Buderus

GB312 Series
Natural Gas Condensing Boiler

Flexible Energy Efficient Solutions

High Efficiency—93.1% Thermal Efficiency

Modulating Natural Gas Pre-mix Burner for Extremely Quiet Operation

Lightweight, High Performance Aluminium Heat Exchanger for Maximum Heat Transfer

Quick and Easy Installation

305 to 944 MBH Output: 6 Models Available

Comfortable. Efficient. Intelligent Heating.

Buderus

GB312 Series

GB312: Efficiency and Performance

Buderus knows it's important to keep costs as low as possible yet still maintain high efficiencies, low emissions, and exceptional performance. That's why we have worked hard to bring all of these qualities together in the GB312 gas fired condensing boiler from Buderus.

Powerful, Convenient, Economical

The gas fired condensing GB312 boiler offers innovative technology in a compact, robust form with simple, space-saving, advanced condensing technology. Features like exemplary energy efficiency, ease of handling, optional balanced flue operation and clean combustion make the GB312 your definitive solution.

Ease of Installation and Servicing in a Compact Design

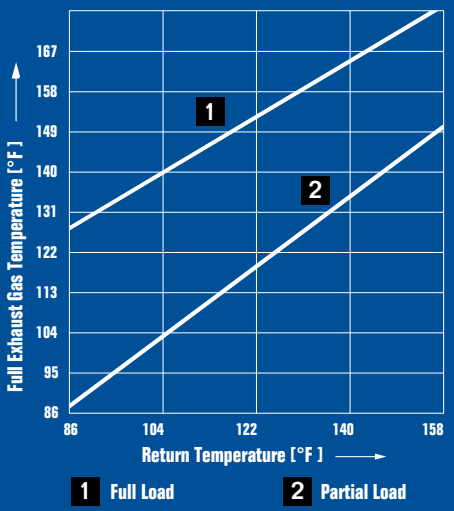
Everything about the GB312 is designed for greater simplicity and economy, including ease of operation and installation. Matching components and factory settings make installation quick and easy. The modulating premix gas burner is ready for natural gas and can be quickly removed for cleaning, easy servicing, and maintenance. Other components are equipped with their own clean-outs. Although the GB312 delivers a lot, it takes up remarkably little space. Its compact design makes it an ideal choice for tight installation areas, plus it easily fits through standard doorways.

Continuous System Monitoring and Control

The EMS (Energy Management System) uses sensors to monitor the status of the boiler. If the system values deviate greatly from the set values, the system issues a fault or service message. When faults occur that have impact on safety, the SAFe control triggers either a blocking or safety shutdown.

Efficiency in Operation

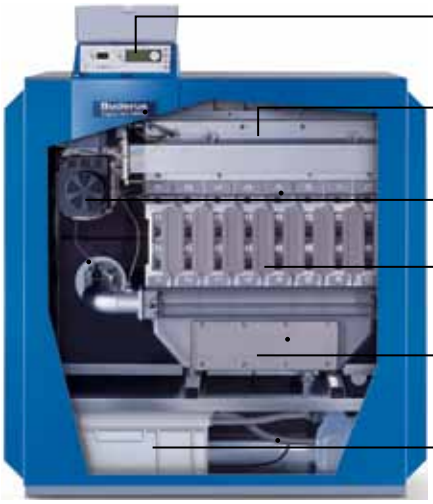
Actual Boiler Efficiency VS. Return Temperature at Full/Partial Load



Exhaust gas temperatures are dependent on the boiler return temperature GB312 (series average value)

Exhaust Gas Temperature

The exhaust gas temperature in the vent pipe is dependent on the return water temperature.



EMS Logamatic Control System:
Digital link-up with the SAFe burner control unit

Modulating premix gas burner:
With a wide modulation range and good accessibility

Combustion Air Fan:
Variable speed for low power consumption

High Output Aluminum Heat Exchanger:
With insulation for minimum thermal losses and maximum energy yield

Generously Sized Clean-Out Apertures:
For easy maintenance and inspection from the front

Neutralizing System:
Integrates under the boiler jacket*

*This is an accessory item not included with boiler

Efficient Energy Solutions

Buderus commercial boilers are designed to deliver high levels of energy efficiency, reliable heating, and a long product life. Manufactured in Europe to their strict safety standards, all Buderus products undergo rigorous quality tests to ensure total safety, durability, and outstanding performance year after year.

The Buderus GB312 boiler offers a range of outputs from 305 MBH up to 955 MBH. Whether you're planning projects for private multi-unit housing or commercial premises, the wide range offered by the Buderus GB312 means you are certain to find a condensing heating system to suit your needs.

The GB312 is a high performance, compact condensing boiler which provides a high combustion rating of 93.4%. Especially well-suited for large residential applications, multi-unit apartment dwellings, and light to moderate commercial applications, the GB312 can be installed as a single unit or as part of a multi-boiler cascade of up to 8 units. As a powerful floor-standing boiler, it's remarkably compact, lightweight, and easy to install. The GB312 is also whisper quiet, even when running at full output.

The GB312 is designed to make servicing and maintenance as straightforward as possible. All parts can be accessed from the front, and the burners can be accessed without having to disturb the gas connection. The boiler is equipped with SAFe digital ignition technology and a Buderus Energy Management System (EMS).

Engineering Made Easy — Thanks to High Quality

Designing heating systems for medium and large buildings demands more than just heat at the push of a button, but the added benefits of security for years to come and greater flexibility. The innovative gas fired condensing GB312 boiler from Buderus offers advanced condensing technology in a compact, robust form—with high-grade components that meet every demand. All of that plus the freedom to use the available space as you want it, thanks to compact dimensions and the option of a balanced flue operation.

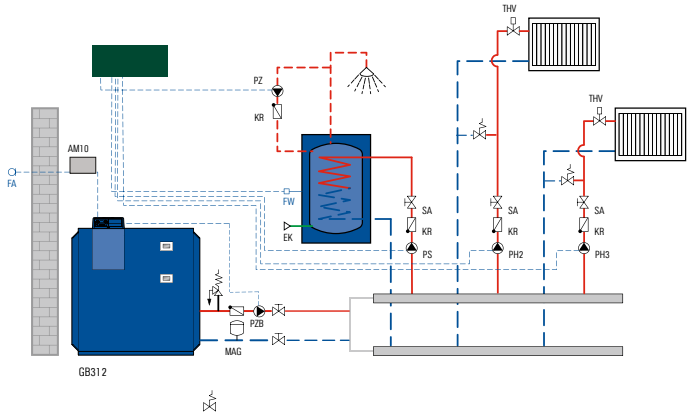
More Benefits

- Supplied with the BC10 and AM10 boiler controls with digital service diagnostic and status display
- Insulated boiler block for low standby loss
- Intelligent controls with built-in Energy Management System (EMS)
- Condensate trap included
- Burner management technology
- Lightweight and compact to fit into existing boiler rooms
- Modulating burner 25% to 100% for all except the 90kW which is 33% to 100%
- Suitable for sealed combustion or open vented installations
- Simple to service and maintain
- Vertical or sidewall vent up to 100 ft.
- CSD-1 Installation kit option available
- Cascade of four boilers using the available MCM10 control module
- Cascade system controls up to 8 boilers with the Logamatic 4323 Control
- Optional condensate neutralization tank is available

GB312 with AM10: Outdoor reset, DHW and multi-zones with relay panel

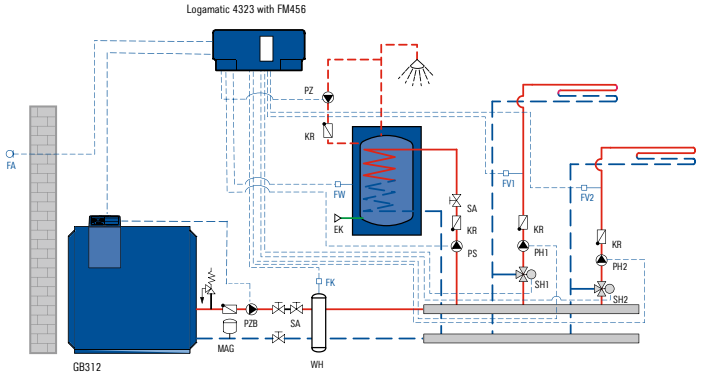
EK	Inlet Water
FA	Outside Sensor
FW	DHW Tank Aquastat
KR	Check Valve
MAG	Expansion Tank
PH	Circulation Pump - Heating Zone
PS	DHW Load Pump
PZ	Recirculating Pump
PZB	Boiler Pump
SA	Shut-off Valve (reccomended)
THV	Thermostatic Head

* Third Party Product



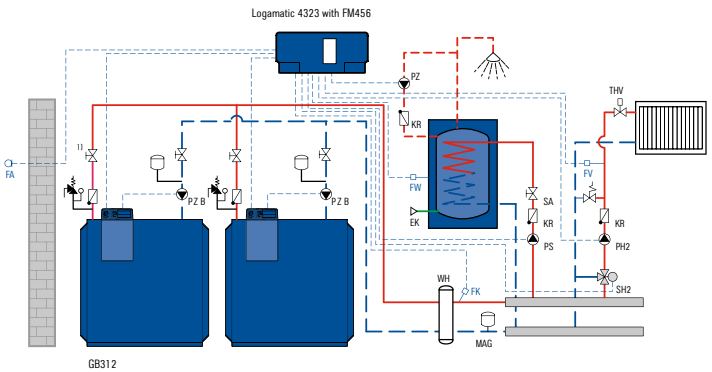
GB312 with 4323 Control and Full System Functionality

EK	Inlet Water
FA	Outside Sensor
FK	System Flow Sensor
FV	Heating Zone Temperature Sensors
FW	DHW Tank Sensor
KR	Check Valve
MAG	Expansion Tank
PH	Circulation Pump - Heating Zone
PS	DHW Load Pump
PZ	Recirculating Pump
PZB	Boiler Pump
SA	Shut-off Valve (reccomended)
SH	Mixing Valve
WH	Low Loss Header (LLH)

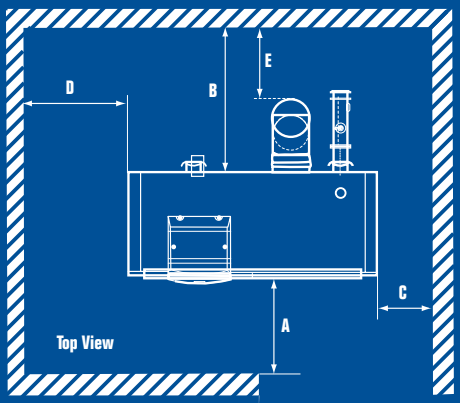


GB312 with 4323 Control and the FM456 Module

EK	Inlet Water
FA	Outside Sensor
FK	System Flow Sensor
FV	Heating Zone Temperature Sensors
FW	DHW Tank Sensor
KR	Check Valve
MAG	Expansion Tank
PH	Circulation Pump - Heating Zone
PS	DHW Load Pump
PZ	Recirculating Pump
PZB	Boiler Pump
SA	Shut-off Valve (reccomended)
SH	Mixing Valve
THV	Themostatic Head
WH	Low Loss Header (LLH)

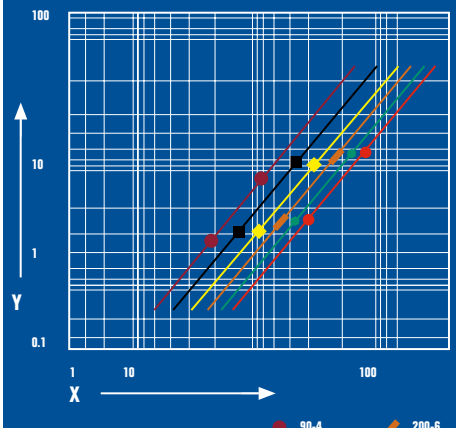


GB312 Clearance Requirements



Dimension	Min.	Recommended
A	20"	28"
B	22"	28"
C	20"	28"
D	20"	28"
E	6"	14"

GB312 Boiler Pressure Drop



X Flow Rate in Gal/Min (GPM)

Y Primary Pressure Drop in PSI

Complete Your System

Once you have a Buderus boiler, you can add a Buderus indirect fired hot water tank, or an optional Buderus control — or both. In addition to maximizing comfort and fuel savings, optional Logamatic control will accommodate specialized heating applications such as radiant flooring or multiple boilers. Multiple design innovations increase the versatility of Buderus Logamatic controls. A Buderus boiler combined with a Logamatic control produces a premium heating system that will provide years of exceptional comfort and economy.

Buderus Controls

Standard

- MC10 control assembly with BC10 controller
- AM10 included for single boiler installations

Options

- MCM10 (cascade module) for 4 boiler installations
- 4000 series controls
  - Accommodates single or multiple boiler installations
  - Can be interfaced to a building management system via **LonWorks Gateway**
  - Modular construction allows for ease of field configuration and flexibility of installation

The Convenience of a Logamatic Control

In addition to manual adjustments, Logamatic controls can be programmed for automatic night and day functions and set to trigger automatic adjustments based on outdoor or indoor temperature shifts. This includes adjustment by time, date, or temperature between various modes of operation. All Logamatic controls now include summer, winter and vacation modes to efficiently regulate energy consumption. An optional module is available that enables direct communication with building management systems.

Multiple or Single Boiler Control with the 4000 Series

Logamatic controls can be used to adjust the firing rates of burners in multi-boiler systems. The Logamatic control maintains precise control of system temperature to match load requirements, providing maximum system efficiency. This regulation is effective in single or multi-boiler systems, with any heat source, and in accordance with one or multiple heating zones.

Logamatic Control

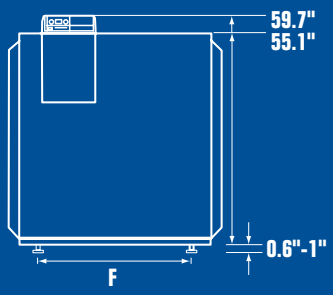
Optional integrated multi-boiler system controller with the following features and control modules:

- **Control of modulating burners for up to 8 boilers with 4323 control**
- **Automatic and load/switch dependent burner rotation**
- **Operation of boiler pumps, 2, 3, or 4-way valves and system pumps**
- **Capable of DHW and other external on-demand loads**
- **Self diagnostics and system parameter display**

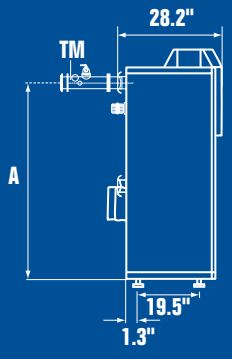
GB312 Series

Model	GB312/90	GB312/120	GB312/160	GB312/200	GB312/240	GB312/280
Performance Data						
Gas Input (MBH)	328.3	440.5	588.3	732.6	880.7	1,028.8
Gross IBR Output (MBH)	305	409	544	676	810	944
Input at Minimum Capacity	132	132	176	220	264	309
Output at Minimum Capacity	131	131	173	217	261	306
Net IBR Rating (MBH)	265	356	473	588	705	821
Thermal Efficiency	93.1%	92.8%	92.5%	92.3%	92.0%	91.7%
Combustion Efficiency	93.4%	93.1%	92.8%	92.5%	92.2%	92.0%
Boiler Horse Power	9.1	12.2	16.2	20.2	24.2	28.2
Fireside Pressure Drop (Inch WC)	0.49	0.63	0.89	0.97	1.22	1.44
MAWP (PSI)	50	50	50	50	50	50
Minimum Gas Pressure (Inch WC)	3½	3½	3½	3½	3½	3½
Maximum Gas Pressure (Inch WC)	10½	10½	10½	10½	10	10½
Operating Temperature	180˚F	180˚F	180˚F	180˚F	180˚F	180˚F
Maximum Temperature Limit	200˚F	200˚F	200˚F	200˚F	200˚F	200˚F
Piping Connections						
Flue Pipe Diameter (**AA**)	6"	6"	6"	8"	8"	8"
Dimension (**YAA**)	18½"	18½"	18½"	19½"	19½"	19½"
Dimension (**ZAA**)	5¾"	5¾"	5¾"	12¼"	12¼"	12¼"
Combustion Air Pipe Diameter (**AL**)	4"	4"	4"	4"	4"	4"
Connections (**VK** and **RK**)	2½" NPT	2½" NPT	2½" NPT	2½" NPT	2½" NPT	2½" NPT
Connection (**ST**) (B-kit)	¾" NPT	¾" NPT	¾" NPT	¾" NPT	¾" NPT	1" NPT
GAS Connection Size	1" NPT	1" NPT	1" NPT	1¼" NPT	1¼" NPT	1¼" NPT
Physical Dimensions						
# of Heat Exchanger Sections	4	4	5	6	7	8
Dimension (**XAA**)	13⅛"	13⅛"	15⅛"	17¼"	19¼"	21¼"
Dimension (**XRK** (= **XAL** = **GAS**)	10⅝"	10⅝"	14¾"	10⅝"	14¾"	10⅝"
Dimension (**A**)	51½"	51½"	51¼"	51¼"	51¼"	51¼"
Height	59¾"	59¾"	59¾"	59¾"	59¾"	59¾"
Width (**B**)	39⅛"	39⅛"	47⅜"	47⅜"	55½"	55½"
Boiler Feet Spacing (**F**)	31½"	31½"	39¾"	39¾"	48"	48"
Dry Weight (lbs.)	455	455	530	585	665	730
Approx. Water Content (gal.)	4.2	4.2	5.3	6.3	7.1	7.9

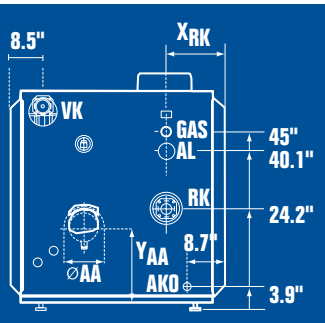
ØAA - Flue Connection
AL - Combustion Air Pipe
AKO - Condensate Drain
GAS - Gas Connection
VK - Boiler Supply
RK - Boiler Return
ST - Safety Valve Connection
TM - Pressure / Temperature Gauge



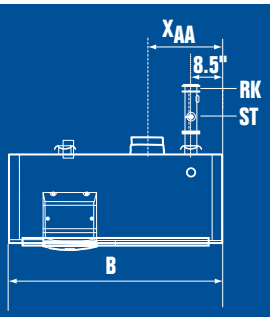
Front View



Side View



Rear View



Top View

Technical Specifications

Venting Guidelines

This boiler requires a flue system approved for Category IV (condensing, positive pressure: to ANSI Z21.13/CSA4.9.) It can be direct vented horizontally or vertically. Combustion air can be obtained from the space or via sealed combustion. Consult your local codes for details.

Approved Stainless Steel vent systems

Manufacturer	Flue System	Material
Heat Fab	Saf-T Vent EZ Seal	AL29-4C
Z-Flex	Z-Vent IV Special Gas Vent	AL29-4C
Metal Fab	Corr Guard	AL29-4C
Pro-Tech	Fas-N-Seal	AL29-4C
Security Chimney	CI-System	AL29-4C

CPVC Venting Systems

(Requires use of starter adapter. See Installation Manual for list of approved chimney manufacturers.)

Locastion	Manufacturer	System
USA	Spears	CPVC schedule 80 pipe to ASTM D1784
Canada	IPEX	System 636 CPVC

CPVC Venting Systems

GB312 Boiler Size	Required Air Flow (CFM)
GB312/90	95
GB312/120	95
GB312/160	130
GB312/200	160
GB312/240	190
GB312/280	220

Vent and combustion air supply system installation must comply with Part 10, Venting of Equipment of the National Fuel Gas Code, ANSI Z223.1 or CSA B.149 or other applicable local building code regulations. **IMPORTANT:** The flue and air supply system must be designed for a maximum pressure of 0.40 inches WC (100Pa) for the overall system (vent and combustion air system) Vent Terminations: Approved Tee, Termination Elbow or Roof Cap for all category IV venting systems is required.

Basic Water Quality Guidelines

Water hardness

- Fill the system with clean water from the municipal water supply.
- Consult your local water department for the level of CaCO3 (calcium carbonate) to determine if water treatment is necessary.
- Do not use water from salt bedding systems (ion exchange) used to soften water.
- Approved Anti-freeze (Aluminum safe)
- Rhomar – Rhogard (at a concentration no more than 60% by volume).
- Noble Company – Noburst-AL (at a concentration no greater than 50% by volume).

Maintenance

- Follow the instructions of the approved anti-freeze vendor. An annual visit by a qualified service technician is recommended.

Corrosion

- Damage to the system can occur when oxygen is introduced to the heating system water. The following must be avoided for best system operation:
  - Undersized or faulty expansion vessels
  - Open vented systems
  - If the system can not be constructed as a sealed system, the use of a heat exchanger as a means of system separation is required.

Retrofit installations

- Installing a dirt trap such as a wye-strainer is required. It must be installed in the immediate vicinity of the boiler on the return pipe at the lowest point in the system.

GB312 Series
Natural Gas Condensing Boiler

GB312 Benefits at a Glance

- Excellent value and performance
- Boiler sizes from 305 to 955 MBH output
- Modulating premix gas burner for quiet, energy efficient operation
- Small footprint, low weight
- Condensing boiler with high performance aluminium heat exchanger
- Thermally insulated boiler block
- Easy installation, fully assembled at the factory
- Intelligent control system (Logamatic EMS and Logamatic 4000)
- Maintenance made simple by easy accessibility of components requiring service
- Balanced flue operation
- Neutralizing system may be added for condensate conditioning

Approvals and Certifications

Approval Numbers

CRN 7834.7C
MA # G1-0409-410

Approval numbers are subject to periodic changes and updates. Please visit our web site for the most up-to-date approval numbers.

A Tradition of Excellence

The World's leader in heating technologies since 1825, Buderus produced the world's first low-temperature hydronic heating systems. Today, Buderus products are acknowledged as the world standard in high-efficiency, low emissions hydronic heating. All Buderus products are designed to meet strict safety and environmental regulations.

Buderus boilers are quick and easy to install and will outlast and outperform virtually any other commercial hot water heating system. They are designed for easy access and service. With appropriate maintenance, Buderus boilers deliver the highest possible efficiencies throughout the lifespan of operation.

In 2008 Buderus became a member of the Bosch Group, representing the Bosch, Buderus and FHP brands with products that are designed to improve efficiency, reliability and are environmentally friendly. Bosch Thermotechnology offers floor-standing and wall hung boilers, water heaters, solar systems, heat pumps, control systems and tankless water heaters.

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