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Fuel Dispensing and Transfer Filtration

Fuel Filter Vessels with Water Separators, Water Absorbers, or Coalescers



How They Work

RV Series vessels are designed to be used in bulk fuel storage, fuel dispensing, fuel transfer, and large engine applications.

The RV Series set up as a filter/water separator (RVFS), will remove emulsified free water and solids from diesel fuel, gasoline, and other hydrocarbon streams. When equipped with filter/water separator filters, water can be drained and removed from the RVFS sump.

The RV Series set up as a particulate filter (RVMF), is designed to remove solid contaminants such as dirt, rust, scale, and other solid materials from a hydrocarbon fuel stream down to two microns.

Order a complete system “off the shelf” or customize via our three step ordering process as shown on page 5.

Biodiesel Filtration

Racor filter vessels are great for biofuel applications due to ease of service, rugged construction, and filtration efficiency.



Product Features:

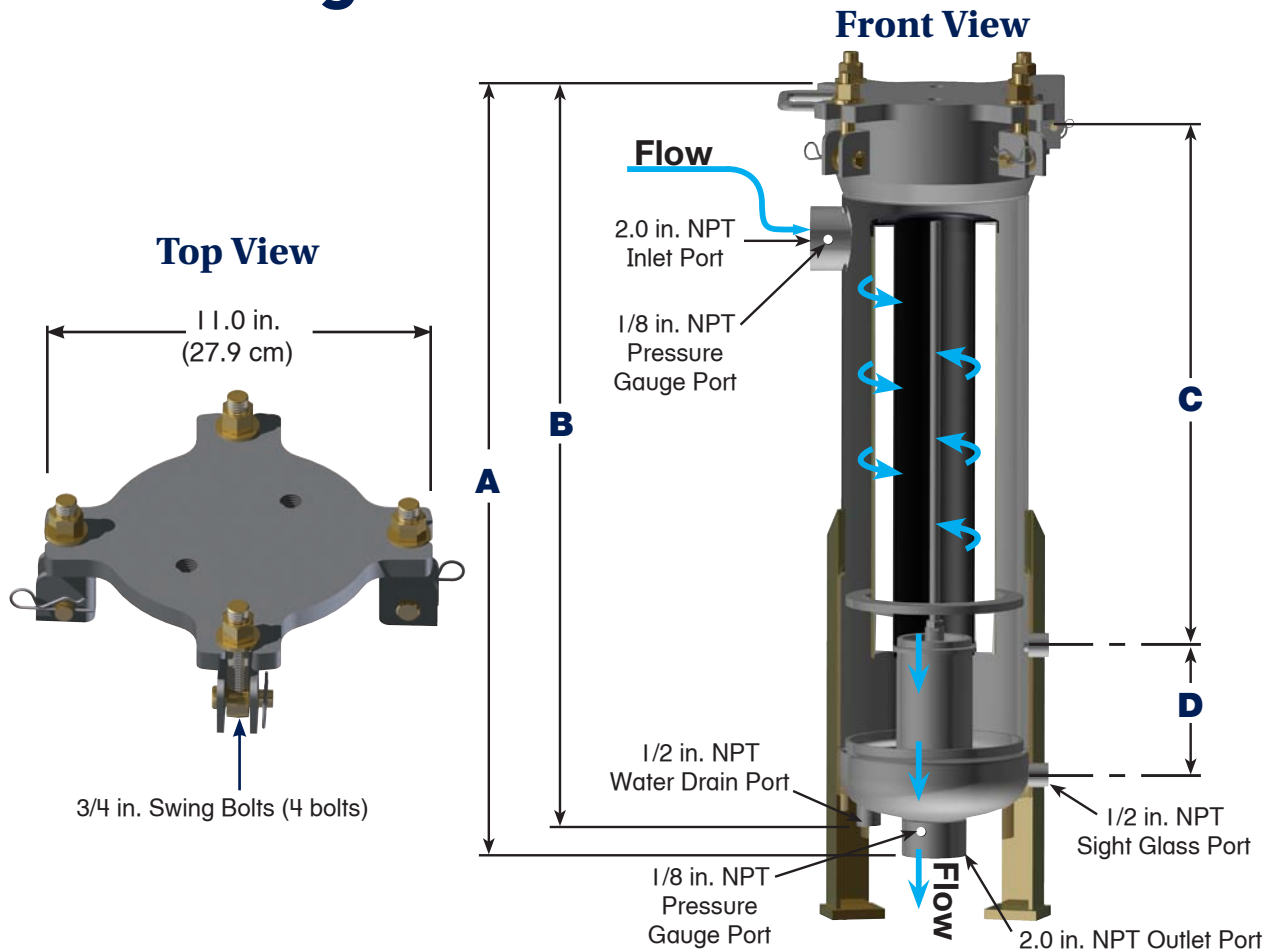
- Carbon Steel Construction
- 250 PSI ASME Code, Section VIII Construction Stamped and Certified
- Inlet and Outlet Permanently Marked
- Interior: Epoxy Coated To MIL-C-4556E
- Exterior: Grey Primer Coated
- Hinged Cover
- Leg Mounts or Wall Mounts
- Connections are 2” FNPT
- Optional Accessories Include: pressure relief valve, automatic air eliminator, drain valve, water-in-fuel sight glass, and differential pressure gauge.

Fuel Flow Information

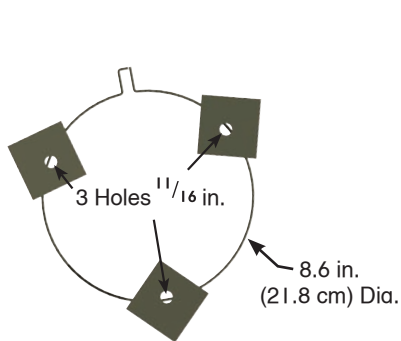
Flow Rate with Diesel Fuel		
Type	RVFS	RVMF
Size 1	25 GPM (95 LPM)	66 GPM (250 LPM)
Size 2	50 GPM (189 LPM)	133 GPM (503 LPM)
Size 3	75 GPM (284 LPM)	200 GPM (757 LPM)

Flow Rate with Kerosene or Aviation Fuel		
Type	RVFS	RVMF
Size 1	50 GPM (189 LPM)	66 GPM (250 LPM)
Size 2	100 GPM (379 LPM)	133 GPM (503 LPM)
Size 3	150 GPM (568 LPM)	200 GPM (757 LPM)

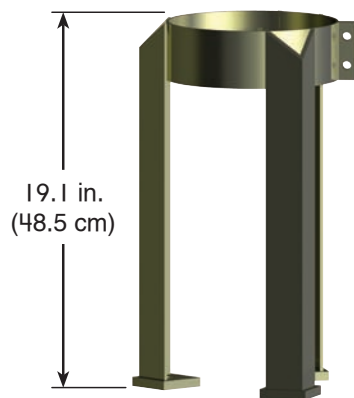
Mounting Information



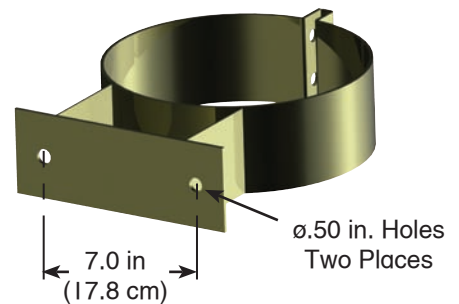
Dimensions	RVFS-1 and RVMF-1		RVFS-2 and RVMF-2		RVFS-3 and RVMF-3	
	in.	cm	in.	cm	in.	cm
A	35.3	89.7	49.8	126.5	63.8	162.1
B	34.0	86.4	48.5	123.2	62.4	158.5
C	24.8	63.0	39.3	99.8	54.0	137.2
D	6.0	15.2	6.0	15.2	6.0	15.2



Bottom View



Mounting Legs



Bulkhead Mounting Bracket

RV Series Specs

Racor RV Series filter vessels offer economy, versatility, unparalleled high efficiency, and low maintenance solutions to many fuel delivery and industrial filtration applications. The vessels will accept fuel filter or fuel filter/water separator filters.

Filter vessels are used in the diesel and kerosene re-fueling industry on fuel

dispensing locations, providing clean dry fuel. Equally these vessels can be used for AV gas, heating oils, gasoline, and other hydrocarbon fuels.

RV Series vessels provide the required filtration for today's high-pressure common-rail engines.



Specifications	RVFS-1 RVMF-1	RVFS-2 RVMF-2	RVFS-3 RVMF-3
Inlet and Outlet Ports	2 in. NPT	2 in. NPT	2 in. NPT
Vent and Relief Ports	3/4 in. NPT	3/4 in. NPT	3/4 in. NPT
Water Level Gauge Ports	1/2 in. NPT	1/2 in. NPT	1/2 in. NPT
Deferential Gauge Ports	1/8 in. NPT	1/8 in. NPT	1/8 in. NPT
Pressure and Temperature	150 PSI @ 250°F (10 bar @ 121°C)*		
ASME Code Stamped	Yes	Yes	Yes
Pressure Drop - Clean	2 PSID (0.14 bar)	2 PSID (0.14 bar)	2 PSID (0.14 bar)
Pressure Drop/Filter Change-out	25 PSID (1.7 bar)	25 PSID (1.7 bar)	25 PSID (1.7 bar)
Height	35.3 in. (89.7 cm)	49.8 in. (126.5 cm)	63.8 in. (162.1 cm)
Width	13.5 in. (34.3 cm)	13.5 in. (34.3 cm)	13.5 in. (34.3 cm)
Depth	13.2 in. (33.5 cm)	13.2 in. (33.5 cm)	13.2 in. (33.5 cm)
Dry Weight	100 lbs. (45 kgs)	115 lbs. (52 kgs)	130 lbs. (59 kgs)
Overhead Service Clearance	16.0 in. (40.6 cm)	32.0 in. (81.3 cm)	47.0 in. (119.4 cm)

* For high pressure requirements contact Racor technical services.

Ordering:

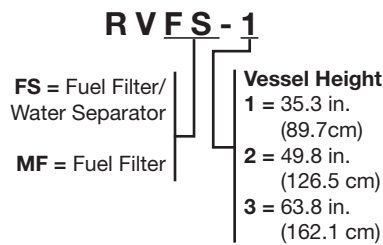
A. The following vessel part numbers are **in stock and ready to ship** at all times:

- RVFS-1-10C
- RVFS-2-10C
- RVFS-3-10C

OR

B. Customize a RV Series vessel with three easy steps (lead time 10 days):

Step 1: Select A Vessel



Step 2: Select Accessories

Part Number	Description
71330-150	Pressure Relief Valve
70906	Water Level Sight Glass, (diesel only, 125 PSIG)
72061-RVFS	Water Level Site Gauge (Jet, AV gas, and Gasoline, 300 PSIG)
71679	Stainless Steel Air Eliminator
72059	Differential Pressure Gauge Assembly
71943-.75	3/4" NPT Brass Drain Valve
72060-.75	3/4" NPT Stainless Steel Drain Valve
71981	Mounting Legs
71982	Wall Mount Bracket
72482	Inlet Check Valve

Installation Kits*

72153-1, 2, or 3	For Coalescer/ Separator
72193-1, 2, or 3	For Paper or Synthetic Microfilter

* Come with order of RVFS or RVMF unit.

Step 3: Select a Filter

RVFS-1**	Micron	Description
OCP-15858	5	Coalescer
SP-15404	5	Separator
OCP-15868	10	Coalescer
SP-15405	10	Separator
OCP-15878	25	Coalescer
SP-15407	25	Separator
RVFS-2**	Micron	Description
OCP-30858	5	Coalescer
SP-30404	5	Separator
OCP-30868	10	Coalescer
SP-30405	10	Separator
OCP-30878	25	Coalescer
SP-30407	25	Separator
RVFS-3**	Micron	Description
OCP-44858	5	Coalescer
SP-44404	5	Separator
OCP-44868	10	Coalescer
SP-44405	10	Separator
OCP-44878	25	Coalescer
SP-44407	25	Separator

RVMF-1	Micron	Description	RVMF-1	Micron	Description
FP-14601	1	Silicone Treated	FS-14601	1	Micro Synthetic
FP-14604	5	Silicone Treated	FS-14604	5	Micro Synthetic
FP-14605	10	Silicone Treated	FS-14605	10	Micro Synthetic
FP-14607	25	Silicone Treated	FS-14607	25	Micro Synthetic
RVMF-2	Micron	Description	RVMF-2	Micron	Description
FP-29601	1	Silicone Treated	FS-29601	1	Micro Synthetic
FP-29604	5	Silicone Treated	FS-29604	5	Micro Synthetic
FP-29605	10	Silicone Treated	FS-29605	10	Micro Synthetic
FP-29607	25	Silicone Treated	FS-29607	25	Micro Synthetic
RVMF-3	Micron	Description	RVMF-3	Micron	Description
FP-44601	1	Silicone Treated	FS-44601	1	Micro Synthetic
FP-44604	5	Silicone Treated	FS-44604	5	Micro Synthetic
FP-44605	10	Silicone Treated	FS-44605	10	Micro Synthetic
FP-44607	25	Silicone Treated	FS-44607	25	Micro Synthetic

Note: All vessels come equipped with Viton® o-rings. Compatible with biodiesel mixtures.

For RVFS-1, 2, and 3, customer must order one **OCP and one **SP** filter. A fuel filter/water separator consists of one coalescer and one separator filter.

FBO Series

- Fuel Filter/Heater,
- Fuel Filter/Water Separator, or
- Fuel Filter/Water Absorber

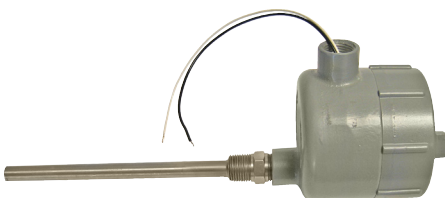
Filter Options

These versatile housings have three filter options to meet various requirements: fuel filter, fuel filter/water separator, or water absorber. For fuel dispensing applications, a fuel filter/water separator filter is recommended.

FBO filter assemblies are designed to meet the toughest hydrocarbon refueling conditions feature easy cartridge filter change-outs.

Product Features

- **Die-Cast Aluminum Head**
- **Steel Bowl Assembly**
- **Powder Coated Components**
- **Locking Ring Collar (no v-clamps)**
- **1.5" NPT Inlet and Outlet Ports**
- **Maximum Pressure: 150 PSI (10 bar) and Maximum Temperature 240°F (115°C)**
- **Lockable Manual Drain Valve: 1/2" NPT (part # 73225-.5)**
- **Manual Vent Valve**
- **Sight Glass (1/2" NPT)**
- **Optional Mounting Bracket (part 73084)**
- **Optional Water Sensor Probe (bushing part# 72709, water sensor part# RK 30880)**
- **Optional 120 Volt AC Heater Available for Cold Climate Applications**



(part# FBO-HTR-KIT)

Typical Applications

Racor's FBO assemblies are specifically designed to meet filtration requirements of today's high-pressure common-rail diesel injection systems.

They can be used on mobile refuelers, installed in refueling cabinets, for fuel dispensing pumps, as a primary fuel filter/water separator for large diesel engines, in bulk fuel handling, fuel transfer, or other higher flow applications.

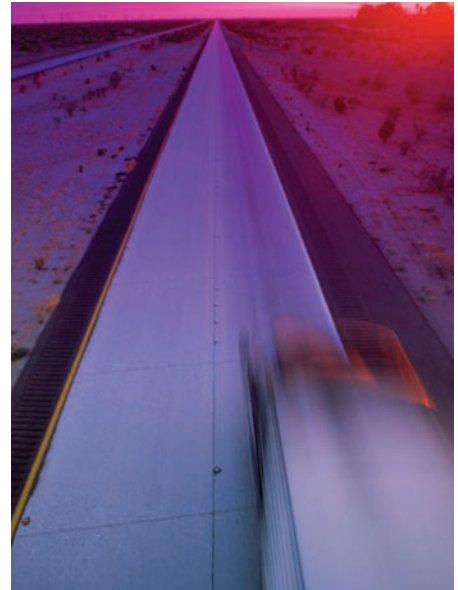
Servicing

FBO assemblies have a flow rate of 10 GPM (38 LPM) to 75 GPM (284 LPM), depending on model, filter, and type of fuel to be filtered. They also feature a "locking ring collar", which attaches the filter housing to an aluminum die cast filter head with four bolts. A slotted "locking ring collar" allows maintenance personnel to hand loosen four collar bolts, rotate, and lower the bowl assembly for easy filter change-outs.

With a new filter installed, simply raise the bowl and rotate into position on the locking ring and hand tighten (evenly torquing the 4 closure bolts to 100 lb-in is highly recommended).

The closure hardware consists of stainless steel nuts, bolts, and washers with metal hand knobs for ease of maintenance. No wrenches or other special tools are required, allowing one person to easily change the filter.

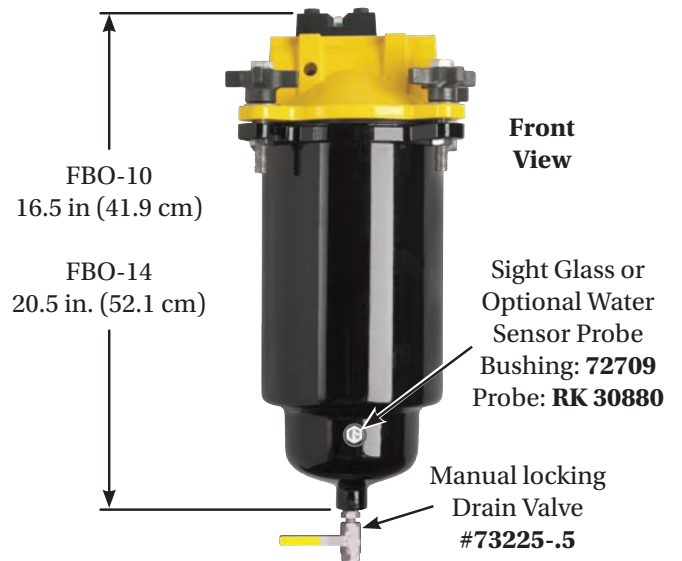
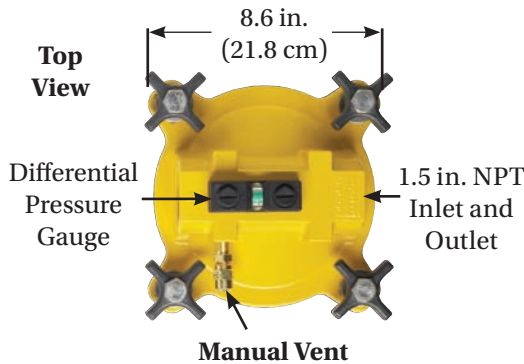
Note: No V-band clamps are used. Contains Viton® o-rings for compatibility in Biodiesel applications.



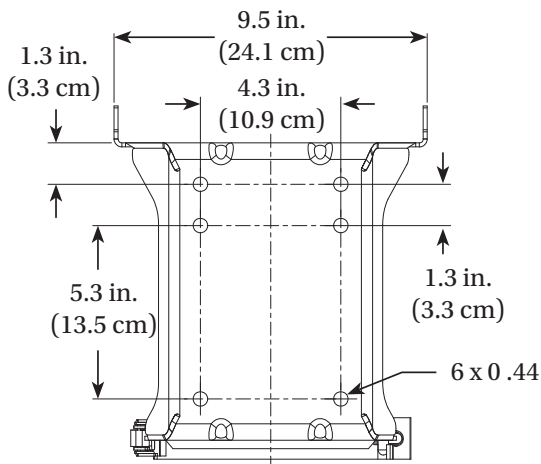
Technical Information

Specifications	Maximum Flow Rates			Clean	Change
	FBO-10	Diesel	Gasoline	Kerosene	Delta P
Filter	25 GPM (95 LPM)	53 GPM (201 LPM)	35 GPM (132 LPM)	2.5 PSID	15 PSID
Water Separator	20 GPM (76 LPM)	32 GPM (121 LPM)	21 GPM (79 LPM)	2.5 PSID	15 PSID
Water Absorber	20 GPM (76 LPM)	45 GPM (170 LPM)	35 GPM (132 LPM)	2.5 PSID	30 PSID
FBO-14	Diesel	Gasoline	Kerosene	Delta P	Delta P
Filter	30 GPM (114 LPM)	75 GPM (284 LPM)	50 GPM (189 LPM)	2.5 PSID	15 PSID
Water Separator	25 GPM (95 LPM)	45 GPM (170 LPM)	30 GPM (114 LPM)	2.5 PSID	15 PSID
Water Absorber	25 GPM (95 LPM)	70 GPM (265 LPM)	55 GPM (208 LPM)	2.5 PSID	30 PSID

Mounting Information



Mounting Bracket Hole Pattern



In The Field And On The Road



FBO Commercial Application



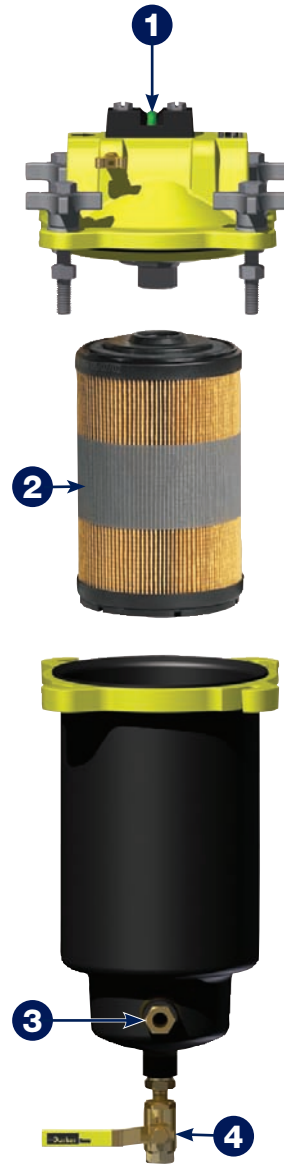
FBO Commercial Application



FBO Duplex Application



FBO Mining Application



FBO - 10 - DP

Fixed Based Operation

Flow Rates

10 = 5-40 GPM (19-157 LPM)
14 = 10-60 GPM (38-227 LPM)

DP = Deferential Gauge
DPL = Delta-P Gauge with Liquid Sight Glass
MA = Marine Assembly
25M = Unit with 25 Micron Filter
HTR = 120 Volt AC Cartridge Heater

How to Order

Below is a part number guide to help you get the right FBO assembly with the accessories you need.

	1 Delta-P Gauge	2 Filter	3 Sight Glass	4 Drain Valve
FBO-10		Order Separately		
FBO-10-DP	X	Order Separately		
FBO-10-DPL	X	Order Separately	X	X
FBO-10-25M	X	FBO 60332	X	X
FBO-10-HTR ¹	X	Order Separately	X	X
FBO-14		Order Separately		
FBO-14-DP	X	Order Separately		
FBO-14-DPL	X	Order Separately	X	X
FBO-14-25M	X	FBO 60341	X	X
FBO-14-HTR ¹	X	Order Separately	X	X

¹Includes a 120 Volt AC, explosion proof heater, for stationary applications.
For components see brochure # 7589.

Replacement Filters

Filters are used to protect the OEM supplied fuel system.

Water Separator

Water separator filters remove water and contaminants from hydrocarbon fuel streams and are the most popular filters.

Silicone Treated

Silicone treated fuel filters remove particle contaminants down to one micron.

Silicone filters can also be used upstream, before a fuel filter/water separator, to extend filter life.

Water Absorber

Water absorber filters absorb water and filter out contaminants from diesel fuel and other hydrocarbon streams.



FBO	Micron Rating	Water Separator	Silicone Treated	Water Absorber
<p>FBO-10 (6 X 10 Filter)</p>	1	FBO 60327 FBO 60360 ²	FBO 60330	FBO 60333
	5	FBO 60328	FBO 60331	FBO 60334
	10	FBO 60353	FBO 60354	FBO 60355
	25	FBO 60329	FBO 60332	FBO 60335
<p>FBO-14¹ (6 X 14 Filter)</p>	1	FBO 60336 FBO 60361 ²	FBO 60339	FBO 60342
	5	FBO 60337	FBO 60340	FBO 60343
	10	FBO 60356	FBO 60357	FBO 60358
	25	FBO 60338	FBO 60341	FBO 60344

¹ **7295I** Monitor Adapter Plate enables the **FBO-14** to take five **RMO-210-4** monitor filters.

² API/EI 1583 5th Edition filters are certified for jet fuel applications.

Racor Additives



We've Bottled Racor Protection

Racor additives are performance-enhancing products for all climates and seasons. There are several convenient sizes, including a 16 oz. bottle, 1 and 5 gallon containers, and a 55 gallon drum. The high concentration of active ingredients in Racor additives allows for higher treatment rates. All Racor additives are alcohol-free.



Powershot+™ Diesel Conditioner

Powershot+™ Diesel Fuel Conditioner is recommended for use in all engine applications using #1 and #2 diesel fuels.

With regular use of Racor Powershot+ Diesel Conditioner, fuel economy is improved, corrosion protection is provided and fuel stability is enhanced during storage.

Compatible with Biodiesel blends up to B20.



Diesel Conditioner Plus+

Diesel Conditioner Plus + is a multi-functional fuel additive for all season use. Its formulation contains a cetane improver. Its lubricity additives reduce friction and pass the scuffing BOCLE test for lubricity. Corrosion and rust formation are also reduced.

Compatible with Biodiesel blends up to B20.



Diesel Winter Plus+

Diesel Winter Plus+ is added to middle petroleum distillates such as No. 2 heating oil or diesel fuel to improve their low temperature operability as measured by pour point and cold filter plugging point. Diesel Winter Plus+ prevents the plugging of lines, filter screens, and valves and allows the fuel to flow freely down to 32°F (0°C). It also contains a deicer, which can help reduce line freezing.

Compatible with Biodiesel blends up to B20.



Diesel Biocide

Diesel Biocide is a multifunctional petroleum distillate fuel additive. It is used to help maintain color stability and clarity; control bacteria, fungi, organic reaction and sludge formation, inhibit corrosion, and disperse existent sludge.

EPA Est. No. 072342-CA-001, EPA Reg. No. 1448-17-47099.

Compatible with Biodiesel blends up to B20.



Diesel Performance Plus+

Diesel Performance Plus+ has the same engine protection qualities as the Diesel Conditioner Plus + and it has five times the cetane improver to deliver optimal engine performance. The added performance comes with improved lubricity and is alcohol free for better fuel system component protections.

Compatible with Biodiesel blends up to B20.



Powershot+™ Gasoline Conditioner

Powershot+™ Gasoline Conditioner is a convenient gasoline additive that cleans while it protects. It can be used in all types of internal combustion systems and gasoline blends.

By cleaning the engine's fuel injectors or carburetor, Powershot+™ Gasoline Conditioner provides better combustion, better fuel economy and lower exhaust emissions.



Gasoline Conditioner Plus+

Gasoline Conditioner Plus+ is a diluted multi-functional gasoline additive that cleans as it protects. It is designed for secondary treatment applications and can be used with all types of internal combustion systems and gasoline blends. It provides better combustion, better fuel economy and lower exhaust emissions.



Lube Oil Treatment

Lube Oil Treatment is a fluorocarbon oil which contains an advanced, highly effective polymer lubricant. It provides a superior thin coating to protect precision engine parts and does not contain PTFE, which has been known to fall from suspension and clog precision engine components. It may be used with diesel and gasoline engines and is compatible with all engine oils.

Additive Part Numbers and Treat Ratios

Part Number	Description	Size	Treats
ADT 1111	Powershot+ Diesel Fuel Conditioner	11 ounces	30 gallons
ADT 1116	Diesel Conditioner Plus+	16 ounces	320 gallons
ADT 1201	Diesel Conditioner Plus+	1 gallon	2,560 gallons
ADT 1555	Diesel Conditioner Plus+	55 gallon drum	140,800 gallons
ADT 2116	Diesel Biocide	16 ounces	1,280 gallons
ADT 2201	Diesel Biocide	1 gallon	10,240 gallons
ADT 2405	Diesel Biocide	5 gallons	51,200 gallons
ADT 2555	Diesel Biocide	55 gallon drum	563,200 gallons
ADT 3116	Diesel Performance Plus+	16 ounces	80 gallons
ADT 4116	Diesel Winter Plus+	16 ounces	128 gallons
ADT 4201	Diesel Winter Plus+	1 gallon	1,024 gallons
ADT 4555	Diesel Winter Plus+	55 gallon drum	563,200 gallons
ADT 5111	Powershot+ Gasoline Conditioner	11 ounces	15 gallons
ADT 5116	Gasoline Conditioner Plus+	16 ounces	320 gallons
ADT 7116	Lube Oil Treatment	16 ounces	up to 2 gallons

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