

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.
C.E.C. California Energy Commission

FEATURES

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

WATER CONNECTIONS - For ease of installation, BTR'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 (1103.2 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 "snap action" diverter with automatic motorized flue damper to minimize standby losses.

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

PLUG KITS — Pipe nipples and caps are included to plug unused water connections.

OTHER FEATURES

- Equipped with gas pressure regulator and pilot filter.
- Integral automatic gas shutoff system prevents excessive water temperature.
- A.G.A. rated temperature and pressure relief valve factory-installed.
- Maximum working pressure is 160 psi (1103.2 kPa) standard.
- Cathodic protection.
- Adjustable thermostat with a 120-180°F range.

OPTIONS

- Power vent kits for side wall venting (page A105.4).
- Manifold kits for multiple heater installations.
- Meets NSF Standard 5 with optional leg kit.

MasterFit®

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



ASME

on selected models.



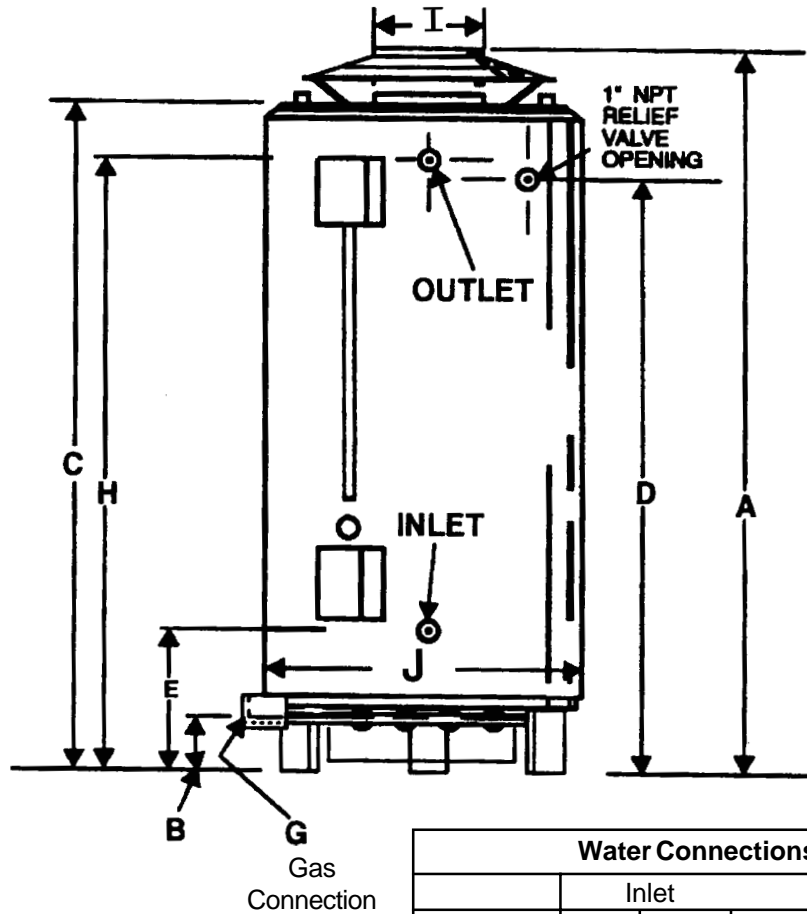
**Approved to NSF
Standard 5
with Optional Leg Kit**

LIMITED WARRANTY OUTLINE

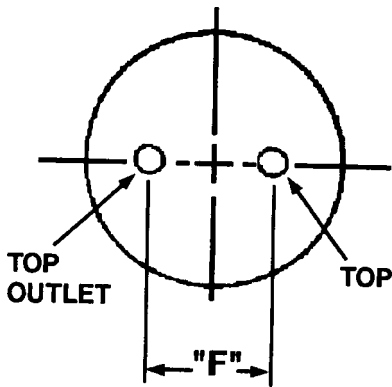
If the tank should leak any time during the first three years, under the terms of the limited warranty, . A. O. Smith will furnish a replacement heater; installation, labor, handling and local delivery extra. **THIS OUTLINE IS NOT A WARRANTY.** For complete information, consult the written warranty or 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 OF BTR
Models 120-500**



Top View of BTR



Water Connections in Inches

Models	Inlet			Outlet		
	Top	Front	Back	Top	Front	Back
BTR120	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR154	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR180	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR197	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR198	1 1/2	1 1/2	2	1 1/2	1 1/2	2
BTR199	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR200	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR250(A)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR251(A)	NA	1 1/2	1 1/2	NA	1 1/2	1 1/2
BTR275(A)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR305(A)	NA	1 1/2	1 1/2	NA	1 1/2	1 1/2
BTR365(A)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR400(A)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTR500(A)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2

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
BTR	120VAC	.7
BTR with Power Venter	120VAC	3.0 FLA

Model	Input Rate BTU/Hr.	Approx. Tank Cap.	A	B	C	D	E	F	Gas Inlet G	H	Vent Dia. I	J	Connections						Approximate Ship. Weight	
													Inlet			Outlet			STD.	ASME
													Top	Front	Back	Top	Front	Back		
BTR120	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	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	400 Lbs 182 Kg	NA NA	
BTR154	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	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	470 Lbs 213 Kg	NA NA	
BTR180	180,000 BTU/Hr 53 Kw/Hr	81 Gal 307 L	67.50" 171 cm	4.50" 12 cm	62.00" 157 cm	53.62" 136 cm	20.50" 52 cm	21" 53 cm	1/2" 1/2"	54.62" 139 cm	6" 15 cm	27.75" 71 cm	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	470 Lbs 213 Kg	NA NA	
BTR197	199,000 BTR/Hr 58 kw/Hr	100 Gal 379 L	75.00" 192 cm	4.50" 12 cm	70.00" 178 cm	61.62" 157 cm	20.50" 52 cm	21" 53 cm	1/2" 1/2"	62.62" 159 cm	6" 15 cm	27.75" 71 cm	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	603 Lbs 273 Kg	NA NA	
BTR198	199,000 BTU/Hr. 58 Kw/Hr	100 Gal 379 L	75.00" 192 cm	4.50" 12 cm	70.00" 178 cm	61.62" 157 cm	20.50" 52 cm	21" 53 cm	1/2" 1/2"	61.50" 150 cm	6" 15 cm	27.75" 71 cm	1.50" 1.50"	1.50" 1.50"	2.00" 2.00"	1.50" 1.50"	1.50" 2.00"	603 Lbs 273 Kg	NA NA	
BTR199	190,000 BTU/Hr 56 kw/Hr	81 Gal 307 L	67.50" 171 cm	4.50" 12 cm	62.00" 157 cm	53.62" 136 cm	20.50" 52 cm	21" 53 cm	1/2" 1/2"	54.62" 139 cm	6" 15 cm	27.75" 71 cm	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	470 Lbs 213 Kg	NA NA	
BTR200	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	1.50" 1.50"	2.00" 2.00"	2.00" 2.00"	1.50" 1.50"	2.00" 2.00"	630 Lbs 286 Kg	725 Lbs 329 Kg	
BTR250	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	1.50" 1.50"	2.00" 2.00"	2.00" 2.00"	1.50" 1.50"	2.00" 2.00"	630 Lbs 286 Kg	725 Lbs 329 Kg	
BTR251	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	1/2" 1/2"	58.75" 149 cm	8" 20 cm	27.75" 70 cm	NA NA	1.50" 1.50"	1.50" 1.50"	NA NA	1.50" 1.50"	750Lbs 341 Kg	862 Lbs 391 Kg	
BTR275	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	1.50" 1.50"	2.00" 2.00"	2.00" 2.00"	1.50" 1.50"	2.00" 2.00"	630 Lbs 286 Kg	725 Lbs 329 Kg	
BTR305	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	1/2" 1/2"	58.75" 149 cm	8" 20 cm	27.75" 70 cm	NA NA	1.50" 1.50"	1.50" 1.50"	NA NA	1.50" 1.50"	750 Lbs 341 Kg	862 Lbs 391 Kg	
BTR365	365,000 BTU/Hr 107 kw/Hr	85 Gal 322 L	79.50" 202 cm	4.50" 12 cm	70.25" 178 cm	62.50" 159 cm	22.50" 57 cm	23" 58 cm	3/4" 3/4"	63.00" 160 cm	8" 20 cm	27.75" 70 cm	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	725 Lbs 329 Kg	833 Lbs 379 Kg	
BTR400	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	1.50" 1.50"	2.00" 2.00"	2.00" 2.00"	1.50" 1.50"	2.00" 2.00"	760 Lbs 345 Kg	874 Lbs 396 Kg	
BTR500	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	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	1.50" 1.50"	745 Lbs 338 Kg	857 Lbs 389 Kg	

MODEL	INPUT RATE BTUH	APPROX. GAL CAP.	EFF. %	RECOVERY RATING CAPACITIES (GPH AND LPH)													
				30° F (-) 1 C	40° F 4 C	50° F 10 C	60° F 15 C	70° F 21 C	80° F 27 C	90° F 32 C	100° F 38 C	110° F 43 C	120° F 49 C	130° F 54 C	140° F 60 C		
				BTR 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
BTR 154	154,000 BTUH 45 Kw/Hr	81 Gal 306 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		
BTR 180	180,000 BTUH 53 Kw/Hr	81 Gal 306L	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		
BTR 197	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		
BTR 198	199,000 BTUH 58 Kw/Hr	100 Gal 379L	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		
BTR 199	190,000 BTUH 56 Kw/Hr	81 Gal 306 L	80	614 2324	461 1745	368 1393	307 1162	263 996	230 871	205 776	184 697	167 632	154 583	142 538	132 500		
BTR 200	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		
BTR 250	250,000 BTUH 73 Kw/Hr	100 Gal 379 L	80	808 3059	606 2294	485 1835	404 1529	346 1311	303 1147	269 1020	242 918	220 834	202 765	186 706	173 655		
BTR 251	251,000 BTUH 73 Kw/Hr	65 Gal 246 L	80	811 3071	608 2303	487 1843	406 1536	348 1316	304 1152	270 1024	243 921	221 838	203 768	187 709	174 658		
BTR 275	275,000 BTUH 80 Kw/Hr	100 Gal 379 L	80	889 3365	667 2524	533 2019	444 1682	381 1442	333 1262	296 1122	267 1009	242 918	222 841	205 776	190 721		
BTR 305	305,000 BTUH 89 Kw/Hr	65 Gal 246 L	80	986 3732	739 2799	592 2239	493 1866	423 1599	370 1399	329 1244	296 1120	269 1018	246 933	228 861	211 800		
BTR 365	365,000 107 Kw/Hr	85 Gal 322 L	80	1180 4466	885 3349	708 2680	590 2233	506 1914	442 1675	393 1489	354 1340	322 1218	295 1116	272 1031	253 957		
BTR 400	399,000 BTUH 117 Kw/Hr	100 Gal 379 L	80	1293 4894	970 3671	776 2936	646 2447	554 2097	485 1835	431 1631	388 1468	353 1335	323 1224	298 1129	277 1049		
BTR 500	500,000 BTUH 147 Kw/Hr	85 Gal 322 L	80	1616 6118	1212 4588	970 3671	808 3059	693 2622	606 2294	539 2039	485 1835	441 1668	404 1529	373 1412	346 1311		

MECHANICAL VENTING

SINGLE UNIT INSTALLATION

When mechanical venting of these heaters is desired, the following kits are available.

BTR(C) 120 through the BTR(C) 200/A, A. O. Smith part number 193933

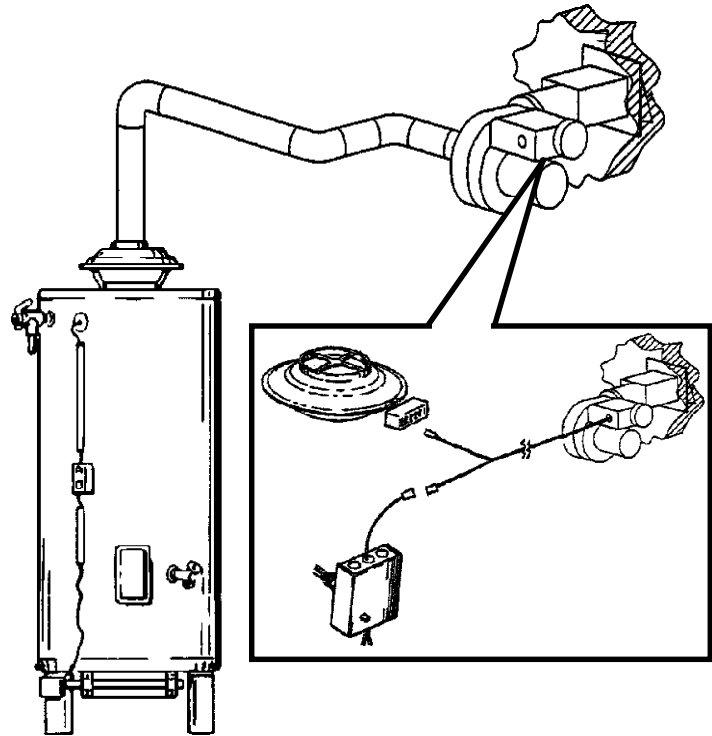
BTR(C) 250/A through the BTR(C) 500/A, A. O. Smith part number 193933-1

Where a draft inducer is to be installed to operate in conjunction with the water heater thermostat, the following codes must be adhered to. Field wiring should conform to the latest version of the National Electric Code. ANSI/NFPA No. 70. For Canadian installations the electrical connections and grounding shall be done in accordance with the current Canadian Electrical Code CSA C22.1 Part 1 and/or local codes.

NOTE: The draft inducer must be installed downstream of the drafthood. See figure 13.

- Install draft inducer in the vent system.
- Take one way plugs and insert male into thermostat connector and plug female into connection coming from drafthood.
- Run 120 VAC to drafthood inducer.

See side wall vent kit installation manual for complete instructions.



VENT INSTALLATION

Seal all joints between the blower and the vent termination. This is to prevent leakage of exhaust products into the room(s) due to positive pressure of blower.

The "Sequence of Operation" description will be the same with mechanical venting except,

When the appliance thermostat calls for heat:

Thermostat contacts "Close" and the draft inducer blower(120 VAC) is energized. Sufficient draft must be established for the "Draft Prover Switch (N.O.)" to "Close". When the draft prover switch "Closes" the relay coil of the flue damper is energized.

See side wall vent kit installation manual for complete instructions.

Model Number	Power Vent Part Number
BTR(C) 120 through 200/A	193933
BTR(C) 250/A through 500/A	193933-1

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 water, and exceed requirements of ASHRAE/IES 90.1b-1992. Heaters shall have an input rating of _____ and a recovery rating of _____ GPH at a temperature rise of 100°F with a storage capacity of _____ gallons. Heaters shall be equipped with 1 1/2" water inlet and outlet openings (BTR198 rear openings are 2"), a 2 3/4" x 3 3/4" boiler-type handhole cleanout and shall have a maximum working pressure of 160 psi. Water heater(s) shall be equipped with an integrated control system consisting of a 180°F 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. A.G.A. 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° to 1600°F. 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
Automated Fax Service,
Phone: 800-527-1953

A.O. Smith
Water Products Company
Irving, TX

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