



aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



Marine Filtration Systems

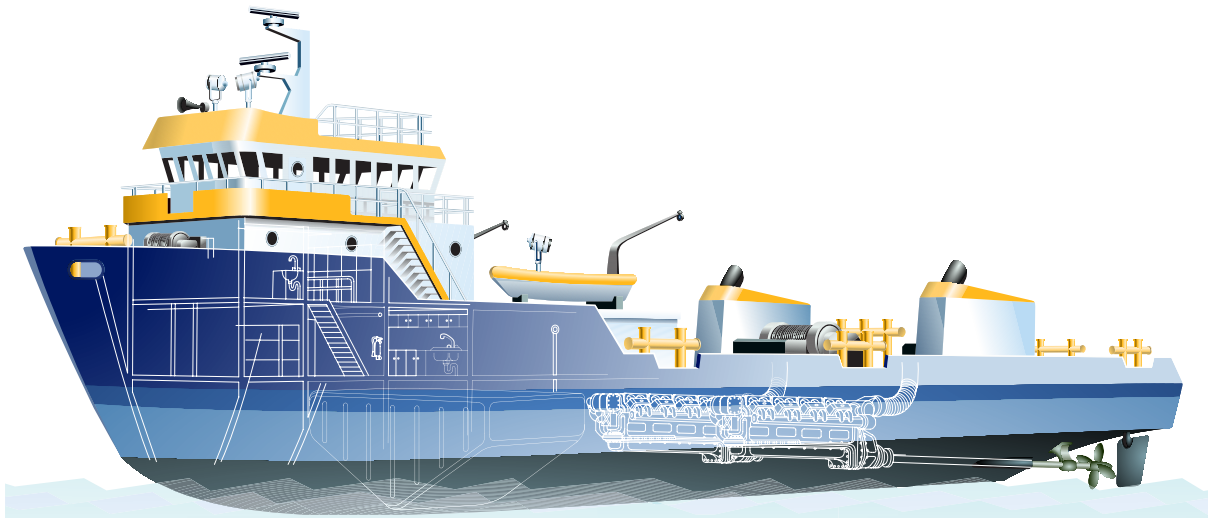
Racor Filter Division Europe

FDRB521UK V3 04/2017



ENGINEERING YOUR SUCCESS.

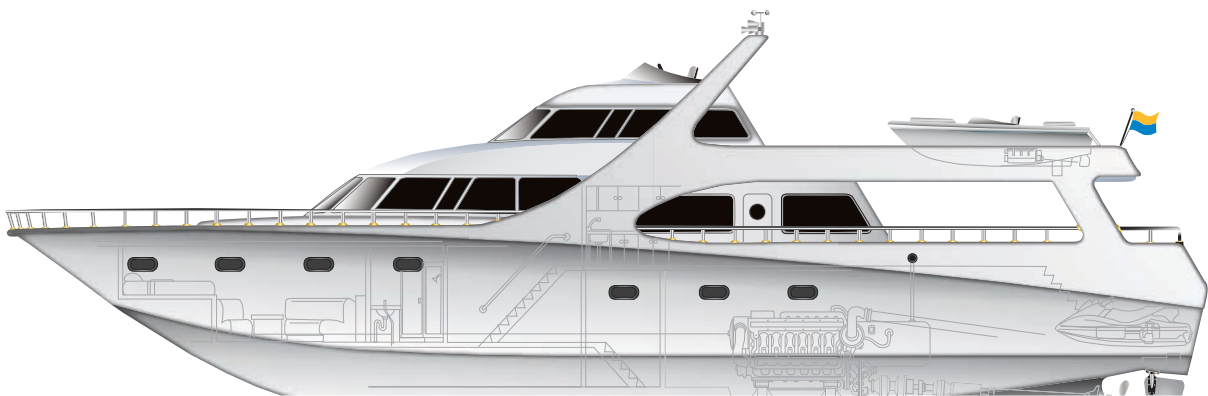
Racor Marine Filtration Solutions



For more than 40 years, more vessels have put out to oceans, rivers and lakes with protection from the most trusted name in the business... Racor.

Racor offers a complete range of filtration products that are as efficient as they are reliable. And for every product you see here, there are dozens of

complementary models with capacity and features suited precisely for your systems and working conditions.



Ask a sailor about engine protection, about filtration or about reliability and performance. Whether they are a captain of a superyacht, sailboat, fishing boat or tug, the chances are the one-word answer will be the same as it has been for over four decades...Racor

Delivering the quality and reliability mariners most respect is a customer-driven effort at Racor.

We view every marine vessel, and the sailors who depend upon them for livelihood or leisure, as a personal responsibility.

Products that are the result of computer-aided design and stringent manufacturing processes, solidly built to withstand the rigors of the marine environment. This commitment to uncompromising quality has earned Racor a global reputation as the most trusted name in engine protection.

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If It's Not A Genuine Racor Filter, you could be asking for trouble...

Issue	Concerns With Competitor Copies	Racor Commitment to Quality
Blocked Filter	Low quality media will perform poorly and can block 70% sooner than Racor media.	Racor uses propriety Aquabloc® media that meets or exceeds water removal and particle efficiency requirements for OEM fuel injection systems.
Bypassing	Poorly constructed filters may bypass internally allowing dirty fuel and water to reach the engine.	Racor uses high quality materials and production processes to ISO/TS16949 to eliminate bypass problems.
Split Or Leaking Seals	Poor quality seals will swell excessively, leak, and may deteriorate within the service period.	Racor uses high quality automotive grade gaskets and seals that are compatible with B20 bio-diesel (i.e. NBR, HNBR, and Viton®).
Dirty Fuel Reaching Engine	Inefficient filters will not protect the engine.	Racor replacement filters will perform as designed for the application.
Water In Fuel Reaching Engine	Very few, if any, copycat filters perform to original equipment specifications.	Racor uses the same media and materials in original equipment and replacement filters.
Cold Conditions	Poor quality pump diaphragms and seals will harden and cause leaking.	Racor uses high quality materials that are rated for operating temperatures of -40° to +255°F (-40° to +124°C).
Cracked Head Casting	Poor quality head castings cannot cope with extreme environmental conditions and vibrations.	Racor products are validated under extreme vibration and climatic conditions.
Contains Banned Substances	Some copy filters contain banned substances in the canister coating and plating.	Racor canisters contain no banned substances and are validated under extreme salt spray and climatic conditions.
Cracked Clear Bowl	Copycat filter bowls are often made from poor quality material that will crack under extreme temperature, chemical exposure, or continuous vibrations.	Racor uses a unique durable clear plastic bowl material with high clarity, excellent UV protection, low and high temperature resistance, is impact resistant, and is impervious to all fuel types.
Filter Accessories	Unauthorized Racor copies do not always offer accessories. If they do, they are likely not tested.	Racor has a wide range of filter accessories that are validated for integrity, EMC compatibility, and safety.

SNAPP.

The fuel filter change that changes everything.

SNAPP is big protection for small engines with fuel flows up to 40 gph and makes every filter change literally a snap. Fast, easy, clean. No tools are needed – when it's time for service, simply snap in a new filter. Simple installation and a patented priming system mean that protecting your engine investment is now ... a SNAPP.

GENUINE
RACOR

**Fast, easy, clean,
SNAPP is a fuel
filter change for the
better.**

The world turns to Racor for filtration solutions that provide ultimate protection from water and solid contamination.

This is filtration that includes two innovations often copied but never quite duplicated – the powerful protection of patented, world-class Aquabloc® filter media and, the Racor trademark, a clear bowl that allows for at-a-glance inspection of fuel system integrity.

Suitable for Diesel and Gasoline applications.

Quick-release squeeze tabs make filter changes a snap.

Permanent mounting bracket is stainless steel for withstanding corrosive environments.

SNAPP is a one-piece fuel filter water separator for 24/7 protection.

Heavy-duty high-impact nylon construction won't ever rust or corrode, even in humid conditions.

Clear bowl for at-a-glance inspection. The rugged clear bowl allows on-the-spot inspection for water in fuel – a significant advantage when troubleshooting fuel quality.

The Racor self-venting drain means easy service with no mess – twist, drain, done.

Legendary Aquabloc® filter media in 2, 10 or 30 micron rating.

The Aquabloc® media is the world's definitive filtration protection – it's 99% effective in separating water and solid contamination from marine and diesel fuels.



Part #	SNAPP Fittings
RK23319	90° Quick-Connect Fitting Kit, 3/8" x 3/8"
RK23320	Straight Quick-Connect Fitting Kit, 3/8" x 5/16"
RK23321	90° Quick-Connect Fitting Kit, 3/8" x 5/16"

Specifications		Part #	Description
Maximum Flow Rate	2 micron - 40 gph (151 lph)	23281-02	Fuel Filter with Bracket - 2 Micron
	10 micron - 34 gph (129 lph)	23281-10	Fuel Filter with Bracket - 10 Micron
	30 micron - 26 gph (100 lph)	23281-30	Fuel Filter with Bracket - 30 Micron
Aquabloc Micron Rating	2, 10, or 30 micron	R23280-02	Fuel Filter - Service - 2 Micron
Height	7.8" (198 mm)	R23280-10	Fuel Filter - Service - 10 Micron
Width	3.8" (97 mm) at bracket	R23280-30	Fuel Filter - Service - 30 Micron
Depth	4.1" (104 mm)	23299-02	Fuel Filter with Bracket - with Drain - 2 Micron
Water Sump Capacity	3.4 oz. (100 ml)	23299-10	Fuel Filter with Bracket - with Drain - 10 Micron
Bracket Material	Stainless Steel	23299-30	Fuel Filter with Bracket - with Drain - 30 Micron
Port Size	3/8" (9.5 mm)	R23298-02	Fuel Filter - Service - with Drain - 2 Micron
Quick-Connect Fittings	3/8" (9.5 mm) (per SAE J2044)	R23298-10	Fuel Filter - Service - with Drain - 10 Micron
Rated Pressure	50 PSI (3.5 bar)	R23298-30	Fuel Filter - Service - with Drain - 30 Micron
Water Removal Efficiency	99%		
Rated Temperature Range	-20° to 150°F (-29° to 66°C)		

Turbine Series Fuel Filter



Duplex units offer mariners the peace-of-mind of having a clean filter in reserve. Rough seas can stir up tank sediment which will quickly clog a single fuel filter.

With Racor, a simple turn of a valve puts a clean filter back on-line. Servicing of the clogged filter can then be preformed even with the engine running.

Legendary Diesel Fuel Filtration

When engines demand heavy-duty, high-capacity water separation and fuel filtration, the Turbine Series is the most complete, efficient, and reliable engine protection you can install. Symbolizing Racor's continuing commitment to the science of filtration, the Turbine Series has established its position as the filter/separator often

imitated, but never equaled. Models that include an aluminum bowl or stainless steel shield meet ASTM FS1201 certification, are UL-listed, American Bureau of Shipping, Veritas, ISO 10088, and USCG accepted. For severe service, all-metal bowls should be specified. Paired with our famous and genuine Aquabloc® filters,



the Racor Turbine Series is still the preferred brand for serious sailors globally.

Aquabloc® Filters

Besides removing asphaltene, water, gums, and varnishes, Aquabloc® filters out tiny particles of dirt and algae from diesel fuel. Aquabloc® filters have polymer end-caps that will not corrode, ever.

With an Aquabloc® replacement filter, you get a complete kit with all the seals you need. And not just any seals, but specially-formulated, Racor-engineered seals.

Always carry extra Racor fuel filters as one tankful of dirty fuel can quickly clog a filter.

Many Racor filters include an emergency bypass.



Long Life high performance elements (TL option) can be specified when service life is critical on high usage applications such as prime power generators and fuel polishing systems.

2020	TM	-OR
Select Filter 2010 (500 Series), 2040 (900 Series), or 2020 (1000 Series)	Select a Micron Rating SM = 2, TM = 10, or PM = 30 TL = Long life	Must have " -OR " in part number (includes o-rings)

Turbine Elements

Make certain that you replace your Turbine Series assemblies only with Genuine Racor Aquabloc® filters. While many others try to imitate the construction and performance of Aquabloc® filters, only the genuine article delivers the fit and performance specified by engine manufacturers, and guarantees that your Racor filter/water separator will deliver the protection you count on.

For convenience, end-caps are color-coded for easy identification and application.

Red = 30 micron, primary filtration.

Blue = 10 micron, secondary filtration.

Brown = 2 micron, final filtration.

TL = Long Life high performance element

The top cap includes handles for easy servicing and a filter bypass button for emergencies.



Aquabloc® media is a blend of high-grade cellulose compounded with engineered fibers, and a special chemical treatment. Water will not cling to the filter, Aquabloc® repels it.

The Inside Story

3 Stage Filtration

1

Separation:
As fuel enters, it moves past the internal check valve, then through the turbine centrifuge where it flows in a spiraling direction, spinning off large particulates and water droplets. Being heavier than fuel, they fall to the bottom of the bowl.

2

Coalescing:
Smaller water droplets bead-up along and on the sides of the internal components and on the surface of the Aquabloc® filter. When large enough, they too fall into the high-capacity bowl to be drained as needed.

3

Filtration:
Besides repelling water asphaltenes, algae, rust, and tiny solids from fuel. Aquabloc® filters are waterproof, so they remain effective longer, that saves you money.

T-handle for easy filter servicing. An optional T-handle restriction gauge kit is available

Green arrows show fuel flow through the filter element and out of the outlet port

Genuine Aquabloc® replacement filter

An internal shut-off valve in the 900 and 1000 series safeguards your engine from inferior will-fit filters

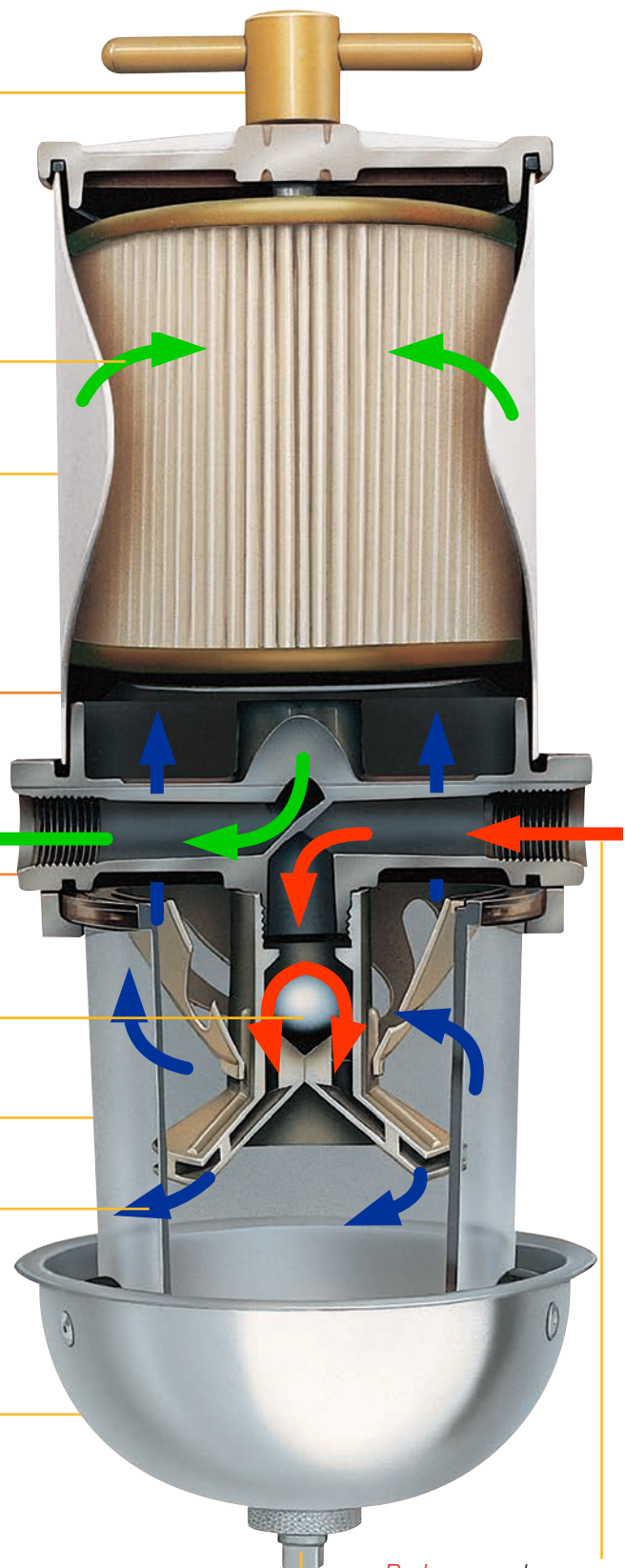
Rugged, die cast aluminum construction

Checkball

Turbine centrifuge

Blue arrows show fuel flow over the centrifuge and then up into the filter element

MA units have clear bowls with a metal shield. MAM bowls are all-metal.



UL-listed drain valve and water sensor probe options are available.

Red arrows show fuel in moving past the check valve

Electric Primer Pump Kit



Racor's electric primer pump kit can be retrofitted to many of the Racor 900 or 1000 Turbine Series fuel filters/water separators already in service.

The filter pump is an innovative and proprietary system consisting of a 100 micron pre-screen filter, a flow bypass circuit, and an innovative roller cell pump powered by a 12 or 24 vdc Racor brushless motor.

When the switch is activated the fuel is drawn into the pre-screen, then pumped through the housing, refilling the unit with fresh, clean, dry fuel.

When not in use, the filter pump system is bypassed and the Racor fuel filter/water separator functions normally.

The complete primer pump kit includes a wiring harness and controller switch.

Order Part Number:

- RKP1912 for 12 vdc systems
- RKP1924 for 24 vdc systems

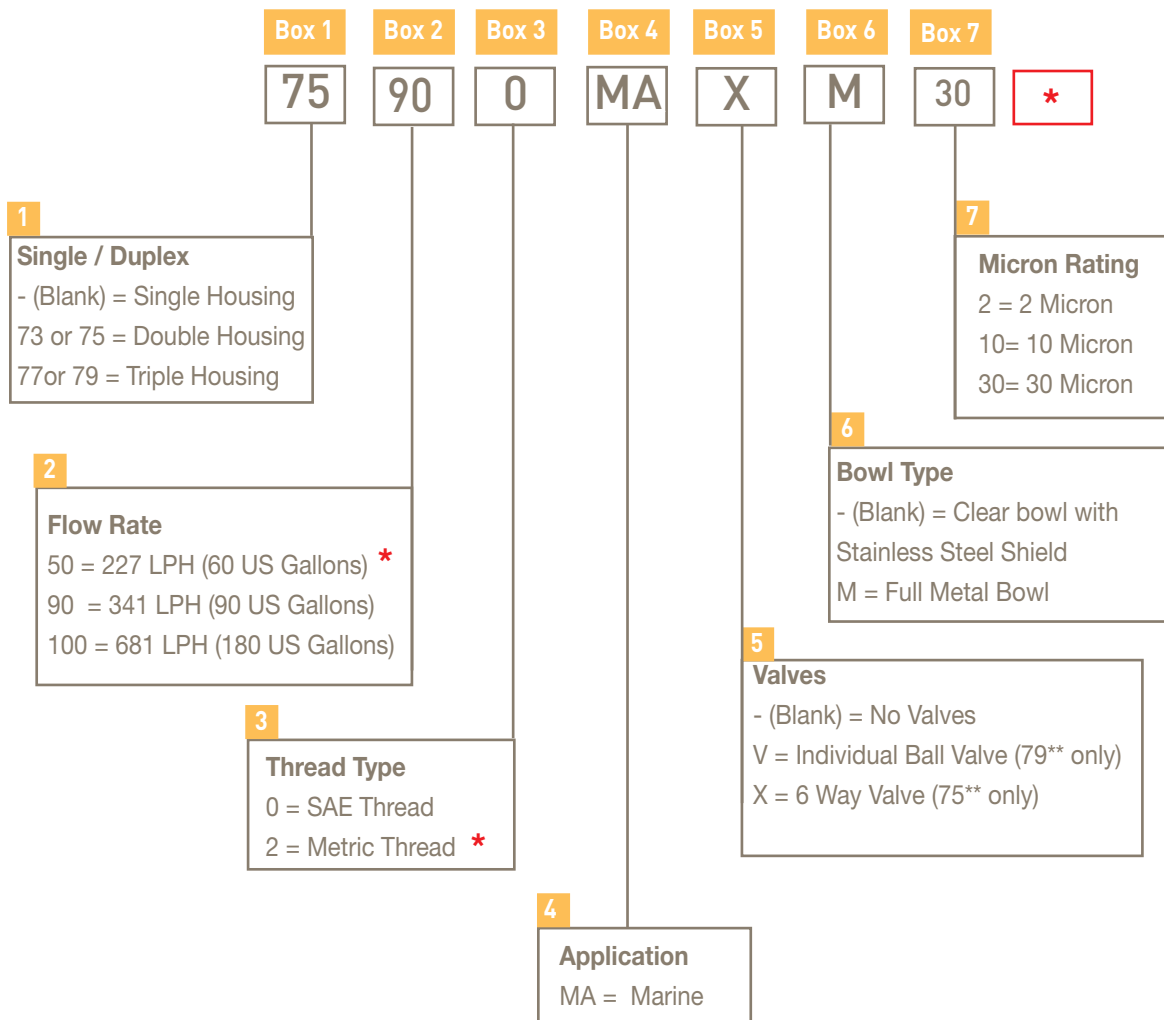


The unitized assembly is only 3.3 in. (8.4 cm) tall and kit is easily retrofitted to a 900 or 1000 series filter. For Racor duplex or triplex filter systems, only one primer pump is needed.

Note: Do not use in continuous duty applications.

Marine Turbine Series

Ordering and Specification



*** Note:**

For 500 Series MA Housings in metric please use suffix "MTC" rather than "502"
 e.g. Use "500MA10MTC" and not "502MA10"



Marine Turbine Series

Ordering and Specification



Model	500MA	900MA	1000MA	75500MAX	75900MAX
Max. Flow Rate (One filter on-line) (Two filters on-line)	227 LPH (60 GPH) N/A	341 LPH (90 GPH) N/A	681 LPH (180 GPH) N/A	227 LPH (60 GPH) 454 LPH (120 GPH)	341 LPH (90 GPH) 681 LPH (180 GPH)
Height	29.2 cm (11.5 in.)	43.2 cm (17.0 in.)	55.9 cm (22 in.)	29.2 cm (11.5 in.)	43.2 cm (17.0 in.)
Width	14.7 cm (5.8 in.)	15.2 cm (6.0 in.)	15.2 cm (6.0 in.)	36.8 cm (14.5 in.)	47.8 cm (18.8 in.)
Depth	12.2 cm (4.8 in.)	17.8 cm (7.0 in.)	17.8 cm (7.0 in.)	24.1 cm (9.5 in.)	27.9 cm (11.0 in.)
Weight (approx.)	1.8 kg (4 lbs)	2.7 kg (6 lbs)	7.7 kg (17 lbs)	7.7 kg (17 lbs)	10.4 kg (23 lbs)
Port Size (500 Series metric = MTC ¹)	16 mm x 1.5 3/4"-16 SAE	22 mm x 1.5 7/8"-14 SAE	22 mm x 1.5 7/8"-14 SAE	N/A 3/4"-16 SAE	N/A 7/8"-14 SAE
Clean Pres. Drop	0.02 bar (0.3 PSI)	0.02 bar (0.3 PSI)	0.03 bar (0.49 PSI)	0.05 bar (0.70 PSI)	0.12 bar (1.7 PSI)
Max. Operating Pressure ²	1.03 bar (15 PSI)	1.03 bar (15 PSI)	1.03 bar (15 PSI)	1.03 bar (15 PSI)	1.03 bar (15 PSI)
Replacement Filter	2010 Series	2040 Series	2020 Series	2010 Series	2040 Series
Overhead Clearance	10.2cm (4.0 in.)	12.7 cm (5.0 in.)	25.4 cm (10.0 in.)	10.2cm (4.0 in.)	12.7 cm (5.0 in.)
Ambient Temperature Range	-40° to +124°C (-40° to +255°F)				
Maximum Fuel Temperature	88°C (190°F)				

Notes: Units are available with full metal bowls, add "M" after MA, i.e. 1000MAM.

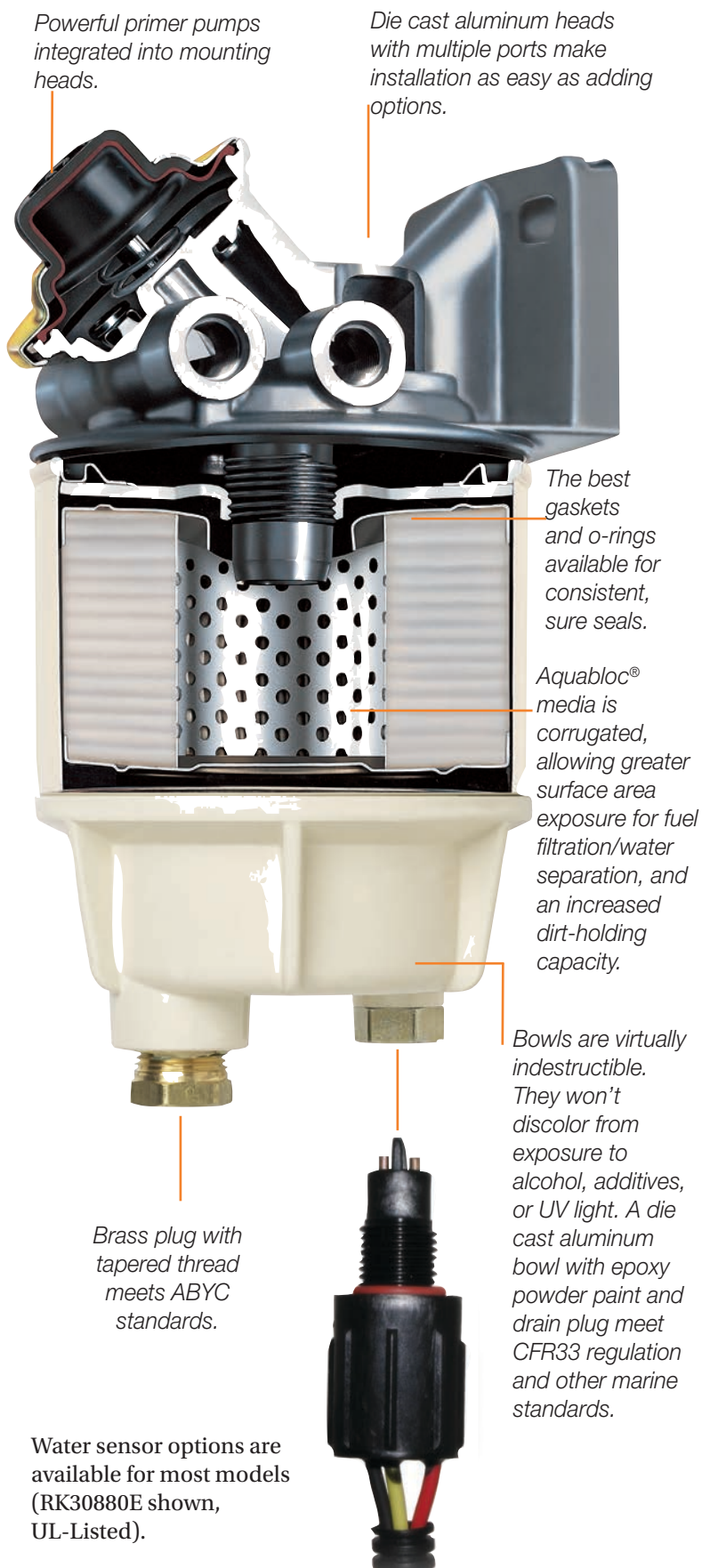
¹ 500 Series use (MTC) for metric port threads ² Vacuum installations are recommended.



Model	731000MA	751000MAX	771000MA	791000MAV
Max. Flow Rate (One filter on-line) (Two filters on-line) (Three filters on-line)	N/A 1363 LPH (360 GPH) N/A	681 LPH (180 GPH) 1363 LPH (360 GPH) N/A	N/A N/A 2044 LPH (540 GPH)	681 LPH (180 GPH) 1363 LPH (360 GPH) 2044 LPH (540 GPH)
Height	55.9 cm (22 in.)	55.9 cm (22 in.)	55.9 cm (22 in.)	55.9 cm (22 in.)
Width	41.9 cm (16.5 in.)	45.7 cm (18.0 in.)	45.7 cm (18.0 in.)	54.6 cm (21.5 in.)
Depth	30.5 cm (12.0 in.)	27.9 cm (11.0 in.)	27.9 cm (11.0 in.)	30.0 cm (11.8 in.)
Weight (approx.)	11.8 kg (26 lbs)	13.6 kg (30. lbs)	17.7 kg (39 lbs)	23.6 kg (52 lbs)
Port Size	3/4"-14 NPT	7/8"-14 SAE	1"-11.5 NPT	3/4"-14 NPT
Clean Pres. Drop	0.12 bar (1.7 PSI)	0.26 bar (3.7 PSI)	0.12 bar (1.7 PSI)	0.17 bar (2.5 PSI)
Max. Operating Pressure ³	1.03 bar (15 PSI)	1.03 bar (15 PSI)	1.03 bar (15 PSI)	1.03 bar (15 PSI)
Replacement Filter	2020 Series	2020 Series	2020 Series	2020 Series
Overhead Clearance	25.4 cm (10.0 in.)	25.4 cm (10.0 in.)	25.4 cm (10.0 in.)	25.4 cm (10.0 in.)
Ambient Temperature Range	-40° to +255°F (-40° to +124°C)			
Maximum Fuel Temperature	190°F (88°C)			

Notes: Units are available with metal bowls, add "M" after MA, i.e. 1000MAM. ³ Vacuum installations are recommended.

Diesel Spin-On Series



Compact and Versatile Systems for Main Propulsion and Genset Applications

Cost-Effective

Cost-effective designs for on-engine or remote mounting. Complete assemblies available in all-metal bowls.

High-Capacity

Hand-operated fuel priming pumps are integral to many Racor diesel spin-on series models, a feature that allows for removal of unwanted air from the filter and engine fuel system.

Environmentally Friendly

Metal bowls are reusable, impact-resistant, and virtually indestructible. When it's time for service, only the filter is replaced—the bowl and drain plug are reused. The long life-cycle of Racor bowls saves you money and reduces the environmental impact through disposal of less material.

Note: Use metal bowl versions for all marine engine room applications.

Easy Upgrades

Water-in-fuel (WIF) sensors are available to alert operators to drain accumulated water from the bowl.

Corrosion-Resistant Construction

Advanced technology means bowls will not deteriorate from water collection, alcohol-blended fuels, exposure to harsh additives, salt spray, or UV light.

Safety First

Racor's UL-listed filters meet ABYC, ASTM, ISO, and many other global standards for filters used in marine engine rooms.

Diesel Spin-on Series



Racor Aquabloc® Spin-on Fuel Filters Are Available in Color Coded 2,10, or 30 Micron Ratings.

P = 30 micron, primary filtration

T = 10 micron, secondary filtration

S = 2 micron, final filtration

Aquabloc® Spin-on Fuel Filters

Besides removing asphaltenes, water, gums, and varnishes, Aquabloc® filters out tiny particles of dirt and algae from diesel fuel.

With an Aquabloc® replacement filter, you get a complete kit with all the seals you need. And not just any seals, but specially-formulated, Racor-engineered seals.

Always carry extra Racor fuel filters as one tankful of dirty fuel can quickly clog a filter.

Please specify carefully – there are important differences among Spin-On Series features which effect performance and application.



Specifications	215RMAM	230RMAM	245RMAM	445MAM10	460MAM10	490MAM10	4120MAM10
Maximum Flow Rate	57 LPH (15 GPH)	114 LPH (30 GPH)	170 LPH (45 GPH)	170 LPH (45 GPH)	227 LPH (60 GPH)	341 LPH (90 GPH)	454 LPH (120 GPH)
Maximum PSI ¹	2.1 bar (30 PSI)	2.1 bar (30 PSI)	2.1 bar (30 PSI)	1.0 bar (15 PSI)	1.0 bar (15 PSI)	1.0 bar (15 PSI)	1.0 bar (15 PSI)
Clean Pressure Drop	0.01 bar (0.12 PSI)	0.02 bar (0.3 PSI)	0.04 bar (0.6 PSI)	0.01 bar (0.12 PSI)	0.02 bar (0.3 PSI)	0.03 bar (0.4 PSI)	0.03 bar (0.4 PSI)
Port Size	1/4" -18 NPTF	1/4" -18 NPTF	1/4" -18 NPTF	3/8" NPTF	3/8" NPTF	3/8" NPTF	3/4" SAE
Primer Pump	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Replacement Filter	R15TUL	R20TUL	R25TUL	S3204TUL	S3211TUL	S3201TUL	S3201TUL
Number of Ports	3	3	3	4	4	4	4
Water Sensor Option	RK30880E						
Height	19.6 cm (7.7 in.)	22.9 cm (9.0 in.)	26.7 cm (10.5 in.)	23.9 cm (9.4 in.)	27.4 cm (10.8 in.)	32.5 cm (12.8 in.)	32.5 cm (12.8 in.)
Width	9.9 cm (3.9 in.)	9.9 cm (3.9 in.)	10.2 cm (4.0 in.)	11.4 cm (4.5 in.)	11.4 cm (4.5 in.)	11.4 cm (4.5 in.)	11.4 cm (4.5 in.)
Depth	10.2 cm (4.0 in.)	10.2 cm (4.0 in.)	10.2 cm (4.0 in.)	12.2 cm (4.8 in.)	12.2 cm (4.8 in.)	12.2 cm (4.8 in.)	12.2 cm (4.8 in.)
Weight (approx.)	0.5 kg (1.2 lbs)	0.9 kg (2.0 lbs)	1.0 kg (2.2 lbs)	10.3kg (2.9 lbs)	1.4 kg (3.1 lbs)	1.5 kg (3.3 lbs)	1.5 kg (3.3 lbs)
Ambient Temp Range	-40° to +124°C (-40° to +255°F)						
Maximum Fuel Temp	88°C (190°F)						

¹ Pressure Installations are applicable up to the maximum PSI shown, vacuum installations are recommended.

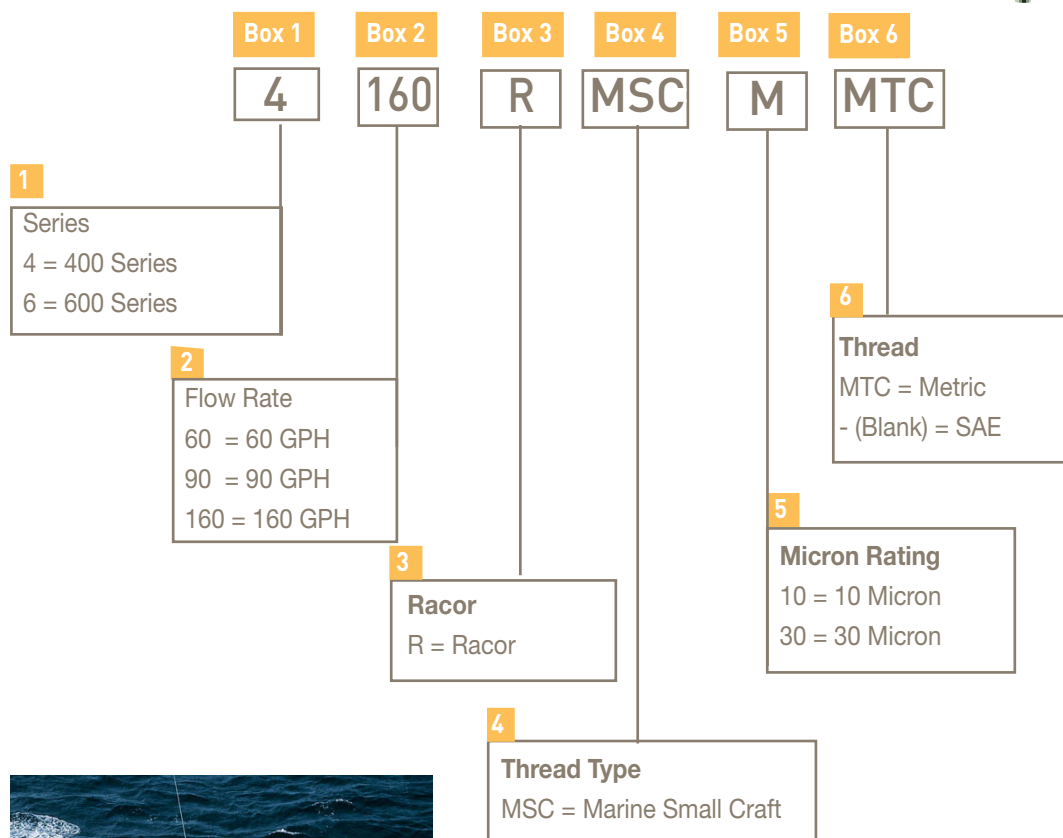
Marine Small Craft

Ordering and Specification

This MSC Spin-On filter series based on the successful 400 and 600 Series filters and now has a metal bowl Fire Tested to BS EN 7840:2004, fulfilling the requirements set out in ISO 10088:2001 small craft directive.

This filter is particularly good for use in applications where space is at a premium, or where there is a desire to mount the fuel filter water separator directly onto an engine.

The filters are available in 3 sizes: 60GPH (227LPH), 90GPH (341LPH) and 160GPH (600LPH), and they can be specified with either the 400 series aluminium head incorporating a manual primer pump, or the 600 series head without primer pump.



Model	Replacement Filter Canister
460RMSC10MTC	R60T-D-MAX
490RMSC10MTC	R90T-D-MAX
4160RMSC10MTC	R160T
660RMSC10MTC	R60T-D-MAX
690RMSC10MTC	R90T-D-MAX
6160RMSC10MTC	R160T

Fuel Conditioning Module

Ordering and Specification



Durable, 12 vdc roller-cell electric fuel pump offers the benefit of an electric, on-demand, priming pump.

A fuel filter/water separator and primer pump in one unit.

High-performance Aquabloc® cartridge-style filter media is environmentally friendly and incinerable.

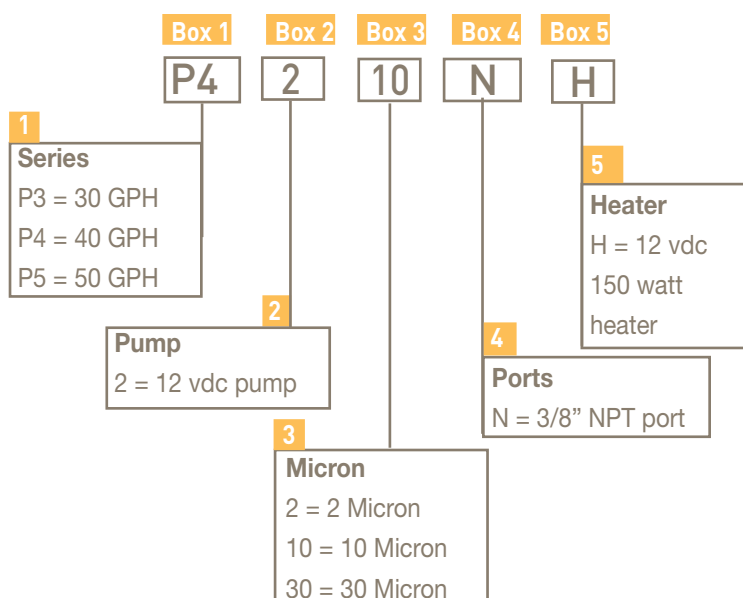
Important Note: ABYC standards allow for installation outside of the engine room only.



The P Series Diesel Fuel Conditioning Module (for vacuum side applications only) was developed for application in any diesel engine fuel injection system.

P Series assemblies are available in three sizes and all feature 3/8" NPT fuel ports. This innovative and modular fuel filter/water separator incorporates low-pressure fuel system components into a single package.

It supplies clean, dry fuel to the fuel system and serves as a repriming system.



Specifications	P4	P5
Maximum Flow Rate	151 LPH (40 GPH)	189 LPH (50 GPH)
Clean Pressure Drop	0.5 PSI (0.03 bar)	0.8 PSI (0.06 bar)
Max. Pump Output (at 14.4 volts)	40 GPH (151 LPH)	40 GPH (151 LPH)
Standard Fuel Port Size (SAE J476)	3/8"-18 NPT	3/8"-18 NPT
Total Number of Ports Available	2	2
Fuel Inlets	1	1
Fuel Outlets	1	1
Replacement Filter		
2 micron	R58095-2	R58039-2
10 micron	R58095-10	R58039-10
30 micron	R58095-30	R58039-30
Minimum Service Clearance	6.4 cm (2.5 in.)	6.4 cm (2.5 in.)
Height	22.9 cm (9.0 in.)	29.2 cm (11.5 in.)
Depth	13.2 cm (5.2 in.)	13.2 cm (5.2 in.)
Width	12.2 cm (4.8 in.)	12.2 cm (4.8 in.)
Weight (dry - approx.)	3.8 lbs (1.7 kg)	4.2 lbs (1.9 kg)
Maximum Pump Outlet Pressure	10 PSI (0.7 bar)	10 PSI (0.7 bar)
Features		
Water Sensor	Standard	Standard
Heater ¹	Standard	Standard
Pressure Regulator (10 PSI)	Standard	Standard
Ambient Temp Range	-40° to +255°F (-40° to +124°C)	
Maximum Fuel Temperature	190°F (88°C)	

Vacuum installations are recommended. ¹ Not for use with gasoline applications.

Fuel Conditioning Modules

The New Racor Fuel Polisher removes contamination at the source - the fuel tank. Most filtration solutions block contamination as it moves through the fuel system on the way to the engine.

As contamination builds, fuel filters will choke leading to inadequate fuel delivery to the engine, damage to injectors and other engine components, increased emissions, and decreased performance.

The Racor fuel polisher removes contamination from the fuel tank allowing the fuel system to run at peak performance.

By setting up a new fuel circuit around the fuel tank contaminates such as water, dirt and rust will be removed from the fuel delivery circuit, resulting in increased filter life, better performance, and less downtime to change filters.



Product Specifications	
Max. Flow Rate	60 GPH (220 LPH)
No. of Ports	2
Port Size	M16-1.5 ORB
Water Sensor	Standard
Micron Rating	10
Operating Voltage	12V and 24V

Available Part Numbers	
P510MAM	FF/WS, 10 micron
R58065-2	2 micron Replacement Element
R58065-10	10 micron Replacement Element
R58065-30	30 micron Replacement Element
RK 20725	12V Water Detection
RK 20725-24	24V Water Detection
RK 12870	12V Water Detection w/ Buzzer
RK 12871	24V Water Detection w/ Buzzer

Filter Funnels

Racor Filter Funnel (RFF) is a heavy-duty, fast-flow, filter-in-a-funnel that separates damaging free water and contaminants from gasoline, diesel, heating oil, and kerosene.

The RFF family of products is capable of removing free

water and solids down to 0.005 inches and allows you to visually inspect the integrity of your fuel supply as you refuel.

The RFF family is manufactured using industrial-grade black electro-conductive

polypropylene. Carbon powder is injected into the plastic so that the RFF will conduct static electricity. The grounding capability of the RFF is an important safety feature. Always use proper fuel handling procedures and follow local, state, and federal regulations.

Specifications	RFF1C	RFF3C	RFF8C	RFF15C
Max. Flow Rate	2.5 GPM (9.4 LPM)	3.5 GPM (13.2 LPM)	5 GPM (18.9 LPM)	12 GPM (45.4 LPM)
Micron Rating	50 micron	50 micron	50 micron	50 micron
Height	6.0 in. (15.2 cm)	9.0 in. (22.9 cm)	10.0 in. (25.4 cm)	10.0 in. (25.4 cm)
Diameter	3.5 in. (8.9 cm)	5.5 in. (14.0 cm)	8.5 in. (21.6 cm)	8.5 in. (21.6 cm)
Weight	0.2 lb (0.09 kg)	0.3 lb (0.14 kg)	0.6 lb (0.27 kg)	1.0 lb (0.45 kg)



Caution for Users: Petroleum products flowing over a plastic surface generate static electricity. Caution should be taken to ensure that the RFF is grounded to reduce static electricity buildup and reduce the chance of explosions or fire. Electrically bond the funnel by using a wire with a metal clip on each end and clamp one to the upper rim of the funnel and the other to the fueling source. For example, the metal gas can or nozzle from the pump.



Every Time You Squeeze The Trigger, You Threaten Your Engine's Life.

No matter how carefully gasoline is handled or stored, dirt, rust, gums, algae, and water are going to find their way in, and just a few drops can leave you dead in the water. Racor gasoline fuel filter/water separators with Aquabloc® media remove virtually 100% of damaging water and solids, allowing engines to run with more power and greater efficiency. Install a Racor mounting head or spin directly onto your existing filter head to protect your engine and improve its performance. Spin on a Racor fuel filter/water separator, for the life of your engine.

Marine Gasoline Series

The Most Complete Protection on the Water

Being on the water is fun, having water in your fuel is not. And more than ever today's high-performance gasoline inboard and outboard engines require clean, dry fuel. Racor filters offer the improved features and peace-of-mind that come with our quality fuel filter/water separators.



- Clear contaminant collection bowl with drain valve for outboards only
- 10 micron Aquabloc®
- media is standard
- High capacity and long life
- Rated 98% efficient at 10 micron per SAE test procedures
- Corrosion-resistant construction.
- Metal bowl units for inboard powered boats meet 33 CFR and USCG regulations
- Meets ABYC standard for gasoline powered vessels
- Meets ISO 10088



Specifications	120R-RAC-01	120R-RAC-02	320R-RAC-01	320R-RAC-02	490R-RAC-01	660R-RAC-01	660R-RAC-02	3120R-RAC-32
Max. Flow Rate	114 LPH	114 LPH	227 LPH	227 LPH	341 LPH	341 LPH	341 LPH	454 LPH
Filter (10 micron) (2 micron)	S3240 N/A	S3240TUL N/A	S3227 S3228SUL	S3228TUL S3228SUL	S3227 S3228SUL	S3232 N/A	S3232TUL N/A	S3232TUL N/A
Center Threads	M18 x 1.5	M18 x 1.5	1"-14	1"-14	1"-14	1"-14	1"-14	1"-14
Port Size	1/4"-18 NPTF	1/4"-18 NPTF	1/4"-18 NPTF	1/4"-18 NPTF	3/8"-18 NPTF	3/8"-18 NPTF	3/8"-18 NPTF	1/2"-14 NPTF
Height	16.5 cm	15.2 cm	23.9 cm	22.9 cm	25.1 c)	27.9 cm	26.7 cm	26.4 cm
Width	8.1 cm	8.1 cm	10.2 cm	10.2 cm	11.4 cm	10.7 cm	10.7 cm	10.2 cm
Depth	8.1 cm	8.1 cm	10.2 cm	10.2 cm	12.2 cm	11.4 cm	11.4 cm	52.7 cm
Weight (approx.)	0.5 kg	0.5 kg	0.9 kg	0.9 kg	1.2 kg	1.4 kg	1.4 kg	0.9 kg
Clean Pressure Drop	0.01 bar	0.01 bar	0.04 bar	0.04 bar	0.07 bar	0.04 bar	0.04 bar	0.01 bar
Max. Working Pressure [†]	0.5 bar	0.5 bar	0.5 bar	0.5 bar	0.5 bar	0.5 bar	0.5 bar	0.5 bar
Service Clearance (under bowl)	2.5 cm	2.5 cm	2.5 cm	2.5 cm	2.5 cm	2.5 cm	2.5 cm	2.5 cm
Ambient Temp Range	-40° to +255°F (-40° to +124°C)							
Max. Fuel Temperature	190°F (88°C)							

[†] Pressure installations are acceptable up to the maximum PSI shown. Racor filter/separators will not separate oil from gasoline in blended fuel mixtures.

Upgrade Your Gasoline Filter

With These Convenient Spin-On Filters

Now, owners of inboard or outboard engines can get smoother operation and longer life—all in one easy spin, onto their existing

engine filter heads. There's a choice of rugged, reusable clear bowls with self-venting drains (for outboard applications), or a metal bowl

with drain plug (for inboard applications). Metal bowls are UL Listed and USCG accepted.



PFF5510	Replaces Mercury, Mercruiser, Yamaha, Suzuki, Honda, and Tohatsu. 10 micron.	Inboard or Outboard
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B32020MAM	Replaces quicksilver. Also fits: SMI, Sierra, Aquapower, and other filter heads (comes with a metal bowl—shown above). 10 micron.	Inboard or Outboard
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S3220TUL	Replacement filter for B32020MAM. 10 micron.	Inboard or Outboard
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B32021MAM	Replaces OMC. UL Recognized (comes with a metal bowl). 10 micron.	Inboard or Outboard
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S3221TUL	Replacement filter for B32021MAM. 10 micron.	Inboard or Outboard
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B32013	Replaces Quicksilver, Yamaha, Suzuki, SMI, Volvo Penta, Sierra, AquaPower, and other filter heads (comes with a clear bowl—shown above). 10 micron.	Outboard
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S3213	Replacement filter for B32013. 10 micron.	Outboard
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B32014	Replaces OMC (comes with a clear bowl). 10 micron.	Outboard
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S3214	Replacement filter for B32014. 10 micron.	Outboard
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Compact Gasoline Filters for Smaller Boats and Personal Watercraft



Specifications	025-RAC-01	025-RAC-02	110A
Max. Flow Rate	25 GPH (95 LPH)	25 GPH (95 LPH)	35 GPH (132 LPH)
Media	250 micron (cleanable plastic screen)	10 micron (Aquabloc® filter)	10 micron (Aquabloc® filter)
Port Size	1/4"-18 NPTF	1/4"-18 NPTF	1/4"-18 NPTF
Dimensions	H 4.3" x D 2.1"	H 4.3" x D 2.1"	H 6" x D 3.3" x W 3.2"



800 Series Fuel Filtration



Specs	804MA	75804MA	79804MA
Flow Rate	240 GPH (908 LPH)	480 GPH (1817 LPH)	720 GPH (2725 LPH)
In/Out Ports	3/4" NPT	3/4" NPT	3/4" NPT
Height	20.6 in. (52.3 cm)	20.6 in. (52.3 cm)	20.6 in. (52.3 cm)
Width	6.7 in. (17.0 cm)	19.0 in. (48.3 cm)	27.0 in. (68.6 cm)
Depth	8.9 in. (22.6 cm)	17.8 in. (45.2 cm)	17.8 in. (45.2 cm)
Delta P	0.48 PSI (0.03 bar)		
Max Working Pressure	15 PSI (1.03 bar)		
Water Capacity	40.6 oz (1.2 L)		
Weight	25 lbs (11.3 kg)	60 lbs (27.2 kg)	90 lbs (40.8 kg)

Racor's compact 804MA Series diesel fuel filter/water separator, made of 100% steel construction to meet ABS and USCG requirements for marine fuel filters on classed and inspected vessels. The 804MA series are available in single, dual valved and triple valved configurations and handle fuel flow rates of 240, 480 and 720 gallons per hour, respectively; utilizing the standard Racor 2020 Series filter cartridges.

800 Series fuel filter/water separators offer large diesel engine operators ease of maintenance and continuous engine operation.

- 100% Steel Construction By ASME Certified Welders
- Stainless Steel T-handle On Steel Lid
- Steel/High Pressure Glass Water Sight-Gauge
- Steel Contaminant Sump With Steel Drain Plug

- Marine-Grade White Exterior Coating
- Durable Steel Mounting Brackets



Specifications	75806MA	79806MA	812MA	75812MA	79812MA
Maximum Flow Rate	720 GPH (2725 LPH)	1080 GPH (4088 LPH)	720 GPH (2725 LPH)	1440 GPH (5451 LPH)	2160 GPH (8176 LPH)
Fuel Ports	1" NPT	1" NPT	1" NPT	1" NPT	1 1/4" NPT
Max Working Pressure	30 PSI (2.1 bar)	30 PSI (2.1 bar)	30 PSI (2.1 bar)	30 PSI (2.1 bar)	30 PSI (2.1 bar)
Clean Pressure Drop	3.2 PSI (0.2 bar)	6.0 PSI (0.4 bar)	3.2 PSI (0.2 bar)	6.0 PSI (0.4 bar)	5.2 PSI (0.35 bar)
Replacement Filter	(2) RK 22788*	(3) RK 22788*	RK 22610**	(2) RK 22610**	(3) RK 22610**
Height	22.8 in. (57.9 cm)	22.8 in. (57.9 cm)	33.2 in. (84.3 cm)	33.2 in. (84.3 cm)	33.2 in. (84.3 cm)
Width	21.8 in. (55.4 cm)	33.3 in. (84.6 cm)	6.6 in. (16.8 cm)	21.8 in. (55.4 cm)	33.3 in. (84.6 cm)
Depth	16.0 in. (40.6 cm)	16.0 in. (40.6 cm)	8.9 in. (22.6 cm)	16.0 in. (40.6 cm)	16.0 in. (40.6 cm)
Weight (approx.)	52 lbs (23.6 kg)	79 lbs (35.8 kg)	36 lbs (16.3 kg)	89 lbs (40.4 kg)	133 lbs (60.3 kg)
Sump Capacity	2 gal (7.6 l)	2.9 gal (11.0 l)	1 gal (3.8 l)	2 gal (7.6 l)	2.9 gal (11.0 l)
Service Clearance (above)	12.0 in. (30.5 cm)	12.0 in. (30.5 cm)	12.0 in. (30.5 cm)	12.0 in. (30.5 cm)	12.0 in. (30.5 cm)
(below)	4.0 in (10.2 cm)	4.0 in (10.2 cm)	4.0 in (10.2 cm)	4.0 in (10.2 cm)	4.0 in (10.2 cm)
Ambient Temp Range	-40° to +255°F (-40° to +124°C)				
Max Fuel Temperature	190°F (88°C)				

* RK 22788 – Replacement filter kit (contains one each of 4021 and 4022 filter and a lid gasket; 75806MA requires 2 kits; 79806MA requires 3 kits).

** RK 22610 – Replacement filter kit (contains one each of 8021 and 8022 filter and a lid gasket; 75812MA requires 2 kits; 79812MA requires 3 kits).

RVFS Series

The RVFS Series filter vessels are designed to be used for diesel fuel dispensing, fuel transfer, and large engine applications. Their prime function is to remove water and dirt to reduce contamination levels, prolong engine life and keep engine applications running.

The RVFS SS CE Marked models have been introduced to work in modern European fuel environments with mixed bio diesel blends. The revised series is now completely fabricated in 304 stainless steel removing the need for internal or external painting, whilst improving fuel compatibility, cleanliness and durability.

These stainless steel vessels will be available only in the CE marked construction code with a maximum operating pressure of 10 barg, (ASME coded vessels in steel are available on request for non-European applications).

The RVFS is used primarily as a filter/water separator, where two elements are installed into the vessel- 1x Coalescer element and 1x separator element.

This set up will remove emulsified free water and solids from diesel fuel, fuel oils, and other hydrocarbon streams. Water is collected in an internal sump area between the stage one and stage two elements. However

the RVFS Series can also be used with a range of alternative filter elements including particulate filter elements, water absorbing elements and even clay bags.

Note: CE marked vessels are available in Europe - specifications are the same as the RVFS vessels manufactured at Racor USA



How to order

Step 1: Select the size of vessel

Select the size of vessel required for the application flow rate, this will be determined by element type.

Type	Coalescer	Prefilter	Monitor
RVFS-1	95 LPM	250 LPM	110 LPM
RVFS-2	190 LPM	500 LPM	220 LPM
RVFS-3	285 LPM	1000 LPM	330 LPM

The sizing's are based on standard diesel applications, however if coalescer/separator elements are to be used in Bio diesel blends which exceed 20% Biodiesel, then Racor recommends that the applications are over-sized by 50%.

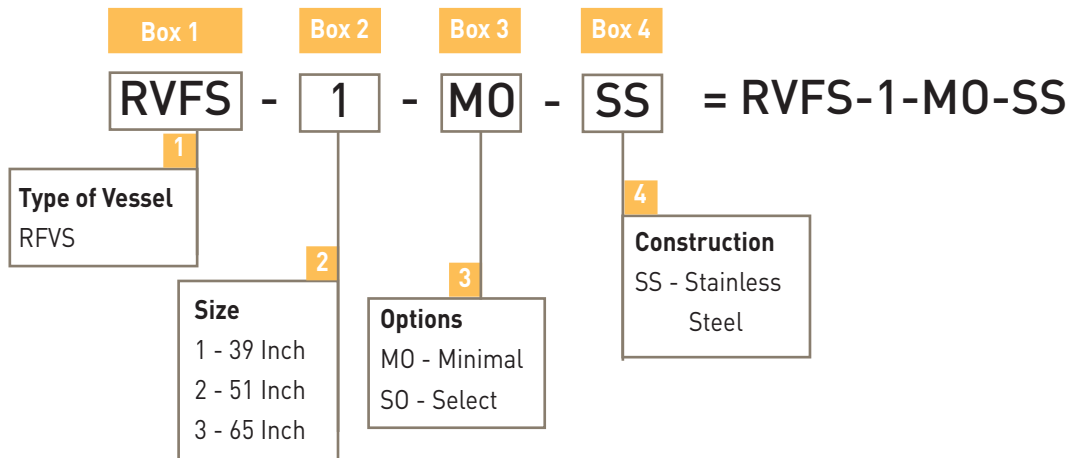
Step 2: Select Options

Use the table to the right to select the pre-assembled accessories you require

	MO	SO
	Minimal Options	Select Options
Diff Pressure Gauge	X	X
Auto Air Eliminator		
Pressure Relief Valve		
1 x Water Sight Glass	X	
2 x Water Float sight Glasses		
Manual Air Vent	X	
Manual Water Drain	X	
Sample Probes		
Auto Water Drain		
	Note: The Minimal Specification of equipment. Other options Can be added but fitted by customer and quoted as separate line items	Note: Basic vessel. All ports plugged and customer selects and fits options. All Options quoted a separate line items .

How to order

Step 3: Select the vessel part number



Specifications	RVFS-1	RVFS-2	RVFS-3	Europe Options
Inlet and Outlet Ports	2.0 in. NPT	2.0 in. NPT	2.0 in. NPT	The RVFS is available with PED / CE approval and is manufactured in Europe.
Maximum Flow Rate (diesel)	25 GPM (94 LPM)	50 GPM (189 LPM)	75 GPM (283 LPM)	
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	
Differential Gauge Ports	1/8 in. NPT	1/8 in. NPT	1/8 in. NPT	
Pressure and Temperature	250 PSI @ 250°F (17 bar @ 121°C)			AO AO = All Options MO MO = Minimal Options SO SO = Selected Options
ASME Code Stamped	Yes	Yes	Yes	
Clean Pressure Drop	2 PSID (0.14 bar)	2 PSID (0.14 bar)	2 PSID (0.14 bar)	
Pressure Drop/Filter Change-out	15 PSID (1.0 bar)	15 PSID (1.0 bar)	15 PSID (1.0 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)	

Note: For RVFS-1, 2, and 3, customer must order one HOCP and one HSP filter. A fuel filter/water separator consists of one coalescer and one separator filter.

Step 4: Order Elements separately

Replacement Filter Options

RVFS-1**	Micron	Description	RVFS-2**	Micron	Description	RVFS-3**	Micron	Description
HOCP-15801	1	Coalescer	HSP-30401	1	Separator	HSP-44401	1	Separator
HSP-15401	1	Separator	HOCP-30805	5	Coalescer	HOCP-44805	5	Coalescer
HOCP-15805	5	Coalescer	HSP-30405	5	Separator	HSP-44405	5	Separator
HSP-15405	5	Separator	HOCP-30810	10	Coalescer	HOCP-44810	10	Coalescer
HOCP-15810	10	Coalescer	HSP-30410	10	Separator	HSP-44410	10	Separator
HSP-15410	10	Separator	HOCP-30825	25	Coalescer	HOCP-44825	25	Coalescer
HOCP-15825	25	Coalescer	HSP-30425	25	Separator	HSP-44425	25	Separator
HSP-15425	25	Separator						

Note: All vessels come equipped with Viton® o-rings and are 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.

Fixed Based Operation

FBO and Duplex FBO Series

Racor's FBO-10-MA and FBO-14-MA filter assemblies are designed to meet tough hydrocarbon refueling conditions and provide for ease of filter change-outs. The FBO assemblies can handle flow rates from 18 to 53 GPM (68 to 201 LPM) depending on filter specified and fuel being filtered.

Steel filter bowl assembly, a manual vent valve, and a manual drain valve help provide ease of service—especially significant given the FBO assembly's wide range of installations, including aviation fuel trucks, aviation fueling cabinets, diesel fuel dispensing systems, marine fuel docks, and fuel systems on large diesel

engines. 1 1/2" NPT inlet and outlet.

The DFBO duplex filter brings Racor® FBO filters to engine room environment. The new duplex design ensures that fuel is efficiently filtered all the time. The cast iron head and steel bowls mean that it can be used in Marine applications.

The slotted locking ring collar attaches the filter housing to the aluminum die cast filter head with four bolts. Metal hand knobs are provided for ease of maintenance.

Powder coated components capable of 150 PSI @ 240°F max design pressure.



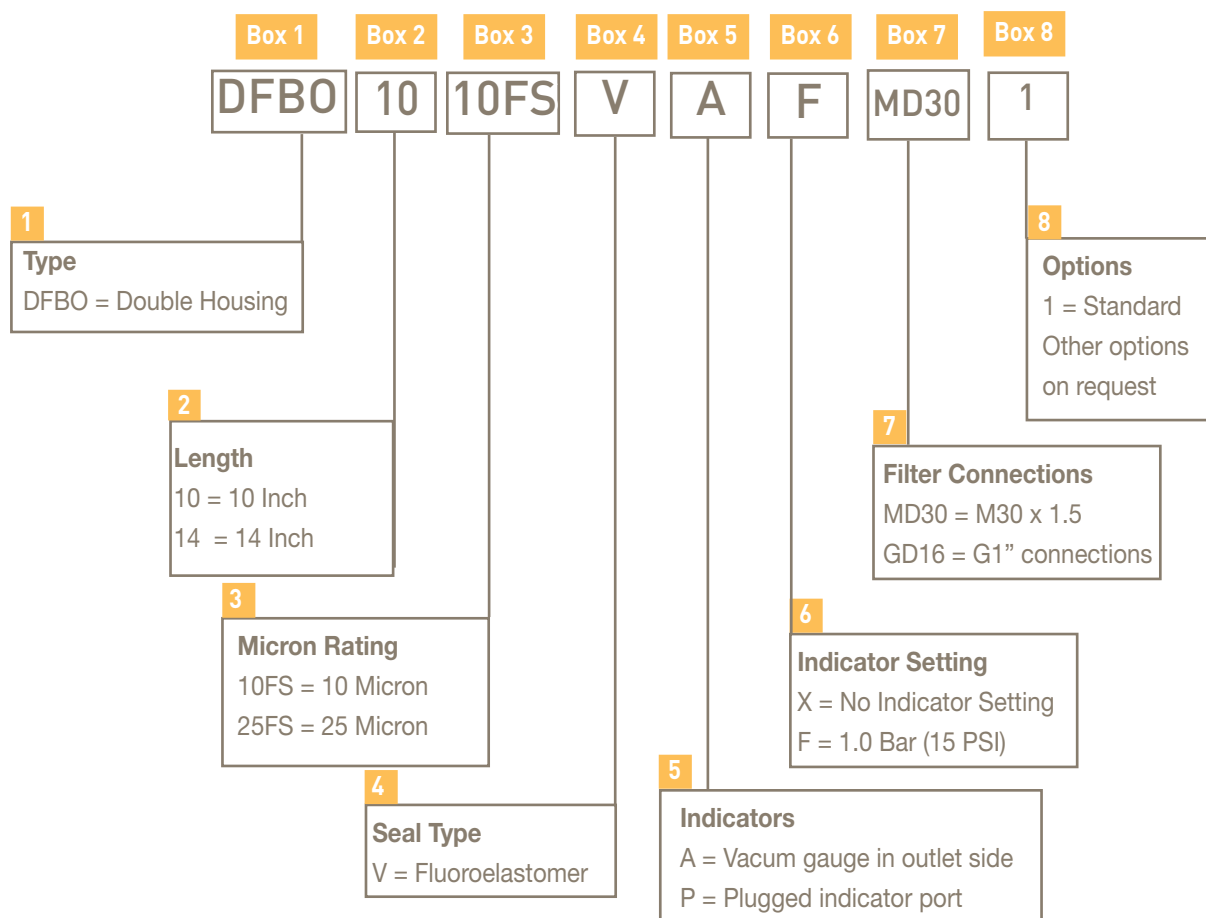
Change-over valve with open center position. Locking device for both end positions and center position. Manual vent valves and drain valves.

The DFBO comes with two bowl lengths allowing diesel flows up to 90 l/min. Depending on the elements inside the unit can be used as a prefilter, a water separator/particle filter or a water absorptive filter. Easy service, no special tools are required.



Specifications	FBO-10-MA	FBO-14-MA
Fuel Ports	1 1/2" NPT	1 1/2" NPT
Max. Flow Rate	see chart below	
Max. Working pressure	150 PSI @ 240°F (10.3 bar @ 115°C)	
Clean Pressure Drop	1 PSI (0.07 bar)	1 PSI (0.07 bar)
Height	18.8 in. (47.8 cm)	22.6 in. (57.4 cm)
Width	8.6 in. (21.8 cm)	8.6 in. (21.8 cm)
Depth	8.6 in. (21.8 cm)	8.6 in. (21.8 cm)
Weight (approx.)	13 lbs (5.9 kg)	16 lbs (7.3 kg)
Service Clearance	12.0 in. (30.5 cm)	16.0 in. (40.6 cm)
Ambient Temp Range	-40° to +255°F (-40° to +124°C)	
Max Fuel Temperature	190°F (88°C)	
Max flow Coalescer	10 GPM (38 LPM)	15 GPM (57 LPM)
Max flow Pre-Filter	18 GPM (68 LPM)	25 GPM (95 LPM)

DFBO Ordering Matrix



FBO & DFBO Replacement Filter Element Options

Water Separator / Coalescer

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

Silicone Treated / Particulate

Silicone treated fuel filters remove particle contaminants down to one micron. Silicone filters can 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	Coalescer / Separator	C	Particulate (pre-filter)	F	Water Absorber	W	Advanced	A
10/ FBO-10 (6 X 10 Filter)	1	FBO 60327		FBO 60330		FBO 60333		-	
	5	FBO 60328		FBO 60331		FBO 60334		-	
	10	FBO 60353		FBO 60354		FBO 60355		FBO 60363	
	25	FBO 60329		FBO 60332		FBO 60335		-	
14/ FBO-14 (6 X 14 Filter)	1	FBO 60336		FBO 60339		FBO 60342		-	
	5	FBO 60337		FBO 60340		FBO 60343		-	
	10	FBO 60356		FBO 60357		FBO 60358		FBO 60364	
	25	FBO 60338		FBO 60341		FBO 60344			

FBO Fuel Filter Trolley

Cleaner fuel means lower costs and less engine wear



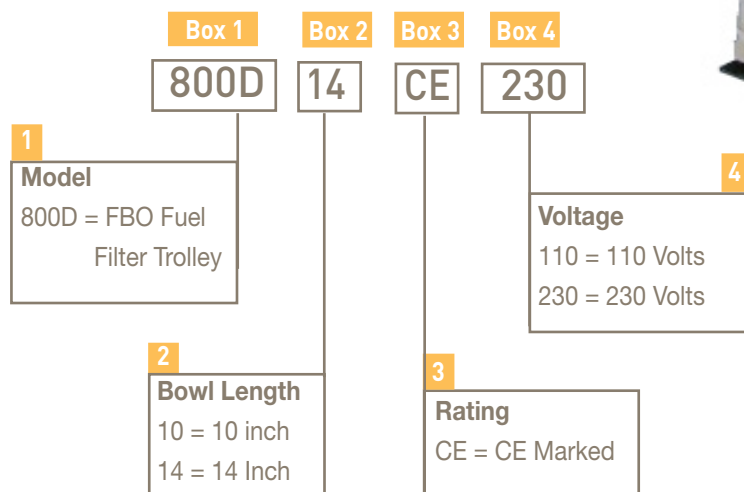
The Racor FBO Filter Trolley is a new lightweight mobile unit ideal for on-site cleaning of fuel tanks, drums and bowzers. It incorporates state-of-the-art Racor fuel filter technology which removes potentially damaging contamination from your diesel fuel.

Available with a range of filters from 1 to 25 micron it removes particles and virtually 100% water quickly and efficiently (flow rate of over 50 litres per minute).

Key Benefits

- *Excellent portability, allowing fast on-site fuel polishing*
- *Protects engines from failure and unscheduled shutdowns due to contaminated fuel*
- *Removes need for expensive additional on-engine filtering*
- *Eliminates cost of replacement fuel*
- *Safe, stand alone operation due to automatic shut down and built in alarm*

Ordering Matrix



Dispensing & Transfer

Start protecting your engine investment right at the pump. Racor's Fuel Dispensing Filters are essential for stationary and overhead tanks and mobile service vehicles. With their easy-to-install heads, they remove virtually 100% of the contaminants from diesel fuel.

Racor FDW filters feature a super-absorbent, chemically-treated media that absorbs 25 times its weight in water, "locking it in" as a barrier against free and emulsified water. There is no bypass valve which ensures that your engine is completely protected. As the media swells, it

significantly reduces fuel flow rate, signaling a need to replace the filter. Racor offers filter protection down to 25 micron (nominal). Flow rates range from 15 to 100 GPM (57 to 379 LPM). Filter service is clean and easy, there's no cartridge to replace, just spin-on a new Racor filter.

PFHH07500 (Dispensing Head)

- Flow rate: 15 gpm (56 lpm)
- Max pressure: 100 psi (6.9 bar)
- Port size: 3/4" NPTF
- Center thread: 1"-12
- NOTE: No Bypass



PFFDW3525 (Filter Element)

- Micron Rating: 25 Micron
- Max Pressure: 100 psi (6.9 bar)
- Center Thread: 1"-12 UNF
- Water Absorbing Filter

PFHH07525 (Dispensing Head)

- Flow rate: 15 gpm (189 lpm)
- Max pressure: 100 psi (6.9 bar)
- Port size: 3/4" NPTF
- Center thread: 1"-12
- NOTE: Bypass setting: 25 psi



PFFDW3525 (Filter Element)

- Micron Rating: 25 Micron
- Max Pressure: 100 psi (6.9 bar)
- Center Thread: 1"-12 UNF
- Water Absorbing Filter

PFFDH12500 (Dispensing Head)

- Flow rate: 50 gpm (189 lpm)
- Max pressure: 175 psi (12.1 bar)
- Port size: 1 1/4" NPTF
- Center thread: 1 1/2"-16 UNF
- NOTE: No Bypass



PFFDW51125 (Filter Element)

- Micron Rating: 25 Micron
- Max Pressure: 100 psi (6.9 bar)
- Center Thread: 1 1/2"-16 UNF
- Water Absorbing Filter

PFHH12515MP (Dispensing Head)

- Flow rate: 50 gpm (189 lpm)
- Max pressure: 175 psi (12.1 bar)
- Port size: 1 1/4" NPTF
- Center thread: 1 1/2"-16 UNF
- NOTE: Bypass setting: 15 psi



PFFHW5710 (Filter Element)

- Micron Rating: 10 Micron
- Max Pressure: 100 psi (6.9 bar)
- Center Thread: 1 1/2"-16 UNF
- Water Absorbing Filter

PFHH12525MP (Dispensing Head)

- Flow rate: 50 gpm (189 lpm)
- Max pressure: 175 psi (12.1 bar)
- Port size: 1 1/4" NPTF
- Center thread: 1 1/2"-16 UNF
- NOTE: Bypass setting: 25 psi



PFFHW51110 (Filter Element)

- Micron Rating: 10 Micron
- Max Pressure: 100 psi (6.9 bar)
- Center Thread: 1 1/2"-16 UNF
- Water Absorbing Filter

PFHH12525MP (Dispensing Head)

- Flow rate: 50 gpm (189 lpm)
- Max pressure: 175 psi (12.1 bar)
- Port size: 1 1/4" NPTF
- Center thread: 1 1/2"-16 UNF
- NOTE: Bypass setting: 25 psi



PFFDW51125 (Filter Element)

- Micron Rating: 30 Micron
- Max Pressure: 100 psi (6.9 bar)
- Center Thread: 1 1/2"-16 UNF
- Water Absorbing Filter

Crankcase Filtration

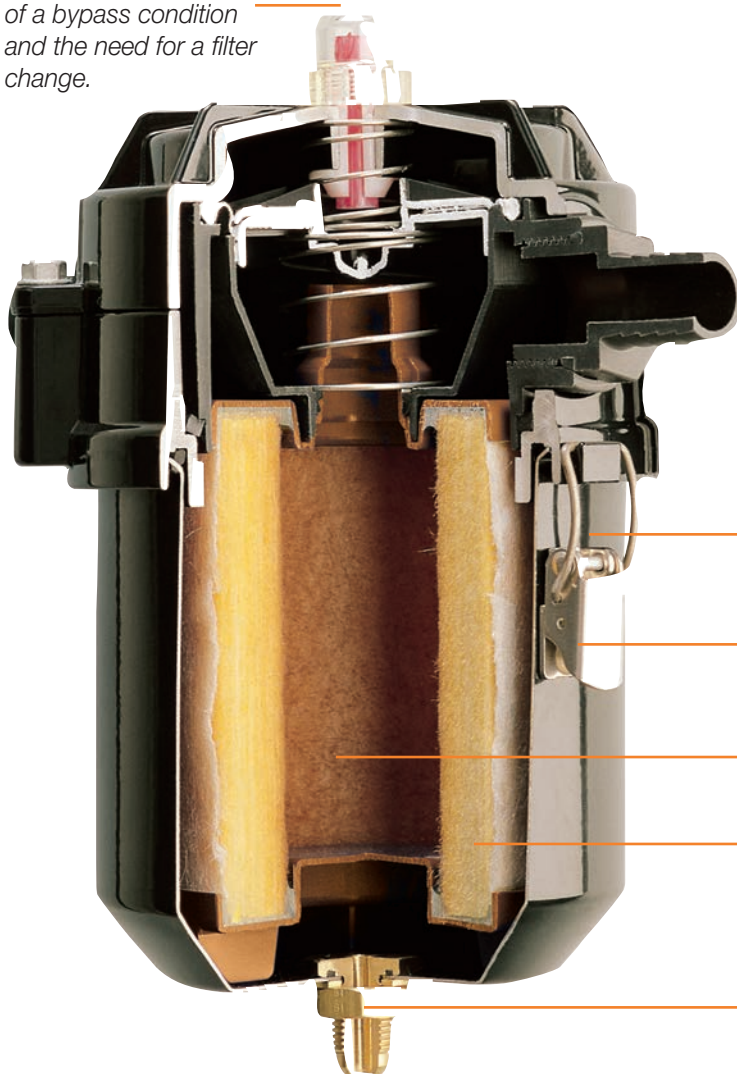


In a robust, compact package, the Racor Closed Crankcase Ventilation (CCV) Filter Systems provide superior oil coalescence and crankcase pressure control under the most severe conditions.

CCV systems eliminate crankcase emissions and provide a cleaner engine environment by performing the functions below:

- They reduce oil consumption by separating the oil from crankcase gases and returning the oil to the sump.
- The high-efficiency filter prevents fouling of the turbocharger and after-cooler.
- Keeps engine compartment and components clean.
- Filtered crankcase gas is returned to the engine intake system for re-combustion instead of polluting the environment.

Pop-up style indicator that alerts of a bypass condition and the need for a filter change.



A unique crankcase pressure regulator with integral bypass valve minimizes variation in crankcase pressure. Excessive variation in crankcase pressure can damage seals, cause loss of oil, and other problems.

Left or right-hand inlet/outlet options.

High-efficiency oil separation down to 0.3 microns.

Durable glass-filled nylon and die cast aluminum components.

Steel with epoxy powder coating.

Stainless steel latches for tool-less filter change.

Replaceable high-performance filter with depth-loading, micro-glass fiber coalescing media.

Extended filter service interval from the Vaporbloc filter.

Drain check valve allows collected oil to be returned to the crankcase. This eliminates frequent draining and significantly reduces oil consumption.



CCV Operation

The only routine maintenance required for the Racor Closed Crankcase Ventilation filter system is filter replacement. Typical service life of the high performance filter in diesel applications is 750 hours. Some variations in service life occur depending on load profile, engine wear condition, flow, aerosol mass concentration of crankcase emissions, and soot concentration.

CCV systems operate by filtering contaminants and coalescing oil mist from crankcase gases. The crankcase breather hose is connected to the 3/4" inlet hose barb of the CCV assembly. The connection at the engine can be positioned at the valve cover or crankcase.

Filtered air from the CCV assembly is plumbed to the air intake system between the air

filter and turbocharger. Coalesced oil drains from the filter sump to an external drain. A check valve holds oil in the line until it is released to the oil pan via a hose connection.

The pressure regulating valve protects the engine from excessive crankcase vacuum.



Specifications	CCV4500	CCV6000	CCV8000	CCV12000
Maximum Flow Rate	10 CFM (283 LM)	20 CFM (566 LM)	40 CFM (1133 LM)	50 CFM (1416 LM)
Maximum Engine Rating	400 HP (298.3 KW)	800 HP (596.6 KW)	1600 HP (1193.1 KW)	2000 HP (1491.4 KW)
Inlet/Outlet Port Size	1 3/16"-12 STOR	1 5/8"-12 STOR	1 7/8"-12 STOR	1 7/8"-12 STOR
Weight (approx.)	3.3 lbs (1.5 kg)	5.0 lbs (2.3 kg)	8.7 lbs (3.9 kg)	9.3 lbs (4.2 kg)
Replacement Filter Media Density: Low	CCV55248-04	N/A	N/A	N/A
Replacement Filter Media Density: High	CCV55248-08	CCV55274-08	CCV55222-08	CCV55222-12-08
Replacement Filter Media Density: Ultra	CCV55248-10	CCV55274-10	CCV55222-10	CCV55222-12-10
Housing Material	Die cast head, glass-filled nylon and black powder epoxy-coated steel bowl.	Die cast head, glass-filled nylon and black powder epoxy-coated steel bowl.	Die cast head, glass-filled nylon and black powder epoxy-coated steel bowl.	Die cast head, glass-filled nylon and black powder epoxy-coated steel bowl.
Crankcase Pressure Regulator	Integral	Integral	Integral	Integral
Bypass/Change Indicator	Integral or Remote	Integral or Remote	Integral or Remote	Integral or Remote
Engine Block Check Valve Return Fitting	1/4" NPT	1/4" NPT	3/8" NPT	3/8" NPT
Swivel Fitting (Qty.)	#6 JIC (2 pcs.)	#6 JIC (2 pcs.)	#8 JIC (2 pcs.)	#8 JIC (2 pcs.)
Oil Drain Hose I.D.	0.375 in. (0.95 cm)	0.375 in. (0.95 cm)	0.5 in. (1.27 cm)	0.5 in. (1.27 cm)

Units can be manifolded to handle higher flow rates. Do not use CCV1500 in continuous duty applications.

Total Air Intake Solutions

Clean Up Engine Rooms and Engines

Marine diesel engines can benefit from the installation of a combination Racor Closed Crankcase Ventilation (CCV) and Air Filter/Silencer System. The CCV contains Racor's high-performance Vaporbloc™ filter made of depth-loading, micro-glass fiber coalescing media.

The marine Air Filter/Silencer (AF) contains a washable media and is ruggedly built to provide an extended service life.



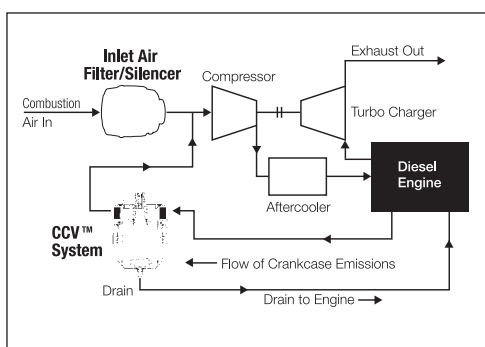
Air Filter/Silencers

The Racor Marine Air Filter/Silencer removes contaminants introduced into the air from both outside and inside the vessel. Sand, salt, carpet fibers, and other contaminants are trapped in the oil-impregnated Vaporbloc™ filter media. Turbo noise is reduced by the unique design of the housing. An integral hose connection on the housing routes the clean blowby from the CCV back into the engine.

- Pop-up style indicator alerts the operator of a bypass condition and the need for a CCV Vaporbloc™ filter change.
- Air Filter/Silencer is standard with an integral vent port for CCV connection.
- Air filter media is washable.
- Optional tap sleeves for easy connection of existing air cleaner to CCV assembly.
- Prevents turbo and intercooler fouling.

How the Systems Work

The engine crankcase breather is connected to the inlet of the Racor CCV assembly. The CCV outlet is connected to the engine's combustion air inlet via an air intake connector where filtered blowby gas is recycled through the combustion process. Oil collected in the CCV sump is returned to the crankcase through a hose and a drain check valve.



Marine Engine Application Worksheet

In order to determine the correct Racor CCV system for a particular application, certain engine information is required. A complete kit is composed by following the next 3 steps.

1 Select the Racor CCV Assembly:

Racor CCV application is determined by crankcase flow in cubic feet per minute or CFM. Flow on new engines is low but as the engine wears on, the CFM increases. Select the correct Racor CCV model by dividing the engine horsepower output by 40.

For example:

CAT 3116/260HP ÷ 40 = 6.5 CFM, select CCV4500 or CAT 3406/525HP ÷ 40 = 13.13 CFM, select CCV6000



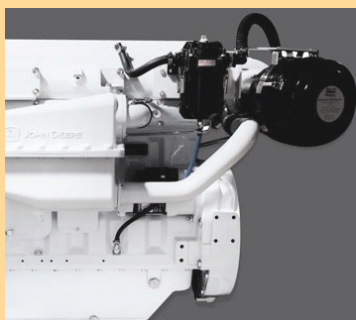
CCV units are designed to handle crankcase flow rates of up to 50 CFM (1416 l/m). Traditionally, the crankcase flow rate can be calculated as follows: Rated horsepower ÷ 40 = cubic feet per minute (CFM). This formula can only be used as a guide since recent improvements in piston design

have produced engines with higher horsepower and lower blowby flow rates. The blowby flow rate of a worn engine, at time of overhaul, is generally double the flow rate when the engine is new. The flow rate of a worn engine is factored into the formula. Note: Specify left or right-hand inlet when ordering.

Maximum Flow Rate	
CCV Model	Flow
CCV4500	10 CFM (283 l/m)
CCV6000	20 CFM (566 l/m)
CCV8000	40 CFM (1133 l/m)
CCV12000	50 CFM (1416 l/m)



Cummins QSM11 marine engine with CCV cutaway



John Deere Marine PowerTech engine with Racor CCV/AF System



Marine Air Filter/Silencer (AF) System

Marine Air Filters (AF) typically correspond with the following CCV models, see chart below.

Marine Air Filter	CCV Model
AF M408512	CCV3500 or CCV4500
AF M501012	CCV4500 or CCV6000
AF M601212	CCV8000
AF M701212	CCV12000

2 Select a Fitting/Hose Kit:

Fitting/Hose Kits come with both fittings and enough hose for the inlet and outlet sides of the Racor CCV assembly. Racor CCV filter units require straight thread o-ring hose barb fittings available only from Racor distributors. In order to determine the correct application, you will need to know the quantity and the outside diameter of engine breather(s)/hose connection. Fitting/Hose Kits are available in various sizes and hose configurations.

3 Air Intake Connector

Select A, B, or C, Depending on Application:

A. Tap Sleeve

Tap sleeves connect the Racor CCV outlet to the engine's air intake. Determine the inside diameter of the hose between the turbo and the air cleaner. This will determine the outside diameter of the tap sleeve required for completion of the installation of your Racor CCV system. Verify all dimensions required of the tap sleeve before ordering.

Example: John Deere #4045T — Hose between turbo and air cleaner is 4" inside diameter. Correct tap sleeve is CCV40100, which is 4" outside diameter with a 1" OD hose barb.

Tap Sleeves

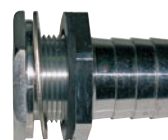


Tap Sleeve	Dimensions		
	O. D.	Length	Hose Barb
CCV30100	3 in.	5 in.	1 in.
CCV40100	4 in.	5 in.	1 in.
CCV50125	5 in.	6 in.	1.1/4 in.
CCV60125*	6 in.	6 in.	1.1/4 in.

*Note: CCV60125 includes a 1 1/4" x 1 1/2" bushing (connects to 1 1/2" ID hose).

B. Hump Hose Fittings:

Use these with existing air cleaner-to-turbo rubber adapters.



Part Number	Hose
CCV55540	3/4 in.
CCV55113	1 in.
CCV55114	1 1/4 in.
CCV55115	1 1/2 in.

C. Marine Air Filter Silencer Assembly.

In order to determine the correct marine air filter application, you will need to know the engine's marine air filter rating (AFR) and provide the hose connection to turbo. Choose the correct marine air filter application per the following guideline. Verify that the marine air filter dimensions will fit into your engine room.

4-cycle engines: $AFR = HP \times 2.0$

2-cycle engines: $AFR = HP \times 2.5$

Maximum Flow Rate	
Marine Air Filter	Air Flow Rate
AF M408512	800 CFM (377 l/s)
AF M501012	1200 CFM (566 l/s)
AF M601212	1600 CFM (755 l/s)
AF M701212	2000 CFM (944 l/s)

Note: If AFR is close to maximum capacity of the marine air filter as listed above, use the next size larger.

Example: DDC 12V92TA DDEC (2-cycle - twin turbo):

$826 \text{ hp} \times 2.5 = 1032.5 \text{ AFR per turbo} = (2) \text{ AF M501012}$

$1110 \text{ hp} \times 2.5 = 1387.5 \text{ AFR per turbo} = (2) \text{ AF M601212}$

CAT 3196 (4-cycle - twin turbo):

$660 \text{ hp} \times 2.0 = 1320.0 \text{ AFR} = (1) \text{ AF M601212}$

Air Filter/Silencer



Specifications	AF M408512	AF M501012	AF M601212	AF M701212**
Max. Air Flow*	800 CFM (378 l/s)	1200 CFM (566 l/s)	1600 CFM (755 l/s)	2000 CFM (944 l/s)
Outlet Diameter	10.2 cm (4.0 in.)	12.7 cm (5.0 in.)	15.2 cm (6.0 in.)	17.8cm (7.0 in.)
Filter	AF M8040	AF M8050	AF M8060	AF M8070
Length	31.8 cm (12.5 in.)	31.8 cm (12.5 in.)	31.8 cm (12.5 in.)	31.8 cm (12.5 in.)
Depth	24.4 cm (9.6 in.)	29.2 cm (11.5 in.)	34.3 cm (13.5 in.)	34.3 cm (13.5 in.)
Hose Barb Size	2.5 cm (1.0 in)	3.2cm (1.25 in.)	3.2cm (1.25 in.)	2.5 cm (1.0 in)
Weight	1.9 kg (4.2 lbs)	2.3 kg (5.0 lbs)	3.6 kg (8.0 lbs)	3.6 kg (8.0 lbs)
Operating Temperature	-40° to +240°F (-40° to +116°C)			

*Values given are cubic feet per minute (CFM) and liters per second (l/s). **AF M701212-01 is available with a 1.25 in. hose barb.



Competitor Part Number	Racor Part Number	Dimensions D x H x D inches
CD170	AF M8145	10 x 8 x 10
CD174	AF M8121	7.5 x 6 x 7.5
CD175	AF M8122	7.5 x 7 x 7.5
CD178	AF M8126	7.5 x 10 x 7.5
CD180	AF M8010	3" Air Separator
CD183	AF M8153	12 x 12 x 12
CD184	AF M8037	9 x 14 x 6.875
CD185	AF M8047	10 x 14 x 7
CD186	AF M8152	12 x 7 x 12
CD189	AF M8157	12 x 14 x 12
CD190	AF M8026	7.5 x 10 x 5.125
CD195	AF M8025	7.5 x 8 x 5.125
CD196	AF M8034	9 x 9 x 7
CD197	AF M8033	9 x 12 x 6.88
CD200	AF M8134	9 x 9 x 9
CD201	AF M8133	9 x 12 x 9
CD202	AF M8141	10 x 6 x 10
CD204	AF M8156	12 x 12 x 8

Air Filter Replacements

Racor offers direct replacements for the intake air filter portion of competitive air filters/silencers. Also available is the replacement filter for the vacuum limiter air separator.

The filter media for all replacement filters is an oil-impregnated cotton gauze and is sandwiched between pleated, epoxy-coated aluminum wire-mesh with polyurethane sealing surfaces. This product is cleanable and must be oiled before re-using.



LG50 and LG100

LG50 (for gasoline)

Stage 1:



Venting tank fuel is diffused by the flow diverter and air is allowed to bypass the diverter. Fuel is directed back into the fuel tank.

Stage 2:

Vapor collects on the interior surfaces and coalesces. The fuel returns downward by gravity and air continues up and out of the unit.

LG100 (for diesel/gasoline)

Stage 1: Venting tank fuel is diffused by the flow diverter and air is allowed to bypass the diverter. Fuel is directed back into the fuel tank.



Stage 2:

Fuel de-foams through a fine wire mesh screen which filters out large contaminants. Under the screen, the fuel collects temporarily until it can freely flow back to the fuel tank.

Stage 3:

Vapor collects on the interior surfaces and coalesces. The fuel returns downward by gravity and air continues up and out of the unit.

Note: The safety relief valve includes a floating check ball which will not permit a large in-rush of fuel to bypass. In the event of internal pressure reaching 2.4 PSI (0.17 bar), the spring will compress and open the safety seat.



ECO Friendly

Fuel / Air Separator

Eliminate Fuel Vent Line Overflow During Refueling

Next time you fill up, watch your fuel vent line.

A typical refueling will send up to half a gallon or more of fuel spilling overboard.

Fuel spillage is not only expensive, it's absolutely deadly to fragile lakes, rivers, and waterways. Also, USCG and other regulations prohibit the discharge of oils with civil and criminal penalties.

Installed in the fuel tank vent line, the Racor Fuel/Air Separator efficiently separates air from fuel forced into the line. Air is vented, and all fuel is returned to the tank. The Fuel/Air Separator captures fuel normally discharged due to agitation and thermal expansion up to 2.4 PSI (0.17 bar). It also eliminates damage to expensive striping, labels, and protects finishes from fuel stains. The unit is also maintenance free—there's nothing to rust or corrode.



The Racor Fuel/Air Separator fits neatly into your vent line, actually replacing a section of the line and fittings are included with each kit. One Fuel/Air Separator unit is required for each vent line. Fuel/Air Separators fit 5/8" vent lines, 1/2" fittings are available.



Specifications	LG50	LG100
Application: Gasoline Diesel	Yes No	Yes Yes
Maximum Air Flow	12 CFM (340 l/m)	17 CFM (481 l/m)
Hose Barb ¹	5/8"	5/8"
Thermal Expansion	Up to 2.4 PSI (0.17 bar)	Up to 2.4 PSI (0.17 bar)
Height	6.0 in. (15.2 cm)	9.8 in. (24.9 cm)
Diameter	1.8 in. (4.6 cm)	4.0 in. (10.2 cm)
Weight (dry)	1.2 lbs (0.5 kg)	1.6 lbs (0.7 kg)

Notes: ¹ Order part **RK 50033** for 1/2" NPTF threaded fitting)

Water Detection Probes

Stainless Steel Water In Fuel (WIF) Probe

The new all-steel and ceramic water in fuel (WIF) probe was designed to meet new IMO Marine Requirements. Racor's new RK23191 water probe can be used with all of our American Bureau of Shipping (ABS) and Underwriters Laboratories, Inc. (UL) Marine products. This passive probe design has a 303 stainless steel housing which captivates a ceramic insulator and stainless probe tip. The housing features a durable plastic connector housing to attach to an external pigtail harness with yellow and black 18 AWG wires (no polarity).

Water Probes

Racor offers a wide selection of water-in-fuel (WIF) detection systems, each designed for specific filter assemblies and installation requirements.

Water probes simply provide metal pin tip entry into a water collection bowl. Some contain no active electronics and require an external electronic detection module to detect water.

Electronic Detection Modules

Detection modules have internal electronics that pass a small current across special metal pins. When water bridges the pin tips, a solid state switch is activated allowing a larger current to flow to drive a light or provide a signal to an engine computer. Electronic detection modules will automatically reset once water is drained away from the probe tips.

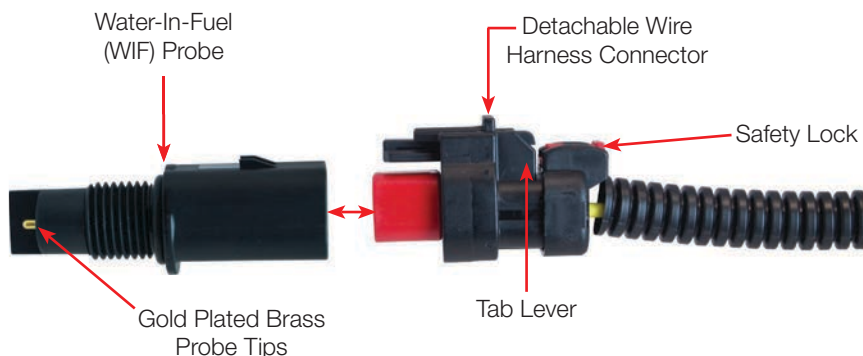
Detailed instructions are supplied with every WIF sensor and electronic detection module.



RK23191

Stainless Steel WIF Probe

- ABS Marine Type Approved, Cert. #11-HS800012-PDA.
- UL Marine Listed, 168Y.
- Meets requirements of ISO19921 fire resistance test.
- Robust 303 stainless steel and ceramic design.
- One inch (1") hex drive body, over 3 in. (7.6 cm) long.
- 1/2"-20 straight threads with SAEJ1926 sealing design.
- FKM o-ring material for durable service life.
- Detachable Packard GT-Series connector and 36" long wiring loom.



Specifications	RK 55484	RK56235	RK56140-01	RK55617	RK30880E**	RK30880-03**	RK 30964	RK 21069
Mating Connector	Delphi Packard 12162000	Delphi Packard 12162000	Delphi Packard 12162000	N/A	Racor 22556	Yazaki 7283-7031-10	None	None
Thread Size	1/2"-20 UNF							
Volts	12 or 24	12 or 24	12	12	12 or 24	12 or 24	12 or 24	12 or 24
Probe Tips	Gold Plated Brass	Gold Plated Brass	Beryllium Copper	Beryllium Copper	Beryllium Copper	Beryllium Copper	Stainless Steel	Stainless Steel
Wire Length (L)	8.0 in. (20.3 cm)	4.0 in. (10.2 cm)	6.0 in. (15.2 cm)	8.7 in. (22.1 cm)	8.0 in. (20.3 cm)	11.0 in. (27.9 cm)	8.0 in. (20.3 cm)	8.5 in. (21.6 cm)
Internal Resistor	220K ohm	220K ohm	220K ohm	82.5K ohm	Amplifier	Amplifier	None	None
Application	Cummins	-	John Deere	Cummins	All	Hino	All	All
Output	-	-	-	-	To Ground	To Ground	-	-

** These WIF probes have a built-in water detection module.

Vacuum / Compound Gauge Kits

Vacuum and Compound (vacuum/pressure) gauges and related hardware are available to monitor filter condition. As the filter slowly becomes clogged with contaminants the restriction (resistance to flow) increases.

The fuel pump still tries to draw fuel (suction) but because of this restriction less fuel is delivered to the engine and instead more air is pulled from it (fuel de-gassing). These results can cause the engine to lose power and eventually stall. By installing a vacuum gauge in your fuel system (on the outlet side of the Racor filter) visual monitoring of filter condition is possible at a glance.

Note the position of the dial, or apply the 'red line' decal provided with most kits. This will assist in easy monitoring as filter efficiency begins to decrease when a filter change is necessary.

Note: Intervals of filter changeout may vary depending on fuel cleanliness. Always keep a spare Racor filter on hand.



PFHG15LF
30/60 PSI Gauge

Accessories

Enhance Your Fuel Systems Performance and Ease of Service

When is My Engine Air Filter "Used Up?"

Because it performs so well, it is not uncommon for the engine air filter to appear as if it has reached its capacity. The only way to know when the engine air filter has reached it's capacity is to measure the restriction at service.

An effective way to verify restriction is with a filter restriction monitor. A restriction monitor will provide a quick and accurate assessment of the air filter's condition and remaining service life.








Standard Filter Monitor Part Numbers

Part Number	Range (in. water vac.)	Description
400033015 ^A	8-15 inHg (27-51 kPa)	Direct Mount
400033020 ^A	8-20 inHg (27-68 kPa)	Direct Mount
400033025 ^A	8-25 inHg (27-85 kPa)	Direct Mount
014440001 ^A	8-25 inHg (27-85 kPa)	Direct Mount w/ 90° Fitting
072604000 ^B	4-25 inHg (14-85 kPa)	Remote Mount
076248001 ^A	8-25 inHg (27-85 kPa)	Dash Mount

^A Unit standard with a 1/8"-27 NPT straight fitting.

^B Unit standard with a 90° coupling and 10' hose.

Part No.	Description	Thread Size	
RK19668	2.5" Diameter, stainless steel case, pressure restriction gauge	1/4" NPT Bottom Mount	
7232-4	Adapter Fitting	1/8" MNPT x #4 (1/4") Hose	
0102-4-2	Adapter Fitting	1/4" NPTM x 1/8" NPTF	
RK19669	2.5" Diameter stainless steel cased, pressure restriction gauge	1/4" NPT Bottom Mount	
RK 19492	UL-Listed Brass Drain Valve	1/4" NPTF	

Water Detection Modules & Kits

Racor Water Detection Kits are available in a wide selection for various installation requirements. Under-dash, in-dash, and remote mount, these solid-state units may be used with any Racor fuel filter/water separator and water probe. They are manufactured using the highest quality materials and are all 100% electrically tested.

An electronic detection module analyzes electrical resistance at the water probe and determines if water is present. If so, the detection module operates to indicate water, based on its features listed below. All units reset automatically after water is removed (unless specified).

Caution: The water probe and detection modules work with 12 or 24 volts, direct current only and should never be wired to other brand modules or household 110 or 220 volts, alternating current. Use the guide below to find the correct detection module for your application.

Part Number	Description	Voltage	Image
RK 12870	Under-dash water detection module. Light illuminates and alarm sounds when water is detected. Water must be drained to reset light and stop alarm. Plastic enclosure measures: 1.38" square x 1.25" deep. Water probe included.	12 vdc	
RK 12871	Same as above	24 vdc	
RK 20725	Under-dash mount water detection module. Light only. Green 'ON' lamp illuminates with power on. Red 'DRAIN' lamp illuminates when water is detected. Initial power-up self diagnosis feature and circuit protection included. Plastic enclosure measures: 2.75" x 1" x 1.5". Water probe included.	12 vdc	
RK 20725-24	Same as above	24 vdc	
RK 20726	2" gauge-type water detection module. Light and audio. Red 'DRAIN' lamp illuminates and horn sounds when water is detected. Initial power-up self diagnosis feature and circuit protection included. Plastic case, satin black dial with white lettering. Water probe included.	12 or 24 vdc	
RK 11-1570	2" gauge-type water detector and filter restriction module. Includes pre-set vacuum switch (7 inHg), connector, and outlet adapter fitting. Red 'DRAIN' or 'CHANGE FILTER' lamp illuminate and horn sounds when water is detected. Water probe included.	12 or 24 vdc	
RK 14329	Remote detection unit sends 12 VDC hot (+) signal when an input ground signal (from a water probe or a vacuum switch—not included) is received. Must be used with a relay to power a horn or indicator lamp (if draw is over 1 amp). Plastic enclosure measures: 3" x 2.5" x .75"	12 vdc	
RK 14321	Same as above	24 vdc	
14332	Under-dash mounts same as RK 14329 but sends a ground (-) signal. Enclosure size is same as RK 20725 above.	12 vdc	
RK 20163	Vacuum Switch Kit Non-adjustable, 'Normally Open' contacts close at 7 inHg (3.4 PSI) 1/8"-27 NPT threads. For use with all models.	N/A	
RK 21030	Vacuum Switch Connector Kit Molded connector with single 18 AWG., 18" blue wire lead.	N/A	
RK30880E	This kit includes new and enhanced detection electronics built into the probe body and works with 12 or 24 volt DC systems. Water probe and detection module all in one.	12 or 24 vdc	

Clear collection bowl must have a 7/8" SAE port.



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Aerospace

Key Markets

Aftermarket services
Commercial transports
Engines
General & business aviation
Helicopters
Launch vehicles
Military aircraft
Missiles
Power generation
Regional transports
Unmanned aerial vehicles

Key Products

Control systems & actuation products
Engine systems & components
Fluid conveyance systems & components
Fluid metering, delivery & atomization devices
Fuel systems & components
Fuel tank inerting systems
Hydraulic systems & components
Thermal management
Wheels & brakes



Climate Control

Key Markets

Agriculture
Air conditioning
Construction Machinery
Food & beverage
Industrial machinery
Life sciences
Oil & gas
Precision cooling
Process
Refrigeration
Transportation

Key Products

Accumulators
Advanced actuators
CO₂ controls
Electronic controllers
Filter driers
Hand shut-off valves
Heat exchangers
Hose & fittings
Pressure regulating valves
Refrigerant distributors
Safety relief valves
Smart pumps
Solenoid valves
Thermostatic expansion valves



Electromechanical

Key Markets

Aerospace
Factory automation
Life science & medical
Machine tools
Packaging machinery
Paper machinery
Plastics machinery & converting
Primary metals
Semiconductor & electronics
Textile
Wire & cable

Key Products

AC/DC drives & systems
Electric actuators, gantry robots & slides
Electrohydraulic actuation systems
Electromechanical actuation systems
Human machine interface
Linear motors
Stepper motors, servo motors, drives & controls
Structural extrusions



Filtration

Key Markets

Aerospace
Food & beverage
Industrial plant & equipment
Life sciences
Marine
Mobile equipment
Oil & gas
Power generation & renewable energy
Process
Transportation
Water Purification

Key Products

Analytical gas generators
Compressed air filters & dryers
Engine air, coolant, fuel & oil filtration systems
Fluid condition monitoring systems
Hydraulic & lubrication filters
Hydrogen, nitrogen & zero air generators
Instrumentation filters
Membrane & fiber filters
Microfiltration
Sterile air filtration
Water desalination & purification filters & systems



Fluid & Gas Handling

Key Markets

Aerial lift
Agriculture
Bulk chemical handling
Construction machinery
Food & beverage
Fuel & gas delivery
Industrial machinery
Life sciences
Marine
Mining
Mobile
Oil & gas
Renewable energy
Transportation

Key Products

Check valves
Connectors for low pressure fluid conveyance
Deep sea umbilicals
Diagnostic equipment
Hose couplings
Industrial hose
Mooring systems & power cables
PTFE hose & tubing
Quick couplings
Rubber & thermoplastic hose
Tube fittings & adapters
Tubing & plastic fittings



Hydraulics

Key Markets

Aerial lift
Agriculture
Alternative energy
Construction machinery
Forestry
Industrial machinery
Machine tools
Marine
Material handling
Mining
Oil & gas
Power generation
Refuse vehicles
Renewable energy
Truck hydraulics
Turf equipment

Key Products

Accumulators
Cartridge valves
Electrohydraulic actuators
Human machine interfaces
Hybrid drives
Hydraulic cylinders
Hydraulic motors & pumps
Hydraulic systems
Hydraulic valves & controls
Hydrostatic steering
Integrated hydraulic circuits
Power take-offs
Power units
Rotary actuators
Sensors



Pneumatics

Key Markets

Aerospace
Conveyor & material handling
Factory automation
Life science & medical
Machine tools
Packaging machinery
Transportation & automotive

Key Products

Air preparation
Brass fittings & valves
Manifolds
Pneumatic accessories
Pneumatic actuators & grippers
Pneumatic valves & controls
Quick disconnects
Rotary actuators
Rubber & thermoplastic hose & couplings
Structural extrusions
Thermoplastic tubing & fittings
Vacuum generators, cups & sensors



Process Control

Key Markets

Alternative fuels
Biopharmaceuticals
Chemical & refining
Food & beverage
Marine & shipbuilding
Medical & dental
Microelectronics
Nuclear Power
Offshore oil exploration
Oil & gas
Pharmaceuticals
Power generation
Pulp & paper
Steel
Water/wastewater

Key Products

Analytical Instruments
Analytical sample conditioning products & systems
Chemical injection fittings & valves
Fluoropolymer chemical delivery fittings, valves & pumps
High purity gas delivery fittings, valves, regulators & digital flow controllers
Industrial mass flow meters/controllers
Permanent no-weld tube fittings
Precision industrial regulators & flow controllers
Process control double block & bleeds
Process control fittings, valves, regulators & manifold valves



Sealing & Shielding

Key Markets

Aerospace
Chemical processing
Consumer
Fluid power
General industrial
Information technology
Life sciences
Microelectronics
Military
Oil & gas
Power generation
Renewable energy
Telecommunications
Transportation

Key Products

Dynamic seals
Elastomeric o-rings
Electro-medical instrument design & assembly
EMI shielding
Extruded & precision-cut, fabricated elastomeric seals
High temperature metal seals
Homogeneous & inserted elastomeric shapes
Medical device fabrication & assembly
Metal & plastic retained composite seals
Shielded optical windows
Silicone tubing & extrusions
Thermal management
Vibration dampening

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AE – United Arab Emirates,
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Tel: +971 4 8127100
parker.me@parker.com

AT – Austria, Wiener Neustadt
Tel: +43 (0)2622 23501-0
parker.austria@parker.com

AT – Eastern Europe, Wiener
Neustadt
Tel: +43 (0)2622 23501 900
parker.easteurope@parker.com

AZ – Azerbaijan, Baku
Tel: +994 50 2233 458
parker.azerbaijan@parker.com

BE/LU – Belgium, Nivelles
Tel: +32 (0)67 280 900
parker.belgium@parker.com

BG – Bulgaria, Sofia
Tel: +359 2 980 1344
parker.bulgaria@parker.com

BY – Belarus, Minsk
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

CH – Switzerland, Etoy
Tel: +41 (0)21 821 87 00
parker.switzerland@parker.com

CZ – Czech Republic, Klecany
Tel: +420 284 083 111
parker.czechrepublic@parker.com

DE – Germany, Kaarst
Tel: +49 (0)2131 4016 0
parker.germany@parker.com

DK – Denmark, Ballerup
Tel: +45 43 56 04 00
parker.denmark@parker.com

ES – Spain, Madrid
Tel: +34 902 330 001
parker.spain@parker.com

FI – Finland, Vantaa
Tel: +358 (0)20 753 2500
parker.finland@parker.com

FR – France, Contamine s/Arve
Tel: +33 (0)4 50 25 80 25
parker.france@parker.com

GR – Greece, Athens
Tel: +30 210 933 6450
parker.greece@parker.com

HU – Hungary, Budaörs
Tel: +36 23 885 470
parker.hungary@parker.com

IE – Ireland, Dublin
Tel: +353 (0)1 466 6370
parker.ireland@parker.com

IL – Israel
Tel: +39 02 45 19 21
parker.israel@parker.com

IT – Italy, Corsico (MI)
Tel: +39 02 45 19 21
parker.italy@parker.com

KZ – Kazakhstan, Almaty
Tel: +7 7273 561 000
parker.easteurope@parker.com

NL – The Netherlands, Oldenzaal
Tel: +31 (0)541 585 000
parker.nl@parker.com

NO – Norway, Asker
Tel: +47 66 75 34 00
parker.norway@parker.com

PL – Poland, Warsaw
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

PT – Portugal
Tel: +351 22 999 7360
parker.portugal@parker.com

RO – Romania, Bucharest
Tel: +40 21 252 1382
parker.romania@parker.com

RU – Russia, Moscow
Tel: +7 495 645-2156
parker.russia@parker.com

SE – Sweden, Spånga
Tel: +46 (0)8 59 79 50 00
parker.sweden@parker.com

SK – Slovakia, Banská Bystrica
Tel: +421 484 162 252
parker.slovakia@parker.com

SL – Slovenia, Novo Mesto
Tel: +386 7 337 6650
parker.slovenia@parker.com

TR – Turkey, Istanbul
Tel: +90 216 4997081
parker.turkey@parker.com

UA – Ukraine, Kiev
Tel: +48 (0)22 573 24 00
parker.poland@parker.com

UK – United Kingdom, Warwick
Tel: +44 (0)1926 317 878
parker.uk@parker.com

ZA – South Africa, Kempton Park
Tel: +27 (0)11 961 0700
parker.southafrica@parker.com

North America

CA – Canada, Milton, Ontario
Tel: +1 905 693 3000

US – USA, Cleveland
Tel: +1 216 896 3000

Asia Pacific

AU – Australia, Castle Hill
Tel: +61 (0)2-9634 7777

CN – China, Shanghai
Tel: +86 21 2899 5000

HK – Hong Kong
Tel: +852 2428 8008

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Tel: +91 22 6513 7081-85

JP – Japan, Tokyo
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Tel: +82 2 559 0400

MY – Malaysia, Shah Alam
Tel: +60 3 7849 0800

NZ – New Zealand, Mt
Wellington
Tel: +64 9 574 1744

SG – Singapore
Tel: +65 6887 6300

TH – Thailand, Bangkok
Tel: +662 186 7000

TW – Taiwan, Taipei
Tel: +886 2 2298 8987

South America

AR – Argentina, Buenos Aires
Tel: +54 3327 44 4129

BR – Brazil, Sao Jose dos
Campos
Tel: +55 800 727 5374

CL – Chile, Santiago
Tel: +56 2 623 1216

MX – Mexico, Toluca
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Parker Hannifin Manufacturing (UK) Ltd.

Racor Filter Division Europe

Tel: +44(0)1924 487000

Email: filtrationinfo@parker.com

www.parker.com/rfde

