

Product Overview | Air/Oil Ratiotrols

7052 Ratiotrols proportion oil flow to combustion air flow in cross-connected control systems. Outlet oil pressure from the Ratiotrol is proportional to the impulse air signal, see Table 2. Therefore, as combustion air is turned up or down, the Ratiotrol causes oil to follow it in proportion. Desired air/oil ratio is set with a manual valve (see 1813 Sensitrol™ Oil Valve bulletin) at the burner.

MULTIPLE BURNERS

A single Ratiotrol can serve several burners when it is cross-connected downstream of the zone air control valve if burners are on one side of furnace and difference in their elevation is less than 12".

PISTON ACCUMULATORS

If Ratiotrol is in light oil line between valves that are closed when burners are shut off, radiant heat from furnace could expand oil trapped in the line, bursting Ratiotrol diaphragms and damaging gauges. Install one or more 8521-01 Accumulators downstream of Ratiotrol to prevent this. See Bulletin 8521-01.

SPECIFICATIONS

Operating inlet pressure: 25-30 psi

Emergency inlet pressure: 50 psi

Maximum oil temperature:

180°F for standard 7052

300°F for 7052- V (with Viton diaphragms)

Oil grades:

7052-01: light oils only

7052-0: #1 through #6 oils

Optional gauges (and thermometer):

7052-01-WG: inlet and outlet oil pressure gauges with gauge cocks, air impulse pressure gauge

7052-0-WTG: inlet and outlet oil pressure gauges with gauge cocks, air impulse pressure gauge, dial thermometer

Table 1 Recommended Inlet Pressures

| Size | Air impulse ('w.c.) | Inlet pressure (psig) |
|---------|---------------------|-----------------------|
| 7052-01 | 10-55 | 25 |
| | 62 | 30 |
| | 69 | 35 |
| 7052-0 | 10-28 | 25 |
| | 35 | 30 |
| | 42 | 35 |
| | 59 | 45 |

Table 2 Pressure Multiplication Factor

| Size | Low flow | Maximum flow |
|---------|----------|--------------|
| 7052-01 | 9:1 | 7:1 |
| 7052-0 | 14:1 | 10.5:1 |

Spring Bias: 7052-01: +1.9/-1.5 psi
7052-0: +3.2/-2.5 psi

Table 3 CAPACITIES
gph (#2 oil)

| Ratiotrol | air impulse pressure, "w.c. | | | |
|-----------|-----------------------------|------|------|------|
| | 13.9 | 20.8 | 27.7 | 41.6 |
| 7052-01 | 55 | 67 | 78 | 95 |
| 7052-01-V | 36 | 45 | 52 | 63 |
| 7052-0 | 161 | 197 | 227 | 274 |
| 7052-0-V | 101 | 123 | 142 | 171 |

FLOW and PRESSURE

Flow and pressure are determined using the table in this bulletin.

Example: Given a 7052-01 with 25 psig inlet pressure and 16" w.c. impulse air at high fire, what is the maximum outlet pressure and maximum flow at high fire.

With 25 psig inlet and 16" w.c., based on Table 1 the conditions are suitable to provide the maximum possible flow.

From Table 2 we can determine the maximum oil outlet pressure. With 16" w.c. impulse pressure oil outlet pressure is 16 x 7 = 112" w.c. or 4.04 psig.

By using linear interpolation on Table 3, an air impulse pressure of 16" w.c. give 58.65 gph.

TURNDOWN

Turndown is determined based on using the Square Root Law of air impulse pressure to oil flow. The more impulse air available the higher the flow turndown that can be achieved. As a general rule the minimum impulse air pressure should not be less than 1" w.c. for good control.

Example: Given the example above, what would be the flow turndown?

High fire impulse pressure is 16" w.c. A minimum impulse pressure of 1" water column at low fire means the 16:1 air impulse would be $\sqrt{\frac{16}{1}}$.

Which gives 4:1 turndown from the max flow of 58.65 gph, which is approximately 14.66 gph.