

# SIDEWINDER II GAS FLAT FLAME & EXCESS AIR BURNER

MODEL: 3503

Revision: 0

BULLETIN  
3503

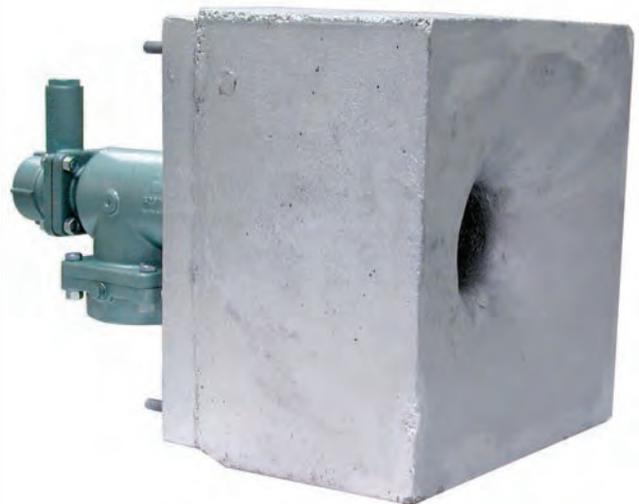
## FEATURES

- Flames Flat to Furnace Wall
- No Forward Velocity at Normal Firing Rates
- On-Ratio, Excess Air, or Excess Gas Firing (see Table 2)
- Simple Nozzle Mix Construction
- Flanged Air and Gas Connections - Fewer Pipe Unions Required
- 3000°F Refractory Block
- Rugged Cast Iron Burner
- Pilot, Flame Detector Ports
- 10:1 Turndown, On-Ratio with 16 oz. Air at Burner
- Roof Mounting Support Lugs and Wall Flanges Available



## APPLICATIONS

- Billet Heaters
- Cover Annealers
- Car Furnaces
- Roof Fired Rotary Furnaces
- Galvanizing Tanks
- Crucible Melters
- Process Heaters
- Heat Exchangers
- Holding Ladles



CAUTION: Operation of combustion equipment can be hazardous resulting in bodily injury or equipment damage. Each burner should be supervised by a combustion safeguard and only qualified personnel should install, make system adjustments and perform any required service.



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## DESCRIPTION

Sidewinder Gas Burners are nozzle-mixing units with a high-velocity, spinning, air flow. The swirling air stream produces a negative vortex at the refractory block mouth. Gas enters the vortex, mixing rapidly, producing intense combustion.

The inverted parabolic shape of the burner block port works with the vortex to pull flames flat to the furnace wall at firing rates and mixtures.

## INSTALLATION INSTRUCTIONS

Sidewinder II Gas Burners may be installed in any position. The inside flared face of the Refractory Block must be flush with the interior furnace wall.

All unused Pilot Flame Detector or Sight Ports must be plugged since a Back Pressure exists in the Burner Throat at high air flow rates.

Minimum centerline distance between burners must be as shown in Table 2.

When the Furnace Pressure is expected to vary considerably, a Biasing Line must be run to the Main Gas Regulator. Also, a Biasing Line should be run from the Pilot Mixture Line to the Pilot Gas Regulator to insure pilot stability at all Main Burner Firing Rates.

Wall Mounting Flanges are available to fasten the Block Holder to a Furnace Shell except for the SW-1 size. Lifting Eye-Bolt Hangers are available for Furnace Roof Suspension installations, except for SW-1.

A Flame Detection Device is recommended on each burner for maximum furnace safety and ease of starting. Flame Detection is required on all Excess Air Installations and where furnace temperature is below 1400°F. Either Flame Rods or Ultra-Violet Scanners may be used. Pyronics Sens-A-Flame is recommended although other makes will operate satisfactorily.

Flexible Nipples are recommended for air and gas connections at the burner to allow for slight movement or misalignment of piping. The Flexible Nipples should be one pipe size larger than the pipe connection at the burner to allow for pressure drop.

When a Pilot is used, it should be installed in the port which is in the most clockwise position when viewing the burner from the outside. The Flame Rod or U.V. Scanner should be in the next adjacent port.

To obtain the rated Blower Air Pressure at each burner the Air Header must be properly sized and the Pipe Run to each burner should be on pipe size larger than the pipe size at the burner.

Line Gas Pressure must be adequate and the Gas Header must be properly sized to insure adequate gas flow at each burner.

**TABLE I - BURNER CAPACITIES**

Catalog Number	Recommended Pipe Runs to each Burner (I.P.S.)		Thousands of BTU/HR with various Air Pressures at Burner on Ratio Operation (Note 1)				
	AIR	GAS	0.16 o.s.i.	4 o.s.i.	8 o.s.i.	12 o.s.i.	16 o.s.i.
SW-1	1-1/2"	3/4"	12	60	90	110	125
SW-2	1-1/2"	3/4"	23	115	160	202	230
SW-3	2"	1"	32	160	225	280	320
SW-4	2-1/2"	1"	65	315	445	555	630
SW-5	3"	1-1/2"	100	500	705	870	1000
SW-6	4"	1-1/2"	125	630	890	1110	1260
SW-7	6"	2-1/2"	250	1250	1760	2200	2500
NOTE 1 BURNER RATINGS ACHIEVED WITH:							
<ul style="list-style-type: none"> <li>a) 6 o.s.i. Gas Press to Ratio Regulator</li> <li>b) Bleed Loader set at 3.5 o.s.i.</li> <li>c) Balanced Combustion Chamber Pressure</li> <li>d) Natural Gas or Propane (consult factory for other gases)</li> <li>e) Recommended Pilots and Pilot Settings</li> </ul>			Turn down capability from various Air Pressures at Burner				

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TABLE II - BURNER SELECTION AIDS

Catalog Number	Pilot Catalog Number	Maximum Pilot Mix. Pressure with Max. Main Air to Burner	Max. % Excess Air at 16 o.s.i.		Approximate Flame Diameter		Minimum Burner Spacing (On-Ratio)	
			With Pilot	Without Pilot	On Ratio at Maximum Rating	75% Aeration with Max. Air at Burner	Between Burners (Note 1)	Burner to Load (Min.)
SW-1	P62PBST	1.0" W.C.	2000	1200	12"	18"	18"	12"
SW-2	P62PBST	2.0" W.C.	2000	1500	16"	23"	24"	12"
SW-3	P62PBST	2.5" W.C.	2000	600	24"	32"	36"	12"
SW-4	P62PBST	2.5" W.C.	2000	900	36"	36"	40"	18"
SW-5	P84PBST	3.0" W.C.	2000	700	30"	45"	45"	18"
SW-6	P84PBST	3.5" W.C.	2000	540	36"	56"	54"	18"
SW-7	P84PBST	6.0" W.C.	2000	700	60"	90"	72"	18"

NOTE 1: When two different sizes of burners are mounted adjacent to each other, minimum spacing for larger burner must be used.

## OPERATION

Sidewinder II gas burners must be ignited at low fire (when the air pressure at the burner is 1 inch water column or less). They can be ignited with a manual torch or a spark-ignited blast pilot or direct spark electrically installed in a threaded opening in the block holder. Pilots should be operated on an interrupted basis.

Main burner air should not be cut off when the furnace is hot since the air provides cooling for burner internals. The gas tube life will be adversely affected if air flow is cut off in a hot setting.

## CONSTRUCTION

Refractory burner tiles are cast with a 60% alumina light-weight aggregate. Blocks are formed in rugged cast-iron holders with four stainless steel anchors embedded in the refractory. These threaded anchors extend out from the holder for installation of mounting brackets or lifting lugs.

The standard refractory material used for burner blocks is rated by the manufacturer at 3000°F permitting continuous operation of a furnace up to 2700°F.

Burner bodies are cast-iron construction with 4-bolt flanged mounting to the block holder. Air and gas connections are Pyronics' standard 4-bolt flanged type, threaded for pipe connections. No additional pipe unions are required for installation.

Gas entry to the burner body is flanged in the F series and equipped with gas adjusters in the GA series.

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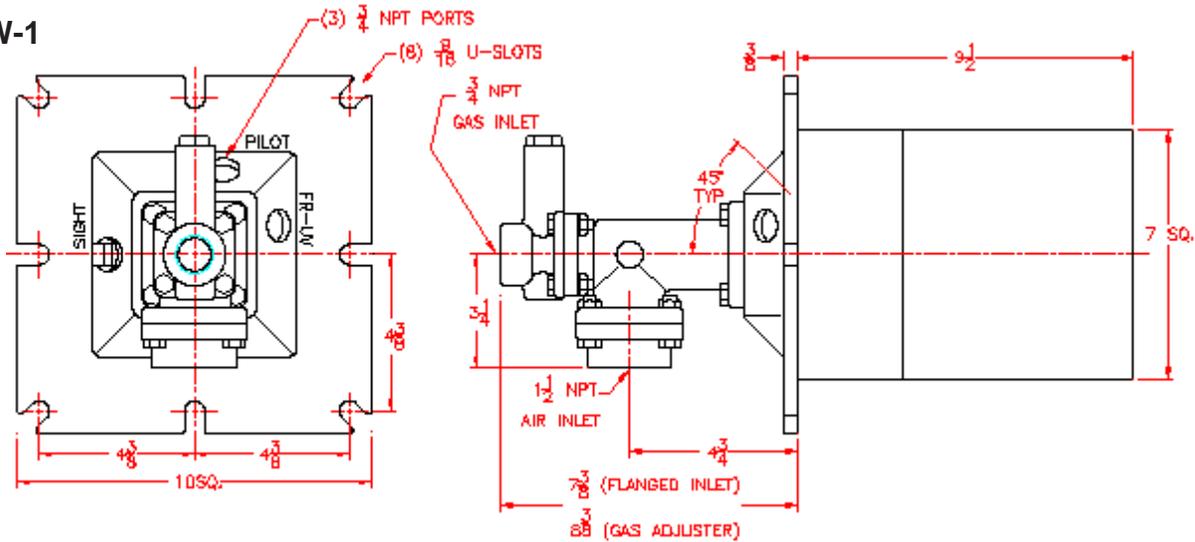
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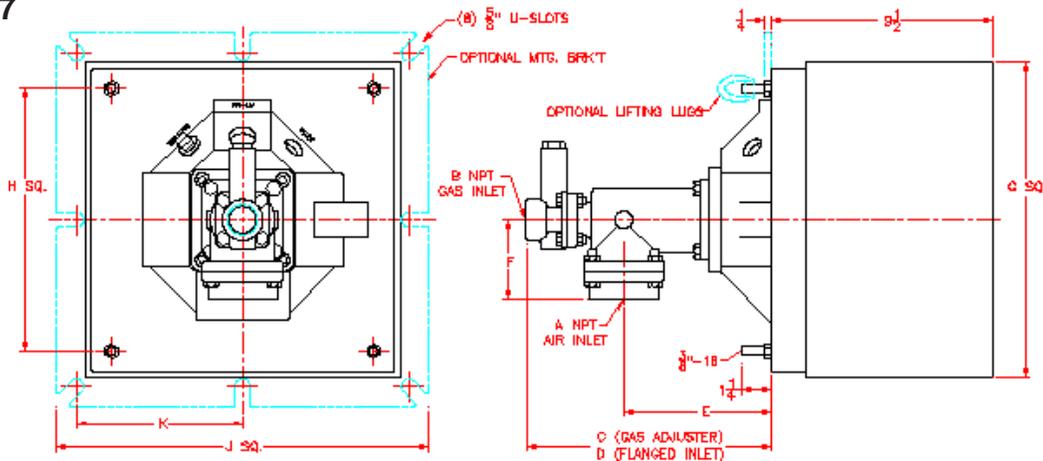
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## DIMENSIONS

**SW-1**



**SW-2 - 7**



SIGHT PORT : 1/4" NPT (TYP. ALL SIZES) AT 60°  
FR-LW PORT : 1 NPT (TYP. ALL SIZES) AT 45°  
PILOT PORT : 1/4" NPT (SW-2, 3, 4) AT 60°  
1 NPT (SW-5, 6, 7) AT 60°

## ORDERING INFORMATION

1. Select number and size of sidewinder Gas Burners based on total heat input and heating patterns required.
2. Specify quantity and catalog number of burners.
3. Specify pilots required (see Page 3).

Select mountings if required	Mounting Bracket	Lifting Lugs
SW-1	None	09069B12
SW-2, -3, -4	4336B	09069B12
SW-5, -6, -7	4377B	09069B12