# Bulk Diesel Fuel Skid BDS

*Coalescing Elements Patent Pending

## Applications


POINT OF USE FUEL DISPENSING


FLEET FILL / BULK FUEL TRANSFER


BULK FUEL UNLOADING


PROTECTION FOR HIGH-FLOW FUEL INJECTION SYSTEMS


BULK TANK KIDNEY LOOP / RECIRCULATION

## Features and Benefits

- Designed with integrated particulate removal pre-filtration for maximum coalescing filter element life in the downstream housing
- Sized for high flow or highly contaminated fluid applications
- Routine element change is only needed on Pre-filter (the particulate filter) which saves time and money
- Patent-pending, three-phase, particulate and fuel/water separation media technology
- A revolutionary element designed for the highest single-pass water and particulate removal efficiencies in today's ultra-low sulfur diesel (ULSD) fluids
- Protects expensive Tier 3 and Tier 4 engine components against failures caused by particulate and water transferred from the bulk fuel tank to the vehicle
- Allows users to achieve or exceed the particulate and water removal specifications of the injection system OEMs
- Previously acceptable industry standard products no longer provide the high-efficiency separation needed in today's ULSD fluids
- In applications >32°F (0°C) complete automation is achievable with a water in fuel sensor and fail-safe auto-drain feature using a remote 5 gallons (18L) or 20 gallons (75L) sump with alarm and auto shutdown
- Anti-Static Pleat Media (ASP®) is standard for all coalescing elements

Model no. of filter in photograph is: BDS39QPMLZ3VVM

70 gpm
265 L/min

100 psi
7 bar
Standard

45 psi
3 bar
When Ordered w/ Sight Gauge Option

## Markets


INDUSTRIAL


MOBILE VEHICLES


MARINE


MINING TECHNOLOGY


AGRICULTURE


POWER GENERATION


COMMON RAIL INJECTOR SYSTEMS


FLEET


RAILROAD


BULK FUEL FILTRATION

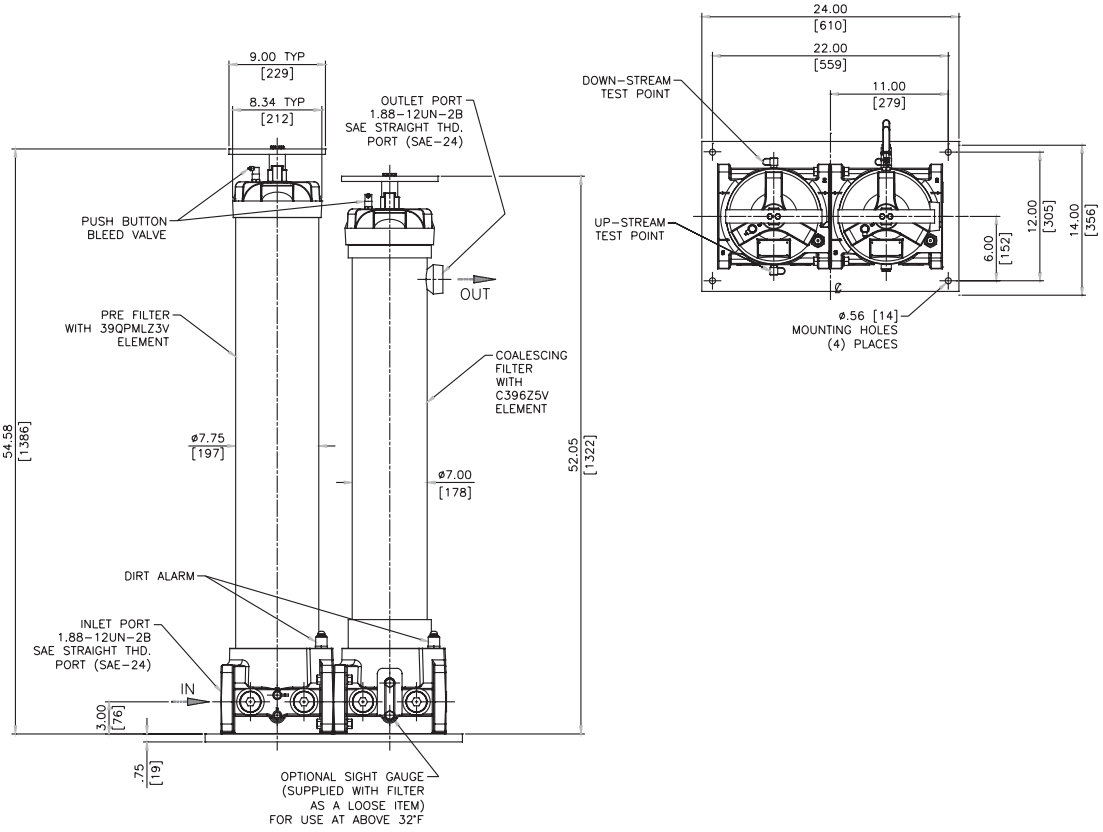
# BDS Bulk Diesel Fuel Skid

## Filter Housing Specifications

| | | |
|---|---|---|
| Flow Rating: | Up to 70 gpm (265 L/min) for ULSD15 | |
| Inlet/Outlet Connection: | SAE J1926 -24 (ORB) | |
| Drain Connection Upper: | 1/4" NPT Ball Valve | |
| Drain Connection Lower: | 1/4" NPT Ball Valve | |
| Max. Operating Pressure: | 100 psi (7 bar); 45 psi (3 bar) with water sight gauge | |
| Min. Yield Pressure: | 400 psi (27.6 bar) without sight gauge<br>Contact factory for use with sight gauge | |
| Rated Fatigue Pressure: | Contact Factory | |
| Temperature range: | -20°F to 165°F (-29°C to 74°C) Standard<br>32ºF to 165ºF (0ºC to 74ºC) with optional sight gauge or AWD option | |
| Bypass Indication:<br>(Lower indication options available) | Particulate Filter<br>Particulate: 15 psi (1.03 bar) | Coalescing Filter<br>Coalescing: 25 psi (1.7 bar) |
| Bypass Valve Cracking: | Particulate Filter<br>Particulate: 20 psi (1.37 bar) | Coalescing Filter<br>Coalescing: 30 psi (2 bar) |
| Materials of Construction: | Particulate Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel | Coalescing Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel |
| Weight: | 441 Lbs. (200 kg) | |
| Element Change Clearance: | 33.8” (858 mm) | |

NOTES:

Elements are sold with the housing




Metric dimensions in ( ).

# Bulk Diesel Fuel Skid BDS

## Element Particulate Performance Information

**Filtration Ratio per ISO 16889**
Using APC calibrated per ISO 11171

| Particulate Elements | DHC | $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
|---|---|---|---|
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

## Element Coalescing Performance Information

Elements Sold with Housing

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

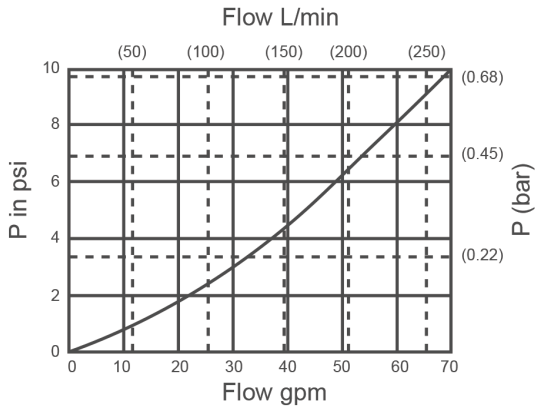
**Particulate Element**
Flow Direction: Outside In
Element Nominal Dimensions: 6.0” (150 mm) O.D. x 37.80” (960 mm) long

**Coalescing Element**
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4” (163 mm) O.D. x 39.4” (1001 mm) long

## Pressure Drop Information Based on Flow Rate and Viscosity

### $\Delta P_{housing}$

BDS $\Delta P_{housing}$ for fluids with sp gr= 0.86




sp gr = specific gravity

### $\Delta P_{element}$

$\Delta P_{element}$ = flow x element ΔP factor x viscosity factor

El. ΔP factors @ 37 SUS (3 cSt).

C396Z5V = .17

39QPMLZ1V = .01

39QPMLZ3V = .01

If working in units of bars & L/min, divide above factor by 54.9.

Viscosity factor: Divide viscosity by 37 SUS (3 cSt).

$\Delta P_{filter} = \Delta P_{housing} + \Delta P_{element}$

**Exercise:** Determine ΔP at 70 gpm (265 L/min) for BDS39QPMLZ3VVM

**Solution:**

$\Delta P_{housing}$ = 10 psi = [ 0.69 bar]

$\Delta P_{element\ (39QPML)}$ = 70 x 0.01 = 0.7 psi [.05 bar]

$\Delta P_{element\ (C396)}$ = 70 x 0.17 = 11.9 psi [.82 bar]

$\Delta P_{total}$ = 10 + 0.7 + 11.9 = 22.6 psi [1.56 bar]

Notes

# BDS Bulk Diesel Fuel Skid

## Filter Model Number Selection

How to Build a Valid Model Number for a Filtroil BDS supplied with coalescing element:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 |
|---|---|---|---|---|
| BDS | – | – | – | – |

**Example:** NOTE: One option per box

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | |
|---|---|---|---|---|---|
| BDS | 39QPMLZ3 | V | VM | | = BDS39QPMLZ3VVM |

BOX 1

| Filter Series |
|---|
| BDS |

BOX 2

| Particulate Filter Micron Rating |
|---|
| 39QPMLZ1 = 1µm |
| 39QPMLZ3 = 3µm |

BOX 3

| Housing Seal Material |
|---|
| V = Viton® |

BOX 4

| Dirt Alarm® |
|---|
| VM = Visual Pop-Up w/ Manual Reset |

BOX 5

| Additional Options | |
|---|---|
| Omit = | None (standard) |
| H = | Sump Heater |
| S = | Sight Gauge |
| AWD5 = | Auto water drain 5 gal tank w/ failsafe |
| AWD20 = | Auto water drain 20 gal tank w/ failsafe |
| C = | Cla-Val® Flow Control Valve (2" ANSI 150# flange) |

NOTES:

Optional sight gauge and AWD's for use only >32° F (0°C)
Box 4. Viton® is a registered trademark of DuPont Dow Elastomers

## Element Part Number Selection

| | | Filtration Ratio per ISO 16889 Using APC calibrated per ISO 11171 | |
|---|---|---|---|
| Particulate Elements | DHC | $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

**Particulate Element**
Flow Direction: Outside In
Element Nominal Dimensions: 6.0" (150 mm) O.D. x 37.80" (960 mm) long

**Coalescing Element**
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4" (163 mm) O.D. x 39.4" (1001 mm) long

## Fluid Compatibility

### Fuel Oils

- ULSD15, low sulfur diesel and high sulfur diesel
- Biodiesel blends
- Synthetic diesel and blends
- No. 2 fuel oil and heating oil

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# Bulk Diesel Multi-Skid BDS2

*Coalescing Elements Patent Pending

## Applications


POINT OF USE FUEL DISPENSING


FLEET FILL / BULK FUEL TRANSFER

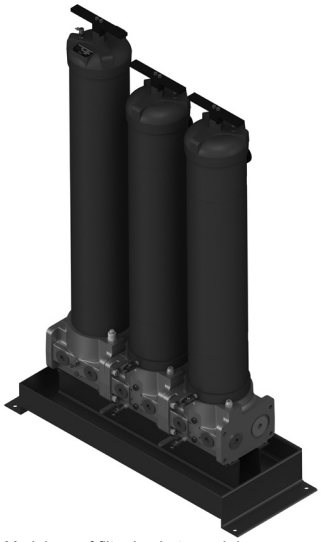

BULK FUEL UNLOADING


PROTECTION FOR HIGH-FLOW FUEL INJECTION SYSTEMS


BULK TANK KIDNEY LOOP / RECIRCULATION

## Features and Benefits

- Designed with integrated particulate removal pre-filtration for maximum coalescing filter element life in the downstream housing
- Sized for higher flows or highly contaminated fluid applications
- Routine element change is only needed on pre-filter (the particulate filter) which saves time and money
- Patent-pending, three-phase, particulate and fuel/water separation media technology
- A revolutionary element designed for the highest single-pass water and particulate removal efficiencies in today's ultra-low sulfur diesel (ULSD) fluids
- Protects expensive Tier 3 and Tier 4 engine components agains failures caused by particulate and water transferred from the bulk fuel tank to the vehicle
- Allows users to achieve or exceed the particulate and water removal specifications of the injection system OEMs
- Previously acceptable industry standard products no longer provide the high-efficiency separation needed in today's ULSD fluids
- In applications >32°F (0°C) complete automation is achievable with a water in fuel sensor fail-safe auto-drain feature using a remote 5 gallon (18L) or 20 gallon (75L) sump with alarm and auto shutdown
- Anti-Static Pleat Media (ASP®) is standard for all coalescing elements



Model no. of filter in photograph is: BDS239QPMLZ3VVM

70-140 gpm
248-530 L/min

100 psi
7 bar
Standard

45 psi
3 bar
When Ordered w/ Sight Gauge Option

## Markets


INDUSTRIAL


MOBILE VEHICLES


MARINE


MINING TECHNOLOGY


AGRICULTURE


POWER GENERATION


COMMON RAIL INJECTOR SYSTEMS


FLEET


RAILROAD


BULK FUEL FILTRATION

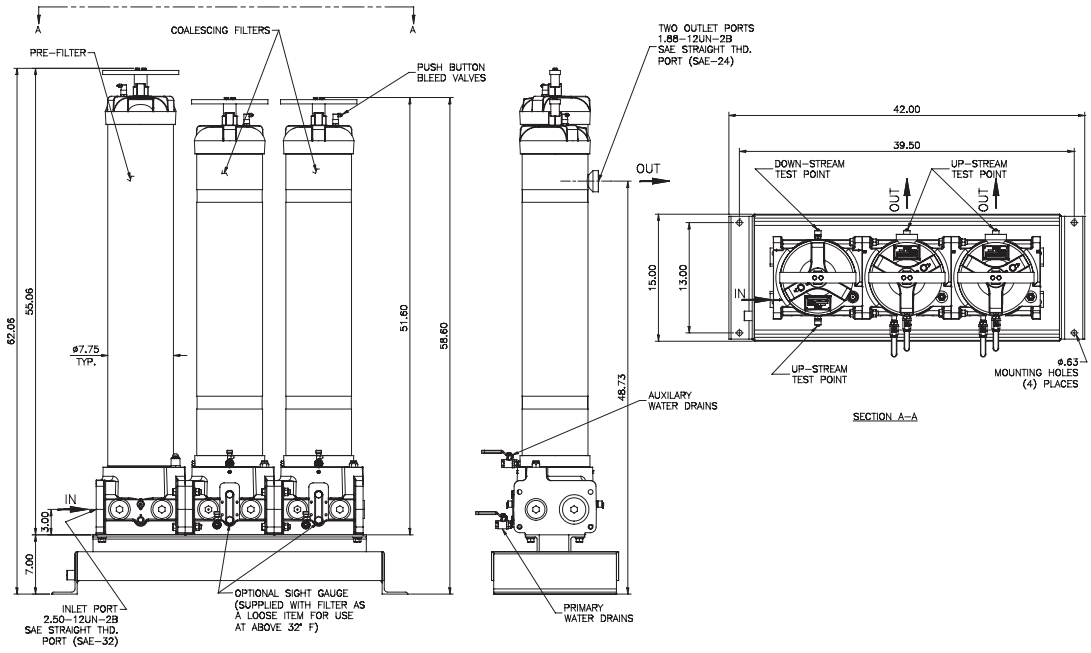
# BDS2 Bulk Diesel Multi-Skid

## Filter Housing Specifications

| | | |
|---|---|---|
| Flow Rating: | Up to 140 gpm (530 L/min) for ULSD15 | |
| Inlet/Outlet Connection: | SAE J1926 -32 (ORB) | |
| Drain Connection Upper: | 1/4" NPT Ball Valve | |
| Drain Connection Lower: | 1/4" NPT Ball Valve | |
| Max. Operating Pressure: | 100 psi (7 bar); 45 psi (3 bar) with water sight gauge | |
| Min. Yield Pressure: | 400 psi (27.6 bar) without sight gauge<br>Contact factory for use with sight gauge | |
| Rated Fatigue Pressure: | Contact Factory | |
| Temperature range: | -20°F to 165°F (-29°C to 74°C) Standard<br>32ºF to 165ºF (0ºC to 74ºC) with optional sight gauge or AWD option | |
| Bypass Indication:<br>(Lower indication options available) | Particulate Filter<br>Particulate: 15 psi (1.03 bar) | Coalescing Filter<br>Coalescing: 25 psi (1.7 bar) |
| Bypass Valve Cracking: | Particulate Filter<br>Particulate: 20 psi ( 1.37 bar) | Coalescing Filter<br>Coalescing: 30 psi ( 2 bar) |
| Materials of Construction: | Particulate Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel | Coalescing Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel |
| Weight: | 596 Lbs. (270 kg) | |
| Element Change Clearance: | 33.8" (858 mm) | |

NOTES:

Element are sold with the housing




Metric dimensions in ( ).

# Bulk Diesel Multi-Skid BDS2

## Element Particulate Performance Information

| Particulate Elements | DHC | Filtration Ratio per ISO 16889 Using APC calibrated per ISO 11171 $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
|---|---|---|---|
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

## Element Coalescing Performance Information

Elements Sold with Housing

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

**Particulate Element**
Flow Direction: Outside In
Element Nominal Dimensions: 6.0" (150 mm) O.D. x 37.80" (960 mm) long

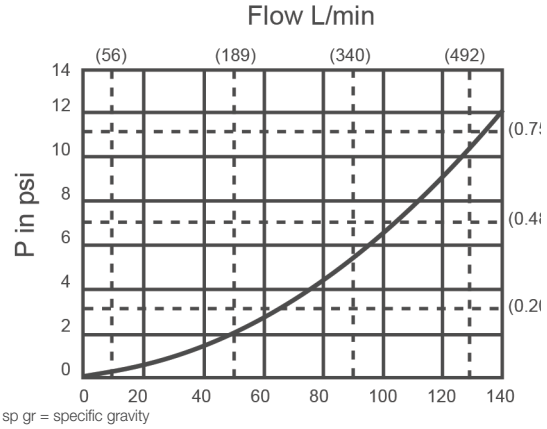
**Coalescing Element**
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4" (163 mm) O.D. x 39.4" (1001 mm) long

## Pressure Drop Information

Based on Flow Rate and Viscosity

### $\Delta P_{housing}$

BDS $\Delta P_{housing}$ for fluids with sp gr= 0.86




sp gr = specific gravity

### $\Delta P_{element}$

$\Delta P_{element}$ = flow x element ΔP factor x viscosity factor

El. ΔP factors @ 37 SUS (3 cSt).

C396Z5V = .17

39QPMLZ1V = .01

39QPMLZ3V = .01

If working in units of bars & L/min, divide above factor by 54.9.

Viscosity factor: Divide viscosity by 37 SUS (3 cSt).

$\Delta P_{filter} = \Delta P_{housing} + \Delta P_{element}$

**Exercise:** Determine ΔP at 70 gpm (265 L/min) for BDS239QPMLZ3VVM

**Solution:**

$\Delta P_{housing}$ = 3.0 psi = [ 0.21 bar]

$\Delta P_{element\ (39QPML)}$ = 70 x 0.01 = 0.7 psi [.05 bar]

$\Delta P_{element\ (C396)}$ = 70 x 0.17 = 11.9 psi [.82 bar]

$\Delta P_{total}$ = 3.0 + 0.7 + 11.9 = 15.6 psi [1.07 bar]

Notes

# BDS2 Bulk Diesel Multi-Skid

## Filter Model Number Selection

How to Build a Valid Model Number for a Filtroil BDS Housing Supplied with Element:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 |
|---|---|---|---|---|---|
| BDS | | | | | |

**Example:** NOTE: One option per box

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | |
|---|---|---|---|---|---|---|
| BDS | 2 | 39QPMLZ3 | V | VM | | = BDS239QPMLZ3VVM |

**BOX 1 – Filter Series**

| Filter Series |
|---|
| BDS |

**BOX 2 – No. of Coalescing Filters**

| No. of Coalescing Filters |
|---|
| 2 = 140gpm |

**BOX 3 – Particulate Filter Micron Rating**

| Particulate Filter Micron Rating |
|---|
| 39QPMLZ1 = 1µm |
| 39QPMLZ3 = 3µm |

**BOX 4 – Housing Seal Material**

| Housing Seal Material |
|---|
| V = Viton® |

**BOX 5 – Dirt Alarm®**

| Dirt Alarm® |
|---|
| VM = Visual Pop-Up w/ Manual Reset |

**BOX 6 – Sump Options**

| | |
|---|---|
| Omit = | None (standard) |
| H = | Sump Heater |
| S = | Sight Gauge |
| AWD5 = | Auto water drain 5 gal tank w/ failsafe |
| AWD20 = | Auto water drain 20 gal tank w/ failsafe |
| C = | Cla-Val® Flow Control Valve (2" ANSI 150# flange) |

NOTES:

Optional sight gauge and AWD's for use only >32° F (0°C)
Box 4. Viton® is a registered trademark of DuPont Dow Elastomers

## Element Part Number Selection

| Particulate Elements | DHC | Filtration Ratio per ISO 16889 Using APC calibrated per ISO 11171 $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
|---|---|---|---|
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

**Particulate Element**
Flow Direction: Outside In
Element Nominal Dimensions: 6.0” (150 mm) O.D. x 37.80” (960 mm) long

**Coalescing Element**
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4” (163 mm) O.D. x 39.4” (1001 mm) long

## Fluid Compatibility

### Fuel Oils

- ULSD15, low sulfur diesel and high sulfur diesel
- Biodiesel blends
- Synthetic diesel and blends
- No. 2 fuel oil and heating oil

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EMAIL: filtroil@filtroil.com

# Bulk Diesel Multi-Skid BDS3

## Applications


POINT OF USE FUEL DISPENSING


FLEET FILL / BULK FUEL TRANSFER

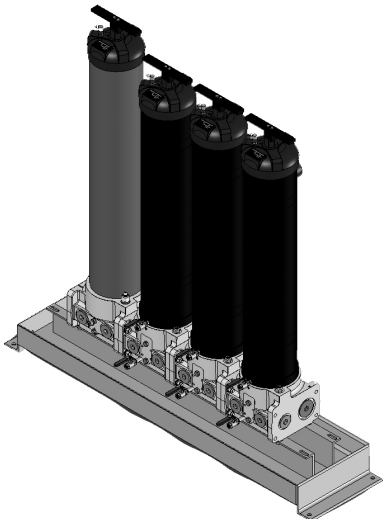

BULK FUEL UNLOADING


PROTECTION FOR HIGH-FLOW FUEL INJECTION SYSTEMS


BULK TANK KIDNEY LOOP / RECIRCULATION

## Features and Benefits

- Designed with integrated particulate removal pre-filtration for maximum coalescing filter element life in the downstream housing
- Sized for higher flows or highly contaminated fluid applications
- Routine element change is only needed on pre-filter (the particulate filter) which saves time and money
- Patent-pending, three-phase, particulate and fuel/water separation media technology
- A revolutionary element designed for the highest single-pass water and particulate removal efficiencies in today's ultra-low sulfur diesel (ULSD) fluids
- Protects expensive Tier 3 and Tier 4 engine components against failures caused by particulate and water transferred from the bulk fuel tank to the vehicle
- Allows users to achieve or exceed the particulate and water removal specifications of the injection system OEMs
- Previously acceptable industry standard products no longer provide the high-efficiency separation needed in today's ULSD fluids
- In applications >32°F (0°C) complete automation is achievable with a water in fuel sensor fail-safe auto-drain feature using a remote 5 gallon (18L) or 20 gallon (75L) sump with alarm and auto shutdown
- Anti-Static Pleat Media (ASP®) is standard for all coalescing elements



Model no. of filter in photograph is: BDS339QPMLZ3VVM

## Markets


INDUSTRIAL


MOBILE VEHICLES


MARINE


MINING TECHNOLOGY


AGRICULTURE


POWER GENERATION


COMMON RAIL INJECTOR SYSTEMS


FLEET


RAILROAD


BULK FUEL FILTRATION

140-210 gpm
530-795 L/min

100 psi
7 bar
Standard

45 psi
3 bar
When Ordered w/ Sight Gauge Option

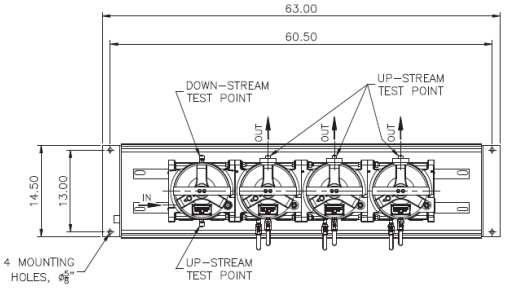
# BDS3 Bulk Diesel Multi-Skid

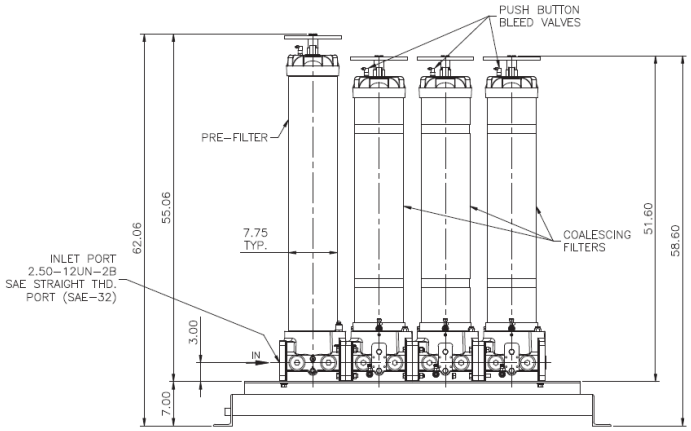
## Filter Housing Specifications

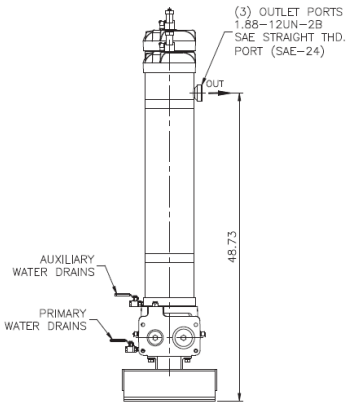
| | | |
|---|---|---|
| Flow Rating: | Up to 140 gpm to 210 gpm (530 to 795 L/min) for ULSD15 | |
| Inlet/Outlet Connection: | SAE J1926 -32 (ORB) | |
| Drain Connection Upper: | 1/4" NPT Ball Valve | |
| Drain Connection Lower: | 1/4" NPT Ball Valve | |
| Max. Operating Pressure: | 100 psi (7 bar); 45 psi (3 bar) with water sight gauge | |
| Min. Yield Pressure: | 400 psi (27.6 bar) without sight gauge<br>Contact factory for use with sight gauge | |
| Rated Fatigue Pressure: | Contact Factory | |
| Temperature range: | -20°F to 165°F (-29°C to 74°C) with heater option<br>32ºF to 165ºF (0ºC to 74ºC) standard, with optional sight gauge or AWD option | |
| Bypass Indication:<br>(Lower indication options available) | Particulate Filter<br>Particulate: 15 psi (1.03 bar) | Coalescing Filter<br>Coalescing: 25 psi (1.7 bar) |
| Bypass Valve Cracking: | Particulate Filter<br>Particulate: 20 psi ( 1.37 bar) | Coalescing Filter<br>Coalescing: 30 psi ( 2 bar) |
| Materials of Construction: | Particulate Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel | Coalescing Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel |
| Weight: | 596 Lbs. (270 kg) | |
| Element Change Clearance: | 33.8" (858 mm) | |

NOTES:

Elements are sold with the housing




Metric dimensions in ( ).

# Bulk Diesel Multi-Skid BDS3

## Element Particulate Performance Information

**Filtration Ratio per ISO 16889**
Using APC calibrated per ISO 11171

| Particulate Elements | DHC | $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
|---|---|---|---|
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

## Element Coalescing Performance Information
Elements Sold with Housing

**Particulate Element**
Flow Direction: Outside In
Element Nominal Dimensions: 6.0" (150 mm) O.D. x 37.80" (960 mm) long

**Coalescing Element**
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4" (163 mm) O.D. x 39.4" (1001 mm) long

## Pressure Drop Information
Based on Flow Rate and Viscosity

### $\Delta P_{housing}$

BDS $\Delta P_{housing}$ for fluids with sp gr= 0.86

Note: Contact Factory for deltaP housing data

### $\Delta P_{element}$

$\Delta P_{element}$ = flow x element ΔP factor x viscosity factor

El. ΔP factors @ 37 SUS (3 cSt).

C396Z5V = .17

39QPMLZ1V = .01

39QPMLZ3V = .01

If working in units of bars & L/min, divide above factor by 54.9.

Viscosity factor: Divide viscosity by 37 SUS (3 cSt).

$\Delta P_{filter} = \Delta P_{housing} + \Delta P_{element}$

**Exercise:** Determine ΔP at 70 gpm (265 L/min) for BDS239QPMLZ3VVM

**Solution:**

$\Delta P_{housing}$ = 3.0 psi = [ 0.21 bar]

$\Delta P_{element\ (39QPML)}$ = 70 x 0.01 = 0.7 psi [.05 bar]

$\Delta P_{element\ (C396)}$ = 70 x 0.17 = 11.9 psi [.82 bar]

$\Delta P_{total}$ = 3.0 + 0.7 + 11.9 = 15.6 psi [1.07 bar]

Notes

# BDS3 Bulk Diesel Multi-Skid

## Filter Model Number Selection

How to Build a Valid Model Number for a Filtroil BDS Housing Supplied with Element:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 |
|---|---|---|---|---|---|
| BDS | | | | | |

Example: NOTE: One option per box

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | |
|---|---|---|---|---|---|---|
| BDS | 3 | 39QPMLZ3 | V | VM | | = BDS339QPMLZ3VVM |

BOX 1

| Filter Series |
|---|
| BDS |

BOX 2

| No. of Coalescing Filters |
|---|
| 3 = 210gpm |

BOX 3

| Particulate Filter Micron Rating |
|---|
| 39QPMLZ1 = 1µm |
| 39QPMLZ3 = 3µm |

BOX 4

| Housing Seal Material |
|---|
| V = Viton® |

BOX 5

| Dirt Alarm® |
|---|
| VM = Visual Pop-Up w/ Manual Reset |

BOX 6

| Sump Options | |
|---|---|
| Omit = | None (standard) |
| H = | Sump Heater |
| S = | Sight Gauge |
| AWD5 = | Auto water drain 5 gal tank w/ failsafe |
| AWD20 = | Auto water drain 20 gal tank w/ failsafe |
| C = | Cla-Val® Flow Control Valve (2" ANSI 150# flange) |

NOTES:

Optional sight gauge and AWD's for use only >32° F (0°C)
Box 4. Viton® is a registered trademark of DuPont Dow Elastomers

## Element Part Number Selection

| Particulate Elements | DHC | Filtration Ratio per ISO 16889 Using APC calibrated per ISO 11171 $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
|---|---|---|---|
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

Particulate Element
Flow Direction: Outside In
Element Nominal Dimensions: 6.0" (150 mm) O.D. x 37.80" (960 mm) long

Coalescing Element
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4" (163 mm) O.D. x 39.4" (1001 mm) long

## Fluid Compatibility

Fuel Oils

- ULSD15, low sulfur diesel and high sulfur diesel
- Biodiesel blends
- Synthetic diesel and blends
- No. 2 fuel oil and heating oil

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# Bulk Diesel Multi-Skid BDS4

## Applications


POINT OF USE FUEL DISPENSING

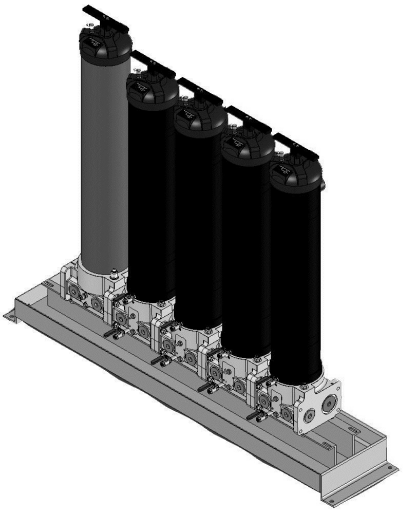

BULK FUEL UNLOADING


PROTECTION FOR HIGH-FLOW FUEL INJECTION SYSTEMS


BULK TANK KIDNEY LOOP / RECIRCULATION

## Features and Benefits

- Designed with integrated particulate removal pre-filtration for maximum coalescing filter element life in the downstream housing
- Sized for higher flows or highly contaminated fluid applications
- Routine element change is only needed on pre-filter (the particulate filter) which saves time and money
- Patent-pending, three-phase, particulate and fuel/water separation media technology
- A revolutionary element designed for the highest single-pass water and particulate removal efficiencies in today's ultra-low sulfur diesel (ULSD) fluids
- Protects expensive Tier 3 and Tier 4 engine components against failures caused by particulate and water transferred from the bulk fuel tank to the vehicle
- Allows users to achieve or exceed the particulate and water removal specifications of the injection system OEMs
- Previously acceptable industry standard products no longer provide the high-efficiency separation needed in today's ULSD fluids
- In applications >32°F (0°C) complete automation is achievable with a water in fuel sensor fail-safe auto-drain feature using a remote 5 gallon (18L) or 20 gallon (75L) sump with alarm and auto shutdown
- Anti-Static Pleat Media (ASP®) is standard for all coalescing elements



Model no. of filter in photograph is:
BDS439QPMLZ3VVM

## Markets


INDUSTRIAL


MOBILE VEHICLES


MARINE


MINING TECHNOLOGY


AGRICULTURE


POWER GENERATION


COMMON RAIL INJECTOR SYSTEMS


FLEET


RAILROAD


BULK FUEL FILTRATION

210-280 gpm
795-1060 L/min

100 psi
7 bar
Standard

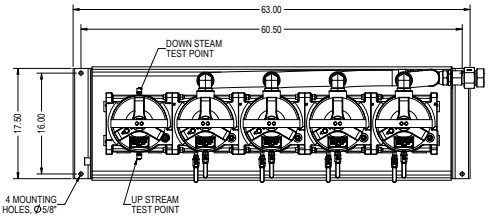
45 psi
3 bar
When Ordered w/ Sight Gauge Option

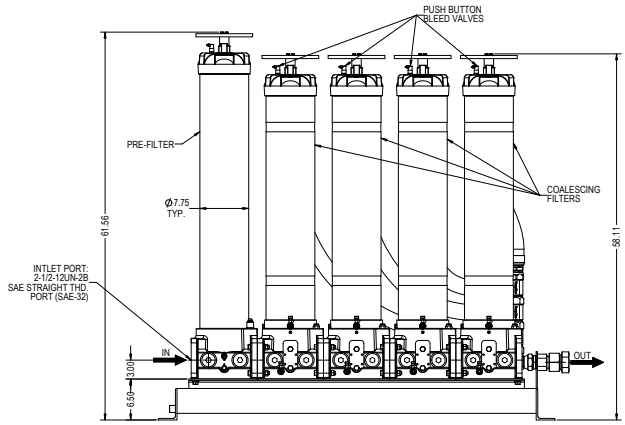
# BDS4 Bulk Diesel Multi-Skid

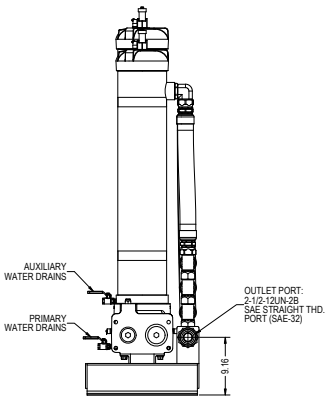
| | | |
|---|---|---|
| Flow Rating: | From 210 gpm to 280 gpm (795 to 1060 L/min) for ULSD15 | |
| Inlet/Outlet Connection: | SAE J1926 -32 (ORB) | |
| Drain Connection Upper: | 1/4" NPT Ball Valve | |
| Drain Connection Lower: | 1/4" NPT Ball Valve | |
| Max. Operating Pressure: | 100 psi (7 bar); 45 psi (3 bar) with water sight gauge | |
| Min. Yield Pressure: | 400 psi (27.6 bar) without sight gauge<br>Contact factory for use with sight gauge | |
| Rated Fatigue Pressure: | Contact Factory | |
| Temperature range: | -20°F to 165°F (-29°C to 74°C) with heater option<br>32ºF to 165ºF (0ºC to 74ºC) standard, with optional sight gauge or AWD option | |
| Bypass Indication:<br>(Lower indication options available) | Particulate Filter<br>Particulate: 15 psi (1.03 bar) | Coalescing Filter<br>Coalescing: 25 psi (1.7 bar) |
| Bypass Valve Cracking: | Particulate Filter<br>Particulate: 20 psi ( 1.37 bar) | Coalescing Filter<br>Coalescing: 30 psi ( 2 bar) |
| Materials of Construction: | Particulate Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel | Coalescing Filter<br>Porting Base: Anodized Aluminum<br>Element Bowl: Epoxy Paint w/ High-phos Electroless Nickel Plating (Standard)<br>Cap: Plated Steel |
| Weight: | 904 Lbs. (410 kg) | |
| Element Change Clearance: | 33.8" (858 mm) | |

NOTES:

Elements are sold with the housing




Metric dimensions in ( ).

# Bulk Diesel Multi-Skid BDS4

## Element Particulate Performance Information

**Filtration Ratio per ISO 16889**
Using APC calibrated per ISO 11171

| Particulate Elements | DHC | $\beta_x$ (c) ≥ 200 | $\beta_x$ (c) ≥ 1000 |
|---|---|---|---|
| 39QPMLZ1V | 1485 grams | <4.0 | 4.2 |
| 39QPMLZ3V | 1525 grams | <4.0 | 4.8 |

## Element Coalescing Performance Information

Elements Sold with Housing

| Coalescing Element | Pressure Side Coalescing | |
|---|---|---|
| | Max Flow | Single Pass Water Removal Efficiency |
| C396Z5V | 70 gpm | ≥ 99.5% |

Note:
Based on ULSD15 with 27 Dynes/cm surface tension and 0.25% (2500 ppm) water injection

**Particulate Element**
Flow Direction: Outside In
Element Nominal Dimensions: 6.0" (150 mm) O.D. x 37.80" (960 mm) long

**Coalescing Element**
Flow Direction: Inside Out
Element Nominal Dimensions: 6.4" (163 mm) O.D. x 39.4" (1001 mm) long

## Pressure Drop Information Based on Flow Rate and Viscosity

### $\Delta P_{housing}$

BDS $\Delta P_{housing}$ for fluids with sp gr= 0.86

Note: Contact Factory for deltaP housing data

### $\Delta P_{element}$

$\Delta P_{element}$ = flow x element ΔP factor x viscosity factor

El. ΔP factors @ 37 SUS (3 cSt).

C396Z5V = .17

39QPMLZ1V = .01

39QPMLZ3V = .01

If working in units of bars & L/min, divide above factor by 54.9.

Viscosity factor: Divide viscosity by 37 SUS (3 cSt).

$\Delta P_{filter} = \Delta P_{housing} + \Delta P_{element}$

**Exercise:** Determine ΔP at 70 gpm (265 L/min) for BDS239QPMLZ3VVM

**Solution:**

$\Delta P_{housing}$ = 3.0 psi = [ 0.21 bar]

$\Delta P_{element\ (39QPML)}$ = 70 x 0.01 = 0.7 psi [.05 bar]

$\Delta P_{element\ (C396)}$ = 70 x 0.17 = 11.9 psi [.82 bar]

$\Delta P_{total}$ = 3.0 + 0.7 + 11.9 = 15.6 psi [1.07 bar]

Notes

# BDS4 Bulk Diesel Multi-Skid

## Filter Model Number Selection

How to Build a Valid Model Number for a Filtroil BDS Housing Supplied with Element:

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 |
|---|---|---|---|---|---|
| BDS | | | | | |

Example: NOTE: One option per box

| BOX 1 | BOX 2 | BOX 3 | BOX 4 | BOX 5 | BOX 6 | |
|---|---|---|---|---|---|---|
| BDS | 4 | 39QPMLZ3 | V | VM | | = BDS439QPMLZ3VVM |

**BOX 1 — Filter Series**

BDS

**BOX 2 — No. of Coalescing Filters**

4 = 280gpm

**BOX 3 — Particulate Filter Micron Rating**

39QPMLZ1 = 1µm

39QPMLZ3 = 3µm

**BOX 4 — Housing Seal Material**

V = Viton®

**BOX 5 — Dirt Alarm®**

VM = Visual Pop-Up w/ Manual Reset

**BOX 6 — Sump Options**

Omit = None (standard)

H = Sump Heater

S = Sight Gauge

AWD5 = Auto water drain 5 gal tank w/ failsafe

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