

HIGH VELOCITY OIL BURNERS

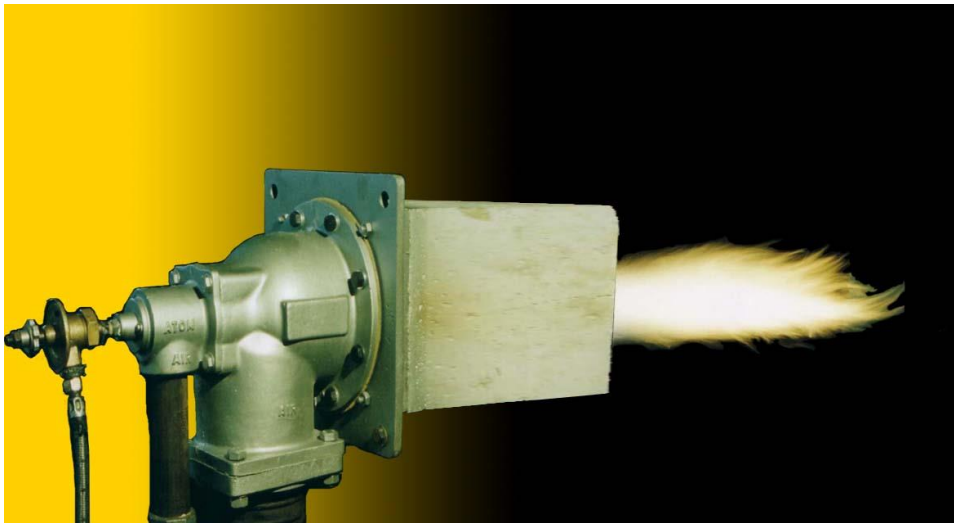
MODEL : **NAHO**

BULLETIN: 802

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NAHO Oil burners are widely used on heat treat and melting furnaces, kilns, ovens, air heaters, dryers, chemical process equipment, and other applications where superior temperature uniformity is required.

These sealed-in, nozzle-mix burners for distillate oil are stable on stoichiometric Ratio, with large amounts of excess air, or with up to 50% excess fuel (provided additional air for combustion is in the furnace near the burner.)



OPERATION

Burners can be lighted at rich, lean, or correct air / fuel ratio then immediately turned to high fire.

Required oil pressure at burner is nearly zero, but a pressure drop should be taken across the adjustable oil valve (ADOV).

The most common ratio control system for these burners uses a cross-connected governor. When appropriate for the application, flow balancing systems or fuel only control (see "Excess Air" paragraph) is very satisfactory.

If furnace temperatures after shutdown rise above 1000°C, pass some air through burner to prevent overheating.

LIGHTING / FLAME SUPERVISION

A PGL pilot is normally used to light these burners.

Burners accept ultraviolet (UV) scanners for monitoring pilot or main flame.

When using flame supervision, an interrupted pilot is required – do not use constant or intermittent pilots.

All burners are furnished with an observation port. A lighter hole cover is supplied if a pilot is not ordered. Position of pilot, flame detector, and observation port are interchangeable as long as pilot and flame detector are mounted in adjacent holes.

SHOLEH SANAT ENG. & MFG. CO.

MANUFACTURER OF BURNERS FOR FURNACES

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EXCESS AIR

Excess air improves temperature uniformity by avoiding hot spots in front of burners , churning furnace atmosphere to reduce stratification ,and creating positive furnace pressure to eliminate cold air infiltration.

Excess air can give very high effective burner turn down . Thus a furnace used for high temperature work with burners firing on stoichiometric air/fuel ratio can also be used for low temperature jobs with burners firing on lean ratio.

Burner model	Kcal/hr at 70 mbar (air pressure)	Flame Length(cm) with 70 mbar (air pressure)
		Oil
65NAHO	65,000	15
100NAHO	100,000	45
150NAHO	150,000	60
250NAHO	250,000	75
390NAHO	390,000	90
680NAHO	680,000	180
840NAHO	840,000	180
1100NAHO	1,100,000	180

CONSTRUCTION FEATURES

Air inlets can be rotated in 90° intervals , but air pipes should be brought in from the top or side to prevent oil dripping into them .

Mounting plates are cast iron. For thicker furnace walls ,the tunnel beyond the end of tile should be flared at least 30° included angle , starting at tile OD . Extension tiles are not recommend .

For installation convenience , burner body can be separated from the mounting plate and tile assembly . But tile must be set in the wall with pilot and flame detector notches in proper location relative to intended burner body position .

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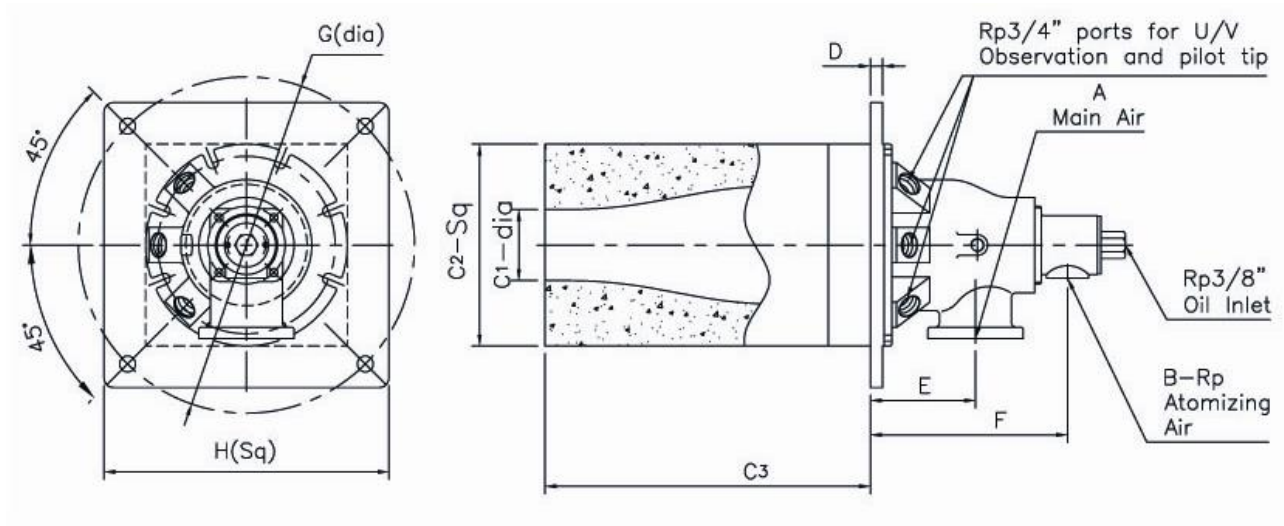
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BURNER Design	A in	B in	C1 in	C2 mm	C3 mm	D mm	E mm	F mm	G mm	H mm
65 NAHO	1.1/2	1/2	76	216	348.5	13	114.5	214.5	360	305
100 NAHO	1.1/2	1/2	76	216	348.5	13	114.5	214.5	360	305
150 NAHO	2	3/4	76	216	348.5	13	114.5	214.5	360	305
250 NAHO	3	1	76	216	348.5	13	114.5	214.5	360	305
390 NAHO	3	1	76	216	348.5	13	114.5	214.5	360	305
680 NAHO	4	1.1/2	115	252	342	15	142	276	400	340
840 NAHO	4	1.1/2	115	252	342	15	142	276	400	340
1100 NAHO	6	2	115	252	342	15	142	276	400	340

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INSTALLATION

1-Requirements :

- a) Fuel oil must be supplied to the oil governor at 3 bar . Oil should be supplied from a circulating system controlled by a diaphragm relief valve or regulator .
- b) Atomizing air pressure at burner must be at least 70 mbar .
- e) Consult your SHOLEH SANAT engineer for automatic shut off and flame supervision requirements .

2-Burner Mounting :

- a) Burners should be mounted with air, pilot , and UV connections on the top or side to prevent oil dripping into them .
- b) **WARNING** : Burners cannot be rotated with respect to the mounting plate as the pilot and flame detector ports must align with notches in the plate .
- c) To minimize leaks around the tile and to prevent tile damage from thermal expansion of the wall, follow the instructions of SHOLEH SANAT.

3-Piping :

- a) Minimize piping pressure losses . Use a minimum of elbows . Substitute 45° elbows for 90° elbows when possible . Do not use street elbows . Use pipe (not tubing)for pilot air and gas lines . 1/4" tubing may be used for impulse lines up to 3 m long , 1/2" tubing or larger for longer runs .
- b) Pipe air and fuel lines in a manner similar to that shown in Figure 1 . Flexible connections are recommended in air and fuel lines to minimize strain from piping and thermal expansion .
- c) Pilot air,pilot gas and atomizing air supply connections must be made upstream of primary burner controls so that they are not affected by the zone air control .
- d) Connect impulse piping as shown in Figure 1 .
- e) Ratio regulator impulse line connections must be located between the zone control air valve and the manual burner air valve for multiple burner zones and downstream of the manual burner air valve for single burner .

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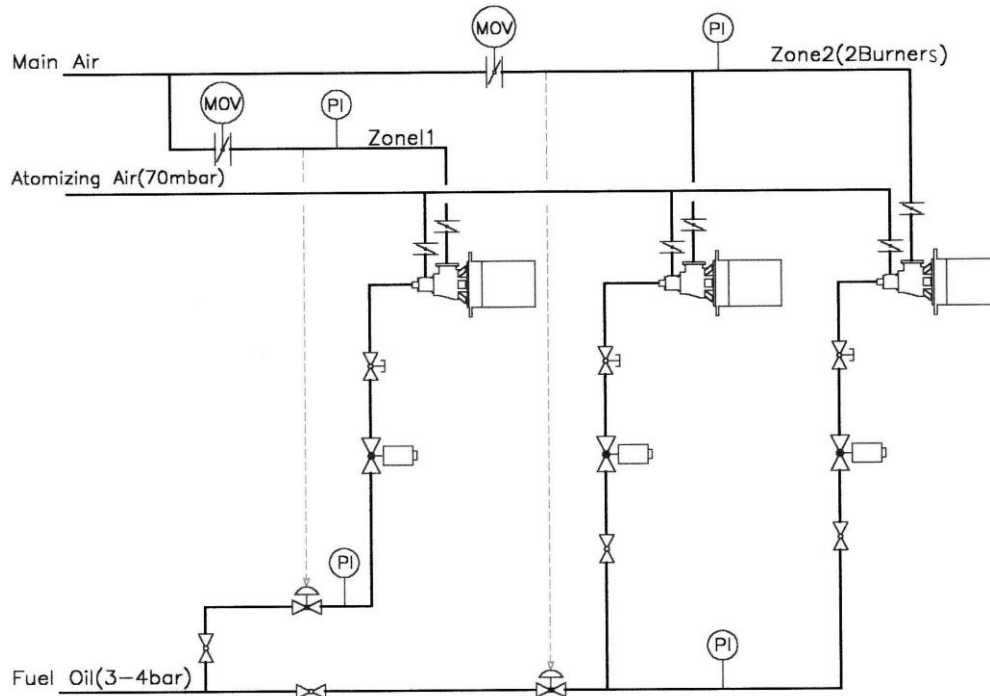


Fig 1 Suggested Piping Arrangement for NAHO Burner

LIGHTING AND ADJUSTMENT

1-Basic

- All manual and automatic fuel valves must be closed.
- Open all furnace doors and flue dampers . Lock all burner air valves in full open position .
- Start combustion air blower and check rotation .
- Adjust damper motor /air valve linkage (s) for low and high fire .
- Set atomizing air pressure at 70 mbar.
- Set damper motor(s) at high fire allowing furnace to purge for several minutes prior to lighting. Check motor amps with all burners at high fire. If in overload, adjust the linkage to reduce the high fire air flow.
- Return the damper motor to low fire . Linkage must not bind .

2 - Light the pilots in accordance with the pilot instruction sheet .

- Set atomizing air at 70 mbar for light oil (100mbar for heavy oils).
- Open oil shutoff vlave .Purge air from line by breaking oil line at adjustable oil valve collecting oil in a bucket or other container until flow is free of air.
- Adjust oil supply for 3 bar at oil governor inlet.
- Open oil adjustable valve until burner lights.
- Slowly open main air valve to high fire position.Adjust oil adjustable valve as necessary .

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- g) Return control valve to low fire position. Adjust the oil governor for desired flame .
- h) Repeat steps (e) and (f) if necessary. Set oil adjustable valve detent at high fire setpoint.
- i) When shutting down, turn off oil valve upstream of oil governor. Allow to purge , then shut the oil adjustable valve. If oil in the line expands from furnace heat, expansion chambers should be used to prevent oil adjustable damage.

3 - Trouble shooting :

- a) If fire is "sloppy", check atomizing air pressure : at least 70 mbar for light oil, at least 100 mbar for heavy oil.
- b) If fire is "spits", or tends to be unstable, check for air in oil (a suction line leak, usually at the pump) or water or dirt in the oil lines (check filters, oil tank, atomizer, etc).

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