

**schuster®**



# **BWA**

CONDENSING WALL HUNG BOILER  
FROM 50 kW TO 140 kW

# Professional

## From 50 kW to 70 kW

- ★★★★ EFFICIENCY CLASS (CE DIR. 92 / 42).  
Seasonal efficiencies up to 109%
- CLASS 5 Low NO<sub>x</sub> (EN 483) thanks to the **pre-mixed burner** with gas-air ratio control which offers a constant CO<sub>2</sub> content for the whole modulation range
- Al/Si/Mg exchanger/condenser
- Certification in output range
- Dimensions: h 93 cm, w 61,5 cm, d 26,6 cm
- Modulating ratio 1:7 - BWA 70, 1:5 - BWA 50
- Standard interface for modulating heating controllers with communication protocol (bus-data)
- Coupling with a **modulating pump** (standard supply only for BWA 70)
- Optional accessories:** thermoregulation, mixing header, additional safety devices, equipment for cascade mounting (up to 4 boilers), equipment for DHW production kit



## 90 kW

- ★★★★ EFFICIENCY CLASS (CE DIR. 92 / 42)
- Al/Si/Mg exchanger/condenser
- Anti-corrosion painted steel casing for indoor and outdoor floor standing installation
- Standard supplied modulating pump
- Certification in output range
- Protection degree IP X5D
- Possibility of cascade mounting (up to 4 boilers)
- Max input 90 kW, min. 22 kW



## 140 kW

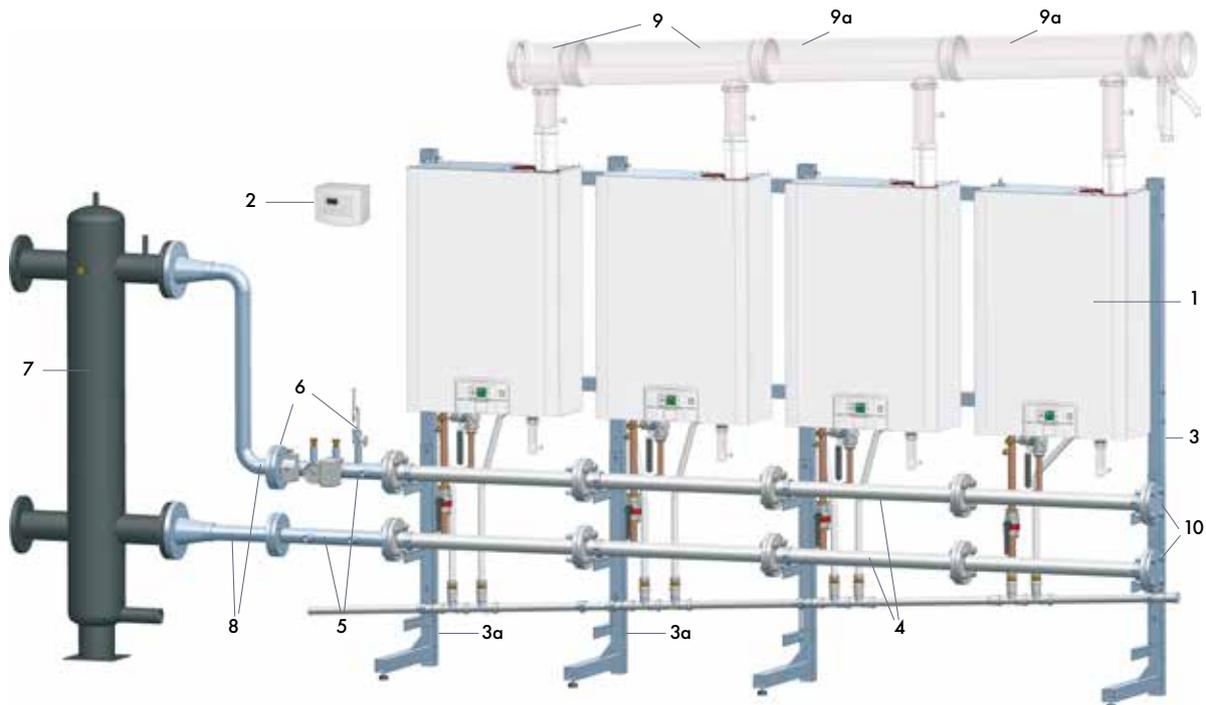
- ★★★★ EFFICIENCY CLASS (CE DIR. 92 / 42).  
Seasonal efficiencies until 104,3%
- CLASS 5 Low NO<sub>x</sub> (EN 483) thanks to ready-mixed modulating burner with fixed combustion
- 2 Al/Si/Mg exchanger/condenser with anticorrosion anodization treatment
- Certification in output range
- Dimensions: h 128 cm, w 76 cm, d 47 cm
- Standard supplied modulating pump: modulating ratio 1:13
- Just one common smokes evacuation
- Twin safety switch (emergency working)
- Wall-hung units with self supporting metallic structure suitable also for floor standing
- Optional accessories:** thermoregulation, mixing header, additional safety devices, equipment for cascade mounting (up to 4 boilers)



MODEL		BWA 50	BWA 70	BWA 90	BWA 140
nominal output max/min	condensing mode kW	49,3 ÷ 10,3	68,5 ÷ 10,3	93,6 24,0	136 ÷ 11,5
	conventional mode kW	47,2 ÷ 9,1	65,5 ÷ 9,1	87,5 ÷ 21,1	131,6 ÷ 10,5
efficiency category (Dir. 92/42)		★★★★			

# Allestimenti in cascata

50 - 70 kW modules - up to 280 kW

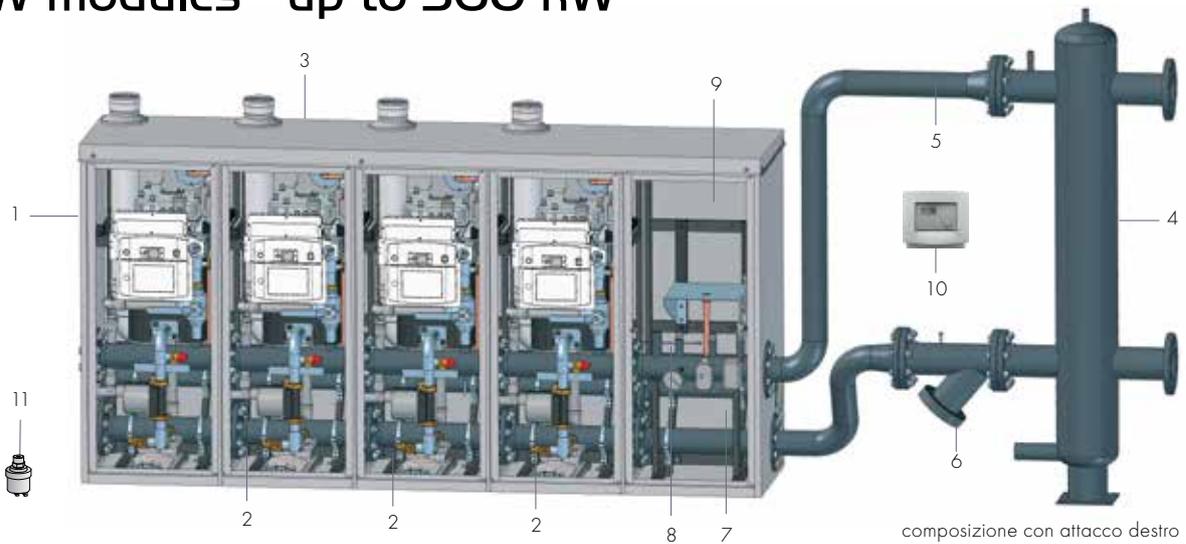


## BATTERY COMPOSITION + PRIMARY CIRCUIT - description of the components as shown in the picture

- 1 - BWA 50 for gas natural or LPG  
- BWA 70 for gas natural or LPG
- 2 - E8 heating controller
- 3 - Supporting frame for 2 units
- 3A- Expansion frame for 1 unit
- 4 - Manifolds Kit
- 5 - Pipes for safety devices kit
- 6 - Safety devices Kit
- 7 - Mixing header Kit until 150 kW  
- Mixing header Kit from 180 to 450 kW
- 8 - Adaptation pipes Kit until 150 kW  
- Adaptation pipes Kit from 180 to 450 kW
- 9 - Smokes evacuation Kit for 2 units in pps (inspection kit included) DN 160
- 9A- Expansion smokes evacuation Kit for 1 unit in pps DN 160  
- Smoke thermostat
- 10- Blind flanges Kit  
- Modulating Pump  
(only for BWA 50: to be ordered eparately for supply completion)

# Cascade mounting

## 90 kW modules - up to 360 kW

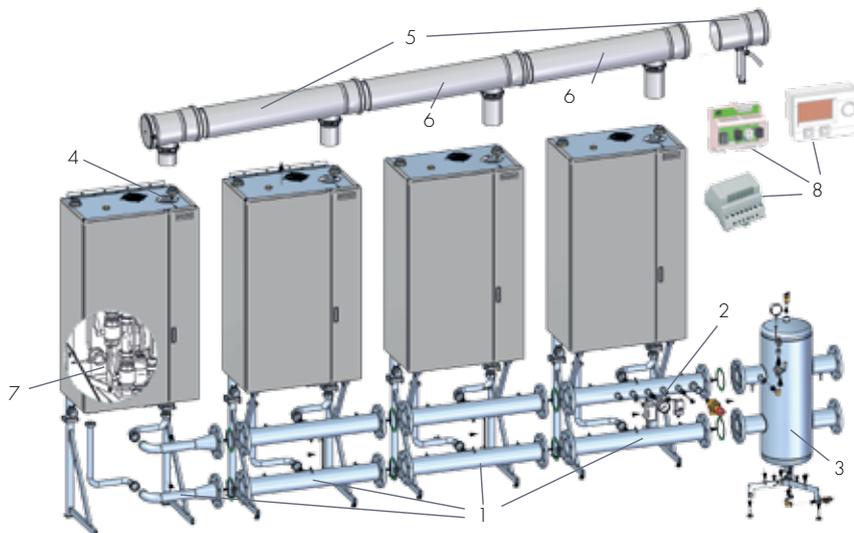


### BATTERY COMPOSITION + PRIMARY CIRCUIT - description of the components as shown in the picture

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1 - BWA 90 "master" - natural gas LPG</li> <li>2 - BWA 90 combined with "master" (except boiler side panels, blind flanges, bolts, top cover for one unit) natural gas - LPG</li> <li>3 - Top cover for 2 units + frame extensions<br/>- Top cover for 3 units + frame extensions<br/>- Top cover for 4 units + frame extensions<br/>- Top cover for 5 units + frame extensions<br/>- Kit for indoor installations for 2 units</li> <li>4 - Header until 180 kW dn 65<br/>- Header until 360 kW dn 100</li> <li>5 - Header connection kit DN 65 on the right<br/>- Header connection kit DN 65 on the left</li> </ul> | <ul style="list-style-type: none"> <li>6 - Y shape filter DN 65<br/>- Y shape filter DN 100</li> <li>7 - Pipes for safety devices kit + hydraulic and gas manifolds</li> <li>8 - Safety devices pipes kit</li> <li>9 - Differential pressure switch kit for each module</li> <li>10 - Outer casing for safety devices complete with support*<br/>- Empty casing kit*<br/>- Safety devices Kit (advisable for indoor)</li> <li>11 - E8 heating controller</li> </ul> |
|--|---|

\* It is recommended to order the outdoor cover kit (provided with a cap for the unused drain) to protect the casing, whether empty or containing the additional safety devices kit (pos. 9). If both cases are installed, a cover for two additional elements is needed.

## 140 kW modules - up to 560kW



- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>1 - Flow and return manifold kit 4 units</li> <li>2 - Additional safety devices kit</li> <li>3 - Mixing header kit 3/4 units</li> <li>4 - Smoke thermostat kit</li> <li>5 - Smoke evacuation for 2 units</li> </ul> | <ul style="list-style-type: none"> <li>6 - Smoke evacuation extension for 3/4 units (BWA 140)</li> <li>7 - Differential pressure switch kit</li> <li>8 - Control manager kit CM A 140 formed by:<br/>-cascade manage PCB<br/>-visualizer/programmer HSCP<br/>-230/24 V adaptor</li> </ul> |
|--|---|

# Features

## Premix Burners

Combustion system with total premix burners equipped with:

- Modulating fan, controlled by the main electronic PCB, determined by the output request sucks the exact quantity of gas to be burnt, thus avoiding waste and giving very low polluting emissions
- “Flat” burner that ensures:
  - long duration thanks to low thermal and mechanical stresses and to unalterable fiber woven
  - ideal heat diffusion for radiation thanks its chemical-physical
  - high combustion silence thanks to low pressures and to anti-resonance casing fan

### CONDENSATION HEAT

Hot smokes generated by combustion, full of water vapour, passing through exchanger, releases heating, cool down and condensing they produce about a liter of water for every m<sup>3</sup> of burned gas. The saved energy, called “condensation heating” or “latent heat recycling” determines an increasing of output and so, seasonal, until 30%.

### SELF-ADAPTATION

The use of the premix burner provides the boiler with the capacity to adjust the output depending on the smoke side resistance, thus resolving any problems connected with the execution of the flue ducts.

### CONTROLS AND COMMANDS

- **Electronic modulation:** The temperature and output regulations, are automatically checked with the aid of modulating thermostats and external temperature sensors.
- **Auto-diagnosis and safety:** The powerful microprocessors on the panel board provide an exceptional level of safety and breakdown prevention, due to the auto-diagnosis in real time.

## Complementary functions

- Sliding temperature mode
- Frost protection mode
- Anti-jamming pump and diverting valve
- Post-circulation anti-overheating
- Chimney sweeper function
- External probe (optional)
- Thermoregulations

## Simplified maintenance

Thermal elements disposition, allows to enter easily at all the components in case of extraordinary maintenance.

In case of ordinary maintenance, it simplifies and abbreviates operation times, both for exchangers cleaning and starting devices and flame control.



## Exchanger/condenser

Constructed with an aluminium/silicon/magnesium alloy. Withstanding the corrosion of acid condensate and to guarantee a high thermal efficiency

- Dense fins on heat exchanger
- Low water content and low thermal inertia
- High speed of exchange
- Absence of overheating phenomena



BWA 50-70  
Al/Si/Mg exchanger/condenser



BWA 90  
Al/Si/Mg exchanger/condenser

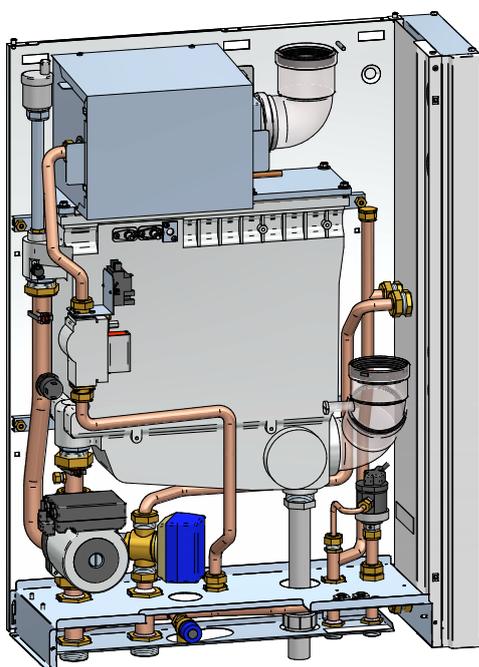
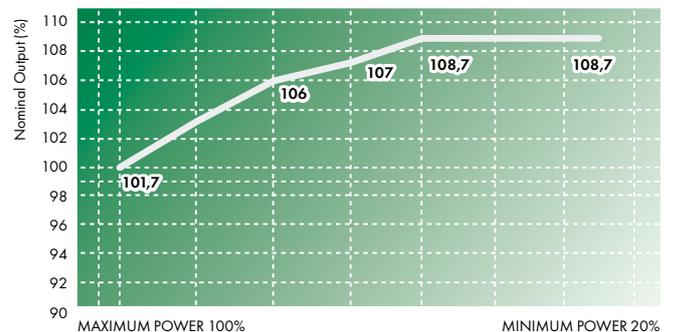
## Power modulation

High modulation ratio power in all Schuster condensational boilers, ensure to the system the terms of maximum output, independently from the supplied value.

The power will be regulate and reduced in proportion to the reduction of the charge without wasting any watt and saving fuel.

Ratio modulation goes up to 1:60.

BWA WATER EFFICIENCY ACCORDING TO THE OUTPUT AND THE INTERVENTION OF THE MODULATING PUMP



## DHW optional kit

For the series 50/70 is foreseen an optional kit for the production of DHW, easily applicable on the R.H. side panel of the boiler, and connecting it to the flow and return through a three way priority valve.

The electrical connection is made on the terminal block predisposed in the panel board.

Constituted by a plate heat exchanger it assures a D.H.W. production of 23.8 l/min in the boiler of 50 kW and 29.5 l/min in the boiler of 70 kW, with a Delta T of 30 K and it has a rewarding factor (R factor) of four taps (according to the Standard EN 13203-1:2006), in a temperature regulation range between 35 and 60°C.



# HSCP Thermoregulation



Panel HSCP

Equipped with a backlit LCD display and a selector knob, it allows:

- an **hourly weekly scheduling** up to a maximum of 12 totally independent heating circuits (optionals) and a hot water accumulator
- an **hourly scheduling** of different kinds of activities
- the **management of the DHW recirculation pump**
- the **anti-legionella function** for both the boiler and the secondary circuits with special accessories.

Management will be through the SHC (Slave Heating Controller) multifunction optional boards, for CH and DHW circuits and auxiliary resources (relays with a timer, solar accumulators and so on) in order to meet the real needs of users, thus justifying performances and budget.

As an alternative, two different communication and remote management standards are available as well:

- **eBUS and Modbus**, intended for the connection to different control devices, in order to get remotely all their operational information, included the complete management of the diagnostic for the visualization and the reset of alarms.

Moreover, on board, there are changeover switches and fuses for the insertion and protection of the 2 thermal elements.

Thanks to the BCM (Burner Control Manager) interface board, it is available a control predisposition with a 0-10 volt signal, to adjust the power supplied from an external source, and connections for:

- an external probe
- a modulating and on/off pump control
- a Modbus port
- an alarm contact

# E8 Thermoregulation

(optional for 50-70-90 kW)



It exploits the maximum power modulation and the maximum reachable condensation, allowing:

- **System optimization:** it assures the comfort temperature bringing forward the system ignition and the flame heating modifications, according to the user's settings and to the burner features.
- **Fast temperature set:** obtained by calculating the optimum ignition start-up time. This calculation can be carried out taking into consideration the outdoor temperature or the room temperature.
- **Overheating protection:** the boiler safety temperature is controlled through the follow-up of heating circulators functioning, in order to get rid of any thermal inertia.
- **Self adaptation:** it processes the data coming from the room probe, therefore, it adapts the generator warmth to the building features, according to the external temperature

## DHW management

- **DHW management:** programmable to get the maximum comfort or the highest savings and the fastest boiler temperature stability, raising the boiler temperature to the maximum set value.
- **Antilegionella:** it removes possible DHW pathogens, raising the boiler temperature to 60°C each 20 heating cycles or at least once a week.
- **Boiler charging pump optimization:** it switches on only if the boiler temperature is 5°C higher than storage tank temperature.

variations and taking into account the building thermal inertia and additional heating gains (solar radiation, internal heating sources).

- **Optimization of DHW (loading pump):** it manages the different heating curves set for the 2 circuits: the setpoint temperature of the boiler is calculated according to temperature of the mixing circuit with the highest flow rate and to the distance between the two curves.
- **Mixing valve opening time** based on the characteristics of the servomotor.
- **Number of burner ignitions**
- **Burner run hours**
- **Antifrost protection:** the room temperature for all the heating circuits is set to 5°C and the DHW preparation temperature is 10°C.
- **Swimming pools heating** predisposition.

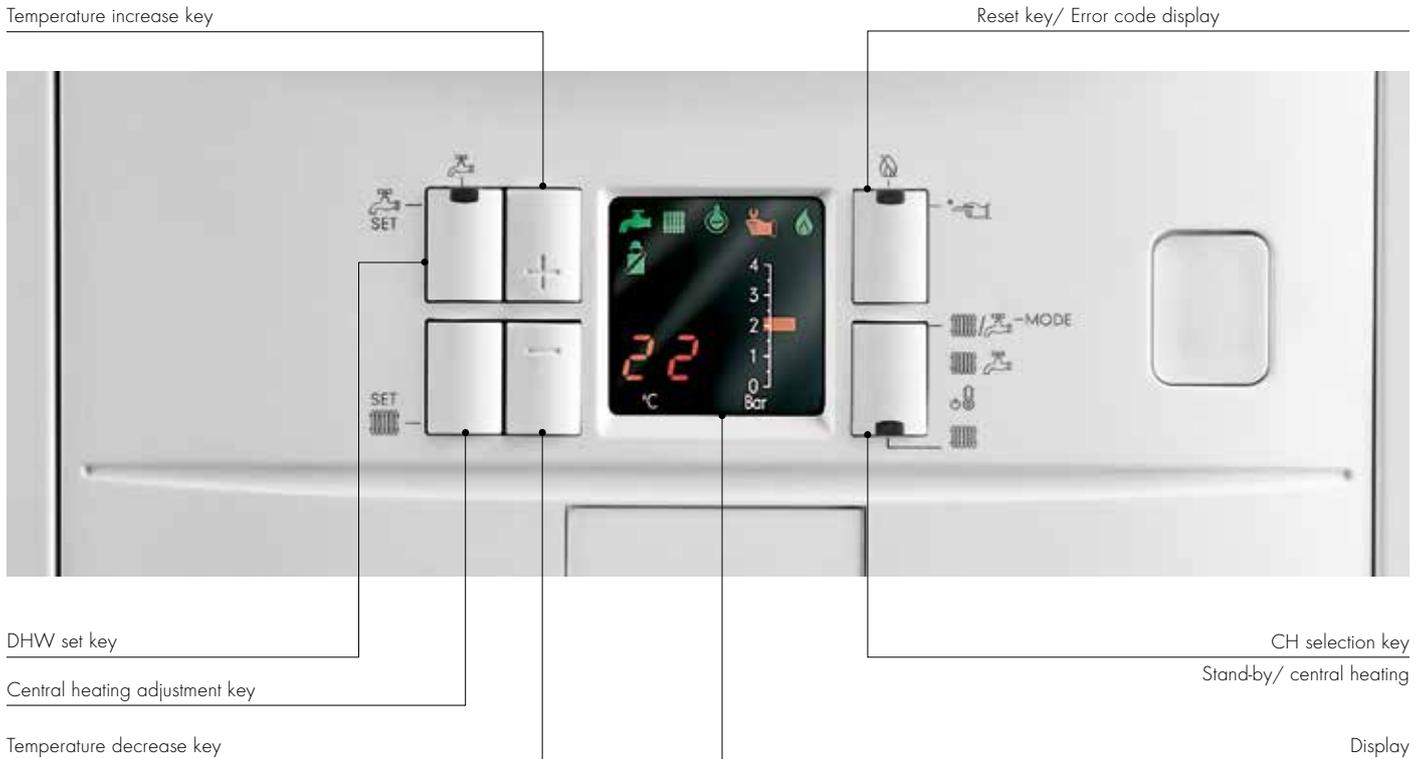
## Programming

- **Daily or weekly programming:** it manages various switching-ons and offs or reductions along the 24h.
- **Control of 2 independent circuits** with different features.

## Renewable energy boilers

- **Possible integration with solar systems and/or biomass boilers.**

# Control panel BWA 50-70-90



The control panel is equipped with an alphanumerical display with 6 pre-selection keys, which enable the user to view the following information:

- Boiler operation
  - boiler status; flow and return temperature
  - error code
- User's parameters
  - working temperature setting
  - on/off central heating
- Service parameters
  - maximum working temperature setting
  - room thermostat (on/off) remote thermoregulation
  - post circulation
  - fan ignition speed
- Data readout
  - global flow and return temperature
  - DHW temperature (if a DHW storage tank is present)

## BCM Panel (optional)

The BCM panel (Burner Cascade Manager) allows:

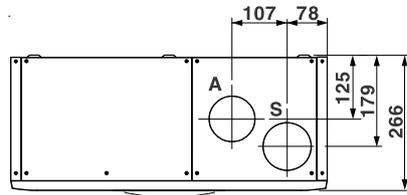
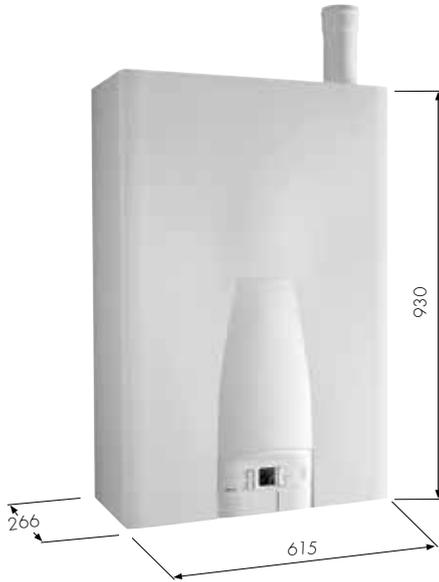
- **control heat reque:** regulates modulation and temperature level
- **supervision** of working status
- **communication with central automation systems** (PLC)
- **warning alarm and boiler unlocking.**
- **emergency operations** in case of E8 thermoregulation failure



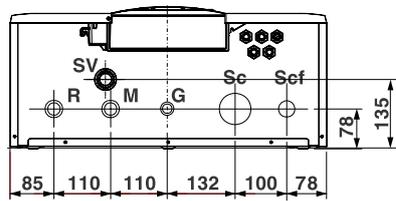
BCM Panel  
(Burner Cascade Manager)

# Dimensions - Technical data

## 50 kW and 70 kW



UPPER VIEW



BOTTOM VIEW

Key:

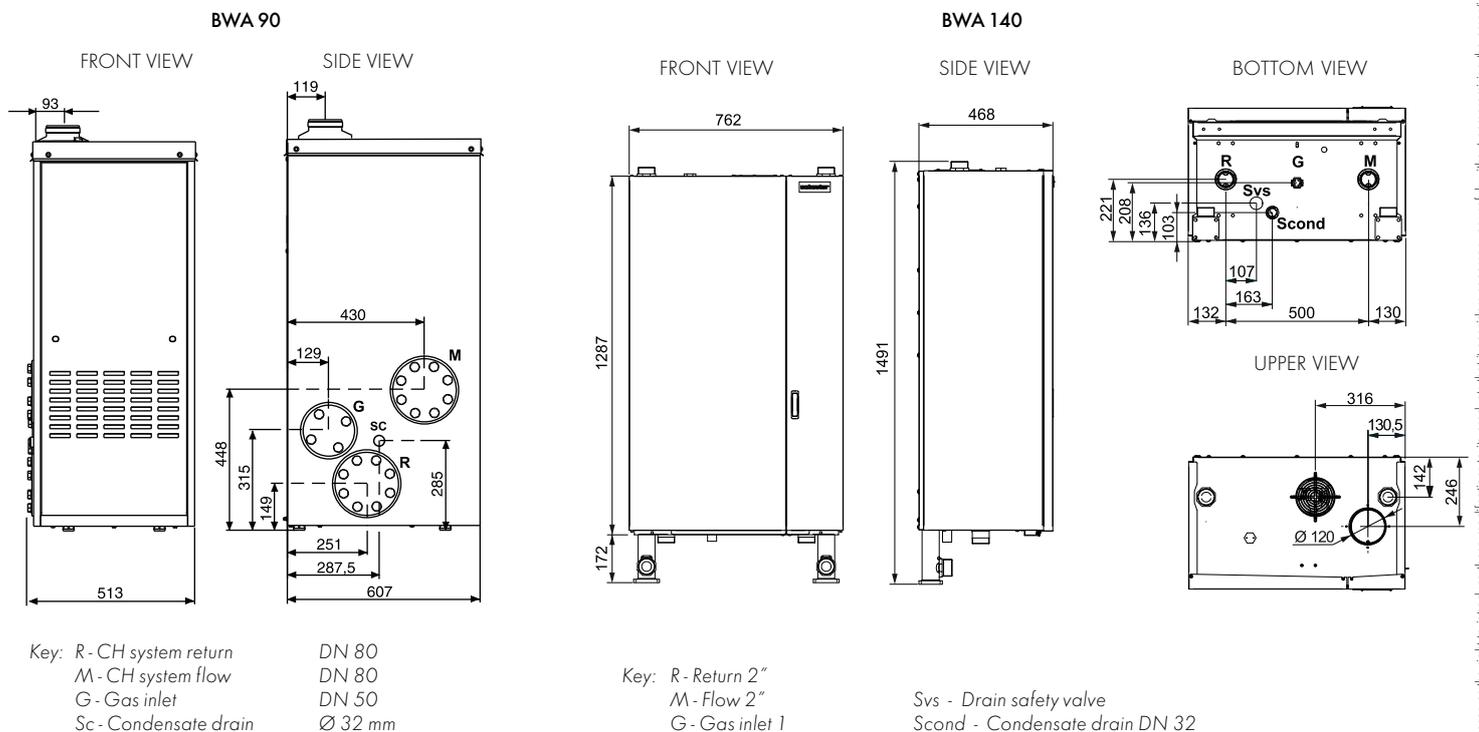
- R - Heating system return
- M - Heating system flow
- G - Gas inlet
- Sc - Condensate siphon drain outlet (aluminium body)
- Scf - Condensate evacuation (coming from evacuation smoke pipe)

MODEL		BWA 50	BWA 70
Output			
NOMINAL/MINIMUM OUTPUT IN CONDENSING MODE	kW	49,3 / 10,3	68,5 / 10,3
NOMINAL/MINIMUM OUTPUT IN CONVENTIONAL MODE	kW	47,2 / 9,1	65,5 / 9,1
NOMINAL/MINIMUM INPUT	kW	48,5 / 9,6	67,5 / 9,6
Efficiency			
EFFICIENCY CLASS (Directive CEE 92/42)		★★★★	★★★★
WATER EFFICIENCY at full load	%	97,3	97,3
WATER EFFICIENCY at part load	%	94,9	94,9
WATER EFFICIENCY at nominal load in CONDENSING MODE	%	101,6	101,5
WATER EFFICIENCY at part load in CONDENSING MODE	%	104,3	104,3
WATER EFFICIENCY at the min. modulating output (9,1 kW) IN CONDENSING MODE	%	107,3	107,3
COMBUSTION EFFICIENCY at nominal load / part load	%	97,8 / 98,4	97,4 / 98,4
STAND-BY LOSSES (min-max)	%	0,2 / 0,51	0,2 / 0,12
Combustion			
CO <sub>2</sub> (min/max input)	%	9,0/9,2	9,5/9,5
CO AT 0% OF O <sub>2</sub> (min)	mg/kWh	19,7	19,7
NO <sub>x</sub> (value according to EN 297/A3 and EN 483)	mg/kWh	33,9	34,68
CONDENSATE PRODUCTION max	kg/h	7,8	10,87
NO <sub>x</sub> CLASS		5	5
APPLIANCE'S FAMILY GAS CATEGORY		II2H3P	II2H3P
Central Heating			
MIN/MAX OPERATING TEMP. in CH mode	°C	30 / 85	30 / 85
MIN/MAX PRESSURE in CH circuit	bar	0,5-6	0,5-6
MIN. WATER FLOW RATE in CH circuit (Δt 20 K)	l/min	6,65	9,45
Weight			
NET WEIGHT	kg	50	50
Electrical supply			
MAXIMUM ABSORBED POWER * (with modulating pump)	W	172	290
ELECTRICAL SUPPLY / POWER CONSUMPTION	V/Hz	230 / 50	230 / 50
ELECTRICAL PROTECTION	IP	X4D	X4D

Supplied as a standard: wall mounting bracket - condensate drain siphon - PP smoke outlet pipe Ø 80 mm - wall-mounting dowels. BWA 50 kW is supplied without pump. Pump as a standard for 70 kW version.

# Dimensions - Technical data

## 90 kW and 140 kW



MODEL		BWA 90	BWA 140
Output			
MIN/MAX NOMINAL OUTPUT IN CONDENSING MODE	kW	93,6 ÷ 24	136 / 11,5
MIN/MAX NOMINAL OUTPUT IN CONVENTIONAL MODE	kW	87,5 ÷ 21,1	131,6 / 10,5
MIN/MAX HEAT INPUT	kW	90 ÷ 22	135 / 11
Efficiency			
EFFICIENCY CLASS (Directive CEE 92/42)		★★★★	★★★★
WATER EFFICIENCY AT NOMINAL LOAD in CONDENSING MODE	%	104,0	100,5
WATER EFFICIENCY AT PART LOAD in CONDENSING MODE	%	109,1	104,3
WATER EFFICIENCY AT NOMINAL LOAD in CONVENTIONAL MODE	%	97,26	97,5
WATER EFFICIENCY AT PART LOAD in CONVENTIONAL MODE	%	96,03	95,1
COMBUSTION EFFICIENCY AT NOMINAL LOAD / PART LOAD	%	98,1 / 98,3	97,5 / 98,3
STAND-BY LOSSES (min-max)	%	0,90	0,02
Combustion			
CO <sub>2</sub>	%	8,8 - 9,1	9-9,1
CO AT 0% OF O <sub>2</sub>	mg/kWh	21,5 - 104,4	49/139
NO <sub>x</sub> (VALUE ACCORDING TO EN 483)	mg/kWh	35,62	68
MAX CONDENSATE PRODUCTION	kg/h	14,54	21,8
NO <sub>x</sub> Class		5	5
APPLIANCE'S GAS CATEGORY		I12H3P	I12H3P
Central Heating			
MIN/MAX OPERATING TEMP. in CH mode	°C	30 / 85	25 / 85
MIN/MAX PRESSURE in CH circuit	bar	0,5 - 8	0,5 - 6
MIN. WATER FLOW RATE in CH circuit ΔT 20 K	l/min	15,1	28,3
Electrical Supply			
MAXIMUM ABSORBED POWER	W	303	560
ELECTRICAL SUPPLY / VOLTAGE / FREQUENCY	V/Hz	230 / 50	230 / 50
ELECTRICAL PROTECTION	IP	X5D	X4D
Weight			
NET WEIGHT	kg	135	150

**schuster®**