

MasterFit® Low Nox Commercial Gas Tank-Type Water Heaters

APPROVAL RATINGS AND CERTIFICATION

All models comply with ANSI Z21.10.3 CSA4.3
 All models comply with ASHRAE/IES 90.1-2004
 C.E.C. California Energy Commission
 All models comply with Texas and So. California
 SCAQMD Rule 1146.2

FEATURES

Eighty plus percentage thermal efficiency affords lower operating costs on most models.

INDUCED DRAFT BUILT-IN BLOWER - The blower is built into the top cover, factory mounted and wired. Ideal for installations where negative pressure is present in the building. Blower proves draft prior to ignition. No drafthood or barometric damper required.

METAL VENTING - Rated Category I Appliance. Uses standard metal single wall or double wall type "B" vent. Can be commonly vented with other Category I appliances. Vent connects directly to the blower outlet. Perfect choice for retrofit and upgrade installations.

WATER CONNECTIONS - For ease of installation, all BTN's feature 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 the heater. It is applied after the complete tank has been assembled to give a seamless barrier against hot water corrosion. The maximum working pressure is 160 psi.

INSTALLED COST SAVINGS - When multiple BTN units are exclusively used in a vent manifold, use the National Flue Gas Code Table 11 Fan Sizing Charts to determine vent diameter and specifications. The BTN with its internal induced draft blower enables safe use of smaller vent diameters. This feature can save hundreds of dollars in installation costs.

FULLY AUTOMATIC DIGITAL 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 5.0" 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 access for easy cleaning.

FULLY TESTED FOR SAFETY AND PERFORMANCE - Design certified by the Underwriters Laboratory for 180°F 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.

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

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

MODELS BTN 120-400(A)



GAS-FIRED



Approved to NSF Standard 5 with option leg kit.



ASME
on selected models.

OTHER FEATURES


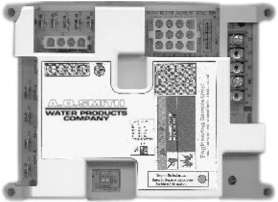


- Equipped with gas pressure regulator and pilot filter • Integral automatic gas shutoff system prevents excessive water temperature • A.G.A. rated temperature and pressure relief valve factory-installed • Maximum working pressure is 160 psi standard • Cathodic protection
- Adjustable thermostat with a 120-180°F range.
- **THREE YEAR LIMITED TANK WARRANTY** – For complete warranty information, consult written warranty or contact A. O. Smith.

OPTIONS

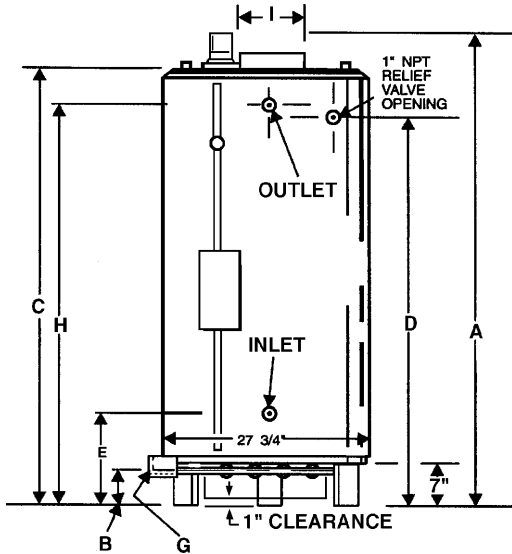
- Manifold kits for multiple heater installations.
- Meets NSF Standard 5 with optional leg kit.

BTN DIA-SCAN™ CONTROLS

The A.O. Smith BTN models feature true self diagnostic controls in a digital solid state design. These advanced control aid in both the installation and maintenance of the BTN water heater. The White Rogers Silicon Nitride Hot Surface Ignitor ensures rugged reliability and years of trouble free operation.

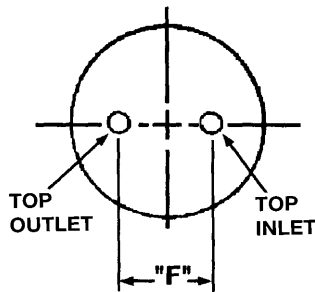
 <p>Digital Temperature Control</p>	<p>Digital Temperature Control</p> <ul style="list-style-type: none"> • Accuracy to within $\pm 2^\circ\text{F}$ • Power On/Standby Indicator • ECO Open Indicator • Reset Status Indicator • Heating-Mode Indicator
 <p>Solid State Ignition Control</p>	<p>Solid State Ignition Control</p> <ul style="list-style-type: none"> • Power On/Standby Indicator • Gas Valve Circuit Monitor • Reverse Polarity Indicator • Improper Grounding Error Indicator • Lock Out Condition Indicator with Auto Retry • Low Gas Pressure & Blower Prover Indicator • Weak Flame Sense Indicator • Combustion Operation Indicator • Call for Heat Indicator
 <p>Solid State Temperature Probe</p>	<p>Solid State Temperature Probe</p> <ul style="list-style-type: none"> • Solid State Thermistor Technology • Plus or minus 2°Fahrenheit • Direct immersion package
 <p>Silicon Nitride Hot Surface Ignitor</p>	<p>Silicon Nitride Hot Surface Ignitor</p> <ul style="list-style-type: none"> • Rugged • Dependable • Separate Flame Prover Rod • Quick connect terminals • Adaptive learning technology extends ignitor life

**ROUGH-IN DIMENSIONS
SIDE VIEW OF BTN
Models 120-400**



Model	Clearance to Combustibles		Clearance to Non-Combustibles	
	Sides & Rear	Top Cover	Sides & Rear	Top Cover
BTN120	1"	12"	0"	12"
BTN154	1"	12"	0"	12"
BTN180	1"	12"	0"	12"
BTN199	1"	12"	0"	12"
BTN200(A)	1"	12"	0"	12"
BTN250(A)	2"	12"	0"	12"
BTN275(A)	2"	12"	0"	12"
BTN310(A)	2"	12"	0"	12"
BTN366(A)	3"	12"	0"	12"
BTN400(A)	3"	12"	0"	12"

TOP VIEW OF BTN



Models	Water Connections in Inches					
	Inlet			Outlet		
	Top	Front	Back	Top	Front	Back
BTN120	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTN154	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTN180	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTN199	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTN200(A)	1 1/2	1 1/2	2	1 1/2	1 1/2	2
BTN250(A)	1 1/2	1 1/2	2	1 1/2	1 1/2	2
BTN275(A)	1 1/2	1 1/2	2	1 1/2	1 1/2	2
BTN310(A)	1 1/2	1 1/2	2	1 1/2	1 1/2	2
BTN366(A)	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	1 1/2
BTN400(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	14" w.c.	14" w.c.
Min. Supply Pressure	5.0" w.c.	11" w.c.
Manifold Pressure	3.5" w.c.	10" w.c.

Electrical Specifications

	Volts	Amps
BTN	120VAC	5.0



Commercial Gas Water Heaters

Dimension Tables for BTN Models 120-400															
Model	Approx. Tank Cap. (Gals.)	Type of Gas	Input Rating Btu/Hr.	A	B	C	D	E	F	G	H	I	J	Approx. Ship. Weight	
														Std.	ASME
BTN120	71	nat	120,000	63	4 1/4	59 1/2	50 7/8	19 5/8	19	1/2	51 7/8	6	27 3/4	400	--
BTN154	81	nat	154,000	68	4 1/2	62	53 5/8	20 1/2	21	1/2	54 5/8	6	27 3/4	470	--
BTN180	99	nat	180,000	72	4 1/2	70	61 5/8	20 1/2	21	1/2	61	6	27 3/4	470	--
BTN199	99	nat	199,000	72	4 1/2	70	61 5/8	20 1/2	21	1/2	61	6	27 3/4	470	--
BTN200(A)	100	nat	199,000	72	4 1/2	70	61 5/8	20 1/2	21	1/2	61	6	27 3/4	603	625
BTN250(A)	100	nat	250,000	72	4 1/2	70	61 5/8	20 1/2	21	1/2	61	6	27 3/4	603	625
BTN275(A)	100	nat	275,000	72	4 1/2	70	61 5/8	20 1/2	21	1/2	61	6	27 3/4	603	625
BTN310(A)	85	nat	310,000	73	4 1/2	72	62 1/2	20 1/2	21	1/2	63	6	27 3/4	603	625
BTN366(A)	85	nat	366,000	73	4 1/2	72	62 1/2	22 1/2	21	1/2	63	6	27 3/4	725	833
BTN400(A)	85	nat	390,000	73	4 1/2	72	62 1/2	22 1/2	21	1/2	63	6	27 3/4	725	833

All dimensions are in inches.

Recovery Capacities for BTN														
Model	Input Rating Btu/Hr.	Gal.	Temperature Rise - Degrees F - Gallons Per Hour											
			30	40	50	60	70	80	90	100	110	120	130	140
BTN120	120,000	71	388	291	233	194	166	145	129	116	106	97	90	83
BTN154	154,000	81	498	373	299	249	213	187	166	149	136	124	115	107
BTN180	180,000	99	582	436	349	291	249	218	194	175	159	145	134	125
BTN199	199,000	99	643	482	386	322	276	241	214	193	175	161	148	138
BTN200(A)	199,000	100	643	482	386	322	276	241	214	193	175	161	148	138
BTN250(A)	250,000	100	808	606	485	404	346	303	269	242	220	202	186	173
BTN275(A)	275,000	100	889	667	533	444	381	333	296	267	242	222	205	190
BTN310(A)	310,000	85	1002	752	601	501	430	376	334	300	273	251	231	215
BTN366(A)	366,000	85	1183	887	710	592	507	444	394	355	323	296	273	254
BTN400(A)	390,000	85	1261	945	756	630	540	473	420	378	344	315	291	270

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 gasfired, 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 meet the requirements of ASHRAE/IES 90.1-2004. 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 (BTN 200, 250, 275, 310 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.

For Technical Information and Automated Fax Service, call 800-527-1953. A.O. Smith Corporation reserves the right to make product changes or improvements without prior notice.