ALARKO

Premix Full Condensing Combi Boilers

# Seradens Super
# Seradens Super Plus

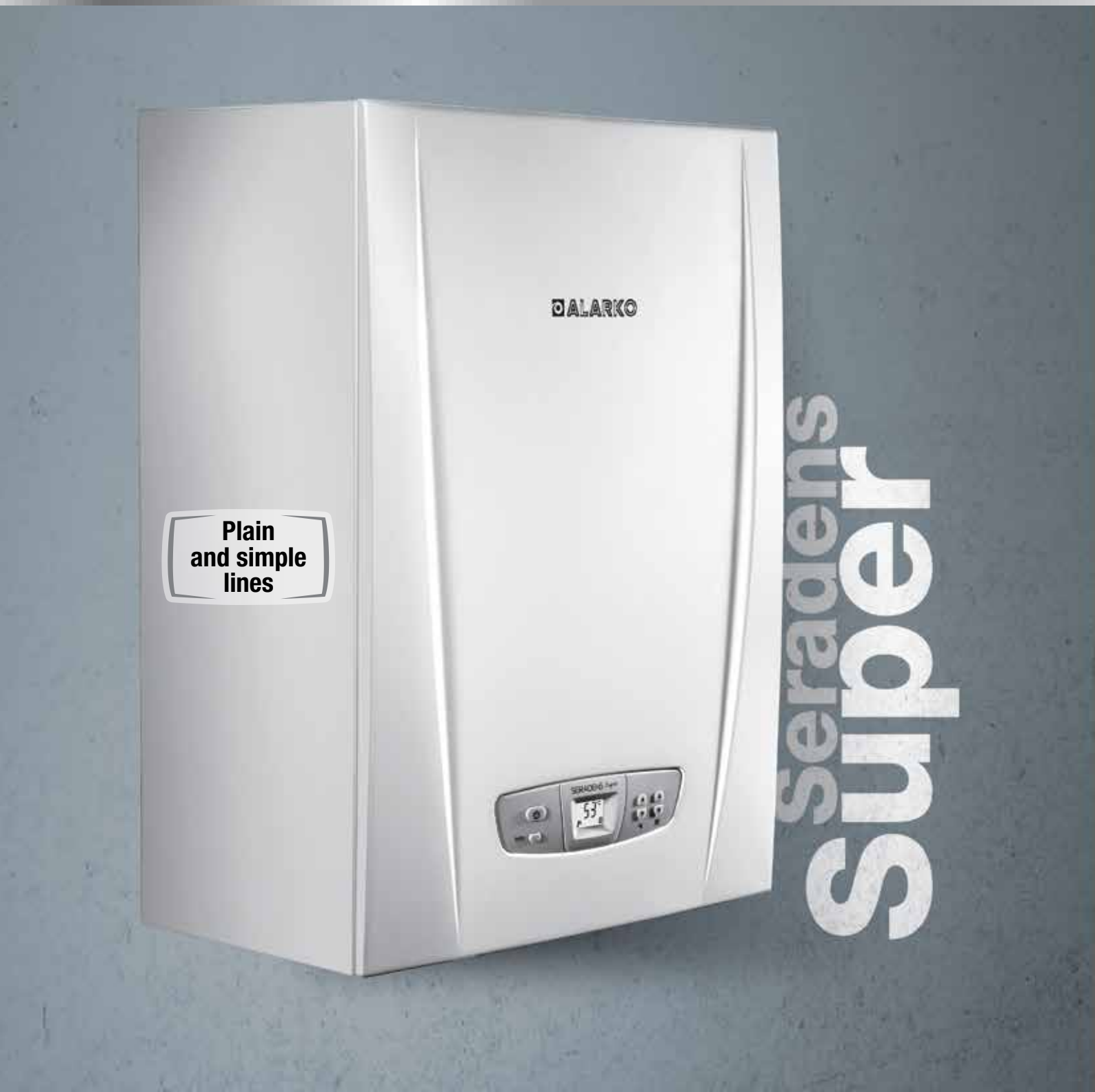

**20 - 28 - 36 kW**

**THE FIRST CONDENSING TECHNOLOGY BOTH IN HEATING AND DOMESTIC HOT WATER IN TURKEY**

Smaller, more elegant and efficient

# New Seradens

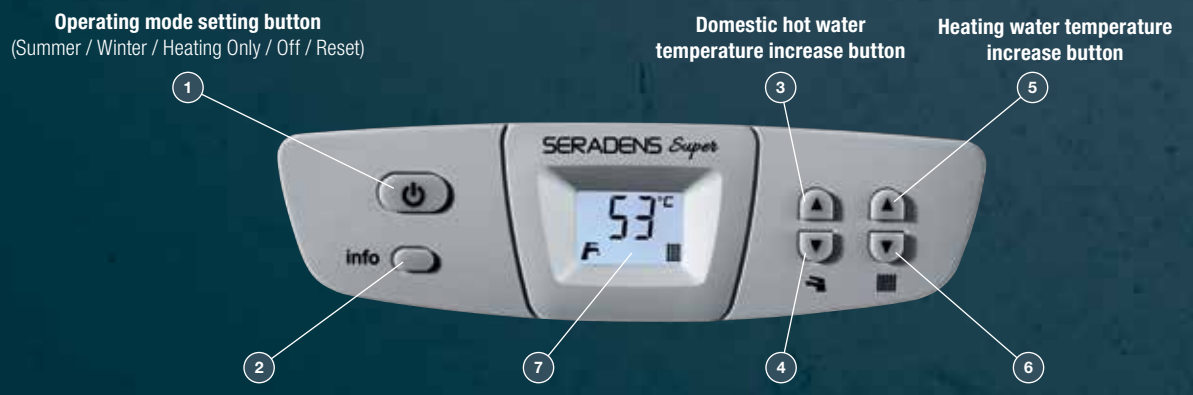
- Elegant and modern design
- Stainless steel exchanger with long service life and high resistance against condensate water
- Capacities of 20, 28 and 36 kW ( at 50/30°C)
- Ideal gas-air mixture, high efficiency, low noise level, low flue gas temperature and low emission rate thanks to the premix system, environmentally friendly product
- High efficiency proved by the very low flue gas temperature (flue gas temperature reduced up to 40°C)
- Minimum stop and start operations, maximum fuel saving with the very extensive heating modulation range that goes from 17% to 100%
- Capability to make use of solar energy in the heating of domestic hot water with the solar energy connection set (using optional solar connection set and an additional hot water tank)
- Pre-heating function for domestic hot water
- Higher pump head



# Premix Full Condensing Combi Boilers

- Bigger expansion tank
- Capability to operate under lower flow rate
- Higher heating modulation range
- More hot water
- Higher heating efficiency
- Maximum domestic hot water efficiency (in Seradens Super Plus models)
- Less fuel consumption
- White illuminated LCD display
- Digital manometer
- Ease of demonstration and explanation in showrooms with the demo mode
- Opentherm remote control connection
- Complies with EN 15502 norm (gas fired boilers with a rated heat load under 1,000 kW)
- Compatible for natural gas and LPG
- Certified for EMC (Electro Magnetic Compatibility) and LVD (Low Voltage Directive) from a certification body

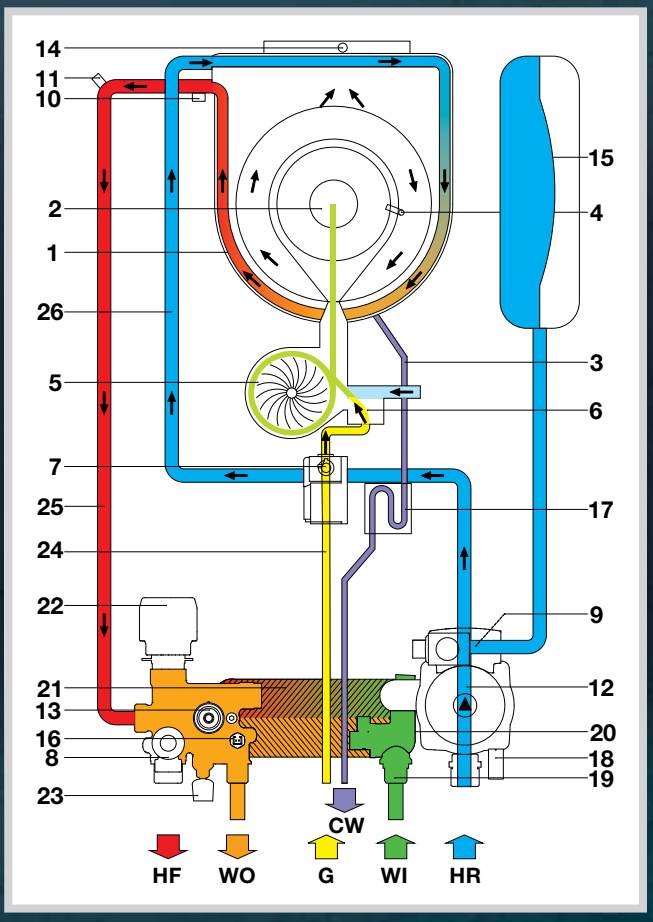

## Control Panel




1. **Operating mode setting button** (Summer / Winter / Heating Only / Off / Reset)
2. **Info menu entry button**
3. **Domestic hot water temperature increase button**
4. **Domestic hot water temperature decrease button**
5. **Heating water temperature increase button**
6. **Heating water temperature decrease button**
7. **LCD display for temperature, error codes and operating mode**

# Seradens Super

## Operating Diagram



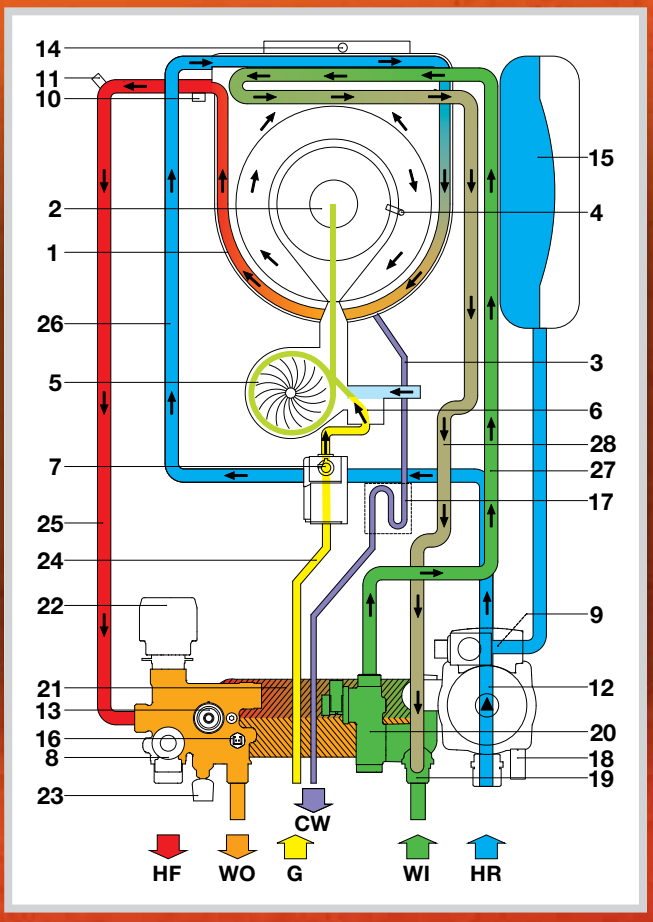

**1**- Main exchanger **2**- Premix burner unit (gas manifold + burner) **3**- Condensation drainage pipe **4**- Ionization and ignition electrode **5**- Fan **6**- Venturi **7**- Electronic gas valve **8**- 3 bar safety valve **9**- Automatic air vent **10**- Limit thermostat **11**- Heating flow temperature sensor **12**- Circulation pump **13**- Pressure sensor **14**- Flue fuse **15**- Expansion tank **16**- DHW temperature sensor **17**- Siphon **18**- Drainage tap **19**- Flow limiter **20**- Electronic flow sensor **21**- DHW plate exchanger **22**- 3 way valve motor **23**- Water filling tap **24**- Gas inlet pipe **25**- Heating flow pipe **26**- Heating return pipe


## Control Panel


1. **Operating mode setting button**
(Summer / Winter / Heating Only / Off / Reset)
2. **Info menu entry button**
3. **Domestic hot water temperature increase button**
4. **Domestic hot water temperature decrease button**
5. **Heating water temperature increase button**
6. **Heating water temperature decrease button**
7. **LCD display for temperature, error codes and operating mode**
8. **eco (economy) mode on-off button**
(upper limit as 50°C for radiator system and 38°C for underfloor heating system, fixed 45°C for domestic hot water)

# Seradens Super Plus

## Operating Diagram




**1**- Main exchanger **2**- Premix burner unit (gas manifold + burner) **3**- Condensation drainage pipe **4**- Ionization and ignition electrode **5**- Fan **6**- Venturi **7**- Electronic gas valve **8**- 3 bar safety valve **9**- Automatic air vent **10**- Limit thermostat **11**- Heating flow temperature sensor **12**- Circulation pump **13**- Pressure sensor **14**- Flue fuse **15**- Expansion tank **16**- DHW temperature sensor **17**- Siphon **18**- Drainage tap **19**- Flow limiter **20**- Electronic flow sensor **21**- DHW plate exchanger **22**- 3 way valve motor **23**- Water filling tap **24**- Gas inlet pipe **25**- Heating flow pipe **26**- Heating return pipe **27**- DHW water pre-heating inlet pipe **28**- DHW water pre-heating outlet pipe

# Main Components

## Electronic Card

Seradens Super and Seradens Super Plus series combi boilers use state-of-the-art electronic board by Nordgas. Electronic board allows displaying of operating modes and temperatures, ambient temperature, warnings and error messages on the elegant, white LDC display. Monitors the boiler continuously for safe, comfortable and high efficiency operation.

- Compatible both for radiator and underfloor heating systems with standard (30-85°C) / reduced (30-45°C) heating temperatures
- User info menu
- Service info menu
- Seradens Super Plus models have eco mode
- Demo mode
- Continuous flame modulation during heating and domestic hot water cycles
- Automatic flame control system
- Initial power increase time (ramp time) setting for heating cycle
- Pre-heating function for domestic hot water
- Activation delay period setting for heating cycle
- Heating anti-freeze function
- Domestic hot water anti-freeze function
- Circulation pump anti-locking function
- 3-way diverting valve anti-locking function
- Pump overrun feature for heating cycle
- Pump overrun feature for domestic hot water cycle
- Heating circuit low water pressure safety
- Heating circuit high water pressure safety (two stages)
- Fault reporting with error codes (self-diagnostic)
- Remote controller communication channel (opentherm protocol)
- Outside temperature compensation function (with using optional outside sensor)
- Selection of gas type
- Chimney sweeper function
- Parameters programming function

## Main Exchanger

- Sermeta brand. With smooth oval pipes, made of long service lifed stainless steel resistant against condensate water.
- Highly efficient, durable, resistant against shocks.
- Seradens Super Plus models have additional exchanger coils for condensation in domestic hot water generation.
- Efficiency is increased even more with less radiation losses thanks to the cold burner door on the front cover side.
- Provides maximum safety for you and your boiler with the integrated flue and safety fuses.
- Exchanger's burner is the patented, very quiet Bluejet® burner with a long service life developed by Sermeta. CO and NOx emissions caused by burning are reduced to minimum level.
- Quick maintenance is possible with easy access to combustion chamber by removing a few nuts.

**Seradens Super Exchanger**

**Seradens Super Plus Exchanger**

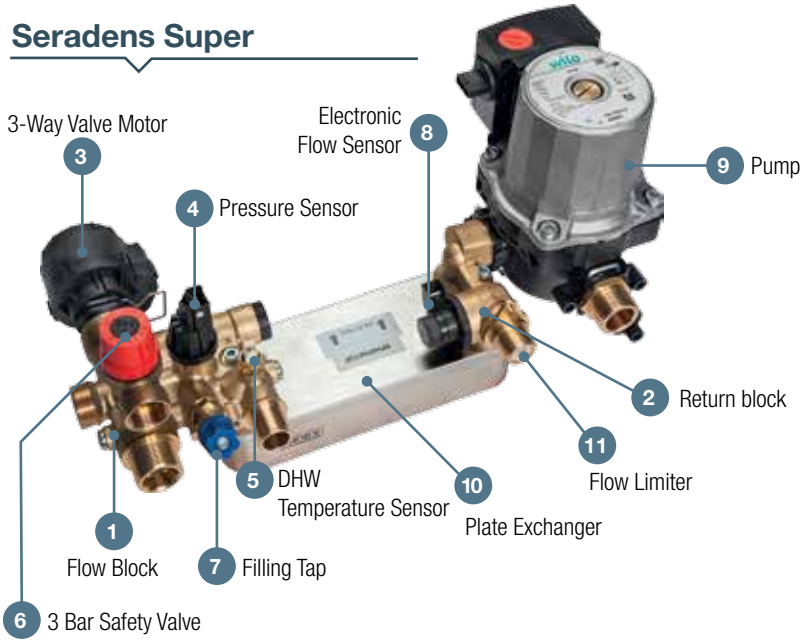
## Fan-Venturi-Gas Valve Assembly

- Required amount of gas-air mixture is provided as per the boiler capacity with the EBM made modulated fan integrated in the assembly. Fan speed is increased or decreased as per capacity. Thus, low noise level is maintained besides preventing low efficiency caused by excess air.
- Gas valve provides the gas flow required for combustion safely as per the modulating fan that changes according to the capacity
- With the venturi, ideal gas-air mixture rate of 1:10 is provided in a fixed fashion throughout whole capacity range. This is the most important point that ensures efficient and clean burning.

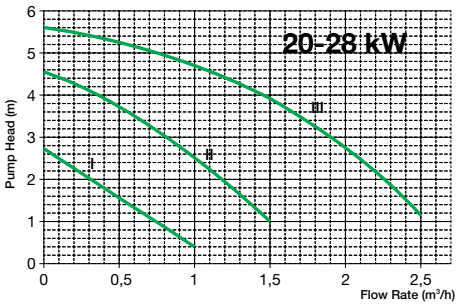
## Hydraulic Circuit

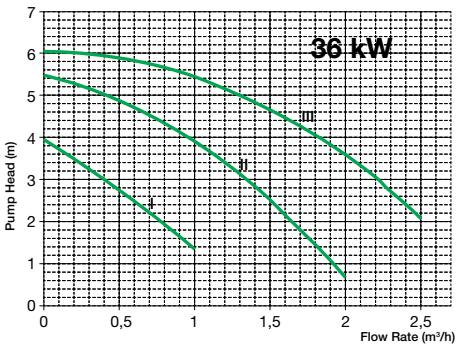
- Seradens Super and Seradens Super Plus models have the same flow blocks, but different return blocks.
- Flow and return hdyraulic blocks made of brass are much more durable and have a longer service life than plastic blocks. Service interventions, removal and installation operations are performed more easily and safely.
- Circulation pumps with three stages and automatic air vent have pump heads of 4.8-4.4-4.7 mWc respectively for capacities of 20, 28 and 36 kW. Thus, pump shall suffice for houses with two or three floors.
- 20, 28 and 36 kW models use three different types of domestic hot water plate exchangers selected for comfortable and abundant domestic hot water usage. For example, 28 and 36 kW models produce 17, 18 and 21 l/min domestic hot water which cannot be achieved by many boilers. Amount of hot water produced with high flow rate cancels the requirement for using hot water tanks in may projects Thus, first investment cost is reduced besides saving from fuel that shall be used for keeping hot water tank warm continuously.
- Automatic bypass that takes place through the plate exchanger allows continued circulation even if all radiator valves are closed.

### Seradens Super

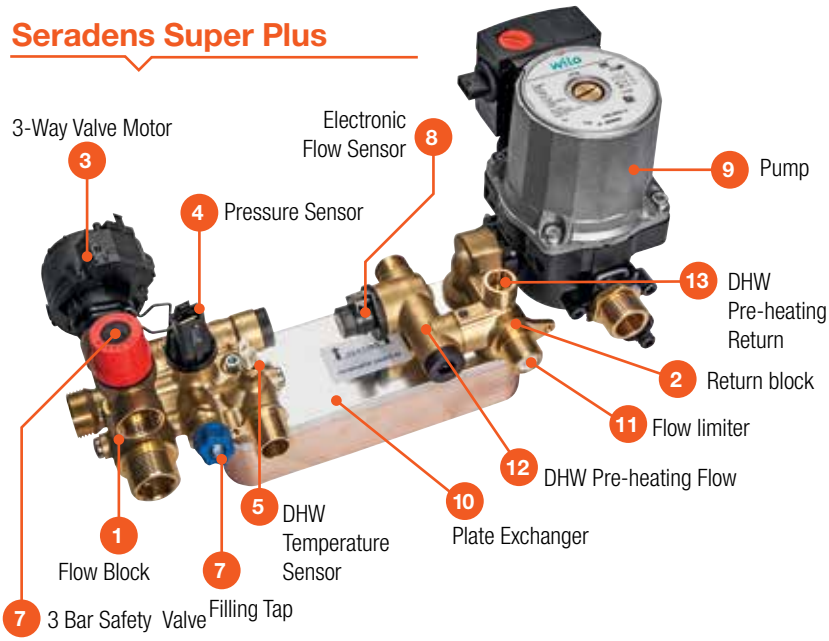



| Capacity kW | Flow Rate (m³/h) | Pump Head (mWc) |
|---|---|---|
| 20 | 0,86 | 4,8 |
| 28 | 1,20 | 4,4 |
| 36 | 1,50 | 4,7 |




### Seradens Super Plus

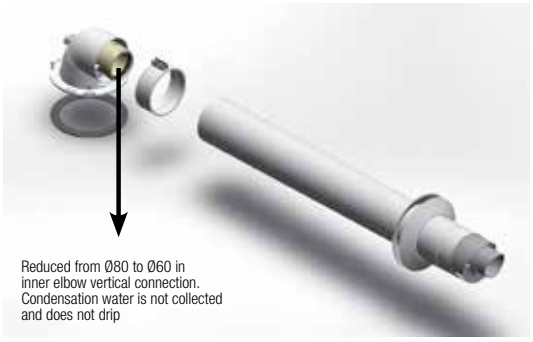



## Expansion Tank

Expansions tanks with a capacity of 8 litre used for 20 and 28 kW models and 10 litre used for 36 kW models allow expansion of very large installations, no problem occurs.

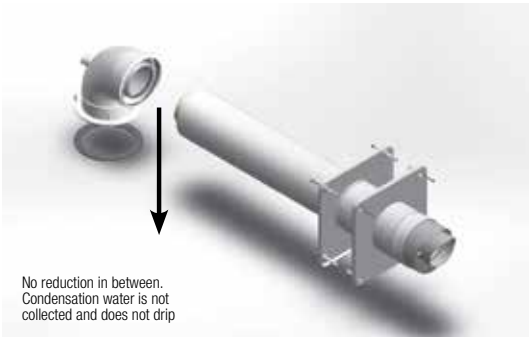
# Flue Sets and Various Flue Set Accesories for Your Need

## Ø 60/100 Horizontal Concentric Flue Set




- Provided as standard with the appliance for SRS/SSP 20 and 28 types
- If requested, can be changed with another set on order
- Maximum linear flue set length:
  SRS/SSP 20: 6 m.
  SRS/SSP 28: 5 m.
- Linear length of additional elbows:
  90° elbow: 0.8 m.
  45° elbow: 0.5 m.

## Ø 80/125 Horizontal Concentric Flue Set




- Provided as standard with the appliance for SRS/SSP 36 type
- If requested, can be changed with another set on order
- Maximum linear flue set length:
  SRS/SSP 36: 8 m.
- Linear length of additional elbows:
  90° elbow: 0.8 m.
  45° elbow: 0.5 m.

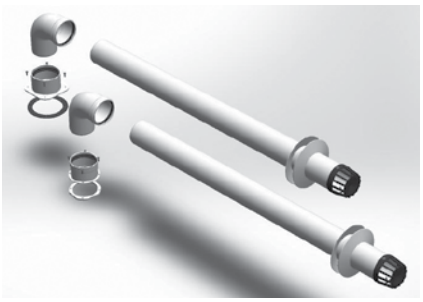
## Ø60/100 Vertical Concentric Flue Set

- If requested, can be changed with standard set on order
- Maximum linear flue set length:
  SRS/SSP 20: 6 m.
  SRS/SSP 28: 5 m.
- Linear length of additional elbows:
  90° elbow: 0.8 m.
  45° elbow: 0.5 m.

## Ø80/125 Vertical Concentric Flue Set

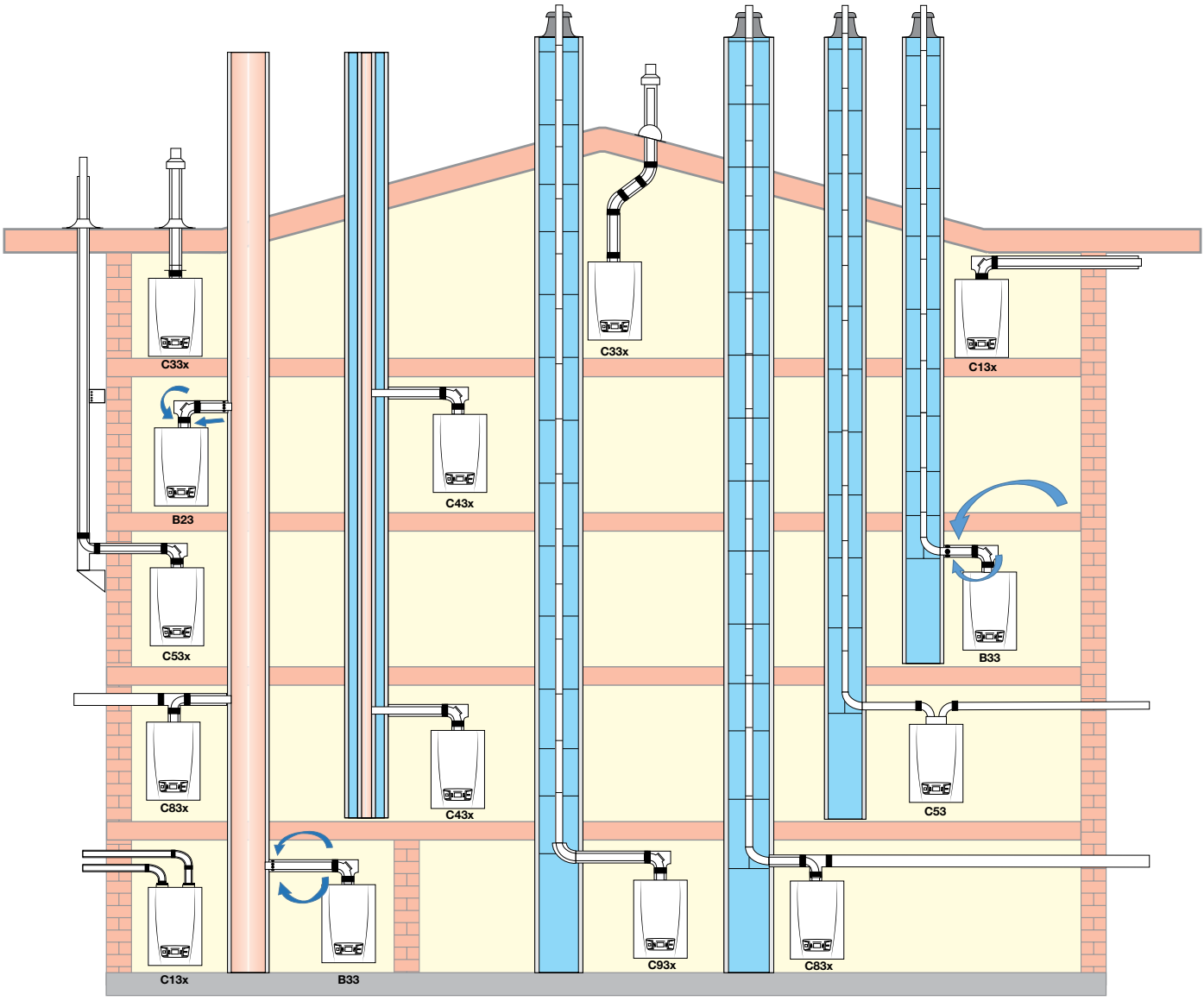
- If requested, can be changed with standard set on order
- Maximum linear flue set length:
  SRS/SSP 36: 8m.
- Linear length of additional elbows:
  90° elbow: 0.8 m.
  45° elbow: 0.5 m.

## Ø80+80 Twin Flue Set



- If requested, can be changed with standard set on order
- Maximum linear flue set length:
  SRS/SSP 20/28/36: 50 m.
- Linear length of additional elbows:
  90° elbow: 1.5 m.
  45° elbow: 1.2 m.

# Flue
# Connection Types




| Flue Type | Description |
|---|---|
| B23 | Flue gas pipe through the chimney, combustion air directly from the location through the device (open type). |
| B33 | Flue gas pipe through the chimney, combustion air from the location, with horizontal concentric connection (open type). |
| C13(x) | Horizontal combustion air intake and flue gas discharge through side face or from the roof.<br>Outlets are close to each other, at the same pressure area. |
| C33(x) | Combustion air intake and flue gas discharge with vertical outlet. Outlets are close to each other, at the same pressure area. |
| C43(x) | Combustion air and flue gas connections connected to multiple air-flue gas chimney system. |
| C53(x) | Combustion air intake and flue gas discharge with different lines. Outlets are at different pressure areas. |
| C63(x) | Connection design as per appliances where combustion air intake and flue gas discharge cannot be measured. |
| C83(x) | Flue gas installation is independent or with multiple connections (under pressure) and intake of independent combustion air from external environment. |
| C93(x) | Similar to C33 type combustion air intake and discharge of flue gas from the roof. Outlets are close to each other, at the same pressure area. Combustion air intake is through the building shaft on the roof partially or as a whole. |

# Automatic Control Devices for Superior Comfort and Extra Economy

## Room Thermostat

Operates the combi boiler according to the required room temperature.

## Wired and Wireless Weekly Programmable Room Thermostat

Operates the combi boiler according to the required room temperature in the required weekly schedules.

## Phone Control Interface Devices

These allow remote controlling of combi boilers in a simple way, such as on or off. There are two models that can work with fixed lines or GSM lines.

## Outside Temperature Sensor

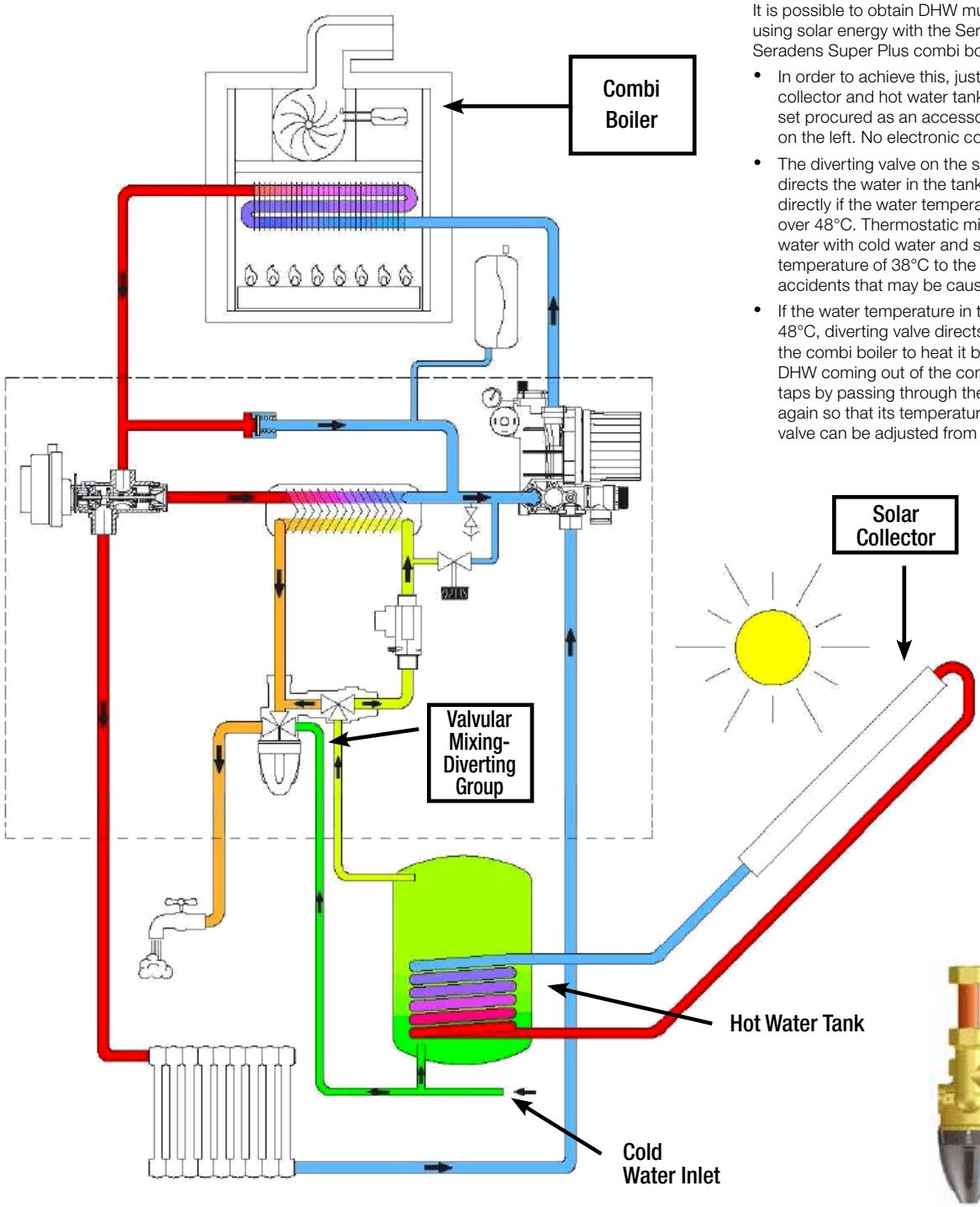
Operates the combi boiler automatically according to the weather conditions. May be used together with room thermostats or individually.

## Smart Thermostat Set

With your smart thermostat, you may control your combi boiler from your smart phone or tablet wherever you are in the world. You may access and change the current temperature settings or timing schedules.

**Devices are optional.*

## Solar Connection Set (Accessory)




It is possible to obtain DHW much more economically using solar energy with the Seradens Super or Seradens Super Plus combi boilers.

- In order to achieve this, just collect the solar collector and hot water tank to the solar connection set procured as an accessory as shown the diagram on the left. No electronic control system is required.
- The diverting valve on the solar connection set directs the water in the tank to the mixing valve directly if the water temperature in the tank is over 48°C. Thermostatic mixing valve mixes this water with cold water and sends DHW at a fixed temperature of 38°C to the taps and prevents accidents that may be caused by high temperature.
- If the water temperature in the tank is lower than 48°C, diverting valve directs the DHW to the combi boiler to heat it by the combi boiler. DHW coming out of the combi boiler reaches the taps by passing through the thermostatic valve again so that its temperature is set. Thermostatic valve can be adjusted from 30 to 56°C.

# THE DIFFERENCE OF PREMIX CONDENSING TECHNOLOGY

The temperature of flue gas generated by the combustion for conventional (non-condensing) combi boilers with copper or titanium exchanger is about 120 to 150°C regardless of the operating temperature of the boiler. With this high temperature, energy and fuel cost on the water vapor inside the flue gas just flies away, too. However, for premix, i.e. full condensing combi boiler with gas-air pre-mixing feature, flue gas temperature are lowered under 55°C while generating flow water temperature at about 50°C and lower thanks to the exchangers with much wider heat transfer surface.

For flue gas temperatures under 55°C, the water vapour inside the flue gas condenses, i.e. transforms to liquid from gas form. Thus, energy is captured before going out of the flue, and transferred to the water inside the exchanger. This is called concealed heat energy. By regeneration of energy inside the water vapour, it is possible to save up to 30% from fuel costs.

As the condensate water is acidic, main exhangers to premix full condensing combi boilers shall be made of stainless steel or aluminium alloy resistant to acidic condensate water. Alarko Seradens Super and Seradens Super Plus condensing combi boilers use stainless steel main exchanger with very high resistance against condensate water.

Combustion is always performed ideally with the premix system, i.e. premixing of gas and air at the ideal ratio of 1:10 before the combustion. This is ensured by the modulating fan which adjusts its speed as per the capacity requirement and the venturi which mixes the gas taken by the drawing of the fan from the modulating gas valve and air in the ideal ratio.

Premix condensing boilers do not perform condensing while generating domestic hot water. However, in Seradens Super Plus double condensing combi boiler models, the domestic hot water entering the boiler is passed through the full condensing stainless steel exchanger coils integrated in addition to the main exchanger, and thus both pre-heating and condensing are achieved. Flue gas temperatures are reduced up to 18°C while generating domestic hot water for these models.

This proves how efficiently the appliance operates.

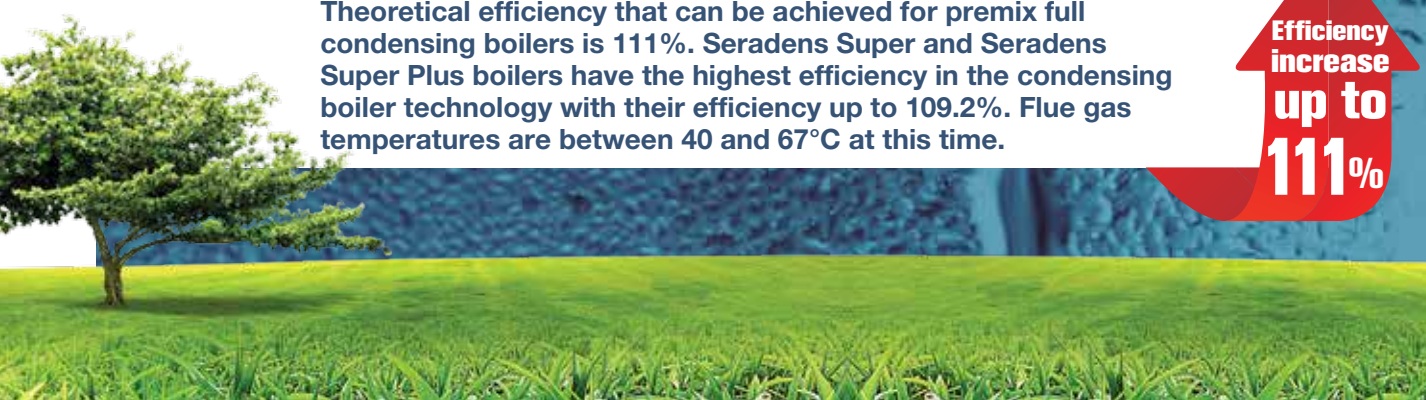
However, gas and air mixture cannot be performed at ideal ratios in conventional (non-condensing) combi boilers. Because, the fan providing the air has only one stage.

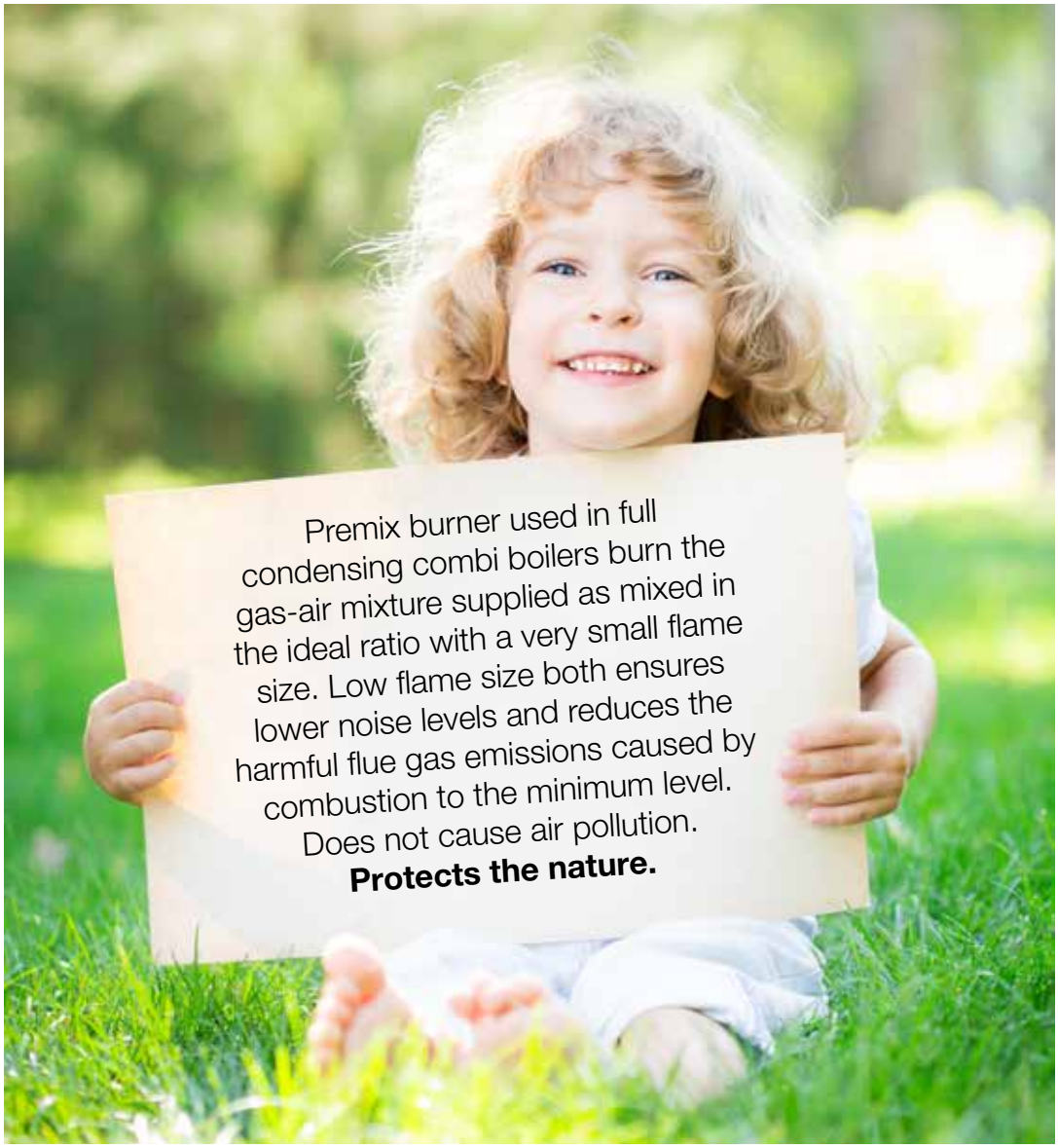
Even if gas is drawn less or more as per the capacity requirement from the modulating gas valve, fan always blows the air at maximum capacity. Therefore, efficiency is lower a great deal for these type of boiler as the air is provided more than normal especially while working in lower capacities.

Fuel costs are increased. Noise levels are higher.

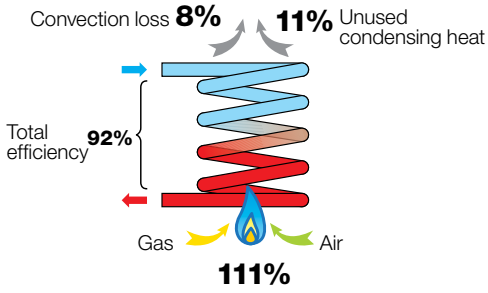
As copper exchangers that are not resistant to condensate water are used for boilers with recuparators, i.e. boilers with an additional small exhanger to the main exchanger of the boiler, also known as boilers with three exchangers, condensation does not occur on the main exchanger. Flue gas is put through the combi boiler return water in the additional exhanger, and thus a small amount of condensation occurs. However, as modulating fan, venturi and premix burner are not available in boilers with three exchangers, flue gas temperature, harmful flue gas emissions and noise level are much higher than premix condensing boiler, and efficiency is much lower. These types of boilers can achieve 102-103% efficiency level.

**Theoretical efficiency that can be achieved for premix full condensing boilers is 111%. Seradens Super and Seradens Super Plus boilers have the highest efficiency in the condensing boiler technology with their efficiency up to 109.2%. Flue gas temperatures are between 40 and 67°C at this time.**



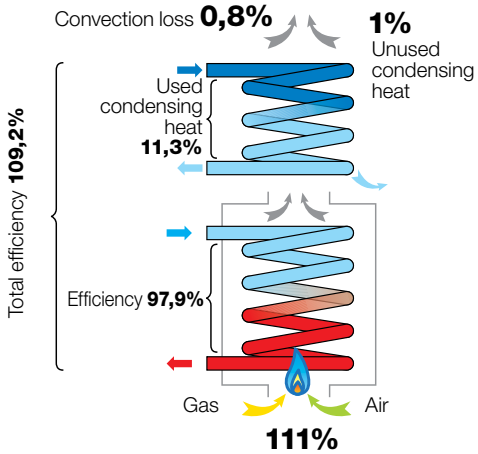



## Conventional (Non-Condensing) Combi Boiler




- Efficiency: 90 to 92% (approx.)
- Flue gas temperature: 120 to 150°C
- Risk of intoxication for open chamber flue types
- High flue gas emission (non-environmentally-friendly)
- Low combustion efficiency due to fixed natural gas - air mixture ratio

## Seradens Super / Super Plus Premix Condensing Combi Boiler




- Efficiency: 105.9 - 109.2%
- Flue gas temperature: 40 - 67°C (at 50 / 30ºC operating range)
- Hermetic - no flue gas intoxications
- Low flue gas emission (environmentally-friendly)
- High combustion efficiency due to premix ideal natural gas - air mixture
- Condensation of flue gas caused by low flow water temperature

## Dimensions


## Technical Specifications

| MODEL | UNIT | SERADENS SUPER | | | SERADENS SUPER PLUS | | |
|---|---|---|---|---|---|---|---|
| | | SRS 20 | SRS 28 | SRS 36 | SSP 20 | SSP 28 | SSP 36 |
| CE Certificate No. | no | 1312CR6123 | 1312CR6123 | 1312CR6123 | 1312CR6123 | 1312CR6123 | 1312CR6123 |
| Flue Connection Types | | B23 - B33 - C13 - C13(x) - C33 - C33(x) - C43 - C43(x) - C53 - C53(x) - C63 - C63(x) - C83 - C83(x) - C93 - C93(x) | | | | | |
| Device Category | | II2H3B/P | II2H3B/P | II2H3B/P | II2H3B/P | II2H3B/P | II2H3B/P |
| DHW Load Max. | kW | 21 | 29.3 | 37.7 | 20.6 | 27.6 | 34.7 |
| Heating Load Min. (50/30°C) | kW | 3.9 (G20) - 5.5 (G30) | 5.5 (G20) - 8.15 (G30) | 5.7 (G20) - 8.89 (G30) | 3.92 (G20) – 4.44 (G30) | 5.57 (G20) – 7.36 (G30) | 5.79 (G20) – 7.84 (G30) |
| Heating Power Min. (50/30°C) | kW | 4.0 (G20) - 3.74 (G30) | 5.7 (G20) - 5.19 (G30) | 6.0 (G20) – 6.78 (G30) | 4.01 (G20) - 3.04 (G30) | 5.97 (G20) - 5.59 (G30) | 6.17 (G20) – 5.92 (G30) |
| Heating Load Max. (50/30°C) | kW | 18.5 | 26.0 | 32.8 | 18.54 | 26.11 | 32.86 |
| Heating Power Max. (50/30°C) | kW | 20.1 | 27.9 | 35.3 | 20.18 | 27.90 | 35.72 |
| Efficiency at 100% Load (50/30°C) | % | 109.2 | 107.3 | 107.6 | 108.8 | 108.7 | 108.7 |
| Efficiency at 30% Load (50/30°C) | % | 106,8 | 106,3 | 105,9 | 108,7 | 107,2 | 107,7 |
| Heating Modulation Range (50/30°C-G20) | % | 19.9 - 100 | 20.4 - 100 | 17.0 - 100 | 19.9 - 100 | 21.4 - 100 | 17.3 - 100 |
| Heating Power Max. (80/60°C) | kW | 18.1 | 25.5 | 32.2 | 18.15 | 25.86 | 33 |
| Heating Power Min. (80/60°C) | kW | 3.7 (G20) – 2.92 (G30) | 5.3 (G20) – 5.19 (G30) | 5.5 (G20) – 5.98 (G30) | 3.52 (G20) – 2.67 (G30) | 5.33 (G20) – 5.05 (G30) | 5.47 (G20) – 5.48 (G30) |
| Efficiency at 100% Load (80/60°C) | % | 97.9 | 97.9 | 98.03 | 97.82 | 98.82 | 99.23 |
| Flue Gas Temperature (50/30°C,min-max) | °C | 49.5 - 59 | 44 - 66.6 | 55 - 63 | 44 - 49 | 40 - 49 | 43 - 49 |
| Flue Gas Temperature (80/60°C,max) | °C | 82 | 82 | 82 | 64 | 68 | 65.5 |
| Sound Level | dB (A) | 39-42 | 39-42 | 39-42 | 39-42 | 39-42 | 39-42 |
| **Heating Circuit** | | | | | | | |
| Heating Temperature Setting Range (min. - max.) | °C | 30-85 / 30-45 | 30-85 / 30-45 | 30-85 / 30-45 | 30-85 / 30-45 | 30-85 / 30-45 | 30-85 / 30-45 |
| Max. Heating Operating Temperature | °C | 95±4 | 95±4 | 95±4 | 95±4 | 95±4 | 95±4 |
| Expansion Tank Capacity | liter | 8 | 8 | 10 | 8 | 8 | 10 |
| Max. Operating Pressure (Heating) | bar | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 | 2.8 |
| Min. Operating Pressure (Heating) | bar | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| **DHW Circuit** (Automatic bypass feature) | | | | | | | |
| DHW Temperature Setting Range (min. - max.) | °C | 30-60 | 30-60 | 30-60 | 30-60 | 30-60 | 30-60 |
| Max. Hot Water Operating Pressure | bar | 10 | 10 | 10 | 10 | 10 | 10 |
| Min. Hot Water Operating Pressure | bar | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Hot Water Flow Rate at ΔT 30 K | liter/minute | 10 | 14 | 18 | 12 | 17 | 21 |
| **Dimensions** | | | | | | | |
| Width | mm | 437 | 437 | 437 | 437 | 437 | 437 |
| Height | mm | 640 | 640 | 640 | 640 | 640 | 640 |
| Depth | mm | 296 | 296 | 296 | 302 | 366 | 366 |
| Weight (net) | kg | 29 | 30 | 32 | 33 | 35 | 36 |
| **Hydraulic Connections** | | | | | | | |
| Heating Flow | Ø | 3/4" | 3/4" | 3/4" | 3/4" | 3/4" | 3/4" |
| Heating Return | Ø | 3/4" | 3/4" | 3/4" | 3/4" | 3/4" | 3/4" |
| Cold Water Inlet | Ø | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" |
| DHW Outlet | Ø | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" |
| Gas Inlet | Ø | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" | 1/2" |
| **Flue Systems** | | | | | | | |
| Horizontal - Concentric Flue System | Ø mm | 60/100 | 60/100 | 80/125 | 60/100 | 60/100 | 80/125 |
| Max. Flue Length | m | 6 | 5 | 8 | 6 | 5 | 8 |
| Twin Flue System | Ø mm | 80+80 | 80+80 | 80+80 | 80+80 | 80+80 | 80+80 |
| Max. Flue Length (from terminal to terminal) | m | 50 | 50 | 50 | 50 | 50 | 50 |
| Vertical Concentric Flue System | Ø mm | 60/100 | 60/100 | 80/125 | 60/100 | 60/100 | 80/125 |
| Max. Flue Length | m | 6 | 5 | 8 | 6 | 5 | 8 |
| **Gas Supply** | | | | | | | |
| Natural Gas G20 | | | | | | | |
| Inlet Pressure | mbar | 20 | 20 | 20 | 20 | 20 | 20 |
| Gas Consumption | m³/h | 2 | 2.8 | 3.57 | 2 | 2.82 | 3.55 |
| LPG G30 | | | | | | | |
| Inlet Pressure | mbar | 30 | 30 | 30 | 30 | 30 | 30 |
| Gas Consumption | kg/h | 1.28 | 1.85 | 2.36 | 1.19 | 1.83 | 2.27 |
| **Power Supply** | | | | | | | |
| Electrical Connection | V/Hz | 230/50 | 230/50 | 230/50 | 230/50 | 230/50 | 230/50 |
| Power Consumption | W | 113 | 121 | 123 | 125 | 134 | 140 |
| Protection Class | IP | X4D | X4D | X4D | X4D | X4D | X4D |

Manufacturer reserves the right to change any product specifications without notice.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