Pall Corporation

Ultipleat® Diesel Fuel Filters

For particulate removal in bulk diesel fuel and filling applications

Filtration. Separation. Solution.SM

IMUDFFENb

Ultipleat® Diesel Fuel Filters

Technical Information

Housing Features

- Designed to ASME Section VIII Div. 1 requirements, with code stamping as an available option
- 10 barg (150 psi) pressure rated
- Carbon Steel and 316 Stainless Steel options
- Horizontal and vertical configurations

Element Features

- 6" diameter Ultipleat (wave-shaped pleat) filter medium pack
- In-to-out filter element flow path
- Coreless element configuration
- Reproducible and consistent removal rating, see Table1. Element Ordering Information

Description

Ultipleat diesel fuel filters are specifically designed for solid particulate contamination removal in high volume, high flow diesel fuel applications. These large diameter filter elements feature filtration media and a filter element configuration with a unique wave-shaped pleat geometry. This allows the use of significantly fewer elements and smaller housings, which is particularly beneficial in bulk diesel fuel applications where high flow rates and high contamination ingression rates are present. Ultipleat diesel fuel housings have been designed so that all sizes use the same installation footprint. This allows users to easily replace a smaller housing with a larger one - with no costly pipework modifications - should process changes require additional filtration capacity. The housings are also available in horizontal and vertical configurations to facilitate access during filter element change-outs.

Filter Sizing

There are two key aspects that must be understood when sizing a bulk diesel filtration system:

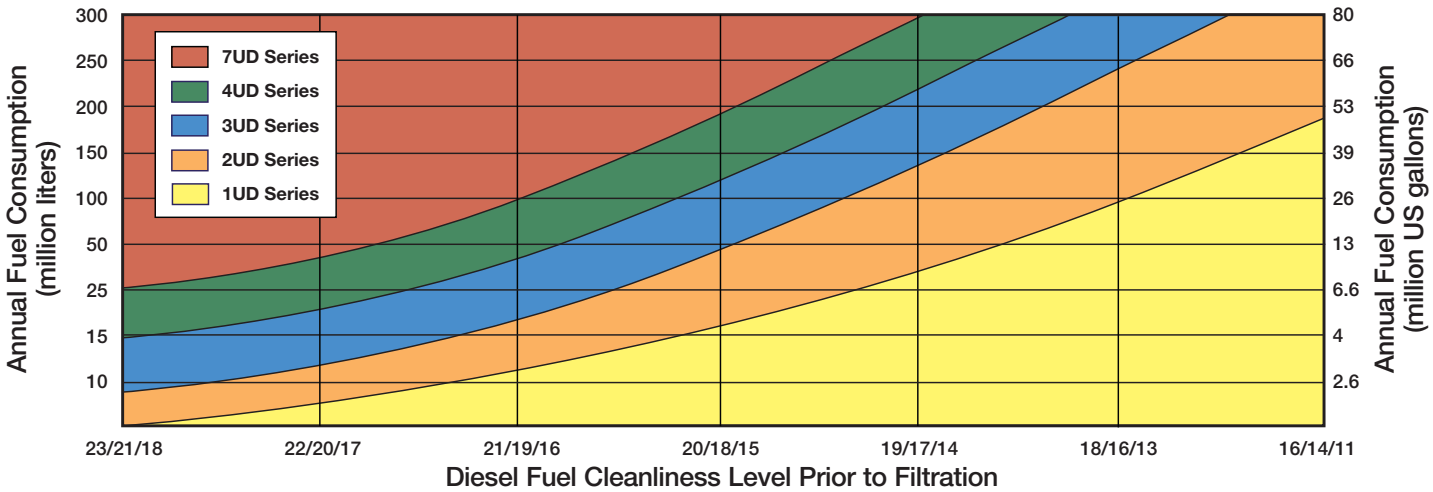
1. The single-pass filtration efficiency, since the filter element must remove the majority of contamination in a single pass
2. The annual fuel consumption and mass of contamination expected to be removed

Typically, diesel filtration systems are sized based on pump flow rate, fuel viscosity, fuel density, and system pressure. Experience has shown that, in many cases, bulk fuel filtration solutions have been drastically undersized for their intended purposes. Figure 1 illustrates the amount of solid contamination (mass) that is present in fuel, based on different fuel cleanliness levels and annual fuel consumption rates. The sizing recommendations for Ultipleat diesel fuel filter systems, shown in Figure 2, ensure solid contamination is removed efficiently, consistently, cost-effectively.

Figure 1: Annual Fuel Contamination Mass, kg (lb)*

Annual Fuel Consumption, Million Liters (Million US gal)	Delivered Fuel ISO Cleanliness Level			
	22/20/17	20/18/15	18/16/13	16/14/11
25 (6.6)	400 (882)	100 (220)	25 (55)	6.3 (14)
75 (19.8)	1,200 (2,646)	300 (661)	75 (165)	19 (41)
100 (26.4)	1,600 (3,527)	400 (882)	100 (220)	25 (55)
200 (52.8)	3,200 (7,055)	800 (1,764)	200 (441)	50 (110)
300 (79.3)	4,800 (10,582)	1,200 (2,646)	300 (661)	75 (165)

Figure 2: Recommended Ultipleat diesel fuel filter housing size*



* Based on 40" length elements; when filtering with 60" elements, the next size smaller housing can be used

Ultipleat® Diesel Fuel Filters

Housing Ordering Information

Vertical Housing Configuration

Part Number	Number of Filter Elements	Housing Diameter mm (in) (Nominal)	Flange face to face mm (in)	40" Ultipleat Diesel Filter		60" Ultipleat Diesel Filter	
				Max. Height mm (in) **A**	Inlet Port Height mm (in) **B**	Max. Height mm (in) **A**	Inlet Port Height mm (in) **B**
1UDV + Table **1 2 3 4**	1	203 (8)	406 (16)*	2243 (88.31)	1934 (76.13)	2751 (108.31)	2442 (96.13)
2UDV + Table **1 2 3 4**	2	406 (16)	914 (36)	2577 (101.44)	1934 (76.13)	3085 (121.44)	2442 (96.13)
3UDV + Table **1 2 3 4**	3	457 (18)	914 (36)	2620 (103.13)	1934 (76.13)	3128 (123.13)	2442 (96.13)
4UDV + Table **1 2 3 4**	4	508 (20)	914 (36)	2661 (104.75)	1934 (76.13)	3169 (124.75)	2442 (96.13)
7UDV + Table **1 2 3 4**	7	610 (24)	914 (36)	2756 (108.5)	1934 (76.13)	3264 (128.5)	2442 (96.13)

* Additional spacer available to maintain 914mm (36") flange face to face dimension

Horizontal Housing Configuration

Part Number	Number of Filter Elements	Housing Diameter mm (in) (Nominal)	40" Ultipleat Diesel Filter Max. Height mm (in) **D**	60" Ultipleat Diesel Filter Max. Height mm (in) **D**
1UDH + Table **1 3 4**	1	203 (8)	1695 (66.75)	2203 (86.75)
2UDH + Table **1 3 4**	2	406 (16)	1883 (74.13)	2391 (94.1)
3UDH + Table **1 3 4**	3	457 (18)	1934 (76.13)	2442 (96.1)
4UDH + Table **1 3 4**	4	508 (20)	2000 (78.75)	2508 (98.8)
7UDH + Table **1 3 4**	7	610 (24)	2188 (86.13)	2696 (106.1)

Table 1: Housing Size Options

Code	Element Length (in) (Nominal)
4	40
6	60

Table 2: Port Alignment

Code	Orientation
Omit	90 Degree Offset - Horizontal Option Only
A	Aligned (Same Side) - Vertical Option Only
O	Opposite - Vertical Option Only

Table 3: Material of Construction

Code	Material*
CS	Carbon Steel with 304 Tubesheet and Hold Down
SS	316L Stainless Steel

* Nitrile seals fitted as standard

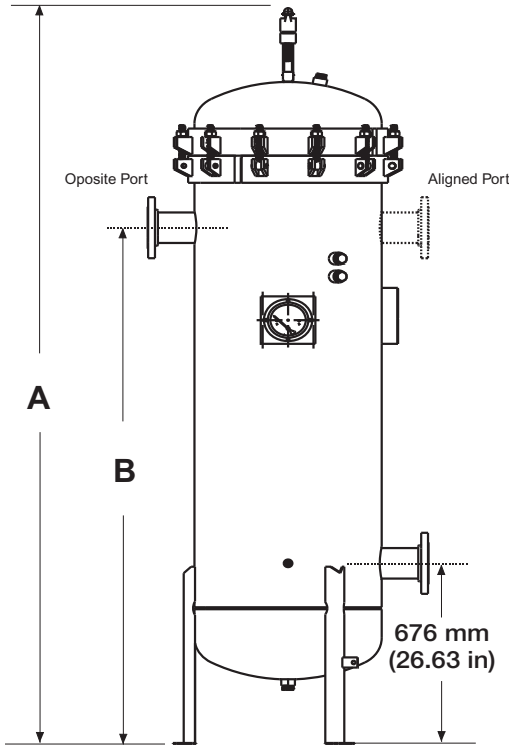
Table 4: Design Options

Code	Option
U	ASME Section VIII DIV 1
CE	In accordance with PED
SQL	In accordance with GB150
METI	Japanese Ministry of Economy - Standard Case
CRN	CSA B51-97 - Canadian Standard

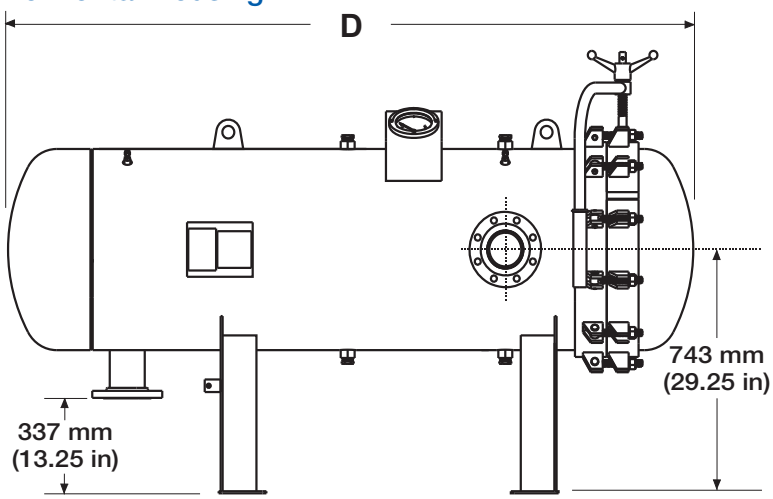
Example Part Number: 4UDV4OCSU

Denoted by bold option codes in the tables

Vertical Housing



Horizontal Housing



Ultipleat® Diesel Fuel Filters

Pressure Drop Information

Housing Pressure Drop

Housing pressure drop is negligible for flows up to 1890 L/min (500 USgpm); for applications over 1890 L/min (500 USgpm), please contact Pall.

Element Pressure Drop

Multiply actual flow rate times appropriate factor in table below to determine pressure drop with diesel fuel at 3 centipoise (cP). Correct for other fluids by multiplying new viscosity in cP/3.

Note: Factors are per 1000 L/min and per 1 USgpm. Refer to sample calculation below

3389 Series Filter Elements - bard/1000 L/min (psid/USgpm)

Length Code	JZ	JN	JS	JT
40	0.061 (0.0033)	0.050 (0.0027)	0.044 (0.0024)	0.033 (0.0018)
60	0.040 (0.0022)	0.033 (0.0018)	0.029 (0.0016)	0.022 (0.0012)

Sample ΔP Calculation

Ultipleat diesel fuel filter 40" element with JS grade media. Operating conditions 700 L/min flow rate using a diesel fuel of 2.5 cP.

Filter Element ΔP

= **ΔP Element**

= (700 x 0.044/1000) x 2.5/3 bard

= 0.026 bard

Element Ordering Information

Element P/N: UD 3389 F 1 2 H13

Example Part Number: UD3389FJS40H13

Denoted by bold option codes in the tables

Note: H13 denotes Nitrile seal fitted as standard

Table **1**: Filter Element Options

Code	$\beta_x \geq 1000$*	Maximum Element Pressure Drop, bard (psid)
JZ	2	3.44 (50)
JN	6	3.44 (50)
JS	12	3.44 (50)
JT	20	3.44 (50)

* The filtration efficiency is qualified using a modified multi-pass filter performance test procedure, based on ISO 16889 but modified to run in the single-pass mode (i.e., with the system clean-up filter in line throughout the test) using water at ambient temperature as the test fluid, ISO Fine Test Dust (ISO 12103-A2) specially prepared for dispersion in water (referred to as AIChE contaminant) as the test contaminant, and calibration of the automatic particle counters with Latex spheres. The filtration ratios obtained by the above test method should not be directly compared with filtration ratios obtained per ISO 16889.

Table **2**: Filter Element Length Options

Code	Length mm (in) (Nominal)
40	1,016 (40)
60	1,524 (60)

* Based on typical contamination levels in bulk diesel fuel, we recommend a maximum flow of 700 L/min (185 gpm) through each 40" element and 1100 L/min (200 gpm) through each 60" element. In applications with good diesel fuel cleanliness, the filters can be sized for flows up to 1890 L/min (500 gpm) per element.

Pall Corporation

Pall AeroPower

25 Harbor Park Drive
Port Washington, NY 11050
+1 516 484 3600 telephone
+1 888 333 7255 toll free US

Melbourne - Australia
+61 (0)3 9584 8100 telephone
+61 (0)3 9584 6647 fax
dieselfuel@pall.com

Filtration. Separation. Solution.SM

ENABLING A GREENER FUTURE℠

Visit us on the Web at www.pall.com

Pall Corporation has offices and plants throughout the world. For Pall representatives in your area, please go to www.pall.com/contact

Because of technological developments related to the products, systems, and/or services described herein, the data and procedures are subject to change without notice. Please consult your Pall representative or visit www.pall.com to verify that this information remains valid. Products in this document may be covered by one or more of the following patent numbers: EP 667,800; EP 982,061; EP 1,380,331; EP 1 656 193; US 5,543,047; US 5,690,765; US 5,725,784; US 6,113,784; US 7,083,564; US 7,318,800.

IMUDFFENb Produced in the UK January 2011