SMR Series
Submicronic Removal Fluid Purification Systems

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding
The SMR Series is the smart purification solution for fluid flow in the 2-10 GPM (8 - 38 LPM) range. The SMR contains patented Balanced Charge Agglomeration (BCA™) technology, which maintains hydraulic and lubricating fluids in optimum condition while preventing/removing the build-up of sludge and varnish. The system is available in a PLC or simplified control version.

Balanced Charge Agglomeration (BCA™) technology does not remove water, however with the removal of thousands of submicron particles, the majority of sites where water can readily attach are mitigated. Water is more easily separated and removed, improving demulsibility.

- **Power Generation**
  - Steam & Gas Turbine
  - Hydraulics & lubrication
- **Oil & Gas**
  - Compressor/Turbine hydraulics & lubrication
- **Pulp & Paper**
  - Lube oil
  - Hydraulics
- **Manufacturing**
  - Hydraulics
  - Lubrication
  - EDM
  - Injection molders
- **Others**
  - Cooking oil
  - Gear oil
  - Fuels
  - Bio fuels
  - Steel
  - Military
SMR Series
Balanced Charge Agglomeration (BCA™) - How the Technology Works

1. Particles are passed across high-voltage electrodes, inducing a charge on the particles (+) and (-) in separate paths.

2. Oppositely charged particles are mixed and are attracted to each other, forming larger particle clusters.

3. Particle clusters are more efficiently filtered.

Evaluation of the SMR Process - Actual Test Results

- Varnish is stripped from the hydraulic or lubrication system as fluid is processed through the SMR.
- The varnish is suspended in the hydraulic fluid as sub-micron particulate.
- BCA™ develops larger particles (see graphic above).
- The particulate is effectively removed from the hydraulic or lubrication fluid by high efficiency filters.

Results from a 10 month field trial
SMR Series
Features and Benefits

• Contaminant Removal to the Sub-Micron Level

• Prevention and Removal of Sludge and Varnish

• Removal of Oxidation Byproducts and Biological Contamination

• Removal of Ferrous and Non-Ferrous Contaminants

The Parker SMR Benefit

• Unmatched Fluid Purification & System Polishing

• Proven Varnish Removal

• PLC Control & Data Tracking

• OEM Approvals
SMR2
Element Performance

Efficiency vs. Micron Size (c)

- Beta Rating
- 10000
- 1000
- 200
- 100
- 20
- 10
- 2
- 1
- 0

Efficiency %
- 99.9
- 99.5
- 99.0
- 99.0
- 95.0
- 50.0

Capacity vs. PSID

- 100
- 80
- 60
- 40
- 20
- 10
- 0

Capacity vs. BAR

- 6
- 5
- 4
- 3
- 2
- 1
- 0

Drawings are for reference only. Contact factory for current version.

Dimensions are in inches.
SMR2
Specifications

Fluid
Viscosity: 1,020 SUS (220 cSt) maximum
Maximum Pressure: 50/80 PSI (operating/static)
Minimum Fluid Temperature: 65° F (18° C)
Maximum Fluid Temperature: 200° F (93° C)
Minimum Fluid Flash Point: >140° F (60° C)

Power
Customer Provided
Voltage: 110VAC/1Ph/60Hz, 230VAC/3Ph/60Hz, 460VAC/3Ph/60Hz
Phase: 1/3
Frequency: 60Hz

Motor
Power: 0.5 HP
Voltage/Ph/Freq: 0-230/460/3/variable
RPM: 0 to 2000

Pump
Positive Displacement - Variable Frequency Drive (VFD)
Design Flow Rate: 0.5 - 2.5 GPM

Parameter Settings

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Default</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow</td>
<td>2 GPM [7.58 LPM]</td>
<td>0.5 GPM [1.9 LPM]</td>
<td>2.5 GPM [9.45 LPM]</td>
</tr>
<tr>
<td>Shutdown Pressure</td>
<td>70 psi [4.82 bar]</td>
<td>0 psi/bar</td>
<td>75 psi [5.17 bar]</td>
</tr>
<tr>
<td>Max Operating Pressure</td>
<td>50 psi [3.4 bar]</td>
<td>0 psi/bar</td>
<td>60 psi [4.13 bar]</td>
</tr>
<tr>
<td>Min Operating Pressure</td>
<td>0 psi [0.0 bar]</td>
<td>0 psi/bar</td>
<td>5 psi [0.34 bar]</td>
</tr>
<tr>
<td>Maximum Temperature</td>
<td>200° F [93.3°C]</td>
<td>35° F [1.6°C]</td>
<td>200° F [93.3°C]</td>
</tr>
<tr>
<td>Minimum Temperature</td>
<td>35° F [1.5°C]</td>
<td>35° F [1.6°C]</td>
<td>200° F [93.3°C]</td>
</tr>
<tr>
<td>Upstream Filter Delta-P</td>
<td>15 psi [1.0 bar]</td>
<td>5 psi [0.34 bar]</td>
<td>25 psi [1.7 bar]</td>
</tr>
<tr>
<td>Downstream Filter Delta-P</td>
<td>10 psi [0.67 bar]</td>
<td>5 psi [0.34 bar]</td>
<td>25 psi [1.7 bar]</td>
</tr>
<tr>
<td>Auto-Restart after power loss</td>
<td>OFF</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Auto-Restart after temperature shutdown</td>
<td>OFF</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>US or Metric units</td>
<td>US</td>
<td></td>
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</tr>
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## Parts List

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Parker Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>165-00002</td>
<td>Drive, AC, A/B .5 HP 240V 1 PH</td>
</tr>
<tr>
<td></td>
<td>165-00001</td>
<td>Drive, AC, A/B .5 HP 480V 3 PH</td>
</tr>
<tr>
<td></td>
<td>165-00011</td>
<td>Drive, Line Filter, .5 HP 120V &amp; 240V 1 PH</td>
</tr>
<tr>
<td></td>
<td>165-00014</td>
<td>Drive, Line Filter, .5 HP 460V 3 PH</td>
</tr>
<tr>
<td>1</td>
<td>270-00006</td>
<td>PLC/HMI</td>
</tr>
<tr>
<td>1</td>
<td>275-00007</td>
<td>Power Supply, H.V.</td>
</tr>
<tr>
<td>1</td>
<td>275-00002</td>
<td>Power Supply, A/B 24V 110-240V</td>
</tr>
<tr>
<td>1</td>
<td>275-00006</td>
<td>Power Supply, C/H 24V 380-480V</td>
</tr>
<tr>
<td>1</td>
<td>290-00001</td>
<td>Relay, H.V., A/B</td>
</tr>
<tr>
<td>1</td>
<td>245-00006</td>
<td>Light Module, A/B, Green</td>
</tr>
<tr>
<td>1</td>
<td>245-00005</td>
<td>Light Module, A/B, Yellow</td>
</tr>
<tr>
<td>1</td>
<td>250-00005</td>
<td>Motor, .5 HP, 230-380 STD</td>
</tr>
<tr>
<td>1</td>
<td>280-00014</td>
<td>Pump/Bypass, 2 GPM, STD</td>
</tr>
<tr>
<td>1</td>
<td>255-00016</td>
<td>O-Ring, vessel 1, 2 or 3</td>
</tr>
<tr>
<td>1</td>
<td>936623Q</td>
<td>5 Micron Filter, Upstream</td>
</tr>
<tr>
<td>1</td>
<td>936622Q</td>
<td>2 Micron Filter, Downstream</td>
</tr>
<tr>
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<td>195-00003</td>
<td>Feedthru, H.V.</td>
</tr>
<tr>
<td>4</td>
<td>350-00001</td>
<td>Transducer, pressure</td>
</tr>
</tbody>
</table>
SMR10
Element Performance

Filtration Ratio/Beta Rating
1000
10000

Efficiency %

Efficiency

0

2

50.0

Efficiency %

20

50.0

Capacity grams

0

20

50

300

400

Capacity

0

20

50

300

400

Micron Size (c)

0 4 8 12 16 20

0 50 100 150 200

Capacity grams

0 50 100 150 200 250 300 350 400

PSID

0 1 2 3 4 5 6

Drawings are for reference only. Contact factory for current version.

Dimensions are in inches.
SMR10
Specifications

Fluid
Viscosity: 1,020 SUS (220 cSt) maximum
Maximum Pressure: 50/80 PSI (operating/static)
Minimum Fluid Temperature: 65° F (18° C)
Maximum Fluid Temperature: 200° F (93° C)
Minimum Fluid Flash Point: >140° F (60° C)

Power
Customer Provided
Voltage: 110VAC/1Ph/60Hz, 230VAC/3Ph/60Hz,
460VAC/3Ph/60Hz
Phase: 1/3
Frequency 60Hz

Motor
Power: 0.5 HP
Voltage/Ph/Freq: 0-230/460/3/variable
RPM: 0 to 2000

Pump
Positive Displacement - Variable Frequency Drive (VFD)
Design Flow Rate: 2.5 - 10 GPM

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<td>255-00016</td>
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</tr>
<tr>
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<td>933219Q</td>
<td>5 Micron Filter, Upstream</td>
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<td>933218Q</td>
<td>2 Micron Filter, Downstream</td>
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<tr>
<td>1</td>
<td>195-00003</td>
<td>Feedthru, H.V.</td>
</tr>
<tr>
<td>4</td>
<td>350-00001</td>
<td>Transducer, pressure</td>
</tr>
</tbody>
</table>
SMR Series

How to Order

Select the desired symbol (in the correct position) to construct a model code.

Example:

<table>
<thead>
<tr>
<th>BOX 1</th>
<th>BOX 2</th>
<th>BOX 3</th>
<th>BOX 4</th>
<th>BOX 5</th>
<th>BOX 6</th>
<th>BOX 7</th>
<th>BOX 8</th>
<th>BOX 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMR</td>
<td>2</td>
<td>460</td>
<td>20QE</td>
<td>V</td>
<td>M2</td>
<td>X</td>
<td>N08</td>
<td>MS</td>
</tr>
</tbody>
</table>

**BOX 1: Basic Assembly**
- **Symbol**: SMR
- **Description**: Submicronic Filtration System

**BOX 2: Flow Rate**
- **Symbol**: 2
  - **Description**: 2 GPM (7.6 LPM)
- **Symbol**: 10
  - **Description**: 10 GPM (38 LPM)

**BOX 3: Power**
- **Symbol**: 120
  - **Description**: 120VAC, 1Ph, 60Hz
- **Symbol**: 230
  - **Description**: 230VAC, 3Ph, 60Hz
- **Symbol**: 380
  - **Description**: 380VAC, 3Ph, 50Hz
- **Symbol**: 460
  - **Description**: 460VAC, 3Ph, 60Hz
- **Symbol**: 575
  - **Description**: 575VAC, 3Ph, 60Hz

**BOX 4: Element Media**
- **Symbol**: SMR2
  - **Description**: Ecoglass III, 2 micron
- **Symbol**: 02QE
  - **Description**: Ecoglass III, 2 micron
- **Symbol**: 05QE
  - **Description**: Ecoglass III, 5 micron
- **Symbol**: 10QE
  - **Description**: Ecoglass III, 10 micron
- **Symbol**: 20QE
  - **Description**: Ecoglass III, 20 micron

**BOX 5: Seals**
- **Symbol**: V
  - **Description**: Fluorocarbon (FKM)
- **Symbol**: E
  - **Description**: Ethylene Propylene (EPR)

**BOX 6: Indicator**
- **Symbol**: P
  - **Description**: No Indicator
- **Symbol**: M2
  - **Description**: Analog Visual Indicator

**BOX 7: Bypass**
- **Symbol**: X
  - **Description**: No Bypass

**BOX 8: Ports**
- **Symbol**: N08
  - **Description**: ½” NPT threaded ports
- **Symbol**: N16
  - **Description**: 1” NPT threaded ports

**BOX 9: Options**
- **Symbol**: SS
  - **Description**: Stainless steel wetted parts
- **Symbol**: EXP
  - **Description**: Explosion proof (Class 1, Div. 2, Gp. C & D)
- **Symbol**: MS
  - **Description**: Moisture Sensor
- **Symbol**: PD
  - **Description**: Particle Detector
- **Symbol**: PDM
  - **Description**: Particle Detector with Moisture Sensor

**Note:**
1. Outlet polishing filter is always fitted with 02QE/02Q element.
2. icountPD not available when EXP option is selected.

---

**Replacement Elements**

<table>
<thead>
<tr>
<th>SMR2</th>
<th>SMR10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecoglass III Media</td>
<td>Ethylene Propylene</td>
</tr>
<tr>
<td>02QE</td>
<td>936622Q</td>
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<td>05QE</td>
<td>936623Q</td>
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<tr>
<td>10QE</td>
<td>936720Q</td>
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<tr>
<td>20QE</td>
<td>936721Q</td>
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</tbody>
</table>

Note: “CF” = Consult Factory