

# 500MA/MAM Turbine Series (for marine applications)

## Fuel Filter/Water Separator

Instruction Part Number 15335 Rev G



Turbine Series fuel filter/water separator protects the precision components of your engine from dirt, rust, algae, asphaltines, varnishes and especially water, which is prevalent in low distillate fuels. Contaminants are removed from fuel using the following legendary three stage process:

### **Stage 1—Separation**

Using the fuel flow, the stationary turbine separates large solids and free water through enhanced centrifugal force.

### **Stage 2—Coalescing**

Smaller water droplets and solids coalesce on the conical baffle and fall to the collection bowl.

### **Stage 3—Filtration**

Engines will benefit from near 100% water separation and fuel filtration with Racor's proprietary Aquabloc® water repelling media. The replaceable filters are available in 2, 10, and 30 micron ratings.

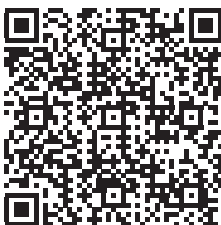


## Contact Information

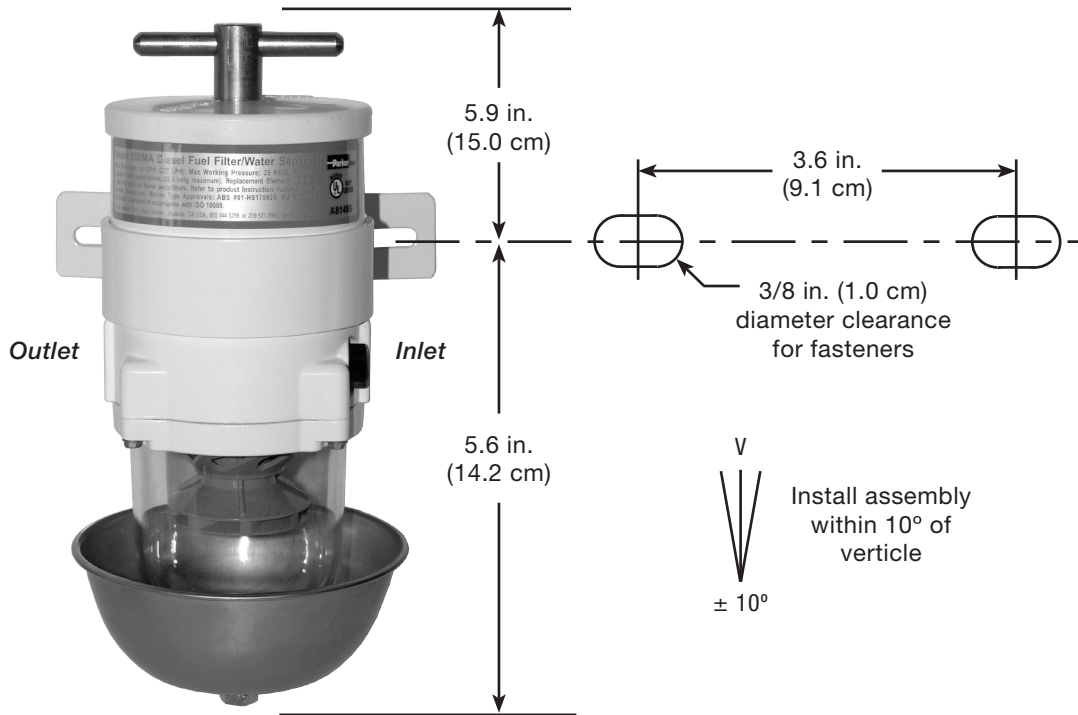
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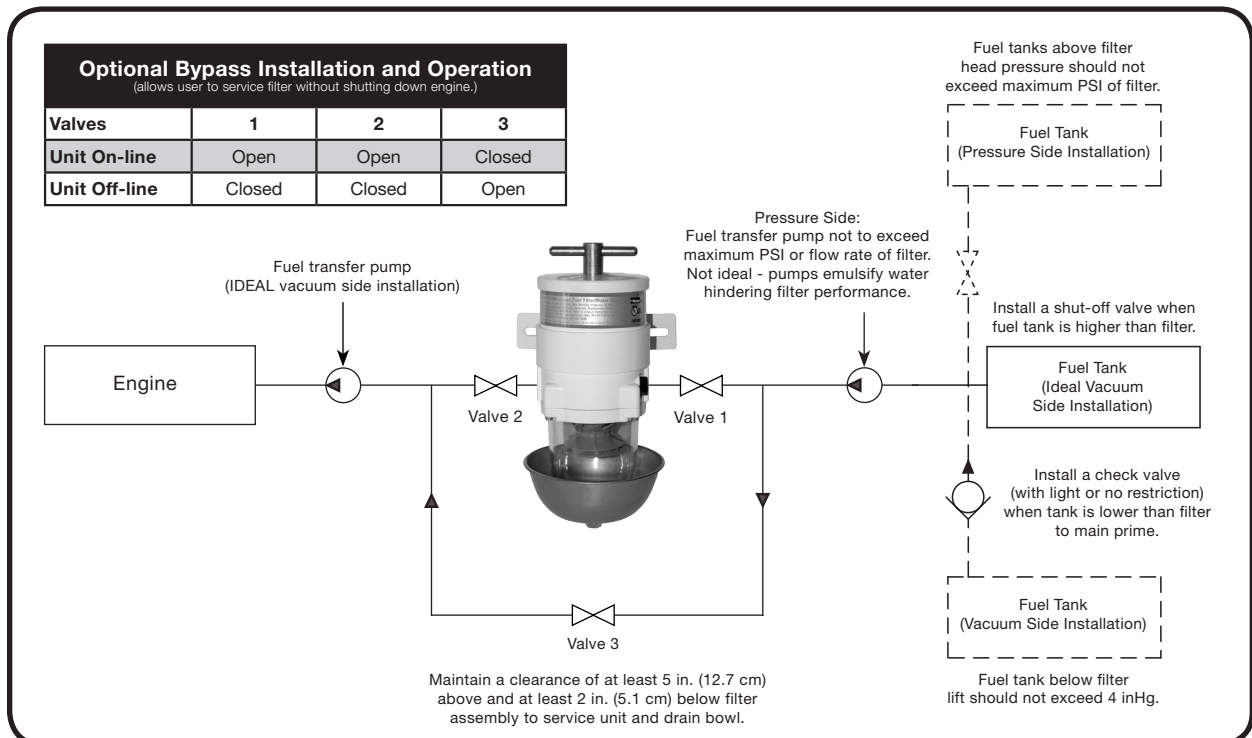
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# Mounting Instructions (all models)



# Installation Diagram



# Installation Guidelines

These *customer supplied* materials should be on hand before beginning installation.

- Shop Towels
- Mounting Hardware
- Inlet/Outlet Fittings
- Fuel Hose
- Clean Diesel Fuel
- Clean Motor Oil
- Thread Sealant (no thread tapes)

## **Positioning The Filter Assembly**

Install filter assembly on suction side of fuel transfer pump for optimum water separating efficiency. See *Installation Diagram*.

Keep fuel line restrictions to a minimum. Locate the filter assembly between horizontal planes of the bottom of the fuel tank and inlet of fuel pump, if possible. If the filter assembly is installed in an application where the fuel tank is higher than the filter, a shut-off valve must be installed between the tank and filter assembly INLET. This will be used when servicing the replacement filter.

## **BEFORE Installing The Filter Assembly**

- Obtain good ventilation and lighting.
- Maintain a safe working environment.
- Engine must be off for installation.
- DO NOT smoke or allow open flames near installation.

## **Installing The Filter Assembly**

- Completely remove any suction side filters in fuel line between fuel tank and fuel pump. This is where the Racor filter will mount. Leaving these filters in place will add to fuel system restriction. Filter heads cast into the engine or that are non-removable or hard piped should be serviced with a new filter and left in place.
- Keep fuel flow restriction to a minimum. Always use the maximum size fuel hose possible. Do not make sharp bends with flexible hose as kinks may occur. Avoid use of two 45° elbow fittings where one 90° elbow will work.

- When routing hose, avoid surfaces that move, have sharp edges, or get hot (such as exhaust piping).
- Avoid using one-way check valves that have an opening pressure higher than 0.5 PSI (0.03 bar).

## **Priming Instructions**

1. Remove T-handle and lid from top of filter assembly.
2. Fill filter with clean fuel.
3. Lubricate lid gasket and T-handle O-ring with clean fuel or motor oil.
4. Replace lid and T-handle and tighten snugly by hand only—do not use tools.
5. If applicable, refer to equipment operator's service manual to complete fuel priming procedure.
6. Start engine and check for fuel system leaks. Correct as necessary with engine off and pressure relieved from filter assembly.

# Service Instructions

## **Draining Water**

Frequency of water draining is determined by the contamination level of the fuel. Inspect or drain collection bowl of water daily or as necessary. Collection bowl must be drained before contaminants reach the bottom of the turbine (inside the bowl), or when the Water Detection Module (optional) indicates a drain is required.

## **Suction Side Applications**

1. Close inlet valve (or valve #1) and open self-venting drain on bottom of bowl.
2. Close drain after all water and contaminants have been evacuated—DO NOT leave drain open too long as it will eventually completely drain entire filter of water AND fuel.
3. Follow *Priming Instructions*.

## **Pressure Side Applications**

1. Open self-venting drain on bottom of bowl. Head pressure will push any water and contaminants out of drain while keeping filter primed.
2. Close drain after all water and contaminants have been evacuated—DO NOT leave drain open too long as it will eventually completely drain entire filter of water AND fuel, and possibly drain entire tank.

# Filter Replacement

Frequency of filter replacement is determined by the contamination level of your fuel. Replace filter every 500 hours, every other oil change, when vacuum gauge (optional) reads between 7 to 10 inches of mercury (inHg), if power loss is noticed, or annually, whichever occurs first.

**Note—always carry extra replacement filters as one tankful of excessively dirty fuel can plug a filter.**

Use only genuine Racor Aquabloc® replacement filters—see *Part List*.

## All Applications

1. Isolate the filter assembly with bypass or shut-off valves, if applicable.
2. Remove T-handle and lid.
3. Remove filters by holding bail handles and slowly pulling upward with a twisting motion. Dispose properly according to local regulations.
4. Remove and discard old lid gasket and T-handle O-ring and clean seal glands of any dirt or

debris. Lubricate new gasket and seal (supplied with new filter) with motor oil or diesel fuel before installation.

5. Refer to Priming Instructions, otherwise, fill unit with clean fuel, replace lid and T-handle and tighten snugly by hand only—**do not use tools**.
6. Open any closed valves; if applicable.

**Note—above ground tanks or transfer pump applications may use head pressure to prime filter assembly.**

# Troubleshooting

**Damaged, worn, or dirty seals will allow air ingestion. Inspect and replace all seals as needed. Clean the sealing surfaces of dirt or debris every time the filter is replaced.**

Hand tighten only! Do not use tools for leverage. Tighten 70 to 90 in. lbs.

If filter is changed or assembly drained for any reason, reprime assembly. Fill to just above top of filter before replacing lid. It is normal for the fuel level to drop during use. This is especially apparent at filter element change-out.

The hollow aluminum checkball floats up against the seal when fuel is stopped, preventing fuel bleed-back. If unit loses prime, inspect upstream hose connections first, disassemble unit to inspect seal and ball. (It's normal to hear a "rattling" sound at any time).

Do not over tighten self-tapping capscrews to avoid stripping out body threads. After disassembly, start threads by hand prior to using tools. Tighten to 55-65 in. lbs.

Air bubbles or fuel leakage appearing from drain may indicate drain is not closed completely or seal has been clogged with contaminants. Tighten or disassemble and inspect. Tighten to 30-35 in. lbs.

A plug is installed if the water sensor option is not selected. Tighten to 15-20 in. lbs.

Replace T-handle o-ring and lid gasket with each filter element replacement.

Replace filter every 500 hours, every other oil change, annually, or at first indication of power loss, whichever occurs first. For Construction and Agricultural use, change filter every 300 hours.

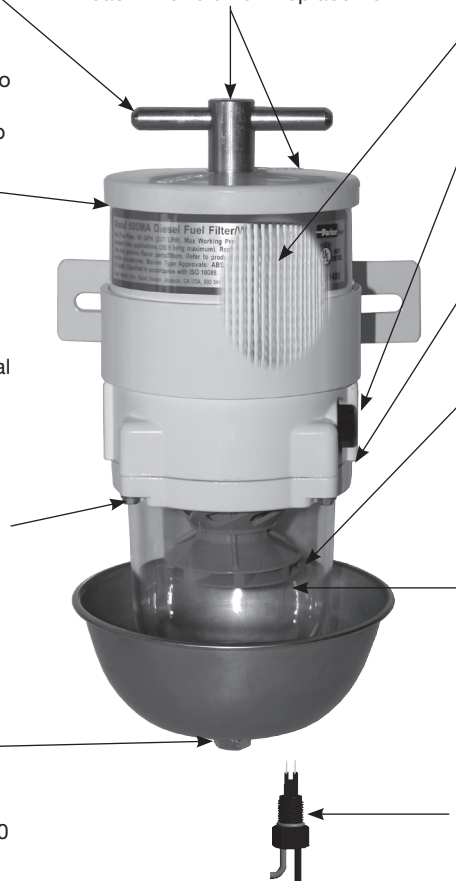
Optional heater port—not used on marine models. O-ring must not be damaged or swollen. Tighten to 15-20 in. lbs.

SAE O-ring ports should have a smooth angled seat for sealing. Do not scratch this surface. Check O-ring for damage.

Air bubbles appearing from turbine are an indication of an upstream leak between Racor inlet and fuel tank pick-up tube.

Drain water (if present) before it gets to this level. At some time, the contaminant collection bowl may become dirty on the inside. Remove the four bowl ring capscrews and drop the bowl. Clean the inside with hot soapy water, dry off and re-install. Ensure bowl gasket is cleaned, and lubricate with silicone grease prior to reuse.

The water sensor, if equipped, is used in conjunction with a water detection amplifier and should activate when water contacts the tips. Air bubbles or fuel leakage appearing from sensor may indicate it is loose or O-ring is damaged. Tighten to 15-20 in. lbs.



# Specifications



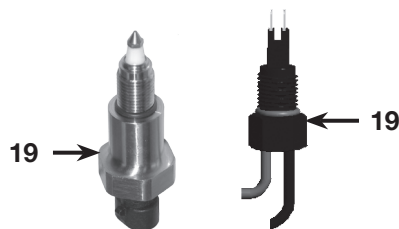
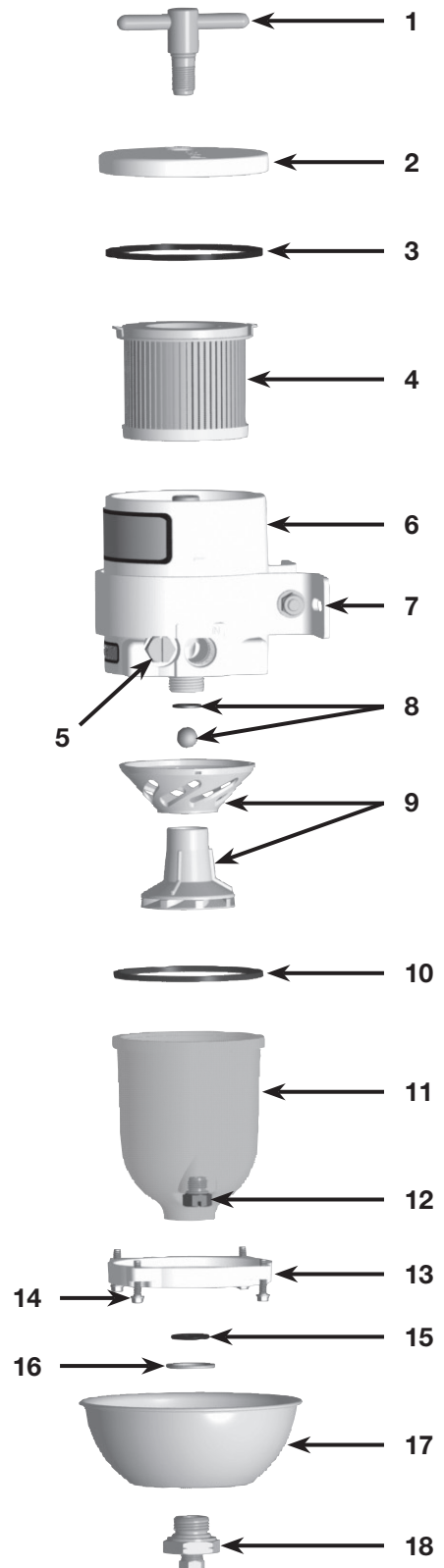
	500MA	500MAM
<b>Maximum Flow Rate:</b>	60 GPH (227 LPH)	60 GPH (227 LPH)
<b>Port Size</b> (SAE J1926)	3/4"-16 UNF	3/4"-16 UNF
<b>Service Clearance</b> Above Assembly Below Assembly	5.0 in. (12.7 cm) 2.0 in. (5.1 cm)	5.0 in. (12.7 cm) 2.0 in. (5.1 cm)
<b>Replacement Filters</b> 2 micron 10 micron 30 micron	2010SM-OR 2010TM-OR 2010PM-OR	2010SM-OR 2010TM-OR 2010PM-OR
<b>Water In Bowl Capacity</b>	3.7 oz. (109 ml)	3.7 oz. (109 ml)
<b>Height</b>	11.5 in. (29.2 cm)	11.0 in. (27.9 cm)
<b>Width</b>	5.8 in. (14.7 cm)	5.8 in. (14.7 cm)
<b>Depth</b>	4.8 in. (12.2 cm)	4.8 in. (12.2 cm)
<b>Weight (dry)</b>	4.0 lb (1.8 kg)	5.0 lb (2.2 kg)
<b>Max. Allowable Working Pressure</b>	25 PSI (1.7 bar)	25 PSI (1.7 bar)
<b>Clean Pressure Drop</b>	0.25 PSI (1.7 kPa)	0.25 PSI (1.7 kPa)
<b>Water Removal Efficiency</b>	99%	99%
<b>Ambient Temp. Range</b>	-40°F to +250°F (-40°C to +121°C)	
<b>Max. Fuel Temperature</b>	190°F (88°C)	

# Part List

Parts/kits listed can be purchased from a Racor distributor.  
Go to [parker.com/racor](http://parker.com/racor) for a distributor near you.

Part Number	Description
1 <i>RK 11888</i> <i>RK23183</i>	Brass T-handle Stainless Steel T-handle (both kits include o-ring)
2 <i>RK15078-02</i>	Lid (includes #3)
3 <i>15005</i>	Lid Gasket
4 <i>2010SM-OR</i> <i>2010TM-OR</i> <i>2010PM-OR</i>	2 Micron Filter (includes seals) 10 Micron Filter (includes seals) 30 Micron Filter (includes seals)
5 <i>RK 11-1679</i>	Plug, Heater Feedthru
6 <i>Not available separately</i>	500 Series Body
7 <i>RK 15378-02</i>	Mounting Bracket
8 <i>RK 15010B</i>	Checkball and Seal
9 <i>RK 15013D</i>	Turbine Centrifuge/Conical Baffle
10 <i>15374</i>	Bowl Gasket
11 <i>RK 15279-01</i> <i>RK 15301-02</i>	Clear Bowl (MA assemblies) Metal Bowl (MAM assemblies)
12 <i>RK 20126</i>	Bowl Plug
13 <i>RK 15035-01</i>	Bowl Ring
14 <i>RK 15081</i>	Capscrew
15 <i>RK 11340</i>	O-ring
16 <i>RK 11341</i>	Bowl Drain Gasket (includes O-ring)
17 <i>RK 15104</i>	Heat Deflector
18 <i>RK 11-1910</i>	Plug Assembly
19 <i>RK 21069</i> <i>RK23191</i>	MA Water Probe Assembly <sup>1</sup> MAM Stainless Steel WIF <sup>1</sup>
20 <i>RK 15211</i>	Seal Service Kit (all models - not shown)

<sup>1</sup>Must be used with Water Detection Amplifier. Contact Racor for more info.

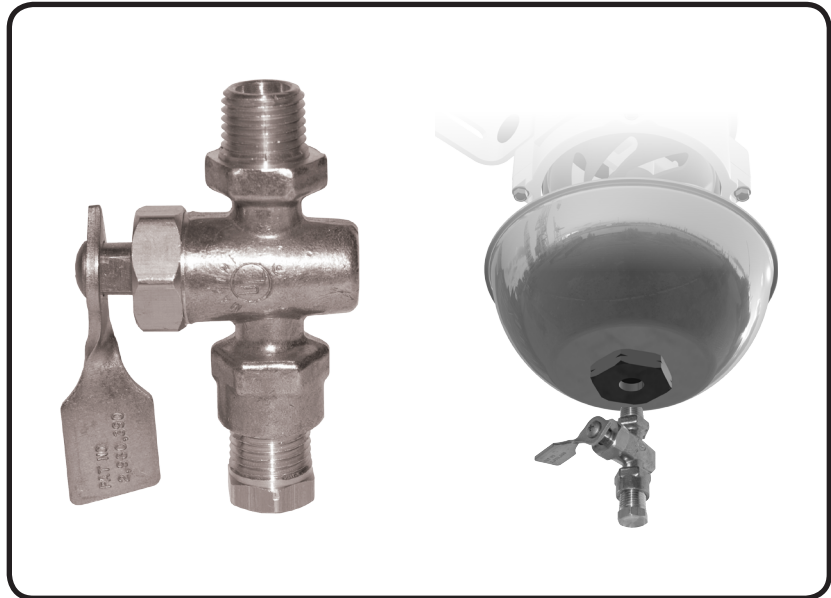




## RK 19492 (UL Listed Shut-off Valve Kit)

The RK 19492 UL Listed Shut-off Valve Kit may be retrofitted to fit most Racor Marine Fuel Filter/Water Separators to simplify draining contaminants from the collection bowl.

- Simple open/close valve for easy contaminant evacuation.
- 1/4" NPT threads on Valve and Plug.
- Coast Guard accepted in most diesel applications with use of supplied plug.



## RK23262 T-handle Vacuum Gauge

The T-handle vacuum gauge monitors your filters condition. As your filter slowly becomes clogged with contaminants, restriction (resistance to flow) increases. Because of this restriction, more air is mixed with fuel and less fuel is delivered to the engine (fuel degassing). This will result in loss of power and eventually stall the engine.

Installing a T-handle vacuum gauge in your fuel system gives you a visual monitor of your filter condition. Excessive resistance on the gauge means it's time to change the filter.



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