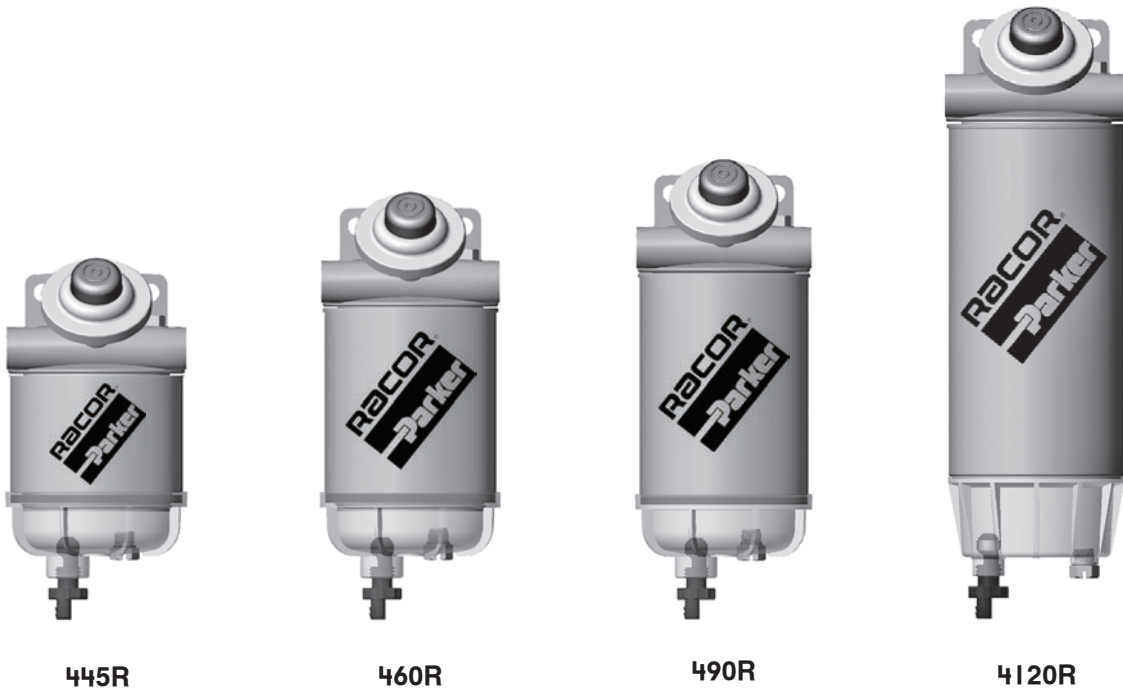


## 400 Series



All 400 Series spin-on fuel filter/water separators feature a hand (palm) operated fuel priming pump which simplifies service procedures and yields extremely low flow resistance due to its unique pump bypass characteristic. These filters also feature multiple fuel ports (two inlets and two outlets) and a unitized mounting bracket for installation convenience. Inlet and outlet threads are 3/8"-18 NPTF (SAE J476) for the 445R, 460R and 490R and 3/4"-16 UNF (SAE J1926) for the 4120R. These filter assemblies provide flexibility during mounting to fit any engine application.

Additional 400 Series features include spin-on, high-capacity, Aquabloc® II replaceable filter elements which stop water, remove solid

contamination, and are available in 2, 10 and 30 micron. Filtration needs should be based on application, fuel quality, operating climates, and maintenance schedules. Also included are spin-on contaminant collection bowls. The clear bowls used with these filters will not discolor from alcohol, additives, or UV light and have a leak-proof, positive seal, self-venting drain for easy servicing. Water and contamination levels can be seen easily at a glance.

Options for the 400 Series filters include: water detection kits (for diesel applications only), vacuum or compound gauges and 12 or 24 volt dc, 200 watt fuel heaters.



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# Mobile Fuel Filtration

## 400 Series



Specifications	445R	460R	490R	4120R
<b>Maximum Flow Rate</b>	45 GPH (170 LPH)	60 GPH (227 LPH)	90 GPH (341 LPH)	120 GPH (454 LPH)
<b>Port Size</b>	3/8"-18 NPTF (SAE J476)	3/8"-18 NPTF (SAE J476)	3/8"-18 NPTF (SAE J476)	3/4"-16 SAE (SAE J1926)
<b>Total Number of Ports:</b> (total inlets) (total outlets)	4 2 2	4 2 2	4 2 2	4 2 2
<b>Min. Service Clearance</b>	2.0 in. (5.1 cm)	2.0 in. (5.1 cm)	2.0 in. (5.1 cm)	2.0 in. (5.1 cm)
<b>Center Threads</b>	1"-14	1"-14	1"-14	1"-14
<b>Height</b>	9.3 in. (23.6 cm)	11.0 in. (27.9 cm)	11.8 in. (30.0 cm)	15.0 in. (38.1 cm)
<b>Width</b>	4.5 in. (11.4 cm)	4.5 in. (11.4 cm)	4.5 in. (11.4 cm)	4.5 in. (11.4 cm)
<b>Depth</b>	4.8 in. (12.1 cm)	4.8 in. (12.1 cm)	4.8 in. (12.1 cm)	4.8 in. (12.1 cm)
<b>Weight (dry)</b>	2.5 lb (1.1 kg)	2.7 lb (1.2 kg)	2.9 lb (1.3 kg)	3.9 lb (1.8 kg)
<b>Clean Pressure Drop</b>	0.17 PSI (0.01 bar)	0.39 PSI (0.03 bar)	0.95 PSI (0.07 bar)	0.85 PSI (0.06 bar)
<b>Max. Allowable Pressure<sup>1</sup></b>	30 PSI (2.07 bar)	30 PSI (2.07 bar)	30 PSI (2.07 bar)	15 PSI (1.03 bar)
<b>Available Options:<sup>2</sup></b> (water sensor) (heater) <sup>3</sup>	Yes Yes	Yes Yes	Yes Yes	Yes Yes
<b>Bowl Capacity (water)</b> (with heater)	4.0 oz. (118 ml) 3.5 oz. (104 ml)	4.0 oz. (118 ml) 3.5 oz. (104 ml)	4.0 oz. (118 ml) 3.5 oz. (104 ml)	2.8 oz. (82 ml) 2.4 oz. (70 ml)
<b>H<sub>2</sub>O Removal Efficiency</b>	99%			
<b>Operating Temperature</b>	-40° to +255°F (-40° to +124°C)			

<sup>1</sup> Pressure installations are applicable up to maximum PSI shown. Vacuum installations are recommended.

<sup>2</sup> Do not use with gasoline applications.

<sup>3</sup> Maximum power requirements for in-bowl heater option: 12 vdc (200 watt) = 16.6 amps, 24 vdc (200 watt) = 8.3 amps. See Accessories section for heater relay kits, if needed.

**RACOR**®

Technical Support:  
800.344.3286 ext. 7555  
racortech@parker.com

## 400 Series

### How to Order

(The examples below illustrate how part numbers are constructed)

*	490R	12	2
Add an * for optional 16 mm fuel ports <sup>1</sup> (omit if not desired)	Specify a model number: 445R, 460R, 490R, or 4120R.	Add 12 or 24 for a 12 or 24 volt dc heater <sup>2</sup> . (omit if not desired)	Specify a micron rating: 2, 10, or 30.
<sup>1</sup> Standard fuel ports are 3/8"-18 NPTF (445R, 460R and 490R) and 3/4"-16 UNF (4120R).			
<sup>2</sup> Use with Racor relay kit - see Accessories.			

Replacement Elements			
Model Number	2 Micron (Final Filtration)	10 Micron (Secondary Filtration)	30 Micron (Primary Filtration)
445R	R45S or R47S	R45T	R45P
460R	R60S	R60T	R60P
490R	R90S	R90T	R90P
4120R	R120S	R120T	R120P

### Optional Dual Media Filter

Dual-Layer media offers enhanced high dirt-holding capacity, and extended filter life. Dual-Layer media ensures more complete removal of all size contaminants. The R47S filter replaces the R45S

Spin-on element, and provides removal efficiencies of 99.98% nominal on 2 micron particles. Still much greater than the 50-90% efficiency of most single-stage filters.

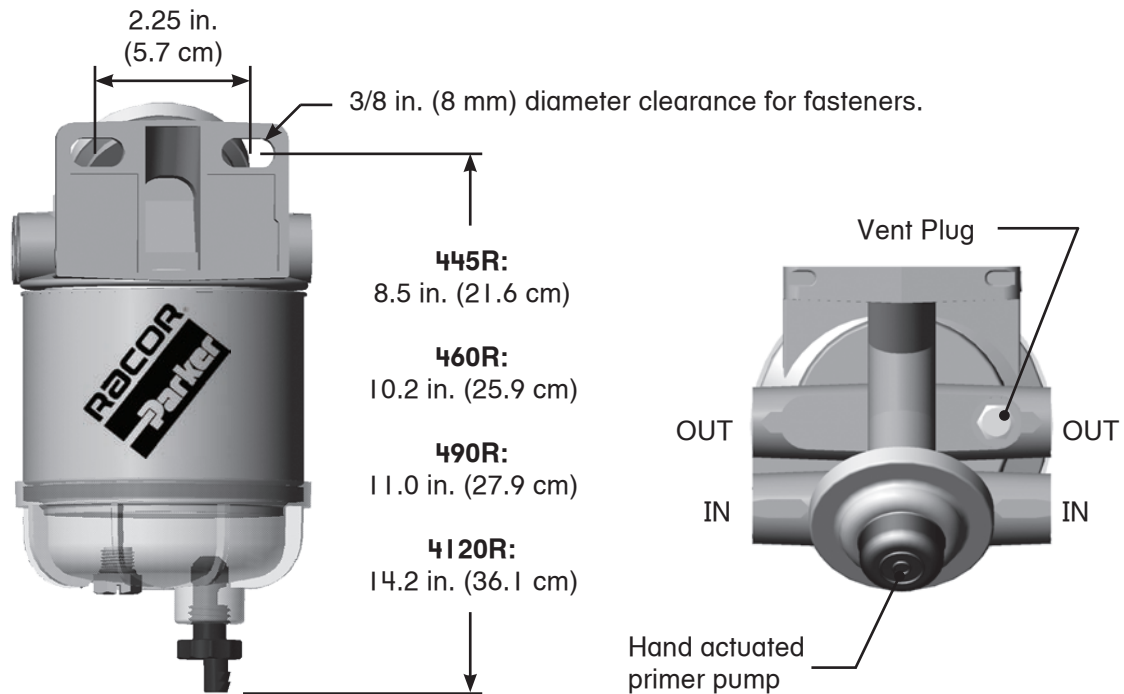
**R47S Dual Media Filter**



# Mobile Fuel Filtration

## 400 Series

### Mounting Information



### Installation Instructions

Refer to Mounting Instructions and Installation Diagram and install as follows:

1. Make sure engine is off and cool to touch.
2. 445R, 460R and 490R: Apply thread sealant to NPT fittings (do not use thread tapes as particles may break off and contribute to clogging element). 4120R: Apply motor oil or diesel fuel to O-ring on UNF fittings.
3. Thread fittings into appropriate fuel ports and tighten snugly. Plug unused ports (if any) with port plugs and tighten snugly.
4. Mount filter vertically in a protected area and away from heat sources. Maintain at least 2.0" (5.1 cm) of clearance below filter for draining water and servicing element.
5. Attach fuel lines to filter. Avoid tight bends and rubbing areas when routing hose.
6. Connect water probe and heater wires (if equipped).
7. Open vent plug and operate hand primer pump until fuel purges from vent.
8. Close vent plug and start engine. Correct as necessary with engine off.

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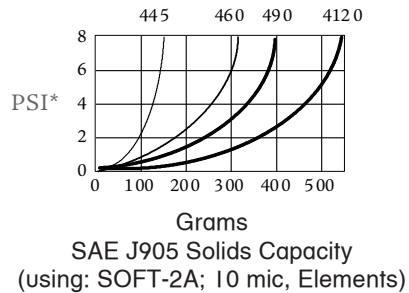
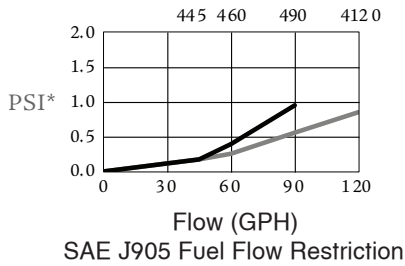
Technical Support:  
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racortech@parker.com

## 400 Series

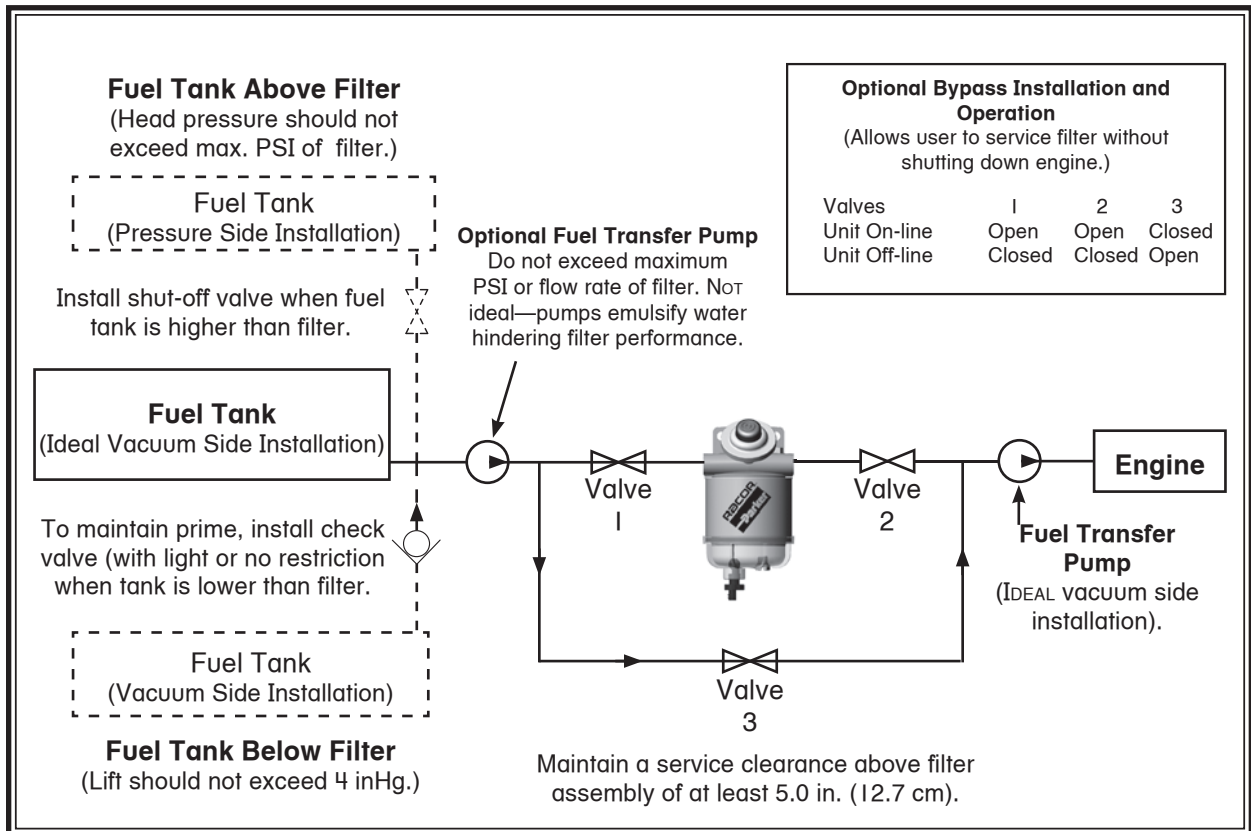
### Test Data

(Test results are from controlled laboratory testing. Field results may vary.)

\*PSI X 2.036 = inHg. (PSI X 6.895 = kPa)



### Installation Diagram



Installation diagram applies to all 400 Series filters. Model 445R shown above. Racor offers hose and fittings to complete this installation - see Accessories.

# Mobile Fuel Filtration

## 400 Series

### Service Instructions

Element replacement frequency is determined by contamination level in fuels. Fuel flow to engine becomes restricted as element gradually plugs with contaminants, resulting in noticeable power loss and/or hard starting. As a guideline, change element every 500 hours, 10,000 miles, every other oil change, annually, or at first indication of power loss, whichever occurs first. Always carry extra replacement elements as one tankful of excessively dirty fuel can quickly plug a filter.

1. Make sure engine is off and cool to touch.
2. Close all fuel valves, if applicable, to make sure excess fuel does not spill during servicing.
3. Disconnect water probe and heater connectors, if equipped.
4. Open vent plug on mounting head.
5. Drain unit of fuel.
6. Remove bowl and element. Dispose element properly. Bowl is reusable.
7. Lubricate new element seals with motor oil or clean fuel and install only with new element.
8. Re-install bowl and tighten by hand only - do not use tools.
9. Connect water probe and heater connectors, if equipped.
10. Open all fuel valves, if applicable.
11. Operate hand primer pump until fuel purges from vent.
12. Close vent plug and start engine. Correct as necessary with engine off.

#### Draining the Collection Bowl

Water is heavier than fuel and will settle to bottom of bowl and appear different in color if collected in a clear jar. In high humidity environments, check bowl frequently (daily if a poor fuel source is

suspected). 400 Series bowls are equipped with a water sensor port that will accept a water probe (sold separately) and will alert operator of a high water condition in the filter.

**Do NOT** use water probe electronics in gasoline applications - an explosion could occur.

1. Make sure engine is off and cool to touch.
2. Open vent plug.
3. Drain water from filter by opening self-venting drain. Close as soon as all water has evacuated.

If drain is open too long, the entire filter may drain completely of water and fuel

4. Follow priming instructions.

#### Priming Instructions

1. Prime filter by operating hand primer pump until fuel spills out of vent port.
2. Close vent plug snugly.
3. Verify all other connections are tight.
4. Start engine and check for leaks. Correct as necessary with engine off.

## Trouble Shooting

If a 400 Series filter fails to hold prime, first check vent plug, drain valve, fittings, head, element and bowl are properly tightened. Next, check fuel line connections and verify that they are free of pinches or unnecessary bends and check to see if fuel tank strainer (or pick-up tube) is clogged. If problems persist and element is new, call Racor Technical Support at the number listed below.

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Technical Support:  
800.344.3286 ext. 7555  
racortech@parker.com

## Replacement Parts

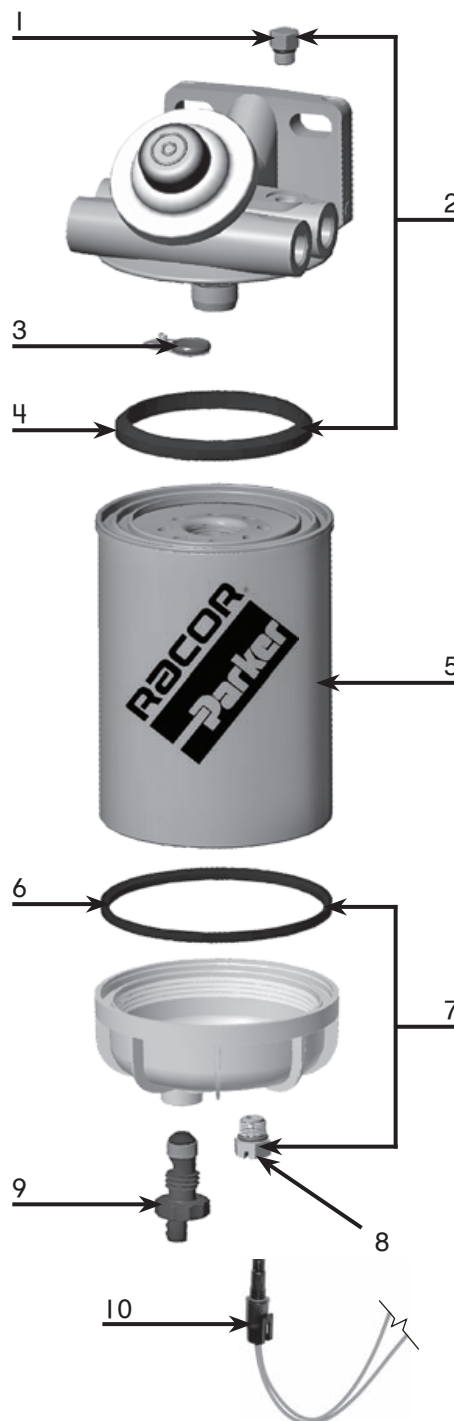
445R, 460R and 490R

Part Number	Description
1. <b>RK10110</b>	Metal Vent Plug Kit (3/8"-24 SAE)
2. <b>RK22425</b>	Mounting Head Kit (3/8"-18 NPTF) (includes head, #1, #3 and #4)
<b>RK22168-05BP</b>	Mounting Head Kit (16 mm X 1.5) (includes same as RK22425)
3. <b>RK22798</b>	Bypass Valve Kit
4. <b>RK22998</b>	Element Gasket Kit
5.	See Replacement Element Chart
6. <b>RK22333</b>	Bowl Gasket Kit
7. Replacement Bowl Kits (includes bowl #6, #8 and #9)	
<b>RK21113-13-11</b>	Clear Bowl Kit
<b>RK22616-01<sup>1</sup></b>	Heated Clear Bowl Kit (same as above, 12 vdc heater)
<b>RK22616-02<sup>1</sup></b>	Heated Clear Bowl Kit (same as above, 24 vdc heater)
8. <b>RK20126</b>	Plug Kit (1/2"-20 SAE)
9. <b>RK30476</b>	Self-Venting Drain Kit
10. <b>RK30964<sup>2</sup></b>	Water Probe Kit
Additional Parts (not shown)	
<b>RK22323<sup>1</sup></b>	Heater Connector Kit
<b>22209</b>	Installation Instructions

<sup>1</sup> In-bowl heater may require a Heater Relay Kit. Power requirements (maximum) are: 12 vdc = 16.6 amps, 24 vdc = 8.3 amps.

<sup>2</sup> Water probe must be used with a Water Detection Kit - see Accessories. Do not use on gasoline applications.

## 400 Series



# Mobile Fuel Filtration

## 400 Series

### Replacement Parts

#### 4120R

Part Number	Description
1. <b>RK10110</b>	Metal Vent Plug Kit (3/8"-24 SAE)
2. <b>RK22168</b>	Mounting Head Kit (3/4"-16 SAE) (includes head, #1, #3 and #4)
3. <b>RK22998</b>	Element Gasket (includes #3 and #6)
4. <b>RK22798</b>	By-Pass Valve Kit
5. Replacement Elements:	
<b>RI20S</b>	2 micron
<b>RI20T</b>	10 micron
<b>RI20P</b>	30 micron
6. <b>RK22998</b>	Bowl O-ring
7. Replacement Bowl Kits (includes bowl #6, #8 and #9)	
<b>RK30063</b>	Clear Bowl Kit
<b>RK30900</b> <sup>1</sup>	Heated Clear Bowl Kit (same as above, 12 vdc heater)
<b>RK30925</b> <sup>1</sup>	Heated Clear Bowl Kit (same as above, 24 vdc heater)
8. <b>RK20126</b>	Plug Kit (1/2" SAE)
9. <b>RK30476</b>	Self-Venting Drain Kit
10. <b>RK30964</b> <sup>2</sup>	Water Probe Kit

#### Additional Parts (not shown)

**22209** Installation Instructions

<sup>1</sup> In-bowl heater may require a Heater Relay Kit. Power requirements (maximum) are: 12 vdc = 16.6 amps and 24 vdc = 8.3 amps - see Accessories.

<sup>2</sup> Water probe must be used with a Water Detection Kit - see Accessories. Do not use on gasoline applications.

