

Setup | Metering Orifice

TABLE C. Gas Data

Kind of Gas	Gas Gravity	Btu per cu ft	Correct Air/Gas Ratio	Flow Factor [§]
Natural gas [○]	0.6	1060	10	1.00
Coke Oven gas [□]	0.4	570	5.45	1.22
Propane	1.5	2500	23.8	0.63
Butane	2.0	3210	30	0.55
Air	1.0	—	—	0.77
Oxygen [△]	1.1	—	—	0.74

* 00 is a blank plate without orifice

† For pressure and temperature conditions other than 14.397 psia and 80°F, see Sheets 8697-3 and -5.

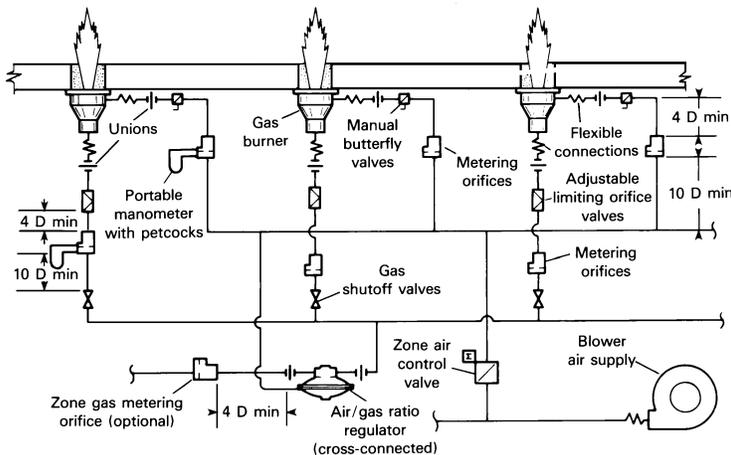
○ Natural gas capacity at 3½" w.c. dp is the plate number.

‡ High Beta ratio; normally used for air to prove flow only.

△ For oxygen, specify 8697--C-plate #. Use oxygen-cleaned metal tubing and pipe to an oxygen-approved differential-pressure gauge. Use only for line pressure at or below 25 psig.

§ Capacity factor of a given orifice relative to same orifice with natural gas.

□ Corrosive to brass.



Piping for metering orifices with nozzle-mix burners (with premix burners, install orifice holder between atmospheric regulator and mixer). One portable manometer can be used for all orifice differential readings.

CHANGING ORIFICES

1. Turn off gas supply.
2. Remove orifice plate size tag.
3. Remove cover screws and cover.
4. Loosen internal spring holding screw.
5. Remove orifice plate.
6. Install new orifice plate.
7. Tighten internal spring holding screw.
8. Replace cover and cover screws.
9. Attach new orifice plate size tag.
10. Perform leak test to verify no leakage.

TABLE D. Average Recovery % of Tap Differential

ID	Average Recovery	Permanent Pressure Loss
1st	15	85
2nd	17	83
3rd	20	80
4th	23	77
5th	27	73
6th	32	68
7th	36	64

The pressure recovery for any specific orifice/holder combination depends on its position in the group of seven standard ID's available for its pipe size.

EXAMPLE: 36% pressure recovery is possible with an 8697-1-810 or with an 8697-7-12450 (as well as the 7th ID in all other pipe sizes). This means that when the pressure taps show a 3.5"wc pressure differential, the permanent pressure loss is (100 - 36) or 64% of 3.5 or 2¼"wc.

FIELD SETUP

1. Light burner. Adjust regulator and limiting orifice valve per their instructions.
2. Attach a manometer or quality air pressure gauge to burner air connection. Set burner air valve for desired pressure.
3. Open each orifice holder pressure tap momentarily to flush out condensate and dirt.
4. Connect a manometer, with its equalizing valve open, to orifice holder taps. Slowly open these taps; then slowly close the equalizing valve, taking care not to "blow" the manometer.
5. Adjust limiting orifice valve for proper gas flow reading.

Using example (from "Selection," page 1):

If actual high fire air pressure on gauge is 14 osi, air flow is $27,000 \times \sqrt{14/16} = 25,260$ cfh and corresponding natural gas flow should be 2526 cfh.

Adjust limiting orifice gas valve until manometer across the #2400 plate shows 3.88"wc: $(2526/2400)^2 \times 3.5$. (If using an 8736-A Manometer, its right hand scale [specifically for 8697 Metering Orifices] could be used--in this case $2526/2400 = 1.05$ scale factor.)