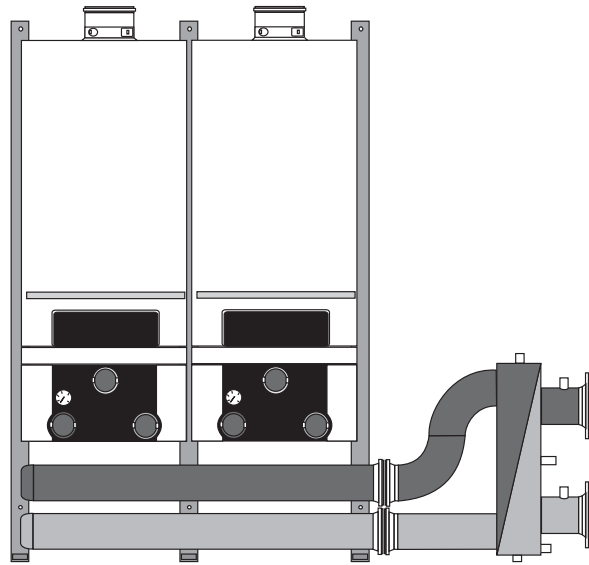


# GB162 Series Boiler TR & TL Cascade Kit Configurations

Engineering  
Submittal  
Sheet

# Buderus

## Cascade Overview



## Engineering Specifications

There shall be provided a Buderus GB162 TR or TL condensing hot water boiler cascade kit with a total output of \_\_\_\_\_ MBH, suitable for induced draft firing with natural gas or propane. The cascade components shall be supplied by Buderus with the specific boiler rack assembly, individual header connection sets, reversible supply and return headers, hydraulic separator assembly with flanged system connections and molded insulation kit.

The factory provided racking system shall be powder coat finished and provide for a back-to-back mounting configuration. All hardware shall be furnished with the racking system for field assembly.

The factory provided header system shall be constructed of schedule 40 carbon steel with pre-welded mounting lobes for racking attachment. The header system shall be reversible to accommodate site specific connection requirements. Boiler pump groups shall be connected to the header system with provided pipe segments and compression fittings.

The factory provided hydraulic separator shall be connected to the header system to ensure the boiler and system flows are decoupled. The hydraulic separator shall be factory fitted with an air vent, drain tapping and sensor well tapping. System connection may be completed with an included companion flange.

The pre-molded insulation kit shall be made from closed-cell polystyrene and shall be provided with the cascade assembly materials.

Each boiler in the cascade shall be constructed, tested and labeled in accordance with ASME Section IV and shall bear the ASME stamp. Boilers shall be CSA approved and have an applicable Canadian Registration number.

The MCM10 cascade controller shall be capable of sequencing up to 4 boilers with expansion capabilities up to 16 boilers, able to accept 0-10vdc setpoint signal, transmit alarm conditions and monitor system supply temperature via resistance sensor input. Sequencing of each boiler shall be accomplished in a serial method; lead/lag rotation shall be completed every 100 operating hours for equal boiler runtime.

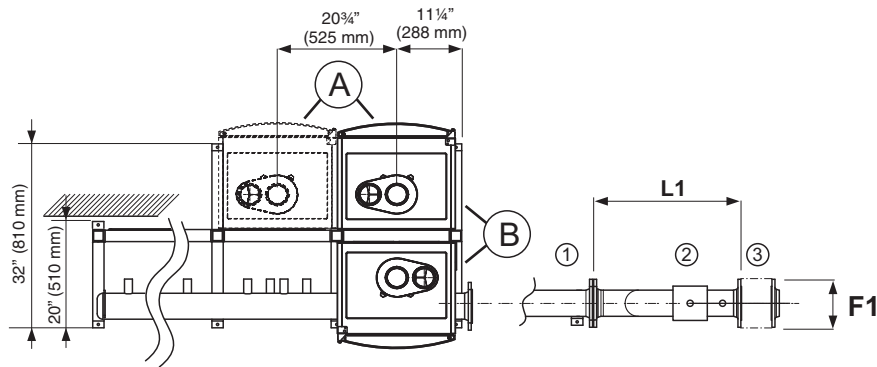
Independent outdoor temperature reset may be accomplished with the optional AM10 controller; a mounting enclosure shall be included with the provided resistance dependent sensor. Standard communication interface from the AM10 to MCM10 controller shall be a two-wire low voltage bus.

GB162 Series Boiler  
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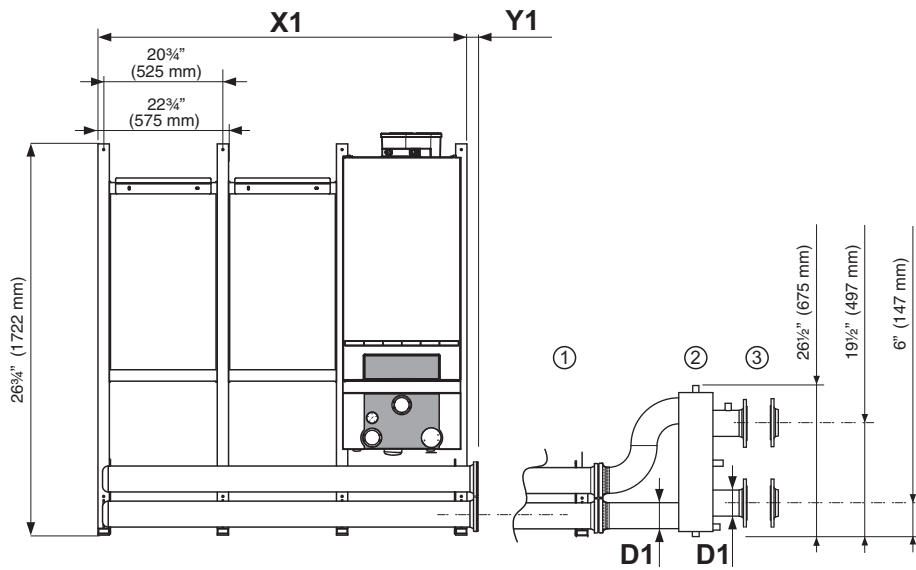


| Specifications   |                   |                  |                   |     |   |                         |        |
|------------------|-------------------|------------------|-------------------|-----|---|-------------------------|--------|
| NG               |                   | LP               |                   | kW  | Cascade frame system options<br>TL = inline TR = back-to-back | Number of boilers GB162 |        |
| Input (k.Btu/hr) | Output (k.Btu/hr) | Input (k.Btu/hr) | Output (k.Btu/hr) |     |   | 80 kW                   | 100 kW |
| 290              | 260               | 270              | 242               | 80  | Single Boiler   |                         |        |
| 333              | 302               | 315              | 282               | 100 | Single Boiler   |                         |        |
| 580              | 520               | 540              | 484               | 160 | TL2 / TR2   | 2                       | -      |
| 623              | 562               | 585              | 524               | 180 | TL2 / TR2   | 1                       | 1      |
| 666              | 604               | 630              | 564               | 200 | TL2 / TR2   | -                       | 2      |
| 870              | 780               | 810              | 726               | 240 | TL3 / TR3   | 3                       | -      |
| 913              | 822               | 855              | 766               | 260 | TL3 / TR3   | 2                       | 1      |
| 956              | 864               | 900              | 806               | 280 | TL3 / TR3   | 1                       | 2      |
| 999              | 906               | 945              | 846               | 300 | TL3 / TR3   | -                       | 3      |
| 1160             | 1040              | 1080             | 968               | 320 | TL4 / TR4   | 4                       | -      |
| 1203             | 1082              | 1125             | 1008              | 340 | TL4 / TR4   | 3                       | 1      |
| 1246             | 1124              | 1170             | 1048              | 360 | TL4 / TR4   | 2                       | 2      |
| 1289             | 1166              | 1215             | 1088              | 380 | TL4 / TR4   | 1                       | 3      |
| 1332             | 1208              | 1260             | 1128              | 400 | TL4 / TR4   | -                       | 4      |
| 1450             | 1300              | 1350             | 1210              | 400 | TR5/6   | 5                       | -      |
| 1493             | 1342              | 1395             | 1250              | 420 | TR5/6   | 4                       | 1      |
| 1536             | 1384              | 1440             | 1290              | 440 | TR5/6   | 3                       | 2      |
| 1579             | 1426              | 1485             | 1330              | 460 | TR5/6   | 2                       | 3      |
| 1622             | 1468              | 1530             | 1370              | 480 | TR5/6   | 1                       | 4      |
| 1665             | 1510              | 1575             | 1410              | 500 | TR5/6   | -                       | 5      |
| 1740             | 1560              | 1620             | 1452              | 480 | TR5/6   | 6                       | -      |
| 1783             | 1602              | 1665             | 1492              | 500 | TR5/6   | 5                       | 1      |
| 1826             | 1644              | 1710             | 1532              | 520 | TR5/6   | 4                       | 2      |
| 1869             | 1686              | 1755             | 1572              | 540 | TR5/6   | 3                       | 3      |
| 1912             | 1728              | 1800             | 1612              | 560 | TR5/6   | 2                       | 4      |
| 1955             | 1770              | 1845             | 1652              | 580 | TR5/6   | 1                       | 5      |
| 1998             | 1812              | 1890             | 1692              | 600 | TR5/6   | -                       | 6      |
| 2030             | 1820              | 1890             | 1694              | 560 | TR7/8   | 7                       | -      |
| 2073             | 1862              | 1935             | 1734              | 580 | TR7/8   | 6                       | 1      |
| 2116             | 1904              | 1980             | 1774              | 600 | TR7/8   | 5                       | 2      |
| 2159             | 1946              | 2025             | 1814              | 620 | TR7/8   | 4                       | 3      |
| 2202             | 1988              | 2070             | 1854              | 640 | TR7/8   | 3                       | 4      |
| 2245             | 2030              | 2115             | 1894              | 660 | TR7/8   | 2                       | 5      |
| 2288             | 2072              | 2160             | 1934              | 680 | TR7/8   | 1                       | 6      |
| 2331             | 2114              | 2205             | 1974              | 700 | TR7/8   | -                       | 7      |
| 2320             | 2080              | 2160             | 1936              | 640 | TR7/8   | 8                       | -      |
| 2363             | 2122              | 2205             | 1976              | 660 | TR7/8   | 7                       | 1      |
| 2406             | 2164              | 2250             | 2016              | 680 | TR7/8   | 6                       | 2      |
| 2449             | 2206              | 2295             | 2056              | 700 | TR7/8   | 5                       | 3      |
| 2492             | 2248              | 2340             | 2096              | 720 | TR7/8   | 4                       | 4      |
| 2535             | 2290              | 2385             | 2136              | 740 | TR7/8   | 3                       | 5      |
| 2578             | 2332              | 2430             | 2176              | 760 | TR7/8   | 2                       | 6      |
| 2621             | 2374              | 2475             | 2216              | 780 | TR7/8   | 1                       | 7      |
| 2664             | 2416              | 2520             | 2256              | 800 | TR7/8   | -                       | 8      |

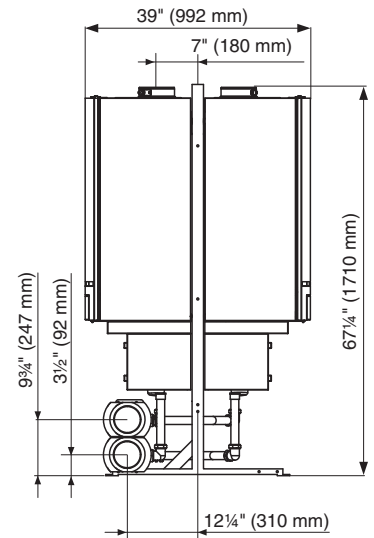
Cascade Dimensions and Connections



- Top view -



- Front view -



- Side view -

LEGEND:

- A - TL - Inline configuration
- B - TR - Back-to-back configuration
- 1 - Supply and return header
- 2 - Low loss header
- 3 - Enclosed welding flanges

GB162 Series Boiler  
TR & TL Cascade Kit Configurations



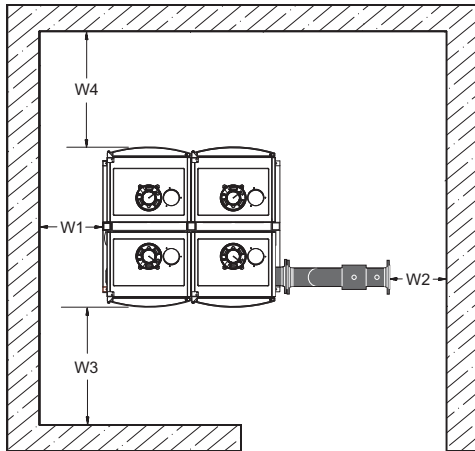
| TL - Dimensions / Connections Data |   |  |  |
|------------------------------------|---|--|--|
| Cascade Frame System               | X1 + Y1   | (X1 + Y1) = Total Length                   | Width                                    |
| TL2                                | 43 <sup>3</sup> / <sub>8</sub> " (1,100mm) + 1 <sup>3</sup> / <sub>8</sub> " (38mm) | 44 <sup>3</sup> / <sub>8</sub> " (1,138mm) | 22 <sup>3</sup> / <sub>4</sub> " (575mm) |
| TL3                                | 64 <sup>1</sup> / <sub>8</sub> " (1,625mm) + 1 <sup>3</sup> / <sub>8</sub> " (38mm) | 65 <sup>1</sup> / <sub>2</sub> " (1,663mm) | 22 <sup>3</sup> / <sub>4</sub> " (575mm) |
| TL4                                | 84 <sup>5</sup> / <sub>8</sub> " (2,150mm) + 1 <sup>3</sup> / <sub>8</sub> " (42mm) | 86 <sup>1</sup> / <sub>4</sub> " (2,192mm) | 22 <sup>3</sup> / <sub>4</sub> " (575mm) |

| TR - Dimensions / Connections Data |   |  |             |
|------------------------------------|---|--|-------------|
| Cascade Frame System               | X1 + Y1   | (X1 + Y1) = Total Length                   | Width       |
| TR2                                | 22 <sup>7</sup> / <sub>8</sub> " (575mm) + 1 <sup>3</sup> / <sub>8</sub> " (38mm)   | 24 <sup>1</sup> / <sub>4</sub> " (613mm)   | 39" (992mm) |
| TR3, TR4                           | 43 <sup>3</sup> / <sub>8</sub> " (1,100mm) + 1 <sup>3</sup> / <sub>8</sub> " (45mm) | 45" (1,142mm)                              | 39" (992mm) |
| TR5, TR6                           | 64" (1,625mm) + 1 <sup>3</sup> / <sub>4</sub> " (45mm)                              | 65 <sup>3</sup> / <sub>4</sub> " (1,670mm) | 39" (992mm) |
| TR7, TR8                           | 84 <sup>3</sup> / <sub>4</sub> " (2,150mm) + 1 <sup>3</sup> / <sub>4</sub> " (45mm) | 86 <sup>1</sup> / <sub>2</sub> " (2,195mm) | 39" (992mm) |

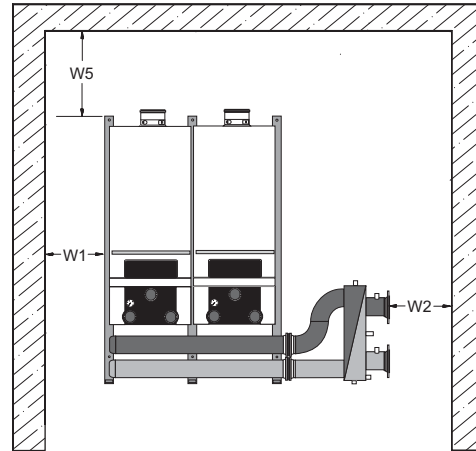
| Header Dimensions Data |                                 |   |   |
|------------------------|---------------------------------|---|---|
| Cascade Frame System   | Header diameter D1              | Length L1                                 | F1 flange dimension                         |
| TL2, TR2               | 2 <sup>1</sup> / <sub>2</sub> " | 19" (482 mm)                              | 2-1/2" Weld Type Flanges and 2" NPT Flanges |
| TL3                    | 2 <sup>1</sup> / <sub>2</sub> " | 19" (482 mm)                              | 2-1/2" Weld Type Flanges                    |
| TR3, TL4, TR4          | 3"                              | 22 <sup>3</sup> / <sub>4</sub> " (571 mm) | 3" Weld Type Flanges                        |
| TR5/6 & TR7/8          | 4"                              | 25 <sup>1</sup> / <sub>2</sub> " (651 mm) | 4" Weld Type Flanges                        |

| Approval Data            |                 |
|--------------------------|-----------------|
| Approval description     | Approval number |
| Massachusetts Approval # | G3-0809-45      |
| CRN #                    | 7990.7C         |

**Boiler Clearances**



Top View



Front View

| Description       | Unit      | Minimum clearance |
|-------------------|-----------|-------------------|
| Wall clearance W1 | Inch (mm) | 0                 |
| Wall clearance W2 | Inch (mm) | 24 (610)          |
| Wall clearance W3 | Inch (mm) | 37 (940)          |
| Wall clearance W4 | Inch (mm) | 37 (940)          |
| Top clearance W5  | Inch (mm) | 6 (152)           |