MONARCH NOZZLES
Oil burner nozzles | Industrial Oil Nozzles | Water Nozzles

ATOMIZING NOZZLES | HOLLOW CONE NOZZLES | SOLID CONE NOZZLES | FLAT SPRAY NOZZLES

MONARCH NOZZLES
7249-B Browning Road
Pennsauken, NJ 08109

Email: hbeccari@monarchnozzles.com
Phone: 1-856-241-1500
MONARCH HISTORICAL
Since its founding in 1916 MONARCH Manufacturing produces spray nozzles and accessories for many different applications in industry and agriculture. In 1933, the export business tackled and has continued to represent an important part of our business. Meanwhile, there are general agencies abroad and distributors in many other countries.

MONARCH QUALITY
Because of product durability and consistently high quality MONARCH has acquired a reputation worldwide. An experienced staff ensures that each design and demand can be achieved.

MONARCH PROMISE
The wide range of nozzles is either as a finished product ready for immediate shipment or unwrought stock to be completed immediately to customer specifications. MONARCH is able to submit short term deals on special designs. The development department available to customers on new applications with words and deeds.
## OVERVIEW

**MONARCH PRODUCTS**

### MONARCH QUALITY, FAQ’S and ORDER INFORMATION

**04**

### NOZZLE BASICS

**05**

### FIND YOUR APPLICATION

**06**

### OIL BURNER NOZZLES

<table>
<thead>
<tr>
<th>Series</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>PL, PLP, R, HV, AR, NS</td>
<td>08</td>
</tr>
<tr>
<td>HO</td>
<td>10</td>
</tr>
</tbody>
</table>

### INDUSTRIAL OIL NOZZLES

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPS</td>
<td>12</td>
</tr>
<tr>
<td>C-169 / 170 -WA</td>
<td>14</td>
</tr>
<tr>
<td>C-202 Air Operated Nozzle</td>
<td>16</td>
</tr>
<tr>
<td>C-206 Air Operated Nozzle</td>
<td>17</td>
</tr>
<tr>
<td>D-41-H</td>
<td>18</td>
</tr>
<tr>
<td>E-180-H</td>
<td>20</td>
</tr>
</tbody>
</table>

### AAMA test nozzles

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>B-25 large capacity AAMA Nozzle</td>
<td>22</td>
</tr>
</tbody>
</table>

### WATER NOZZLES

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>629 / 631 non-clog ( wide angle )</td>
<td>24</td>
</tr>
<tr>
<td>F-80-W.</td>
<td>26</td>
</tr>
<tr>
<td>H-261 (-CJ)</td>
<td>27</td>
</tr>
<tr>
<td>H-530</td>
<td>28</td>
</tr>
<tr>
<td>H-535</td>
<td>29</td>
</tr>
<tr>
<td>H-545</td>
<td>30</td>
</tr>
<tr>
<td>H-601 air operated</td>
<td>31</td>
</tr>
<tr>
<td>H-837 solid jet nozzles</td>
<td>32</td>
</tr>
<tr>
<td>MIDGET</td>
<td>33</td>
</tr>
<tr>
<td>M2P Plastic</td>
<td>34</td>
</tr>
</tbody>
</table>

### CARBON BLACK NOZZLES

<table>
<thead>
<tr>
<th>Nozzle</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-94</td>
<td>35</td>
</tr>
</tbody>
</table>

### ACCESSORIES

<table>
<thead>
<tr>
<th>Accessory</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AAMA Kit, Nozzle Remover, Nozzle Case, PVC Tee, Multiple Nozzle Adaptors, No Drip Strainer Check Valve, Pump Test kit</td>
<td>36</td>
</tr>
</tbody>
</table>
QUALITY TESTING: Each nozzle is individually spray tested for spray angle, quality and balance. All tests are made at 150 PSI or 10 bar pressure.

NOZZLE INTERCHANGE CHART
NOTE: the information can only be used as a guide to selecting the nearest comparable MONARCH Nozzle. No guarantee can be made that the nozzles indicated are exact equivalents in regard to either spray angle or spray pattern.

<table>
<thead>
<tr>
<th>Type</th>
<th>MONARCH EQUIVALENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>DELAVAN</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>NS or PL</td>
</tr>
<tr>
<td>B</td>
<td>R or PLP</td>
</tr>
<tr>
<td>W</td>
<td>AR</td>
</tr>
<tr>
<td>DEL-O-FLO</td>
<td>R or NS</td>
</tr>
<tr>
<td>CF</td>
<td>CC</td>
</tr>
<tr>
<td>HAGO</td>
<td></td>
</tr>
<tr>
<td>ES</td>
<td>R or AR</td>
</tr>
<tr>
<td>H</td>
<td>NS or PL</td>
</tr>
<tr>
<td>SS</td>
<td>PLP</td>
</tr>
<tr>
<td>P</td>
<td>R or PLP</td>
</tr>
<tr>
<td>STEINEN</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>NS</td>
</tr>
<tr>
<td>PH</td>
<td>PL</td>
</tr>
<tr>
<td>Q</td>
<td>AR</td>
</tr>
<tr>
<td>S</td>
<td>F</td>
</tr>
<tr>
<td>SS</td>
<td>PLP</td>
</tr>
<tr>
<td>DANFOSS</td>
<td></td>
</tr>
<tr>
<td>H</td>
<td>NS or PL</td>
</tr>
<tr>
<td>B</td>
<td>AR</td>
</tr>
<tr>
<td>S</td>
<td>PLP or R</td>
</tr>
</tbody>
</table>

WARRANTY
All Material is guaranteed to be free from defects in workmanship and material.

Parts believed to be defective should be returned with an authorized RGA from the factory. If our inspections confirms buyers claim, material will be either repaired or replaced, at our option, and credit issued for the shipping charges. Disassembly of the nozzle unit voids the implied warranty.

Monarch accepts no responsibility for defective workmanship or material other than the repair or replacement of the item under either express or implied warranty.
CONE SPRAY
Nozzles whose spray is emitted in a conical shape and a round cross section. Cone sprays have less impact than flat sprays and are therefore better suited for rinsing and wetting.

SOLID CONE SPRAY NOZZLES
Good all-round nozzle suitable for most burners.

HOLLOW CONE SPRAY NOZZLES
Cone Spray Nozzles in which the cross section distribution shows little or no droplets in the center and with most of the spray concentrated at the outer edge.

FLAT SPRAYS
Also known as fan sprays, these Nozzles produce either a flat or elliptical sheet of water. They are best suited for washing operations where high impact is desirable. The spray normally breaks into individual droplets a few inches from the orifice.

ATOMIZING NOZZLES
Produce a highly atomized hollow cone spray. Their light mist ranges from a fog that hangs in the air to slightly larger droplets that fall by gravity. They are most typically used for humidification and very light wetting.

JET NOZZLES
Produce a straight unbroken stream of liquid nominally referred to as a 0° spray angle. Depending on the piping set up, orifice size and water pressure, the stream may remain unbroken from a few inches up to 3 or 4 feet. For blasting and light cutting applications.

GPH
Gallons per hour (gallons per hour: 1 gallon = 3.7853 l). This size unit is always based on water flow. See the table for a given nozzle to determine the pressure of her flow.

SPRAY ANGLE
The included angle of the spray emitted from the Nozzle orifice. This excludes the light “fuzz” at the edge of some sprays, particularly those of low flow rates. Higher operating pressures usually tend to compress the spray, thereby resulting in a narrower spray angle. Liquids with surface tensions lower than water will produce wider spray angles than those of water. See chart on page 16 for coverage data.

ORIFICE
The aperture through which the liquid exits the Nozzle. It meters the liquid and its contours produce the various spray angles. It is normally round but can be elliptical in the case of flat spray Nozzles. On most Nozzles the orifice is a highly polished surface. It should never be probed with any metal object. A wooden toothpick is the best tool for cleaning or unclogging an orifice.

NOZZLE OPENING
The aperture through which the liquid exits the Nozzle. It measures the liquid and its contours produce the various spray angles. It is normally round but can be elliptical in the case of flat spray Nozzles. On most Nozzles the orifice is a highly polished surface. It should never be probed with any metal object. A wooden toothpick is the best tool for cleaning or unclogging an orifice.

PRESSURE
The force of the liquid entering the Nozzle expressed in PSI (pounds per square inch). In general, operating at higher pressures produces smaller droplets, narrower spray angles and more solid patterns. Conversely, lower pressures result in larger droplets, slightly wider angles and less dense distribution.

MINIMUM OPERATING PRESSURE
Lowest possible pressure at which the kinetic energy of the liquid is sufficient to produce a fully developed jet. Data flow in the nozzle tables indicate that value for water. He can be higher or lower if other fluids are used as water because it depends on the specific weight and Viscosity of the liquid.

NPT
National Pipe Thread (American standard pipe thread). This is a tapering thread that participates in the installation of self-tightening. A thread seal as “pipe dope or Teflon tape is needed in order to seal properly.

CFM
Cubic feet per minute (cubic foot per minute). A unit of measurement describing the volume of gas (usually air) flowing to an air operated Nozzle.

SPRAY ATOMIZATION
A Spray Nozzle breaks up a flow of liquid into many small droplets. The efficiency, or results, of the spray process greatly depend on droplet size and distribution. Droplet size may range from a few to thousands of microns in diameter depending upon the liquid being sprayed, the pressure and Nozzle design. Nozzles do not generate droplets of equal size. There is usually a broad spectrum of droplet sizes within a spray. Larger droplets occur as nozzle capacity increases. Coarse atomization is often associated with narrow angles or straight streams. For a given nozzle, fineness of atomization may be improved by increasing pressure. The two important liquid parameters affecting atomization are viscosity and surface tension. Compared with viscosity, surface tension has a relatively minor affect.

SPRAY VELOCITY
The velocity of the spray leaving a Nozzle orifice depends upon the liquid pressure. The velocity is also determined by the design characteristics of the specific Nozzle. Solid stream and flat spray Nozzles will have, under equal conditions, higher velocities than wide angle, round cone Nozzles.

GPM
Gallons per minute (gallons per minute). The unit size for nozzles with a larger flow rate, based on water flow. See the table for a given nozzle to determine the pressure of her flow.

NOTE
Some of our Nozzles that are listed as solid cones can actually be made to produce a hollow cone spray although not specifically listed. If a particular Nozzle configuration suits your requirements but is the wrong nominal spray pattern, let us know of your needs and we’ll be glad to let you know if we can meet your need.

ORDERING INFORMATION
State quantity, Nozzle type, Nozzle number, spray angle, material, size and type pipe connection (Male or Female) and either “tips only” or “complete” Nozzles. Nozzles type designations are shown in the upper corner of each page. (F-80, H-535, etc.).

WARRANTY
All material is guaranteed to be free from defects in workmanship and materials. Parts believed defective should be returned prepaid. If our inspection confirms buyer’s claim, material will be either repaired or replaced, at our option, and credit issued for the shipping charges. Monarch accepts no responsibility for defective workmanship or material other than repair or replacement of the item under either express or implied warranty.

NOZZLE SERVICING
Nozzle orifices are highly polished surfaces which are easily damaged. Pins, needles or other sharp objects should never be used to clean an orifice. A sharpened wooden toothpick is suggested. For calcium build-up from alkaline water, it is suggested that the Nozzles be soaked overnight in inhibited muriatic acid or vinegar. This is usually sufficient to restore the Nozzle serviceability.
SPECIAL APPLICATIONS
We design and develop custom Nozzles with custom Spray Patterns for a wide range of applications. Feel free and ask us for your special application!

EXAMPLES
- Showers
- Tanning, Poultry Disinfection
- Grey water
- Cereal Flavoring + Nutrients
- Food Applications
- Bakery
- Icing
- Fillings
- Poultry growth
- Humidity control
- Powerstream generators
- Global supplier for GE

METHANOL INJECTION FOR RACECARS
- Alcohol / Methane
- Increase of horsepower and torque
- Diesel Injection for trucks, RV, farm equipment

BUILDING TESTING
- Curtain wall leakage
- Spray rack coverage
- Window Certification
- Dust suppression

CLEANING
- Car and Truck Washing
- Carpet steaming
- Manifold degreasing

HIGHWAY
- Asphalt spraying
- Line painting
- Weed kill

CUSTOM DESIGNS
- Reptile / Crocodile
- Butterfly
- Rain forest
- Cool zones - amusement parks
- Patio cooling
- Insect repel
- Special effects
- Cooling towers
- Snow making canons
- Hog cooling
- Automotive
- Dust suppression
- Fire halon spray

RECOMMENDED USAGES
These following applications are general recommendations. Consult factory for specific applications.

NOZZLE APPLICATIONS (right)
Sorted from A ... Z | A - Atomizing | F - Flat Spray | H - Hollow Cone | S - Solide Cone

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
<table>
<thead>
<tr>
<th>Application</th>
<th>Spray Pattern</th>
<th>Nozzle Type</th>
<th>Application</th>
<th>Spray Pattern</th>
<th>Nozzle Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absorption Towers</td>
<td>S</td>
<td>B-25</td>
<td>Gas Cooling</td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td>Aerating</td>
<td>H</td>
<td>629 / 631</td>
<td>Gas Pipe Testing</td>
<td>S</td>
<td>B-25</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>B-8 / A</td>
<td>Gas Scrubbing</td>
<td>S</td>
<td>F-94</td>
</tr>
<tr>
<td></td>
<td></td>
<td>H-261</td>
<td>Gas Washer</td>
<td>S</td>
<td>F-94</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gravel Laundry / Washing</td>
<td>H</td>
<td>S</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ground Air Humidification</td>
<td>A</td>
<td>Midget</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Hog Cooling</td>
<td>A</td>
<td>Midget</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Insecticide Application</td>
<td>F</td>
<td>F-96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Metal Cleaning</td>
<td>F</td>
<td>H-837</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mist Humidification</td>
<td>A</td>
<td>F-80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Paper Pulp Processing</td>
<td>H</td>
<td>B-8 / A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Pesticide Application</td>
<td>F</td>
<td>F-96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Poultry Cooling (Atomization)</td>
<td>A</td>
<td>Midget</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Quenching</td>
<td>S</td>
<td>H-837</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Rinse</td>
<td>A</td>
<td>F-80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Roof &amp; Rooftop Cooling</td>
<td>H</td>
<td>629 / 631</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Salt Solution Spray</td>
<td>S</td>
<td>B-25</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Soot-black Production</td>
<td>S</td>
<td>F-94</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Swine Cooling</td>
<td>A</td>
<td>Midget</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Tank Cleaning</td>
<td>F</td>
<td>H-545-R2</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ventilate</td>
<td>H</td>
<td>629 / 631</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Water Atomization</td>
<td>A</td>
<td>F-80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wax Spraying</td>
<td>A</td>
<td>F-80</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Weed Control</td>
<td>F</td>
<td>H-837</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Window Testing</td>
<td>S</td>
<td>A</td>
</tr>
</tbody>
</table>

**MONARCH NOZZLES**, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
OIL BURNER NOZZLES
Atomizing Nozzle for a wide range of applications

Monarch produces oil burner nozzles for all oils with viscosity to 5 mm²/s (cSt). Special nozzles can be used for oils with a viscosity up to 13 mm²/s (cSt).

All MONARCH nozzles are stamped with the following characteristics, subject to modification on adoption of CEN standards:
- the flow (in USGPH at 100 PSI = 6.895 bar), (soon, capacity at 10 bar and CEN references)
- spray angle
- letters to identify the series of spray patterns
- the reference MTD-92
- the MONARCH trade mark.

Each MONARCH MTD-92 nozzle is individually tested at several different production stages to assure perfect conformity with master nozzles of each series.

The spray patterns (i.e. hollowcone or solid cone) described below refer to the tests carried out with a 60° angle at 75 mm distance from the nozzle orifice. In nozzles of a 60° spray angle or less, and for low flows in particular, the empty section of a hollow cone becomes smaller. The difference between hollow cone and solid cone practically disappears.

**Solid Cone “R” Series: .40 to 3.50 USGPH**
This is the series supplied regularly unless customer specifies otherwise. It’s a good all-round nozzle suitable for most burners. Atomization of the oil is not quite as fine as with the "NS" series.

**HollowCons “NS” Series: .50 to 2.00 USGPH**
This Series works best on many burners due to its exceptionally fine atomization. Produces a quiet stable flame. Widely used in 80° and 90° on flame retention burners.

**SpecialSolid Cone “AR” Series: .50 to 3.50 USGPH**
This series has become widely used due to its success in obtaining quiet combustion in some flame retention head burners. Traditionally a “cure-all” replacement nozzle, it is now increasingly specified on original equipment.

**Semi-SolidCone “PLP” Series: 2.25 to 100.00 USGPH**
The standard nozzle for larger capacities. Fine atomization and “solid” spray pattern up to about 3.50 USGPH, gradually becoming more and more “hollow” in the larger sizes.

**HollowCone “PL” Series: 2.25 to 50.00 USGPH**
This series represents an extension of the “NS” type spray pattern to larger capacity sizes. Spray is not as finely atomized as the “PLP” series, but produces the best results in equipment specifying hollow cone nozzles.

**NarrowSpray Angle “HV” Series: 1.65 to 60.00 USGPH**
Used mostly for Semi-Industrial or Scotch Marine applications where narrow spray angle and high spray velocity is essential and some combustion noise is not objectionable.

**Heavy OilNozzle “HO” Series: 1.25 to 100.00 USGPH**
Designed for use on 70 SSU (approx. 13 centistokes) operating viscosity oil at operating pressures ranging from 200-450 Psig (13.8 to 31 bar).
**Atomizing Nozzle for a wide range of applications**

<table>
<thead>
<tr>
<th>Size</th>
<th>Minimum Capacity: Gallons Per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td>0.4</td>
<td>-</td>
</tr>
<tr>
<td>0.5</td>
<td>-</td>
</tr>
<tr>
<td>0.6</td>
<td>-</td>
</tr>
<tr>
<td>0.7</td>
<td>-</td>
</tr>
<tr>
<td>0.8</td>
<td>-</td>
</tr>
<tr>
<td>0.9</td>
<td>-</td>
</tr>
<tr>
<td>1.0</td>
<td>0.4</td>
</tr>
<tr>
<td>1.1</td>
<td>0.4</td>
</tr>
<tr>
<td>1.2</td>
<td>0.4</td>
</tr>
<tr>
<td>1.3</td>
<td>0.5</td>
</tr>
<tr>
<td>1.4</td>
<td>0.5</td>
</tr>
<tr>
<td>1.5</td>
<td>0.6</td>
</tr>
<tr>
<td>1.7</td>
<td>0.6</td>
</tr>
<tr>
<td>1.8</td>
<td>0.7</td>
</tr>
<tr>
<td>2.0</td>
<td>0.7</td>
</tr>
<tr>
<td>2.3</td>
<td>0.8</td>
</tr>
<tr>
<td>2.5</td>
<td>0.9</td>
</tr>
<tr>
<td>3.0</td>
<td>1.1</td>
</tr>
<tr>
<td>3.5</td>
<td>1.3</td>
</tr>
<tr>
<td>4.0</td>
<td>1.5</td>
</tr>
<tr>
<td>4.5</td>
<td>1.7</td>
</tr>
<tr>
<td>5.0</td>
<td>1.9</td>
</tr>
<tr>
<td>5.5</td>
<td>2.0</td>
</tr>
<tr>
<td>6.0</td>
<td>2.2</td>
</tr>
<tr>
<td>6.5</td>
<td>2.4</td>
</tr>
<tr>
<td>7.0</td>
<td>2.6</td>
</tr>
<tr>
<td>7.5</td>
<td>2.8</td>
</tr>
<tr>
<td>8.0</td>
<td>3.0</td>
</tr>
<tr>
<td>8.5</td>
<td>3.1</td>
</tr>
<tr>
<td>9.0</td>
<td>3.3</td>
</tr>
<tr>
<td>9.5</td>
<td>3.5</td>
</tr>
<tr>
<td>10.0</td>
<td>3.7</td>
</tr>
<tr>
<td>10.5</td>
<td>3.9</td>
</tr>
<tr>
<td>11.0</td>
<td>4.1</td>
</tr>
</tbody>
</table>
The HO series is offered to meet the requirement for Nozzles to be used on higher viscosity oils at elevated operating pressures. It is a redesignation of the PLO-HO, PL-HO and R-HO series to simplify specifications for ordering. These Nozzles (as with all Monarch Nozzles) are stamped with their nominal flow rate at 100 PSIG on #2 fuel oil and are available in capacity sizes from 1.00 through 100.0 GPH.

200 PSI: When regular light oil Nozzles are used on more viscous oil, their sprays tend to „flutter“, they produce a narrower spray angle and often develop streaks in the spray. Accordingly, the standard „HO“ Nozzles are specially tested for spray quality and rated for spray angle at a pressure of 200 PSIG (14 bars) on 70 SSU (13 Centistoke) operating viscosity oil. This special testing assures that the Nozzles will perform properly under heavy oil operating conditions. The spray angle stamped on the Nozzle is the nominal spray angle at 200 PSIG operating pressure.

430 PSI: For very high pressure operation, the HO Nozzles are also tested for spray angle and spray quality at 430 PSIG (30 bars) on 70 SSU operating viscosity oil. The special additional testing is necessary to be sure that no streaks, voids, or flutter appear in the spray at these pressures that would not appear at 200 PSIG. The spray angle stamped on the Nozzle is the nominal Spray Angle at 430 PSIG operating pressure.

The accompanying chart shows approximate flow rates when operating from 200 PSIG through 450 PSIG on 70 SSU operating viscosity oil, specific gravity .846. Note that the nominal flow rates stamped on the Nozzles are based on 100 PSIG using U.S. No. 2 fuel oil, subject to a flow tolerance of plus or minus 5%. Flow rates shown at 300 PSIG on 70 SSU operating viscosity oil are from actual tests. Flow rates at higher and lower pressures are rates predicted from the 300 PSIG data. Actual flow rates may vary, depending on exact operating conditions.

Nozzles for operation at 200 PSIG are available in 45°, 60° and 80° spray angles in sizes of 2.25 GPH up to, and including 45.00 GPH, and sizes of 50.00 GPH and up are available only in 60° and 80°. Nozzles for operation at 430 PSIG are available in 45°, 60° and 80° in sizes 1.00 GPH up to and including 45.00 GPH. Sizes of 50.00 GPH and up are available only in 80°. Strainers are not included with Nozzles but 120 mesh Monel Strainers may be ordered separately. Strainers are specifically not recommended for use on sizes over 50.00 GPH, as restriction may occur.

**MATERIAL**
Models completely made of brass
416 SS would be available per request

**PIPE CONNECTION**
1/8 “NPT male

**SPRAY ANGLES**
“M”: 80 °
“MW”: 90 °, 120 °, 160 °

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com  Phone 1-856-241-1500
### Flow Rates

**Nominal Rating #2 Fuel Oil**

<table>
<thead>
<tr>
<th>Pressure (PSIG)</th>
<th>200</th>
<th>250</th>
<th>300</th>
<th>350</th>
<th>400</th>
<th>430</th>
<th>450</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00</td>
<td>–</td>
<td>–</td>
<td>1.91</td>
<td>2.06</td>
<td>2.21</td>
<td>2.29</td>
<td>2.34</td>
</tr>
<tr>
<td>1.20</td>
<td>–</td>
<td>–</td>
<td>2.14</td>
<td>2.31</td>
<td>2.47</td>
<td>2.56</td>
<td>2.62</td>
</tr>
<tr>
<td>1.25</td>
<td>–</td>
<td>–</td>
<td>2.45</td>
<td>2.60</td>
<td>2.80</td>
<td>2.90</td>
<td>3.00</td>
</tr>
<tr>
<td>1.35</td>
<td>–</td>
<td>–</td>
<td>2.70</td>
<td>2.90</td>
<td>3.10</td>
<td>3.25</td>
<td>3.30</td>
</tr>
<tr>
<td>1.50</td>
<td>–</td>
<td>–</td>
<td>2.90</td>
<td>3.15</td>
<td>3.35</td>
<td>3.50</td>
<td>3.55</td>
</tr>
<tr>
<td>1.65</td>
<td>–</td>
<td>–</td>
<td>3.15</td>
<td>3.40</td>
<td>3.65</td>
<td>3.80</td>
<td>3.85</td>
</tr>
<tr>
<td>1.80</td>
<td>–</td>
<td>–</td>
<td>3.50</td>
<td>3.80</td>
<td>4.05</td>
<td>4.20</td>
<td>4.30</td>
</tr>
<tr>
<td>2.00</td>
<td>2.90</td>
<td>3.25</td>
<td>3.55</td>
<td>3.85</td>
<td>4.10</td>
<td>4.25</td>
<td>4.35</td>
</tr>
<tr>
<td>2.25</td>
<td>3.90</td>
<td>4.35</td>
<td>4.75</td>
<td>5.15</td>
<td>5.50</td>
<td>5.70</td>
<td>5.80</td>
</tr>
<tr>
<td>2.50</td>
<td>4.10</td>
<td>4.60</td>
<td>5.05</td>
<td>5.45</td>
<td>5.80</td>
<td>6.00</td>
<td>6.15</td>
</tr>
<tr>
<td>3.00</td>
<td>4.85</td>
<td>5.45</td>
<td>5.95</td>
<td>6.45</td>
<td>6.85</td>
<td>7.10</td>
<td>7.30</td>
</tr>
<tr>
<td>3.50</td>
<td>5.80</td>
<td>6.45</td>
<td>7.10</td>
<td>7.65</td>
<td>8.20</td>
<td>8.50</td>
<td>8.65</td>
</tr>
<tr>
<td>4.00</td>
<td>6.60</td>
<td>7.40</td>
<td>8.10</td>
<td>8.75</td>
<td>9.35</td>
<td>9.70</td>
<td>9.95</td>
</tr>
<tr>
<td>4.50</td>
<td>6.75</td>
<td>7.55</td>
<td>8.25</td>
<td>8.90</td>
<td>9.55</td>
<td>9.90</td>
<td>10.10</td>
</tr>
<tr>
<td>5.00</td>
<td>7.45</td>
<td>8.35</td>
<td>9.15</td>
<td>9.85</td>
<td>10.55</td>
<td>10.95</td>
<td>11.20</td>
</tr>
<tr>
<td>5.50</td>
<td>8.3</td>
<td>9.3</td>
<td>10.2</td>
<td>11.0</td>
<td>11.8</td>
<td>12.2</td>
<td>12.5</td>
</tr>
<tr>
<td>6.00</td>
<td>9.5</td>
<td>10.6</td>
<td>11.6</td>
<td>12.5</td>
<td>13.4</td>
<td>13.9</td>
<td>14.2</td>
</tr>
<tr>
<td>6.50</td>
<td>10.0</td>
<td>11.3</td>
<td>12.3</td>
<td>13.3</td>
<td>14.2</td>
<td>14.8</td>
<td>15.1</td>
</tr>
<tr>
<td>7.00</td>
<td>10.6</td>
<td>11.8</td>
<td>12.9</td>
<td>14.0</td>
<td>14.9</td>
<td>15.5</td>
<td>15.9</td>
</tr>
<tr>
<td>7.50</td>
<td>11.3</td>
<td>12.6</td>
<td>13.9</td>
<td>15.0</td>
<td>16.0</td>
<td>16.6</td>
<td>17.0</td>
</tr>
<tr>
<td>8.00</td>
<td>11.4</td>
<td>12.8</td>
<td>14.0</td>
<td>15.1</td>
<td>16.2</td>
<td>16.8</td>
<td>17.1</td>
</tr>
<tr>
<td>8.50</td>
<td>11.7</td>
<td>13.1</td>
<td>14.3</td>
<td>15.4</td>
<td>16.5</td>
<td>17.1</td>
<td>17.5</td>
</tr>
<tr>
<td>9.00</td>
<td>12.7</td>
<td>14.1</td>
<td>15.5</td>
<td>16.7</td>
<td>17.9</td>
<td>18.6</td>
<td>19.0</td>
</tr>
<tr>
<td>9.50</td>
<td>13.6</td>
<td>15.2</td>
<td>16.6</td>
<td>17.9</td>
<td>19.2</td>
<td>19.9</td>
<td>20.3</td>
</tr>
<tr>
<td>10.00</td>
<td>14.1</td>
<td>15.8</td>
<td>17.3</td>
<td>18.7</td>
<td>20.0</td>
<td>20.7</td>
<td>21.2</td>
</tr>
<tr>
<td>10.50</td>
<td>14.8</td>
<td>16.4</td>
<td>17.9</td>
<td>19.4</td>
<td>20.9</td>
<td>22.4</td>
<td>23.2</td>
</tr>
<tr>
<td>12.00</td>
<td>15.8</td>
<td>17.7</td>
<td>19.4</td>
<td>20.9</td>
<td>22.4</td>
<td>23.2</td>
<td>23.7</td>
</tr>
<tr>
<td>13.50</td>
<td>18.3</td>
<td>20.4</td>
<td>22.4</td>
<td>24.2</td>
<td>25.9</td>
<td>26.8</td>
<td>27.4</td>
</tr>
<tr>
<td>15.50</td>
<td>21.2</td>
<td>23.7</td>
<td>26.0</td>
<td>28.1</td>
<td>30.0</td>
<td>31.1</td>
<td>31.8</td>
</tr>
<tr>
<td>17.50</td>
<td>25.5</td>
<td>28.5</td>
<td>31.2</td>
<td>33.7</td>
<td>36.1</td>
<td>37.4</td>
<td>38.2</td>
</tr>
<tr>
<td>19.50</td>
<td>27.3</td>
<td>30.2</td>
<td>33.1</td>
<td>35.8</td>
<td>38.2</td>
<td>39.7</td>
<td>40.6</td>
</tr>
<tr>
<td>21.50</td>
<td>30.3</td>
<td>33.5</td>
<td>36.7</td>
<td>39.7</td>
<td>42.4</td>
<td>44.0</td>
<td>45.0</td>
</tr>
<tr>
<td>24.0</td>
<td>35.1</td>
<td>39.3</td>
<td>43.0</td>
<td>46.5</td>
<td>49.7</td>
<td>51.5</td>
<td>52.7</td>
</tr>
<tr>
<td>28.0</td>
<td>41.7</td>
<td>46.6</td>
<td>51.0</td>
<td>55.1</td>
<td>58.9</td>
<td>61.1</td>
<td>62.5</td>
</tr>
<tr>
<td>30.0</td>
<td>45.0</td>
<td>50.3</td>
<td>55.1</td>
<td>59.5</td>
<td>63.6</td>
<td>66.0</td>
<td>67.5</td>
</tr>
<tr>
<td>35.0</td>
<td>49.7</td>
<td>55.5</td>
<td>60.8</td>
<td>65.7</td>
<td>70.2</td>
<td>72.8</td>
<td>74.5</td>
</tr>
<tr>
<td>40.0</td>
<td>59.1</td>
<td>66.1</td>
<td>72.4</td>
<td>78.2</td>
<td>83.6</td>
<td>86.6</td>
<td>88.6</td>
</tr>
<tr>
<td>45.0</td>
<td>65.2</td>
<td>72.9</td>
<td>79.9</td>
<td>86.3</td>
<td>92.2</td>
<td>95.6</td>
<td>97.8</td>
</tr>
<tr>
<td>50.0</td>
<td>66.5</td>
<td>74.4</td>
<td>81.5</td>
<td>88.0</td>
<td>94.1</td>
<td>97.6</td>
<td>99.8</td>
</tr>
<tr>
<td>55.0</td>
<td>74.5</td>
<td>83.5</td>
<td>91.5</td>
<td>99.0</td>
<td>105.5</td>
<td>107.5</td>
<td>112.0</td>
</tr>
<tr>
<td>60.0</td>
<td>85.5</td>
<td>95.5</td>
<td>104.5</td>
<td>113.0</td>
<td>120.5</td>
<td>125.0</td>
<td>128.0</td>
</tr>
<tr>
<td>70.0</td>
<td>97.5</td>
<td>107.0</td>
<td>119.5</td>
<td>129.0</td>
<td>137.5</td>
<td>143.0</td>
<td>146.0</td>
</tr>
<tr>
<td>80.0</td>
<td>107.5</td>
<td>120.5</td>
<td>132.0</td>
<td>142.5</td>
<td>152.5</td>
<td>158.0</td>
<td>161.5</td>
</tr>
<tr>
<td>90.0</td>
<td>119.0</td>
<td>133.0</td>
<td>145.5</td>
<td>157.0</td>
<td>168.0</td>
<td>174.0</td>
<td>178.0</td>
</tr>
<tr>
<td>100.0</td>
<td>135.0</td>
<td>151.0</td>
<td>165.0</td>
<td>178.5</td>
<td>190.5</td>
<td>198.0</td>
<td>202.5</td>
</tr>
</tbody>
</table>

*Test Oil Specifications: U.S. No. 2 FUEL OIL: 4-36 SSU @ 100°F. 32-38 API Gravity @ 60°F
Flow Tolerance: +/- 5% from stamped nominal rating @ 100 PSIG on U.S. No 2 Fuel Oil as specified at left
The BPS nozzles produce variable orifice flow rates by by-passing fluid from the nozzle swirl chamber. The orifice flow is regulated by controlling the by-pass line pressure.

The nozzle tip and disc are made of the same heat resisting, high chrome grade of stainless steel used in our simplex or regular domestic oil burner nozzles. The combination locknut-strainer support is made of brass with a Monel strainer screen and a Viton “O” ring. Nozzle adaptors (bodies) and fittings are made of brass. Nozzles in all sizes are furnished only with strainers, 120 mesh Monel up to and including 13.50 GPH and 80 mesh on larger sizes.

The BPS nozzles are designed and tested for operation at 100 psi on #2 fuel oil, with the capacity and spray angle stamped on the nozzles at these conditions. Both the capacity and spray angle rating are based on having the by-pass line closed. Spray angle widens 5°-10° with the by-pass wide open.

The chart shows the orifice flow rates at specific by-pass line pressures and also the maximum pressure in the by-pass line when the by-pass is closed.

The BPS nozzles can be supplied with spray angles as follows: 30° in capacities from 3.00 GPH up to and including 30.00 GPH; 45° in capacities from .75 GPH up to and including 35.00 GPH; 60° in all listed capacities, 80° in capacities from 1.50 GPH up to and including 35.00 GPH, and 90° from 10.50 GPH up to and including 24.00 GPH.

It is possible to operate standard BPS nozzles up to 250 psi line pressure, and at this pressure they will handle up to 70 S.S.U. operating viscosity oil. The BPS nozzles can be specially tested for operation at line pressures of 300 psi or more at additional cost.

**BY-PASS PRESSURES vs. ORIFICE FLOWS**

Shown is a pressure-flow chart for the 6.00 GPH BPS nozzle operating at 100 psi. oil line pressure on #2 fuel oil. The total flow through the nozzle orifice and the by-pass line when the by-pass is completely open is considerably more than the rated capacity of the nozzle, per last column of chart above. For capacity sizes larger than those indicated as available, we refer you to the E-180-H.

**DIMENSIONS**

**BY-PASSING NOZZLE ADAPTORS**

The H-730-C by-passing nozzle adaptors are 2 1/16” long, made of 3/4” hexagon brass and are furnished with either 1/8” or 1/4” female N.P.T. oil inlet connections. They are equipped with a brass fitting on the side to accommodate 1/4” O.D. tubing for the by-pass line, and the distance between centers of the feed line and the by-pass line is 11/16”. A dual by-passing adaptor, H-711, is also available to take two (2) BPS nozzles. Due to the necessity of combining inlet and by-passing flows of the two nozzles, the single inlet of the H-711 is 1/8” female N.P.T. located on the side of the adaptor and the single by-pass is 1/4” female N.P.T. located at the rear of the adaptor. The H-711 is made from 3/4” x 1 3/4” rectangular brass stock and is 2 1/8” long.
## BPS BY-PASSING

**By-passing nozzle**

### CAPACITIES

#### Minimum Capacity: Gallons Per Hour

<table>
<thead>
<tr>
<th>Nozzle No.</th>
<th>Function Pressure – By Inch-pound limit</th>
<th>BY-PASS PRESSURE - BY-PASS CLOSED</th>
<th>TOTAL** FLOW: GPH TO NOZZLE BY-PASS OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Nominal Capacity, GPH: BY-PASS CLOSED</td>
<td>By-Pass Pressure - PSIG</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.75</td>
<td></td>
<td>.20</td>
<td>.25</td>
</tr>
<tr>
<td>1.00</td>
<td></td>
<td>.40</td>
<td>.60</td>
</tr>
<tr>
<td>1.50</td>
<td></td>
<td>.55</td>
<td>.75</td>
</tr>
<tr>
<td>2.00</td>
<td></td>
<td>1.00</td>
<td>1.20</td>
</tr>
<tr>
<td>2.50</td>
<td></td>
<td>.70</td>
<td>1.20</td>
</tr>
<tr>
<td>3.00</td>
<td></td>
<td>.90</td>
<td>1.35</td>
</tr>
<tr>
<td>3.50</td>
<td></td>
<td>1.10</td>
<td>1.55</td>
</tr>
<tr>
<td>4.00</td>
<td></td>
<td>1.25</td>
<td>1.50</td>
</tr>
<tr>
<td>4.50</td>
<td></td>
<td>1.55</td>
<td>1.70</td>
</tr>
<tr>
<td>5.00</td>
<td></td>
<td>1.75</td>
<td>1.95</td>
</tr>
<tr>
<td>5.50</td>
<td></td>
<td>1.70</td>
<td>2.00</td>
</tr>
<tr>
<td>6.00</td>
<td></td>
<td>1.60</td>
<td>1.85</td>
</tr>
<tr>
<td>6.50</td>
<td></td>
<td>1.75</td>
<td>2.05</td>
</tr>
<tr>
<td>7.00</td>
<td></td>
<td>1.55</td>
<td>1.90</td>
</tr>
<tr>
<td>7.50</td>
<td></td>
<td>2.10</td>
<td>2.50</td>
</tr>
<tr>
<td>8.00</td>
<td></td>
<td>1.90</td>
<td>2.10</td>
</tr>
<tr>
<td>9.00</td>
<td></td>
<td>2.10</td>
<td>2.40</td>
</tr>
<tr>
<td>9.50</td>
<td></td>
<td>1.90</td>
<td>2.30</td>
</tr>
<tr>
<td>10.50</td>
<td></td>
<td>2.25</td>
<td>2.65</td>
</tr>
<tr>
<td>12.00</td>
<td></td>
<td>2.55</td>
<td>3.00</td>
</tr>
<tr>
<td>13.50</td>
<td></td>
<td>3.00</td>
<td>3.45</td>
</tr>
<tr>
<td>15.50</td>
<td></td>
<td>3.40</td>
<td>3.60</td>
</tr>
<tr>
<td>17.50</td>
<td></td>
<td>3.90</td>
<td>4.25</td>
</tr>
<tr>
<td>19.50</td>
<td></td>
<td>3.80</td>
<td>4.30</td>
</tr>
<tr>
<td>21.50</td>
<td></td>
<td>4.65</td>
<td>5.15</td>
</tr>
<tr>
<td>24.00</td>
<td></td>
<td>5.40</td>
<td>6.25</td>
</tr>
<tr>
<td>28.00</td>
<td></td>
<td>5.75</td>
<td>7.10</td>
</tr>
<tr>
<td>30.00</td>
<td></td>
<td>5.50</td>
<td>7.35</td>
</tr>
<tr>
<td>35.00</td>
<td></td>
<td>7.05</td>
<td>10.10</td>
</tr>
<tr>
<td>40.00</td>
<td></td>
<td>9.45</td>
<td>14.50</td>
</tr>
<tr>
<td>45.00</td>
<td></td>
<td>14.50</td>
<td>19.35</td>
</tr>
<tr>
<td>50.00</td>
<td></td>
<td>17.80</td>
<td>24.20</td>
</tr>
</tbody>
</table>
The C-169-WA and C-170-WA nozzles are widely used on Industrial Burners using up to 21 psi air pressure for atomization, and oil pressure at least 2 psi higher (depending on oil flow rate desired). Excellent firing results can be obtained when these nozzles are used in combination with high velocity combustion air through properly designed Air Mixing Equipment to give the flame a rapid whirling motion.

Air and oil are fed into a common swirl chamber through separate openings to properly proportion the two, resulting in the oil being discharged in exceptionally fine spray ready for burning. Flow ratings in the table are on No. 2 fuel oil, but heavy oils can be handled satisfactorily provided they are preheated to bring the viscosity down to about 100 SSU. Flow rates shown are approximate maximums, and turndown ratios between 3 and 4 to 1 can be obtained by reducing air pressure to as low as 5 psi, keeping oil pressure always at least 2 psi higher than the air.

Best atomization is obtained with oil pressure 8 to 10 psi over the air pressure. Some Manufacturers operate at 15 psi constant air pressure and vary only the oil pressure for different flow rates and others modulate both air and oil pressures for maximum turndown. Air requirements depend on air and oil pressures used, as any particular flow rate can be produced by an infinite number of different air-oil pressure combinations. Curve charts showing oil flow rates and air consumption at different air and oil pressures are available upon request for each size nozzle.

C-169-WA and C-170-WA nozzles are made of cold rolled steel and can be supplied with spray angles from 50° to 100° in 10° steps. 80° spray angle is considered the standard and will be furnished unless ordered otherwise. Weight: C-170-WA 1.2 lbs.; C-169-WA 2.0 lbs. Ordering: Specify quantity, figure number, capacity size and spray angle. Note: Oil pressure must be at least 2 PSI higher than air pressure. Refer to burner manufacturer’s instructions. Preheating is recommended for higher viscosity oils.
### C-169 / C-170 WA

**Industrial Burner Nozzles for atomization**

**CAPACITIES**

<table>
<thead>
<tr>
<th>FIG No</th>
<th>RATED GPH</th>
<th>NPT CONNECTIONS</th>
<th>PIN SETTING</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>AIR</td>
<td>OIL</td>
</tr>
<tr>
<td>C-170-WA</td>
<td></td>
<td>1/8”</td>
<td>1/8”</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>1/8”</td>
<td>1/8”</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>50</td>
<td>1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>60</td>
<td>1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>80</td>
<td>1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>100</td>
<td>1/4”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>125</td>
<td>3/8”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>150</td>
<td>3/8”</td>
<td>1/4”</td>
</tr>
<tr>
<td></td>
<td>200</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
<tr>
<td></td>
<td>250</td>
<td>3/8”</td>
<td>3/8”</td>
</tr>
</tbody>
</table>
Monarch offers a superior line of nozzles including the C-202 Air Operated Nozzle. This series is widely used on industrial burners using up to 50 psi air pressure for atomization.

The C-202 nozzle is recommended for large capacity industrial applications such as airports, manufacturing facilities, universities and military applications. For excellent firing results, use the C-202 in combination with high velocity combustion air. C-202 nozzles are made of cold rolled steel and are precisely machined to combine air and oil into a common swirl chamber through separate openings to properly proportion the two. This results in the oil being discharged in exceptionally fine spray ready for burning. Flow ratings in the table are based on No. 2 fuel oil, but heavy oils can be handled satisfactorily provided they are preheated to bring the viscosity down to about 150 SSU.

Flow rates shown are determined by air and oil pressured and turndown ratios between 3 and 4 to 1 can be obtained by reducing air pressure to as low as 5 psi, keeping oil pressure always at least 2 psi higher than the air. Best atomization is obtained by regulating the air pressure. Some manufacturers operate at 15 psi constant air pressure and vary only the oil pressure for different flow rates and others modulate both air and oil pressures for maximum turn-down. Minimum air requirement depends on oil pressures used, as any particular flow rate can be produced by an infinite number of different air-oil pressure combinations. Curve charts showing oil flow rates and air consumption at different air and oil pressures are available upon request for each size nozzle.

The C-202 nozzles comes with angles of 60° or 80° spray angle but other specifications are available for custom.

### MATERIAL
Cold rolled steel

### PIPE CONNECTION
1/8” to 3/8” depending on size

### SPRAY ANGLES
60° or 80° other specifications are available on enquiry

### CAPACITIES & DIMENSIONS

<table>
<thead>
<tr>
<th>Minimum Capacity: Gallons Per Hour</th>
<th>150 SSU</th>
<th>Capacity GPH</th>
<th>Air Pressure PSIG</th>
<th>Oil Pressure PSIG</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-50</td>
<td>33.0</td>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>B-50</td>
<td>35.0</td>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>C-50</td>
<td>67.0</td>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>D-50</td>
<td>5.0</td>
<td>10</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>E-50</td>
<td>11.0</td>
<td>14</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>F-50</td>
<td>7.0</td>
<td>10</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>G-50</td>
<td>150.0</td>
<td>50.0</td>
<td>52.5</td>
<td>65.0</td>
</tr>
</tbody>
</table>

**MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109**

hbeccari@monarchnozzles.com | Phone 1-856-241-1500
Monarch offers a superior line of nozzles including the C-206 Air Operated Nozzles. This series is widely used on industrial burners using 30 psi for optimal atomization.

For excellent firing results use the C-206 in combination with high velocity combustion air. C-206 nozzles are made of cold rolled steel and are precisely machined to combine air and oil into a common swirl chamber through separate openings to properly proportion the two. This results in the oil being discharged in exceptionally fine spray ready for burning. Flow ratings in the table are based on No. 2 fuel oil, but heavy oils can be handled satisfactorily provided they are preheated to bring the viscosity down to about 100 SSU.

Flow rates shown are determined by air and oil pressures and turndown ratios between 3 and 4 to 1 can be obtained by reducing air pressure to as low as 5 psi, keeping oil pressure always at least 2 psi higher than the air. Best atomization is obtained by regulating the air pressure. Some manufacturers operate at 15 psi constant air pressure and vary only the oil pressure for different flow rates and others modulate both air and oil pressures for maximum turn-down. Minimum air requirement depends on oil pressures used, as any particular flow rate can be produced by an infinite number of different air-oil pressure combinations. Curve charts showing oil flow rates and air consumption at different air and oil pressures are available upon request for each size nozzle.

The C-206 nozzles come standard as a 60° spray angle but other specifications are available for custom requests.

ORDERING: Specify quantity and figure number. Note: Oil pressure must be at least 2 PSI higher than air pressure. Refer to burner manufacturer’s instructions.

### MATERIAL
Cold rolled steel

### PIPE CONNECTION
1/8” to 3/8” depending on size

### SPRAY ANGLES
60°

### CAPACITIES & DIMENSIONS

<table>
<thead>
<tr>
<th>Minimum Capacity: Gallons Per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>TIP No.</em></td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>A-1</td>
</tr>
<tr>
<td>A-3</td>
</tr>
<tr>
<td>A-5</td>
</tr>
<tr>
<td>B-1</td>
</tr>
<tr>
<td>B-3</td>
</tr>
<tr>
<td>C-1</td>
</tr>
</tbody>
</table>
The Fig. D-41 direct pressure operated Industrial Oil Nozzle will spray oils having an operating viscosity as high as 100 SSU with liquid pressure of 200-250 psi., depending upon the capacity size—the smaller the capacity, the higher the pressure required. Will handle Bunker “C” oil if heated to about 180° to 200° with 200 psi pressure.

Tips and Discs are case hardened and lapped for proper seating and should not be transposed. Each matched Tip and Disc combination is identified by a letter stamped on each part so the customer can always determine mating parts.

Nozzles are always rated and stamped for capacity on No. 2 fuel oil at 100 psi. If order so specifies (and at a nominal extra charge), nozzles can be tested for spray angle and spray quality on either No. 2 or 100 SSU operating viscosity oil at pressures of either 200, 250 or 300 psi.* Flow rates in the table are based on No. 2 fuel oil of 34 SSU viscosity at 100°F. On 100 SSU viscosity oil, flow rates will increase about 10% over No. 2 oil rating.

*When so tested, the spray angle test pressure is stamped on the nozzles. If tested on 100 SSU oil, the nozzles are stamped “D-41-HO”.

ORDERING:
Specify Quantity, Capacity Size, Pipe Size Connection (1/2” or 3/4” NPT), Spray Angle desired (Can be furnished in 10° steps from minimums shown in chart to 100° maximum), Operating Pressure available and whether to be tested on No. 2 oil or 100 SSU oil. If not otherwise specified, nozzles will be tested only on No. 2 oil at 100 psi.

MATERIAL
Please ask us for more information.

PIPE CONNECTION
1/2 ” or 3/4 ” NPT

SPRAY ANGLES
The spray patterns (i.e. hollow cone or solid cone) described below refer to the tests carried out with a 60° angle at a 75 mm distance from the nozzle orifice. In nozzles of a 60° spray angle or less, and for low flows in particular, the empty section of a hollow cone becomes smaller. The difference between hollow cone and solid cone practically disappears.
## DIMENSIONS & CAPACITIES

<table>
<thead>
<tr>
<th>Rated GPH at 100 PSI</th>
<th>Operating Pressure</th>
<th>Min. Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.0</td>
<td>14.5 17.0 19.0</td>
<td>50°</td>
</tr>
<tr>
<td>14.0</td>
<td>18.0 19.8 22.1</td>
<td>50°</td>
</tr>
<tr>
<td>17.0</td>
<td>20.5 24.0 26.8</td>
<td>50°</td>
</tr>
<tr>
<td>21.0</td>
<td>25.5 29.5 33.2</td>
<td>50°</td>
</tr>
<tr>
<td>24.5</td>
<td>30.0 34.5 38.5</td>
<td>50°</td>
</tr>
<tr>
<td>27.0</td>
<td>33.0 38.0 42.7</td>
<td>50°</td>
</tr>
<tr>
<td>30.0</td>
<td>36.5 42.5 48.5</td>
<td>50°</td>
</tr>
<tr>
<td>34.5</td>
<td>42.0 48.5 54.5</td>
<td>50°</td>
</tr>
<tr>
<td>40.0</td>
<td>49.0 56.6 63.5</td>
<td>50°</td>
</tr>
<tr>
<td>42.0</td>
<td>51.5 59.5 66.5</td>
<td>50°</td>
</tr>
<tr>
<td>45.0</td>
<td>55.0 63.5 71.5</td>
<td>50°</td>
</tr>
<tr>
<td>50.0</td>
<td>61.0 70.5 79.5</td>
<td>50°</td>
</tr>
<tr>
<td>55.0</td>
<td>67.0 78.0 87.0</td>
<td>50°</td>
</tr>
<tr>
<td>60.0</td>
<td>73.0 85.0 95.0</td>
<td>50°</td>
</tr>
<tr>
<td>65.0</td>
<td>80.0 92.5 103.0</td>
<td>50°</td>
</tr>
<tr>
<td>70.0</td>
<td>86.0 99.0 110.0</td>
<td>50°</td>
</tr>
<tr>
<td>78.0</td>
<td>95.5 110.0 123.0</td>
<td>50°</td>
</tr>
<tr>
<td>88.0</td>
<td>107.0 125.0 139.0</td>
<td>60°</td>
</tr>
<tr>
<td>95.0</td>
<td>116.0 135.0 150.0</td>
<td>60°</td>
</tr>
<tr>
<td>100.0</td>
<td>122.0 141.0 158.0</td>
<td>60°</td>
</tr>
<tr>
<td>107.0</td>
<td>131.0 151.0 169.0</td>
<td>60°</td>
</tr>
<tr>
<td>128.0</td>
<td>157.0 181.0 202.0</td>
<td>60°</td>
</tr>
<tr>
<td>140.0</td>
<td>172.0 196.0 222.0</td>
<td>70°</td>
</tr>
<tr>
<td>150.0</td>
<td>184.0 213.0 238.0</td>
<td>70°</td>
</tr>
<tr>
<td>163.0</td>
<td>200.0 231.0 257.0</td>
<td>70°</td>
</tr>
<tr>
<td>170.0</td>
<td>209.0 240.0 268.0</td>
<td>70°</td>
</tr>
<tr>
<td>175.0</td>
<td>215.0 248.0 276.0</td>
<td>70°</td>
</tr>
<tr>
<td>188.0</td>
<td>230.0 266.0 298.0</td>
<td>70°</td>
</tr>
<tr>
<td>200.0</td>
<td>245.0 284.0 317.0</td>
<td>70°</td>
</tr>
<tr>
<td>225.0</td>
<td>275.0 318.0 355.0</td>
<td>70°</td>
</tr>
<tr>
<td>237.0</td>
<td>290.0 333.0 373.0</td>
<td>80°</td>
</tr>
<tr>
<td>241.0</td>
<td>296.0 340.0 381.0</td>
<td>80°</td>
</tr>
<tr>
<td>250.0</td>
<td>305.0 353.0 395.0</td>
<td>80°</td>
</tr>
<tr>
<td>260.0</td>
<td>319.0 368.0 410.0</td>
<td>80°</td>
</tr>
<tr>
<td>280.0</td>
<td>342.0 395.0 455.0</td>
<td>80°</td>
</tr>
<tr>
<td>300.0</td>
<td>370.0 425.0 485.0</td>
<td>80°</td>
</tr>
<tr>
<td>313.0</td>
<td>389.0 443.0 505.0</td>
<td>80°</td>
</tr>
<tr>
<td>327.0</td>
<td>411.0 462.0 535.0</td>
<td>80°</td>
</tr>
<tr>
<td>360.0</td>
<td>436.0 510.0 565.0</td>
<td>80°</td>
</tr>
<tr>
<td>400.0</td>
<td>480.0 565.0 625.0</td>
<td>80°</td>
</tr>
</tbody>
</table>
The E-180-H Nozzles is a large Industrial Nozzles in which the orifice flow is varied by by-passing or “bleeding” liquid from the Nozzle swirl chamber while the line pressure to the Nozzle remains constant. Capacity is varied between maximum and minimum by controlling the by-pass line pressure, and excellent firing results are obtained with turn-down ratios of 3 to 4 to 1.

The capacity and spray angle ratings are based on operating at 300 PSIG line pressure on 100 SSU operating viscosity oil with the by-pass line closed. Spray angles available are 40°, 50°, 60° and 80° and it should be noted that spray angles increase from 5° to 10° when the by-pass line is wide open. These Nozzles may be used on No. 2 fuel oil, but capacities and spray angles will be approximately 10% less than on 100 SSU oil. Oil of 100 SSU operating viscosity is typically obtained by preheating U.S. No.6 fuel oil to 175°F to 265°F with a norm of about 240°F.

Accompanying charts show flow through the orifice when the bypass pressures are at various points from open to closed. Note that the total flow to the Nozzle (when the by-pass line is wide open) can be almost 50% greater than the nominal capacity of the Nozzle and this must be taken into account when sizing pumps. Pressure-flow curves can be supplied for any specific capacity size, on request.

Nozzles are made of cold rolled steel, with tips and discs case hardened and individually lapped together as mated sets. Complete E-180-H Nozzles have a net weight of approximately 18-1/2 ounces. The tip and disc set have a net weight of approximately 2 ounces.

MATERIAL
Please ask us for further information.

PIPE CONNECTION
Please ask us for further information.

SPRAY ANGLES
60° or 80°
Other specifications are available on enquiry

CAPACITIES & DIMENSIONS

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
### Minimum Capacity: Gallons Per Hour

<table>
<thead>
<tr>
<th>Nozzle No.</th>
<th>Function Pressure – By Inch-pound limit</th>
<th>BY-PASS PRESSURE - BY-PASS CLOSED</th>
<th>TOTAL** FLOW: GPH TO NOZZLE BY-PASS OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Capacity, GPH: BY-PASS CLOSED</td>
<td>By-Pass Pressure - PSIG</td>
<td>0</td>
<td>50</td>
</tr>
<tr>
<td>15.0</td>
<td>4.5</td>
<td>5.5</td>
<td>9.0</td>
</tr>
<tr>
<td>20.0</td>
<td>4.5</td>
<td>7.0</td>
<td>14.0</td>
</tr>
<tr>
<td>25.0</td>
<td>5.0</td>
<td>6.0</td>
<td>9.0</td>
</tr>
<tr>
<td>30.0</td>
<td>8.0</td>
<td>9.0</td>
<td>12.0</td>
</tr>
<tr>
<td>35.0</td>
<td>8.0</td>
<td>8.5</td>
<td>13.0</td>
</tr>
<tr>
<td>40.0</td>
<td>8.0</td>
<td>9.0</td>
<td>13.0</td>
</tr>
<tr>
<td>45.0</td>
<td>9.0</td>
<td>11.0</td>
<td>14.0</td>
</tr>
<tr>
<td>50.0</td>
<td>12.0</td>
<td>13.0</td>
<td>18.0</td>
</tr>
<tr>
<td>55.0</td>
<td>15.0</td>
<td>16.0</td>
<td>20.0</td>
</tr>
<tr>
<td>60.0</td>
<td>14.0</td>
<td>14.5</td>
<td>20.0</td>
</tr>
<tr>
<td>65.0</td>
<td>13.5</td>
<td>16.0</td>
<td>22.0</td>
</tr>
<tr>
<td>70.0</td>
<td>15.0</td>
<td>27.5</td>
<td>34.0</td>
</tr>
<tr>
<td>75.0</td>
<td>19.0</td>
<td>20.0</td>
<td>27.0</td>
</tr>
<tr>
<td>80.0</td>
<td>21.0</td>
<td>22.5</td>
<td>33.0</td>
</tr>
<tr>
<td>85.0</td>
<td>21.0</td>
<td>22.5</td>
<td>33.0</td>
</tr>
<tr>
<td>90.0</td>
<td>25.0</td>
<td>25.0</td>
<td>35.0</td>
</tr>
<tr>
<td>100.0</td>
<td>30.0</td>
<td>31.0</td>
<td>36.0</td>
</tr>
<tr>
<td>120.0</td>
<td>27.0</td>
<td>30.0</td>
<td>40.0</td>
</tr>
<tr>
<td>130.0</td>
<td>36.0</td>
<td>40.0</td>
<td>55.0</td>
</tr>
<tr>
<td>140.0</td>
<td>25.0</td>
<td>27.5</td>
<td>38.0</td>
</tr>
<tr>
<td>150.0</td>
<td>50.0</td>
<td>52.5</td>
<td>65.0</td>
</tr>
</tbody>
</table>
The B-25 Nozzles are of two piece construction with large tangential metering slots in the internal Disc to give a nonrestricted flow with a uniform “Solid” distribution. For special applications, a hollow cone spray can be produced from this same design. These Nozzles with high flow rates and coarser sprays are used in gas scrubbing, adsorption towers, brine spraying, and chemical and industrial processing.

**MATERIAL**
Brass is standard with 1/2” NPT. Also available in any machinable material on request.

**PIPE CONNECTION**
3/8”, 1/2”, 3/4”, 1”, 1 1/2”, 2” NPT

**SPRAY ANGLES**
80° at 40 PSI

**AAMA kit available**
Water test kit includes:
(1) B-25 6.030 W/1/2” FNPT
(1) 3/4” Globe valve
(1) 3/4” Garden hose adaptor
(1) 0-60 PSI Pressure gauge
(1) Case Fully assembled and ready to use!

Please ask for further information.
### B-25 AAMA Kit

Large Capacity Nozzle

---

#### CAPACITIES & DIMENSIONS

**B-25 Capacities: Gallons Per Minute**

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Nozzle No.*</th>
<th>Operating Pressure – Lbs. per Square Inch</th>
<th>Dimensions and Weights</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No.*</th>
<th>2.5</th>
<th>3.0</th>
<th>3.5</th>
<th>4.0</th>
<th>4.5</th>
<th>5.0</th>
<th>6.0</th>
<th>7.0</th>
<th>8.0</th>
<th>9.0</th>
<th>10.0</th>
<th>12.0</th>
<th>15.0</th>
<th>1'' or 1 1/4''</th>
<th>1 1/2''</th>
<th>1 3/8''</th>
<th>1 3/4''</th>
<th>1 3/8''</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8''</td>
<td>.9</td>
<td>1.1</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
<td>1.8</td>
<td>2.1</td>
<td>2.5</td>
<td>2.8</td>
<td>3.2</td>
<td>3.5</td>
<td>4.2</td>
<td>5.3</td>
<td>4.2</td>
<td>6.0</td>
<td>8.4</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>5/16''</td>
<td>1.2</td>
<td>1.5</td>
<td>2.1</td>
<td>2.5</td>
<td>3.0</td>
<td>3.5</td>
<td>4.2</td>
<td>5.0</td>
<td>6.0</td>
<td>7.5</td>
<td>10.6</td>
<td>15.0</td>
<td>21.2</td>
<td>23.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1''</td>
<td>4.2</td>
<td>6.0</td>
<td>8.4</td>
<td>12</td>
<td>17.0</td>
<td>21.2</td>
<td>23.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Nozzle No. is capacity in GPM @ 40 PSI water pressure.

1’’ and larger are made from castings. 3/4’’ and smaller are made from bar stock.

---

**AAMA KIT NOZZLE CAPACITIES & DIMENSIONS**

Large Capacity Nozzle

---

**B-25 AAMA Kit**

Large Capacity Nozzle

---

**AAMA KIT NOZZLE**
Because inside the nozzles 629 and 631 are no spacers, they are virtually nonclogging. Each foreign body for which the large tangential inflow permeable, is simply blown through the nozzle opening. The shape of the vortex chamber, both at End is conical, produces a uniform Hollow cone distribution. The atomization at a higher pressure and a larger spray angle is finer.

Typical applications include air-wash systems, ventilators, cooling towers, sparkling resolution, smoke and dust removal, gas cooling, waxing, degreasing and general industrial processing and agricultural applications.

MATERIAL
Brass and 303 stainless steel as standard. Also available in hard rubber or any other material processed.

PIPE CONNECTION
629 (male) 1/8”, 1/4” NPT
631 (male) 1/8”, 1/4” NPT

SPRAY ANGLES
Standard: 80° at 40 PSI. jet with an opening of up to 1/8” available in 120°.

CAPACITIES & DIMENSIONS

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>Weight (oz.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>9/10</td>
<td>9/10</td>
<td>5/8</td>
<td>1/2</td>
<td>1/2</td>
<td>1</td>
</tr>
<tr>
<td>1/4</td>
<td>11/10</td>
<td>11/10</td>
<td>13/16</td>
<td>5/8</td>
<td>5/8</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Weight (oz.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>1/8</td>
<td>5/8</td>
<td>1/2</td>
<td>1/2</td>
<td>1</td>
</tr>
<tr>
<td>1/4</td>
<td>1 1/16</td>
<td>13/16</td>
<td>5/8</td>
<td>5/8</td>
<td>2</td>
</tr>
<tr>
<td>3/8</td>
<td>1 11/16</td>
<td>15/16</td>
<td>3/4</td>
<td>3/4</td>
<td>3 1/4</td>
</tr>
<tr>
<td>1/2</td>
<td>15/18</td>
<td>1 1/4</td>
<td>7/8</td>
<td>1</td>
<td>4 3/4</td>
</tr>
<tr>
<td>3/4</td>
<td>2 1/2</td>
<td>1 9/16</td>
<td>1 1/4</td>
<td>1/4</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>3</td>
<td>1 13/16</td>
<td>1 1/2</td>
<td>1/2</td>
<td>23</td>
</tr>
<tr>
<td>Pipe Size</td>
<td>Orifice</td>
<td>Lead</td>
<td>5</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>--------------</td>
<td>---------</td>
<td>------</td>
<td>-----</td>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>1/8&quot; or 1/4&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>69</td>
<td>69</td>
<td>-</td>
<td>-</td>
<td>2.7</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>61</td>
<td>-</td>
<td>-</td>
<td>4.2</td>
</tr>
<tr>
<td></td>
<td>61</td>
<td>53</td>
<td>2.7</td>
<td>3.7</td>
<td>5.3</td>
</tr>
<tr>
<td></td>
<td>53</td>
<td>53</td>
<td>4.0</td>
<td>5.7</td>
<td>8.2</td>
</tr>
<tr>
<td></td>
<td>49</td>
<td>49</td>
<td>5.6</td>
<td>7.9</td>
<td>11.1</td>
</tr>
<tr>
<td></td>
<td>3/32</td>
<td>3/32</td>
<td>9.6</td>
<td>13.5</td>
<td>19.2</td>
</tr>
<tr>
<td></td>
<td>1/8</td>
<td>1/8</td>
<td>12.2</td>
<td>17.3</td>
<td>24.4</td>
</tr>
<tr>
<td></td>
<td>1/8</td>
<td>7/64</td>
<td>14.6</td>
<td>20.6</td>
<td>29.1</td>
</tr>
<tr>
<td></td>
<td>1/8</td>
<td></td>
<td>15.9</td>
<td>22.5</td>
<td>31.9</td>
</tr>
<tr>
<td></td>
<td>11/64</td>
<td>1/8</td>
<td>21.7</td>
<td>30.6</td>
<td>43.2</td>
</tr>
<tr>
<td></td>
<td>3/16</td>
<td>3/32</td>
<td>30.5</td>
<td>43.2</td>
<td>61.1</td>
</tr>
<tr>
<td></td>
<td>7/32</td>
<td>3/16</td>
<td>45.1</td>
<td>63.8</td>
<td>90.5</td>
</tr>
<tr>
<td></td>
<td>13/64</td>
<td>13/64</td>
<td>54.6</td>
<td>77.8</td>
<td>108</td>
</tr>
<tr>
<td></td>
<td>7/32</td>
<td>7/32</td>
<td>59.8</td>
<td>84.5</td>
<td>120</td>
</tr>
<tr>
<td></td>
<td>9/32</td>
<td>7/32</td>
<td>88.4</td>
<td>125</td>
<td>177</td>
</tr>
<tr>
<td></td>
<td>17/64</td>
<td>1/4</td>
<td>102</td>
<td>141</td>
<td>199</td>
</tr>
<tr>
<td></td>
<td>17/64</td>
<td>17/64</td>
<td>122</td>
<td>173</td>
<td>245</td>
</tr>
<tr>
<td></td>
<td>9/32</td>
<td>17/64</td>
<td>135</td>
<td>191</td>
<td>270</td>
</tr>
<tr>
<td></td>
<td>19/64</td>
<td>9/32</td>
<td>143</td>
<td>203</td>
<td>287</td>
</tr>
<tr>
<td></td>
<td>11/32</td>
<td></td>
<td>15.9</td>
<td>22.5</td>
<td>31.9</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>3/16</td>
<td>3/16</td>
<td>35</td>
<td>49</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>7/32</td>
<td>7/32</td>
<td>50</td>
<td>71</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>1/4</td>
<td>1/4</td>
<td>71</td>
<td>101</td>
<td>142</td>
</tr>
<tr>
<td></td>
<td>6/16</td>
<td>9/32</td>
<td>124</td>
<td>176</td>
<td>249</td>
</tr>
<tr>
<td></td>
<td>21/64</td>
<td>21/64</td>
<td>170</td>
<td>240</td>
<td>339</td>
</tr>
<tr>
<td></td>
<td>11/32</td>
<td>21/64</td>
<td>180</td>
<td>255</td>
<td>361</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>11/32</td>
<td>222</td>
<td>314</td>
<td>444</td>
</tr>
<tr>
<td></td>
<td>13/32</td>
<td>11/32</td>
<td>254</td>
<td>360</td>
<td>509</td>
</tr>
<tr>
<td></td>
<td>7/16</td>
<td>11/32</td>
<td>266</td>
<td>378</td>
<td>535</td>
</tr>
<tr>
<td></td>
<td>15/32</td>
<td>11/32</td>
<td>300</td>
<td>425</td>
<td>610</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>3/8</td>
<td>5/16</td>
<td>145</td>
<td>206</td>
<td>290</td>
</tr>
<tr>
<td></td>
<td>3/8</td>
<td>3/8</td>
<td>182</td>
<td>258</td>
<td>365</td>
</tr>
<tr>
<td></td>
<td>13/32</td>
<td>3/8</td>
<td>207</td>
<td>293</td>
<td>413</td>
</tr>
<tr>
<td></td>
<td>7/16</td>
<td>3/8</td>
<td>226</td>
<td>321</td>
<td>453</td>
</tr>
<tr>
<td></td>
<td>15/32</td>
<td>3/8</td>
<td>245</td>
<td>346</td>
<td>496</td>
</tr>
<tr>
<td></td>
<td>1/2</td>
<td>3/8</td>
<td>266</td>
<td>375</td>
<td>530</td>
</tr>
<tr>
<td>3/4&quot;</td>
<td>7/16</td>
<td>7/16</td>
<td>235</td>
<td>332</td>
<td>471</td>
</tr>
<tr>
<td></td>
<td>9/16</td>
<td>7/16</td>
<td>321</td>
<td>455</td>
<td>644</td>
</tr>
<tr>
<td></td>
<td>9/16</td>
<td>1/2</td>
<td>350</td>
<td>495</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td>5/8</td>
<td>1/2</td>
<td>407</td>
<td>576</td>
<td>830</td>
</tr>
<tr>
<td></td>
<td>9/16</td>
<td>9/16</td>
<td>372</td>
<td>526</td>
<td>744</td>
</tr>
<tr>
<td></td>
<td>5/8</td>
<td>9/16</td>
<td>422</td>
<td>597</td>
<td>845</td>
</tr>
<tr>
<td></td>
<td>5/8</td>
<td>5/8</td>
<td>510</td>
<td>720</td>
<td>1018</td>
</tr>
</tbody>
</table>
The F-80 Hollow Cone Nozzles produce the finest possible breakup with direct pressure operation. No air or steam is required as the atomizing medium. While higher pressures produce finer droplet sizes, these Nozzles will operate satisfactorily on water at pressures of 40 PSI or more. These nozzles are equipped with a 9/16” – 24” machine thread for mounting in either single or multiple adaptors.

**MATERIAL**
Brass and 416 Stainless Steel with 120 mesh Monel screen strainers. Also available in 303, 304 and 316*

**PIPE CONNECTION**
9/16” NPT

**SPRAY ANGLES**
30°, 45°, 60°, 80°, 90°. Sizes #3.0 to #9.5 available in 100°. All ratings are at 40 PSI.

**CAPACITIES & DIMENSIONS**
Capacities: 0.5 – 100.00 GPH on water.
The H-261 direct pressure operated Nozzle produces a very fine hollow cone spray similar to the F-80 Nozzle. However, it has a 1/4” male NPT thread, so no adaptor is needed, and it can be connected directly to a 1/4” Tee. Material: All Brass, with 120 mesh Monel Strainer. Primary use is at snow cannons or spray racks.

The H-261-CJ is the same general construction as the H-261 Nozzle. This version includes a “Center Jet” through the middle of the swirler which produces a Solid Cone Spray and somewhat coarser atomization. It has proven extremely successful in commercial dish washers.

**MATERIAL**
Models completely made of brass

**PIPE CONNECTION**
1/8 “NPT male

**SPRAY ANGLES**
30°, 45°, 60°, 80°, 90°. Sizes #3.0 to #9.50 available in 100°. H-261-CJ: 80°
All ratings are at 40 PSI.

**CAPACITIES**

<table>
<thead>
<tr>
<th>Nozzle No.</th>
<th>Operating Pressure: Lbs. Per Square Inch</th>
<th>Min. Opert Pressure (PSI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>75</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>1.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>1.25</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>1.35</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>1.65</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>2.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>2.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>3.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>3.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>4.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>4.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>5.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>5.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>6.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>6.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>7.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>7.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>8.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>8.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>9.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>9.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>10.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>10.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>11.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>11.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>12.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>12.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>13.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>13.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>14.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>14.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>15.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>15.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>16.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>16.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>17.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>17.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>18.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>18.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>19.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>19.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>20.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>20.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>21.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>21.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>22.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>22.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>23.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>23.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>24.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>24.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>25.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>25.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>26.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>26.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>27.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>27.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>28.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>28.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>29.00</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>29.50</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>30.00</td>
<td>40</td>
<td>60</td>
</tr>
</tbody>
</table>

**H-261-CJ Capacities: Gallons Per Hour**

<table>
<thead>
<tr>
<th>Nozzle No.*</th>
<th>Operating Pressure: Lbs. Per Square Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>5.5</td>
<td>40</td>
</tr>
<tr>
<td>7.0</td>
<td>40</td>
</tr>
<tr>
<td>12.5</td>
<td>40</td>
</tr>
<tr>
<td>14.5</td>
<td>40</td>
</tr>
<tr>
<td>20.0</td>
<td>40</td>
</tr>
<tr>
<td>22.5</td>
<td>40</td>
</tr>
<tr>
<td>30.0</td>
<td>40</td>
</tr>
<tr>
<td>37.0</td>
<td>40</td>
</tr>
<tr>
<td>46.5</td>
<td>40</td>
</tr>
<tr>
<td>60.0</td>
<td>40</td>
</tr>
<tr>
<td>72.0</td>
<td>40</td>
</tr>
<tr>
<td>84.0</td>
<td>40</td>
</tr>
<tr>
<td>120</td>
<td>40</td>
</tr>
<tr>
<td>133</td>
<td>40</td>
</tr>
<tr>
<td>163</td>
<td>40</td>
</tr>
<tr>
<td>180</td>
<td>40</td>
</tr>
<tr>
<td>200</td>
<td>40</td>
</tr>
<tr>
<td>225</td>
<td>40</td>
</tr>
<tr>
<td>300</td>
<td>40</td>
</tr>
<tr>
<td>370</td>
<td>40</td>
</tr>
<tr>
<td>465</td>
<td>40</td>
</tr>
<tr>
<td>600</td>
<td>40</td>
</tr>
<tr>
<td>720</td>
<td>40</td>
</tr>
<tr>
<td>840</td>
<td>40</td>
</tr>
<tr>
<td>1200</td>
<td>40</td>
</tr>
<tr>
<td>1330</td>
<td>40</td>
</tr>
<tr>
<td>1630</td>
<td>40</td>
</tr>
<tr>
<td>1800</td>
<td>40</td>
</tr>
<tr>
<td>2000</td>
<td>40</td>
</tr>
<tr>
<td>2250</td>
<td>40</td>
</tr>
<tr>
<td>3000</td>
<td>40</td>
</tr>
<tr>
<td>3700</td>
<td>40</td>
</tr>
<tr>
<td>4650</td>
<td>40</td>
</tr>
<tr>
<td>6000</td>
<td>40</td>
</tr>
<tr>
<td>7200</td>
<td>40</td>
</tr>
<tr>
<td>8400</td>
<td>40</td>
</tr>
<tr>
<td>12000</td>
<td>40</td>
</tr>
<tr>
<td>13300</td>
<td>40</td>
</tr>
<tr>
<td>16300</td>
<td>40</td>
</tr>
<tr>
<td>18000</td>
<td>40</td>
</tr>
<tr>
<td>20000</td>
<td>40</td>
</tr>
<tr>
<td>22500</td>
<td>40</td>
</tr>
<tr>
<td>30000</td>
<td>40</td>
</tr>
<tr>
<td>37000</td>
<td>40</td>
</tr>
<tr>
<td>46500</td>
<td>40</td>
</tr>
<tr>
<td>60000</td>
<td>40</td>
</tr>
<tr>
<td>72000</td>
<td>40</td>
</tr>
<tr>
<td>84000</td>
<td>40</td>
</tr>
<tr>
<td>120000</td>
<td>40</td>
</tr>
<tr>
<td>133000</td>
<td>40</td>
</tr>
<tr>
<td>163000</td>
<td>40</td>
</tr>
<tr>
<td>180000</td>
<td>40</td>
</tr>
<tr>
<td>200000</td>
<td>40</td>
</tr>
<tr>
<td>225000</td>
<td>40</td>
</tr>
<tr>
<td>300000</td>
<td>40</td>
</tr>
<tr>
<td>370000</td>
<td>40</td>
</tr>
<tr>
<td>465000</td>
<td>40</td>
</tr>
<tr>
<td>600000</td>
<td>40</td>
</tr>
<tr>
<td>720000</td>
<td>40</td>
</tr>
<tr>
<td>840000</td>
<td>40</td>
</tr>
<tr>
<td>1200000</td>
<td>40</td>
</tr>
<tr>
<td>1330000</td>
<td>40</td>
</tr>
<tr>
<td>1630000</td>
<td>40</td>
</tr>
<tr>
<td>1800000</td>
<td>40</td>
</tr>
<tr>
<td>2000000</td>
<td>40</td>
</tr>
<tr>
<td>2250000</td>
<td>40</td>
</tr>
<tr>
<td>3000000</td>
<td>40</td>
</tr>
<tr>
<td>3700000</td>
<td>40</td>
</tr>
<tr>
<td>4650000</td>
<td>40</td>
</tr>
<tr>
<td>6000000</td>
<td>40</td>
</tr>
<tr>
<td>7200000</td>
<td>40</td>
</tr>
<tr>
<td>8400000</td>
<td>40</td>
</tr>
<tr>
<td>12000000</td>
<td>40</td>
</tr>
</tbody>
</table>

**DIMENSIONS**

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
The H-530 is a simple Nozzle which is a variation of the nonclog principle. Nozzle consists of two parts, the Body which contains the inlet pipe connection and the orifice; and a Cap which forms the bottom of the Swirl Chamber. The solid cone spray is uniformly distributed over the entire area of coverage. Typically used where a right angle connection is required for gas scrubbing, rinsing, washing, quenching and dust control.

**CAPACITIES**

**Minimum Capacity: Gallons Per Minute**

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Nozzle No.*</th>
<th>Operating Pressure: Lbs. Per Square Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot;</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>62</td>
<td>0.26</td>
<td>0.36</td>
</tr>
<tr>
<td>78</td>
<td>0.38</td>
<td>0.58</td>
</tr>
<tr>
<td>93</td>
<td>0.60</td>
<td>0.85</td>
</tr>
<tr>
<td>104</td>
<td>0.75</td>
<td>1.0</td>
</tr>
<tr>
<td>109</td>
<td>0.80</td>
<td>1.1</td>
</tr>
<tr>
<td>140</td>
<td>1.0</td>
<td>1.5</td>
</tr>
<tr>
<td>156</td>
<td>1.3</td>
<td>1.8</td>
</tr>
<tr>
<td>171</td>
<td>1.4</td>
<td>2.0</td>
</tr>
<tr>
<td>187</td>
<td>1.5</td>
<td>2.1</td>
</tr>
<tr>
<td>3/8&quot;</td>
<td></td>
<td>234</td>
</tr>
<tr>
<td>250</td>
<td>3.3</td>
<td>4.7</td>
</tr>
<tr>
<td>1/2&quot;</td>
<td></td>
<td>281</td>
</tr>
<tr>
<td>312</td>
<td>5.3</td>
<td>7.5</td>
</tr>
<tr>
<td>343</td>
<td>5.7</td>
<td>8.0</td>
</tr>
<tr>
<td>375</td>
<td>6.6</td>
<td>9.3</td>
</tr>
<tr>
<td>406</td>
<td>7.6</td>
<td>10.7</td>
</tr>
</tbody>
</table>

*"Nozzle No." is orifice diameter in thousandths of an inch

**MATERIAL**
Brass. Available as a special in any machinable material.

**PIPE CONNECTION**
1/4" NPT.

**SPRAY ANGLES**
80° at 40 PSI.

**DIMENSIONS**

---

**MONARCH NOZZLES**, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
The H-535 is a simple, one-piece construction. The „V“ notch milling and oval orifice produce a very thin, high velocity cutting sheet found to be ideal for car washes, commercial dish washers and other applications where spray velocity is important.

**MATERIAL**
Brass, 303 Stainless Steel. Other materials to order

**PIPE CONNECTION**
1/8” & 1/4” NPT.

**SPRAY ANGLES**
30° to 90° in 10° steps at 40 PSI.

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Dimensions</th>
<th>Weight (oz.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8</td>
<td>5/8</td>
<td>7/16</td>
</tr>
<tr>
<td>1/4</td>
<td>15/16</td>
<td>7/16</td>
</tr>
</tbody>
</table>

**CAPACITIES**

<table>
<thead>
<tr>
<th>Nozzle No.*</th>
<th>Operating Pressure: Lbs. Per Square Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td>.20</td>
<td>.14</td>
</tr>
<tr>
<td>.35</td>
<td>.24</td>
</tr>
<tr>
<td>.40</td>
<td>.28</td>
</tr>
<tr>
<td>.44</td>
<td>.31</td>
</tr>
<tr>
<td>.50</td>
<td>.35</td>
</tr>
<tr>
<td>.60</td>
<td>.30</td>
</tr>
<tr>
<td>.75</td>
<td>.37</td>
</tr>
<tr>
<td>.90</td>
<td>.45</td>
</tr>
<tr>
<td>1.0</td>
<td>.50</td>
</tr>
<tr>
<td>1.3</td>
<td>.65</td>
</tr>
<tr>
<td>1.5</td>
<td>.75</td>
</tr>
<tr>
<td>2.0</td>
<td>1.0</td>
</tr>
<tr>
<td>3.0</td>
<td>1.5</td>
</tr>
<tr>
<td>4.0</td>
<td>2.0</td>
</tr>
</tbody>
</table>

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
H-545
Atomizing Nozzle for a wide range of applications

The H-545 is our basic flat spray construction, with a “U” notch milling and rectangular orifice. A “fat” sheet is produced that is useful for rinsing and washing. Car washes and parts washers commonly utilize these Nozzles.

MATERIAL
Brass and 303 Stainless Steel.
Other materials to order.

PIPE CONNECTION
1/8” to 3/4” NPT male

SPRAY ANGLES
50°, 60°, 70° or 80° at 40 PSI

DIMENSIONS

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>Weight (oz.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8”</td>
<td>5/8”</td>
<td>3/16”</td>
<td>7/16”</td>
<td>1/2”</td>
</tr>
<tr>
<td>1/4”</td>
<td>15/16”</td>
<td>7/16”</td>
<td>5/8”</td>
<td>1”</td>
</tr>
<tr>
<td>3/8”</td>
<td>1”</td>
<td>7/16”</td>
<td>3/4”</td>
<td>1 1/2”</td>
</tr>
<tr>
<td>1/2”</td>
<td>1 7/32”</td>
<td>17/32”</td>
<td>7/8”</td>
<td>1 3/4”</td>
</tr>
<tr>
<td>3/4”</td>
<td>1 3/8”</td>
<td>8/16”</td>
<td>1 1/15”</td>
<td>4 1/2”</td>
</tr>
</tbody>
</table>

CAPACITIES

Minimum Capacity: Gallons Per Minute

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>Nozzle No.</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>60</th>
<th>80</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/8” or 1/4”</td>
<td>1.0</td>
<td>.50</td>
<td>.71</td>
<td>.86</td>
<td>1.0</td>
<td>1.2</td>
<td>1.4</td>
<td>1.6</td>
</tr>
<tr>
<td>1.3</td>
<td>.65</td>
<td>.92</td>
<td>1.1</td>
<td>1.3</td>
<td>1.6</td>
<td>1.8</td>
<td>2.1</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>.75</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
<td>1.8</td>
<td>2.1</td>
<td>2.4</td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>1.0</td>
<td>1.4</td>
<td>1.7</td>
<td>2.0</td>
<td>2.5</td>
<td>2.8</td>
<td>3.2</td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>1.5</td>
<td>2.1</td>
<td>2.6</td>
<td>3.0</td>
<td>3.7</td>
<td>4.2</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>2.0</td>
<td>2.8</td>
<td>3.5</td>
<td>4.0</td>
<td>4.9</td>
<td>5.7</td>
<td>6.3</td>
<td></td>
</tr>
<tr>
<td>1/4”</td>
<td>5.0</td>
<td>2.5</td>
<td>3.5</td>
<td>4.3</td>
<td>5.0</td>
<td>6.1</td>
<td>7.1</td>
<td>7.9</td>
</tr>
<tr>
<td>5.5</td>
<td>2.8</td>
<td>3.9</td>
<td>4.8</td>
<td>5.5</td>
<td>6.8</td>
<td>7.8</td>
<td>8.7</td>
<td></td>
</tr>
<tr>
<td>6.0</td>
<td>3.0</td>
<td>4.2</td>
<td>5.2</td>
<td>6.0</td>
<td>7.3</td>
<td>8.5</td>
<td>9.5</td>
<td></td>
</tr>
<tr>
<td>7.0</td>
<td>3.5</td>
<td>4.9</td>
<td>6.1</td>
<td>7.0</td>
<td>8.6</td>
<td>9.9</td>
<td>11.1</td>
<td></td>
</tr>
<tr>
<td>1/4” or 3/8”</td>
<td>8.0</td>
<td>4.0</td>
<td>5.7</td>
<td>6.9</td>
<td>8.0</td>
<td>9.8</td>
<td>11.2</td>
<td>12.7</td>
</tr>
<tr>
<td>9.0</td>
<td>4.5</td>
<td>6.4</td>
<td>7.8</td>
<td>9.0</td>
<td>11.1</td>
<td>12.7</td>
<td>14.3</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>5.0</td>
<td>7.1</td>
<td>8.6</td>
<td>10.0</td>
<td>12.2</td>
<td>14.1</td>
<td>15.8</td>
<td></td>
</tr>
<tr>
<td>1/2”</td>
<td>12</td>
<td>6.0</td>
<td>8.5</td>
<td>10.4</td>
<td>12.0</td>
<td>14.7</td>
<td>17.0</td>
<td>19.0</td>
</tr>
<tr>
<td>15</td>
<td>7.5</td>
<td>10.6</td>
<td>13.0</td>
<td>15.0</td>
<td>18.4</td>
<td>21.2</td>
<td>23.7</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>10.0</td>
<td>14.1</td>
<td>17.3</td>
<td>20.0</td>
<td>24.5</td>
<td>28.3</td>
<td>31.6</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>15.0</td>
<td>21.3</td>
<td>26.0</td>
<td>30.0</td>
<td>37.0</td>
<td>42.5</td>
<td>47.5</td>
<td></td>
</tr>
<tr>
<td>3/4”</td>
<td>40</td>
<td>20.0</td>
<td>28.4</td>
<td>34.8</td>
<td>40.0</td>
<td>49.0</td>
<td>56.5</td>
<td>63.5</td>
</tr>
</tbody>
</table>

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
The H-601 Nozzle is air or steam operated and produces an extremely fine, fog-like atomization. This aspirating Nozzle requires no liquid pressure whatever as the air pressure creates a suction in the liquid inlet which draws the liquid into the Nozzle. If air is readily available you can, therefore, eliminate the expense of a liquid pump. Increasing the lift distance decreases the flow rate. Due to the absence of small internal openings, this Nozzle can produce very low flow rates without risk of clogging.

The H-601 has an unrestricted orifice of 5/64” diameter. The H-601-C to H-601-G have, in addition, an internal disc with metering slots to produce extremely low flow rates but the openings are relatively low flow rates but the openings are H-601 Water Nozzles relatively large in comparison to these flow rates.

**MATERIAL**
Brass or 303 SS on demand. H-601-C to H-601-G Brass only.

**PIPE CONNECTION**
Air inlet 1/4” NPT female, liquid inlet 1/8” NPT female

**SPRAY ANGLES**
45°
The H-837 Nozzles produce a solid unbroken stream with a defined jet length before breakup of the liquid occurs. Useful for cleaning and cutting operations. To maximize stream length, mounting close to tees should be avoided as the turbulence produced from “turning the corner” disrupts smooth stream.

**MATERIAL**
416 SS, 303 SS, 304 SS and 316 SS

**PIPE CONNECTION**
1/8˝ and 1/4˝ NPT.

**SPRAY ANGLES**
0°

**CAPACITIES & DIMENSIONS**
Please ask us for further information.
The “M” or “Midget” series is designed to meet the needs of a very small, efficient, inexpensive nozzle. They are particularly effective in applications where the mounting possibility is limited. Both models produce a very fine spray, but the “MW” is a little coarser than the “M”. Both come standard with a 80-meshed strainer monel for easy cleaning.

The “M” nozzles are ideal for agricultural and industrial applications that require a similar fog atomizer and with low water consumption. They are often used for humidification in greenhouses and in the mist cooling for pigs and poultry.

The “MW” with a spray angle of 90 ° – 160 ° has many industrial applications where maximum coverage is required in a small space. It is often found in greenhouses for fogging and keeping the young plants wet.

Other sizes on enquiry.

**MATERIAL**
Models completely made of brass
416 SS would be available per request

**PIPE CONNECTION**
1/8 “NPT male

**SPRAY ANGLES**
“M”: 80 °
“MW”: 90 °, 120 °, 160 °

**DIMENSIONS**

---

**CAPACITIES**

<table>
<thead>
<tr>
<th>Nozzle No.</th>
<th>Minimum Capacity: Gallons Per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Function Pressure – By Inch-pound limit</td>
</tr>
<tr>
<td>M-0.5</td>
<td>25  30  40  60  80  100</td>
</tr>
<tr>
<td>M-1</td>
<td>( \frac{1}{3} )  ( \frac{1}{2} )  ( \frac{2}{3} )  ( \frac{3}{2} )  ( \frac{3}{4} )  1</td>
</tr>
<tr>
<td>M-2</td>
<td>1.00  1.10  1.30  1.50  1.80  2.00</td>
</tr>
<tr>
<td>M-3</td>
<td>1.50  1.60  1.90  2.30  2.70  3.00</td>
</tr>
<tr>
<td>M-5</td>
<td>2.50  2.70  3.20  3.90  4.50  5.00</td>
</tr>
<tr>
<td>MW-B</td>
<td>2.30  2.50  2.90  3.50  4.10  4.60</td>
</tr>
<tr>
<td>MW-C</td>
<td>3.20  3.50  4.10  4.90  5.70  6.40</td>
</tr>
<tr>
<td>MW-D</td>
<td>5.00  5.50  6.30  7.70  8.90  10.00</td>
</tr>
<tr>
<td>MW-E</td>
<td>7.20  8.00  9.20  11.20  13.00  14.50</td>
</tr>
</tbody>
</table>

**MONARCH NOZZLES**, 7249-B Browning Road, Pennsauken, NJ 08109

hbeccari@monarchnozzles.com Phone 1-856-241-1500
The “M” or “Midget” series is designed to meet the needs of a very small, efficient, inexpensive nozzle. They are particularly effective in applications where the mounting possibility is limited. Both models produce a very fine spray, but the “MW” is a little coarser than the “M”. Both come standard with a 80-meshed strainer monel for easy cleaning.

The “M” nozzles are ideal for agricultural and industrial applications that require a similar fog atomizer and with low water consumption. They are often used for humidification in greenhouses and in the mist cooling for pigs and poultry.

Advantages of this nozzles:
- large filter surface
- plug filters for simple cleaning
- nozzle from durable work plastic
- favorable cost-performance ratio

Other sizes on enquiry.

MATERIAL
Durable work plastic

PIPE CONNECTION
1/8 "NPT male

SPRAY ANGLES
“M”: 80 °

CAPACITIES & DIMENSIONS

<table>
<thead>
<tr>
<th>Nozzle No.</th>
<th>Function Pressure – By Inch-pound limit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25</td>
</tr>
<tr>
<td>M-0.5</td>
<td></td>
</tr>
<tr>
<td>M-1</td>
<td></td>
</tr>
<tr>
<td>M-2</td>
<td>1.00</td>
</tr>
<tr>
<td>M-3</td>
<td>1.50</td>
</tr>
<tr>
<td>M-5</td>
<td>2.50</td>
</tr>
</tbody>
</table>
The F-94 Nozzle is available in a wide range of spray angles for many diverse applications. A unique spirally milled core or “disc” produces a high velocity spinning action that gives a solid cone distribution of medium atomization. The tip has a straight machine thread for use with a male or female adaptor with NPT connections. This Nozzle is particularly successful for dust suppression, industrial washers, coal washing and the production of carbon black.

**MATERIAL**

Standard in 416 Stainless Steel. Also available in 304 and 316 Stainless Steel

**PIPE CONNECTION**

1/4” NPT male

**SPRAY ANGLES**

15°, 30°, 45°, 60°, 80° at 100 PSI

**CAPACITIES & DIMENSIONS**

<table>
<thead>
<tr>
<th>Nozzle No.*</th>
<th>Operating Pressure: Lbs. per Square Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>40  60  80  100</td>
</tr>
<tr>
<td>12.0</td>
<td>6.0  7.6  9.2  10.7  12.0</td>
</tr>
<tr>
<td>15.5</td>
<td>7.8  9.8  12.0  13.9  15.5</td>
</tr>
<tr>
<td>17.5</td>
<td>8.8  11.1  13.6  15.7  17.5</td>
</tr>
<tr>
<td>19.5</td>
<td>9.8  12.3  15.1  17.4  19.5</td>
</tr>
<tr>
<td>24.0</td>
<td>12.0 15.2  18.6  21.4  24.0</td>
</tr>
<tr>
<td>30.0</td>
<td>15.0 18.9  23.2  26.8  30.0</td>
</tr>
<tr>
<td>35.0</td>
<td>17.5 22.1  27.1  31.3  35.0</td>
</tr>
<tr>
<td>37.0</td>
<td>18.5 23.4  28.7  33.1  37.0</td>
</tr>
<tr>
<td>40.0</td>
<td>20.0 25.2  31.0  35.8  40.0</td>
</tr>
<tr>
<td>45.0</td>
<td>22.5 28.4  34.9  40.3  45.0</td>
</tr>
<tr>
<td>50.0</td>
<td>25.0 31.5  38.7  44.8  50.0</td>
</tr>
<tr>
<td>60.0</td>
<td>30.0 37.9  46.4  53.7  60.0</td>
</tr>
<tr>
<td>72.0</td>
<td>36.0 45.5  55.6  64.4  72.0</td>
</tr>
<tr>
<td>88.0</td>
<td>44.0 55.6  68.0  78.6  88.0</td>
</tr>
<tr>
<td>100</td>
<td>50.0 63.1  77.4  89.5  100</td>
</tr>
<tr>
<td>120</td>
<td>60.0 75.8  92.4  107  120</td>
</tr>
<tr>
<td>137</td>
<td>68.5 86.6  106  122  137</td>
</tr>
<tr>
<td>150</td>
<td>75.0 95.0  116  134  150</td>
</tr>
<tr>
<td>175</td>
<td>87.5 111  135  156  175</td>
</tr>
<tr>
<td>200</td>
<td>100 126  155  178  200</td>
</tr>
<tr>
<td>250</td>
<td>125 158  193  224  250</td>
</tr>
<tr>
<td>300</td>
<td>150 189  232  268  300</td>
</tr>
<tr>
<td>400</td>
<td>200 253  310  358  400</td>
</tr>
</tbody>
</table>

*“Nozzle No.” is capacity in GPH @ 100 PSI water pressure

**MONARCH NOZZLES**, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500
ACCESSORIES
Kits & Nozzle Accessories for your needs

ACCESSORIES

MULTIPLE NOZZLE ADAPTORS

NOZZLE CASE

TEST KIT

NO DRIP

NOZZLE REMOVER

AAMA KIT

MORE INFORMATION
For further information feel free to contact us.

MONARCH NOZZLES, 7249-B Browning Road, Pennsauken, NJ 08109
hbeccari@monarchnozzles.com Phone 1-856-241-1500