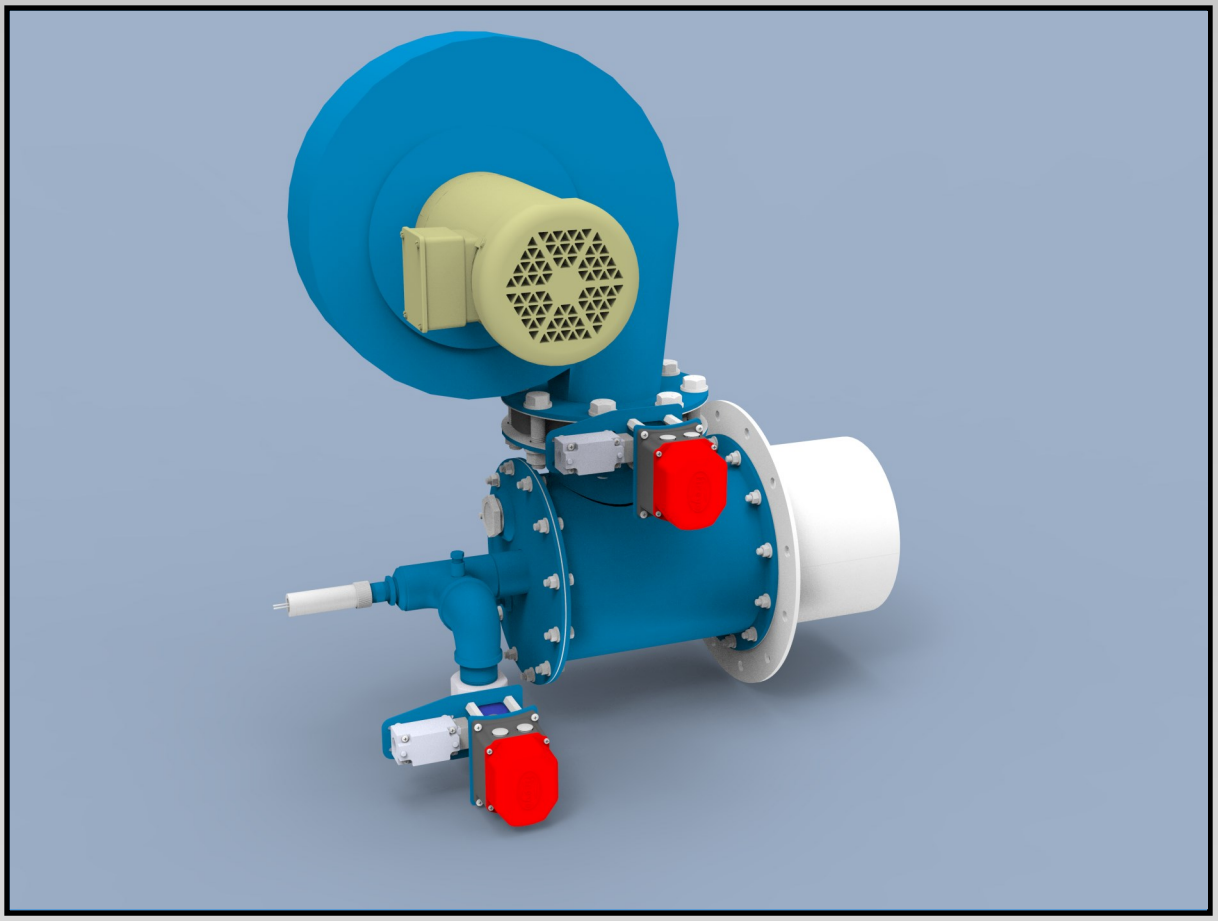
STARCOMBUSTION SYSTEMS LLC

Mason, OH | USA
+1-513-282-0810
STARCOMBUSTION.COM

STAR | PAC

PACKAGED AIR HEATING BURNER

TECHNICAL GUIDE



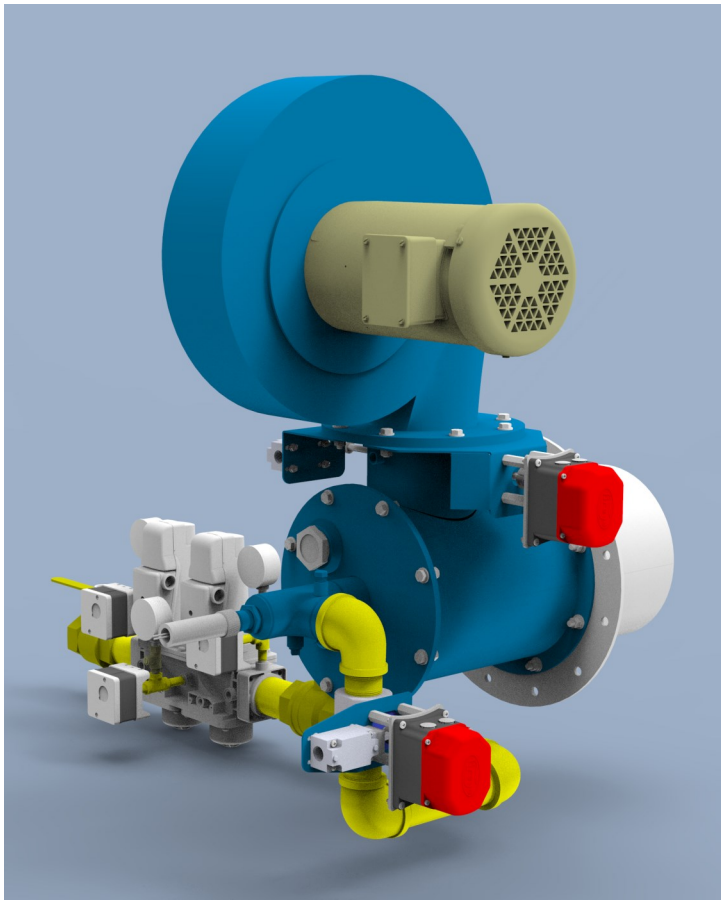
- ⇒ Integral combustion air fan and high precision air/fuel ratio control valves for ease of application
- ⇒ Low NOx and CO emissions
- ⇒ Simple set up and adjustment
- ⇒ Fast mixing flame with excellent stability in a wide variety of combustion chamber conditions
- ⇒ Mounting designed for an excellent seal in a wide variety of combustion chamber pressures

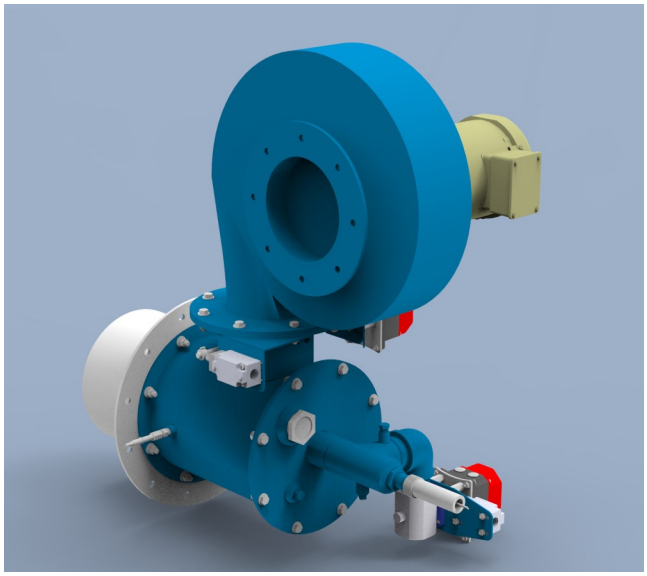
Mason, OH | USA
+1-513-282-0810
starcombustion.com

Features

The Star|Pac burner is an extremely flexible, packaged burner designed for low temperature air heating applications. The burner is packaged with a combustion air fan and air/fuel ratio control valves as standard, and can optionally be supplied with built on fuel train and burner management controls for a turn key burner package.

- Packaged burner sizes range from 250,000 btu/hr to 30,000,000 btu/hr
- Intense air and fuel mixing provides stable combustion with low NOx, CO, and aldehyde emissions over a wide range of firing rates
- 40:1 turndown from maximum to minimum capacity when running on gas
- A variety of air fuel ratio control options include linked valves using a single actuator, a high precision parallel positioning system for characterized control of air/fuel ratio, or the burner can be ordered without air/fuel ratio control valves
- Burns any clean fuel gas including natural gas, propane gas, butane gas, and propane/air mix
- Combustion chamber temperatures to 1500°F
- Direct spark or pilot ignition options
- Worldwide use with NPT or BSP/ISO connections as well as 60Hz or 50Hz combustion air fan motors





Typical Applications

- Direct fired air heaters
- Industrial ovens
- Paint finishing lines
- Rotary dryers
- Fluid bed dryers
- Spray dryers
- Grain dryers
- Indirect fired thermal fluid heaters and boilers
- Indirect fired air heaters
- Virtually any other direct or indirect fired air heating application

Mason, OH | USA
+1-513-282-0810
starcombustion.com

STAR | PAC—SPECIFICATIONS 60Hz

Star|Pac Burner Size	0025	0050	0100	0150	0200
Maximum Capacity (btu/hr HHV)	250,000	500,000	1,000,000	1,500,000	2,000,000
Minimum Capacity (btu/hr HHV)	10,000	15,000	25,000	37,500	50,000
Combustion Air Differential Pressure ("wc)	12.0	12.0	12.0	12.0	12.0
Combustion Air Flow (scfh, 15% Excess Air)	2,786	5,572	11,144	16,716	22,288
Combustion Air Fan Horsepower	1/2HP	1/2HP	1-1/2HP	1-1/2HP	2HP
Natural Gas Differential Pressure ("wc)	10.0	10.0	10.0	10.0	10.0
Natural Gas Flow (scfh, 1002 btu/ft^3, 0.6 sg)	250	499	998	1,497	1,996
Flame Length, approx (in)	6	6	9	9	12
Flame Diameter, approx (in)	6	6	8	8	10

Star|Pac Burner Size	0300	0400	0500	0750	1000
Maximum Capacity (million btu/hr HHV)	3,000,000	4,000,000	5,000,000	7,500,000	10,000,000
Minimum Capacity (million btu/hr HHV)	75,000	100,000	125,000	187,500	250,000
Combustion Air Differential Pressure ("wc)	12.0	12.0	12.0	12.0	12.0
Combustion Air Flow (scfh, 15% Excess Air)	33,433	44,577	55,721	83,582	111,442
Combustion Air Fan Horsepower	2HP	3HP	5HP	7-1/2HP	10HP
Natural Gas Differential Pressure ("wc)	10.0	10.0	10.0	10.0	10.0
Natural Gas Flow (scfh, 1002 btu/ft^3, 0.6 sg)	2,994	3,992	4,990	7,485	9,980
Flame Length, approx (in)	18	24	30	45	60
Flame Diameter, approx (in)	10	12	12	14	14

Star|Pac Burner Size	1250	1500	2000	2500	3000
Maximum Capacity (million btu/hr HHV)	12,500,000	15,000,000	20,000,000	25,000,000	30,000,000
Minimum Capacity (million btu/hr HHV)	315,000	375,000	500,000	625,000	750,000
Combustion Air Differential Pressure ("wc)	12.0	12.0	12.0	12.0	12.0
Combustion Air Flow (scfh, 15% Excess Air)	139,303	167,163	222,884	278,605	334,326
Combustion Air Fan Horsepower	10HP	15HP	20HP	30HP	40HP
Natural Gas Differential Pressure ("wc)	10.0	10.0	10.0	10.0	10.0
Natural Gas Flow (scfh, 1002 btu/ft^3, 0.6 sg)	12,475	14,970	19,960	24,950	29,940
Flame Length, approx (in)	60	60	80	100	120
Flame Diameter, approx (in)	18	18	26	26	26

The above calculations are determined using the following data:

1) Capacities shown are for a balanced combustion chamber (0"wc back pressure), consult Star Combustion for other combustion chamber conditions.
2) Flame lengths are approximate and are measured from the end of the combustion sleeve firing with 15% excess air on natural gas, consult Star Combustion for flame lengths using other fuels
3) Natural gas (Birmingham, AL) with HHV of 1002 btu/ft3, 0.6 specific gravity, and 9.4:1 stoichiometric air fuel ratio
4) Air and gas flows are based on operating conditions at standard temperature and pressures: 68°F ambient air at sea level

Mason, OH | USA
+1-513-282-0810
STARCOMBUSTION.COM

STAR|PAC—MODEL NUMBER

STAR|PAC (I) (II) (III) - (IV) (V) (VI) (VI) - (VII) (VIII) (IX)

TABLE I - Burner Size

Abbreviation	Definition
0025	250,000 btu/hr HHV
0050	500,000 btu/hr HHV
0100	1,000,000 btu/hr HHV
0150	1,500,000 btu/hr HHV
0200	2,000,000 btu/hr HHV
0300	3,000,000 btu/hr HHV
0400	4,000,000 btu/hr HHV
0500	5,000,000 btu/hr HHV
0750	7,500,000 btu/hr HHV
1000	10,000,000 btu/hr HHV
1250	12,500,000 btu/hr HHV
1500	15,000,000 btu/hr HHV
2000	20,000,000 btu/hr HHV
2500	25,000,000 btu/hr HHV
3000	30,000,000 btu/hr HHV

TABLE II - Fuel

Abbreviation	Definition
G	Natural Gas
P	Propane gas
X	All other gaseous fuels
O	Dual fuel - natural gas and fuel oil

TABLE III - Pilot Configuration

Abbreviation	Definition
D	Direct spark ignition
P	Standard pilot, including adjustable orifice

TABLE IV - Flame Sensing

Abbreviation	Definition
F	Flame ionization rod included
U	UV scanner, customer supplied

TABLE V - Connections

Abbreviation	Definition
US	NPT connections
EU	BSP/ISO threaded connections

TABLE VI - Combustion Sleeve

Abbreviation	Definition
S	Standard sleeve, applications <1000°F
H	High temp sleeve, applications <1200°F
I	Standard sleeve, modified for indirect firing
R	Refractory lined sleeve, applications <1500°F

TABLE VII - Air/Fuel Ratio Control Valves

Abbreviation	Definition
S	Star|Linc parallel positioning system with actuators
P	Control valves included, order actuator brackets sep
L	Mechanically linked valves, order actuator bracket sep
A	Air valve only, order actuator bracket separately
F	Fuel valve only, order actuator bracket separately
N	No air/fuel ratio control valves included

TABLE VIII - Combustion Air Fan

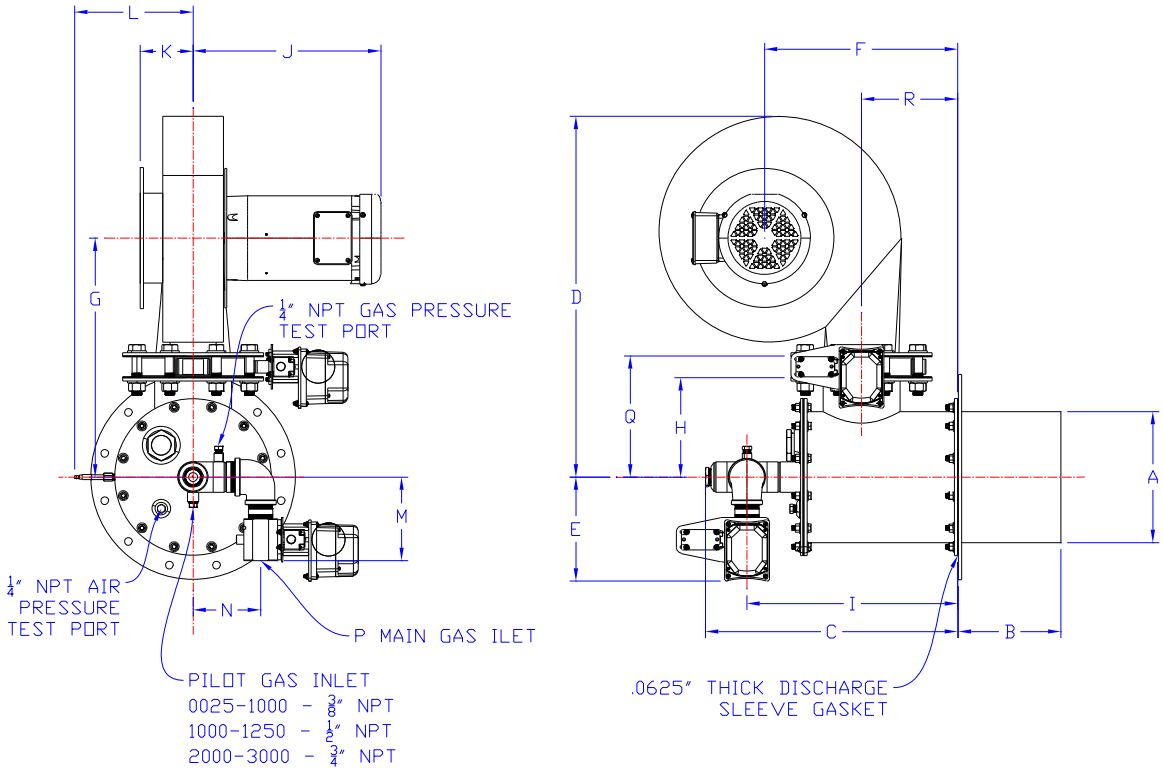
Abbreviation	Definition
AR	230/480/3/60 motor positioned on the right
AL	230/460/3/60 motor positioned on the left
CR	575/3/60 motor positioned on the right
CL	575/3/60 motor positioned on the left
WR	380/3/50 motor positioned on the right
WL	380/3/50 motor positioned on the left
XR	Special voltage motor positioned on the right
XL	Special voltage motor positioned on the left
N	No combustion air fan included

TABLE IX - Position switches

Abbreviation	Definition
B	Purge and lightoff position switches included
P	Purge position switch included
L	Lightoff position switch included
N	No position switches included

Mason, OH | USA
+1-513-282-0810
starcombustion.com

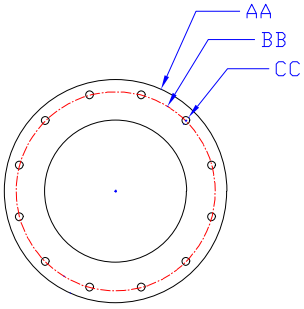
STAR | PAC–DIMENSIONS



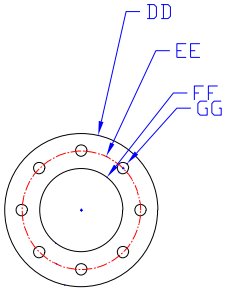
Size	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	R
0025	4.218	7.750	13.125	21.695	6.625	10.625	14.320	5.000	11.625	11.000	3.188	4.500	5.000	3.250	1/2	6.695	5.000
0050	4.218	7.750	13.125	21.695	6.625	10.625	14.320	5.000	11.625	11.000	3.188	4.500	5.000	3.250	3/4	6.695	5.000
0100	6.218	7.750	15.625	23.563	7.125	15.063	16.883	6.000	12.625	13.688	4.125	5.500	5.500	3.250	1	7.695	7.500
0150	6.218	7.750	15.625	23.563	7.125	15.063	16.883	6.000	12.625	14.563	4.125	5.500	5.500	3.250	1	7.695	7.500
0200	8.218	7.750	18.625	24.563	7.625	15.063	17.883	7.000	14.000	14.563	4.125	6.500	6.000	4.250	1-1/4	8.695	7.500
0300	8.218	7.750	18.625	24.563	7.625	15.063	17.883	7.000	14.000	14.563	4.125	6.500	6.000	4.250	1-1/4	8.695	7.500
0400	10.218	7.750	20.000	28.250	8.125	15.375	18.688	8.000	16.750	14.688	4.125	7.500	6.500	5.250	1-1/2	9.695	8.000
0500	10.218	7.750	20.000	28.250	8.125	15.375	18.688	8.000	16.750	14.688	4.125	7.500	6.500	5.250	1-1/2	9.695	8.000
0750	12.218	7.750	22.000	32.256	8.625	16.875	21.820	9.000	18.750	19.375	5.125	8.500	7.000	6.250	2	10.695	9.000
1000	12.218	7.750	22.000	32.256	8.625	16.875	21.820	9.000	18.750	20.250	5.125	8.500	7.000	6.250	2	10.695	9.000
1250	16.218	7.750	24.000	37.941	9.625	20.875	24.878	11.000	20.750	23.125	5.5625	10.500	8.000	8.250	2-1/2	12.695	11.000
1500	16.218	7.750	24.000	37.941	9.625	20.875	24.878	11.000	20.750	23.125	5.5625	10.500	8.000	8.250	2-1/2	12.695	11.000
2000	24.218	11.750	28.000	41.946	11.625	23.875	28.883	15.000	22.750	23.125	5.563	14.500	10.000	12.250	3	16.695	14.000
2500	24.218	11.750	28.000	54.008	11.625	28.500	37.695	15.000	22.750	27.125	7.250	14.500	10.000	12.250	3	16.695	14.000
3000	24.218	11.750	28.000	56.008	11.625	28.500	39.695	15.000	22.750	29.000	7.250	14.500	10.000	12.250	3	16.695	14.000

Dimension listed are for general use should not be used for installation drawings. Certified drawings should be obtained from Star Combustion Systems LLC to prevent any confusion or inaccuracies. Dimensions in the catalog are subject to change without notice.

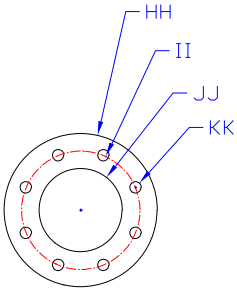
STAR | PAC–DIMENSIONS



BURNER DISCHARGE SLEEVE MOUNTING FLANGE



COMBUSTION AIR FAN INLET FLANGE (BOLT HOLES START AT TOP DEAD CENTER)



BURNER AIR INLET FLANGE AND COMBUSTION AIR FAN OUTLET FLANGE (BOLT HOLES STRADDLE TOP DEAD CENTER)

Size	AA	BB	CC	#	DD	EE	FF	GG	#	HH	II	JJ	KK	#
0025	9.000	3.750	0.750	8	9.000	7.500	0.75	4	8	10.000	8.500	5	0.875	8
0050	9.000	3.750	0.750	8	9.000	7.500	0.75	4	8	10.000	8.500	5	0.875	8
0100	11.000	9.500	0.875	8	11.000	9.500	0.875	6	8	11.000	9.500	7	0.875	8
0150	11.000	9.500	0.875	8	11.000	9.500	0.875	6	8	11.000	9.500	7	0.875	8
0200	13.500	11.750	0.875	8	11.000	9.500	0.875	6	8	11.000	9.500	7	0.875	8
0300	13.500	11.750	0.875	8	11.000	9.500	0.875	6	8	11.000	9.500	7	0.875	8
0400	16.000	14.250	1.000	12	11.000	9.500	0.875	6	8	11.000	9.500	7	0.875	8
0500	16.000	14.250	1.000	12	11.000	9.500	0.875	6	8	11.000	9.500	7	0.875	8
0750	19.000	17.000	1.000	12	13.500	11.750	0.875	8	8	16.000	14.250	10	1.0	12
1000	19.000	17.000	1.000	12	13.500	11.750	0.875	8	8	16.000	14.250	10	1.0	12
1250	23.500	21.250	1.125	16	13.500	11.750	0.875	8	8	16.000	14.250	10	1.0	12
1500	23.500	21.250	1.125	16	13.500	11.750	0.875	8	8	16.000	14.250	10	1.0	12
2000	32.000	29.500	1.375	20	13.500	11.750	0.875	8	8	16.000	14.250	10	1.0	12
2500	32.000	29.500	1.375	20	19.000	17.000	1.000	12	12	19.000	17.000	1.000	12	12
3000	32.000	29.500	1.375	20	19.000	17.000	1.000	12	12	19.000	17.000	1.000	12	12

Dimension listed are for general use should not be used for installation drawings. Certified drawings should be obtained from Star Combustion Systems LLC to prevent any confusion or inaccuracies. Dimensions in the catalog are subject to change without notice.

Mason, OH | USA
+1-513-282-0810
starcombustion.com

STAR | PAC–INSTALLATION

Please read all installation and commissioning instructions before proceeding with installation.

***** IMPORTANT *****

Installation and commissioning should only be done by properly trained and qualified personnel. Failure to do so can result in significant property damage, and injury or death to personnel. Follow all applicable piping and gas safety codes when installing and commissioning this system.

The Star|Pac burner is an integral part of an industrial drying, curing, or air heating process. Combustion chamber, system fans, fuel train, burner management, temperature controls, high temperature limit, and corresponding ductwork must be supplied to compete the heating system for the drying, curing, or air heating operation.

The Star|Pac may require external support. Use a support positioned near the back of the burner to the floor in sizes 1000 and larger, and also in instances where the heater wall is not robust enough to support the burner.

A wall gasket should be used between the discharge sleeve and the heater wall. This is especially important for instances where there is a back pressure in the combustion chamber.

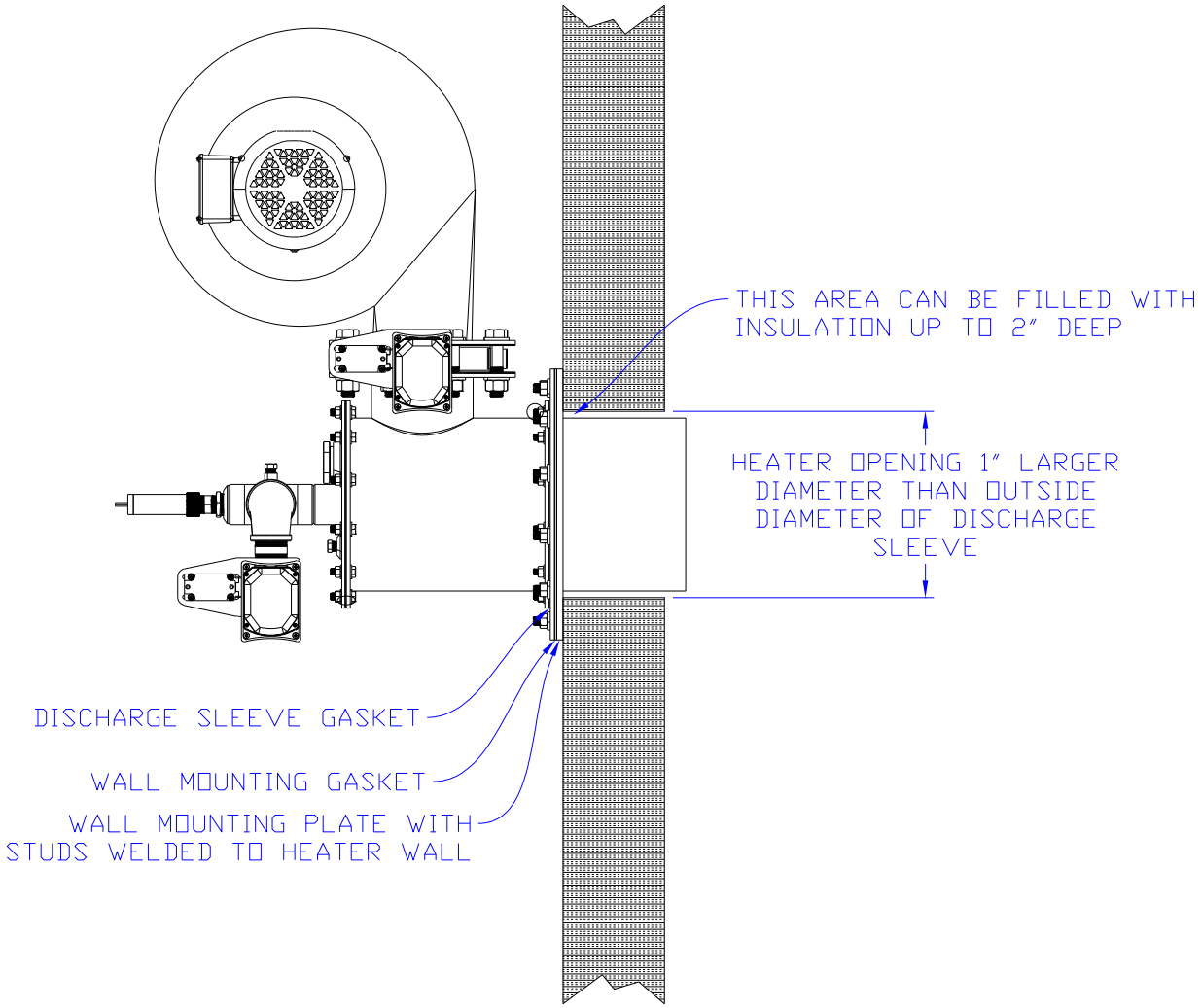
The Star|Pac burner can be mounted and fired in any direction. If up firing the burner, care should be taken so that debris cannot fall into the burner and cause blockage of the air or gas nozzle.

Contact Star Combustion Systems LLC at +1-513-282-0810 or service@starcombustion.com for questions or further information.

Mason, OH | USA
+1-513-282-0810
starcombustion.com

STAR | PAC–INSTALLATION

Mount the Star|Pac burner as show below. The burner may require external support for sizes 1000 and larger or if the heater wall is not strong enough to support the burner weight. Supports are not provided by Star Combustion Systems.



STAR | PAC–COMMISSIONING

***** IMPORTANT *****

Installation and commissioning should only be done by properly trained and qualified personnel. Failure to do so can result in significant property damage, and injury or death to personnel. Follow all applicable piping and gas safety codes when installing and commissioning this system.

Observe all appropriate safety standards when working on equipment including lockout/tagout/try and confined space entry procedures. NEVER bypass any interlock designed for the safe operation of the burner system.

Once proper installation has been verified, including a fuel train, burner management system with high temperature limit, process fans, temperature controls, etc, commissioning can take place. Assure the fuel supply line has been purged up to the fuel train inlet, all system fans have been tested and are rotating in the correct direction, and that all wiring between the Star|Pac burner, fuel train, and burner management system are in place and verified correct. Verify the temperature control and high temperature limit controller sensors are installed and verified working properly.

Verify fuel supply pressure at the inlet of the fuel train is correct according to the fuel train and regulator design. DO NOT ATTEMPT TO LIGHT BURNER IF FUEL SUPPLY PRESSURE IS GREATER THAN THE DESIGN MAX PRESSURE FOR THE FUEL TRAIN, DAMAGE TO REGULATOR MAY RESULT. Contact Star Combustion Systems for further instruction if fuel supply pressure is not within range.

Verify the process, exhaust, and/or combustion air fans are operating properly and in the correct direction. Most fans will have a direction arrow to indicate correct direction. Bump each motor on for a second or so and observe the rotation direction, reverse the direction as necessary, according to the motor wiring.

Verify process air pressure switches are adjusted to a differential pressure that will allow the switch to function during commissioning. Adjust each switch as necessary to get the switch to satisfy the burner management interlocks as necessary.

Provide initial adjustments to low and high gas pressure switches. Remove cover to low and high gas pressure switches, adjust low and high gas pressure switches to a safe pressure setting but one that will prevent nuisance trip during commissioning. These switches will be re-adjusted later but this initial adjustment should allow for burner ignition and testing.

Verify all system fans are interlocked with the burner management system. All system fans should be interlocked with the burner management system via a contactor auxiliary or a VFD at speed contact.

Provide initial adjustment to high temperature limit controller(s). Verify the high temperature limit controller(s) is/are programmed for the appropriate sensor input and that the correct sensor is connected. The limit controller should be programmed to fault when a sensor is disconnected or faulty. A sensor test should be performed to verify the appropriate sensor is connected by disconnecting the sensor wires AT THE SENSOR END, then verifying the appropriate limit controller shows a disconnected sensor on the display. The set point of the controller(s) should be determined by the customer, and is/are normally set to protect the heater and any equipment downstream of the heater. Once this set point is determined, program this into the limit controller as necessary.

Verify the combustion chamber pressure. Attached a manometer to the test connection on the combustion chamber when all system fans are running. Make note of this pressure for future use.

Provide initial adjustments to pilot regulator and pilot air and gas adjusting orifice. Adjust pilot gas regulator to an outlet pressure between 12”wc and 28”wc above the combustion chamber pressure. Remove cap from pilot gas adjusting orifice, turn adjusting screw clock-wise so it is all the way closed, then turn adjusting screw counter-clockwise so it is three turns open.

STAR | PAC–COMMISSIONING

Verify initial adjustments to main gas regulator. Adjust main gas regulator to an outlet pressure between 12"wc and 28"wc higher than the combustion chamber pressure.

Test main and blocking gas shut off valve proof of closure switches. This test should be done with the burner off, before attempting ignition for the first time. With all the manual gas valves closed, remove the main gas shut off valve actuator from the gas valve body and verify the burner management systems indicates a fault. Repeat this procedure for the blocking gas shut off valve. Contact Star Combustion for this test procedure when using Maxon brand shut off valves.

Test valve proving system, if used. Close downstream manual gas valve and attempt valve proving test, verify it indicates failure of the main gas shut off valve. Next, close upstream manual gas valve and attempt valve proving test, verify it indicates failure of the blocking gas shut off valve.

Set combustion air control valve at minimum position. Using the air fuel ratio controller, set the main combustion air control valve so the combustion air differential pressure, measured between the combustion air test connection and the combustion chamber, reads 0.5"wc at the minimum or lightoff position. Refer to instructions for the air fuel ratio controller being used for further information on how to set this valve. If using the Star|Linc air/fuel ratio controller, this valve position is normally pre-set.

Set combustion air control valve at maximum position. Using the air fuel ratio controller, set the main combustion air control valve so the combustion air differential pressure, measured between the combustion air test connection and the combustion chamber, reads 12"wc at the maximum or purge position. This should be done with all the system fans running. Refer to instructions for the air fuel ratio controller being used for further information on how to set this valve. If using the Star|Linc air/fuel ratio controller, this valve position is normally pre-set.

Put the burner firing rate controller in manual and verify it is at the minimum or lightoff firing rate position. Refer to instructions for the air fuel ratio controller being used for further information on how to place the air/fuel ratio controller or firing rate controller in manual mode.

Start the burner. If using a burner management control panel provided by Star Combustion Systems LLC, refer to the sequence of operation provided with that control panel for directions on how to start the burner. If burner management is not provided by Star Combustion Systems LLC, refer to the manufacturer's provided literature for instruction on how to start the burner.

Once the burner management system has verified all system interlocks, it will automatically go into a purge sequence. For applications that use the combustion air for purge, the air fuel ratio controller will requested to drive the combustion air control valve to maximum or purge position. This position must be proven with a purge position switch physically mounted to the Star|Pac burner, or from the air/fuel ratio controller purge position switch output. Some applications will alternatively use a purge air pressure switch for this feedback instead of a position switch. For applications that do not use combustion air for purging, the burner management system will normally keep the combustion air control valve at minimum or lightoff position for purge.

The burner management system should be in the purge sequence for enough time to change the air in the combustion chamber at least 4 times prior to lightoff. Refer to the system documentation for the setting of this purge time, if adjustable in the burner management controls.

Once the purge is complete, the burner management system will request that the air fuel ratio controller drive both the combustion air control valve and the fuel control valve to minimum or lightoff position. This position must be proven with a lightoff position switch physically mounted to the Star|Pac burner, or from the air/fuel ratio controller purge position switch output.

Once lightoff position is proven, the burner management system will turn on the spark ignition transformer and also the pilot shut off valves (or main shut off valves if the system is set up for direct spark ignition.) A spark should be visible from the sight port of the burner.

Once spark is established, the pilot (or minimum main flame in a direct spark system) should light within 2-3 seconds. If the pilot/main does not light within the pilot flame establishing period (normally 10 seconds), verify the manual gas shut off valves are on, verify the pilot/main gas pressure is adjusted to 12-28"wc above the combustion chamber pressure, and that the pilot gas adjusting orifice is 3 turns open. Also check that the pilot solenoid valves are wired correctly and are opening at the appropriate time.

STAR | PAC—COMMISSIONING

Further, check for loose pilot gas connections, and obstructions in the pilot at the burner.

The pilot should be visible from the burner sight port and should be golf ball sized. If the flame is smaller or larger than a golf ball, adjust the pilot gas adjusting orifice accordingly.

Verify main flame. Once the pilot is established, the main gas valves should open and allow main gas to flow to the burner. IMPORTANT! Verify that the pilot flame is extinguished after the main flame establishing period, normally 10 seconds after the main gas valves are opened.

Once the burner management system has interrupted the pilot, visually verify the main flame is lit all the way around the base of the burner air nozzle and provides a good flame signal. Refer to the instructions for the burner management system for a definition of what a good flame signal should be.

With the burner ignited, re-verify the main gas regulator outlet pressure is between 12”wc and 28”wc and adjust accordingly.

Test burner interlocks. Once the main flame is established, all burner interlocks must be tested for proper operation and set according to the applicable fuel gas code instructions. IMPORTANT! If there is a burner interlock failure during testing, the burner system should not be used until the interlock is repaired and verified working correctly. DO NOT ATTEMPT TO BYPASS A BURNER INTERLOCK FOR ANY REASON.

With the burner on and at minimum fire, the interlocks should shut off the burner and the appropriate alarm should be displayed on the burner management controls. Manual intervention should be necessary to re-start the burner after an interlock failure.

- ◊ Test the high temperature limit controller(s) by bringing the set point below actual. The final set point of the controller(s) should be determined by the customer, and is/are normally set to protect the heater and any process equipment downstream of the heater.
- ◊ Test the low gas pressure switch by bringing the set point below actual. The final setting of this switch should be determined by local fuel gas codes, normally 50% below the lowest manifold pressure measured at the switch (normally seen at high fire.)
- ◊ Test the high gas pressure switch by bringing the set point above actual. The final setting of this switch should be determined by local fuel gas codes, normally 50% above the highest manifold pressure measured at the switch (normally seen at low fire.)
- ◊ Test the process air pressure switch by disconnecting the upstream sensing port. The final setting of this switch should be 0.4”wc.
- ◊ Test the combustion air pressure switch by disconnecting the upstream sending port. The final setting of this switch should be 50% below the lowest air manifold pressure measured at the switch (normally seen at high fire.)
- ◊ Test exhaust and other air pressure switches by bringing the set point below actual or disconnecting the sensing port(s). Final settings of these switches should be determined by the local fuel gas codes, normally 50% below the lowest pressure measured at the switch.
- ◊ Test the flame sensor by shutting off the manual gas valve in the main fuel downstream of the shut off valves when the burner is ignited.
- ◊ Test the low position switch by bringing the control valve or actuator to a higher setting than the switch and attempting to ignite the burner. IMPORTANT! Close the pilot manual gas valve before attempting this test to prevent un-intended ignition.
- ◊ There may be more interlocks present, test those as necessary according to the instructions for the burner management system.

Set air and gas pressures at index positions. Once the burner has been ignited and all interlocks tested and verified working correctly, verify the system can handle additional temperature and heat load. IMPORTANT! Verify that the high temperature limit is protecting downstream equipment from unintended heating during commissioning. Some product load inside the process equipment may be necessary to absorb the heat and allow proper high fire gas adjustments. If using a Star|Linc air fuel ratio controller, these index position settings are already pre-set and only high fire verification of air and gas pressures are necessary.

STAR | PAC—COMMISSIONING

Use a manometer to measure differential combustion air and gas pressure between the combustion air pressure test connection and the downstream heater pressure connections, as well as the gas pressure test connection and the downstream heater pressure connection.

Use the charts provided with the Star|Pac burner to set combustion air and gas pressures according to each air fuel ratio controller index position. Refer to instructions for the air fuel ratio controller being used for further information on how to make these adjustments. Once the differential pressures have been set at all firing rates, re-attached the actuator linkage, or place the air fuel ratio controller into automatic mode and verify proper burner firing rate control. The burner is now ready for operation.

Once the heater and system reach full operating temperature/capacity, re-verify all pressures and set points on the burner interlocks. It is always wise to keep good records of both burner settings and all interlock settings to refer back to during troubleshooting.

For more information contact:

Star Combustion Systems LLC
PO Box 636
Mason, OH 45040
www.starcombustion.com
+1-513-282-0810