

# FBO-MA

## FBO Fuel Filter/Water Separator For High-Flow Marine Applications



FBO-10-MA and FBO-14-MA filter assemblies were designed to meet the toughest conditions and offer ease of filter cartridge changeouts. The FBO assembly can flow from 5 GPM (19 LPM) to 75 GPM (284 LPM), depending on which model, filter, and type of fuel to be filtered.

The assembly features a locking ring collar that attaches the filter housing to the aluminum diecast filter head with four bolts and metal hand knobs for ease of maintenance. No wrenches or other special tools are required, allowing one person to easily change the filter.

These versatile fuel filter/water separator assemblies have three filter options to meet various requirements; the fuel/water separator, silicone treated microfilters, and absorptive filters.



### Contact Information

Parker Hannifin Corporation  
**Racor Division**  
P.O. Box 3208  
3400 Finch Road  
Modesto, CA 95353

phone 800 344 3286  
209 521 7860  
fax 209 529 3278  
racor@parker.com

www.racorcustomers.com  
www.parker.com/racor

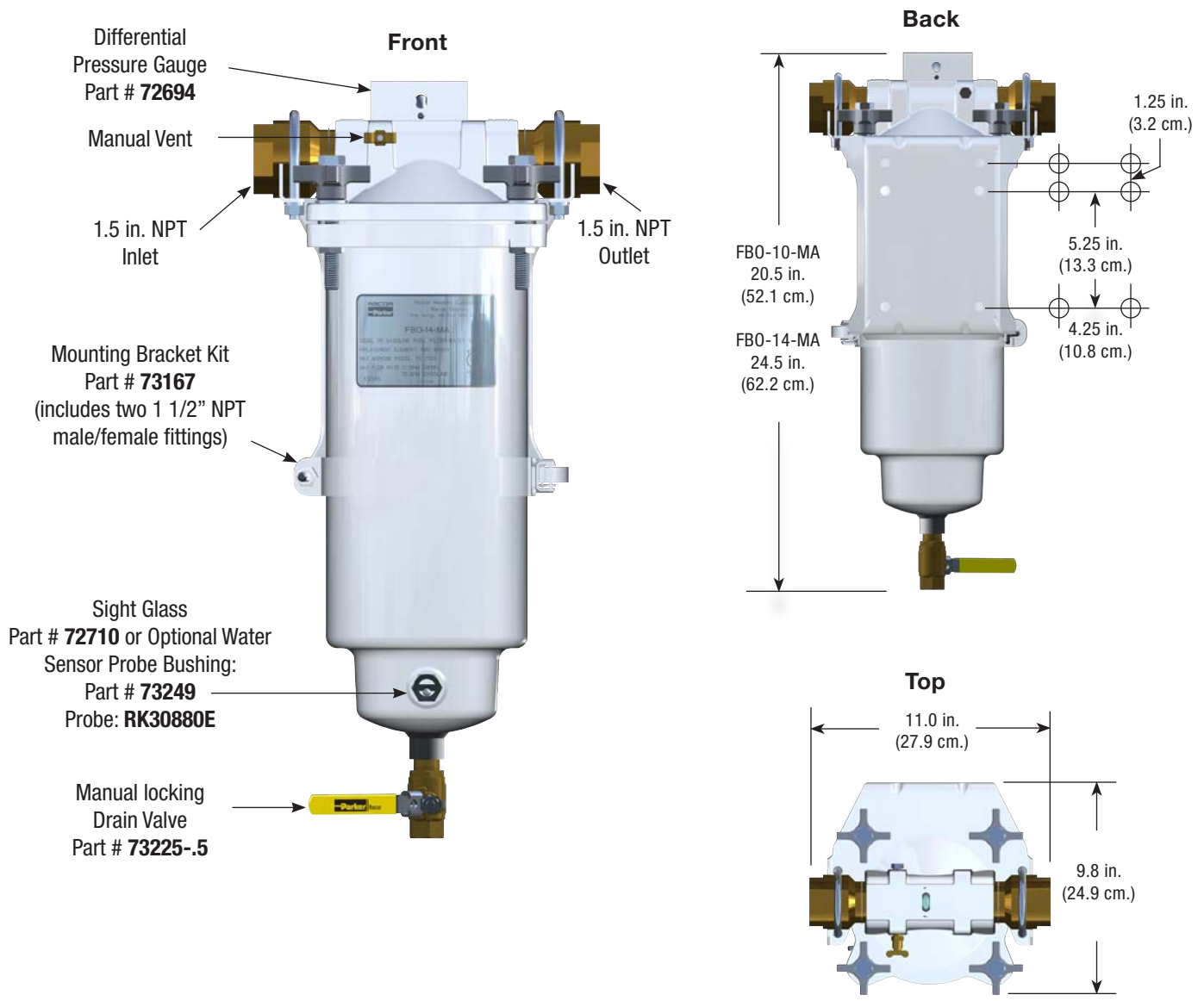
### Product Features

- UL Listed
- Die-cast aluminum head
- Steel filter bowl assembly
- Powder coated components
- Locking ring collar - no V-clamps
- 1.5" NPT inlet/outlet ports
- Designed to withstand 150 PSI maximum pressure at 240°F
- Maximum operating temperature 170°F
- Manual drain valve
- Manual vent valve
- Sight Glass



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# Overview



Specifications	Maximum Flow Rates			Clean Delta P	Change Delta P
	Diesel	Gasoline	Kerosene		
<b>FB0-10-MA</b>					
Microfilter	25 GPM (94.6 LPM)	53 GPM (200.6 LPM)	35 GPM (132 LPM)	2.5 PSID	15 PSID
Filter Separator	20 GPM (75.7 LPM)	32 GPM (121.1 LPM)	21 GPM (79 LPM)	2.5 PSID	15 PSID
Absorber	20 GPM (75.7 LPM)	45 GPM (170.3 LPM)	35 GPM (132 LPM)	2.5 PSID	30 PSID
<b>FB0-14-MA</b>					
Microfilter	30 GPM (113.6 LPM)	75 GPM (284 LPM)	50 GPM (189 LPM)	2.5 PSID	15 PSID
Filter Separator	25 GPM (94.6 LPM)	45 GPM (170 LPM)	30 GPM (114 LPM)	2.5 PSID	15 PSID
Absorber	25 GPM (94.6 LPM)	70 GPM (265.0 LPM)	55 GPM (208.2 LPM)	2.5 PSID	30 PSID

# Replacement Filters

Filters are used to protect the OEM supplied fuel system.

## Water Separator

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

## Silicone Treated

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

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

## Water Absorber

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



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

Parker Hannifin Corporation  
**Filtration Group**  
**Global Headquarters**  
 6035 Parkland Boulevard  
 Cleveland, OH 44124-4141  
 T 216 896 3000, F 216 896 4021  
[www.parker.com](http://www.parker.com)

**North America**  
**Compressed Air Treatment**  
**Filtration & Separation/Balston**  
 242 Neck Road  
 Haverhill, MA 01835-0723  
 T 978 858 0505, F 978 858 0625  
[www.parker.com/balston](http://www.parker.com/balston)

**Filtration & Separation/Finite**  
 500 Glaspie Street, PO. Box 599  
 Oxford, MI 48371-5132  
 T 248 628 6400, F 248 628 1850  
[www.parker.com/finitefilter](http://www.parker.com/finitefilter)

**Purification, Dehydration and Filtration Division**  
 4087 Walden Avenue  
 Lancaster, NY 14086  
 T 716 685 4040, F 716 685 1010  
[www.airtek.com](http://www.airtek.com)

Sales Office  
 5900-B Northwoods Parkway  
 Charlotte, NC 28269  
 T 704 921 9303, F 704 921 1960  
[www.domnickhunter.com](http://www.domnickhunter.com)

**Engine Filtration & Water Purification**  
**Racor**  
 3400 Finch Road, PO Box 3208  
 Modesto, CA 95353  
 T 209 521 7860, F 209 529 3278  
[www.parker.com/racor](http://www.parker.com/racor)  
[www.parker.com/racorproducts](http://www.parker.com/racorproducts)  
[www.racorcustomers.com](http://www.racorcustomers.com)

**Racor**  
 850 North West St., PO Box 6030  
 Holly Springs, MS 38635  
 T 662 252 2656, F 662 274 2118

**Racor**  
 302 Parker Drive  
 Beaufort, SC 29906  
 T 843 846 3200, F 843 846 3230

**Racor -- Village Marine Tec.**  
 2000 West 135th Street  
 Gardena, CA 90249  
 T 310 516 9911, F 310 538 3048  
[www.villagemarine.com](http://www.villagemarine.com)

**Hydraulic Filtration**  
**Hydraulic Filter**  
 16810 Fulton County Road #2  
 Metamora, OH 43540-9714  
 T 419 644 4311, F 419 644 6205  
[www.parker.com/hydraulicfilter](http://www.parker.com/hydraulicfilter)

**Process Filtration**  
**Process Advanced Filtration**  
 2340 Eastman Avenue  
 Oxnard, CA 93030  
 T 805 604 3400, F 805 604 3401  
[www.parker.com/processfiltration](http://www.parker.com/processfiltration)

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**Europe**  
**Compressed Air Treatment**  
**domnick hunter Industrial**  
 Dukesway, Team Valley Trading Estate  
 Gateshead, Tyne & Wear  
 England NE11 0PZ  
 T +44 (0) 191 402 9000,  
 F +44 (0) 191 482 6296  
[www.domnickhunter.com](http://www.domnickhunter.com)

**Hiross Zander**  
**Padova Business Unit**  
 Strada Zona Industriale 4  
 35020 S. Angelo di Piove Padova, Italy  
 T +39 049 9712 111, F +39 049 9701 911  
[www.dh-hiross.com](http://www.dh-hiross.com)

**Hiross Zander**  
**Essen Business Unit**  
 Zander Aufbereitungstechnik GmbH  
 Im Teelbruch 118  
 D-45219 Essen, Germany  
 T +49 2054 9340, F +49 2054 934164  
[www.zander.de](http://www.zander.de)

**Parker Gas Separations**  
 Oude Kerkstraat 4  
 P O Box 258  
 4870 AG Etten- Leur, Netherlands  
 T +31 76 508 5300, F +31 76 508 5333

**Engine Filtration & Water Purification**

**Racor**  
 Shaw Cross Business Park  
 Churwell Vale Dewsbury,  
 WF12 7RD England  
 T +44 (0) 1924 487000,  
 F +44 (0) 1924 487038  
[www.parker.com/rfde](http://www.parker.com/rfde)

**Racor Research & Development**  
 Parker Hannifin GmbH & Co KG  
 Inselstrasse 3 – 5  
 70327 Stuttgart Germany  
 T +49 (0)711 7071 290-0,  
 F +49 (0)711 7071 290 -70  
[www.parker.com/racor](http://www.parker.com/racor)

**Hydraulic Filtration**  
**Hydraulic Filter**  
 Stieltjesweg 8, 6827 BV  
 P.O. Box 5008 6802 EA  
 Arnhem, Holland  
 T +31 26 3760376, F +31 26 3643620  
[www.parker.com/eurofilt](http://www.parker.com/eurofilt)

**Urjala Operation**  
 Salmentie 260  
 31700 Urjala as Finland  
 T +358 20 753 2500, F +358 20 753 2501  
[www.parker.com/fi](http://www.parker.com/fi)

**Condition Monitoring Center**  
 Brunel Way Thetford,  
 Norfolk IP 24 1HP England  
 T +44 1842 763299, F +44 1842 756300  
[www.parker.com/cmc](http://www.parker.com/cmc)

**Process Filtration**  
**domnick hunter Process**  
 Durham Road, Birtley Co. Durham,  
 DH3 2SF England  
 T +44 (0) 191 410 5121,  
 F +44 (0) 191 410 5312  
[www.domnickhunter.com](http://www.domnickhunter.com)

**Asia Pacific**  
**Australia**  
 9 Carrington Road, Castle Hill  
 NSW 2154, Australia  
 T +61 2 9634 777, F +61 2 9899 6184  
[www.parker.com/australia](http://www.parker.com/australia)

**China**  
 280 YunQiao Road  
 JinQiao Export Processing Zone  
 Shanghai 101206 China  
 T +86 21 5031 2525, F +86 21 5834 3714  
[www.parker.com/china](http://www.parker.com/china)

**India**  
 Plot EL 26, MIDC, TTC Industrial Area  
 Mahape, Navi Mumbai 400 709 India  
 T +91 22 5613 7081, 82, 83, 84, 85  
 F +91 22 2768 6618 6841  
[www.parker.com/india](http://www.parker.com/india)

**Japan**  
 626, Totsuka-cho, Totsuka-ku  
 Yokohama-shi, 244-0003 Japan  
 T +81 45 870 1522, F +81 45 864 5305  
[www.parker.com/japan](http://www.parker.com/japan)

**Korea**  
 1-C Block, Industrial Complex of Jangan,  
 615-1, Geumui-Ri Jangan-Myeon,  
 Hwaseong-City Gyeonggi-Do, Korea  
 T +82 31 359 0771, F +82 31 359 0770  
[www.parker.com/korea](http://www.parker.com/korea)

**Singapore**  
 11, Fourth Chin Bee Road  
 Singapore 619 702  
 T +65 6887 6300, F +65 6261 4929  
[www.parker.com/singapore](http://www.parker.com/singapore)

**Thailand**  
 1023 3rd Floor, TPS Building  
 Pattanakam Road, Suanluang,  
 Bangkok 10250 Thailand  
 T +66 2717 8140, F +66 2717 8148  
[www.parker.com/thailand](http://www.parker.com/thailand)

**Latin America**  
**Parker Comercio Ltda.**  
**Filtration Division**  
 Estrada Municipal Joel de Paula  
 900 Eugenio de Melo,  
 Sao Jose dos Campos  
 CEP 12225390 SP Brazil  
 T +55 12 4009 3500, F +55 12 4009 3529  
[www.parker.com/br](http://www.parker.com/br)

**Pan American Division - Miami**  
 7400 NW 19th Street, Suite A  
 Miami, FL 33128  
 T 305 470 8800 F 305 470 8808  
[www.parker.com/panam](http://www.parker.com/panam)

**Africa**  
**Parker Hannifin Africa Pty Ltd**  
 Parker Place, 10 Berne Avenue,  
 Aeroport Kempton Park,  
 1620 South Africa  
 T +27 11 9610700, F +27 11 3927213  
[www.parker.com/eu](http://www.parker.com/eu)



# Marine Fuel Filtration

## Marine FBO

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The Racor Marine FBO assembly is specifically designed to meet the filtration requirements of today's high pressure common rail diesel injection systems. The unit is used for fuel dispensing pumps or as a primary fuel filter/water separator on large diesel engine applications.

Racor's new FBO-10-MA and FBO-14-MA filter assemblies were designed to meet the toughest conditions and offer ease of filter changeouts. The FBO assembly can flow from 10 GPM (38 LPM) to 75 GPM (284 LPM), depending on which model, the element, and the type of fuel to be filtered.

The assembly features a "locking ring collar", which attaches the filter housing to the aluminum die cast filter head with four bolts. The slotted "locking ring collar" allows maintenance personnel to hand loosen the four collar bolts, rotate, and lower the bowl assembly for element changeouts.

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

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

### Features:

- Standard Differential Pressure Gauge
- Optional Water Sight Glass with Bowl
- Standard Mounting Bracket
- Optional Water Sensor Available



FBO-14



**Parker Hannifin Corporation**  
Racor Division, PO Box 3208  
Modesto, CA 95354 USA  
Phone: 800.344.3286  
Fax: 209.529.3278  
E-mail: [racor@parker.com](mailto:racor@parker.com)  
[www.parker.com/racor](http://www.parker.com/racor)

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# Marine Fuel Filtration

## Marine FBO

Specifications	Maximum Flow Rates			Clean	Change
	Diesel	Gasoline	Kerosene	Delta P	Delta P
<b>FBO-10-MA</b>					
Microfilter	18 GPM (38 LPM)	52.5 GPM (199 LPM)	35 GPM (132 LPM)	< 2 PSID	15 PSID
Filter Separator	10 GPM (38 LPM)	31.5 GPM (119 LPM)	21 GPM (79 LPM)	< 2 PSID	15 PSID
Absorber	10 GPM (38 LPM)	31.5 GPM (119 LPM)	21 GPM (79 LPM)	< 2 PSID	15 PSID
<b>FBO-14-MA</b>					
Microfilter	25 GPM (95 LPM)	75 GPM (284 LPM)	50 GPM (189 LPM)	< 2 PSID	15 PSID
Filter Separator	15 GPM (57 LPM)	45 GPM (170 LPM)	30 GPM (114 LPM)	< 2 PSID	15 PSID
Absorber	15 GPM (57 LPM)	45 GPM (170 LPM)	30 GPM (114 LPM)	< 2 PSID	15 PSID

Element Chart	Micron Rating	FBO-10-MA (6 X 10 Element)	FBO-14-MA (6 X 14 Element)
Filter Separator	1	FBO-60327	FBO-60336
	5	FBO-60328	FBO-60337
	10	FBO-60353	FBO-60356
	25	FBO-60329	FBO-60338
Microfilter	1	FBO-60330	FBO-60339
	5	FBO-60331	FBO-60340
	10	FBO-60356	FBO-60357
	25	FBO-60332	FBO-60341
Absorptive Filter	1	FBO-60333	FBO-60342
	5	FBO-60334	FBO-60343
	10	FBO-60355	FBO-60358
	25	FBO-60335	FBO-60344



**RACOR**®

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

# Marine Fuel Filtration

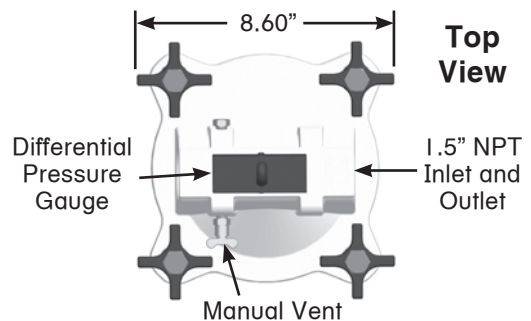
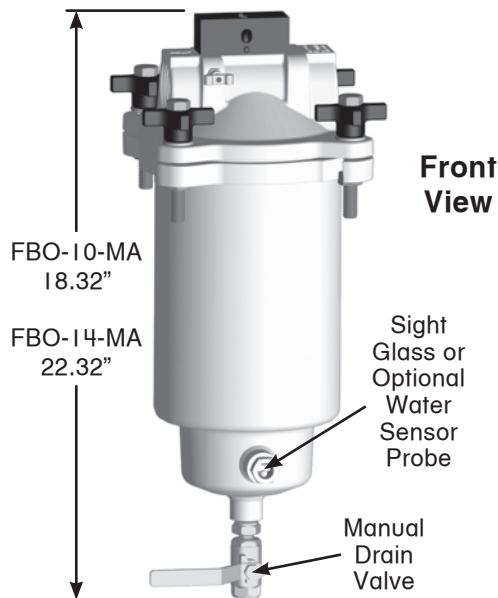
## Marine FBO

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### How to Order

FBO	-10	-14	-MA
Basic Unit 1.5" NPT Inlet & Outlet Ports	add <b>-10</b> For a 6x10 in. element and flow rate of 10-52 GPM	add <b>-14</b> for a 6x14 in. element and flow rate of 15-75 GPM	add <b>-MA</b> for marine Assembly

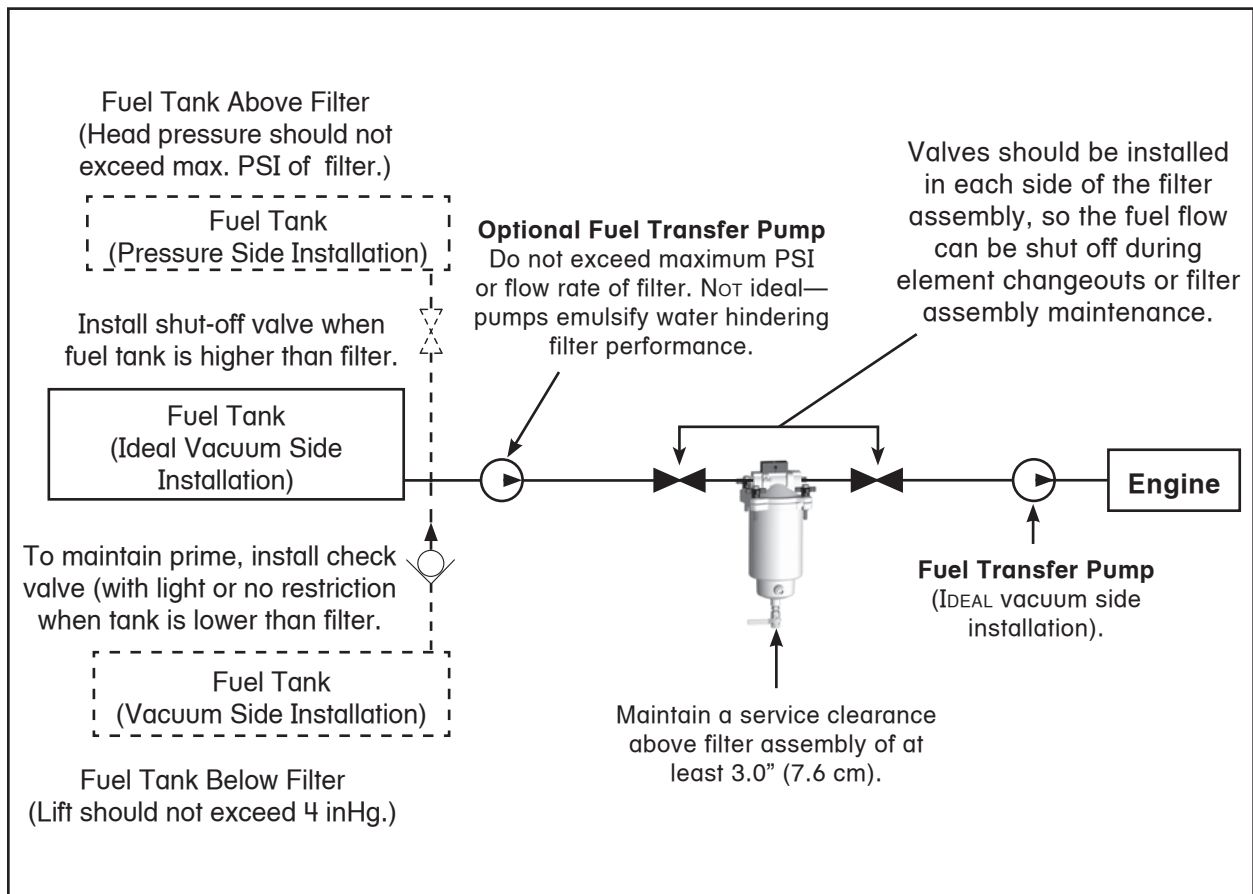
### Mounting Information



# Marine Fuel Filtration

## Marine FBO

### Installation Diagram



**RACOR**

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

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# Marine Fuel Filtration

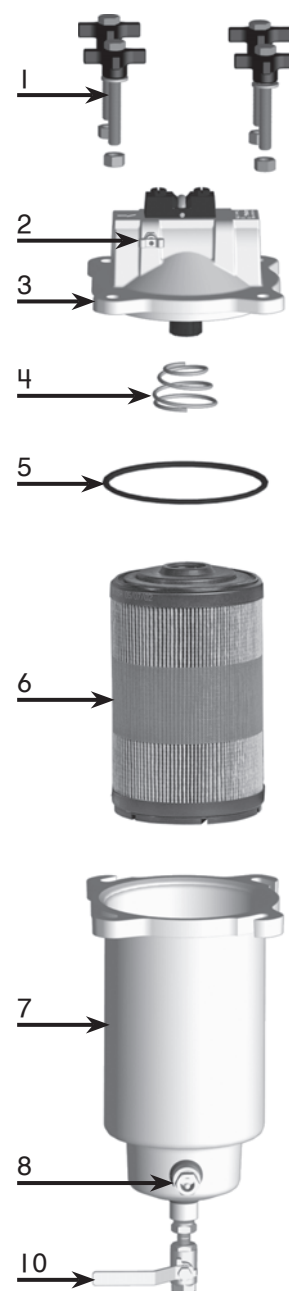
## Marine FBO

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### Replacement Parts

#### FBO-10-MA & FBO-14-MA

	<u>Part Number</u>	<u>Description</u>
1.	<b>72712</b>	Handle Assembly
2.	<b>72695</b>	Pet Cock Assembly
3.	<b>73152</b>	Head Kit (1.5" NPT Ports)
4.	<b>72368</b>	Spring
5.	<b>72699</b>	O-ring
6.	Replacement Elements (see element chart)	
	<b>FBO-10-MA</b>	Use a (6"x10") Element
	<b>FBO-14-MA</b>	Use a (6"x14") Element
7.	<b>73154</b>	FBO-10-MA Housing Assembly
	<b>73155</b>	FBO-14-MA Housing Assembly
8.	<b>72710</b>	Sight Glass Assembly (.5" NPT)
9.	<b>RK21069</b>	Water Sensor
10.	<b>71943-.25</b>	Ball Valve



# RK23191 and RK23191-01 Steel (WIF) Probe

Marine Type Approved For All Vessels

Instruction Part Number 14455 Rev -



This kit includes one water-in-fuel (WIF) probe and one connector harness.

The WIF is of rugged construction, designed to be used in marine machinery spaces that must conform to International Marine Organization (IMO) standards. This WIF is American Bureau of Shipping (ABS) certified for use aboard ABS classed vessels and may be acceptable under other International Association of Classification Societies (IACS) members.

In use, when the collected water level within the Racor filter bowl/sump rises to the height of the probe tip, a Racor Water Detection Amplifier (ordered separately) will detect the change in electrical resistance (ohms) of the fluid.

When this happens, the Amplifier will alert the operator that draining of the Racor is required.

This WIF may be used with all Racor Water Detection Amplifiers and the following Racor filter models: Turbine Series, Spin-on Series, DFBO, FBO and 800 Series.



## Contact Information: Product Features:

Parker Hannifin Corporation  
**Racor Division**  
P.O. Box 3208  
3400 Finch Road  
Modesto, CA 95353

phone 800 344 3286  
209 521 7860

fax 209 529 3278  
racor@parker.com

parker.com/racor

- ABS Marine Type Approved, Cert. #11-HS800012-PDA.
- UL Marine Listed, 168Y.
- Meets requirements of ISO19921 fire resistance test.
- 303 Stainless Steel and Ceramic construction.
- SAEJ1926 Straight thread with O-ring sealing design.
- Fluorocarbon (FKM) O-ring for durable service life.
- Detachable Packard GT-Series 2-terminal connector.
- 36" long 18AWG yellow/black wires (no polarity) (RK23191).
- 8" long 18AWG yellow/black wires (no polarity) harness with Deutsch DT04-3P connector (RH23191-01).

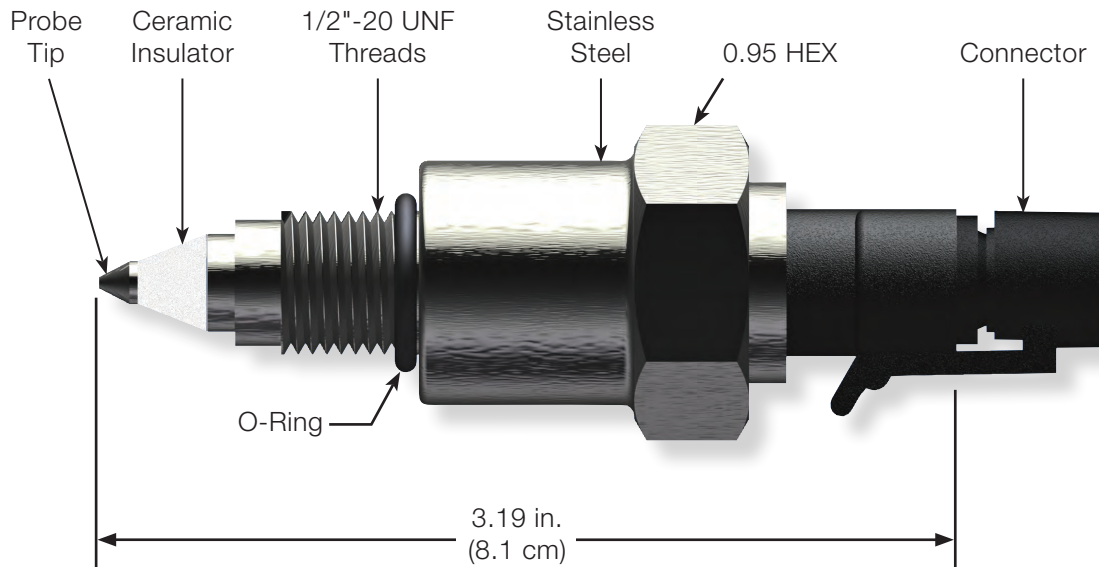


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# Technical Information

Specifications	RK23191	RK23191-01
Volts	12 or 24	12 or 24
Wire Length	36.0 in. (83.8 cm)	8.0 in. (20.3 cm)
Internal Resistor	None	None
Mating Connector	None	Deutsch DT04-3P

# Mounting Information



# Installation Guidelines

**Note:** When installing the WIF in a DFBO, FBO, or 800 Series model, the use of a thread adapter (73249) is required. Apply thread paste to the male threads and install the adapter into the housing port. Tighten adequately and then continue.

1. The WIF is installed in Turbine Series or Spin-on Series contaminant collection bowls by removing the existing probe port plug. This plug will have 1/2"-20 straight threads and an o-ring will be present.
2. Clean the sealing gland of the port with a clean cloth to remove any debris.
3. Apply silicone grease or clean diesel fuel to the WIF O-ring.
4. Install the WIF into the port and tighten to 90 inch pounds (10 newton/m) max.
5. Refer to the instructions provided with the Racor Water Detection Amplifier to complete the wiring procedure.

**Note:** The WIF is passive so it has no polarity (no hot or ground) but you may use the black wire as the 'ground' and the 'yellow' wire for the signal wire, just to make it easier to hook the WIF up to your Amplifier wiring diagram. Use cable tie-wraps to secure the wires away from moving or hot surfaces.

6. Ensure the final connection of the harness to the WIF connector housing is made prior to testing the system.

## Water Detection Modules & Kits

Part Number	Description	Voltage
RK 12870	Under-dash Water Detection Module Light and sound when water is detected. Water must be drained to reset light and stop horn. Plastic enclosure measures: 1.38" square x 1.25" deep.	12 vdc
RK 12971	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".	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.	12 or 24 vdc
RK 11-1570	2" Gauge Type Water Detector & Filter Restriction Module Includes pre-set vacuum switch (7in.Hg.), connector, and outlet adapter fitting. Red 'DRAIN' or 'CHANGE FILTER' lamp illuminate and horn sounds when water is detected.	12 or 24 vdc
RK 14329	Remote Detection Unit Sends 12 V DC hot (+) signal when water is detected or an input ground signal from 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 mount Same as RK14329 but sends a ground (-) signal. Enclosure size is same as RK 20725, above.	12 vdc



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