



Bosch Greenstar™ Boilers

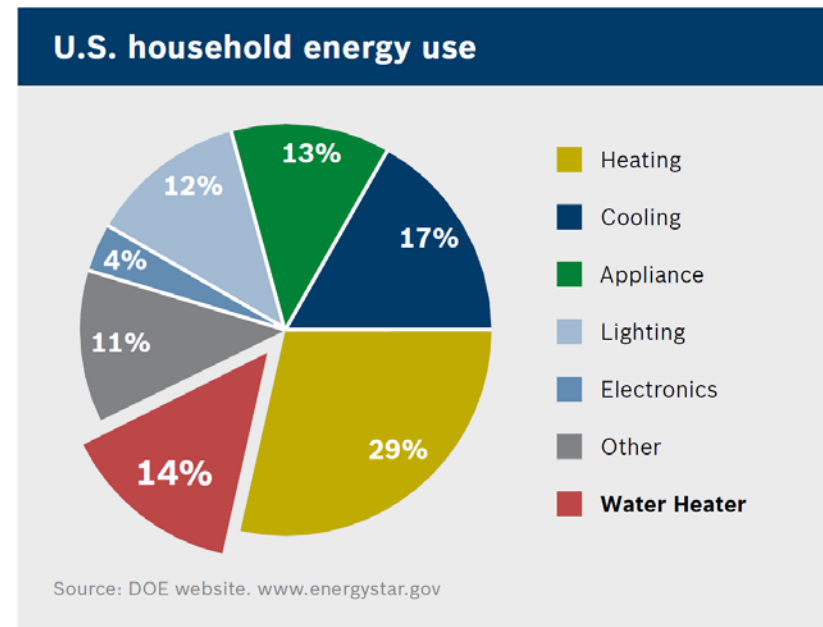
A Green Start to Space & Water Heating

The Benefits of Upgrading to a Modern Water Heating System

Did you know that space & water heating account for 43% of average U.S. household energy use?

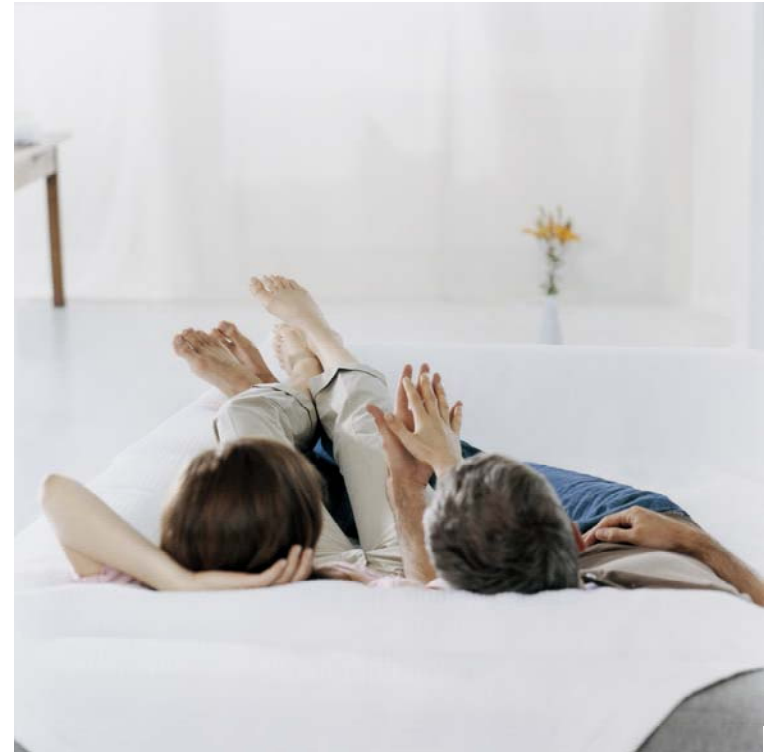
Now is the time to upgrade to the latest, affordable technology that combines both space heating & domestic hot water applications in one, compact unit:

- Condensing technology with increased efficiency & performance will reduce fuel bills & carbon footprint.
- Compact, wall-hung design saves valuable floor space.



Condensing Technology - Efficiency & Performance

- Greenstar condensing boilers deliver energy saving performance by ingeniously recycling exhaust gases to extract and re-use the latent heat.
- This makes for a highly efficient use of energy which also significantly reduces carbon dioxide emissions into the atmosphere.
- Greenstar boilers turn 98.7% of the fuel used into heat, making them more energy & cost efficient.
- Energy efficiency upgrades & a new high-efficiency heating system can often cut your fuel bills & your boiler's pollution output in half.



Compact, Wall-Hung Design Saves Valuable Floor Space

- A traditional boiler is bulky & sits on the floor, taking up ample space in your basement.
- The new Bosch Greenstar boilers are more compact in size & are designed to be wall mounted or hung virtually anywhere, even in your garage given the freeze protection feature.



Just think of what you can now do with all that extra floor space!

The Benefits of Choosing a Bosch Greenstar Boiler

The new line of Bosch Greenstar condensing boilers are engineered to offer the ideal solution for those who want to meet residential space & water heating needs.

Why Bosch?

- Bosch is the name you know & trust
- Bosch is your single source for indoor comfort & water heating solutions
- Exclusive safety & precision controls
- Peace-of-mind warranties – best in industry
- Environmental responsibility – low NOx emissions



Bosch is the Name You Know & Trust

- Bosch Thermotechnology, the inventor of condensing technology, has been producing water heaters, boilers, conventional combi & wall-mounted condensing combi boilers since 1895 & continues to improve its products by constantly renewing its technology.
- The new Bosch Greenstar condensing boiler line is engineered to offer the ideal solution for those who want to meet their residential heating & hot water needs for an affordable price, without compromising quality & fuel economy.



Bosch is Your Single Source for Indoor Comfort & Water Heating Solutions

- ➔ Whether you are retrofitting a worn out boiler & / or water heater tank, making renovations, or building a new home, you can trust Bosch has a high-quality space & water heating solution that's a perfect match for your needs.
- ➔ With over 125 years of engineering experience, you can buy with confidence knowing that Bosch products are designed to integrate & work together seamlessly for the ideal, customized system solution.



Exclusive Safety & Precision Controls

- The exclusive keypad safety lock button feature prevents unwanted tampering, triggering a disable feature, audible alarm & error code for increased reassurance to homeowners with children.



Peace-of-Mind Warranties – Best in Industry

- Bosch products are built using top-grade materials & tested to meet the highest standards for performance, sustainability & safety which meet or exceed industry certification standards.

MA Board # G1-0111-226



Because of this, Bosch can back each product with the most generous warranties in the industry to ensure longevity of your investment:

- **5-Year parts & labor warranty***
- **Lifetime heat exchanger warranty***

**Limited warranty. Copies of original warranties in their entirety are available upon request. Please contact your area representative.*



Environmental Responsibility – Low NOx Emissions

- The EPA identified NOx as a main greenhouse gas contributing to acid rain, respiratory problems and global warming.
- Bosch's Greenstar condensing boiler range uses a combustion process which achieves up to 98.7% efficiency & reduces NOx emissions ahead of 2012 SCAQMD (14ng/j) regulations.
- This provides greater energy savings while contributing to cleaner air & better quality of life.





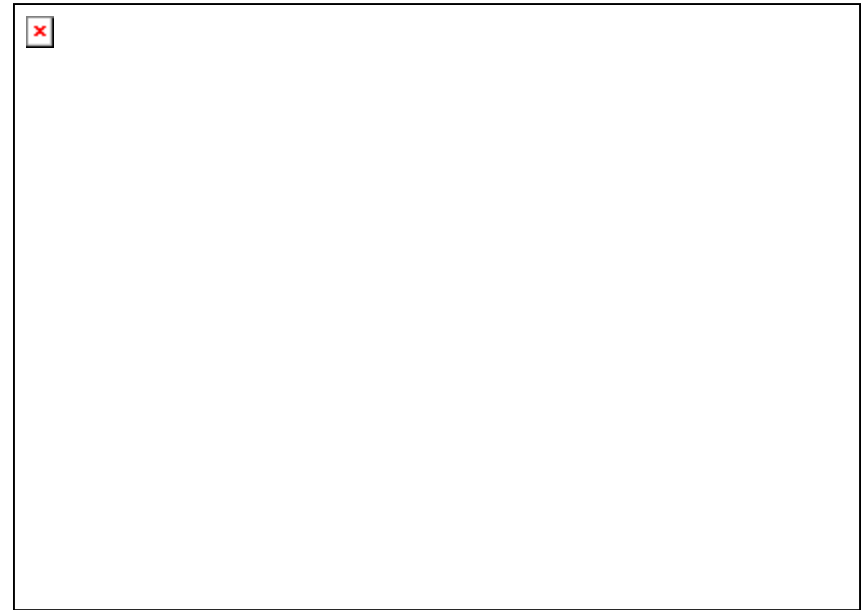
Bosch Greenstar™ Boilers

Bosch Greenstar Boiler Overview

Efficiency with Unsurpassed Performance & Control

The Bosch Greenstar series delivers energy efficient space & water heating comfort solutions for residential applications

- Ideal for detached & terraced houses, also suitable for apartments.
- Available as a space heating boiler for connection to a hot water tank.
- Available as a combi unit with integrated water heating.
- Solar compatible with new control options.



Benefits at a Glance



- ➔ Available in 6 condensing, wall-mounted models with configurations ranging from 57.2 to 151.6 MBH.
- ➔ Energy Star® rated with reliable performance & low emissions.
- ➔ Special insulation ensures ultra quiet operation.
- ➔ Homeowners & service professional's enjoy easy access to control panel while an added layer of security provides peace-of-mind.
- ➔ Can be integrated with other Bosch energy efficient products for a complete & environmentally friendly modern home.

Bosch Greenstar Boiler Models

Greenstar Combi Boilers

Space Heating + Domestic Hot Water

- **Greenstar Combi 100** (100.8 MBH input)
- **Greenstar Combi 151** (151.6 MBH input)

Greenstar Boilers

Space Heating

- **Greenstar 57** (57.2 MBH input)
- **Greenstar 100** (100.8 MBH input)
- **Greenstar 131** (131.9 MBH input)
- **Greenstar 151** (151.6 MBH input)



Energy-Saving & Environmental Features

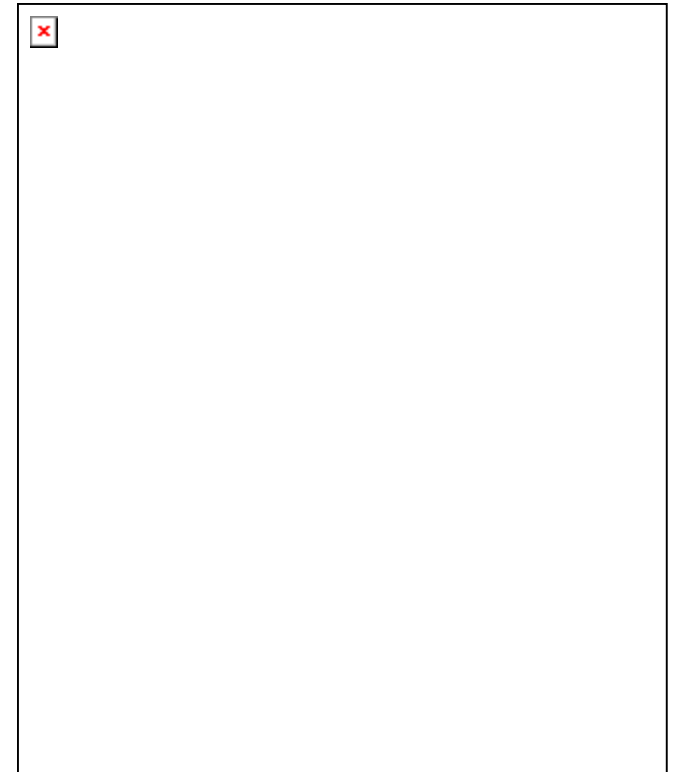
- High efficiency - up to 98.7% with low temperature applications (up to 96.1% AFUE).
- Low NOx - less than 40 mg / kWh (ppm), ahead of 2012 SCAQMD regulations.
- Simple, intelligent control options optimize efficiency & fuel consumption.
- Low electrical consumption when the boiler is in standby mode.
- Aluminum-silicon heat exchanger delivers high efficiency & reliability.
- Electronic ignition.
- Anti-cycle & modulation control.

UP TO
98.7%
EFFICIENCY



Time & Labor Saving Installation Features

- All models available as NG & LP.
- Internal piping manifold allows for BSP / NPT conversion.
- Robust water side PH operating levels of 4.0 – 8.5.
- High altitude flexibility - 7,000 ' no de-rate.
- Venting length up to 100' each way with 3" PVC pipe, up to 8 elbows.
- Venting combined length up to 81' with 2" PVC (except Bosch Greenstar 151 models).



End-User Comfort & Convenience Features

- Limited lifetime heat exchanger warranty.*
Limited 5-year* parts & labor warranty.*
**Limited warranty. Copies of original warranties in their entirety are available upon request. Please contact your area representative.*
- Special insulation ensures ultra quiet operation.
- Compact dimensions & built-in frost protection offer flexibility for location of installation.
- ECO mode for energy saving fuel consumption.
- Exclusive safety feature - passcode protected temperature control panel.





Bosch Greenstar™ Boilers

Technical Specifications

Part Numbers, Descriptions & Performance Specifications

Application	Space Heating + DHW		Space Heating Only			
Models	Greenstar Combi 100	Greenstar Combi 151	Greenstar 57	Greenstar 100	Greenstar 131	Greenstar 151
Description	ZWB28-3	ZWB42-3	ZBR16-3	ZBR28-3	ZBR35-3	ZBR42-3
Part #	7738100002	7713331041	7712231416	7712231415	7712231414	7712231413
Performance Specifications						
Fuel	NG / LP	NG / LP	NG / LP	NG / LP	NG / LP	NG / LP
Input Maximum (MBH)	100.8	151.6	57.2	100.8	131.9	151.6
Input Minimum (MBH)	34.6	36	12.9	24.6	36	36
DOE Heating Capacity (MBH)	89.4	134.4	50.8	89.4	116.7	134.4
Net I=B=R (MBH)	79	117	45	79	103	117
AFUE	95.9%	94.3%	96.1%	95.9%	95.0%	94.3%
Low Temp Application Efficiencies	98.5%	96.8%	98.7%	98.5%	97.5%	96.8%
DHW Flow Max (ΔT at 72F)	2.65 GPM	4.0 GPM	-	-	-	-
Water Volume	0.952 Gal. (3.5)	0.952 Gal. (3.5)	0.952 Gal. (3.5)	0.952 Gal. (3.5)	0.952 Gal. (3.5)	0.952 Gal. (3.5)



Technical Data

Application	Space Heating + DHW		Space Heating Only			
Models	Greenstar Combi 100	Greenstar Combi 151	Greenstar 57	Greenstar 100	Greenstar 131	Greenstar 151
Technical Data						
Weight (Without Packaging)	110.2 Lbs. (50)	110.2 Lbs. (50)	103.6 Lbs. (47)	103.6 Lbs. (47)	103.6 Lbs. (47)	103.6 Lbs. (47)
Dimensions W x H x D	17.4" x 33.5" x 13.9"	17.4" x 33.5" x 13.9"	17.4" x 33.5" x 13.9"	17.4" x 33.5" x 13.9"	17.4" x 33.5" x 13.9"	17.4" x 33.5" x 13.9"
Minimum Recommended Pipe Size	1"	1"	1"	1"	1"	1"
Supply Tappings	1"	1"	1"	1"	1"	1"
Return Tappings	1"	1"	1"	1"	1"	1"
Domestic Cold Water Supply	3/4"	3/4"	-	-	-	-
Domestic Hot Water Supply	3/4"	3/4"	-	-	-	-
Gas Connection Size	3/4"	3/4"	3/4"	3/4"	3/4"	3/4"
Vent Size	2" - 3"	3"	2" - 3"	2" - 3"	2" - 3"	2" - 3"
Vent Material	PVC / CPVC	PVC / CPVC	PVC / CPVC	PVC / CPVC	PVC / CPVC	PVC / CPVC
Combustion Air Size	2" - 3"	3"	3"	2" - 3"	2" - 3"	2" - 3"
High Altitude Capability	No De-Rating up to 7,000'	De-Rated	No De-Rating up to 7,000'	No De-Rating up to 7,000'	No De-Rating up to 7,000'	De-Rated
Gas Pressure Minimum w.c.	NG 3.5 - LP 8"	NG 3.5 - LP 8"	NG 3.5 - LP 8"	NG 3.5 - LP 8"	NG 3.5 - LP 8"	NG 3.5 - LP 8"



Package Contents Included

Application	Space Heating + DHW		Space Heating Only			
Models	Greenstar Combi 100	Greenstar Combi 151	Greenstar 57	Greenstar 100	Greenstar 131	Greenstar 151
Included Package Contents						
Al-Si Heat Exchanger	✓	✓	✓	✓	✓	✓
3 Speed Grundfos Integrated Pump	✓	✓	✓	✓	✓	✓
Integrated Expansion Vessel	3.17 Gal. (12)	3.17 Gal. (12)	-	-	-	-
FW200 Control	✓	✓	✓	✓	✓	✓
Heat Tronic III - Control PCB	✓	✓	✓	✓	✓	✓
Hydronic Manifold Bracket	✓	✓	✓	✓	✓	✓
Twin Pipe Flue Adapter	✓	✓	✓	✓	✓	✓
Tank Sensor	-	-	✓	✓	✓	✓
System Supply Sensor	✓	✓	✓	✓	✓	✓
NG / LP Conversion Kit	✓	✓	✓	✓	✓	✓
Condensation Trap Drain Hose	✓	✓	✓	✓	✓	✓



Optional Accessories Not Included

- **FB100** – secondary zone control in addition to FW200 controller, enables monitoring of room temperatures.
- **ISM2** – intelligent solar controller to enable efficient operation of a variety of solar systems.
- **IPM2** – intelligent pump & mixer valve controller, to enable greater control of external systems.
- **ICM2** – intelligent cascading module for up to 4 units.

Optional Accessories Not Included	FB100 Control	ISM2 Control	IPM2 Control	ICM2 Control	Cleaning Tool 1060	Cleaning Tool 1061
Description	Room Sensor	Solar Control Module	Pump Control Module	Cascade Module (4 Max)	Cleaning Tool Kit	Cleaning Tool
Part #	7719003525	7719003527	7719003526	7719003528	7719002502	7719002503
Product Image						



Bosch Greenstar™ Boilers

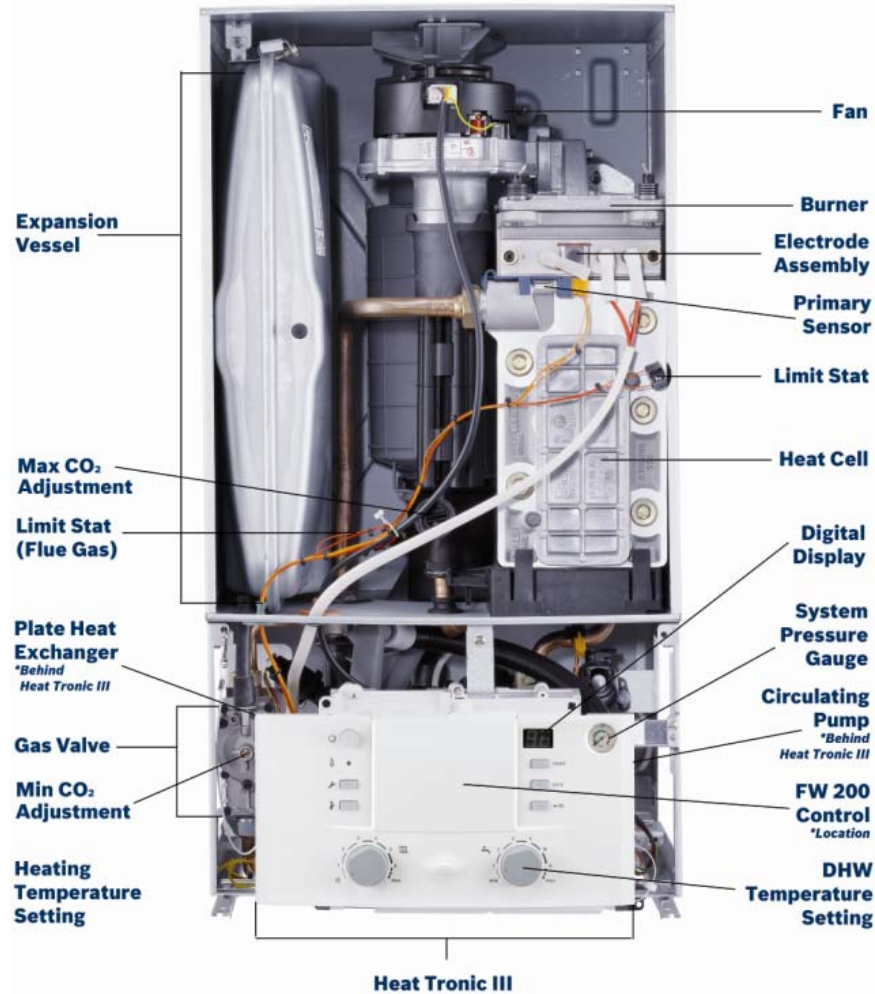
Superior Design & Components

Bosch Greenstar Unique Features

- Al-Si heat exchanger
- Heat Tronic III controls
- FW200 weather compensation
- Plated stainless steel heat exchanger
- Fully modulating fan assembly
- Stainless steel burner
- Primary NTC / Main supply temperature sensor



Internal Diagram



Al-Si Heat Exchanger

- ASME approved heat exchanger constructed of advanced Magnesium-Aluminum- Silicon alloy, offering increased flexibility versus traditional stainless steel (up to 6x's more flexible).
- Robust heat exchanger with coating on flue gas side for high corrosion resistance.
- Less restrictive water flow due to only one open water pathway.
- Equipped with high durability heating blocks that are corrosion resistant (PH levels of 4.0 – 8.5) & designed to optimize clean burning combustion over an extra large surface area, which requires minimal servicing & reliance on spare parts during the boiler's lifetime.



Heat Tronic III Controls

- A device integrated into the base of the boiler providing instant access to the heating & hot water controls.
- Optional system controls are accessible, while instant feedback to the end-user & a built-in diagnostics module effortlessly pinpoint operational issues.
- The exclusive keypad safety lock feature prevents unwanted tampering with the controls.



FW200 Weather Compensation

- The included FW200 digital thermostat & outdoor reset boiler control act as the nerve center of a home's heating system.
- Programmable with up to six switching times throughout the day.
- Can install within the Heat Tronic III control or be wall mounted in any location throughout the home with control of up to four cascaded units.
- Integration of additional Bosch products, including solar applications, can be programmed from the unit.



Plated Stainless Steel Heat Exchanger

- Outfitted with a high strength stainless steel secondary exchanger & burner with double passage - assuring consistent temperature output based on demand.
- DHW hot temperature control limit of 140°F prevents scale build-up within the heat exchanger.
- Testing up to 140 lbs pressure.



Fully Modulating Fan Assembly

- Automatically increases or decreases its speed according to the amount of gas coming into the boiler depending on the heat demand.
- This “modulation” process prevents the boiler from either having too little or too much air in the unit for optimal combustion, assuring high efficiency.
- Non-return diaphragm fitted to prevent air movement through boiler. Bi-metallic strip to ensure efficient gas/air mixing in differing operating temperatures.



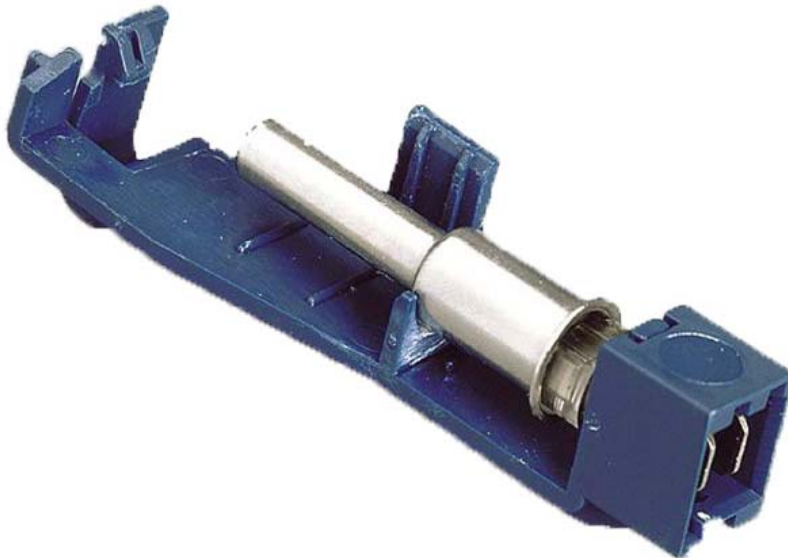
Stainless Steel Burner

- Manufactured from stainless steel with fine mesh covering to produce a stable flame.

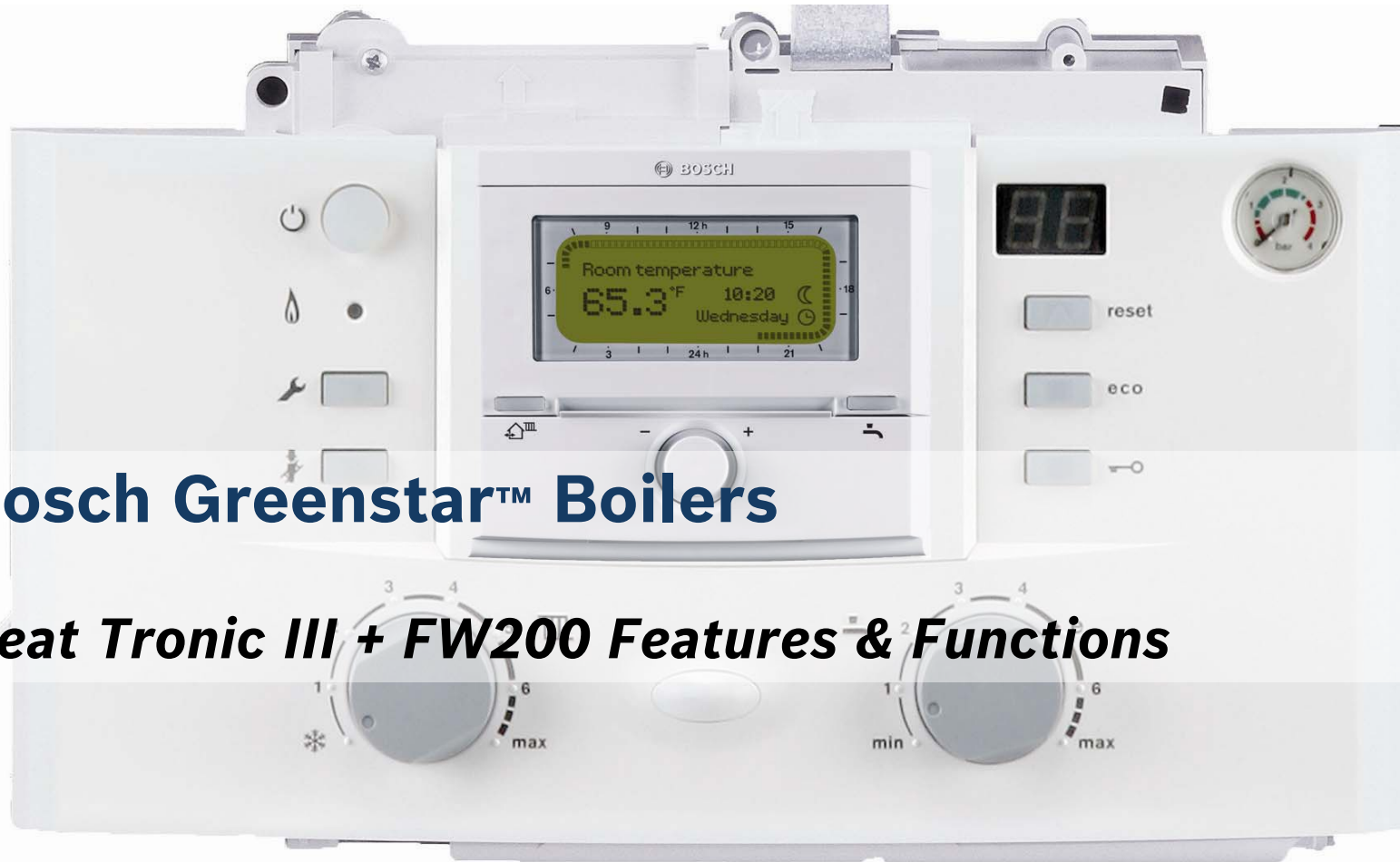


Primary NTC / Main Supply Temperature Sensor Dry Pocket Resistance Values

- Supply sensor
- DHW (tank) sensor
- DHW (flat plate) sensor
- LLH (Low Loss Header) temp sensor



Temperature (°F) °C	Resistance [Ω]
68 (20)	14.772
77 (25)	11.981
86 (30)	9.786
95 (35)	8.047
104 (40)	6.653
113 (45)	5.523
122 (50)	4.608
131 (55)	3.856
140 (60)	3.243
149 (65)	2.744
158 (70)	2.332
167 (75)	1.99
176 (80)	1.704
185 (85)	1.464
194 (90)	1.262
203 (95)	1.093
212 (100)	950



Bosch Greenstar™ Boilers

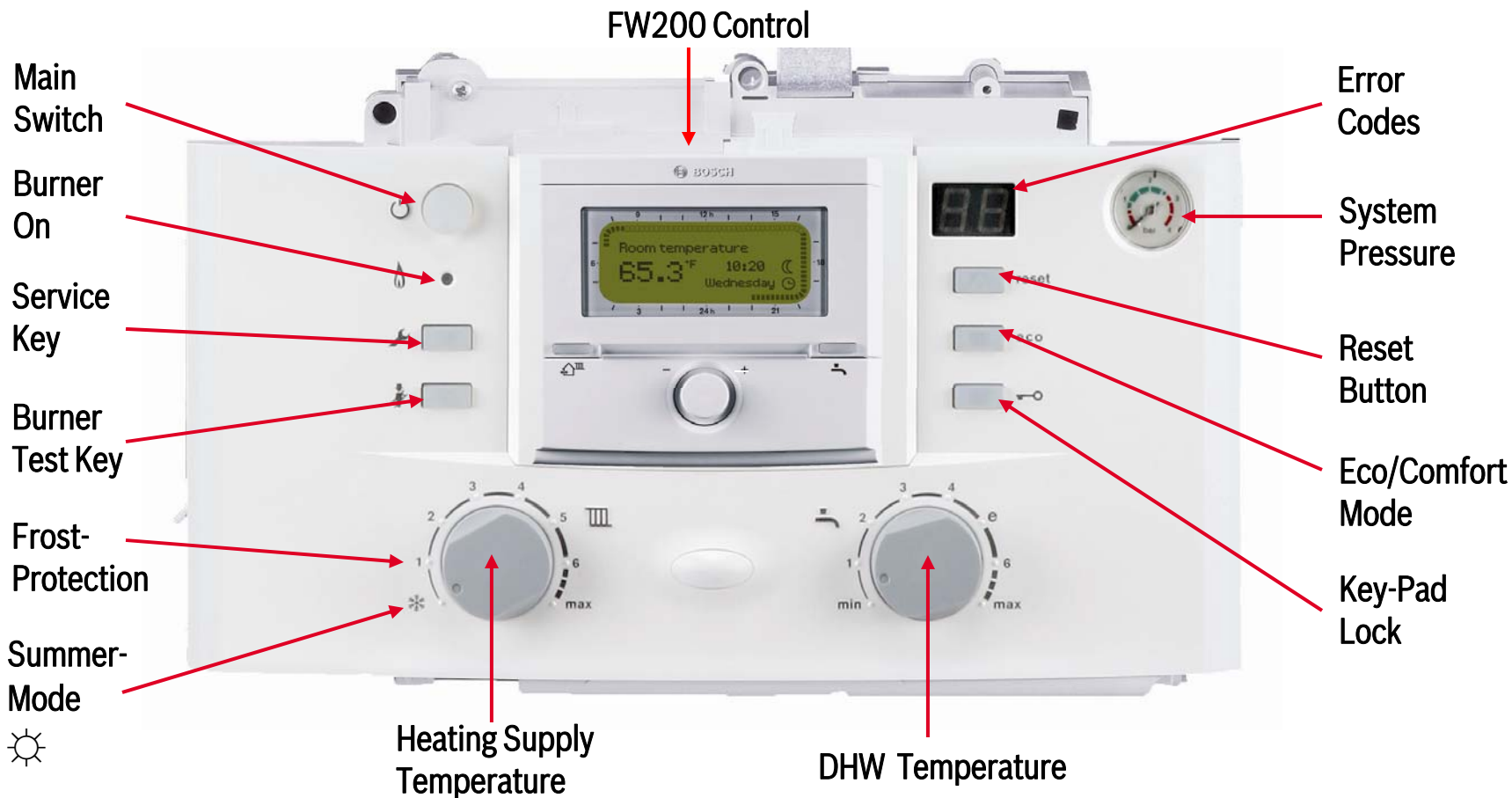
Heat Tronic III + FW200 Features & Functions

Heat Tronic III Features

- Accurate heating & hot water control
- Built in diagnostics
- Optional system controls
- First & second level parameters
- On / Off switch
- Reset function



Heat Tronic III Functions



FW200 Features

- Weekly program with 6 switching times per day for a mixed / unmixed heating circuit & DHW.
- Actuation of modules IPM2, ISM2.
- Can be installed within the Heat Tronic III, or wall mounted away from the boiler.
- 2 heating circuits can be controlled without the FB100.
- Max. 4 heating circuits possible (FW200 + (2) FB100's).
- Adjustable DHW water temperature.
- DHW time program.
- Thermal disinfection possible (158° F).
- Recirculation pump program.
- Solar warm water preparation.
- Solar optimization of heating circuits & DHW.
- Concrete slab drying program.
- Room temperature hook-up.
- Optimized heating curves.



FW200 Functions

auto

“Automatic” operation to preset times & temperatures.



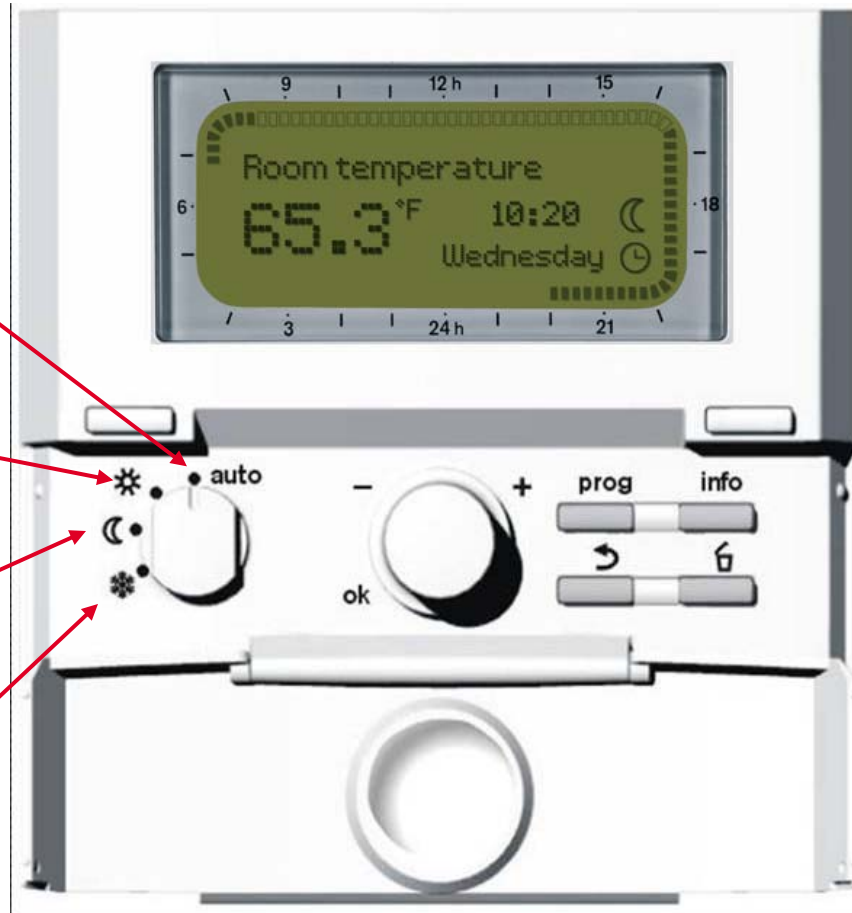
Operates at “comfort / hot” temperature constantly – manual mode.



Operates at “set-back / low” temperature constantly.



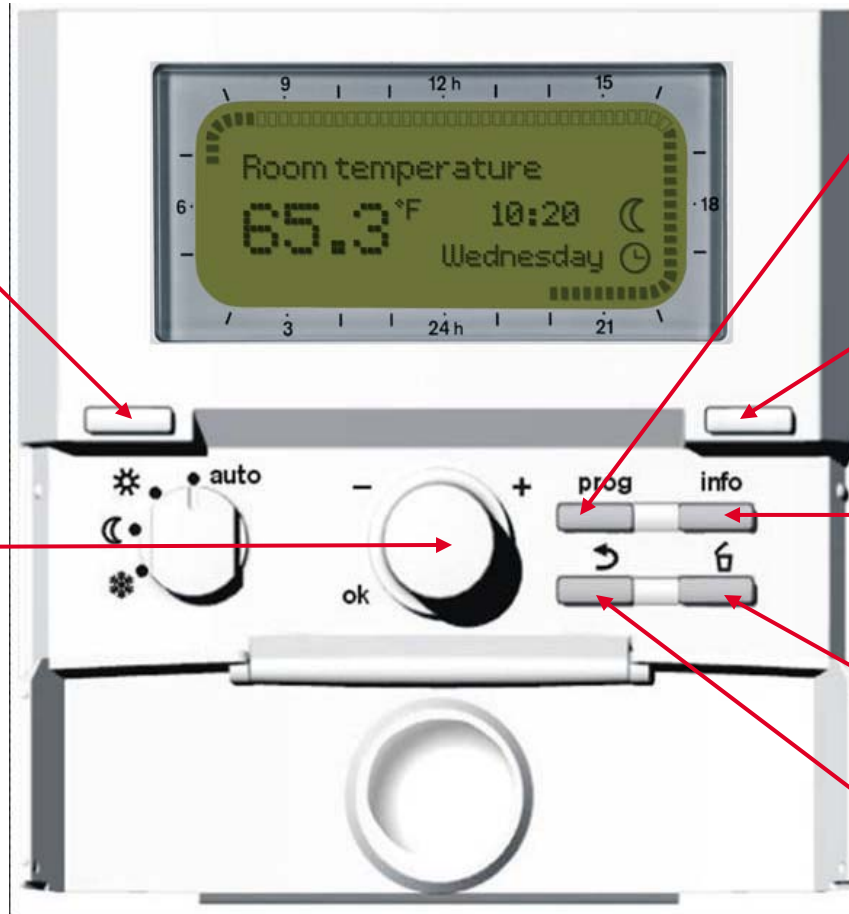
Operates at “frost protection” temperature constantly.



FW200 Functions

Heating Advance –
Press to bring next switching Point forward.

Rotary Selector –
Rotate to change display, press to store setting.



Menu –
Hold 1 sec to activate “customer” level, hold 5 secs to activate “expert” level.

DHW Advance –
Press to bring next switching point forward.

Info –
Press to show system info and control operation.

Delete –
Press to delete setting.

Return –
Press to revert to previous screen.

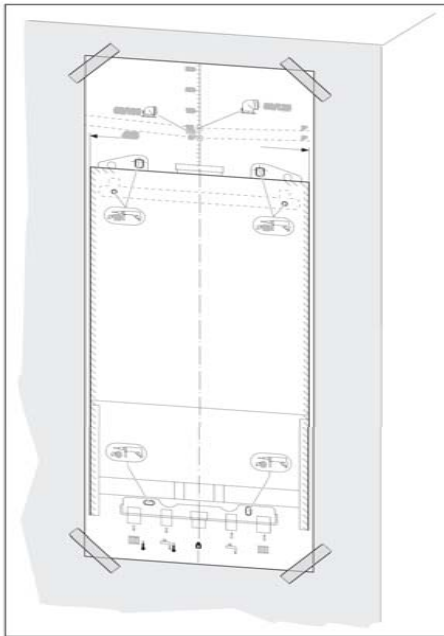


Bosch Greenstar™ Boilers

Installation

On Wall Installation

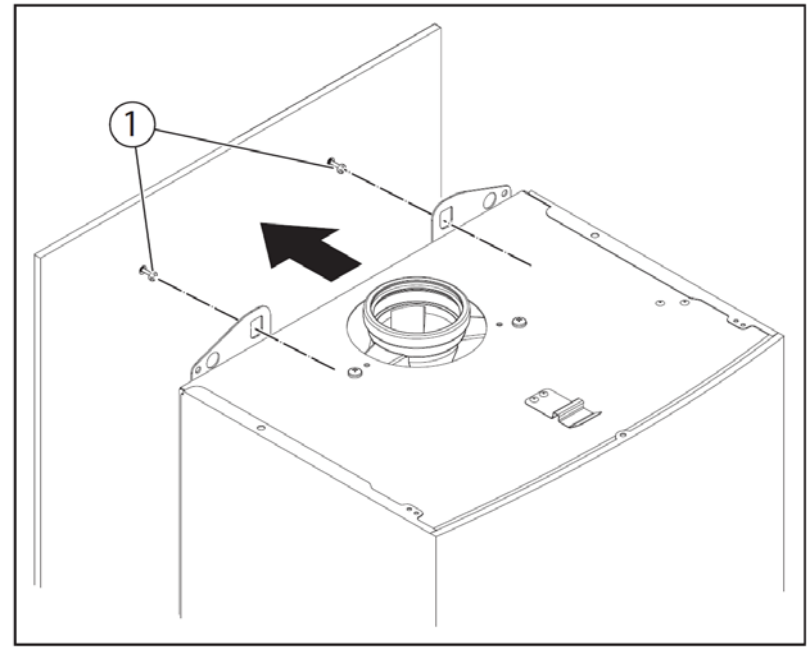
1st



2nd

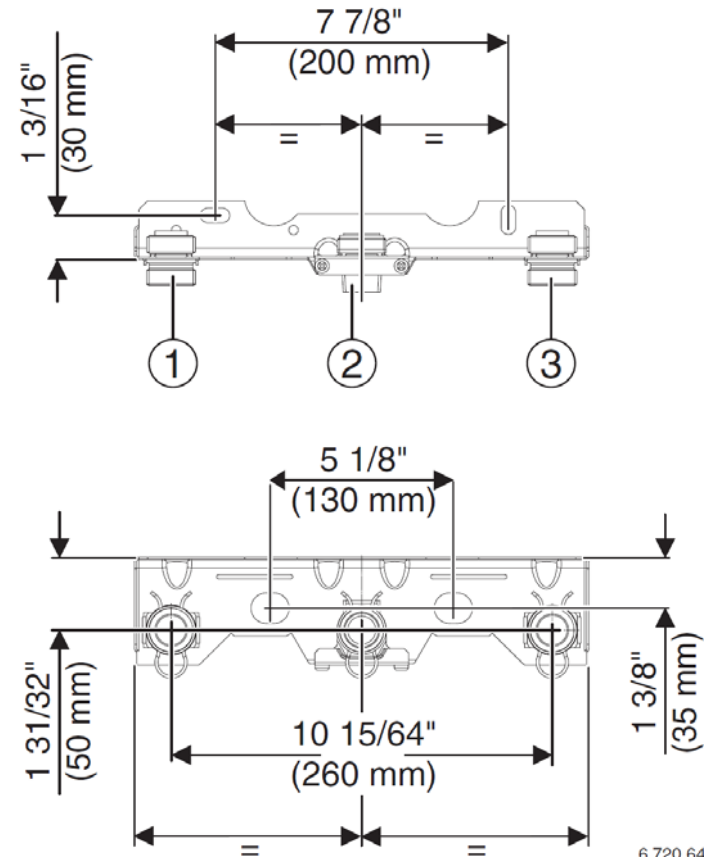


3rd



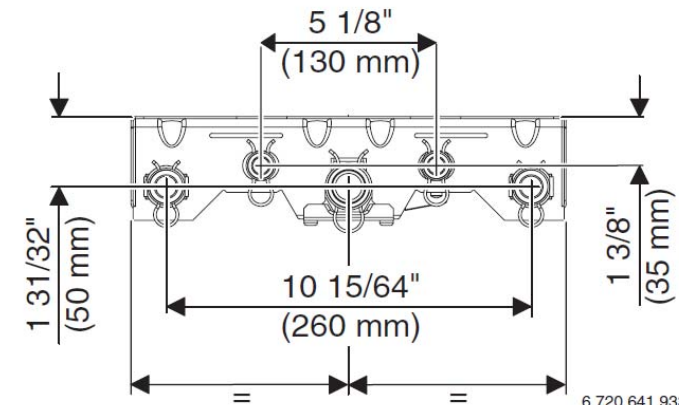
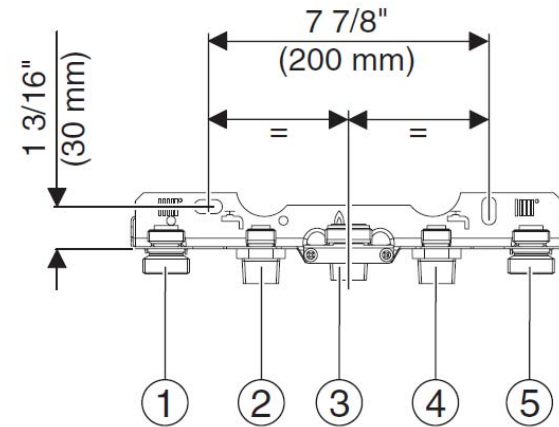
Hydronic Manifold – Greenstar Heating Models Only

- 1) **Heating supply:** 1" NPT
- 2) **Gas:** 3/4" NPT
- 3) **Heating return:** 1" NPT



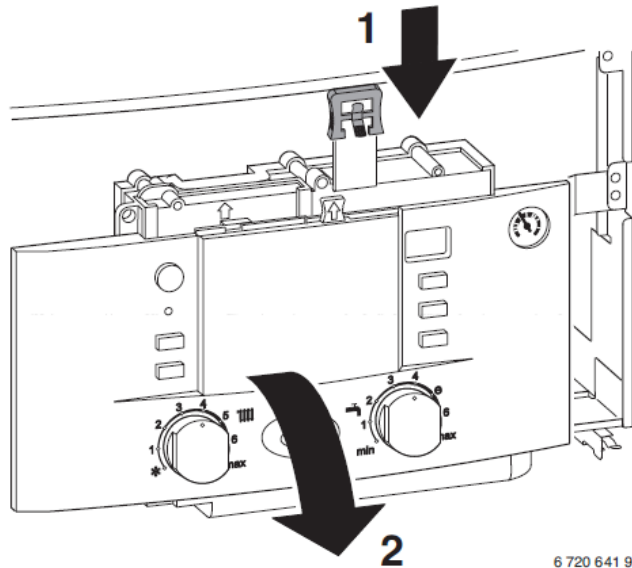
Hydronic Manifold – Greenstar Combi Models Only

- 1) **Heating supply:** 1" NPT
- 2) **DHW / Hot:** 3/4" NPT
- 3) **Gas:** 3/4" NPT
- 4) **DHW / Cold:** 3/4" NPT
- 5) **Heating return:** 1" NPT

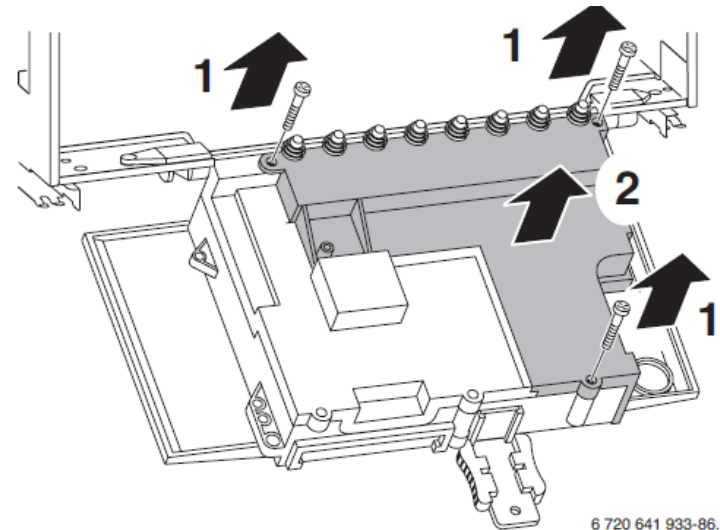


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Electrical Connections Sensors & Low Voltage

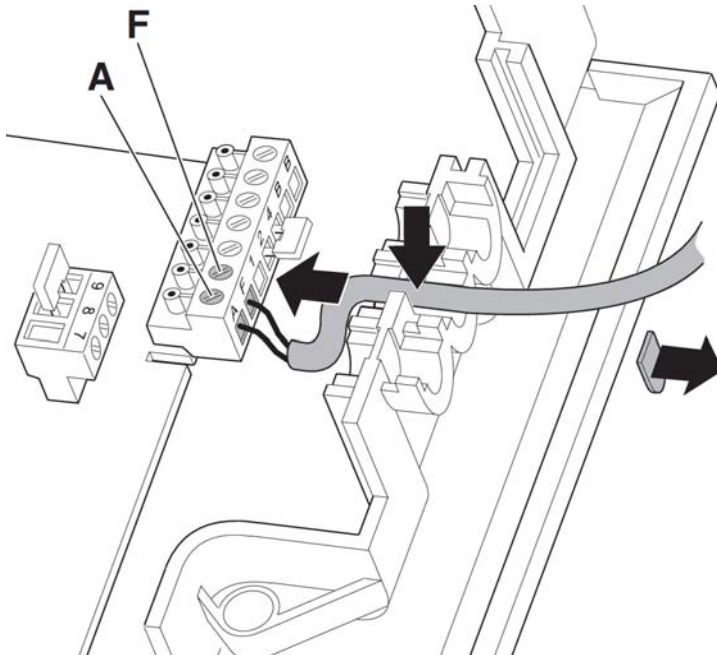


Open front
face plate

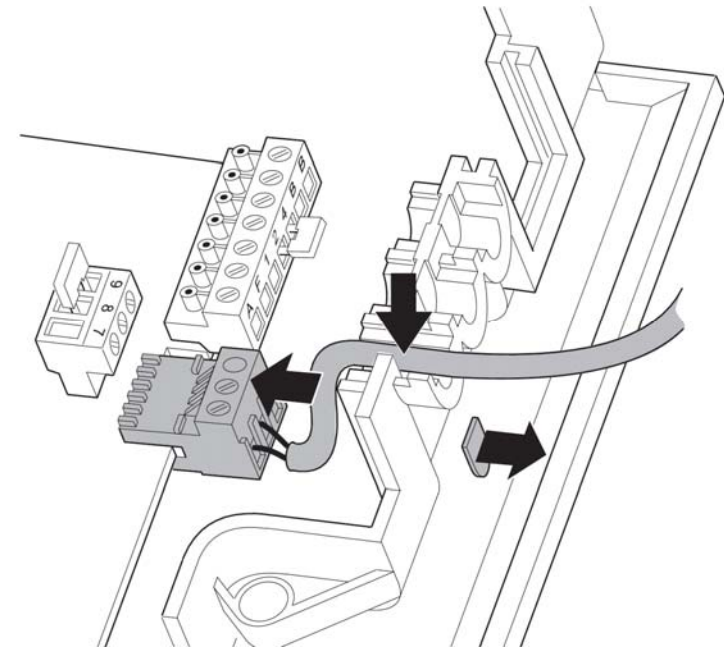


Remove rear
electrical cover

Electrical Connections Sensors & Low Voltage

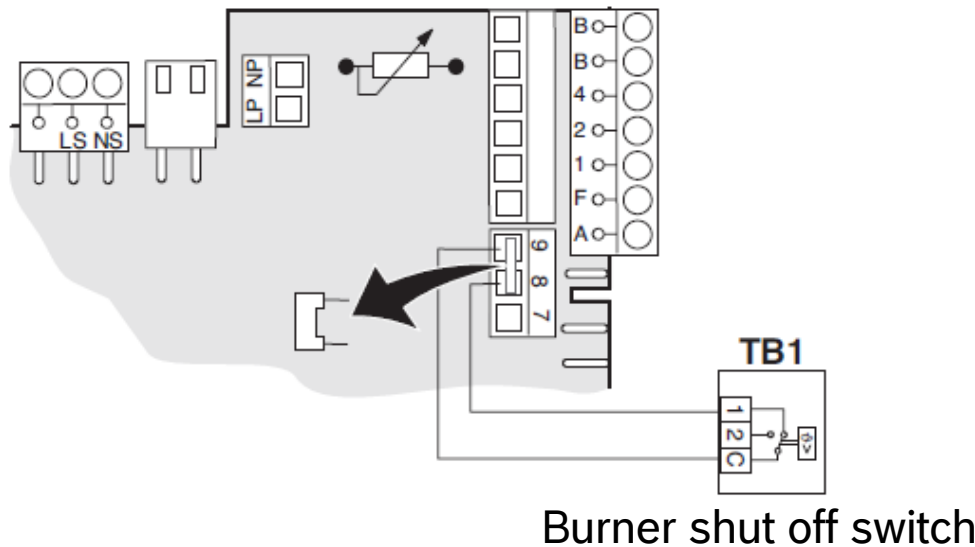


Connecting
outdoor sensor



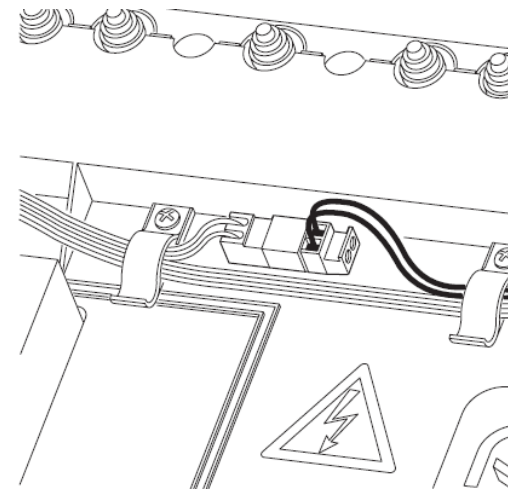
Connecting
indirect tank sensor
(heating only boilers)

Electrical Connections Sensors & Low Voltage



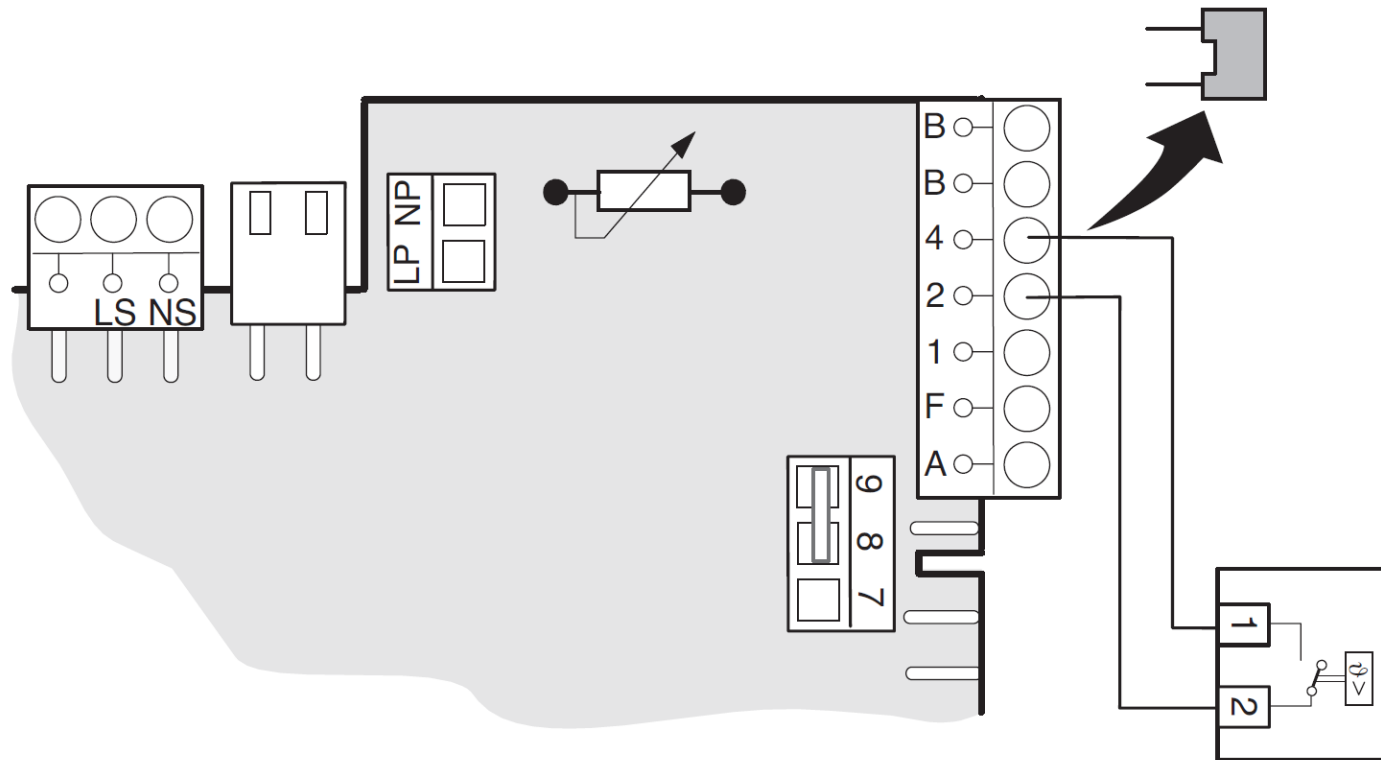
TB1 connection from normally closed external circuit (High Limit, LWCO)

NB: CH & DHW circuits interrupted



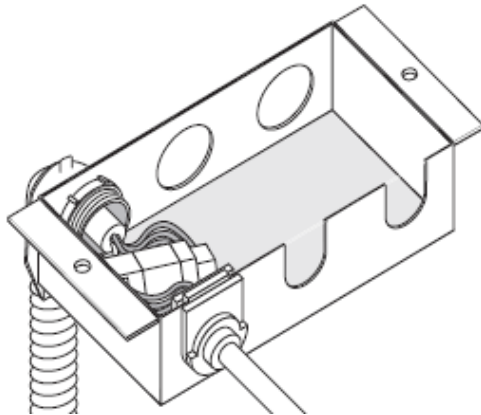
Connection for low loss header sensor

Electrical Connections Sensors & Low Voltage



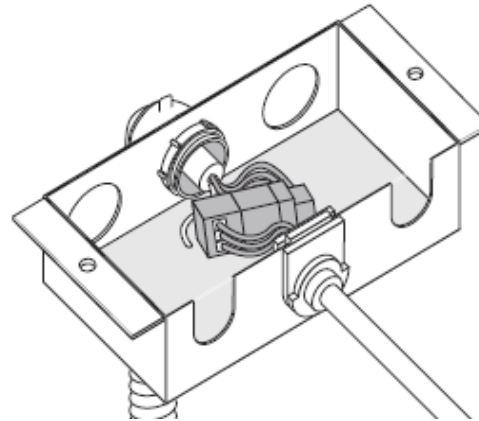
A voltage free (dry contact) third party room thermostat or heat demand (*T - T*) from a relay panel can be used to send an ON/OFF signal to the appliance

Electrical Connections Sensors & Low Voltage



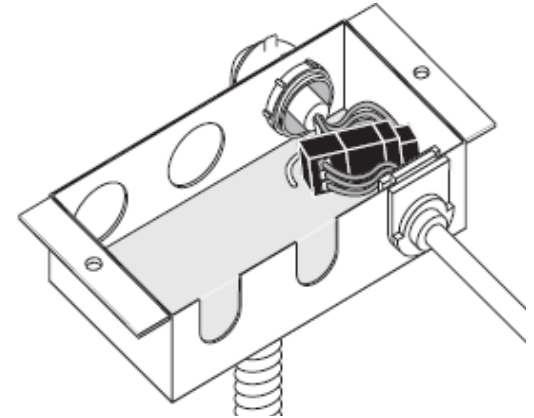
Power cable

WHITE



DWH indirect tank
pump or 3-way valve

RED



External heating pump
or zone control relay

BLACK

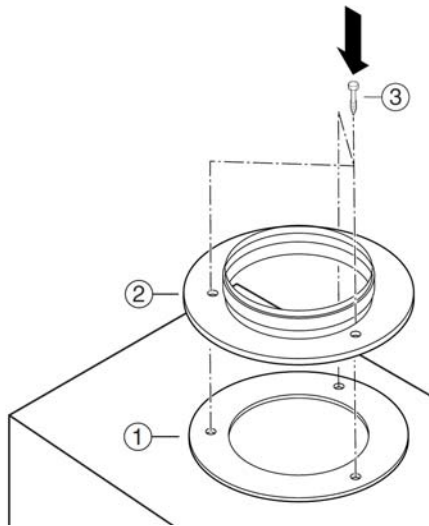


Bosch Greenstar™ Boilers

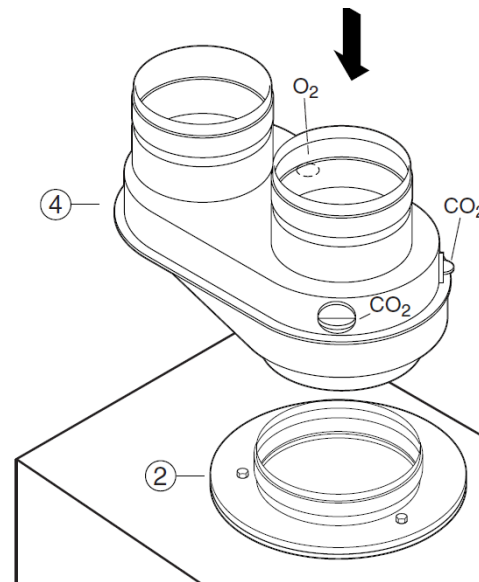
Venting

Venting Guidelines

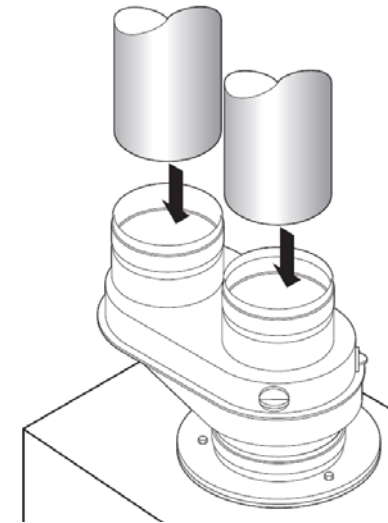
Attach the vent flange to the top of the boiler



Attach the vent adaptor to the flange

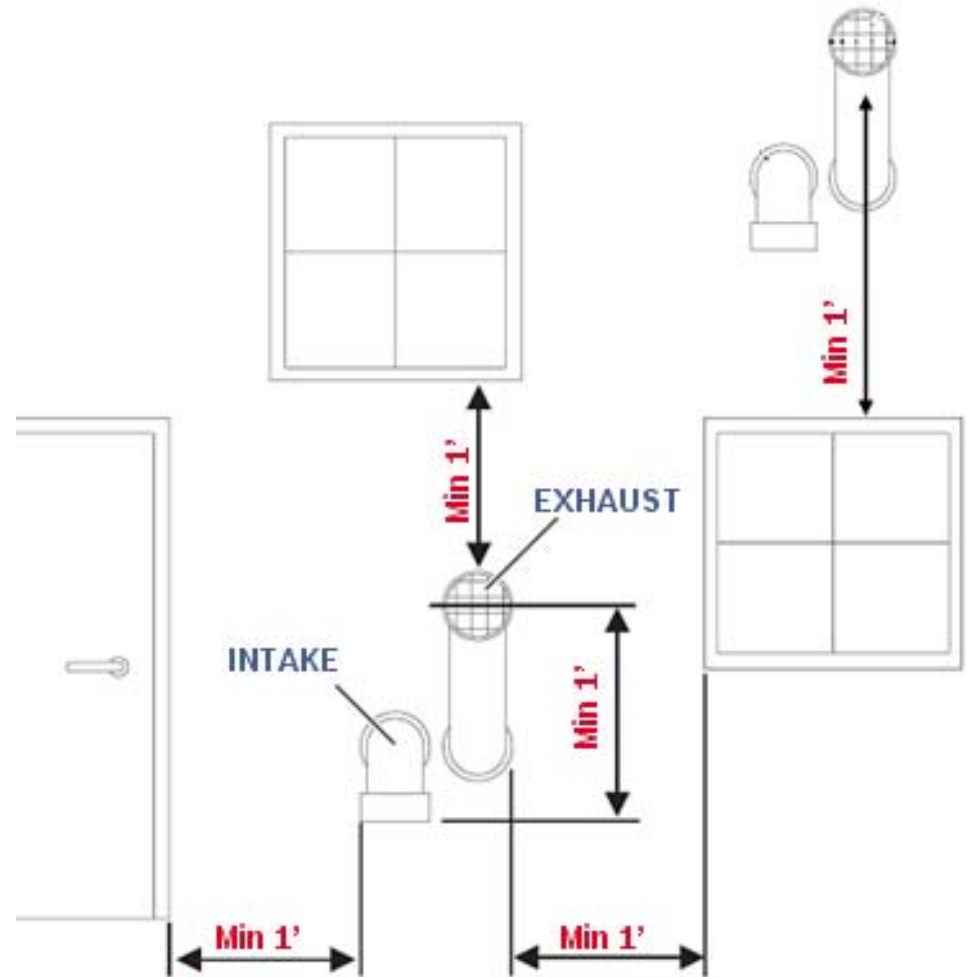


Install the flue pipe



Direct Vent / Sealed Combustion Minimum Clearance

- ➔ Vent will terminate 1' above grade, snowline or roof (Canada 1.5').
- ➔ Termination at least 7' above public walkway.
- ➔ Vent must be 3' above any forced air intake, if within 10'.
- ➔ Do not extend exposed vent pipe beyond the recommended distances to prevent risk of condensation freezing.
- ➔ Vent should terminate 3' away from adjacent walls, inside corners and 5' below roof overhang.



Direct Vent / Non-Sealed Combustion Minimum Clearance

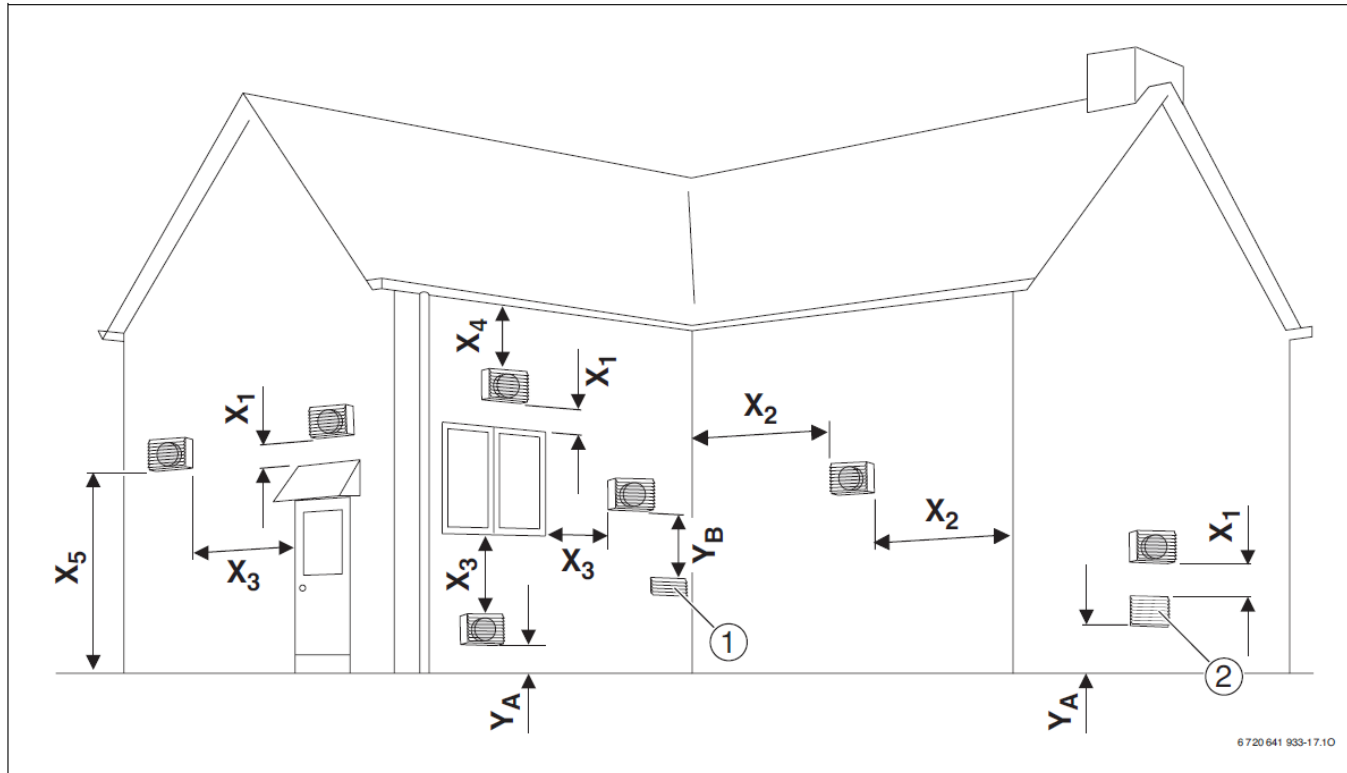


Fig. 22 Vent and air pipe position of a system with combustion air supply from the room (non-room sealed)

X1 = 1 foot

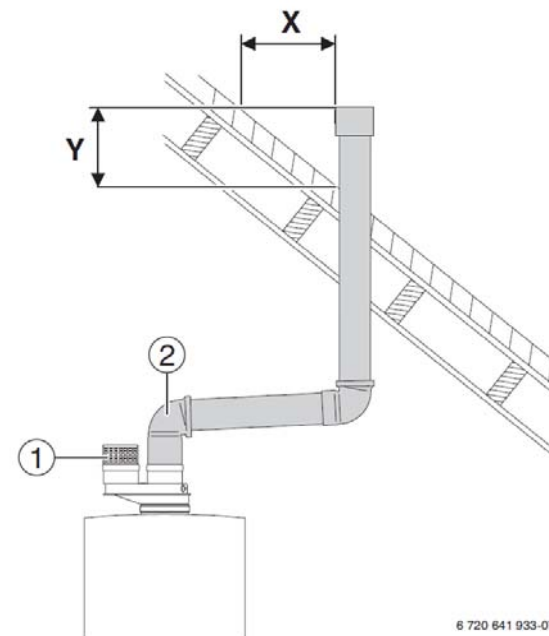
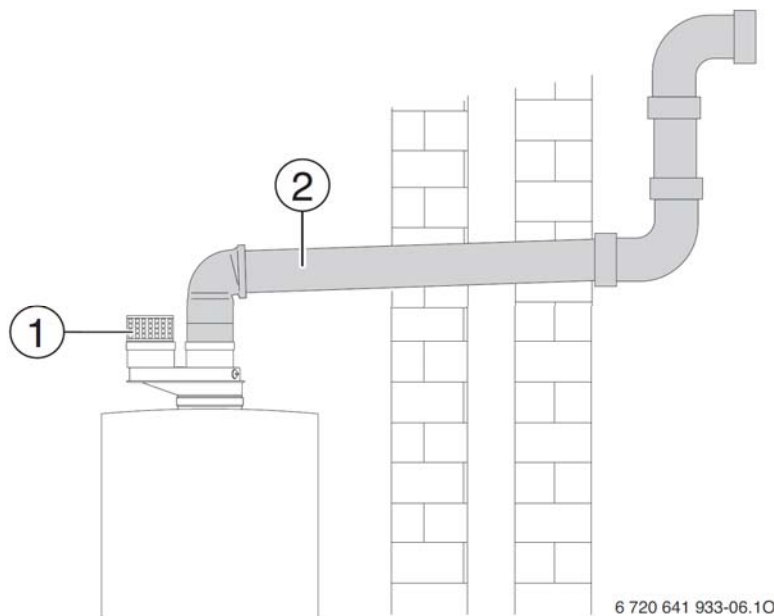
X2 = 3 feet

X3 = 4 feet

X4 = 5 feet

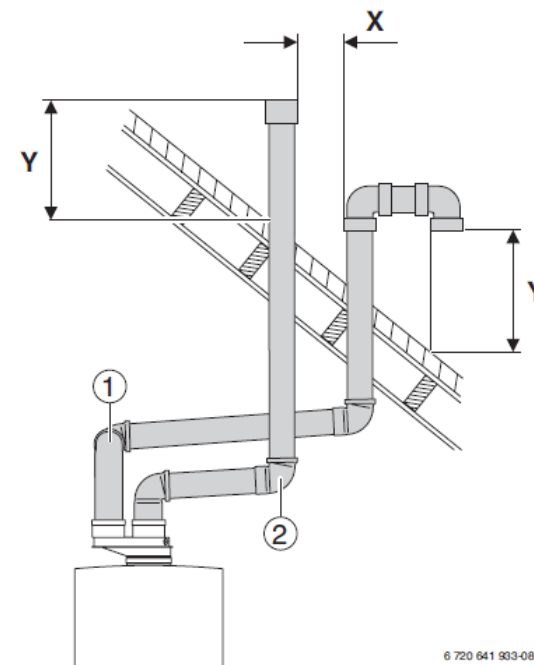
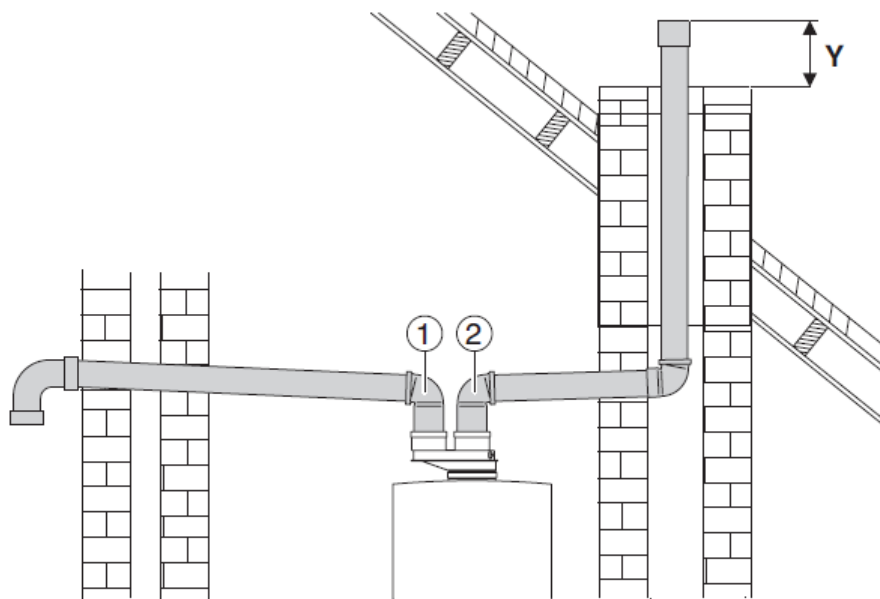
X5 = 7 feet

Vent Routing Example #1



The exhaust pipe must be properly supported and pitched a minimum of $\frac{1}{4}$ inch (6.35 mm) per foot back to the boiler. This allows the condensate to drain away.

Vent Routing Example #2



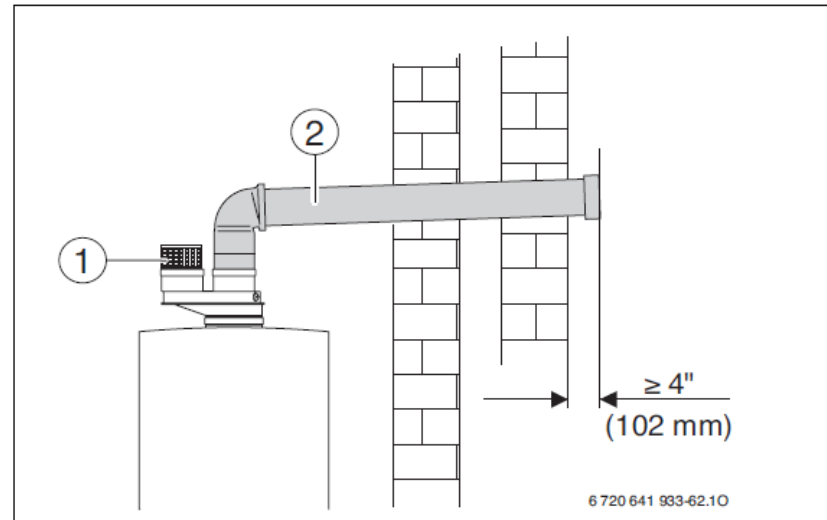
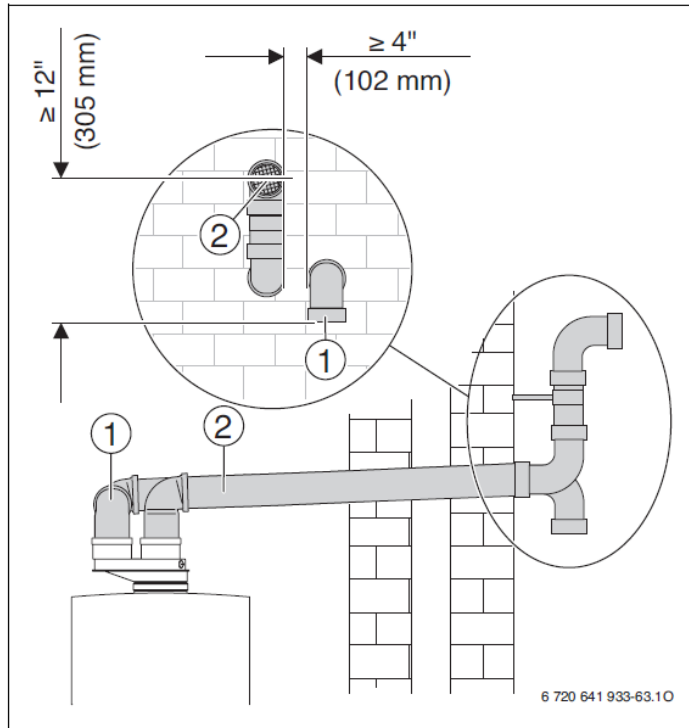
6 720 641 933-08.10



The exhaust pipe must be properly supported and pitched a minimum of ¼ inch (6.35 mm) per foot back to the boiler. This allows the condensate to drain away.



Vent Routing Example #3



Vent Routing Example #4

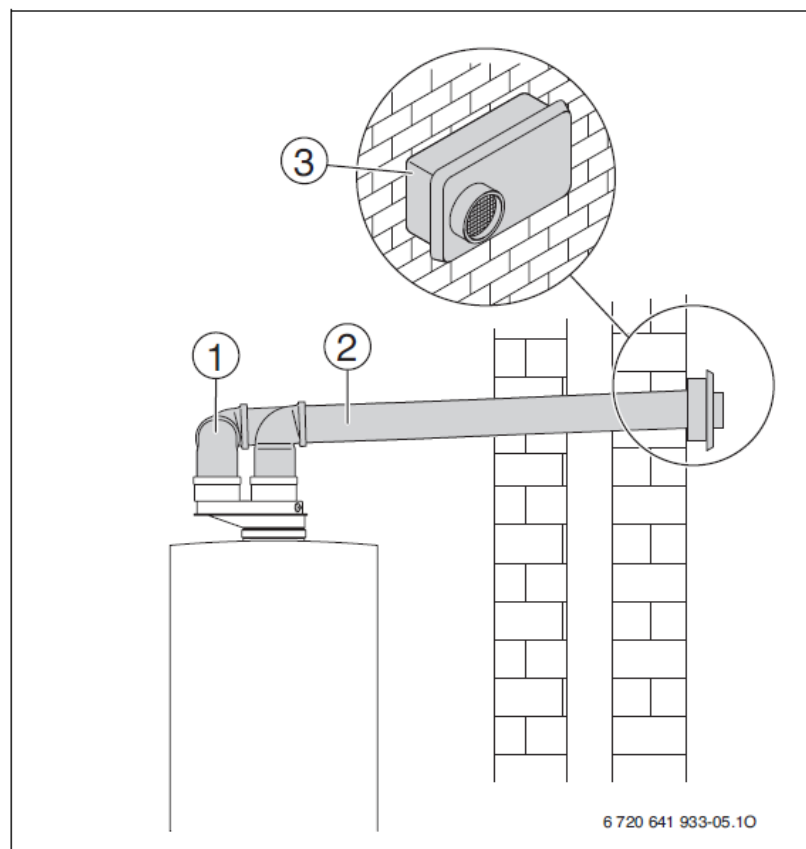


Fig. 30 Horizontal venting system (sealed combustion)

2" Venting Non-Engineered – Separate Terminations

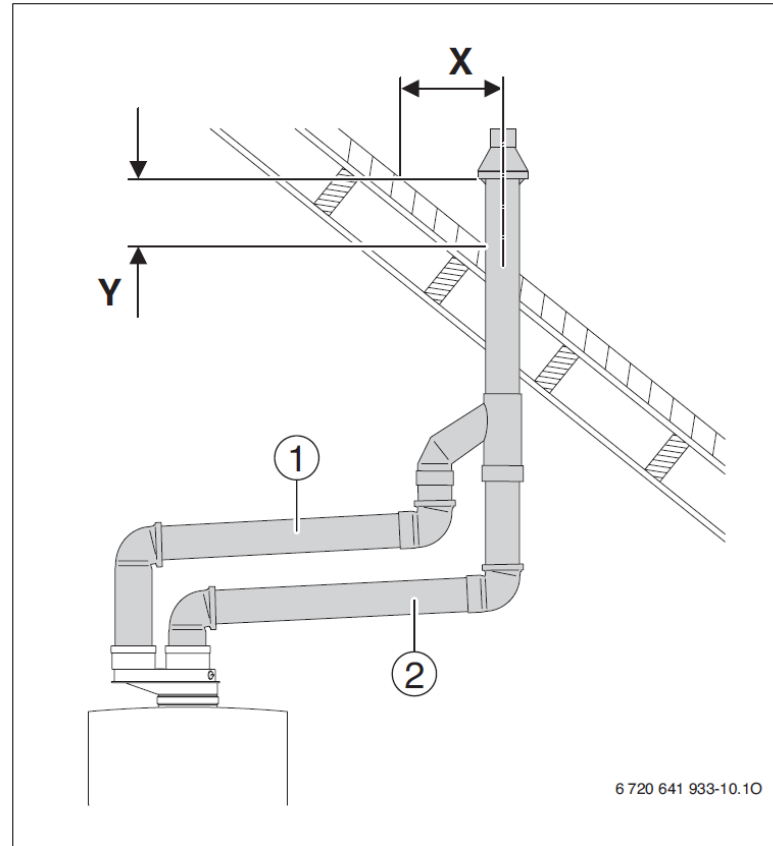
Installations → Fig. 27, 28, 29, 31, 32 and 34

2" pipe	Maximum combined pipe length in feet (m) for	
	ZBR16-3A ZBR28-3A ZWB328-3A	ZBR33-3A ZBR42-3A ZWB42-3A
1	81 ft (24.6 m)	65 ft (19.8 m)
2	73 ft (22.1 m)	57 ft (17.3 m)
3	71 ft (21.6 m)	48 ft (14.6 m)
4	66 ft (20.1 m)	40 ft (12.2 m)
5	61 ft (18.6 m)	32 ft (9.8 m)
6	56 ft (17.1 m)	23 ft (7.0 m)

COMBINED PIPE LENGTH
INTAKE AND EXHAUST

Tab. 21 Vent and combustion air pipes with separate terminations

2" Venting Concentric Vent Kit



Venting in 2” Concentric Vent Kit

Installations → Fig. 33

2" pipe	Maximum combined pipe length in feet (m) for	
	ZBR16-3A ZBR28-3A ZWB28-3A	ZBR35-3A ZBR42-3A ZWB42-3A
1	66 ft (20.1 m)	47 ft (14.3 m)
2	61 ft (18.6 m)	38 ft (11.6 m)
3	56 ft (17.1 m)	30 ft (9.1 m)
4	51 ft (15.6 m)	22 ft (6.7 m)
5	46 ft (14.1 m)	13 ft (4.0 m)
6	41 ft (12.5 m)	5 ft (1.5 m)

COMBINED PIPE LENGTH
INTAKE AND EXHAUST

Tab. 23 Vent and combustion air pipes with concentric termination



Venting Guidelines

Material	Item	United states	Canada	Greenstar 57	Greenstar 100	Greenstar 131	Greenstar 151	Combi 100	Combi 151
PVC schedule 40, 80	2" (50 mm) Vent or air pipe and fitting	ANSI/ASTM D1785	BH Gas venting systems, ULC S636 ¹⁾	X	X	X		X	
PVC-DWV		ANSI/ASTM D2665		X	X	X		X	
CPVC schedule 40, 80		ANSI/ASTM F441		X	X	X	X	X	X
PVC schedule 40, 80	3" (76 mm) Vent or air pipe and fitting	ANSI/ASTM D1785		X	X	X	X	X	X
PVC-DWV		ANSI/ASTM D2665		X	X	X	X	X	X
CPVC schedule 40, 80		ANSI/ASTM F441		X	X	X	X	X	X
PVC		Pipe cement/ primer		ANSI/ASTM D2564	X	X	X	X	X
CPVC	ANSI/ASTM F493			X	X	X	X	X	X

Tab. 17 Materials for pipe

1) Components of the certified vent systems must not be interchanged with other vent systems or unlisted pipe fittings. Plastic components, and specified primers and glues of the certified vent system must be from a single system manufacturer and not intermixed with other system manufacturer's vent system parts.

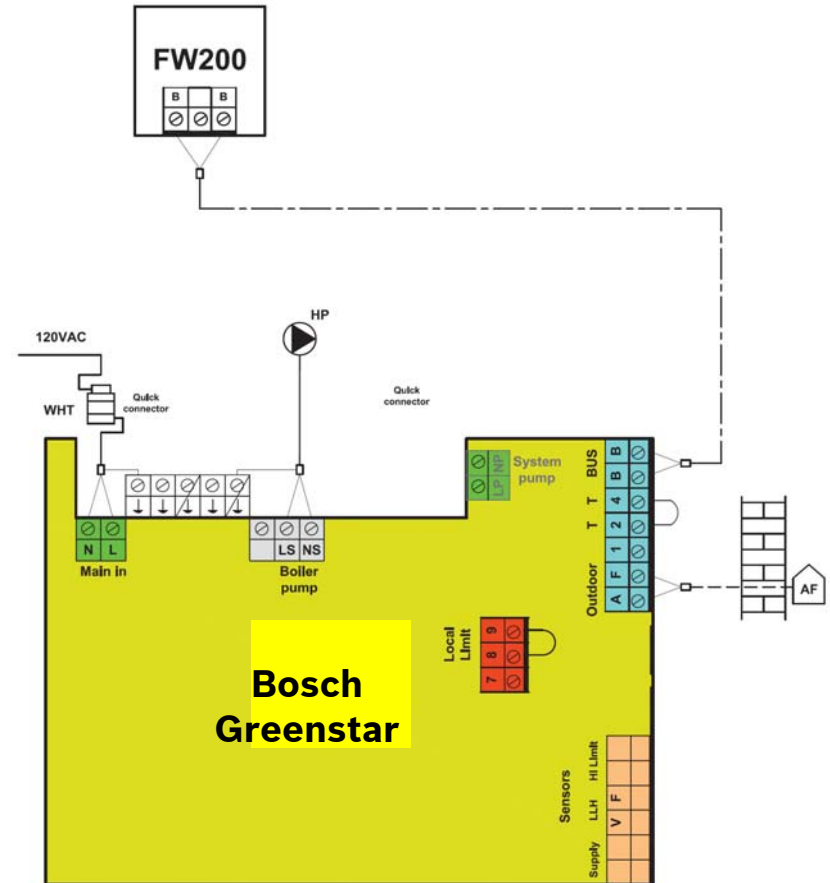
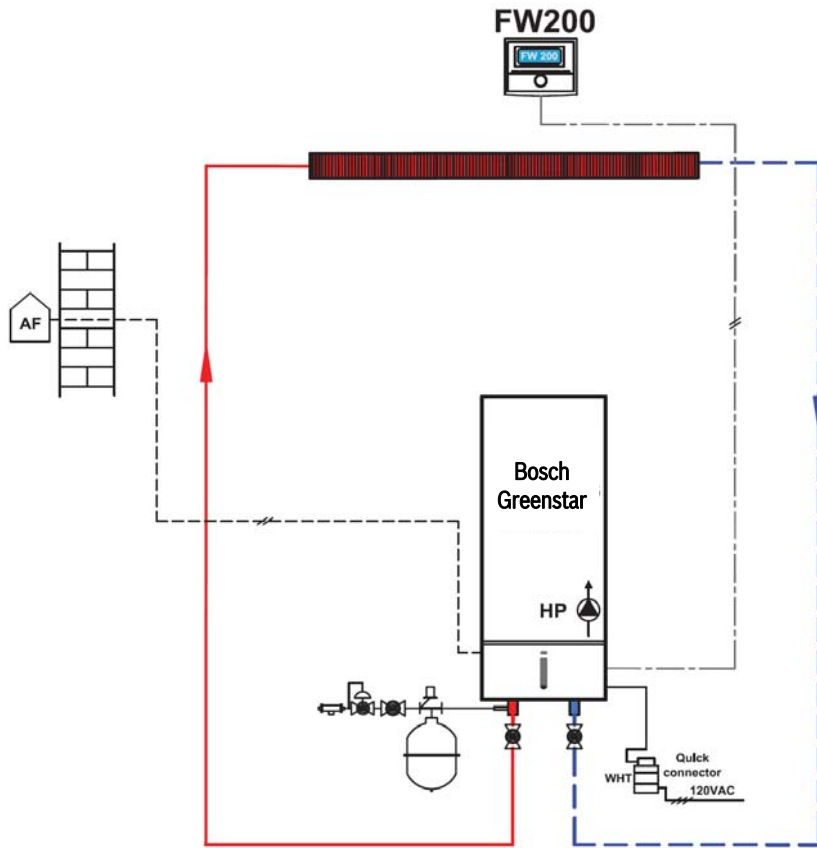




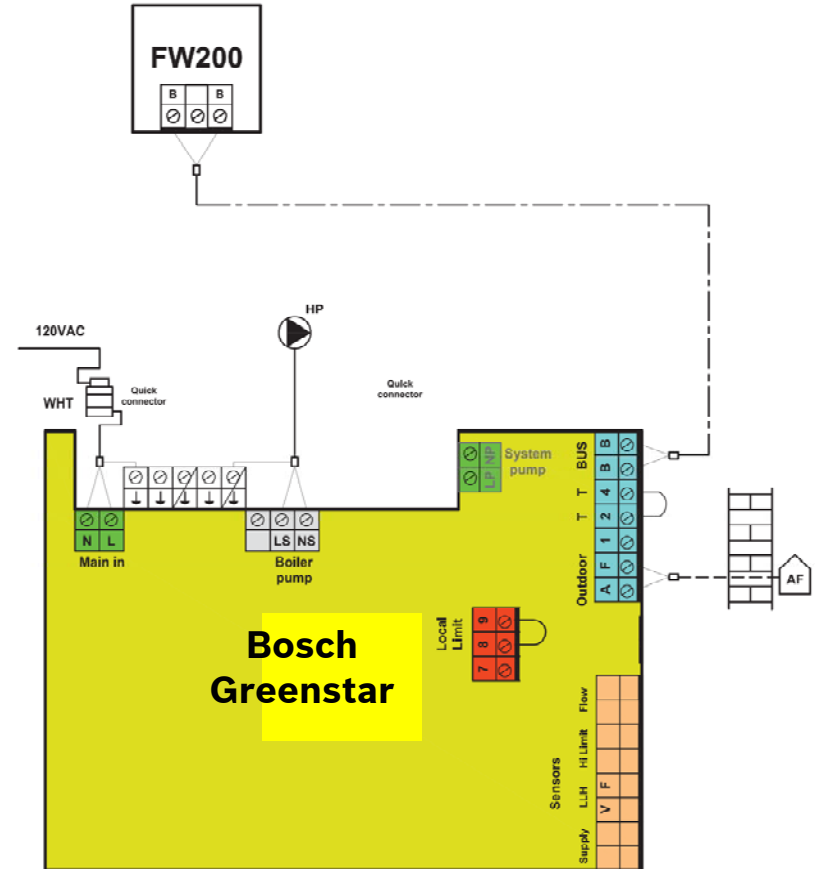
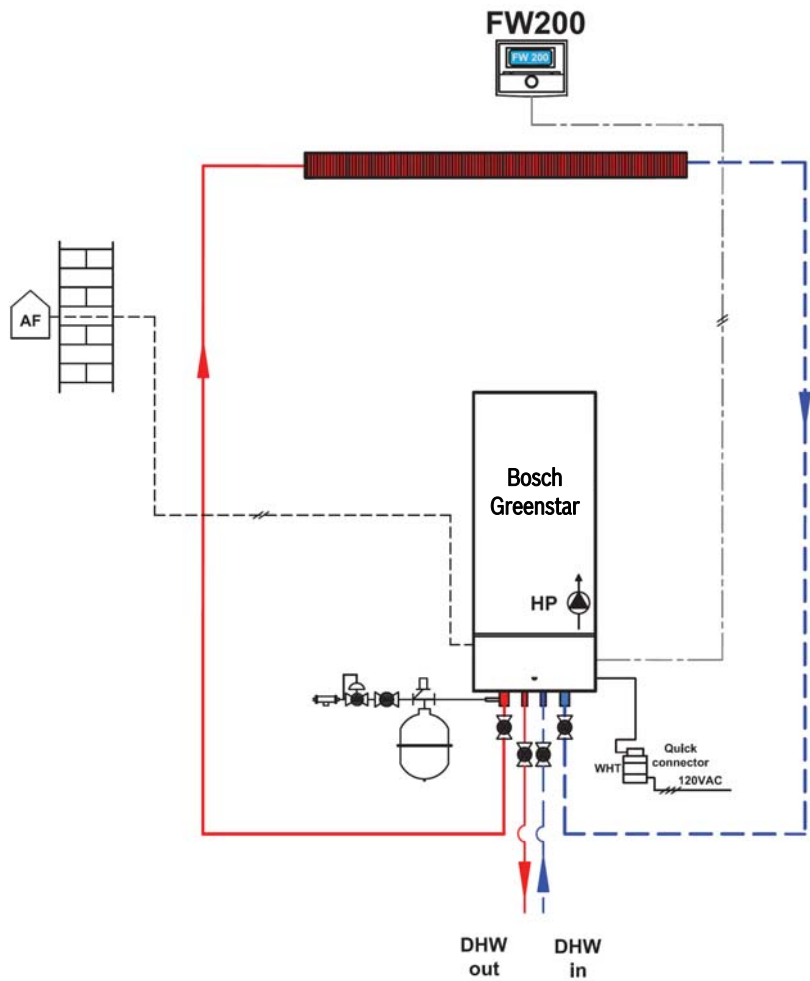
Bosch Greenstar™ Boilers

Hydronic Piping Diagrams

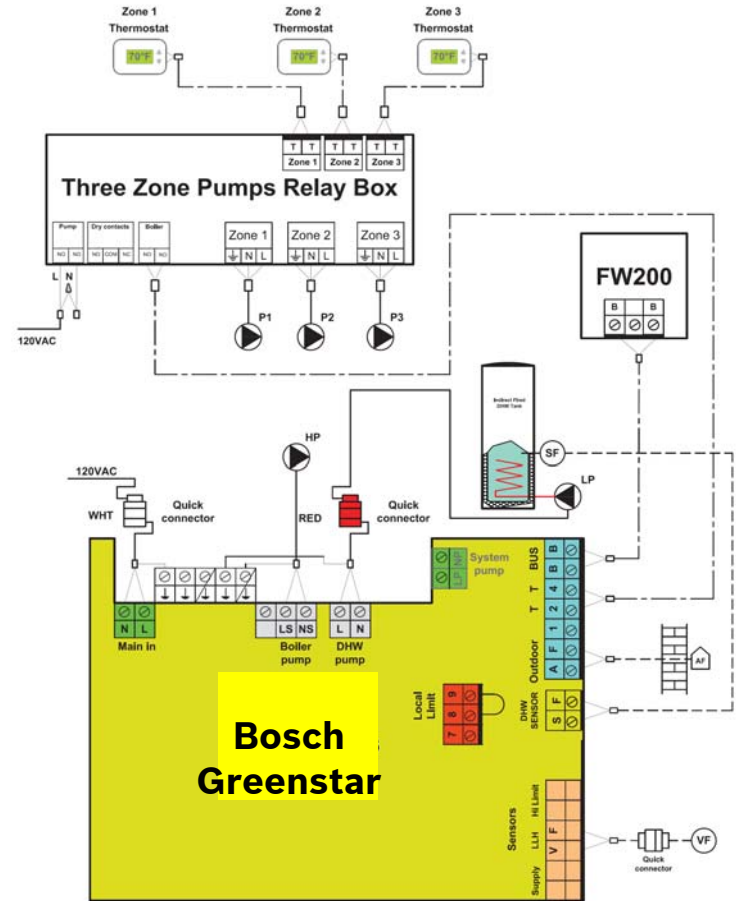
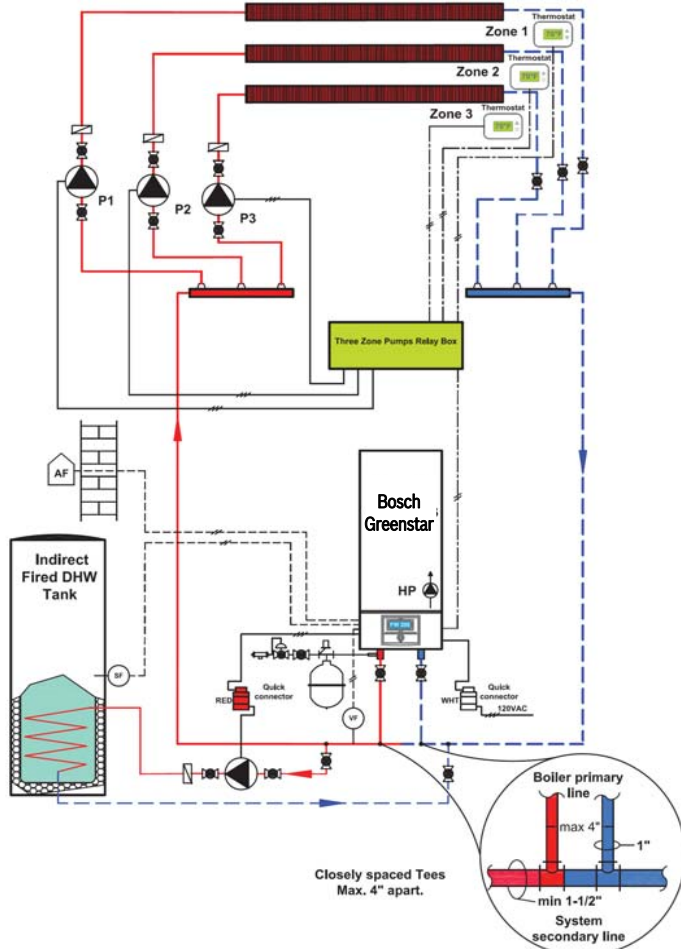
Boiler w/ 1 HZ & FW200 Control



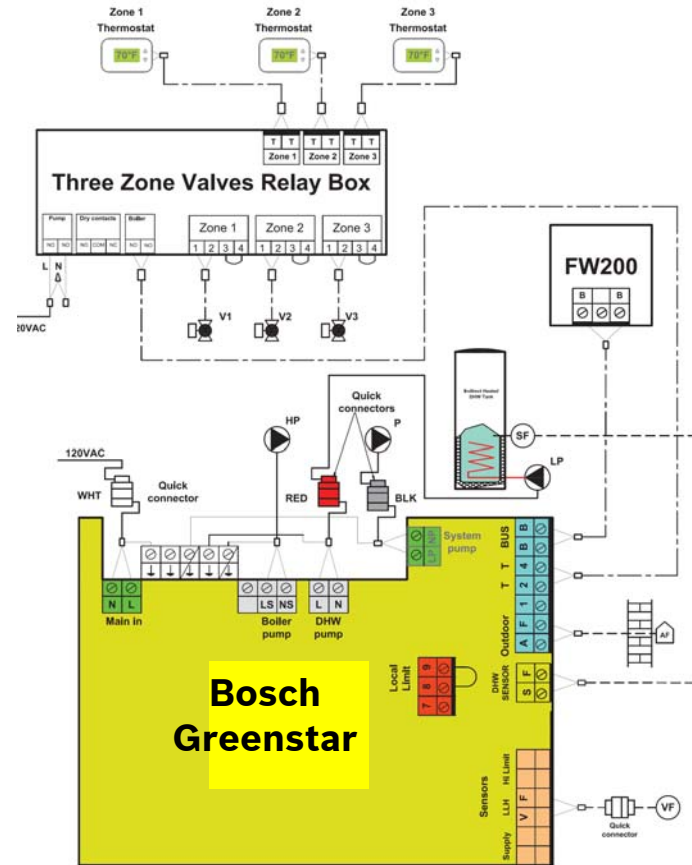
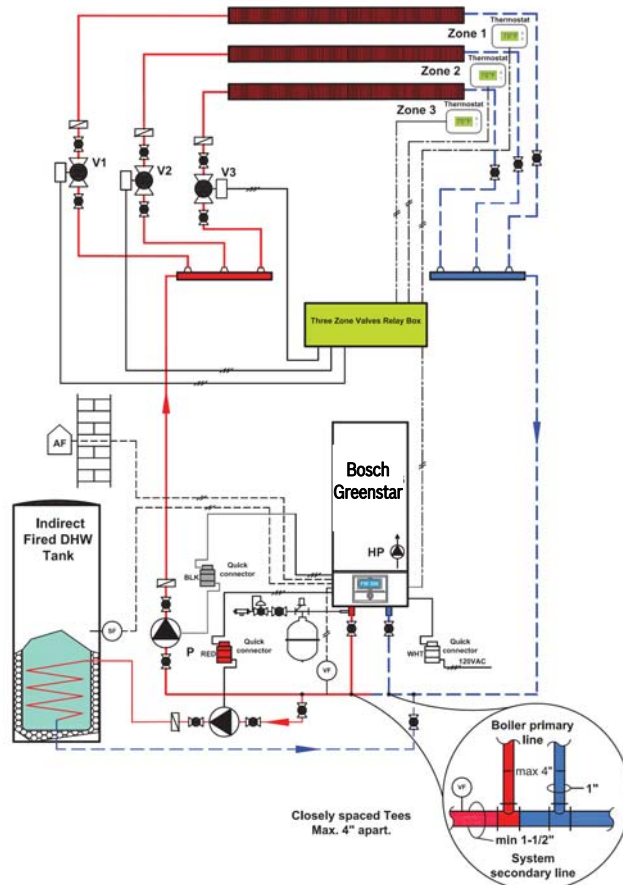
Combi Boiler w/ 1 HZ & FW200 Control



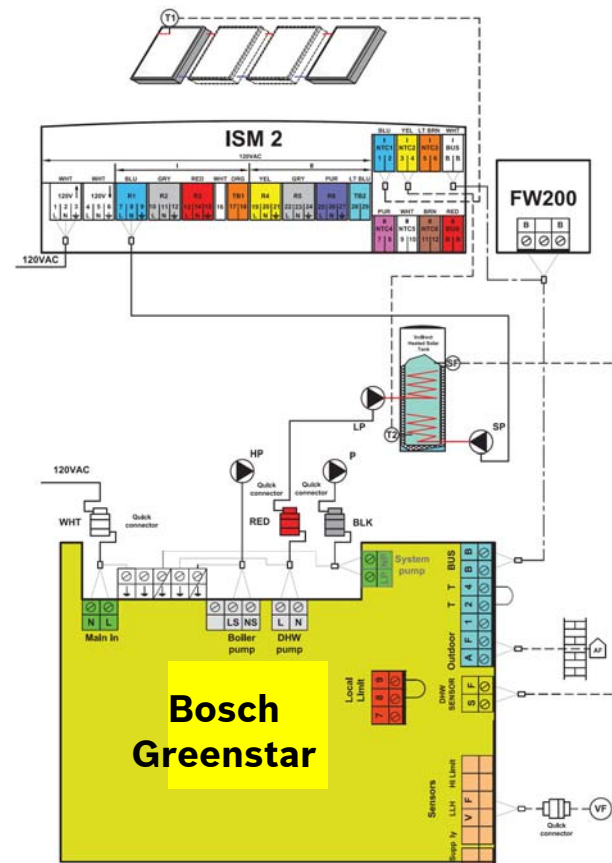
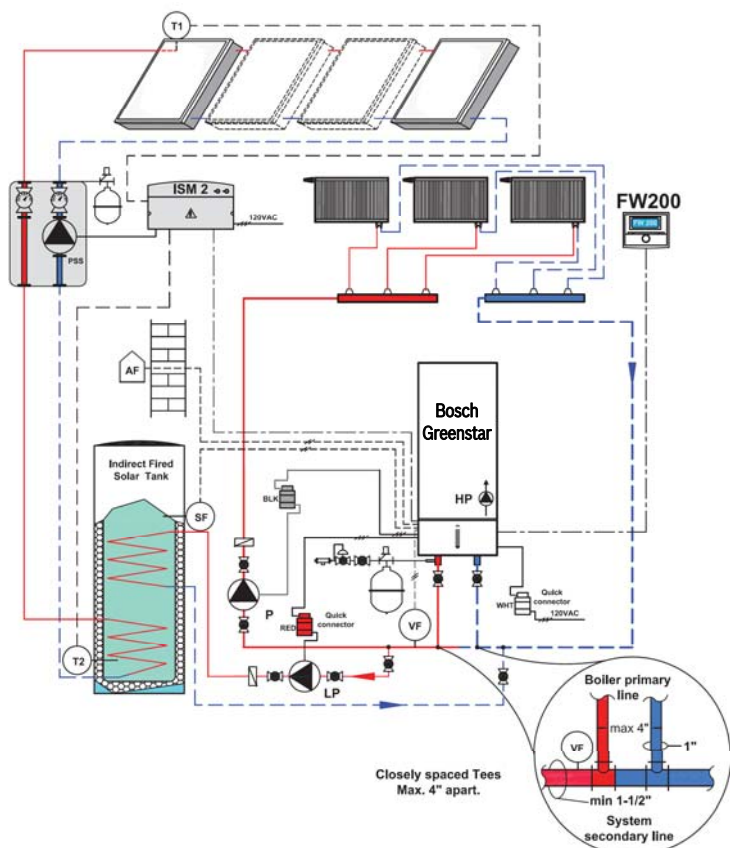
Boiler with 3 Heating Zones with T-Stats & DHW



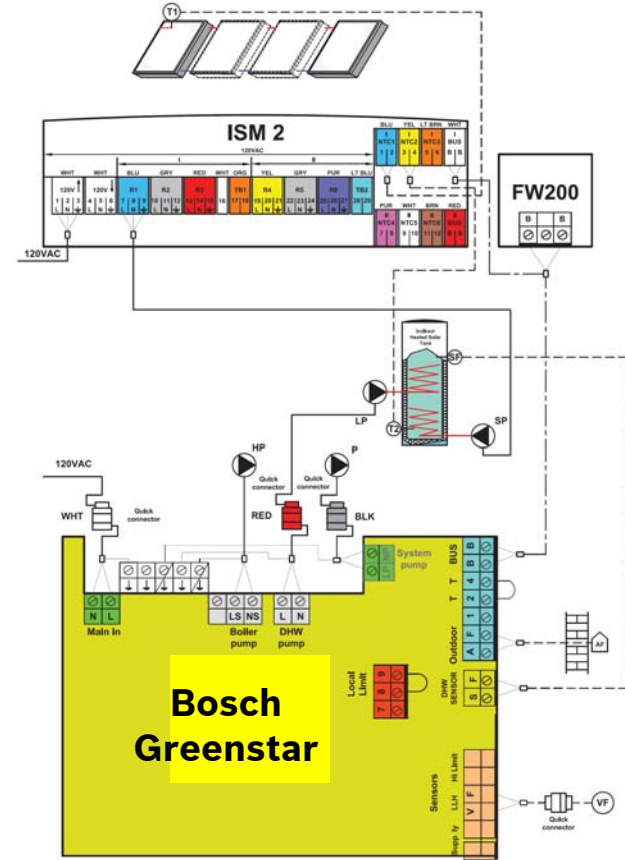
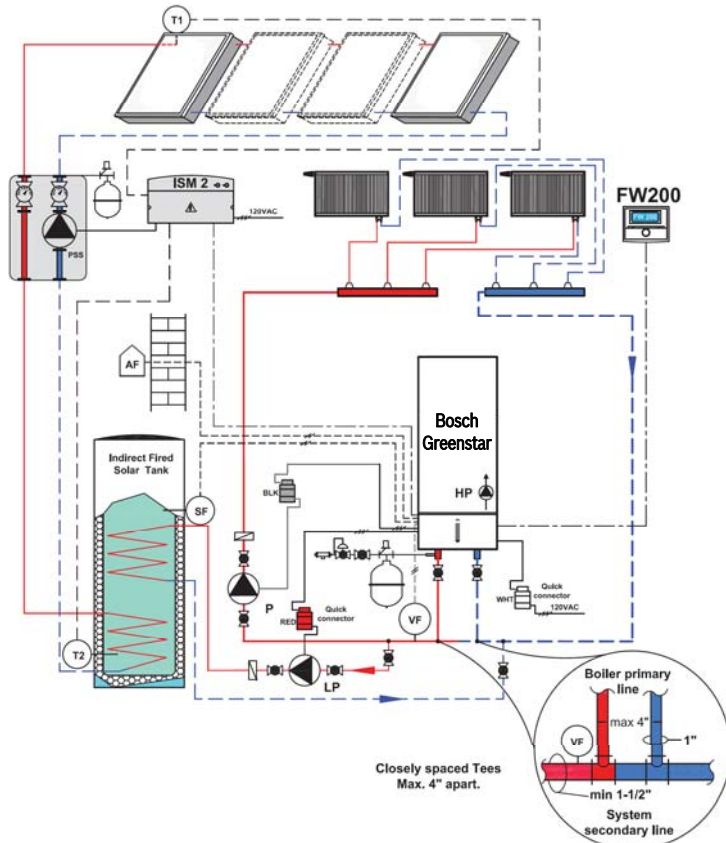
Boiler with 3 Heating Zone Valves with T-Stats & DHW



Boiler Space Heating with Solar DHW Production



Boiler Space Heating with Solar DHW Production





Bosch Greenstar™ Boilers

Commissioning & Service

First Level Service Codes



First Level Service Codes

10.2.1 First service level (press and hold the service button until it lights up)

Service function		
Display		Page
1.A	Maximum heating output	66
1.b	Maximum output (DHW)	66
1.E	Pump control mode	66
1.F	Pump mode	66
2.A	Heating zone pump lockout time	67
2.b	Maximum supply temperature	67
2.C	Air bleed function	67
2.d	Thermal disinfection	67
2.F	Operating mode	67
3.A	Automatic key lock	68
3.b	Anti-cycle time	68
3.C	Switching differential	68
3.d	Min. nominal output (heating and DHW)	68
3.E	Cycle time, keeping DHW hot	68
3.F	Duration for keeping DHW hot	69

4.b	Maximum heating temperature of the heat exchanger	69
4.d	Audible warning signal	69
4.E	Appliance type	69
4.F	Trap filling function	69
5.A	Reset inspection interval	69
5.b	Fan run-on time	69
5.E	Connection NZ - LZ	70
5.F	Set inspection interval	70
6.A	Last fault	70
6.b	Room temperature controller, current voltage, terminal 2	70
6.C	Supply temperature demand outdoor reset control	70
6.d	Current volume flow, turbine	70
7.b	3-way valve in center position	70
7.d	Connection of external supply temperature sensor (e.g. on low-loss header)	70
7.E	Building drying function	71
0.A	Activate tank primary pump for recirculation	71
0.d	Adaptation to elevation above NN	71
0.E	Set display units	71

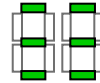
Tab. 25 Service functions, 1nd level

Commissioning Max / Min Settings

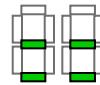
- ➔ To set boiler to “maximum” firing rate, press chimney sweep button until it lights up (approx. 5 – 8 seconds).
- ➔ Press again for “full maximum” output.
- ➔ Press again for low fire.
- ➔ Press again to return to “normal” settings.



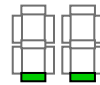
Commissioning Max / Min Settings



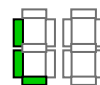
Max. Output



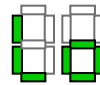
Max. adjustable heating output



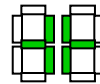
Min. Output



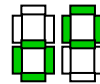
Thermal Disinfection



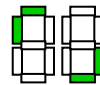
Buttons locked



Siphon-filling-program active



Air-vent function active



Gradient control (too rapid increase of the central heating flow temperature, heating is interrupted for 2 minutes)

Commissioning Max / Min Settings



	Value stored
	Service necessary
	Service necessary
	Pump block protection
	System pressure too low
	Symbol after pushing one button
	Symbol after pushing two buttons at the same time
	Floor drying program active (to activate at weather controller)
	Over temperature 212°F - 228°F 100°C – 109°C

Commissioning Exhaust Gas Test Point

- To obtain the CO₂ readings there is a flue gas test point at the exhaust connection on the top of the boiler.

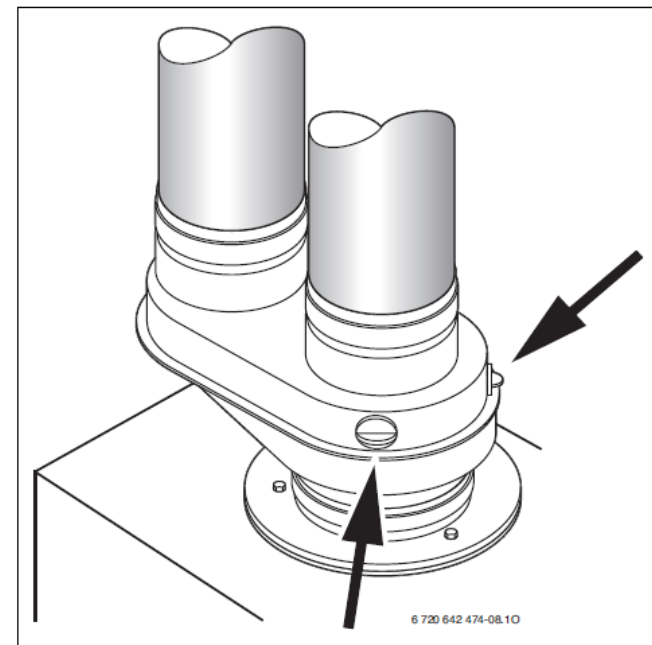
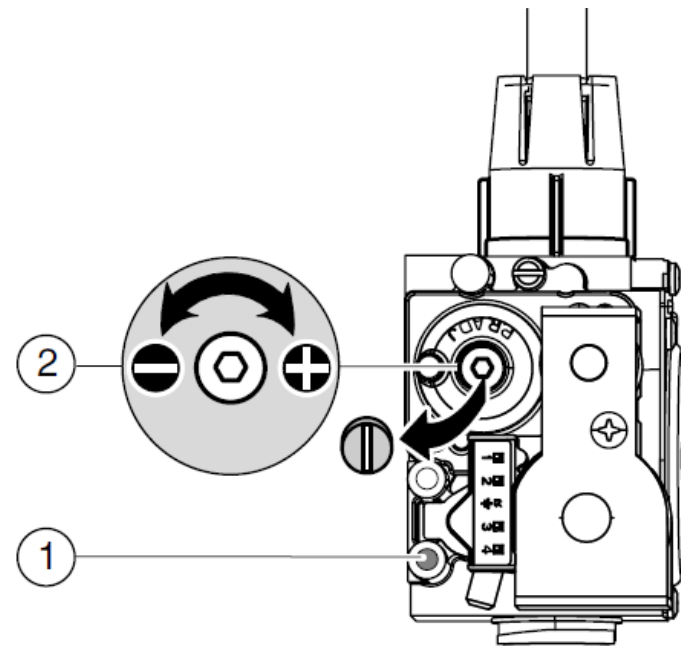


Fig. 58 Flue gas test ports

Commissioning Minimum Setting

Gas type	Maximum rated output		Minimum rated output	
	CO ₂	O ₂	CO ₂	O ₂
LPG	9.4 %	4.0 %	8.6 %	5.5 %
LPG	11.0 %	4.2 %	10.4%	5.1 %

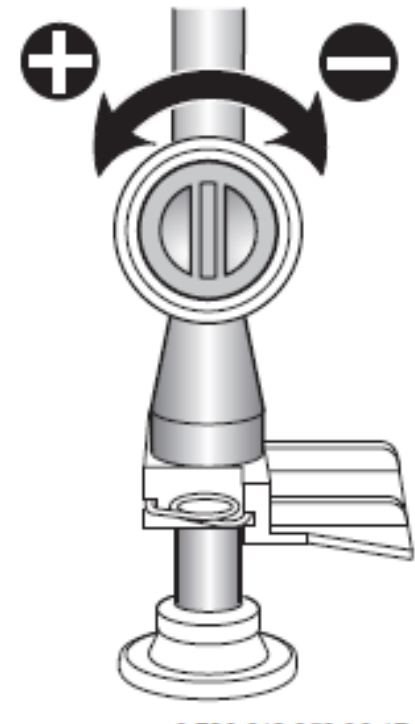
- ➔ Minimum CO₂ setting can be set on gas valve using 'chimney sweep' button located on front, set on minimum.
- ➔ **CARE:** fine adjustment should only be required (very sensitive).



Commissioning Maximum Setting

Gas type	Maximum rated output		Minimum rated output	
	CO ₂	O ₂	CO ₂	O ₂
LPG	9.4 %	4.0 %	8.6 %	5.5 %
LPG	11.0 %	4.2 %	10.4%	5.1 %

- ➔ Maximum CO₂ setting can be set on gas flow throttle using 'chimney sweep' button located on fascia, set on Maximum.
- ➔ **CARE:** fine adjustment should only be required (very sensitive).



Commissioning Maximum Levels of CO ppm



DANGER: Risk of flue gas poisoning.

The CO level in the flue gas must be below 200 ppm (air free).

- ▶ If 9.4 Vol.%¹⁾ CO₂ and a CO level under 200 ppm (af) can not be achieved due to the gas supplied, use a lower CO₂ level with CO emissions under 200 ppm (af) instead.

1) 9.4 Vol.% with NG and 11.0 Vol.% with LPG (propane)

Inspection & Service

	Date →			
1	Latest fault code from service function 6.A (→ page 82).			
2	Fresh water inlet filter (Combi boiler ZWB appliances only) (→ page 82).			
3	Visual inspection of the combustion air pipes and vent pipes.			
4	Dynamic gas pressure (→ page 78).	inches W.C. (mbar)		
5	Gas-air ratio at min./max. nominal output (→ page 76).	min. % max. %		
6	Gas and water-side leak test (→ page 51).			
7	Inspect electrodes (→ page 83).			
8	Inspect heat exchanger block (→ page 84).			



Inspection & Service

9	Check burner (→ page 84).				
10	Inspect diaphragm in mixer unit (→ page 86).				
11	Clean condensate trap (→ page 86).				
12	With the system depressurized, check the expansion vessel pre-charge pressure vs. the static head of the heating system.	psi (bar)			
13	Check the heating system filling pressure.	psi (bar)			
14	Inspect electrical wiring for damage.				
15	Check settings of the heating controller.				
16	Check set service functions according to commissioning report (→ page 97).				

Tab. 34 Maintenance and inspection checklist



Inspection & Service

9	Check burner (→ page 84).				
10	Inspect diaphragm in mixer unit (→ page 86).				
11	Clean condensate trap (→ page 86).				
12	With the system depressurized, check the expansion vessel pre-charge pressure vs. the static head of the heating system.	psi (bar)			
13	Check the heating system filling pressure.	psi (bar)			
14	Inspect electrical wiring for damage.				
15	Check settings of the heating controller.				
16	Check set service functions according to commissioning report (→ page 97).				

Tab. 34 Maintenance and inspection checklist



Second Level Service Codes



Second Level Service Codes



Second Level Service Codes

10.2.2 Service level 2 (at service level 1, service button lights up, press ECO button and button lock simultaneously until e.g. 8.A appears)

Service function		
Display		Page
8.A	Software version	72
8.b	Code plug number	72
8.C	GFA status ¹⁾	72
8.d	GFA fault ¹⁾	72
8.E	Reset all parameters	72
8.F	Permanent ignition	72
9.A	Constant mode	72
9.b	Current fan speed	72
9.C	Current output	72
9.d	Set start speed 1	72
9.E	Turbine signal delay	73
9.F	Heating zone pump post purge	73
A.b	Water temperature	73
A.C	Current DHW tank temperature	73
b.F	DHW heating delay (solar module)	73
C.d	Current heat demand	73

Tab. 26 Service functions, 2nd level

Second Level Service Codes

10.2.2 Service level 2 (at service level 1, service button lights up, press ECO button and button lock simultaneously until e.g. 8.A appears)

Service function		
Display		Page
8.A	Software version	72
8.b	Code plug number	72
8.C	GFA status ¹⁾	72
8.d	GFA fault ¹⁾	72
8.E	Reset all parameters	72
8.F	Permanent ignition	72
9.A	Constant mode	72
9.b	Current fan speed	72
9.C	Current output	72
9.d	Set start speed 1	72
9.E	Turbine signal delay	73
9.F	Heating zone pump post purge	73
A.b	Water temperature	73
A.C	Current DHW tank temperature	73
b.F	DHW heating delay (solar module)	73
C.d	Current heat demand	73

Tab. 26 Service functions, 2nd level

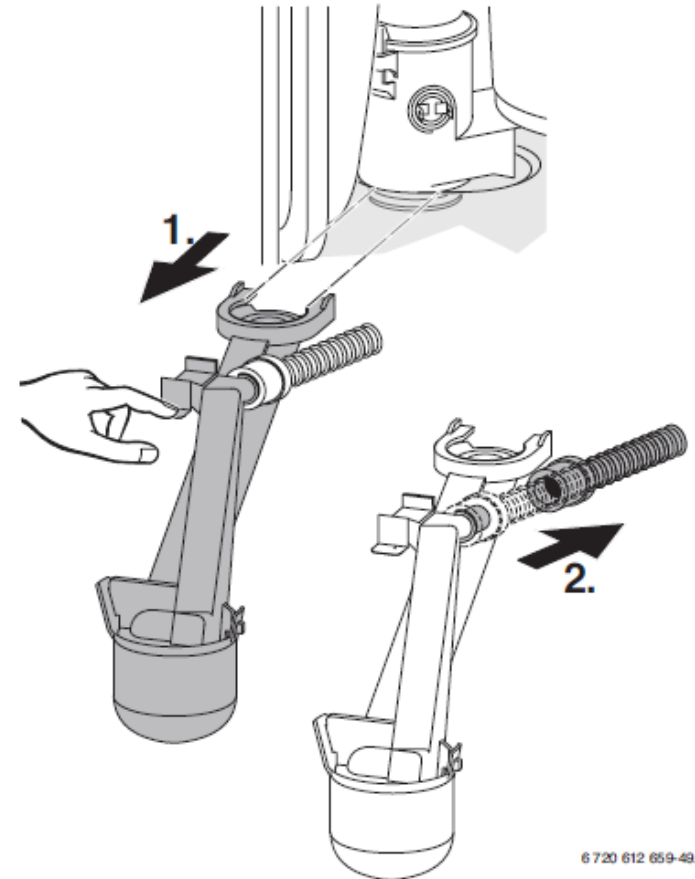


Bosch Greenstar™ Boilers

System Cleansing

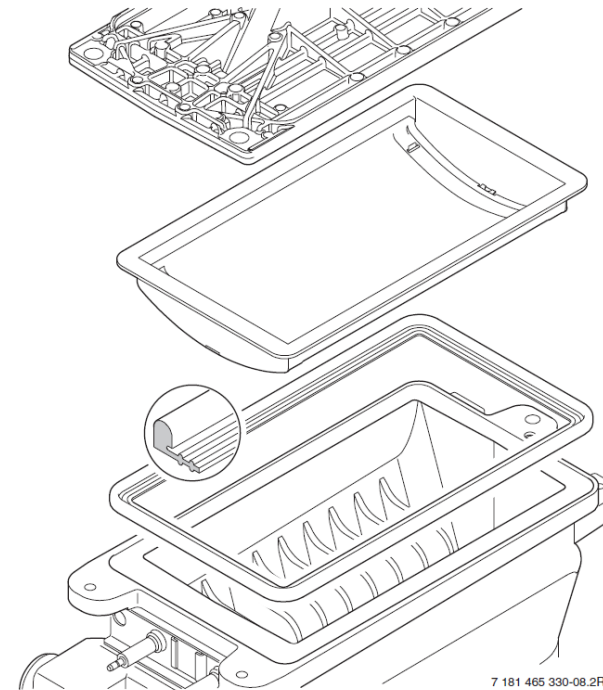
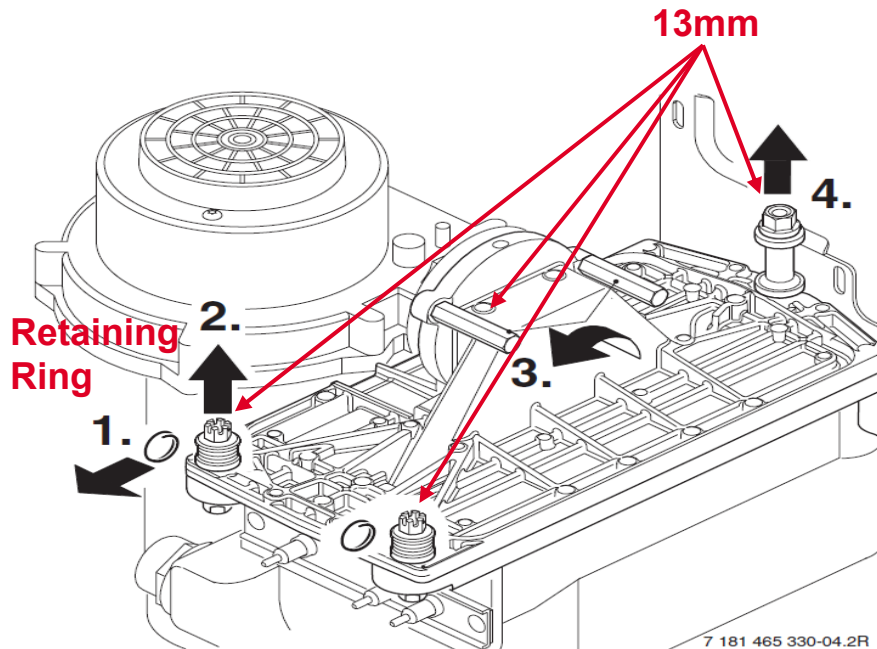
Siphon Condensation Trap

- Enables approximately 250 ml (9 oz.) of condensation to be discharged at one time reducing the chances of freezing occurring.
- End cap is semi-transparent for visual inspection & is also removable to enable cleaning.



6 720 612 659-49.30

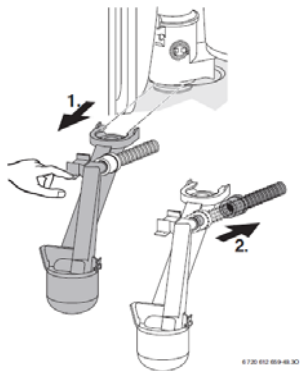
Access to Burner



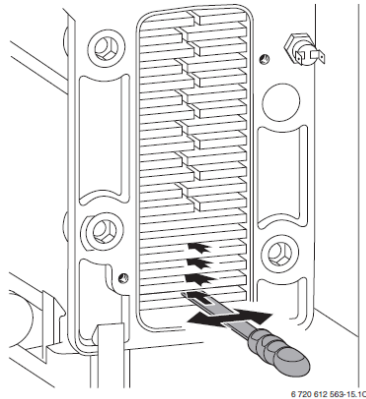
- The burner should only be cleaned using a soft brush to remove dust particles.
- Burner gasket must be replaced if the burner is removed.

Cleaning of Heat Exchanger (as needed / every 5 years)

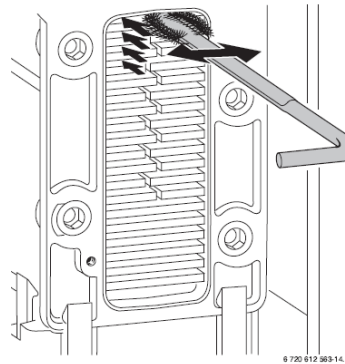
Remove
condensation
trap



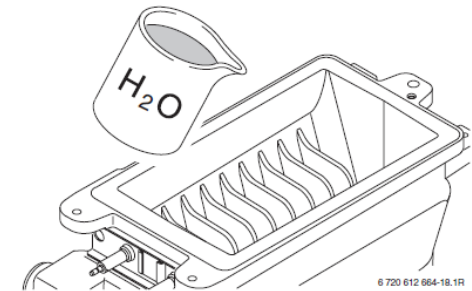
Clean
heat cell
with blade



Clean
heat cell
with brush



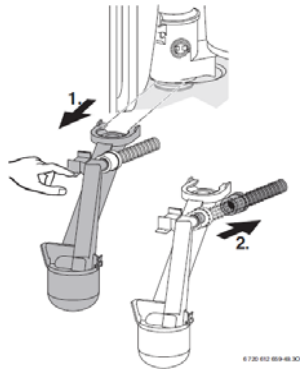
Flush
heat cell
with water



→ **CARE:** aggressive cleaning may remove the sulfur resistant coating of the heat cell.

Cleaning of Heat Exchanger (as needed / every 5 years)

Remove
condensation
trap



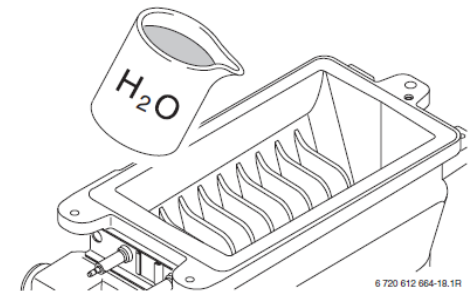
Clean
heat cell
with blade



Clean
heat cell
with brush



Flush
heat cell
with water



➔ **CARE:** aggressive cleaning may remove the sulfur resistant coating of the heat cell.

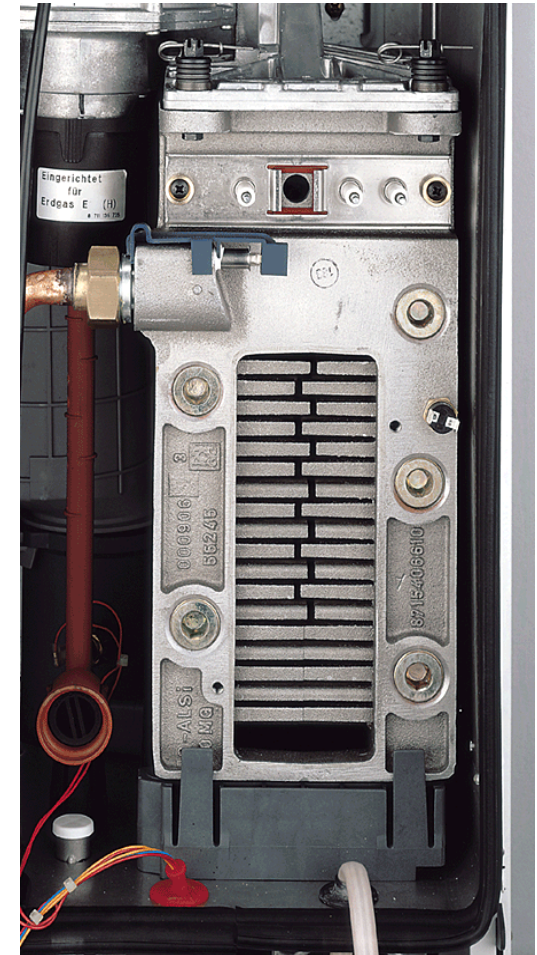
Heat Cell Interior

→ Inspection cover removed for servicing.



NOTICE: Damage to the coating of the heat exchanger.

- ▶ Clean heat exchanger at the earliest five years after the initial commissioning with Bosch cleaning blade or brush.
- ▶ Only clean heat exchanger in case of clearly visible soiling.





Bosch Greenstar™ Boilers

High Altitude & LPG Conversion

High Altitude Service Function Setting

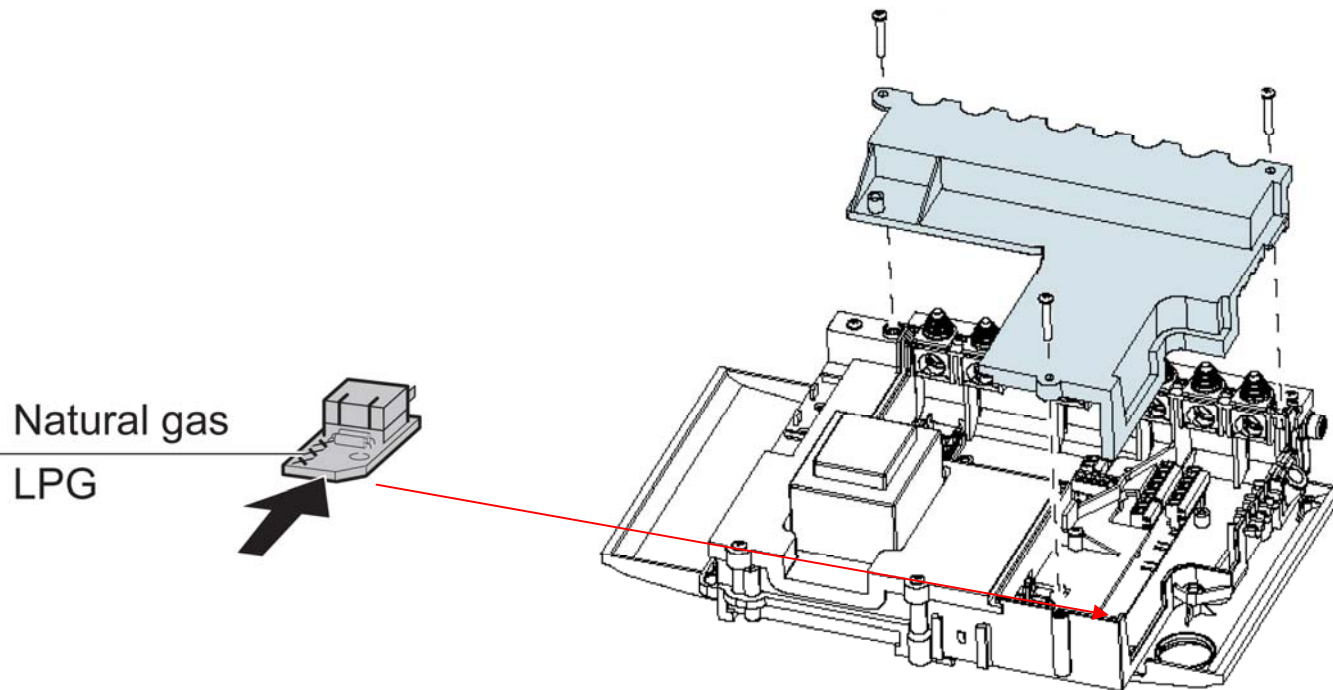
- Due to the lower density of air at high altitude, the mass flow rate in the fan drops.
- To keep the gas-air mixture constant a gas-air ratio control system is built-in.
- Three altitude ranges can be selected through the control system (see table below).
- A drop in heat input is unavoidable above 7000 ft.

Model (BOSCH)	Gas Type	Heat input [Btu/hr]	High altitude service function setting			
			0-2000 ft (1000 ft)	2000-4500 ft (3250 ft)	4500-7000 ft (5750 ft)	7000-10000ft
ZBR 16-3	Natural Gas	12900 - 57200	0	1	2	2
	LPG	21500 - 56400				(-3% per 1000ft)
ZBR 28-3 ZWB 28-3	Natural Gas	24600 -100800	0	1	2	2
	LPG	40100 - 98600				(-3% per 1000ft)
ZBR 35-3	Natural Gas	36000 -131900	0	1	2	2
	LPG	46400 -129100				(-3% per 1000ft)
ZBR 42-3 ZWB 42-3	Natural Gas	36000 -151600	0	0 (-10%)	0 (-17%)	0 (additional
	LPG	46400 -148300	0	0 (- 6%)	0 (-13%)	-3% per 1000ft)

First Level Service Code "0.d"

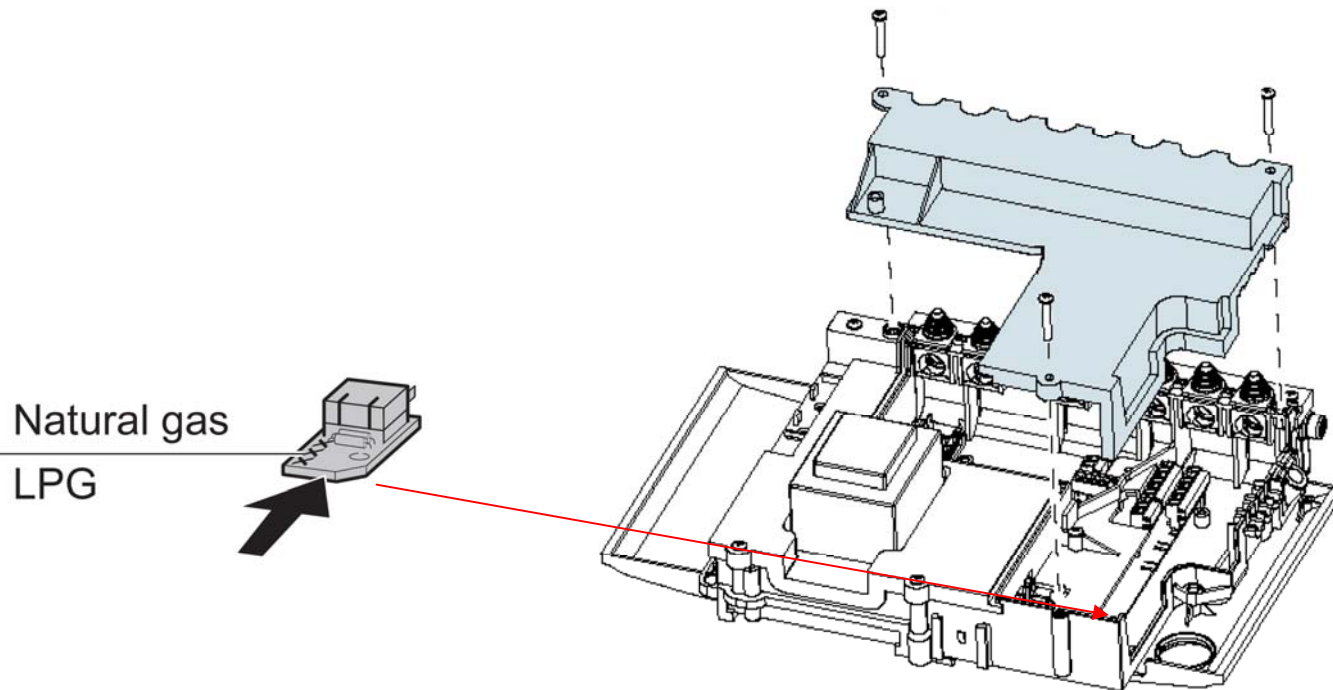
Converting the Appliance From LP to NG / NG to LP

- LPG conversion code plug delivered with every boiler.
- CO₂ and O₂ settings according to Installer manual.



Converting the Appliance From LP to NG / NG to LP

- LPG conversion code plug delivered with every boiler.
- CO₂ and O₂ settings according to Installer manual.





Bosch Greenstar™ Boilers

Special Promotions to Take Advantage of

Greenstar Jacket Give-Away – Every Registered Boiler Wins a Jacket!

Date: 8/1/11 – 12/31/11

Target: Contractors

Regions: New England, Mid West,
Washington, Colorado

Prize:

→ **Winners receive a Bosch Greenstar
branded jacket (\$50 value).**

Details:

→ Every Bosch Greenstar boiler purchased &
registered on **www.BoschWaytoGrow.com**
wins a Bosch Greenstar branded jacket.



iPad2 Launch Promotion – Lotto with 4 Winners Drawn Monthly

Date: 5/1/11 – 12/31/11

Target: Contractors & Wholesalers

Regions: New England, Mid West, Washington, Colorado

Prize:

→ **Winners receive a brand new Bosch branded iPad2 , 16GB + WiFi + 3G (your choice of Verizon / ATT).**

Details:

→ Every Bosch Greenstar boiler purchased & registered on **www.BoschWaytoGrow.com** will be entered into a lotto to win 1 of 4 iPads being raffled off monthly.



iPad2 Launch Promotion – Get More Than Just the iPad....

- ➔ Each Bosch Greenstar boiler purchase registered on www.BoschWaytoGrow.com for the iPad2 promo will **also receive 100 Bosch Loyalty Program points** for a limited time (usually a 75 point value)!



iPad2 Promotion – Go All the Way with Bosch Greenstar!

- Every entry into the raffle to win an iPad2 (every Bosch Greenstar boiler registered to www.BoschWaytoGrow.com) **is automatically entered into the year-end raffle to win 2 tickets to Super Bowl 2012.**
- Each winner is invited to bring a guest, with accommodations covered (flight, hotel, transportation, meals, etc.).

**GET OUT THERE & START SELLING FOR
YOUR CHANCE TO WIN ALL THESE
GREAT PRIZES!**

