



# Greenstar—Just the Right Fit

## The World's Best Selling Condensing Gas Boiler

Residential space and water heating boiler solutions with 95% Annual Fuel Usage Efficiency rating (AFUE) and 57 to 151 MBH inputs.

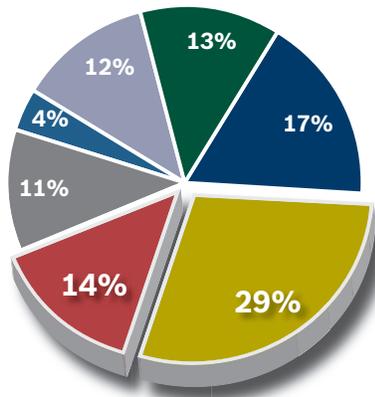


**BOSCH**  
Invented for life



# Reduce Fuel Bills, Emissions and Save Space Upgrade to a Modern Condensing Boiler

Did you know that space and water heating account for 43% of average U.S. household energy use? Now is the time to upgrade to the latest, affordable technology that combines both space heating and domestic hot water applications in one compact unit to save both space in your home and money on monthly utility bills.



## U.S. Household Energy Use

- Cooling
- Appliance
- Lighting
- Electronics
- Other
- Water Heater
- Heating

Source: DOE website. [www.energystar.gov/index.cfm?c=products.pr\\_pie](http://www.energystar.gov/index.cfm?c=products.pr_pie)

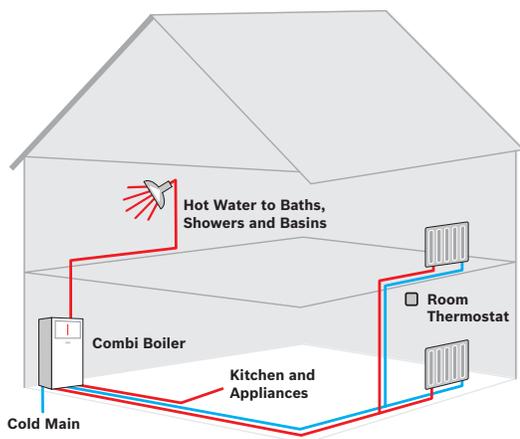
## Reduce Your Fuel Bills and Your Carbon Footprint

Energy efficiency upgrades and a new high-efficiency heating system can often cut fuel bills and boiler pollution output in half. Upgrading your boiler from 56% to 95% efficiency in an average cold-climate house will save 1.5 tons of carbon dioxide emissions each year.\*

## What is a Boiler?

A way to heat your home is a hydronic hot water system. In a hot water system, a boiler heats the water by burning fuel. A circulator moves the water through the pipes that lead to baseboard heaters, radiators or radiant tubing which are heating your home. A boiler can also be used with an indirect domestic hot water tank for your hot water needs.

An alternative option is a combi or combination boiler which is a high efficiency boiler that also uses tankless technology to produce domestic hot water combined in one compact unit. Water is heated directly from the water supply, eliminating the need for a hot water storage tank. Because hot water is delivered to your fixtures or showers at high pressure, it's very convenient and can save on your hot water costs.



## What is High Efficiency Condensing Technology and Why is it More Efficient?

During the operation of a boiler, fuel is burned and exhaust gases are expelled out of the flue; a condensing boiler is able to extract and use much of the latent heat from the flue gases before venting. This ability to extract more heat from the fuel it consumes makes it more efficient and also reduces emissions.

## Fast Payback and Ecological Awareness

AFUE (Annual Fuel Utilization Efficiency) is a measure of how energy efficient the appliance is in its annual fuel consumption. Specifically, AFUE is the ratio of heat output compared to the total energy consumed by the boiler. It takes into account the cyclic on/off operation of your appliance throughout the heating season. However, AFUE does not factor in boilers that utilize reset controls or modern micro-processing technology. Bosch Greenstar models have an AFUE of 95%, meaning 95% of the energy in the fuel becomes heat for the home. All this adds up to greater overall system efficiency – and most importantly, lower energy costs. Bosch offers a 95% AFUE rated high efficiency condensing boiler consuming low fuel and eligible for Federal Tax Credit and utility rebates (where offered) bringing your total installation costs down.

**95%  
AFUE**

\* Source: U.S. Department of Energy

# Bosch Greenstar – Your Best Choice



## Environmental Responsibility with Low NOx Emissions

The EPA identified NOx (nitrous oxide) as one main gas contributing to acid rain. Bosch's Greenstar condensing boiler series uses a combustion process which achieves up to 95% efficiency and reduces NOx emissions in advance of 2012 SCAQMD\*\* regulations, providing greater energy savings while contributing to cleaner air and better quality of life.

## Giving You the Comfort You Deserve

Greenstar is ideal for providing comfortable heating and domestic hot water from small apartments, condominiums and single family homes within the 151,000 maximum BTU rating. Special insulation offers ultra quiet operation perfect for radiant heating with panel radiators, in floor radiant, or baseboards. Radiant heat, like the sun, warms objects rather than just the air, creating a greater sense of warmth and at lower room temperatures.



## Peace-Of-Mind Warranties are Best in Industry

Bosch products are built using top-grade materials and are tested to meet the highest standards for performance and sustainability, which is why Bosch can back each product with the most generous warranties in the industry. Our 5-year parts and labor limited warranty<sup>§</sup> and lifetime heat exchanger limited warranty<sup>§</sup> ensure longevity of your investment.



## Bosch, the Quality Name You Know and Trust

Bosch has been producing products since 1886. We first produced water heaters and boilers in 1895. Since 2001 more than 2 million units have been installed worldwide. The Bosch Greenstar condensing boiler line is engineered to offer the ideal solution for residential heating and hot water needs at an affordable price, without compromising quality or fuel economy.



## Bosch Aesthetic and Space Saving

Sleek appliance like industrial design. Small foot print offering space saving within the installation.

\*\* SCAQMD. Southern California Air Quality Management Department

<sup>§</sup> Limited warranty. Copies of original warranties in their entirety are available on [www.boschheatingandcooling.com](http://www.boschheatingandcooling.com).

# Bosch Greenstar Applications

Greenstar is ideal for providing comfortable heating and domestic hot water for a townhouse, condo, apartment or single family home.



**Wall Mounted**



**Optional Floor Base for Wall Models**



**Floor Standing**



## Just the Right Fit

### One Great High Efficiency Condensing Boiler Three Great Installation Options

The Greenstar is available as a heat only boiler for use with a hot water tank, or as a combi model for heating integrated with tankless domestic hot water (DHW).

- ▶ **Wall Mounted:** No floor space required
- ▶ **Floor Standing with Optional Base for Wall Models:** Small foot print
- ▶ **Floor Standing:** Ideal for replacing old floor boiler

Greenstar Heat-Only Boilers	
Input Rate Range in MBH (180/79°F, 82/26°C)	
Greenstar 151	36 - 151
Greenstar 131	36 - 131
Greenstar 100	24 - 100
Greenstar 79	24 - 79
Greenstar 57	12 - 57

### Heat-Only Boiler

- ▶ Boiler setup with separate circuits for heating and a DHW tank
- ▶ Ideal replacement solution where the existing DHW source will stay in place
- ▶ Perfect for systems with a very high DHW demand as the tank can be matched to the hot water requirement without necessarily having to increase the boiler output
- ▶ For use with renewables like solar thermal to reduce the energy consumption even further

Greenstar Combi Boilers		DHW Flow Rate
Input Rate Range in MBH (180/79°F, 82/26°C)		
Greenstar 151	36 - 151	4 gpm
Greenstar 131	36 - 131	3.2 gpm
Greenstar 100	24 - 100	2.7 gpm

### Combination Boiler

- ▶ Boiler with an integrated system for providing instantaneous DHW
- ▶ All-in-one solution with very low installation effort and very few external components
- ▶ Ideally suited for smaller properties with low to medium DHW demand and relatively short hot water pipe runs
- ▶ Smallest footprint suits properties with little space in the utility room – frees up space that could otherwise be used

# Optional Accessories

## Controllers

Bosch offers comfort room controllers that can be used in single or multizone applications, similar to conventional on/off thermostats in style and use but provide additional energy savings and comfort.

- ▶ **CZM100:** Three zone control module, for circulator pumps or zone valve activation. The sleek, compact zone control module is expandable up to three modules providing a maximum of 8 heating zones. It features external front facing LED lights for operational visibility
- ▶ **CRC200:** Programmable controller with an integrated temperature sensor can be used as a boiler control or in conjunction with the CZM100 as a room controller. It features a time program for space heating and indirect hot water tank and has warm weather shutdown capability when used with an optional outdoor sensor
- ▶ **CRC100:** Integrated temperature sensor with basic thermostat functions can be used as a boiler control or in conjunction with the CZM100 as a room controller



**CZM100**



**CRC200**



**CRC100**



## Domestic Hot Water Tanks

Combine your Bosch boiler with one of our indirect hot water tanks. A Bosch tank is extremely well insulated for minimal stand-by heat loss. Available in 32, 50, 77 and 94 gallons, these tanks have a higher recovery rate than direct fired or tankless coil versions. While a Bosch boiler works great with any hot water tank — you can be sure of increased boiler efficiency, system longevity, and minimized service calls when you insist on a Bosch tank and boiler.



## Panel Radiators

Radiant heat, like the sun, warms objects rather than just the air, creating a greater sense of warmth and at lower room temperatures. Forced hot air or baseboard systems with fin-tubes produce heat that warms the air by convection heat. Panel radiators provide the perfect combination of both radiant and convection heat. Depending on system and designed supply temperatures, panel radiators can offer an additional energy savings of up to 15%.



# Superior Design and Components

The new Bosch Greenstar series features industry-leading design and technology components built for years of reliable operation and optimal energy efficiency.



## AI-Si Heat Exchanger

Each unit features an ASME approved Al-Si heat exchanger constructed of advanced magnesium-aluminum-silicon alloy offering increased flexibility versus traditional stainless steel. This highly durable heating block is corrosion resistant and designed to optimize clean burning combustion over an extra large surface area. The heat exchanger has a coating that prevents scale build-up, reduces service, maintains high efficiency and extends the life of the boiler.



## Plated Stainless Steel Heat Exchanger

All Greenstar Combi boilers are equipped with a high-strength stainless steel flat plate heat exchanger with double passage ensuring consistent DHW temperature output based on demand. This heat exchanger, with its large surface area and advanced technology, allows the boiler to use a lower water temperature and to condense even while producing DHW for greater efficiency and helps reduce the build-up of scale within the heat exchanger.



## Full Modulating Fan Assembly

A full modulating fan automatically increases or decreases its speed depending on the heat demand controlling the amount of gas coming into the boiler. This process, called modulation, prevents the boiler from either having too little or too much air in the unit for optimal combustion ensuring high efficiency.



## Heatronic III Boiler Control

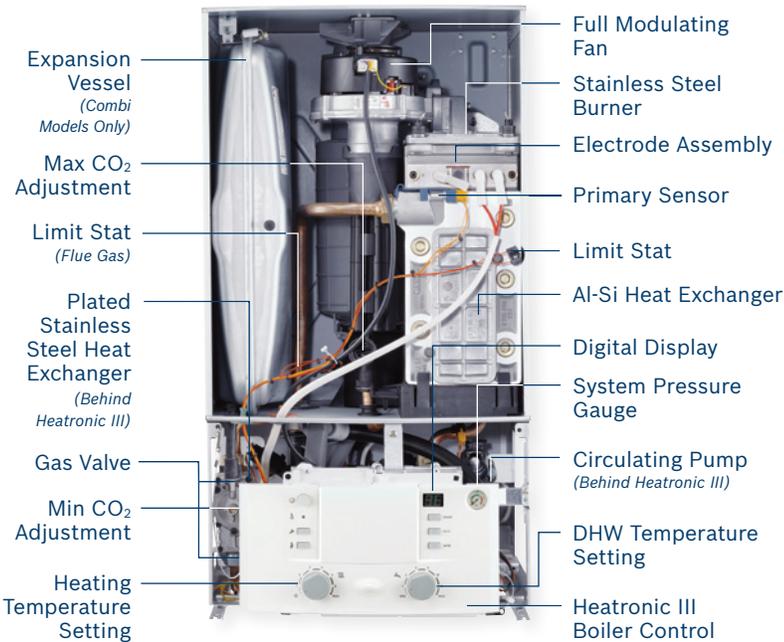
Bosch Heatronic III, a device integrated into the boiler, provides instant access to the hot water and heating control buttons. Furthermore it enables the easy setting and testing of many customized appliance functions and applications. The exclusive keypad safety lock feature prevents unwanted tampering with the control.



## FW200 Weather Compensation Boiler Control

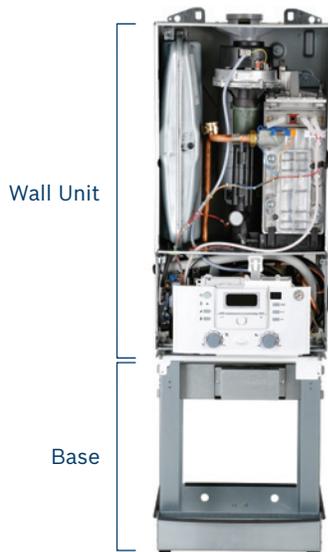
The FW200 digital thermostat and outdoor reset boiler control acts as the nerve center of a home's heating system. Programmable up to six switching times throughout the day, this interface can be installed within the appliance or be wall mounted in any location throughout the home. Providing instant feedback to the end-user along with the built-in diagnostic effortlessly pinpoints operational issues. The FW200 is included in the wall mounted Greenstar, and is optional on the FS models.

# Greenstar Boiler – A Look Inside

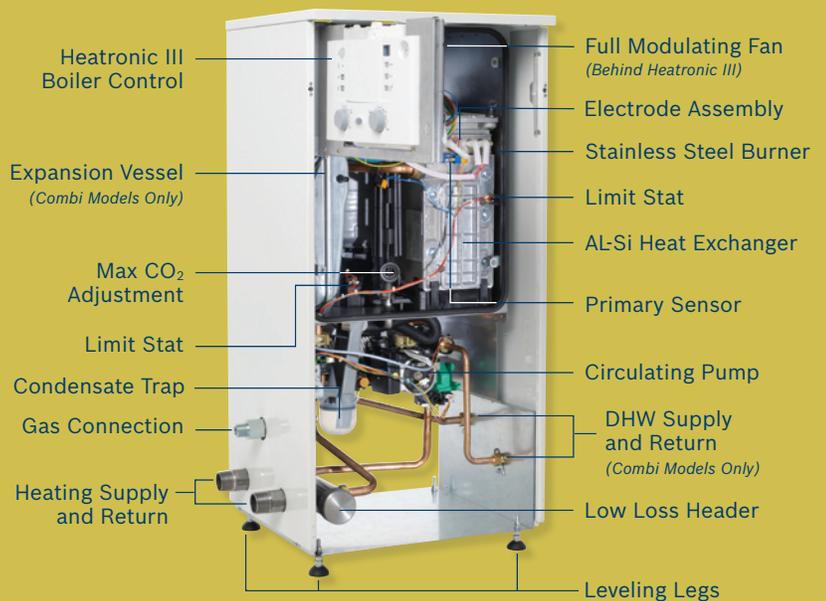


## All Greenstar Models

- ▶ **Broad BTU Output Range:** Floor and Wall models with 95% AFUE and up to 5:1 modulation are available in 5 Heat-Only and 3 Combi sizes
- ▶ **Simplified Installation:** Integral pump is standard on all models
- ▶ **Coated Heat Exchanger:** Reduces scale build-up, reduces service, maintains high efficiency and extends the life of the boiler
- ▶ **Combi Models High DHW Output:** Up to 4 GPM DHW output on Combi models – based on  $\Delta T$  at 72°F / 40°C. Large flat-plate heat exchanger allows for lower operating temperatures and larger  $\Delta T$  in DHW mode for higher efficiency and condensing operation
- ▶ **Proven Reliability:** Over 2 million Greenstar boilers sold worldwide
- ▶ **Venting Material:** Options include polypropylene (PP), flexible PP chimney liner, concentric PP kit, PVC or CPVC



## Greenstar FS Series



## All Greenstar FS Series

- ▶ **Footprint:** Fits in the same footprint as an existing floor boiler, no added cost to build a wall or move the boiler to an outside wall
- ▶ **Piping:** Low loss header pre-piped “under-the-hood”, no need for primary/secondary piping, pipes just like the existing boiler
- ▶ **Wiring:** Connection boxes (both high and low voltage) conveniently located on the back of the boiler for quick and easy connection
- ▶ **Controlling:** Simplified control, no programming required (control options sold separately)

## Installer Benefits

- ▶ Ease of Installation
- ▶ Easy and Fast Replacement
- ▶ Trouble Free Set up
- ▶ Fast Service and Maintenance
- ▶ Multiple Installation Options for the Right Fit

# Technical Specifications

Model	Heating and Tankless Hot Water			Heating*				
	Greenstar Combi 100	Greenstar Combi 131	Greenstar Combi 151	Greenstar 57	Greenstar 79	Greenstar 100	Greenstar 131	Greenstar 151
Wall Model	ZWB28-3	ZWB35-3	ZWB42-3	ZBR16-3	ZBR21-3	ZBR28-3	ZBR35-3	ZBR42-3
Floor Model	KWB28-3	KWB35-3	KWB42-3	KBR16-3	KBR21-3	KBR28-3	KBR35-3	KBR42-3

## Performance Specifications

Fuel	NG / LP			NG / LP				
Input Maximum (MBH)	100.8	131.9	151.6	57.2	79.2	100.8	131.9	151.6
Input Minimum (MBH)	24.6	36.0	36.0	12.9	24.6	24.6	36.0	36.0
DOE Heating Capacity (MBH)	91	118	135	52	71	91	118	135
Net I=B=R (MBH)	79	103	117	45	62	79	103	117
AFUE	95%	95%	95%	95%	95%	95%	95%	95%
DHW Flow Max ( $\Delta T$ at 72°F), GPM	2.65	3.2	4.0	not applicable				
Water Volume, Gal (L)	0.952 (3.5)			0.952 (3.5)				

## Technical Data

Wall Model - Weight, lbs (without Packaging, kg) - Dimensions, in. (W x H x D)	110.2 (50) 17 <sup>2</sup> / <sub>5</sub> x 33 <sup>1</sup> / <sub>2</sub> x 13 <sup>9</sup> / <sub>10</sub>			103.6 (47) 17 <sup>2</sup> / <sub>5</sub> x 33 <sup>1</sup> / <sub>2</sub> x 13 <sup>9</sup> / <sub>10</sub>				
Floor Model - Weight, lbs (without Packaging, kg) - Dimensions, in. (W x H x D)	136.6 (62) 19 <sup>1</sup> / <sub>2</sub> x 41 x 21 <sup>7</sup> / <sub>8</sub>			132 (60) 19 <sup>1</sup> / <sub>2</sub> x 41 x 21 <sup>7</sup> / <sub>8</sub>				
Optional Base Dimensions	Stand dimensions: 13 <sup>3</sup> / <sub>4</sub> " deep, by 17 <sup>3</sup> / <sub>8</sub> " wide by 20 <sup>5</sup> / <sub>8</sub> " high. Total height of stand and boiler: 54 <sup>1</sup> / <sub>8</sub> "							
Wall Boiler Supply & Return Tappings, in.	1			1				
Floor Boiler Supply & Return Tappings, in.	1 <sup>1</sup> / <sub>4</sub>			1 <sup>1</sup> / <sub>4</sub>				
Domestic Cold Water Supply, in.	<sup>3</sup> / <sub>4</sub>			not applicable				
Domestic Hot Water Supply, in.	<sup>3</sup> / <sub>4</sub>			not applicable				
Gas Connection Size, in.	<sup>3</sup> / <sub>4</sub>			<sup>3</sup> / <sub>4</sub>				
Vent Size, in.	2 - 3			2 - 3				
Vent Material	PVC / CPVC / PP / PP-Flex			PVC / CPVC / PP / PP-Flex				
Combustion Air Size, in.	2 - 3			2 - 3				
High Altitude Capability	No De-Rating up to 6,000'	No De-Rating up to 6,000'	De-Rating 3% per 1,000'	No De-Rating up to 6,000'	No De-Rating up to 6,000'	No De-Rating up to 6,000'	No De-Rating up to 6,000'	De-Rating up 3% per 1,000'
Permissible Inlet Gas Pressure - NG in. W.C. - LP (propane) in. W.C.	3.5-10.5" 8-13"							

\* Heat only Greenstar models may be used with indirect water tanks to provide domestic hot water.

<sup>5</sup> Copies of original warranties in their entirety are available at [www.boschheatingandcooling.com](http://www.boschheatingandcooling.com).



## Bosch Thermotechnology Corp.

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