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Racor Filter Division Europe

600 Series Spin-on Filters
Technical Bulletin



ENGINEERING YOUR SUCCESS.

Mobile Fuel Filtration - 600 Series

All 600 Series Spin-on fuel filter/water separators feature multiple fuel ports and a built in mounting bracket for installation convenience and flexible mounting.

The 600 Series feature multiple fuel ports with four inlet options and three outlet options. Inlet and outlet threads are available in either metric M16 x 1.5 or 3/8" - 18 NPTF (SAE J476) for the 645R, 660R and 690R and 3/4" - 16 UNF (SAE J1926) for the 6120R. These filter assemblies provide flexibility during mounting to fit any engine application.

Additional 600 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 ratings.

Filtration needs should be based on application, fuel quality, operating climates, and maintenance schedules.

Also included are spin-on water collection bowls. The clear bowl option will not discolour 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 600 Series filters include: water detection kits (for diesel applications only), vacuum or compound gauges and 12 or 24 volt dc fuel heaters.



Multiple fuel ports with four inlet and 3 outlet options.

The best gaskets and o-rings available promise consistent, sure seals.

Polymer bowls are virtually indestructible. They won't discolour from exposure to alcohol, additives or UV light – a see through that stays see-through. A die-cast aluminium bowl is available for most models.

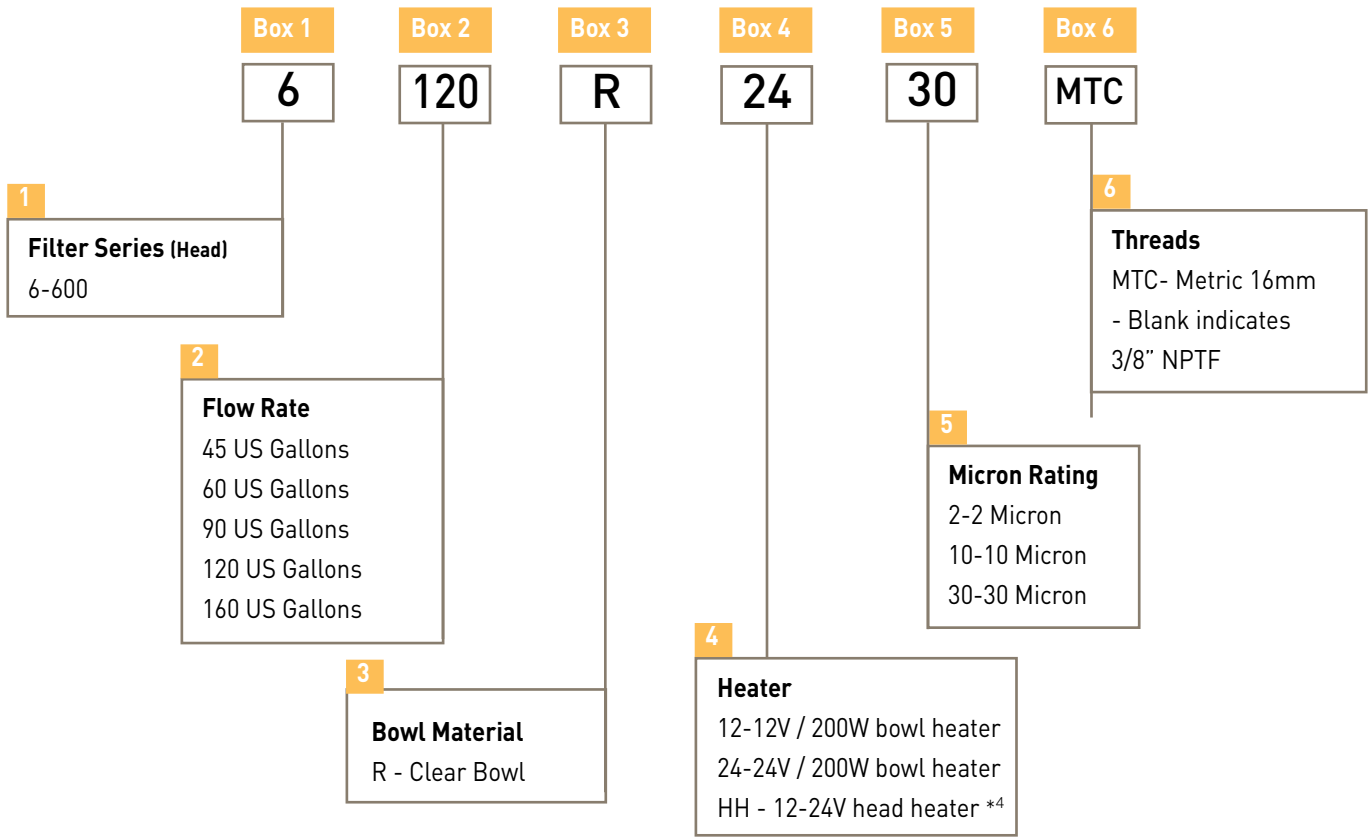
Water sensor and vacuum gauges to signal service are valuable options available for most models.

Aquabloc® II media is pleated, allowing greater surface area exposure for fuel filtration and an increased dirt-holding capacity.

Positive seal self-venting drain eliminates leaks and speeds service.



Diesel and Petrol Spin-On Series - 600 Series



Model	645	660	690	6120
Maximum Flow Rate	170 L/hr (45 G/hr)	227 L/hr (60 G/hr)	341 L/hr (90 G/hr)	454 L/hr (120 G/hr)
Port Size	M16 x 1.5 - 3/8NPTF	M16 x 1.5 - 3/8NPTF	M16 x 1.5 - 3/4SAE	M16 x 1.5 - 3/4SAE
No. of Ports	7	7	7	7
Total Inlets	4	4	4	4
Total Outlets	3	3	3	3
Centre Threads	1"-14	1"-14	1"-14	1"-14
Height mm	216	259	284	358
Depth mm	114	114	114	114
Width mm	114	114	114	114
Weight Kg	1.07	1.17	1.2	1.8
Maximum Pressure Bar *1	2.07	2.07	2.07	2.07
Available Options*2	Water Sensor and Heater available for all models			
Bowl Capacity	Water capacity = 118ml, with heater = 104ml for all models			
Water Removal Efficiency	99%			
Operating Temperature	-40o to +255oF [-40o to +124oC]			

1 Pressure installations are applicable up to maximum PSI shown. Vacuum installations are recommended.

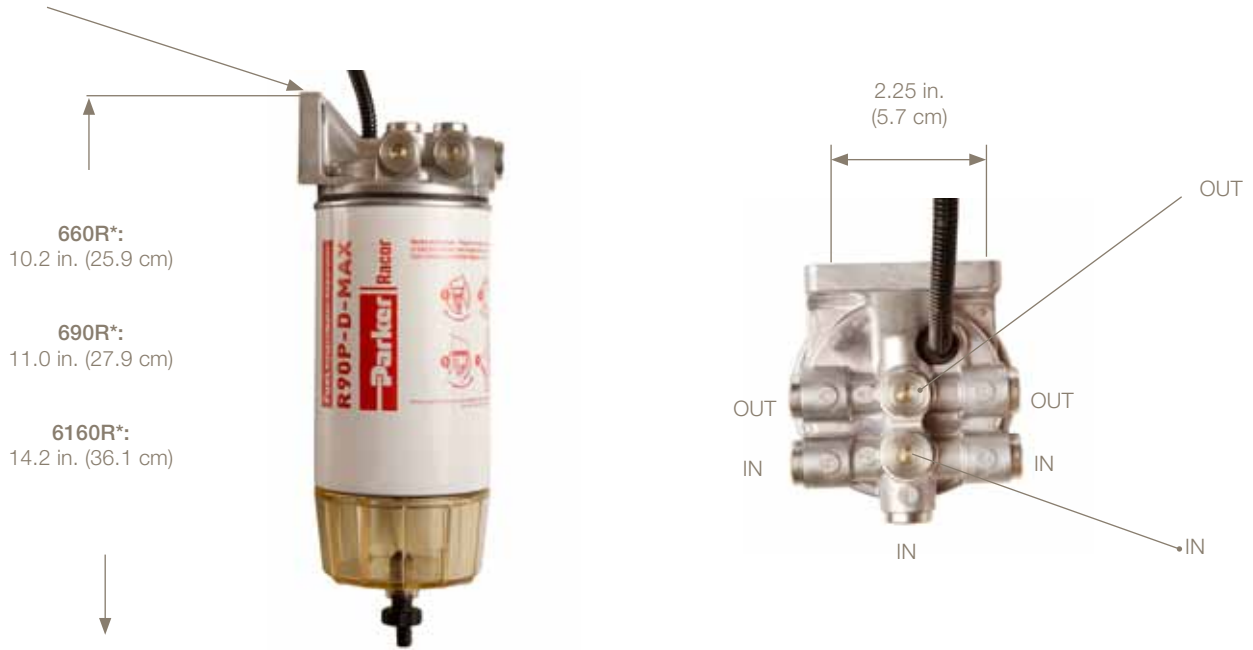
2 Not for use with gasoline applications.

3 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.

4 Head heater models are available in 60, 90 and 160 only and come with M16x1.5 metric ports

Mounting Information

3/8 in. (8 mm) diameter clearance for fasteners.



Installation Instructions

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

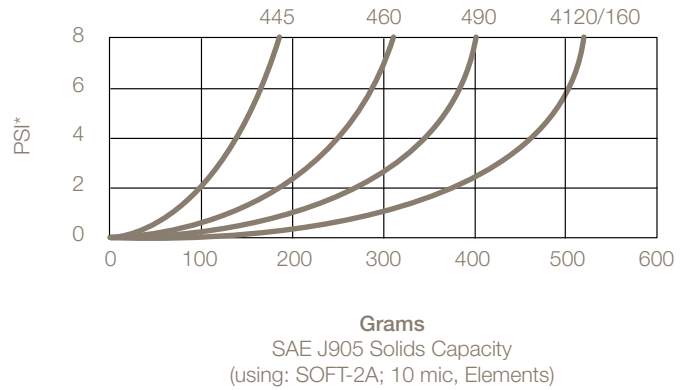
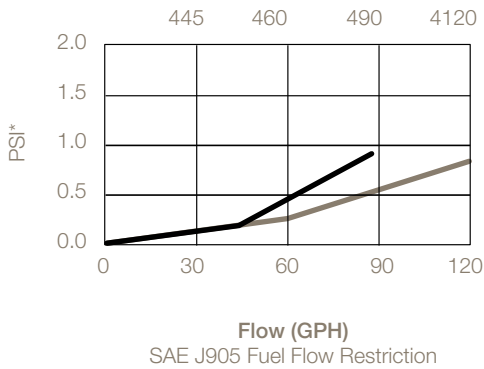
1. Make sure engine is off and cool to touch.
2. Sealing:
 - NPT: Apply thread sealant to NPT fittings (do not use thread tapes as particles may break off and contribute to clogging element).
 - SAE: Apply motor oil or diesel fuel to O-ring on UNF fittings.
 - Metric: Use appropriate fittings with plastic seal or washer.
3. Thread fittings into appropriate fuel ports and manually tighten. Plug unused ports (if any) with port plugs and manually tighten.
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 supplied).
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.



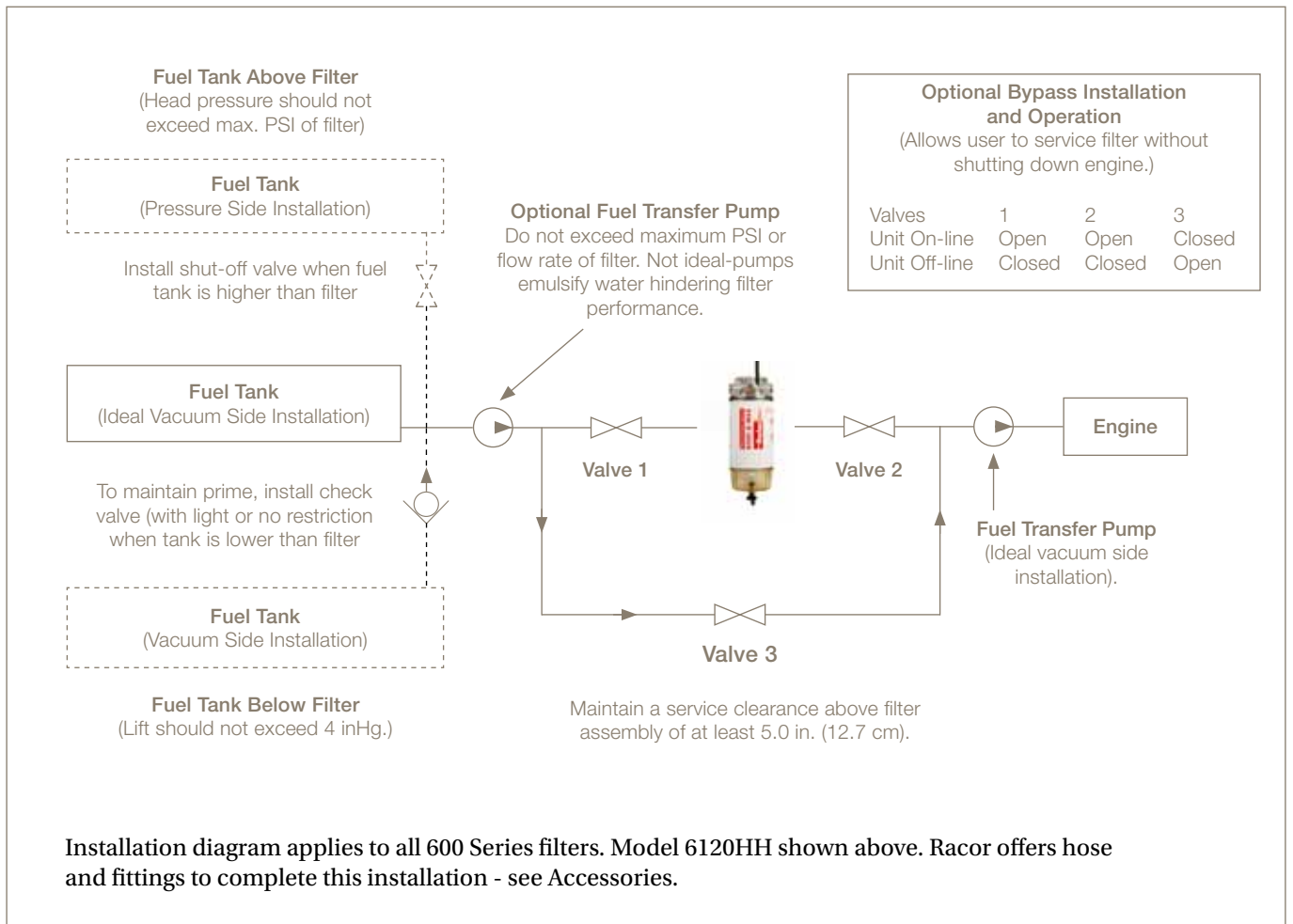
Test Data

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

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



Installation Diagram



Service Instructions

Element replacement frequency is determined by contamination level in fuels.

Fuel flow to engine becomes restricted as element gradually blocks 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 block 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). 600 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 600 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, contact Racor Technical Support:

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Replacement Parts

645R, 660R and 690R		
	Part Number	Description
1	RK22098	Mounting Head Kit (3/8"-18 NPTF) (includes #2, and plug kit 3/8" NPT)
	RK 22423	Mounting Head Kit (M16 X 1.5) (includes same as #2)
2	RK22998	Element Gasket Kit
3	See Replacement Element Chart	
4	RK22333	Bowl Gasket Kit
Replacement Kits		
5	RK21113-13-11 ¹	Clear Bowl Kit
	RK22616-01 ²	Heated Clear Bowl Kit (same as above, 12 vdc heater)
	RK22616-02 ²	Heated Clear Bowl Kit (same as above, 24 vdc heater)
6	RK20126	Plug Kit (1/2"-20 SAE)
7	RK30476	Self-Venting Drain Kit
8	RK30964 ³	Water Probe Kit
	Additional Parts (not shown)	
	01SP-6S	Metal Plug (3/8"NPTF)
	22231	Plug Kit (3/8"NPT)
	RK223231	Heater Connector Kit
22249	Installation Instructions	

¹Includes water probe port plug 1/2" SAE.

²In-bowl heater may require a Heater Relay Kit.

Maximum power requirements are: 12 vdc =16.6 amps, 24 vdc = 8.3 amps.

³ Water probe must be used with a Water Detection Kit

- see Accessories. Do not use on gasoline applications.



Replacement Elements			
Model Number	2 Micron (Final Filtration)	10 Micron (Secondary Filtration)	30 Micron (Primary Filtration)
645R	R45S or R47S	R45T	R45P
660R	R60S	R60T	R60P
690R	R90S	R90T	R90P

Please note: for head heater models the replacement elements available are R60T-D-MAX, R90T-D-MAX, and R160T

Replacement Parts

6120R		
	Part Number	Description
1	RK22098	Mounting Head Kit (3/8"-18 NPTF) includes #2, and plug kit 3/8" NPT)
	RK 22423	Mounting Head Kit (M16 X 1.5) (includes same as #2)
2	RK22998	Element Gasket Kit
Replacement Elements:		
3	R120S	2 micron
	R120T	10 micron
	R120P	30 micron
Replacement Kits		
4	RK 30965	Bowl Gasket Kit
5	RK30063 ¹	Clear Bowl Kit
	RK30900 ²	Heated Clear Bowl Kit (same as above, 12 vdc heater)
	RK30925 ²	Heated Clear Bowl Kit (same as above, 24 vdc heater)
6	RK20126	Plug Kit (1/2" SAE)
7	RK30476	Self-Venting Drain Kit
8	RK30964 ³	Water Probe Kit
	Additional Parts (not shown)	
	01SP-6S	Metal Plug (3/8"NPTF)
	22231	Plug Kit (3/8"NPT)
	RK 30876	Heater Connector Kit
	RK 30058	Drain Valve Seal Kit
	22249	Installation Instructions



¹ Includes water probe port plug 1/2" SAE.

² In-bowl heater may require a Heater Relay Kit.

Maximum power requirements are: 12 vdc =16.6 amps, 24 vdc = 8.3 amps.

³ Water probe must be used with a Water Detection Kit

- see Accessories. Do not use on gasoline applications.

Replacement Parts

660HH		
	Part Number	Description
1	On Request	Mounting head kit M16 x 1.5
2	On Request	Element Gasket
Replacement Elements:		
3	R60T-D-MAX	10 Micron
	R90T-D-MAX	10 Micron
	R160T-D-MAX	10 Micron
4	R60P-D-MAX	30 Micron
	R90P-D-MAX	30 Micron
	R160P-D-MAX	30 Micron
Replacement Kits:		
5	DRK00055	Clear Bowl Kit
6	RK20126	Plug Kit (1/2" SAE)
7	RK30476	Self-Venting Drain Kit
8	RK30964 ¹	Water Probe Kit

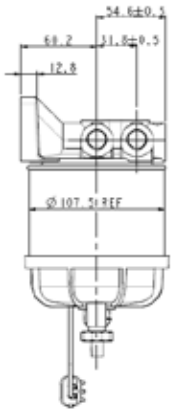
¹ Water probe must be used with a Water Detection Kit - see Accessories. Do not use on gasoline applications.



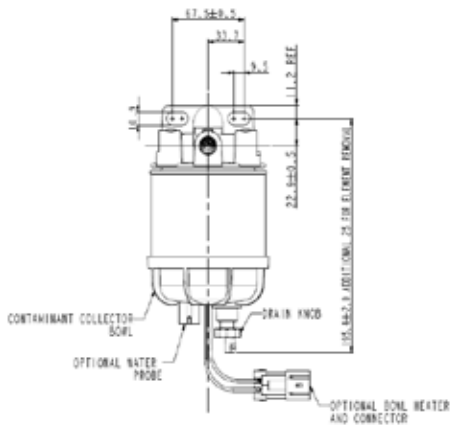
Customer Interface Drawings

645R

Side View

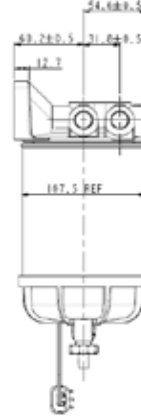


Front View

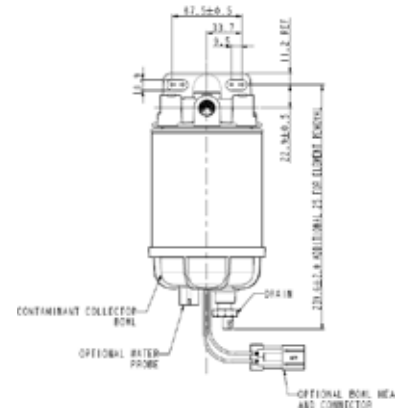


660R

Side View



Front View

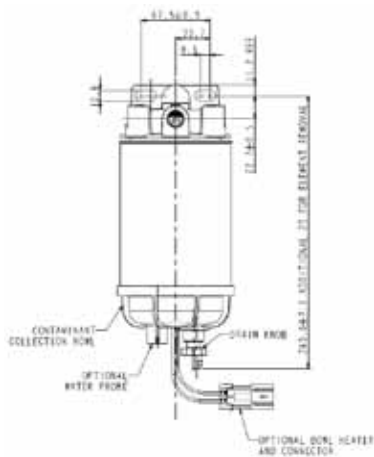


690R

Side View



Front View

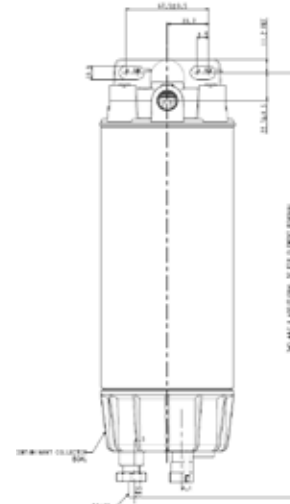


6120R

Side View



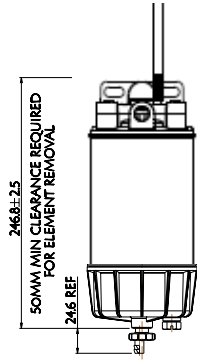
Front View



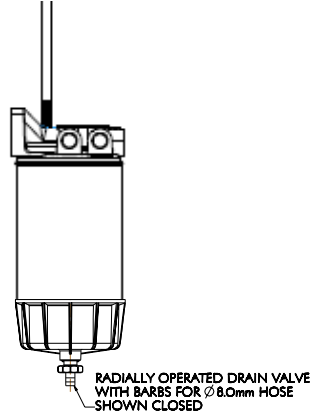
Customer Interface Drawings

660RHH

Front View



Side View

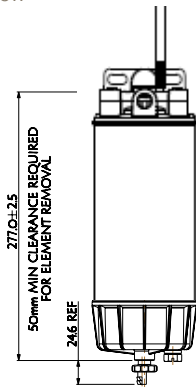


Rear View

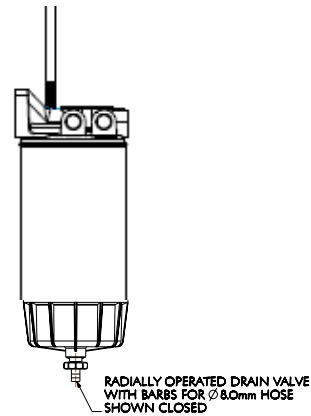


690RHH

Front View



Side View



Rear View

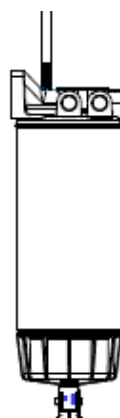


6160RHH

Front View



Side View



Rear View



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