

# A.O. SMITH

## APPROVAL RATINGS AND CERTIFICATION

All models comply with ANSI Z21.10.3 CGA4.3

All models comply with ASHRAE/IES 90.1 b-1992.

## FEATURES

**80+ % thermal efficiency affords lower operating costs on most models.**

**WATER CONNECTIONS** - For ease of installation, BTRC's feature on most models water connections on the top, front, and rear.

**GLASS LINED TANK** - Permaglas® Ultracoat is the proprietary ceramic coating developed by A.O. Smith's ceramic engineers specifically for this heater. It is applied after the complete tank has been assembled to give a seamless barrier against corrosion by hot water. The maximum working pressure is 160 psi (1103 kPa).

**FULLY AUTOMATIC CONTROLS WITH SAFETY SHUTOFF** — Accurate, dependable control system. Manual reset gas shutoff device for added safety. Maximum inlet gas pressure is 14" W.C. Minimum gas pressure is 4.5" W.C. natural gas, 11" W.C. propane.

**FOAM INSULATION**—Saves fuel, helps reduce standby heat loss.

**JACKET**—Heavy gauge steel finished with a baked enamel finish over a bonderized undercoat.

**EASY CLEANING** — Handhole cleanout allows easy cleaning.

**FULLY TESTED FOR SAFETY AND PERFORMANCE** — Design certified by the Underwriters Laboratory for 180°F (82°C) hot water service. Meets rigid requirements of the National Sanitation Foundation when equipped with optional leg kit. Certified for use on combustible flooring.

**INTERMITTENT IGNITION DEVICE**— Eliminates standing pilot. Provides flame failure response in less than one second. Power ON/OFF switch

**EASY TO INSTALL**—Completely factory-assembled. Only gas, water, vent and electric connections need be made. Provided with drain valve.

**FACTORY INSTALLED AND TESTED DRAFT DIVERTER** — Low profile draft diverter with automatic motorized flue damper to minimize standby losses.

**ANODES** — CoreGuard™ long-life, stainless steel core anode rods.

## OTHER FEATURES

- Equipped with gas pressure regulator and pilot filter.
- Integral automatic gas shutoff system prevents excessive water temperature.
- CSA rated temperature and pressure relief valve factory-installed.
- Maximum working pressure is 160 psi (1103 kPa) standard.
- Cathodic protection.
- Adjustable thermostat with a 120-180°F (49°C-82°C) range.

## OPTIONS

- Power vent kits for side wall venting (page A 105.4C).
- Meets NSF Standard 5 with optional leg kit.

# MasterFit®

## COMMERCIAL GAS TANK-TYPE WATER HEATERS BTRC 120-500(A)



**ASME**  
on selected models.



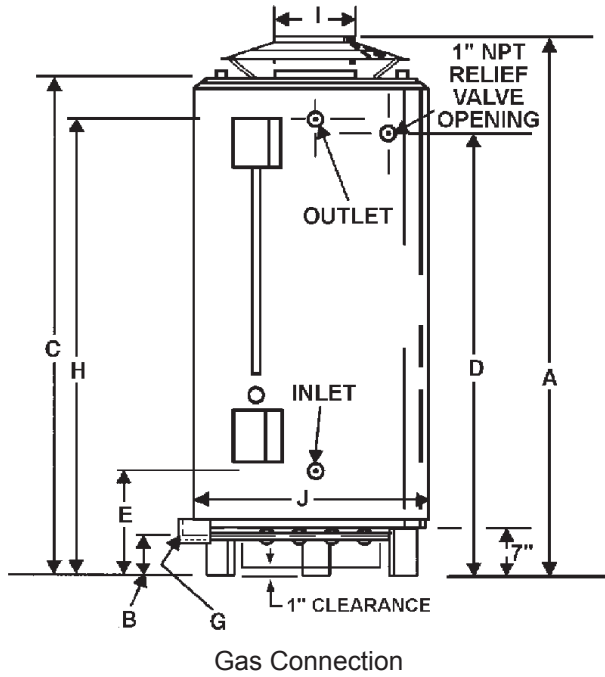
Approved to NSF  
Standard 5  
with Optional Leg Kit

### LIMITED WARRANTY OUTLINE

If the tank should leak any time during the first three years, under the terms of the limited warranty, A. O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. **THIS OUTLINE IS NOT A WARRANTY.** For complete information, consult the written warranty or A. O. Smith Water Products Company.

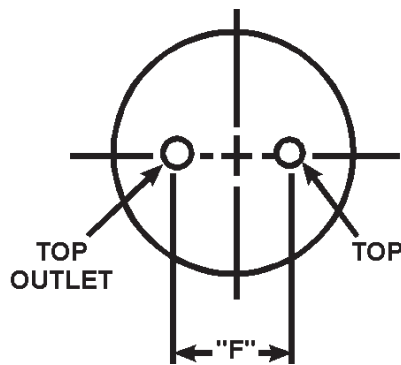
Warranty does not apply to product installed outside of the United States of America or its territorial possessions and Canada.

**ROUGH-IN DIMENSIONS - SIDE VIEW**  
**Models BTRC 120-500**



Model	Clearance To Combustibles		Clearance To Non-Combustibles	
	Sides & Rear	Top Cover	Sides & Rear	Top Cover
BTRC-120	1" (2.54 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-154	1" (2.54 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-180	1" (2.54 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-197	1" (2.54 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-199	1" (2.54 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-200A	1" (2.54 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-250A	2" (5.1 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-251(A)	2" (5.1 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-275A	2" (5.1 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-305(A)	2" (5.1 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-365(A)	4" (10.16 cm)	4" (10.16 cm)	4" (10.16cm)	12" (50.8cm)
BTRC-400A	3" (7.8 cm)	12" (30.48 cm)	0" (0cm)	12" (50.8cm)
BTRC-500A	5" (12.7 cm)	24" (61 cm)	0" (0cm)	12" (50.8cm)

**Top View of BTRC**



Model	Water Connections in Inches (NPT)					
	Inlet			Outlet		
	Top	Front	Rear	Top	Front	Rear
BTRC-120	1.50"	1.50"	1.50"	1.50"	1.50"	1.50"
BTRC-154	1.50"	1.50"	1.50"	1.50"	1.50"	1.50"
BTRC-180	1.50"	1.50"	1.50"	1.50"	1.50"	1.50"
BTRC-197	1.50"	1.50"	1.50"	1.50"	1.50"	1.50"
BTRC-199	1.50"	1.50"	1.50"	1.50"	1.50"	1.50"
BTRC-200	1.50"	2.00"	2.00"	1.50"	2.00"	2.00"
BTRC-250	1.50"	2.00"	2.00"	1.50"	2.00"	2.00"
BTRC-251	NA	1.50"	1.50"	NA	1.50"	1.50"
BTRC-275	1.50"	2.00"	2.00"	1.50"	2.00"	2.00"
BTRC-305	NA	1.50"	1.50"	NA	1.50"	1.50"
BTRC-365	NA	1.50"	1.50"	NA	1.50"	1.50"
BTRC-400	1.50"	2.00"	2.00"	1.50"	2.00"	2.00"
BTRC-500	1.50"	1.50"	1.50"	1.50"	1.50"	1.50"

**Gas Pressure Requirements**

	Natural Gas	Propane Gas
Max. Supply Pressure	13.8" w.c.	13.8" w.c.
Min. Supply Pressure	4.5" w.c.	11" w.c.
Manifold Pressure	3.5" w.c.	10" w.c.

**Electrical Specifications**

	Volts	Amps
BTRC	120VAC	.7
BTRC with Power Venter	120VAC	3.0 FLA

### Dimension Tables for BTRC Models 120-500

Model	Input Rating BTU/Hr.	Approx. Tank Capacity	A	B	C	D	E	F	G	H	Vent Diameter I	J	Approx. Ship Weight STD.	ASME
BTRC -120	120,000 BTU/Hr 35 Kw/Hr	71 GAL 268 L	69.75" 177 cm	4.25" 11 cm	59.50" 151 cm	50.87" 129 cm	19.69" 50 cm	19" 48 cm	1/2" 1/2"	51.88" 132 cm	5" 13 cm	27.75" 71 cm	400 lbs 182 Kg	NA NA
BTRC -154	154,000 BTU/Hr 45 Kw/Hr	81 GAL 307 L	73.00" 185 cm	4.25" 11 cm	66.50" 169 cm	57.87" 147 cm	19.69" 50 cm	19" 48 cm	1/2" 1/2"	59.00" 150 cm	6" 15 cm	27.75" 71 cm	470 lbs 213 Kg	NA NA
BTRC -180	180,000 BTU/Hr 53 Kw/Hr	76 GAL 288 L	70.50" 179 cm	4.25" 11 cm	63.75" 162 cm	55.13" 140 cm	17.75" 45 cm	19" 48 cm	1/2" 1/2"	56.50" 144 cm	6" 15 cm	27.75" 71 cm	470 lbs 213 Kg	NA NA
BTRC -197	199,000 BTU/Hr 58 Kw/Hr	95 gal 360 L	81.50" 207 cm	4.25" 11 cm	74.75" 190 cm	66.13" 168 cm	17.75" 45 cm	19" 48 cm	1/2" 1/2"	67.50" 171 cm	6" 15 cm	27.75" 71 cm	603 lbs 273 Kg	NA NA
BTRC -199	199,000 BTU/Hr 58 Kw/Hr	76 GAL 288 L	70.50" 179 cm	4.25" 11 cm	63.75" 162 cm	55.13" 140 cm	17.75" 45 cm	19" 48 cm	1/2" 1/2"	56.50" 144 cm	6" 15 cm	27.75" 71 cm	470 lbs 213 Kg	NA NA
BTRC -200A	199,000 BTU/Hr 58 Kw/Hr	100 gal 379 L	72.00" 183 cm	4.50" 12 cm	65.13" 165 cm	55.87" 142 cm	19.75" 50 cm	23" 58 cm	1/2" 1/2"	56.38" 143 cm	6" 15 cm	30.25" 77 cm	630 lbs 286 Kg	725 ls 329 Kg
BTRC -250A	250,000 BTU/Hr 72 Kw/Hr	100 gal 379 L	72.00" 183 cm	4.50" 12 cm	65.13" 165 cm	55.87" 142 cm	19.75" 50 cm	23" 58 cm	1/2" 1/2"	56.38" 143 cm	8" 20 cm	30.25" 77 cm	630 lbs 286 Kg	725 lbs 329 Kg
BTRC-251(A)	251,000 BTU/Hr 73 Kw/Hr	65 gal 246 L	75.00" 191 cm	4.50" 12 cm	65.75" 167 cm	57.25" 145 cm	20.00" 51 cm	NA NA	1/2" 1/2"	58.75" 149 cm	8" 20 cm	27.75" 70 cm	750 lbs 341 Kg	862 lbs 391 Kg
BTRC-275A	275,000 BTU/Hr 80 Kw/Hr	100 gal 379 L	72.00" 183 cm	4.50" 12 cm	65.13" 165 cm	55.87" 142 cm	19.75" 50 cm	23" 58 cm	1/2" 1/2"	56.38" 143 cm	8" 20 cm	30.25" 77 cm	NA NA	725 lbs 329 Kg
BTRC-305(A)	305,000 BTU/Hr 89 Kw/Hr	65 gal 246 L	75.00" 191 cm	4.50" 12 cm	65.75" 167 cm	57.25" 145 cm	20.00" 51 cm	NA NA	1/2" 1/2"	58.75" 149 cm	8" 20 cm	27.75" 70 cm	750 lbs 341 Kg	862 lbs 391 Kg
BTRC-365(A)	360,000 BTU/Hr 105 Kw/Hr	65 gal 246 L	75.00" 191 cm	4.50" 12 cm	65.75" 167 cm	57.25" 145 cm	20.00" 51 cm	NA NA	3/4" 3/4"	58.75" 149 cm	8" 20 cm	27.75" 70 cm	750 lbs 341 Kg	862 lbs 391 Kg
BTRC-400A	399,000 BTU/Hr 117 Kw/Hr	100 gal 379 L	75.50" 192 cm	4.50" 12 cm	67.50" 171 cm	58.25" 148 cm	26.75" 68 cm	23" 58 cm	3/4" 3/4"	59.00" 150 cm	8" 20 cm	30.25" 77 cm	NA NA	874 lbs 396 Kg
BTRC-500A	500,000 BTU/Hr 147 Kw/Hr	85 gal 322 L	82.25" 209 cm	4.50" 12 cm	73.50" 187 cm	65.25" 166 cm	25.50" 65 cm	21" 53 cm	1" 1"	65.75" 167 cm	8" 20 cm	27.75" 70 cm	NA NA	857 lbs 389 Kg

"A" suffix identifies ASME only.

"(A)" suffix identifies optional ASME model available. Contact A.O. Smith Enterprises for Dimensions of ASME versions of the BTRC-251, 305 & 365.

Model	Input Rate BTUH	Approx. Gal. Cap.	EFF. %	RECOVERY RATING CAPACITIES (GPH AND LPH)													
				30°F 17°C	40°F 22°C	50°F 28°C	60°F 33°C	70°F 39°C	80°F 45°C	90°F 50°C	100°F 56°C	110°F 61°C	120°F 67°C	130°F 72°C	140°F 78°C		
BTRC-120	120,000 BTUH 35 Kw/Hr	71 GAL 268 L	80	388 1469	291 1102	233 882	194 734	166 628	145 549	129 488	116 439	106 401	97 367	90 341	83 314		
BTRC-154	154,000 BTUH 45 Kw/Hr	81 GAL 307 L	80	498 1885	373 1412	299 1132	249 943	213 806	187 708	166 628	149 564	136 515	124 469	115 435	107 405		
BTRC-180	180,000 BTUH 53 Kw/Hr	76 GAL 288 L	80	579 2192	434 1643	347 1314	289 1094	248 939	217 821	193 731	174 659	158 598	145 549	134 507	124 469		
BTRC-197	199,000 BTUH 58 Kw/Hr	95 GAL 360 L	80	643 2434	482 1825	386 1461	322 1219	276 1045	241 912	214 810	193 731	175 662	161 609	148 560	132 500		
BTRC-199	199,000 BTUH 58 Kw/Hr	76 GAL 288 L	80	643 2434	482 1825	386 1461	322 1219	276 1045	241 912	214 810	193 731	175 662	161 609	148 560	132 500		
BTRC-200A	199,000 BTUH 58 Kw/Hr	100 GAL 379 L	80	643 2434	482 1825	386 1461	322 1219	276 1045	241 912	214 810	193 731	175 662	161 609	148 560	132 500		
BTRC-250A	250,000 BTUH 72 Kw/Hr	100 GAL 379 L	80	808 3059	606 2294	485 1836	404 1529	346 1310	303 1147	269 1018	242 916	220 833	202 765	186 704	173 655		
BTRC-251(A)	251,000 BTUH 73 Kw/Hr	65 GAL 246 L	80	811 3070	608 2301	487 1843	406 1537	348 1317	304 1151	270 1022	243 920	221 837	203 768	187 708	174 659		
BTRC-275A	275,000 BTUH 80 Kw/Hr	100 GAL 379 L	80	889 3365	667 2525	533 2018	444 1681	381 1442	333 1261	296 1120	267 1011	242 916	222 840	205 776	190 719		
BTRC-305(A)	305,000 BTUH 89 Kw/Hr	65 GAL 246 L	80	986 3732	739 2797	592 2241	493 1866	423 1601	370 1401	329 1245	296 1120	269 1018	246 931	228 863	211 799		
BTRC-365(A)	360,000 BTUH 105 Kw/Hr	65 GAL 246 L	80	1164 4406	873 3304	698 2642	582 2203	499 1888	436 1650	388 1468	349 1321	317 1199	291 1105	269 1018	249 942		
BTRC-400A	400,000 BTUH 117 Kw/Hr	100 GAL 379 L	80	1290 4883	967 3660	774 2930	645 2442	553 2093	484 1832	430 1628	387 1465	352 1332	322 1219	298 1128	276 1045		
BTRC-500A	500,000 BTUH 147 Kw/Hr	85 GAL 322 L	80	1596 6041	1197 4531	958 3626	798 3021	684 2589	598 2264	532 2014	479 1813	435 1647	399 1510	368 1393	342 1295		

## POWER VENTS FOR BTRC

### FEATURES

**DESIGNED FOR FLEXIBILITY** - Easy to install sidewall power vent system. Use these kits where gas is the preferred choice, but conventional venting is costly. Allows conversion from electric to gas or upgrading to units with higher inputs without having to do costly venting system upgrades. Easy to install and wire. Approved for use on all A.O. Smith water heaters listed below. Allows the use of smaller diameter vent pipe than allowed with conventional venting.

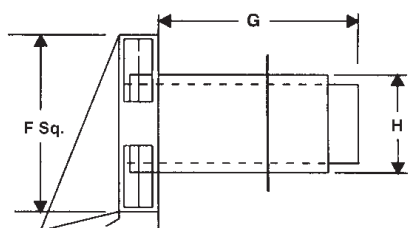
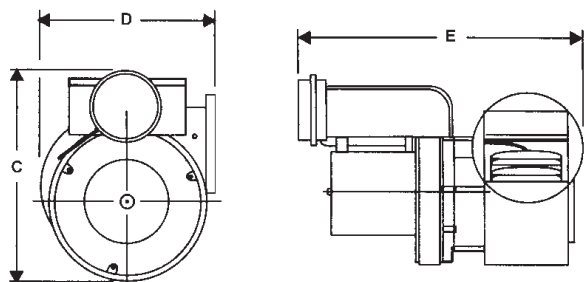
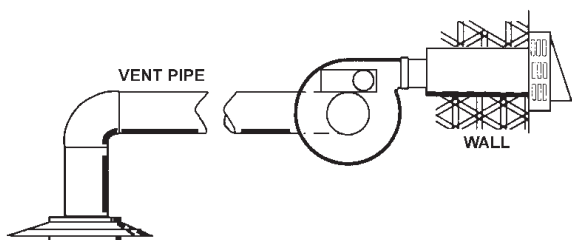
**POWERFUL 115 VOLT POWER VENTER** - Allows venting up to 100 (30.48m) equivalent feet away. Each model sized for a perfect match with A.O. Smith water heaters. Power Venters have one or more of the following depending on the heater's requirements. Built in 24/115 volt relay to interface with control systems. Combination 24 volt relay and adjustable post-purge timer control in lieu of relay on some models. Installed diaphragm draft proving switch. Vibration isolation mount works with common plumber's strap and helps keep operation quiet. All controls factory mounted and wired for simple installation.

**ALUMINUM VENT HOOD** - Mounts on outside of wall. Features telescoping vent pipe connection sleeve, rust free construction, outside wall condensate shield, 1" air space provides clearance for combustibles, special heat shield protects building exterior. Mounting hardware included.

**COLOR CODED WIRING HARNESS** - Eliminates need for electrician (check codes). Simple 24 volt connections and a 40 ft. (12.2m) low voltage cable.

**ADAPTER FITTINGS** - Provided along with mounting hardware and instructions for a quick and simple installation. Approved vent pipe reducers supplied where applicable.

**APPROVED FOR TYPE-B VENT** - Non pressurized vent from heater to power venter allows the use of economical Type-B vent pipe.



Models	Part Number	Motor Watts	Motor Amps	Max. Length of Vent	Vent Dia. Size	C Vent Assembly Height	D Vent Assembly Depth	E Vent Assembly Width	F Vent Termination Square	G	H	Rough In
BTRC-120-200	193933-0	95	1.26	100 ft. (30.48m)	4" (101mm)	7 7/8" (200mm)	7" (177mm)	11" (279mm)	9" (229mm)	8 7/8" (225mm)	7 1/2" sq. (191mm)	8" sq. (203mm)
BTRC-250-500	193933-1	224	2.0	100 ft. (30.48m)	6" (152mm)	9 1/4" (235mm)	8 1/2" (216mm)	11 1/2" (292mm)	10 1/8" (257mm)	9 1/2" (241mm)	8 1/2" dia. (216mm)	9" dia. (229mm)

\* Vent pipe/vent hood connection based on Class B vent pipe sizes. Calculated using total pipe length, plus 5 ft. (1.524m) for every 90° elbow and 2 1/2 ft. (0.762m) for every 45° elbow.

### SUGGESTED SPECIFICATION

Water Heater(s) shall be Model \_\_\_\_\_ as manufactured by A. O. SMITH, or equal. Water heater(s) shall be of glass-lined design, and gas-fired, equipped to burn \_\_\_\_\_ gas and design certified by the Underwriter Laboratory under Volume III tests for commercial heaters for delivery of 180°F (82°C) water, and exceed requirements of ASHRAE/IES 90.1b-1992. Heaters shall have an input rating of \_\_\_\_\_ and a recovery rating of \_\_\_\_\_ GPH (LPH) at a temperature rise of 100°F (38°C) with a storage capacity of \_\_\_\_\_ gallons (liters). Heaters shall be equipped with 1 1/2" (38.1mm) water inlet and outlet openings, a 2 3/4" (69.85mm) x 3 3/4" (95.25mm) boiler-type handhole cleanout and shall have a maximum working pressure of 160 psi (1103.1 kPa). Water heater(s) shall be equipped with an integrated control system consisting of a 180°F (82°C) adjustable thermostat with upper and lower sensing bulbs, which average the water temperatures at the top and bottom of the tank for maximum water temperature control. Heater(s) shall be provided with a manual reset gas shutoff device, a gas pressure regulator set for the type of gas supplied, coated steel burners, an approved draft diverter, anodes for cathodic protection, flue damper and IID system. CSA pressure and temperature relief valve shall be furnished and installed by the factory. The heater shall be insulated with foam insulation or equal. The outer jacket shall have a baked enamel finish over a bonderized undercoating. All internal surfaces of the heater(s) exposed to water shall be glass-lined with an alkaline borosilicate composition that has been fused-to-steel by firing at a temperature range of 1400° (760°C) to 1600°F (871°C). Heater tank shall have a 3 year limited warranty against corrosion or sediment buildup as outlined in the written warranty. Fully illustrated instruction manual to be included.

A.O. Smith Water Products Co., Inc On Line  
www.hotwater.com

For Technical Information and  
Fax Service,  
Phone: 800-265-8520

A. O. Smith Enterprises Ltd.  
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A.O. Smith Corporation reserves the right to make product changes or improvements at any time without notice.