

## General

**Description:** The MacRoy® D is a positive displacement metering pump with a mechanically actuated liquid end.

**Introduction:** 2001

**Weight: Approximate in Pounds (kg)**

|         | Pump & motor | Domestic box | Export box |
|---------|--------------|--------------|------------|
| Simplex | 38 (17.2)    | 45 (20.4)    | 140 (63.5) |
| w/ECC   | 57 (21.2)    | 63 (23.51)   | 157 (58.5) |

**Dimensions: Approximate in inches (mm)**

|         | Domestic Box           | Export box             |
|---------|------------------------|------------------------|
| Simplex | 27x19x28 (686x483x711) | 39x23x31 (991x583x788) |
| w/ECC   | 36x28x30 (914x711x762) |                        |

**Ambient Temperature:** Standard product suitable for temperature environments from 14° F (-14° C) to 122° F (50° C). Modifications are available for extended ranges. Pumps should be protected from direct sunlight exposure.

## Performance

**Maximum Pressure Rating:** 175 PSI (12 bar)

**Maximum Capacity:** 127 GPH (481 Liters/Hour)

**Turndown and Accuracy**

**Standard Turndown Ratio:** 10:1 with constant speed motor - as high as 150:1 with addition of variable speed drive.

**Steady State Accuracy:** ± 1.0 %

**Repetitive Accuracy:** ± 3.0 %

**Linearity:** ± 3.0%

## Liquid End

**Description:** Mechanically actuated diaphragm with suction and discharge single ball check valves.

**Materials:**

- **Diaphragms:** PTFE standard
- **Head and Check Valve Bodies:** Polypropylene, Acrylic, PVDF, 316ss, PVC with Alloy 20 Balls and seats, PVC with 316ss balls and seats
- **Seals:** Viton or Aflas
- **Ball Checks:** Same material as check valve bodies except PVC and PVDF that use ceramic. Optional ball materials are available

## Liquid End (continued)

**Connections:**

| Liquid End Size | PP, PVC, Acrylic, PVDF | H <sub>2</sub> SO <sub>4</sub> | 316SS |
|-----------------|------------------------|--------------------------------|-------|
| D2              | ¼"                     | ¼"                             | ¼"    |
| D4              | ¼"                     | ¼"                             | ½"    |
| D7 & 8          | ½"                     | ½"                             | ½"    |

**Options:**

Flanges and others as required

**Suction Pressure:**

**NPIP (NPSH) Required:** 12 PSIA (0.82 bar absolute)

**Maximum Suction Pressure:** 15 PSI (1 bar)

**Typical Maximum Lift:** (H<sub>2</sub>O) 8.2 ft (2.5 meters)

**Discharge Pressure:**

**Minimum recommended:** for best performance: 30 psi (2.06 bar), or 20 psi (1.4 bar) over suction pressure.

**Liquid Temperature:**

**Standard Minimum:** 14° F (-14° C)

**Standard Maximum:** 122° F (50° C)

**Relief Valve Settings:**

**External in piping system:** 10% over discharge pressure or 15 psi (1 bar) – whichever is greater.

**Ball Check Configurations:**

**Standard:** Single ball

**Options:** Slurry seats, PTFE seats, Alloy 20 seats

**Typical Viscosity Ratings:**

Ratings are conservative estimates. Any applications with viscous fluid should be evaluated with an NPIP (NPSH) calculation.

| SPM | MAX CPS FOR PLASTIC | MAC CPS FOR 316SS | MAX CPS FOR POLYMER |
|-----|---------------------|-------------------|---------------------|
| 36  | 500                 | 2000              | 4000                |
| 43  | 400                 | 2000              | 4000                |
| 72  | 300                 | 1100              | 2200                |
| 86  | 150                 | 900               | 1800                |
| 144 | 100                 | 500               | 1000                |
| 173 | 75                  | 350               | 700                 |
| 180 | 50                  | 350               | 700                 |

## Liquid End (continued)

### Degassing Options:

**Manual bleed:** Vents head on startup.

**Automatic Bleed:** Continuously bleeds a small portion of the fluid to purge any gas bubbles from the liquid end

## Drive

### Description:

### Capacity Adjustment:

#### Standard:

10 turn manual micrometer with indication at 1% intervals

#### Options:

- Electronic capacity control accepting 4-20 mA input with manual override. NEMA 4 or explosion proof enclosures
- Variable speed drives providing additional turndown capabilities and potential for multiple control signals
- Manual micrometer with locking knob

### Capacity Adjustment Design:

**Stroke Length:** 0.47 inches (11.9 mm)

**End Load:** 800 lbs. (3558 Newtons)

**Motor Direction:** Clockwise facing driven end

**Motor Requirements:** ¼ HP (0.18 kW)

**Motor Frames:** NEMA: 56C

**Maximum Motor RPM:** 1800

**Standard Coating:** Baked-on powder coating – yellow RAL 1018 – highly resistant to chemical and corrosion attack.

**Nameplate Material:** 20 gauge 300 series stainless steel

**Nameplate Data:** Model #, Serial #, Rated capacity at maximum pressure. Additional tag space for customer equipment tag information. Optional loose or wired tagging available for more extensive requirements

**Lubrication System:** The gears operate completely submerged in an oil bath.

## Drive (Continued)

### Lubricants and Volumes

|                 | Ambient<br>≥ 50° F (10° C) | Ambient 15° to 50° F<br>(-9° to 10° C) |
|-----------------|----------------------------|----------------------------------------|
| Standard        | Zurn EP 95                 | Zurn EP 35                             |
| AGMA Grade      | 5 EP                       | 2 EP                                   |
| ISO Grade       | 220                        | 68                                     |
| Volume Required | 3.5 Quarts (3.31 Liters)   |                                        |
| Volume supplied | 4 Quarts (3.78 Liters)     |                                        |

## Testing

**Standard Production Test:** Every pump is tested to assure the pump meets capacity and pressure expectations and functions as expected. A report is available that indicates ratings, the test results, the repetitive accuracy based on the test, and if the pump passed test.

### Optional Test:

**Hydrostatic Test Pressure:** Pump head is subjected to maximum rated pressure x 1.5.

**API Linearity Test:** 5 point Curve

**API Repeatability Test:** 10 point curve (5 identical points ascending and descending).

**Customer Witness Test:** For any of the above.

## Certifications

### Electrical

**Motors:** Available in various enclosures and at ratings required by the site conditions

**Electronic capacity control:** Available in 2 enclosures:

- NEMA 4
- FM approved explosion proof Class I, Groups B, C, D, and Class II, Groups F and G

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## Dimension Drawings and Documentation

### General arrangement drawings:

#### METALLIC PUMPS:

Simplex Manual Micrometer: 102-2784-000

#### Manuals:

Pump Manual: 339-0076-000

Electronic Capacity Control: 339-0083-000

#### Literature:

Brochure: PD3212

