On-Board Diesel Fuel Filtration

Why is On-Board Diesel Filtration Required?

Mobile machines and commercial vehicles are subject to the toughest working conditions all over the world. To ensure smooth running vehicles and to protect both the engine and the whole drive system from damage, optimum diesel fuel conditioning is particularly important. With its HDP On-Board diesel coalescing/particulate filter, Schroeder offers a modern system for diesel filtration which protects vehicle manufacturers and operators from failures, breakdowns and expensive service interventions. Our solution “Schroeder HDP On-Board Filter,” is a cartridge filter system available in two versions: automatic drain (HDP-HT) and manual drain (HDP-BC).

Schroeder’s HDP on-board Diesel Coalescing Filters provide the industry’s best engine fuel filtration to ensure that your injectors never see poor quality fuel, and you never see the bill for expensive engine failures. All of Schroeder’s fuel filters are compatible up to B100.

In addition, all Tier 4 diesel engines (on- or off-road) now require a fuel cleanliness level of 12/9/6 at injector or better. This equates to a 3-micron filtration level or smaller, with a beta rating of >1000. Today’s typical Spin-on type, on-board fuel filters were not designed to filter to this level. Schroeder Fuel Filtration On-board diesel coalescing/particulate filters provide this level of filtration.

With all of the various additives and biodiesel now added to ULSD 15 diesel fuel to regain lubricity, compensate for seasonal differences, minimize microbial growth, and prevent gelling, additional filter clogging problems have arisen compared to fuels used in the past.

Filter clogging leads to reduced power or complete breakdown due to filters being run in bypass mode (no filtration). This can lead to common-rail fuel injector failure which will cost in the thousands of dollars to fix. The use of Schroeder’s HDP filters is imperative to remove all of the clogging elements.

The Schroeder HDP On-Board Filter’s product benefits are:

- Low investment costs due to cost-optimized design.
- Small installation space required, since lower section of filter does not have to be accessible
- Great flexibility with regard to installation position since inlet and outlet can be in either direction
- Consistent dewatering over the entire life of the filter element since water is separated on the clean side
- Robust design thanks to aluminum housing.
- Economical and technically reliable operation as a result of long element service life
- High Tech design: Reliable dewatering thanks to automatic water discharge, even during suction side operation
- Simple adaptation to the on-board power supply through the use of independently controlled water discharge
- Low residues of diesel left in the filter element in the event of service
- Reliable radial seal with captive seal design
- Visual analysis of the contamination possible (Rust, metallic swarf, unusual deposits, which require further investigation)
- Water sensor and fuel preheating available as options

The Schroeder HDP On-Board Filter results in reliable machine availability:

- From first-class contamination retention
- Due to highly effective and stable water separation on the clean-side for the entire life of the filter element
- Life-long efficiency, because at element change, the water separation stage is also replaced at the same time
- Due to the excellent water separation (achieved by using first class materials) of >95 % to ISO/CD 16332

Engine Sizes vs. HDP On-Board Filter Solutions

Power Rating Engine [KW]
On-Board Diesel Fuel Coalescing Filter

HDP 240

Flow Rating: up to 63 gph (up to 240 lph)
Operating Pressure: <14.5 psia, (<1 bar absolute) suction side application
Temperature Range: -40°F to 194°F (-40°C to 90°C)
Nominal Voltage: WIF: 12/24VDC
Heater: 12VDC
Fuel Preheater Rated Power: 175W
Weight of incl. Element: 240 BC: approx. 2.7 lbs (1.2 kg.)
Water Separation Efficiency: >95% to ISO CD 16332
Porting Thread: M16 x 1.5
SAE-06 J1926 ORB

Application Introduction:
The Reason for Better Engine Filtration
Mobile machines and commercial vehicles are subject to the toughest working conditions. To ensure smooth operation of vehicles, and to protect both the engine and exhaust aftertreatment from damage, optimum diesel fuel conditioning is particularly important. The new HDP 240 BC expands the Schroeder Industries product portfolio in the field of fuel filtration on modern diesel engines. While formerly a flow volume from 90 to 476 gph (340 to 1800 lph) has been covered, this new product complements the lower engine power range with fuel system flow rates up to 63 gph (240 lph).

Features and Benefits
■ Our new 63 gph fuel filter is designed with compact off-highway equipment in mind
■ Our high performance, dual function diesel filtration and water separation uses the same two-stage element design found in our larger filters
■ Dual function: Diesel filtration and water separation through the two-stage element designs
■ High performance stability due to an efficient water separation on clean side over the entire service life
■ Simple and fast element replacement makes servicing the HDP 240 easy
■ Easy installation and flexibility due to various porting configurations options
■ Guaranteed quality as the filter can only be operated with use of quality replacement elements
■ Modular porting, priming pump, and heater options make for easy installation and servicing in tight spaces

Part of the Schroeder Industries 2030 Initiative

Options Available
■ Transparent or black bowl
■ Fuel pre-heater
■ Water-in-fuel sensor (necessary with black bowl)
■ Hand priming pump
■ Various Inlet/Outlet port configuration options (consult factory for special requests)

Filter Housing Specifications
HDP 240 On-Board Diesel Fuel Coalescing Filter

HDP KF1 240 BC1

Filter Model Number Selection

Metric dimensions in ( ). Dimensions shown are inches (millimeters) for general information and overall envelope size only. For complete dimensions please contact Schroeder Industries to request a certified print.

How to Build a Valid Model Number for a Schroeder HDP Housing Supplied w/ Element:

<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>
<th>BOX 10</th>
<th>BOX 11</th>
<th>BOX 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDP</td>
<td>KF1</td>
<td>240</td>
<td>BC1</td>
<td>7</td>
<td>W</td>
<td>1</td>
<td>X</td>
<td>DLO</td>
<td>TR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example: NOTE: Only box 9 may contain more than one option

<table>
<thead>
<tr>
<th>BOX 1</th>
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<th>BOX 10</th>
<th>BOX 11</th>
<th>BOX 12</th>
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<td>BC1</td>
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<td>W</td>
<td>1</td>
<td>X</td>
<td>DLO</td>
<td>TR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Filter Series | Filter Material | Size | Evolution Stage | Filtration Rating |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HDP</td>
<td>KF1 = Dieselmicron®</td>
<td>240 = 63 gph</td>
<td>BC1 = Manual Drain Configuration</td>
<td>7 μm</td>
</tr>
</tbody>
</table>

Type of Clogging Indicator | Type Code | Modification Number | Options |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>W = No clogging indicator</td>
<td>1</td>
<td>X = Latest version number always supplied</td>
<td>AS16 = WIF sensor w/ integral drain</td>
</tr>
</tbody>
</table>

Port Orientation | Bowl Option |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>DOO = inlet top, outlet top</td>
<td>Omit = Black</td>
</tr>
<tr>
<td>DLO = inlet left, outlet top</td>
<td>TR = Transparent</td>
</tr>
</tbody>
</table>

Port Size

- Omit = M16 x 1.5
- 6 = SAE-06 J1926 ORB

NOTES:

For other options, including the ones listed below, contact factory:
- Porting orientation not listed in model code builder
- SAE J1926 ORB or SAE J2044 Quick Connect Porting
- Cummins® ready Water-in-Fuel (WIF) sensor options
- Other OEM-ready Water-in-Fuel (WIF) sensor options
Applications

Application Introduction:
The Reason for Better Engine Filtration

Mobile machines and commercial vehicles are subject to the toughest working conditions. To ensure smooth running of vehicles, and to protect both the engine and the drive system from damage, optimum diesel fuel conditioning is particularly important. Schroeder Fuel Filtration On-Board Diesel Coalescing filter offers a modern cartridge filter system design available in two configurations, in order to protect equipment operators from failures, breakdowns and expensive service interventions.

Features and Benefits

- Manual or Fully Automatic water drain
- Optional fuel pre-heater and Water-In-Fuel (WIF) sensor
- Small envelope size offers greater flexibility in mounting locations
- Low investment cost due to the economical design
- Long service life of the element yields low operating costs
- Easy installation due to various porting configurations
- Easy adaption to the on-board power supply
- Unsurpassed water removal for ULSD

<table>
<thead>
<tr>
<th>Field</th>
<th>Specification</th>
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</thead>
<tbody>
<tr>
<td>Flow Rating</td>
<td>up to 476 gph (up to 1800 lph)</td>
</tr>
<tr>
<td>Operating Pressure</td>
<td>&lt;14.5 psia, (&lt;1 bar absolute) suction side application</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>BC: -40°F to 194°F (-40°C to 90°C)</td>
</tr>
<tr>
<td></td>
<td>HT: -4°F to 194°F (-20°C to 90°C)</td>
</tr>
<tr>
<td></td>
<td>*for extended ranges, contact factory</td>
</tr>
<tr>
<td>Nominal Voltage</td>
<td>24V DC (12V DC is optional for heater or water sensor)</td>
</tr>
<tr>
<td>Rated Power Fuel Preheating</td>
<td>300W</td>
</tr>
<tr>
<td>Weight of incl. Element</td>
<td>340 BC: 5.1 lbs (2.3 kg)</td>
</tr>
<tr>
<td></td>
<td>600 BC: 6.8 lbs (3.1 kg)</td>
</tr>
<tr>
<td></td>
<td>600 HT: 9.4 lbs (4.25 kg)</td>
</tr>
<tr>
<td></td>
<td>*other models available upon request</td>
</tr>
<tr>
<td>Water Separation Efficiency</td>
<td>&gt;95% to ISO CD 16332</td>
</tr>
<tr>
<td>Porting Thread</td>
<td>340 BC: M22x1.5</td>
</tr>
<tr>
<td></td>
<td>600 BC: M27x2.0, SAE -12 ORB (optional)</td>
</tr>
<tr>
<td></td>
<td>600 HT: G 3/4&quot; (BSPP)</td>
</tr>
</tbody>
</table>

Filter Housing Specifications
On-Board Diesel Fuel Coalescing Filter

HDP KF1 340 BC1
- Manual Water Drain Version

HDP KF1 600 BC1
- Manual Water Drain Version

HDP KF1 600 HT1
- Automatic Water Drain Version

Metric dimensions in ( ). Dimensions shown are inches (millimeters) for general information and overall envelope size only. For complete dimensions please contact Schroeder Industries to request a certified print.
On-Board Diesel Fuel Coalescing Filter

Element
Particulate
Performance
Information

Particulate Element

<table>
<thead>
<tr>
<th>Element</th>
<th>Filtration Ratio Per ISO 19438</th>
<th>Dirt Retention Per ISO 19438</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 μm</td>
<td>n &gt; 10 μm (c)</td>
<td>to DP</td>
</tr>
<tr>
<td></td>
<td>&gt; 99%</td>
<td>300 mbar m &gt; 42g</td>
</tr>
</tbody>
</table>

Flow Direction: Outside In
Element Nominal Dimensions: 3.8” (95.6 mm) O.D. x 7.0” (177.2 mm) long - 340 Size
3.8” (95.6 mm) O.D. x 9.4” (238.2 mm) long - 600 Size

Note: For additional HDP performance information, please contact the factory

Fuel Oils

- ULSD15 and similar petroleum diesels
- Biodiesel blends
- Synthetic diesel and blends

Note: For Flow and Pressure information, please contact the factory

<table>
<thead>
<tr>
<th>Size</th>
<th>Evolution Stage</th>
<th>Filtration Rating</th>
<th>Filter Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>0340</td>
<td>BC1</td>
<td>7 = 7 μm</td>
<td>KF1</td>
</tr>
<tr>
<td>0600</td>
<td>HT1</td>
<td>10 = 10 μm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 = 30 μm</td>
<td></td>
</tr>
</tbody>
</table>

Fluid Compatibility

- Fuel Oils
  - ULSD15 and similar petroleum diesels
  - Biodiesel blends
  - Synthetic diesel and blends

Note: For Flow and Pressure information, please contact the factory

Flow Direction: Outside In
Element Nominal Dimensions: 3.8” (95.6 mm) O.D. x 7.0” (177.2 mm) long - 340 Size
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Note: For additional HDP performance information, please contact the factory

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<td></td>
<td>30 = 30 μm</td>
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<th>BOX 8</th>
<th>BOX 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>KF1</td>
<td>600</td>
<td>BC1</td>
<td>10</td>
<td>W</td>
<td>1.X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Example:

**NOTE:** Only box 9 may contain more than one option

<table>
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<tr>
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<td>600</td>
<td>BC1</td>
<td>10</td>
<td>W</td>
<td>1.X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

= HDP KF1 600 BC1 10 W 1.X

### Filter Series

- HDP

### Filter Material

- KF1 = Diesemicron®

### Size

- 340 = 90 gph
- 600 = 160 gph
- 1200 = 317 gph
- 1800 = 476 gph

### Evolution Stage

- BC1 = Manual Drain Configuration
- HT1 = Auto Drain Configuration

### Filtration Rating

<table>
<thead>
<tr>
<th></th>
<th>7 = 7 μm</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10 μm</td>
</tr>
<tr>
<td>30</td>
<td>30 μm</td>
</tr>
</tbody>
</table>

### Type of Clogging Indicator

- W = no clogging indicator (340 & 600 BC only)
- A = blanking plug in indicator port (600 HT only)
- UED = vacuum gauge (600 HT only)

### Type Code

<table>
<thead>
<tr>
<th>BOX 6</th>
<th>BOX 7</th>
<th>BOX 8</th>
<th>BOX 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Type Code

- W = no clogging indicator (340 & 600 BC only)
- A = blanking plug in indicator port (600 HT only)
- UED = vacuum gauge (600 HT only)

### Modification Number

- X = latest version number always supplied

### Options

- Omit = None
- AS1 = w/ integrated water sensor (12/24 VDC)
- H1 = w/ integrated fuel pre-heating (12 VDC)
- H2 = w/ integrated fuel pre-heating (24 VDC)
- PH3 = Hand priming pump (600 BC only)
- PE1 = Integral Electric Pump 12 VDC (600 BC only)
- PE2 = Integral Electric Pump 24 VDC (600 BC only)

### NOTES:

For other options or configurations not listed, please contact factory

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**SCHROEDER INDUSTRIES | FUEL FILTRATION**
Heavy-Duty Diesel PreCare Duplex Filter

Applications

Application Introduction:
The Reason for Better Engine Filtration
The Heavy-Duty Diesel PreCare Duplex Filter is an advanced system for diesel pre-filtration which protects equipment OEMs and operators from costly service calls and downtime. The duplex configuration consists of an assembly with multiple filter housings, which are connected by a change-over ball valve with a simple, single lever operation. The HDPD is available in the familiar BC (manual drain) or HT (auto drain) version.

Features and Benefits
- Simple, single-lever change-over ball valve for seamless operation and service
- Manual or fully automatic Water-In-Fuel (WIF) sensor
- Optional fuel pre-heater and water sensor
- Small envelope size offers greater flexibility in mounting locations
- Low investment cost due to the economical design
- Long service life of the element yields low operating costs
- Easy installation due to various porting configurations
- Easy adaption to the on-board power supply
- Unsurpassed water removal for ULSD

Flow Rating: up to 476 gph (up to 1800 lph)
Operating Pressure: 14.5 psia, (<1 bar absolute) suction side application
Temperature Range:
  BC: -40°F to 194°F (-40°C to 90°C)
  HT: -4°F to 194°F (-20°C to 90°C)
*for extended ranges, contact factory
Nominal Voltage: 24V DC (12V DC is optional for heater or water sensor)
Rated Power Fuel Preheating: 300W
Weight: contact factory for your specific model code weight
Water Separation Efficiency: >95% to ISO CD 16332
Porting Thread:
  340 BC: M22x1.5
  600 BC: M27x2.0, SAE - 12 ORB (optional)
  600 HT: G 3/4" (BSPP)
Heavy Duty Diesel PreCare Duplex Filter

16.89 (HDPD BC 600)

18.11 (HDPD HT 600)

Metric dimensions in (). Installation instructions included on element.
Dimensions shown are inches (millimeters) for general information and overall envelope size only.
For complete dimensions please contact Schroeder Industries to request a certified print.
Note: for dimensions of other configurations, please contact the factory.
Note: for marine applications requiring filter housings constructed of ductile iron, please contact the factory.
**Heavy-Duty Diesel PreCare Duplex Filter**

<table>
<thead>
<tr>
<th>Particulate Element</th>
<th>Filtration Ratio Per ISO 19438</th>
<th>Dirt Retention Per ISO 19438</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 µm</td>
<td>n &gt; 10 µm (c)</td>
<td>300 mbar m &gt; 42g</td>
</tr>
<tr>
<td></td>
<td>&gt; 99%</td>
<td></td>
</tr>
</tbody>
</table>

**Coalescing Element**

<table>
<thead>
<tr>
<th>Coalescing Element</th>
<th>Max Flow</th>
<th>Single Pass Water Removal Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 µm</td>
<td>158 gal/h</td>
<td>&gt; 95%</td>
</tr>
</tbody>
</table>

**Flow Direction:** Outside In

**Element Nominal Dimensions:**
- 3.8” (95.6 mm) O.D. x 7.0” (177.2 mm) long - 340 Size
- 3.8” (95.6 mm) O.D. x 9.4” (238.2 mm) long - 600 Size

**Note:** For additional HDP performance information, please contact the factory

**Fuel Oils**

- ULSD15 and similar petroleum diesels
- Biodiesel blends
- Synthetic diesel and blends

**Fluid Compatibility**

- Fuel Oils
  - ULSD15 and similar petroleum diesels
  - Biodiesel blends
  - Synthetic diesel and blends

**Size**

<table>
<thead>
<tr>
<th>Size</th>
<th>Evolution Stage</th>
<th>Filtration Rating</th>
<th>Filter Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>0340</td>
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<td>10 = 10 µm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>30 = 30 µm</td>
<td></td>
</tr>
</tbody>
</table>

**Replacement Elements**

**Note:** For Flow and Pressure information, please contact the factory
### How to Build a Valid Model Number for a Schroeder HDPD Housing Supplied w/ Element:

<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>
<th>/-</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDPD</td>
<td>KF1</td>
<td>600</td>
<td>HT1</td>
<td>10</td>
<td>A</td>
<td>1.X</td>
<td></td>
<td></td>
<td>/-AS1</td>
</tr>
</tbody>
</table>

**Example:** NOTE: Only box 9 may contain more than one option

<table>
<thead>
<tr>
<th>BOX 1</th>
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<td>A</td>
<td>1.X</td>
<td></td>
<td></td>
<td>/-AS1</td>
</tr>
</tbody>
</table>

**Box 1:** Filter Series
- **HDPD:** Heavy Duty Diesel PreCare Duplex Filter

**Box 2:** Filter Material
- **KF1:** Dieselmicron®

**Box 3:** Size
- 340 = 90 gph
- 600 = 160 gph
- 1200 = 317 gph
- 1800 = 476 gph

**Box 4:** Evolution Stage
- **BC1:** Manual Drain Configuration
- **HT1:** Auto Drain Configuration

**Box 5:** Filtration Rating
- 7 = 7 μm
- 10 = 10 μm
- 30 = 30 μm

**Box 6:** Type of Clogging Indicator
- **W:** no clogging indicator (340 & 600 BC only)
- **A:** blanking plug in indicator port (600 HT only)
- **UED:** vacuum gauge (600 HT only)

**Box 7:** Type Code
- **X:** latest version number always supplied

**Box 8:** Modification Number
- **AS1:** w/integrated water sensor (12/24 VDC) *standard on 600 HT
- **H1:** w/integrated fuel pre-heating (12 VDC)
- **H2:** w/integrated fuel pre-heating (24 VDC)
- **PH3:** Hand priming pump (600 BC only)
- **Omit:** None

**Box 9:** Options
- **AS1:** w/integrated water sensor (12/24 VDC) *standard on 600 HT

**NOTES:**

The HDPD will have the number of housings needed to support the flow rate specified on each side (ex. HDPD 1200 = 2x HDP 600 left side & 2x HDP 600 right side)