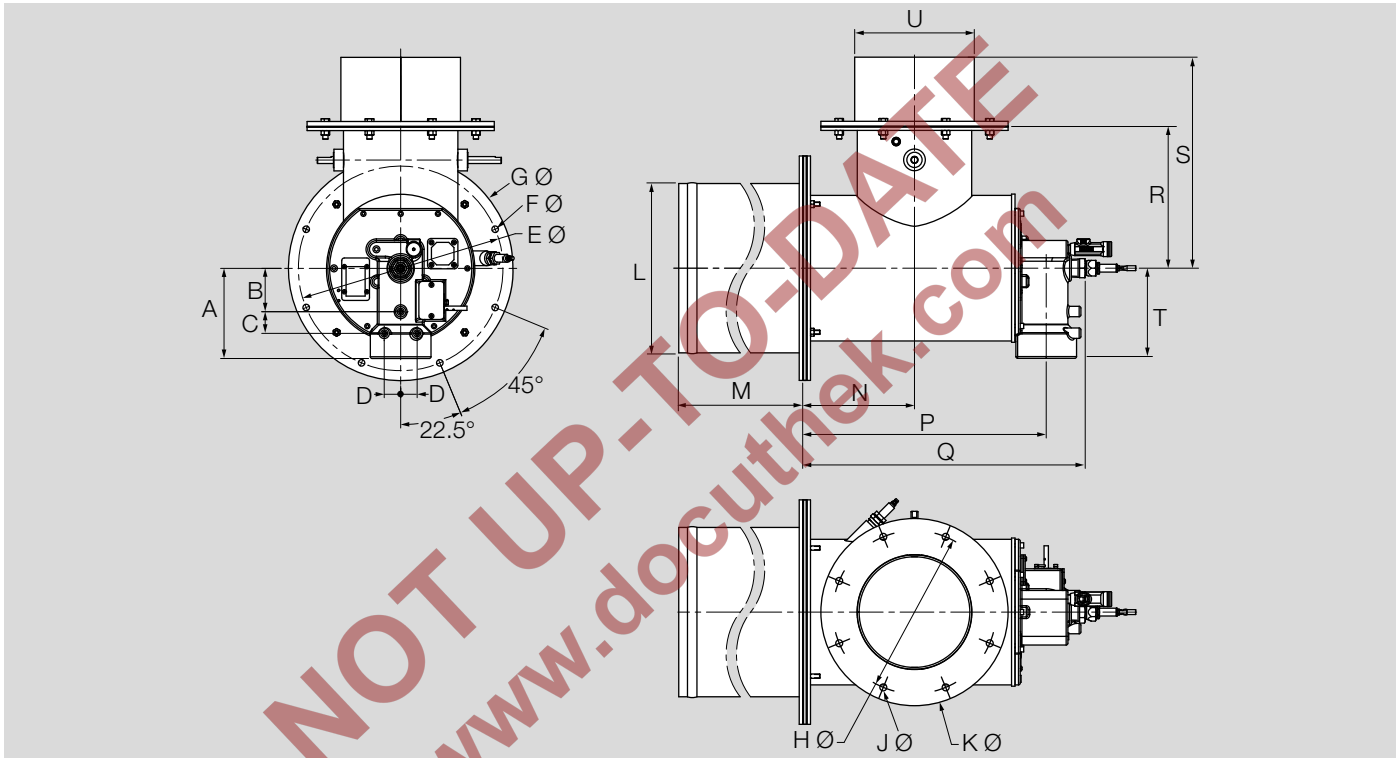


Dimensions in inches unless stated otherwise

Model	A	B	C	D	E Ø	F Ø	G Ø	H Ø	J Ø	K Ø
EB100	6.5	3.12	1.56	1.19	14.75	0.47	16.19	11.75	0.50	13.5

Model	L Ø	L Ø Ref. lined	M	M Short	M Ref. lined	N	P	Q	R	S	T	U Ø	Weight lbs
EB100	12.33	16.21	27.75	17.75	11.75	8.06	17.56	20.38	10.22	15.22	6.5	8.62	65

9.12 OPLE EB100 (metric)



Dimensions in mm unless stated otherwise

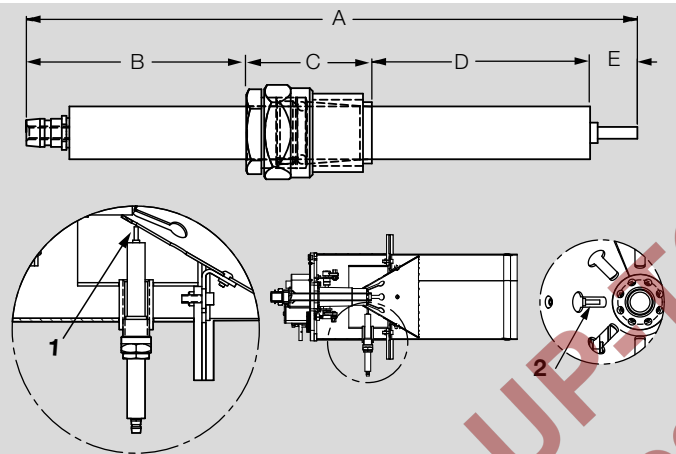
Model	A	B	C	D	E Ø	F Ø	G Ø	H Ø	J Ø	K Ø
EB100	165	79	40	30	375	12	411	298	13	343

Model	L Ø	L Ø Ref. lined	M	M Short	M Ref. lined	N	P	Q	R	S	T	U Ø	Weight kg
EB100	313	412	705	451	298	205	446	518	260	386	165	219	30

9.13 Accessories

9.13.1 Spark ignitors

OPLE5–25, OPLE EB40



Legend

1 Set spark ignitor flush with outside of mixing cone

2 Spark ignitor

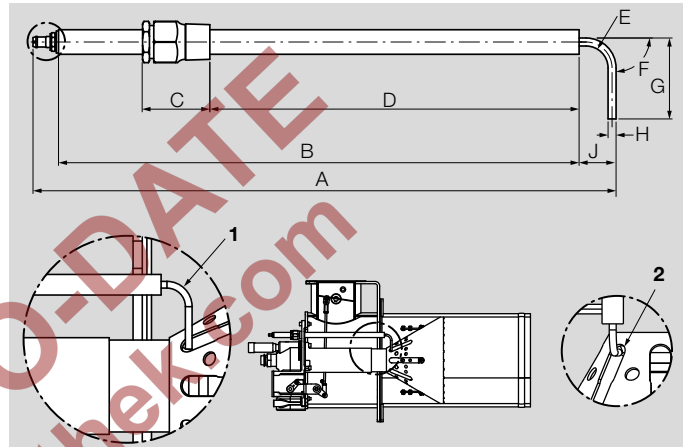
imperial

Dimensions in inches unless stated otherwise					
Burner model	A	B	C	D	E
OPLE5–25, OPLE EB40	6.5	1.9	1.34	2.65	0.50

metric

Dimensions in mm unless stated otherwise					
Burner model	A	B	C	D	E
OPLE5–25, OPLE EB40	164	48	34	67	13

OPLE30–45, OPLE EB65



Legend

1 Set spark ignitor electrode 1/8"–3/16" [3 mm–5 mm] from side of slot in mixing cone

2 Spark ignitor to be located within mixing cone slot, and at least 1/8" [3 mm] from edge of slot

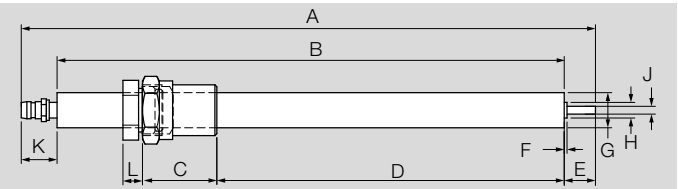
imperial

Dimensions in inches unless stated otherwise									
Burner model	A	B	C	D	E	F	G Ø	H Ø	J Ø
OPLE30–45, OPLE EB65	13.4	12	1.5	8.4	0.5	90°	1.8	0.2	0.8

metric

Dimensions in mm unless stated otherwise									
Burner model	A	B	C	D	E	F	G Ø	H Ø	J Ø
OPLE30–45, OPLE EB65	341	305	39	213	13	90°	47	5	21

OPLE70, OPLE EB100



imperial

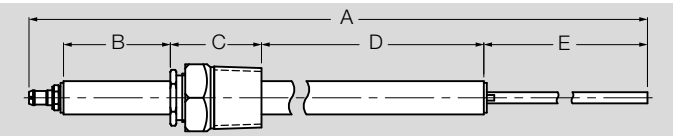
Dimensions in inches unless stated otherwise											
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**GØ**	**HØ**	**JØ**	**K**	**L**
OPLE70, OPLE EB100	9.3	8.3	1.2	5.7	0.5	0.05	0.6	0.3	0.1	0.6	0.3

metric

Dimensions in mm unless stated otherwise											
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**GØ**	**HØ**	**JØ**	**K**	**L**
OPLE70, OPLE EB100	236	210	30	145	13	1	14	6	3	15	8

9.13.2 Flame rods

OPLE5–45, OPLE EB40 and OPLE EB65



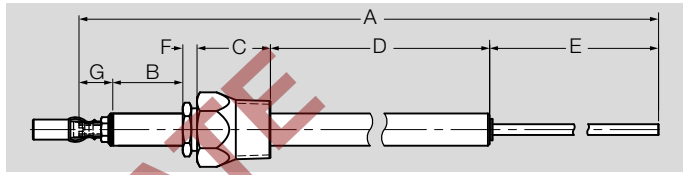
imperial

Dimensions in inches unless stated otherwise					
Burner model	A	B	C	D	E
OPLE5–25, OPLE EB40	21.3	1.7	1.5	8.6	9
OPLE30–45, OPLE EB65	26.46	2.6	1.53	12.75	9

metric

Dimensions in mm unless stated otherwise					
Burner model	A	B	C	D	E
OPLE5–25, OPLE EB40	542	42	40	218	230
OPLE30–45, OPLE EB65	672	66	40	324	230

OPLE70, OPLE EB100



imperial

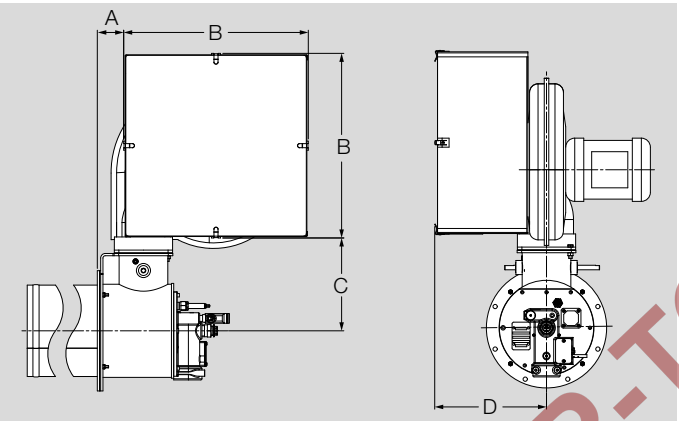
Dimensions in inches unless stated otherwise							
Burner model	A	B	C	D	E	F	G
OPLE70, OPLE EB100	32.7	1.2	1.3	20.3	9	0.3	0.6

metric

Dimensions in mm unless stated otherwise							
Burner model	A	B	C	D	E	F	G
OPLE70, OPLE EB100	830	31	33	516	230	6	15

9.13.3 Filter-silencer

OPLE5–45



Burner model	dB(A)*	dB(A)* with silencer
OPLE5	80	78
OPLE10	85	81
OPLE13	85.7	81
OPLE15	86.1	82
OPLE25	87.2	84
OPLE30	89.3	82
OPLE35	89.5	82
OPLE40	89.5	82
OPLE45	88	83
OPLE70	94.2	84

** dB(A) measured at 39" [1 m] to burner center*

imperial

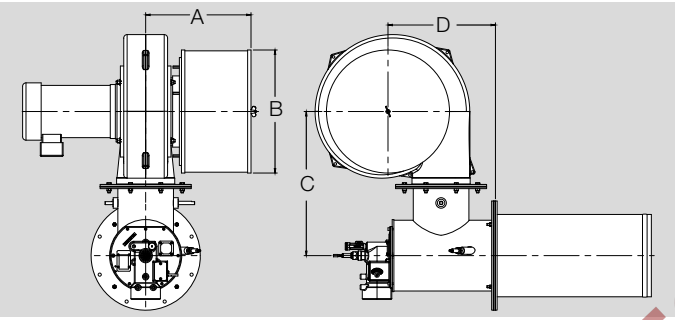
Dimensions in inches unless stated otherwise				
Burner model	A	B	C	D
OPLE5	2.09	20.44	9.34	12.38
OPLE10	2.09	20.44	9.34	12.38
OPLE13	1.18	20.44	8.59	13.92
OPLE15	2.09	20.44	9.34	12.38
OPLE25	2.09	20.44	9.34	12.38
OPLE30	2.92	20.44	10.28	12.38
OPLE35	2.17	24.44	9.40	12.67
OPLE40	2.17	24.44	9.40	12.67
OPLE45	2.95	24.44	10.59	13.57

metric

Dimensions in mm unless stated otherwise				
Burner model	A	B	C	D
OPLE5	53	519	237	314
OPLE10	53	519	237	314
OPLE13	30	519	218	354
OPLE15	53	519	237	314
OPLE25	53	519	237	314
OPLE30	74	519	261	314
OPLE35	55	621	239	322
OPLE40	55	621	239	322
OPLE45	75	621	269	345

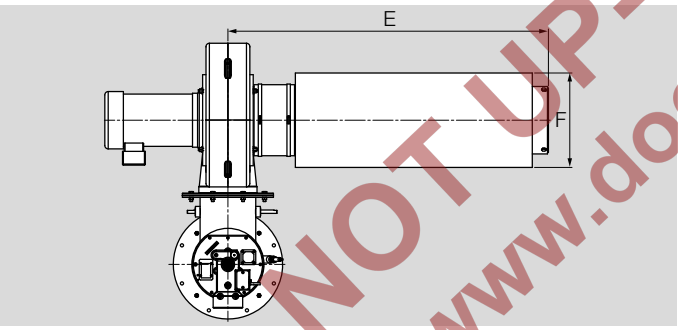
OPLE70

Filter option



Silencer option

Customer needs to supply extra support for silencer



Silencer weight 81 lbs (36.7 kg)

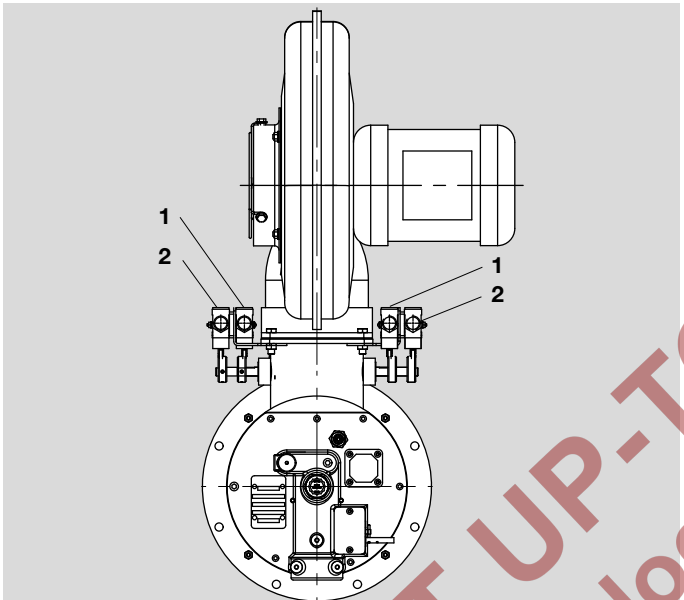
imperial

Dimensions in inches unless stated otherwise						
Burner model	A	B Ø	C	D	E	F Ø
OPLE70	15.62	18.25	21.38	15.94	47.52	14

metric

Dimensions in mm unless stated otherwise						
Burner model	A	B Ø	C	D	E	F Ø
OPLE70	396	464	543	405	1207	356

9.13.4 Typical hi/lo position switches

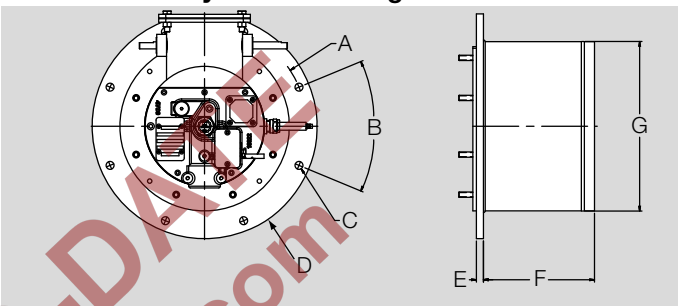


Legend

1 Lo position switch

2 Hi position switch

9.13.5 Refractory lined discharge sleeve



Note: Install refractory-lined sleeve so that metal sleeve is fully covered with insulation.

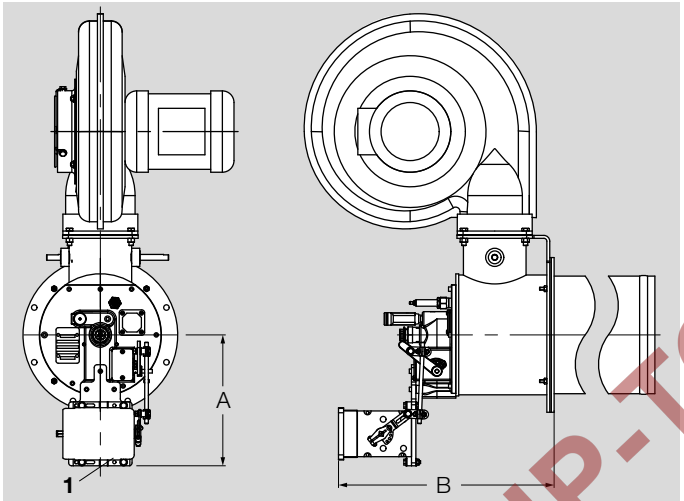
imperial

Dimensions in inches unless stated otherwise							
Burner model	A Ø	B	C Ø	D Ø	E	F	G Ø
OPLE5–10	14.5	45°	0.562	15.937	0.375	7.875	12.12
OPLE13–25, OPLE EB40	14.5	45°	0.562	15.937	0.50	7.875	12.12
OPLE30–45, OPLE EB65	16.531	45°	0.562	18.0	0.50	7.875	14.13
OPLE70, OPLE EB100	18.75	45°	0.47	20.19	0.375	11.75	16.21

metric

Dimensions in mm unless stated otherwise							
Burner model	A Ø	B	C Ø	D Ø	E	F	G Ø
OPLE5–10	368	45°	14	405	10	200	308
OPLE13–25, OPLE EB40	368	45°	14	405	13	200	308
OPLE30–45, OPLE EB65	420	45°	14	457	13	200	359
OPLE70, OPLE EB100	476	45°	12	513	10	298	412

9.13.6 Honeywell Modutrol



Legend

1 Control motor

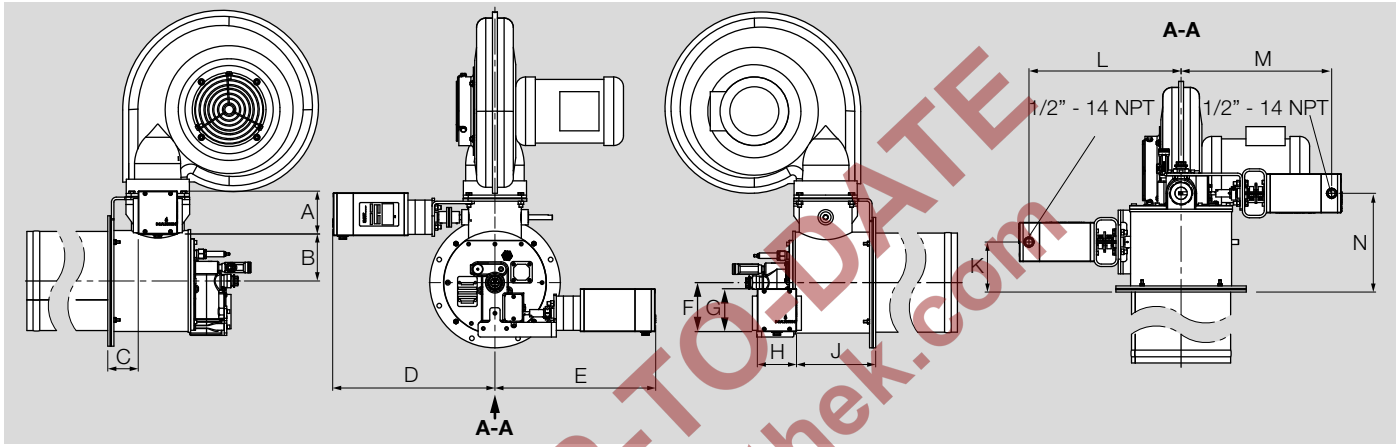
imperial

Dimensions in inches unless stated otherwise		
Burner model	**A**	**B**
OPLE5–25	10.26	17.00
OPLE30–45 (shown)	11.26	18.55
OPLE70	11.26	26.72

metric

Dimensions in mm unless stated otherwise		
Burner model	**A**	**B**
OPLE5–25	261	432
OPLE30–45 (shown)	286	471
OPLE70	286	678

9.13.7 SMARTLINK MRV



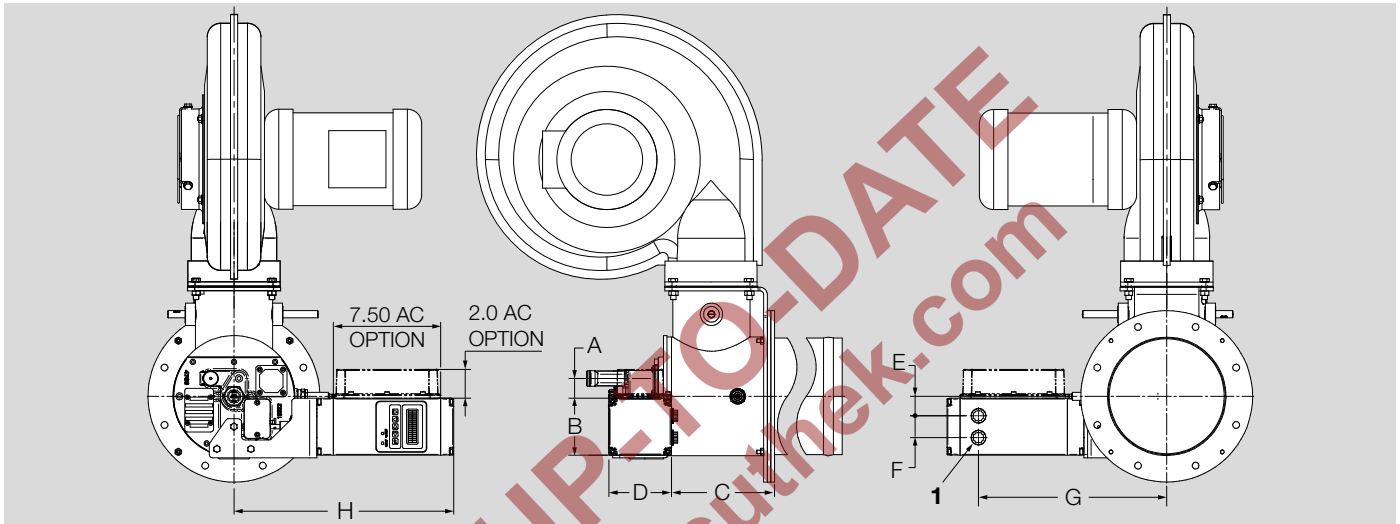
imperial

Dimensions in inches unless stated otherwise													
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**
OPLE5–25	4.38	3.86	2.28	16.57	16.42	4.38	4.0	4.0	6.94	4.28	15.53	15.38	8.94
OPLE30–45 (shown)	4.38	4.8	3.11	16.57	16.42	5.0	4.38	4.0	8.08	5.11	15.53	15.38	10.08
OPLE70	4.38	9.69	6.06	17.86	16.46	5.38	4.38	4.0	15.56	8.06	15.45	16.85	17.56

metric

Dimensions in mm unless stated otherwise													
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**J**	**K**	**L**	**M**	**N**
OPLE5–25	111	98	58	420	417	111	102	102	176	109	394	390	227
OPLE30–45 (shown)	111	122	79	420	417	127	111	102	205	130	394	390	256
OPLE70	111	246	154	454	418	136	111	102	395	205	392	428	446

9.13.8 SMARTLINK DS CV



Legend

1 General purpose: 2x ø 0.88 (for 1/2" conduit), Hazardous location: 2x 1/2" NPT

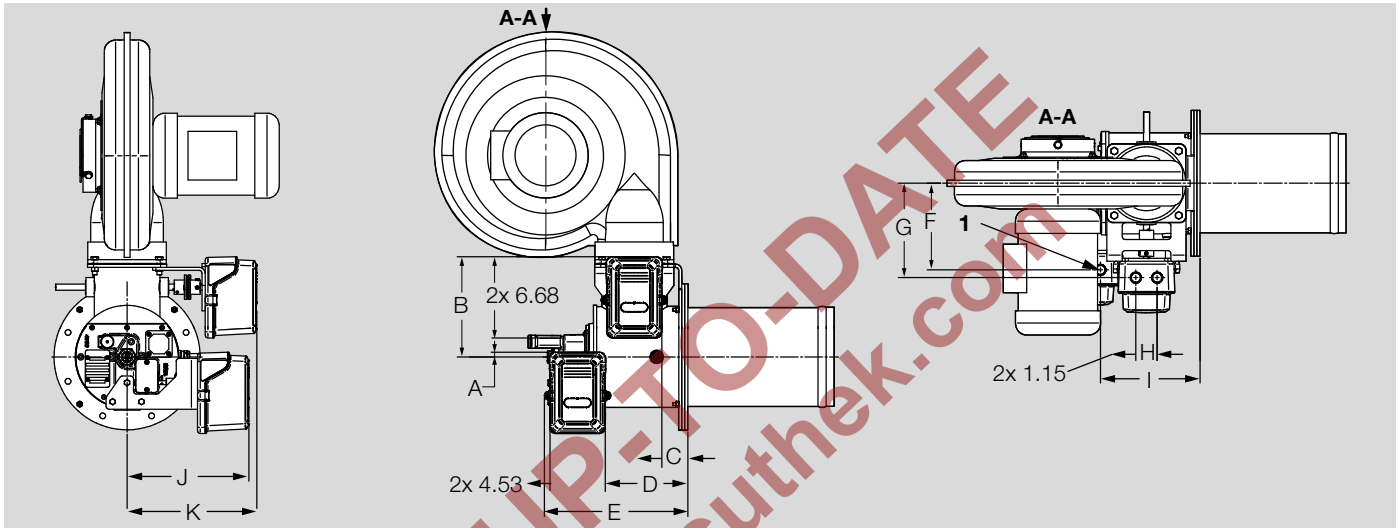
imperial

Dimensions in inches unless stated otherwise								
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
OPLE5–25 (shown)	0.12	4.00	6.79	4.38	1.36	1.53	13.15	15.34
OPLE30–45	1.12	4.00	8.33	4.38	2.36	1.53	13.27	15.47
OPLE70	0.88	4.00	15.93	4.38	2.12	1.53	13.71	15.90

metric

Dimensions in mm unless stated otherwise								
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**
OPLE5–25 (shown)	3	102	172	111	34.5	38.9	334	390
OPLE30–45	28,4	102	212	111	59.9	38.9	337	393
OPLE70	22,4	102	405	111	53.8	38.9	348	404

9.13.9 SLATE LTA MRV



legend

1 1/2" Conduit knockouts

imperial

Dimensions in inches unless stated otherwise											
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
OPLE5–25 (shown)	0.38	8.24	2.13	6.80	11.79	7.13	7.77	3.52	8.19	10.02	10.65
OPLE30–45	0.62	9.18	2.97	7.94	12.93	7.25	7.77	4.36	9.33	10.14	10.65
OPLE70	0.37	10.32	6.05	15.55	20.54	7.69	9.09	7.44	16.94	10.58	11.97

metric

Dimensions in mm unless stated otherwise											
Burner model	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**
OPLE5–25 (shown)	9.7	8.24	209	173	299	181	197	89.4	208	255	271
OPLE30–45	15.7	233	75.4	202	328	184	197	111	237	258	271
OPLE70	9.4	262	154	395	522	195	231	189	430	269	304

10 Spare Parts

The web app PartDetective for selecting spare parts is available at www.adlatus.org.

11 Converting units

See www.adlatus.org

For more information

The Honeywell Thermal Solutions family of products includes Honeywell Combustion Safety, Eclipse, Exothermics, Hauck, Kromschröder and Maxon. To learn more about our products, visit ThermalSolutions.honeywell.com or contact your Honeywell Sales Engineer.

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