

# Bosch Greenstar Wall Hung Heat Only Boiler

Engineering  
Submittal  
Sheet



# BOSCH

## Overview



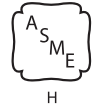
**ZBR16-3: Greenstar Heat Only 57**

**ZBR21-3: Greenstar Heat Only 79**

**ZBR28-3: Greenstar Heat Only 100**

**ZBR35-3: Greenstar Heat Only 131**

**ZBR42-3: Greenstar Heat Only 151**



**MA Plumbing Board approved**

## Product Details

- ▶ Gas-fired, sealed combustion, modulating condensing boilers, available in five sizes
- ▶ Certified by AHRI, ASME, CSA
- ▶ Low NOx emissions ahead of 2012 SCAQMD regulations
- ▶ AFUE Ratings of 95%
- ▶ Hydronic bracket for securing bottom of boiler to wall, union connections and M NPT threads
- ▶ Venting solutions include: concentric, one pipe or two pipe venting
  - Approved materials are CPVC, PVC, rigid PP, flexible PP and stainless steel
  - 3" PVC venting can be up to 100' with up to 8 elbows
  - 2" PVC lengths can be up to 81' with 1 elbow
- ▶ Control
  - Heatronic III with high limit dials for space heating and DHW for simplicity and ease of operation
  - Digital display for fluid temperature leaving the heat exchanger, service function codes, and operation icons.
  - Outdoor Reset when installed with the FW200
- ▶ Low voltage terminal strip offers simplified installation.
  - Terminals include BUS, TT, Outdoor sensor, LWCO, DHW
- ▶ Coated heat exchanger allows service intervals to be extended to 5 years for cleaning
- ▶ 5 year parts and labor warranty and 10 year limited lifetime on heat exchanger

## Engineering specification

The boiler shall be a Bosch Greenstar \_\_\_ wall hung condensing boiler for space heating with or without indirect water heater for domestic hot water production.

The boiler shall be certified to meet AHRI, ASME standards and shall be certified by CSA. The boiler shall come equipped for Natural Gas fuel source. A Liquid Propane (LP) conversion kit

shall be included in the contents of delivery. The boiler shall be Energy Star rated with an AFUE rating of 95% and qualified for Federal Tax Credit. It shall meet the 2012 SCAQMD regulations for Low NOx emissions.

Overall dimensions shall be 33-15/32" x 17-21/64" x 13-57/64" (height x width x depth).

# Bosch Greenstar Wall Hung Heat Only Boiler



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Technical Data Greenstar 57 (ZBR16-3 ) Heat Only Boiler			
Output	Unit	NG	LPG (propane)
Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	57,200 (16.8)	56,400 (16.5)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	54,900 (16.1)	55,300 (16.2)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	54,300 (15.9)	54,600 (16.0)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	50,800 (14.9)	51,200 (15.0)
Min. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	12,900 (3.8)	21,500 (6.3)
Min. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	12,600 (3.7)	21,500 (6.3)
Min. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	12,600 (3.7)	21,500 (6.3)
Min. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	11,300 (3.3)	19,400 (5.7)
<b>Gas supply requirements</b>			
Natural Gas – Hs = 1,010 BTU/ft <sup>3</sup> (37.3MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	56 (1.6)	–
Liquid Propane Gas – HD-S = 2,500 BTU/ft <sup>3</sup> (93.1MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	–	22 (0.6)
NG	in. W.C. (mbar)	3.5 - 10.5" (8.7-26.1)	–
LPG (propane)	in. W.C. (mbar)	–	8 - 13" (19.9-32.3)
<b>Flue gas</b>			
Flue gas mass flow at maximum/minimum nominal output	gps	6.8/1.7	6.7/2.6
Flue gas temperature 176/140 °F (80/60 °C) at maximum/minimum nominal heat input	°F ( °C)	136/133 (58/56)	
Flue gas temperature 104/86 °F (40/30 °C) at maximum/minimum nominal heat input	°F ( °C)	99/88 (37/31)	
CO <sub>2</sub> at max. nominal output	%	9.4	11.0
CO <sub>2</sub> at minimum nominal output	%	8.6	10.4
<b>Condensate</b>			
Max. condensate quantity (t <sub>R</sub> = 86 °F (30 °C))	gph (l/h)	0.32 (1.2)	
pH level, approx.	%	4.8	
<b>General</b>			
Voltage	VAC	120	
Frequency	Hz	60	
Max. power consumption (central heating mode)	W	205	
Max. power consumption (Stand-by)	W	< 6	
Noise level	dB(A)	≤ 33	
Maximum supply temperature	°F ( °C)	190 (88)	
Max. permissible operating pressure (P <sub>MS</sub> ) heating	psi (bar)	30 (2.07)	
Permissible ambient temperature	°F ( °C)	32 - 122 (0 - 50)	
Nominal water capacity (heating)	Gal (L)	0.925 (3.5)	
Weight (without packaging)	lbs. (kg)	103.6 (47)	
Dimensions, W x H x D	inch (mm)	17-21/64" × 33-15/32" × 13-57/64" (440 × 850 × 353)	

# Bosch Greenstar Wall Hung Heat Only Boiler



# BOSCH

Technical Data Greenstar 79 (ZBR21-3 ) Heat Only Boiler			
Output	Unit	NG	LPG (propane)
Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	79,200 (23.2)	77,500 (22.7)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	74,700 (21.9)	74,700 (21.9)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	74,000 (21.7)	74,000 (21.7)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	70,300 (20.6)	70,300 (20.6)
Min. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	24,600 (7.2)	40,100 (11.7)
Min. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	23,900 (7.0)	39,900 (11.7)
Min. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	23,900 (7.0)	39,600 (11.6)
Min. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	21,800 (6.4)	36,200 (10.6)
Gas supply requirements			
Natural Gas – Hs = 1,010 BTU/ft <sup>3</sup> (37.3MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	78 (2.2)	–
Liquid Propane Gas – HD-S = 2,500 BTU/ft <sup>3</sup> (93.1MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	–	31 (0.9)
NG	in. W.C. (mbar)	3.5 - 10.5" (8.7-26.1)	–
LPG (propane)	in. W.C. (mbar)	–	8 - 13" (19.9-32.3)
Flue gas			
Flue gas mass flow at maximum/minimum nominal output	gps	9.4/3.2	9.2/4.8
Flue gas temperature 176/140 °F (80/60 °C) at maximum/minimum nominal heat input	°F ( °C)	145/133 (63/56)	
Flue gas temperature 104/86 °F (40/30 °C) at maximum/minimum nominal heat input	°F ( °C)	115/90 (46/32)	
CO <sub>2</sub> at max. nominal output	%	9.4	11.0
CO <sub>2</sub> at minimum nominal output	%	8.6	10.4
Condensate			
Max. condensate quantity (t <sub>R</sub> = 86 °F (30 °C))	gph (l/h)	0.5 (1.8)	
pH level, approx.	%	4.8	
General			
Voltage	VAC	120	
Frequency	Hz	60	
Max. power consumption (central heating mode)	W	205	
Max. power consumption (Stand-by)	W	< 6	
Noise level	dB(A)	≤ 39	
Maximum supply temperature	°F ( °C)	190 (88)	
Max. permissible operating pressure (P <sub>MS</sub> ) heating	psi (bar)	30 (2.07)	
Permissible ambient temperature	°F ( °C)	32 - 122 (0 - 50)	
Nominal water capacity (heating)	Gal (L)	0.925 (3.5)	
Weight (without packaging)	lbs. (kg)	103.6 (47)	
Dimensions, W x H x D	inch (mm)	17-21/64" × 33-15/32" × 13-57/64" (440 × 850 × 353)	

# Bosch Greenstar Wall Hung Heat Only Boiler



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Technical Data Greenstar 100 (ZBR28-3 ) Heat Only Boiler			
Output	Unit	NG	LPG (propane)
Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	100,800 (29.5)	98,600 (28.9)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	93,800 (27.5)	93,800 (27.5)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	93,100 (27.3)	93,100 (27.3)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	89,400 (26.2)	89,400 (26.2)
Min. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	24,600 (7.2)	40,100 (11.7)
Min. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	23,900 (7.0)	39,900 (11.7)
Min. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	23,900 (7.0)	39,600 (11.6)
Min. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	21,800 (6.4)	36,200 (10.6)
<b>Gas supply requirements</b>			
Natural Gas – H <sub>s</sub> = 1,010 BTU/ft <sup>3</sup> (37.3MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	99 (2.8)	–
Liquid Propane Gas – HD-S = 2,500 BTU/ft <sup>3</sup> (93.1MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	–	39 (1.1)
NG	in. W.C. (mbar)	3.5 - 10.5" (8.7-26.1)	–
LPG (propane)	in. W.C. (mbar)	–	8 - 13" (19.9-32.3)
<b>Flue gas</b>			
Flue gas mass flow at maximum/minimum nominal output	gps	12.0/3.2	11.6/4.8
Flue gas temperature 176/140 °F (80/60 °C) at maximum/minimum nominal heat input	°F ( °C)	147/133 (64/56)	
Flue gas temperature 104/86 °F (40/30 °C) at maximum/minimum nominal heat input	°F ( °C)	117/90 (47/32)	
CO <sub>2</sub> at max. nominal output	%	9.4	11.0
CO <sub>2</sub> at minimum nominal output	%	8.6	10.4
<b>Condensate</b>			
Max. condensate quantity (t <sub>R</sub> = 86 °F (30 °C))	gph (l/h)	0.6 (2.3)	
pH level, approx.	%	4.8	
<b>General</b>			
Voltage	VAC	120	
Frequency	Hz	60	
Max. power consumption (central heating mode)	W	205	
Max. power consumption (Stand-by)	W	< 6	
Noise level	dB(A)	≤ 39	
Maximum supply temperature	°F ( °C)	190 (88)	
Max. permissible operating pressure (P <sub>MS</sub> ) heating	psi (bar)	30 (2.07)	
Permissible ambient temperature	°F ( °C)	32 - 122 (0 - 50)	
Nominal water capacity (heating)	Gal (L)	0.925 (3.5)	
Weight (without packaging)	lbs. (kg)	103.6 (47)	
Dimensions, W x H x D	inch (mm)	17-21/64" x 33-15/32" x 13-57/64" (440 x 850 x 353)	

# Bosch Greenstar Wall Hung Heat Only Boiler



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Technical Data Greenstar 131 (ZBR28-3 ) Heat Only Boiler			
Output	Unit	NG	LPG (propane)
Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	131,900 (38.6)	129,100 (37.8)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	122,800 (36.0)	122,800 (36.0)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	121,800 (35.7)	121,800 (35.7)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	116,700 (34.2)	116,700 (34.2)
Min. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	36,000 (10.5)	46,400 (13.6)
Min. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	35,100 (10.3)	46,100 (13.5)
Min. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	34,800 (10.2)	45,700 (13.4)
Min. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	31,700 (9.3)	42,000 (12.3)
<b>Gas supply requirements</b>			
Natural Gas – Hs = 1,010 BTU/ft <sup>3</sup> (37.3MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	130 (3.7)	–
Liquid Propane Gas – HD-S = 2,500 BTU/ft <sup>3</sup> (93.1MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	–	52 (1.5)
NG	in. W.C. (mbar)	3.5 - 10.5" (8.7-26.1)	–
LPG (propane)	in. W.C. (mbar)	–	8 - 13" (19.9-32.3)
<b>Flue gas</b>			
Flue gas mass flow at maximum/minimum nominal output	gps	15.7/4.5	15.2/5.6
Flue gas temperature 176/140 °F (80/60 °C) at maximum/minimum nominal heat input	°F ( °C)	162/135 (72/57)	
Flue gas temperature 104/86 °F (40/30 °C) at maximum/minimum nominal heat input	°F ( °C)	127/91 (53/33)	
CO <sub>2</sub> at max. nominal output	%	9.4	11.0
CO <sub>2</sub> at minimum nominal output	%	8.6	10.4
<b>Condensate</b>			
Max. condensate quantity (t <sub>R</sub> = 86 °F (30 °C))	gph (l/h)	0.8 (3.1)	
pH level, approx.	%	4.8	
<b>General</b>			
Voltage	VAC	120	
Frequency	Hz	60	
Max. power consumption (central heating mode)	W	205	
Max. power consumption (Stand-by)	W	< 6	
Noise level	dB(A)	≤ 44	
Maximum supply temperature	°F ( °C)	190 (88)	
Max. permissible operating pressure (P <sub>MS</sub> ) heating	psi (bar)	30 (2.07)	
Permissible ambient temperature	°F ( °C)	32 - 122 (0 - 50)	
Nominal water capacity (heating)	Gal (L)	0.925 (3.5)	
Weight (without packaging)	lbs. (kg)	103.6 (47)	
Dimensions, W x H x D	inch (mm)	17-21/64" x 33-15/32" x 13-57/64" (440 x 850 x 353)	

# Bosch Greenstar Wall Hung Heat Only Boiler



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Technical Data Greenstar 151 (ZBR35-3 ) Heat Only Boiler			
Output at elevation 0 - 2000 feet (0 - 610 m)	Unit	NG	LPG (propane)
Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	151,600 (44.4)	148,300 (43.5)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	137,500 (40.3)	137,500 (40.3)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	137,500 (40.3)	137,500 (40.3)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	134,400 (39.4)	134,400 (39.4)
Min. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	36,000 (10.5)	46,400 (13.6)
Min. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	35,500 (10.4)	46,400 (13.6)
Min. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	35,100 (10.3)	46,100 (13.5)
Min. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	31,700 (9.3)	42,000 (12.3)
Gas supply requirements			
Natural Gas – Hs = 1,010 BTU/ft <sup>3</sup> (37.3MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	149 (4.2)	–
Liquid Propane Gas – HD-S = 2,500 BTU/ft <sup>3</sup> (93.1MJ/m <sup>3</sup> )	ft <sup>3</sup> /hr (m <sup>3</sup> /h)	–	59 (1.7)
NG	in. W.C. (mbar)	3.5 - 10.5" (8.7-26.1)	–
LPG (propane)	in. W.C. (mbar)	–	8 - 13" (19.9-32.3)
Flue Gas			
Flue gas mass flow at maximum/minimum nominal output	gps	18.0/4.5	17.5/5.6
Flue gas temperature 176/140 °F (80/60 °C) at maximum/minimum nominal heat input	°F ( °C)	171/135 (77/57)	
Flue gas temperature 104/86 °F (40/30 °C) at maximum/minimum nominal heat input	°F ( °C)	133/91 (56/33)	
CO <sub>2</sub> at max. nominal output	%	9.4	11.0
CO <sub>2</sub> at minimum nominal output	%	8.6	10.4
Condensate			
Max. condensate quantity (t <sub>R</sub> = 86 °F (30 °C))	gph (l/h)	0.9 (3.5)	
pH level, approx.	%	4.8	
General			
Voltage	VAC	120	
Frequency	Hz	60	
Max. power consumption (central heating mode)	W	205	
Max. power consumption (Stand-by)	W	< 6	
Noise level	dB(A)	≤ 45	
Maximum supply temperature	°F ( °C)	190 (88)	
Max. permissible operating pressure (P <sub>MS</sub> ) heating	psi (bar)	30 (2.07)	
Permissible ambient temperature	°F ( °C)	32 - 122 (0 - 50)	
Nominal water capacity (heating)	Gal (L)	0.925 (3.5)	
Weight (without packaging)	lbs. (kg)	103.6 (47)	
Dimensions, W x H x D	inch (mm)	17-21/64 x 33-15/32 x 13-57/64 (440 x 850 x 353)	

Bosch Greenstar  
Wall Hung Heat Only Boiler



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**Technical Data Greenstar 151 (ZBR35-3 ) Heat Only Boiler Continued**

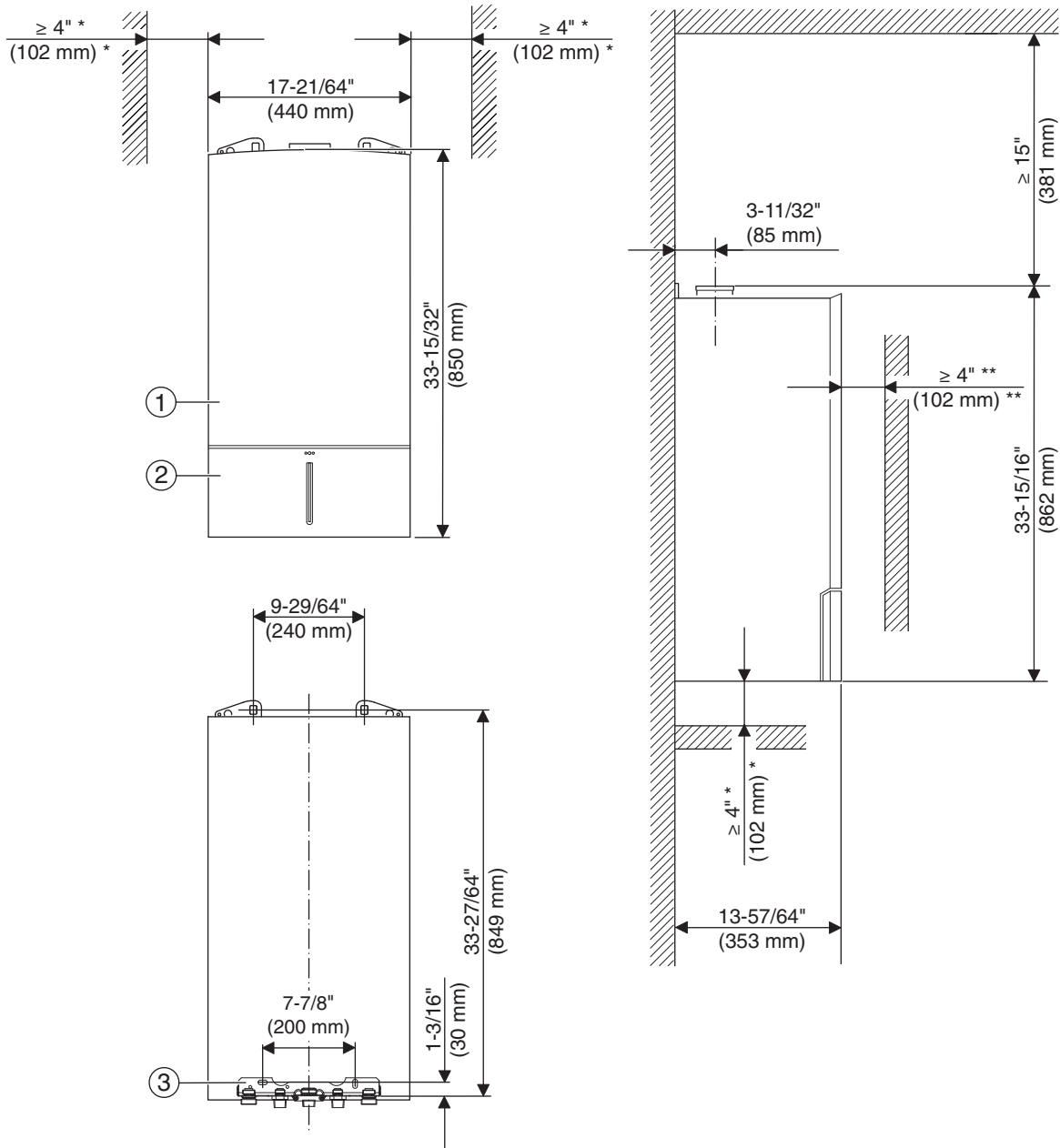
**Output at elevation 2000 - 4500 feet (611 - 1372 m) above sea level**

Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	136,440 (40.0)	139,402 (40.9)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	123,750 (36.3)	129,250 (37.9)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	123,750 (36.3)	129,250 (37.9)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	120,960 (35.5)	126,336 (37.0)

**Output at elevation 4500 - 7000 feet (1373 - 2134 m) above sea level**

Max. input rate 180/79 °F (82/26 °C)	BTU/hr (kW)	125,828 (36.9)	129,021 (37.8)
Max. output rate 104/86 °F (40/30 °C)	BTU/hr (kW)	114,125 (33.5)	119,625 (35.1)
Max. output rate 122/86 °F (50/30 °C)	BTU/hr (kW)	114,125 (33.5)	119,625 (35.1)
Max. output rate 176/140 °F (80/60 °C)	BTU/hr (kW)	111,552 (32.7)	116,928 (34.3)

Greenstar Heat Only Boiler Dimensions and Minimum Clearances



- 1 Appliance jacket
- 2 Service cover
- 3 Hydraulics connection plate

- (\*) Zero clearance from combustibles permitted, but 4" (102 mm) recommended for serviceability
- (\*\*) Distance to door, if mounted inside a closet