


BWAf 100-115

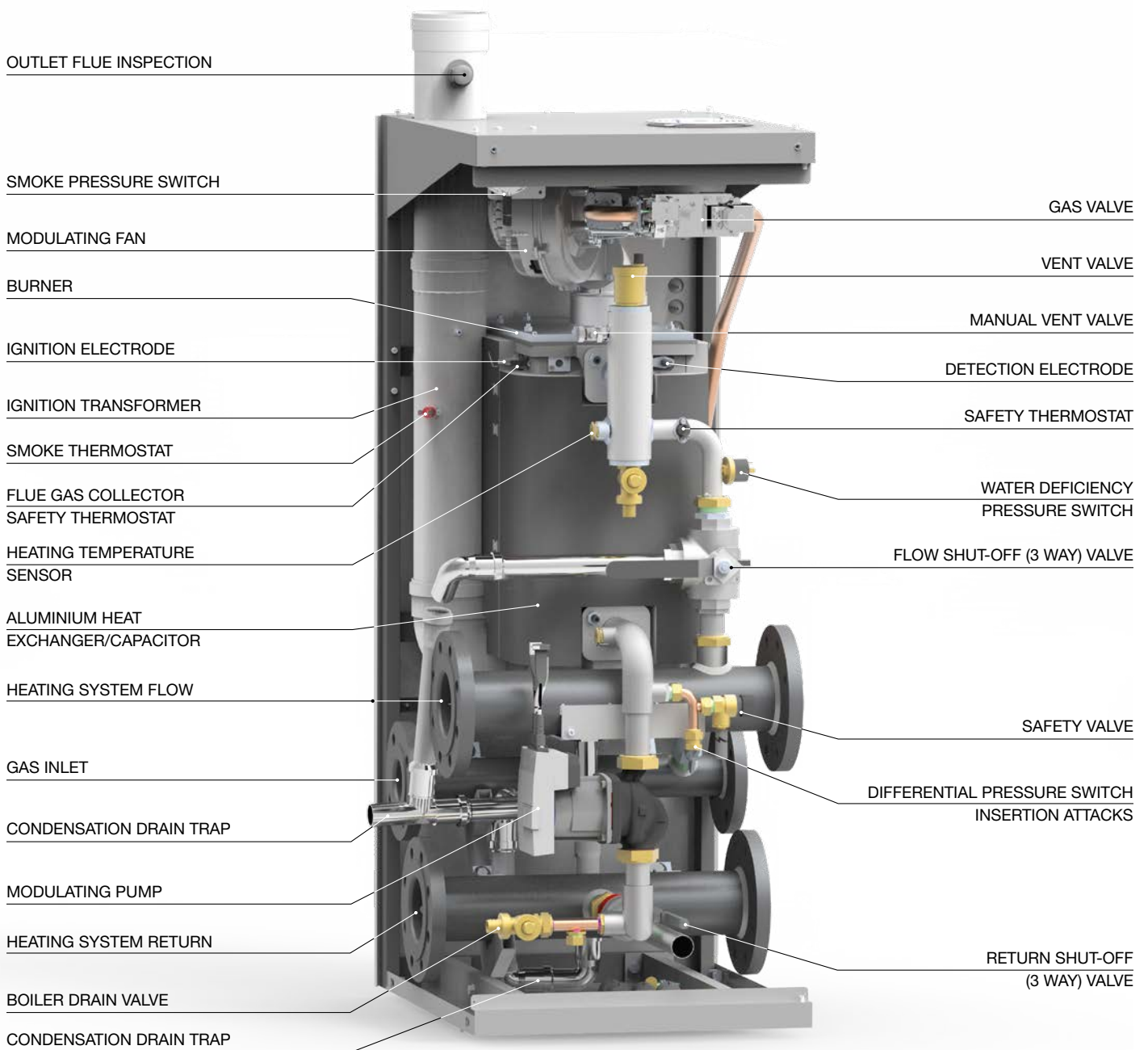


**FLOOR STANDING, MODULATING CONDENSING BOILER
WITH LOW NO_x PREMIX BURNER - FOR INDOOR & OUTDOOR INSTALLATION**

OUTPUT RANGE	from 99.5 to 920 kW in battery (115 kW x 8)	
EMISSIONS	Class 6 NO _x	
SUPPLY	Natural Gas or LPG	
MODELS	BWAf 100	BWAf 115
SEASONAL EFFICIENCY	 A	

Heat exchanger in Al/Si/Mg alloy – floor standing installation – IPX5D (for Outdoor installation)
Battery (up to batteries of 4 boilers each)
 can be combined both with **MIXING HEADER** and with **PLATE HEAT EXCHANGERS**

MAIN COMPONENTS



DESCRIPTION

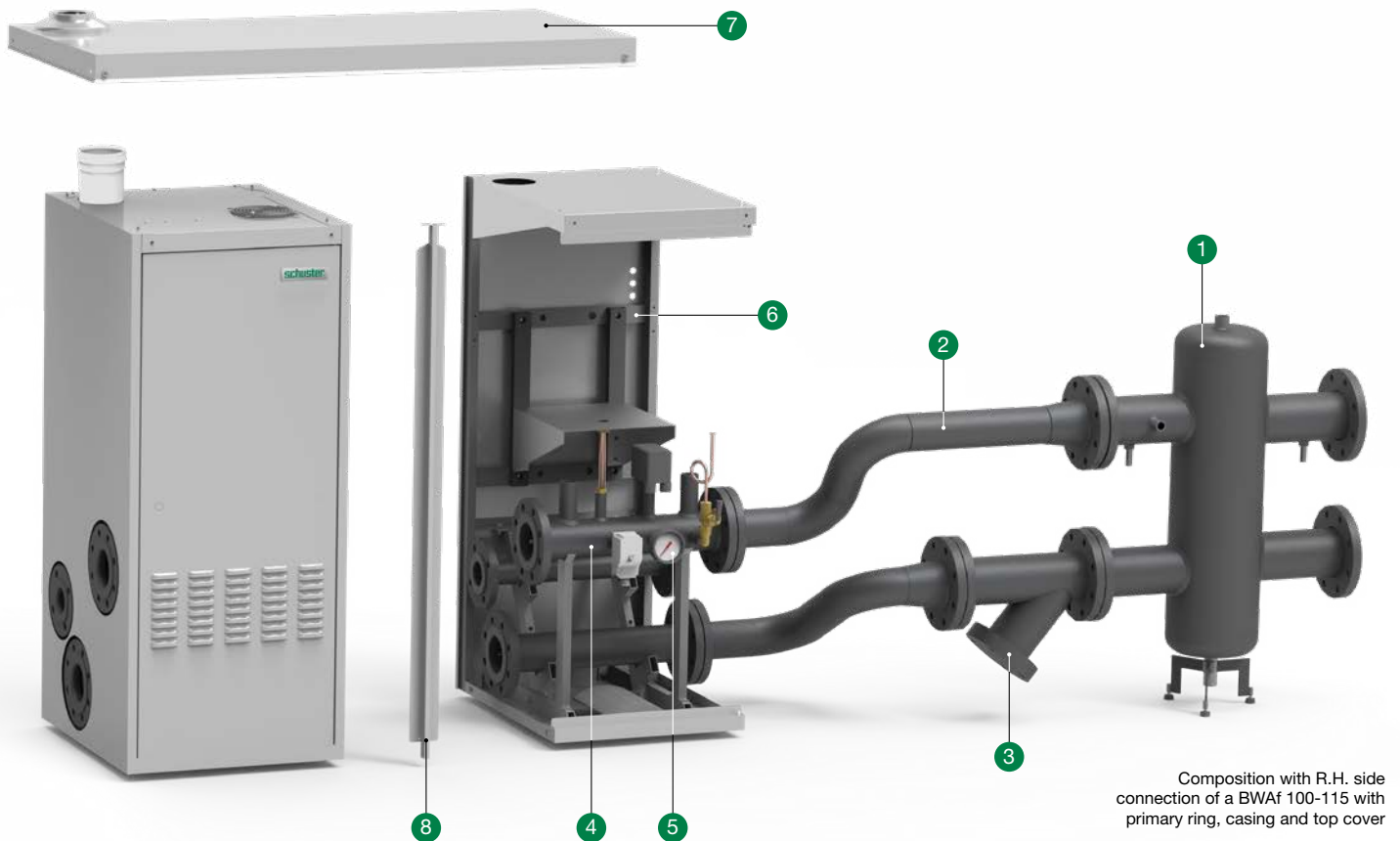
The BWAf is a low water content (ca. 9 litres) gas boiler, with integral totally premix burner, FOR HEATING ONLY.

PECULIAR FEATURES:

- 1) High integration modular structure
- 2) Specially for Outdoor installation (Protection degree IPX5D)
- 3) Predisposition for quick installation "Plug & Play", also in cascade up to 8 units
- 4) Modulating pump controlled by the on board electronics for the maximum efficiency in condensing mode
- 5) Optional controller for the management of each individual unit or the complete cascade and of the thermal charges (possible from remote)
- 6) High modulation ratio for each individual unit (up to 1:5.75)
- 7) Control panel on board of each unit, with display and diagnostics
- 8) Smoke evacuation: elbow in polypropylene PPP and terminal in stainless steel.

Each unit develops an Output of 100/115 kW and belongs to the category II2H/3P, then can operated with Natural Gas or LPG.

COMPONENTS FOR THE CONNECTION TO THE C.H. SYSTEM (optional)



1 - MIXING HEADER Ø 220 mm FOR C.H. SYSTEM UP 350 kW, DN 100

2 - RH SIDE CONNECTION KIT FOR MIXING HEADER DN 100

3 - Y SHAPED FILTER DN 100

4 - ADDITIONAL SAFETY DEVICES MANIFOLD + GAS, FLOW AND RETURN MANIFOLDS

5 - ADDITIONAL SAFETY KIT

made of: - ½" 3 way valve - N. 2 bulb holders ½" for calibration purposes - Thermometer Ø 100 mm with bulb holder
Safety pressure switch 5 bar - Thermostat 100°C - Shock absorber for manometer.
Note: Some of the additional devices aren't supplied because their setting depends on the C.H. system features.

6 - KIT OF OUTDOOR CASING COMPLETE WITH SUPPORTS FOR SAFETY DEVICES *

- KIT OF EMPTY CASING* (to be used as container for accessories)

- KIT OF SUPPORTS FOR SAFETY DEVICES (suggested for indoor installation)

8 - UNION KIT FOR INDOOR INSTALLATIONS for 2 elements

- FLOW SWITCH KIT

(*) In case the kit of outdoor casing, complete with supports for safety devices, or the kit of empty casing is installed (pos. 6), ask also for the top cover (equipped with the closing cap on the not used evacuation hole), considering an additional element. If both, the a.m. kits are installed, ask for a top cover two elements longer. (E.g.: for N.1 BWAf 115 + Kit of outdoor casing complete with supports for safety devices + Kit of empty casing, ask for a top cover for 3 elements)

PRODUCT PLUS VALUES

- **HIGHT EFFICENCY CLASS**
- **CLASS 6 Low NO_x (UNI EN 15502-1)**
thanks to the pre-mix burner with gas-air ratio control
which offers a constant CO₂
- **CERTIFICATION IN OUTPUT RANGE**
- **EXCHANGER / BOILER BODY**
aluminium (Al/Si/Mg)
- **CONTAINED DIMENSIONS**
Height 130 cm, Width 51 cm, Depth 60 cm
- **PREMIX COMBUSTION GROUP WORKING AT
CONSTANT CO₂**
- **MICROPROCESSOR BOARD**
of boiler control
- **THERMOREGULATION Ufly P (optional)**
- **KIT GATEWAY P (optional)**
for Ufly P remote connection
- **BATTERY** formation for a bank
of up to 4 boilers (2x)
- **MODULATING PUMP (std supplied)**
for the maximum condensate production
- **ELEVATED MODULATING RATIO: 1:5.75**
- **PANEL BOARD CAN BE OPEN**
for an easy servicing
- **EASY TO INSTALL**
compact and simple connections
- **CERTIFICATION OF THE ADDITIONAL
SAFETY DEVICES**
- **IPX5D PROTECTION GRADE**
for outdoor installation
- **PLATE HEAT EXCHANGERS**
available on request
up to batteries of 8 modules



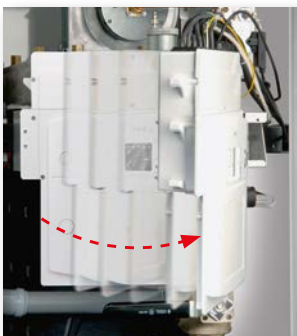
Pre-mixed combustion system with constant CO₂ emission
(modulating gas valve, modulating fan and stainless steel burner)



Heat module complete with primary ring, composed of additional
safety devices kit and mixing header



Thermoregulation Ufly P (optional) for complex heating plants and
battery applications



The control panel can be opened
to facilitate maintenance



Gateway P for Ufly P remote
connection

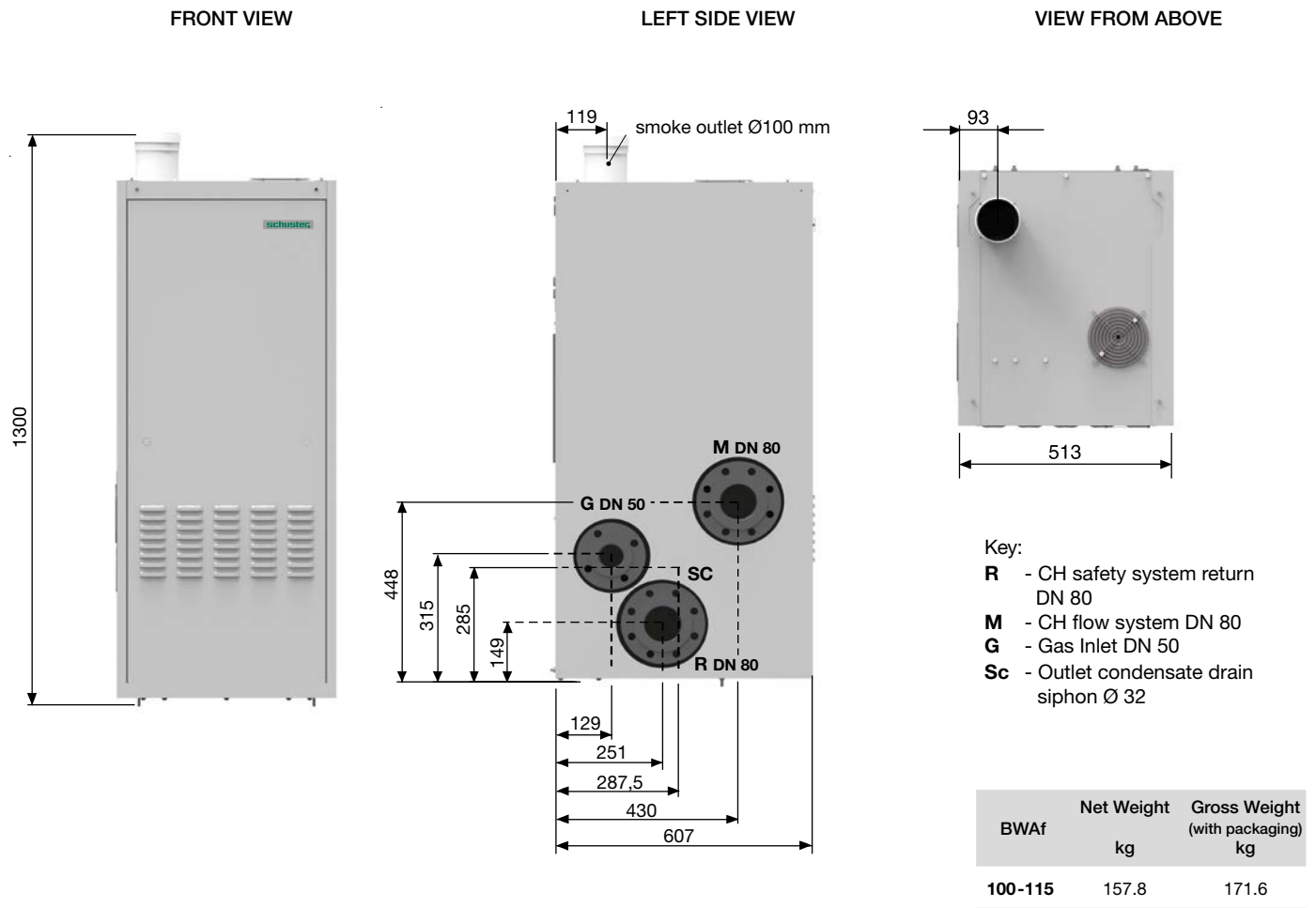


Aluminium (AlSiMg) heat
exchanger/condenser (a detail of
the combustion chamber)



Modulating pump for maximum
condensate production

DIMENSIONS OF SINGLE BOILER



BWaf IN BATTERY



CONTROL PANEL (std. supplied)

The panel board equipping the boiler allows the management of an heating circuit with fixed set-point



- +/- Increase/decrease key
- B** Central Heating adjustment key
- C** Domestic hot water adjustment key
- D** Reset /chimney-sweeper key
- E** Information display
- F** Led/Simbol Heating function active
- G** Led/Simbol Domestic hot water function active
- I** Block symbol
- L** Burner in operation symbol
- M** Fault symbol
- N** Temperature or fault code indication
- O** Power On indicator led
- P** Activation sweeper mode
- Q** Power supply
- S** Function key: Stand-by / Heating / Domestic hot water + Heating / Antifreeze protection

SHC - MULTI-FUNCTION MODULE - HEATING CIRCUITS MANAGEMENT (optional)

The board is designed as a multi-function support for heating systems. It should be considered part of a modular system joined by an **eBUS** or **Modbus** communication system.

It is possible to control up to a maximum of 4 SHC printed circuit boards.

Its input and output resources make it suitable for a variety of applications:

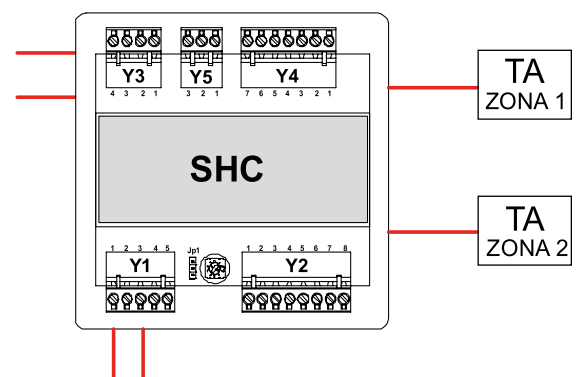
1. Direct or mixed heating circuits
2. Domestic hot water with storage tank.
3. Domestic hot water with plate heat exchanger.
4. Domestic hot water with plate heat exchanger and mixing valve
5. Solar collector with tank.

The multi-function module interacts with the system like a user, whose demands must be met by a manager controller Ufly P, which is responsible for the running of the heat generator.

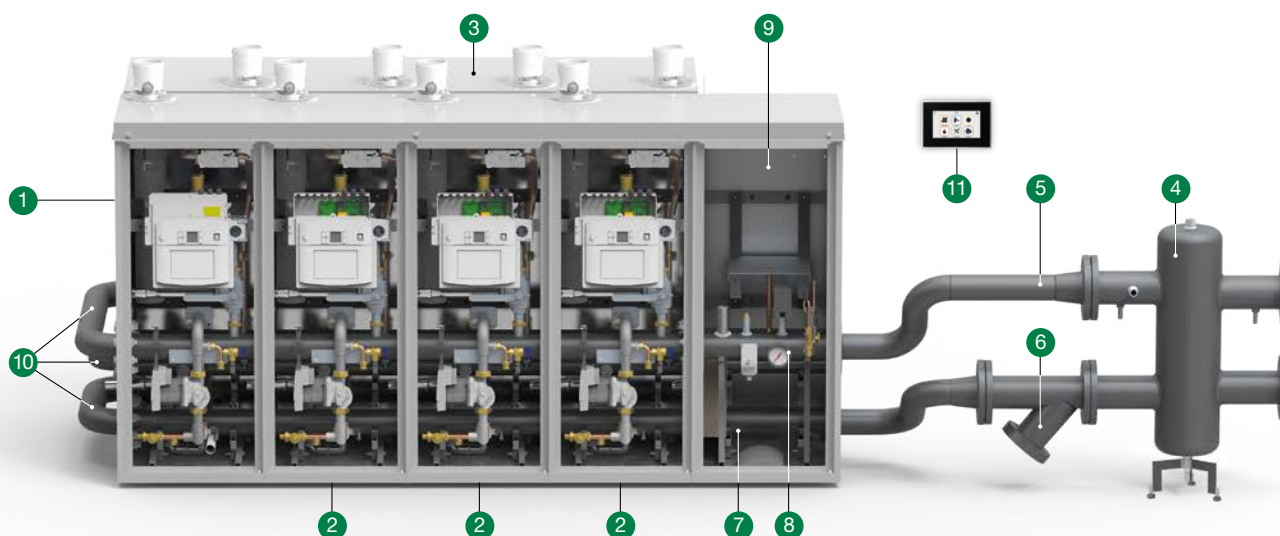
The multi-function module kit consists of:

- SHC panel
- NTC temperature sensor (3 pcs.)
- Technical assembly instructions

For further information consult the site www.schusterboilers.com in the section Accessories of the product.







BATTERY COMPOSITION + PRIMARY RING



COMPOSITION WITH R.H. SIDE CONNECTION	Nr of BWaf UNITS IN BATTERY							
	2	3	4	5	6	7	8	
1 - BWaf 115 "MASTER"	1	1	1	2	2	2	2	
2 - BWaf 100-115 in combination with "MASTER" Does not include : Side panels – Black flanges with bolts and nuts – Casing cover of one unit	1	2	3	3	4	5	6	
3 - Top casing for 1 units + battery coupling longitudinal member * - ASS.Y KIT FOR INDOOR INSTALLATIONS for 2 units	1	2	3	3	4	5	6	
4 - MIXING HEADER UP TO 350 kW DN 100 ø220 - MIXING HEADER UP 360 kW DN 100 ø320	1	1	1					
5 - R.H. SIDE CONNECTION KIT FOR MIXING HEADER DN 100	1	1	1	1	1	1	1	
6 - Y SHAPE FILTER DN 100	1	1	1	1	1	1	1	
7 - ADDITIONAL SAFETY DEVICES KIT + HYDRAULIC AND GAS MANIFOLDS	1	1	1	1	1	1	1	
8 - PROTECTION AND CONTROL KIT for hydraulic manifold for additional safety devices	1	1	1	1	1	1	1	
9 - OUTDOOR CASING KIT, complete with supports for additional safety devices (*) (9a+9b) - EMPTY CASING KIT * (it can be used as container for accessories) - KIT OF SUPPORTS for ADDITIONAL SAFETY DEVICES (suggested for indoor installation)	1	1	1	1	1	1	1	
10 - KIT OF MANIFOLDS FOR WATER & GAS				1	1	1	1	
11 - REGULATION ACCESSORIES - KIT FLOWSWITCH	1	1	1	1	1	1	1	
	2	3	4	5	6	7	8	

(*) If the external casing kit, complete with additional safety devices supports (pos.9) or the empty casing kit, is installed, order an additional cover.
For each ordered empty casing kit it is necessary to order an additional cover for outdoor installations for 1 element.

ACCESSORIES FOR SMOKE EVACUATION IN BATTERY in PPS (optional)

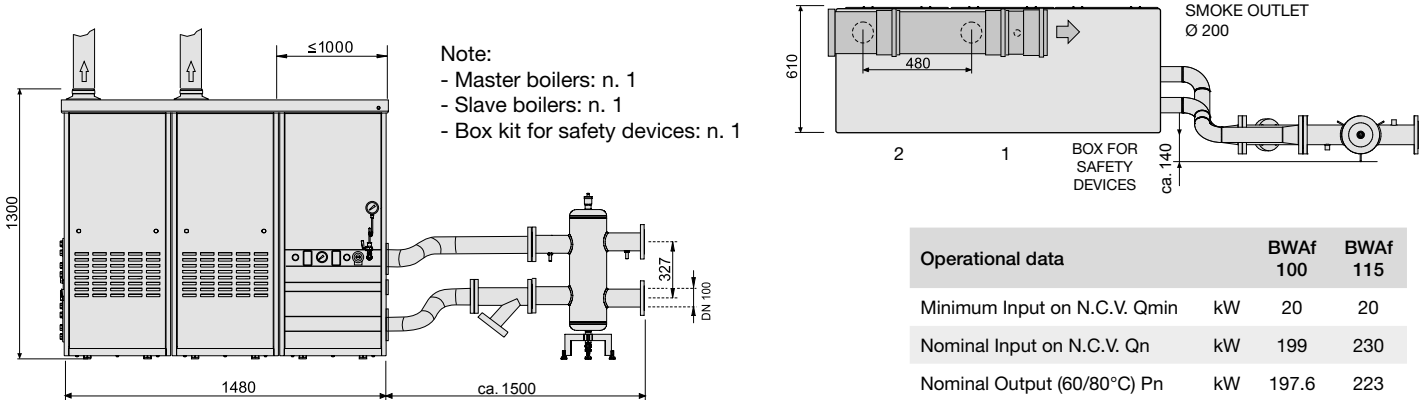
- SMOKE EVACUATION EXPANSION KIT		1	2	3	3	4	5	6
- SIPHON		1	1	1	2	2	2	2
- SINGLE SMOKE MANIFOLD		1	1	1	2	2	2	2
- SMOKE DUCT EXTENSION Ø200					3	2	1	

NOTE: 2 smoke exhaust ducts are foreseen which flow together with 2 separate couplings into a single flue; if you want to connect the 2 smoke ducts together with a special union manifold (not provided), you must have them calculated by a thermal engineer. For information, consult the "battery assembly instructions" document on the website www.schusterboilers.com

The combination with PLATE HEATEXCHANGERS is available - In case of combinations with PLATE HEATEXCHANGERS do not supply parts 4 - 5 - 6

DIMENSIONS BWaf 100-115 IN BATTERY (n.2 boilers)

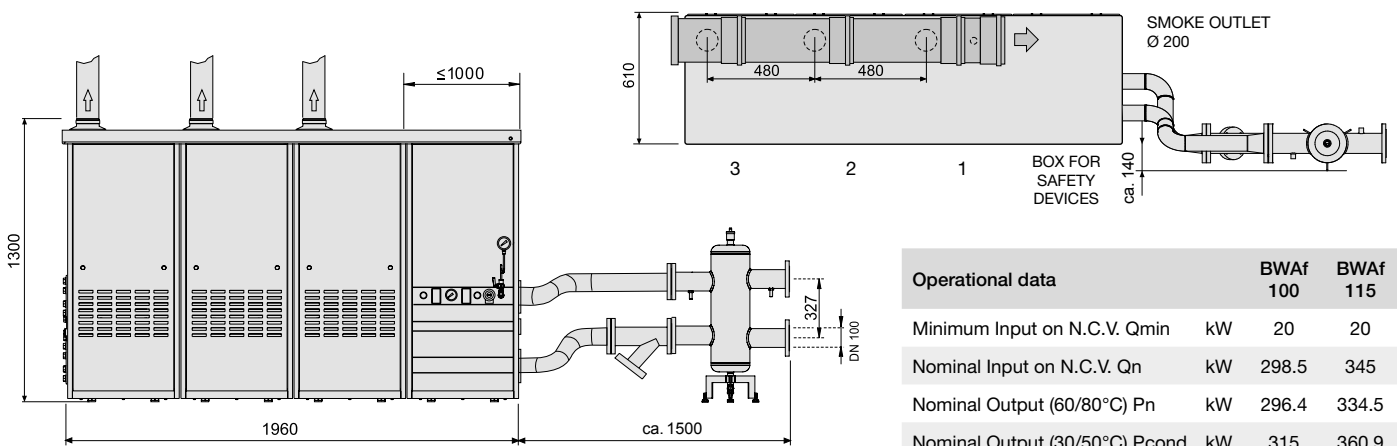
BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



Operational data		BWaf 100	BWaf 115
Minimum Input on N.C.V. Q _{min}	kW	20	20
Nominal Input on N.C.V. Q _n	kW	199	230
Nominal Output (60/80°C) P _n	kW	197.6	223
Nominal Output (30/50°C) P _{cond}	kW	210	240.6

DIMENSIONS BWaf 100-115 IN BATTERY (n.3 boilers)

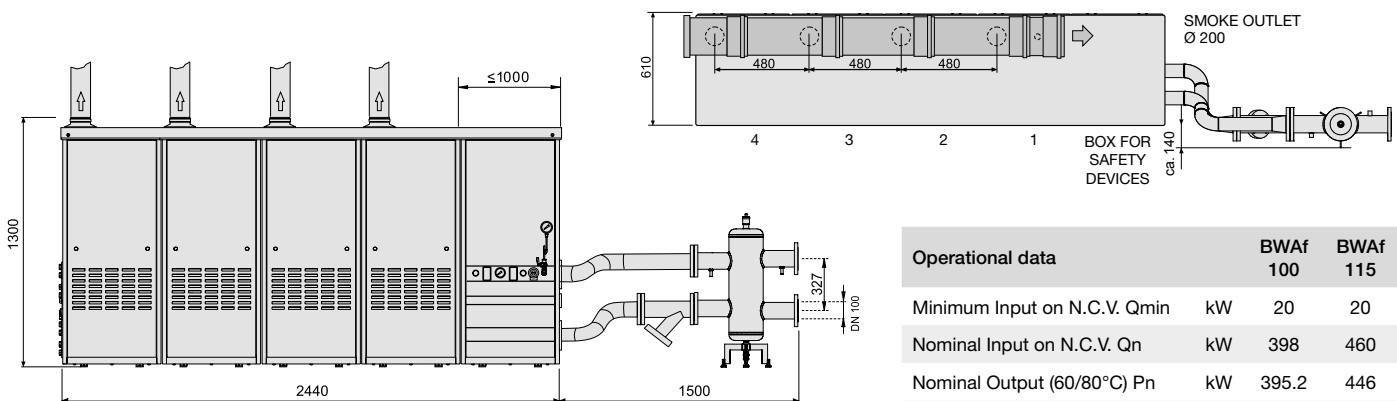
BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



Operational data		BWaf 100	BWaf 115
Minimum Input on N.C.V. Q _{min}	kW	20	20
Nominal Input on N.C.V. Q _n	kW	298.5	345
Nominal Output (60/80°C) P _n	kW	296.4	334.5
Nominal Output (30/50°C) P _{cond}	kW	315	360.9

DIMENSIONS BWaf 100-115 IN BATTERY (n.4 boilers)

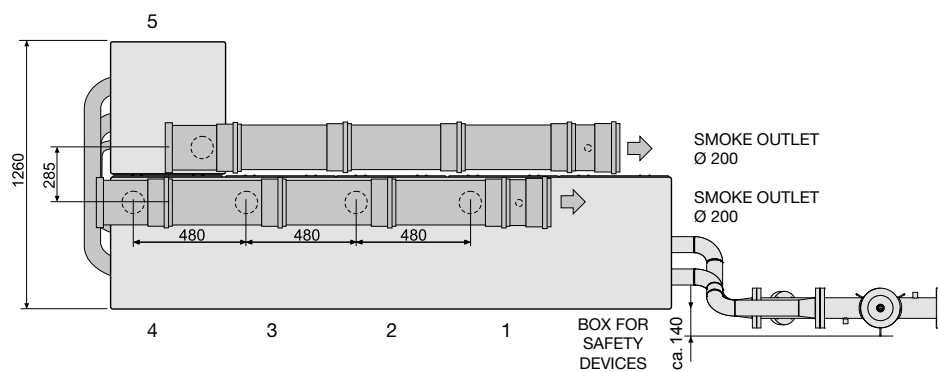
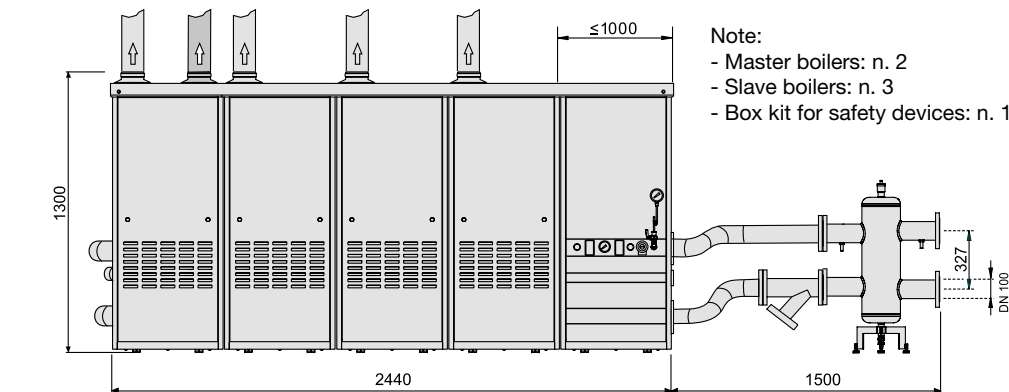
BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



Operational data		BWaf 100	BWaf 115
Minimum Input on N.C.V. Q _{min}	kW	20	20
Nominal Input on N.C.V. Q _n	kW	398	460
Nominal Output (60/80°C) P _n	kW	395.2	446
Nominal Output (30/50°C) P _{cond}	kW	420	481.2

DIMENSIONS BWaf 100-115 IN BATTERY (n.5 boilers 4+1 ON THE OPPOSITE SIDE)

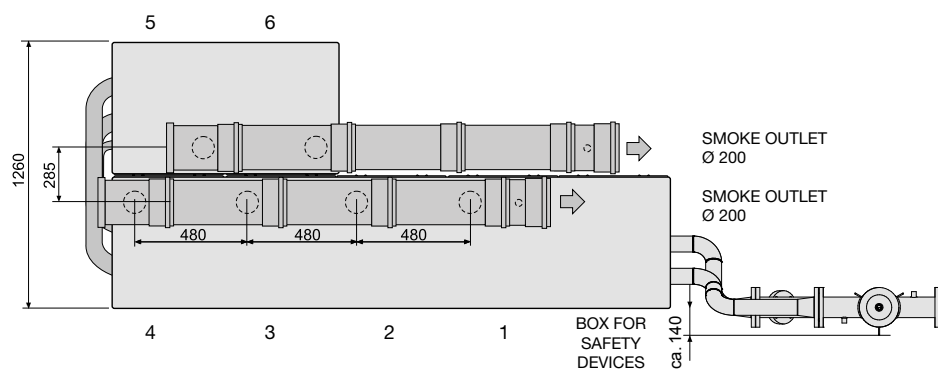
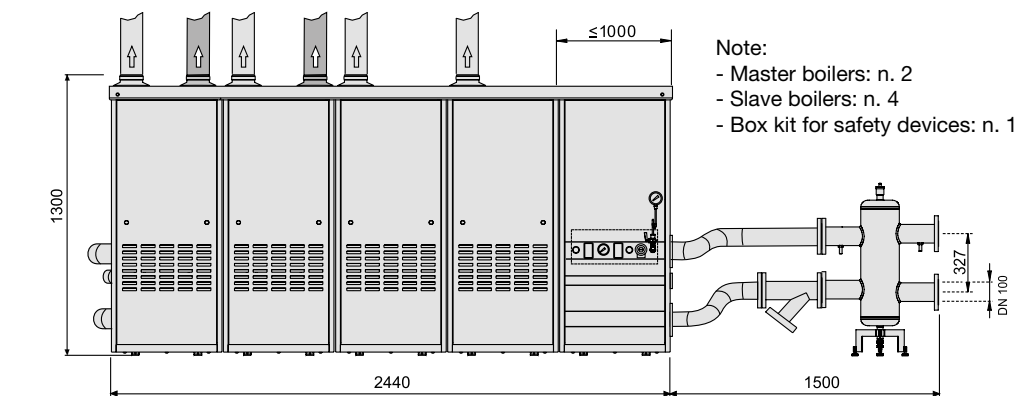
BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



Operational data		BWaf 100	BWaf 115
Minimum Input on N.C.V. Q _{min}	kW	20	20
Nominal Input on N.C.V. Q _n	kW	497.5	575
Nominal Output (60/80°C) P _n	kW	494	557.5
Nominal Output (30/50°C) P _{cond}	kW	525	601.5

DIMENSIONS BWaf 100-115 IN BATTERY (n.6 boilers 4+2 ON THE OPPOSITE SIDE)

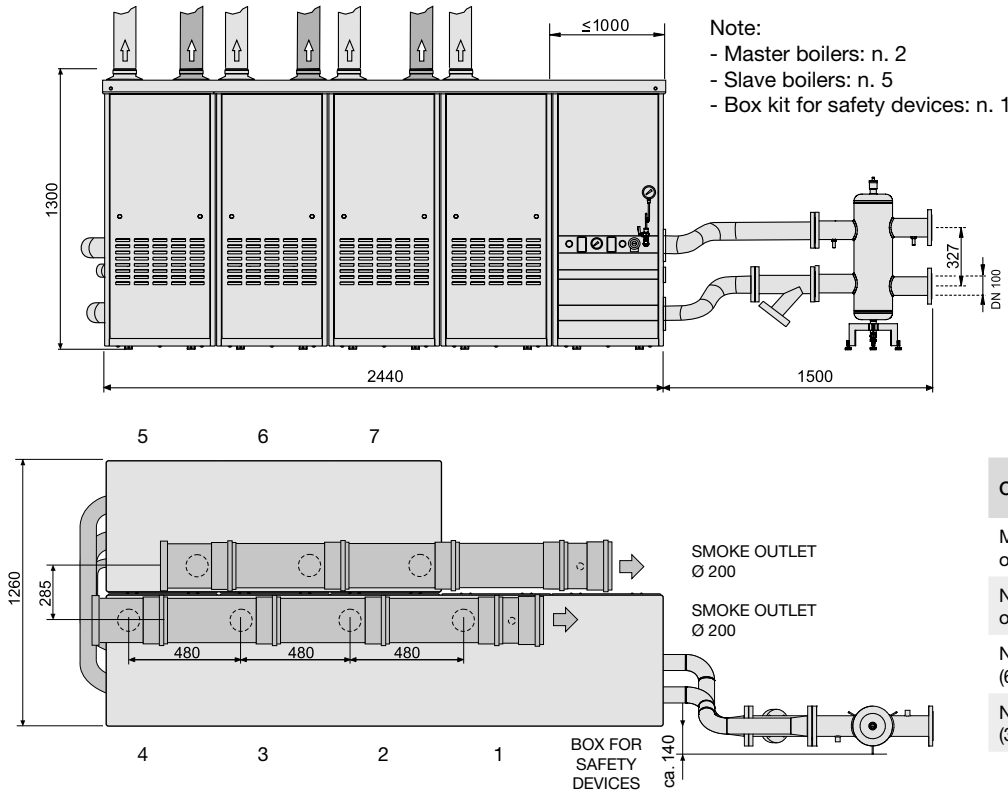
BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



Operational data		BWaf 100	BWaf 115
Minimum Input on N.C.V. Q _{min}	kW	20	20
Nominal Input on N.C.V. Q _n	kW	597	690
Nominal Output (60/80°C) P _n	kW	592.8	669
Nominal Output (30/50°C) P _{cond}	kW	630	721.8

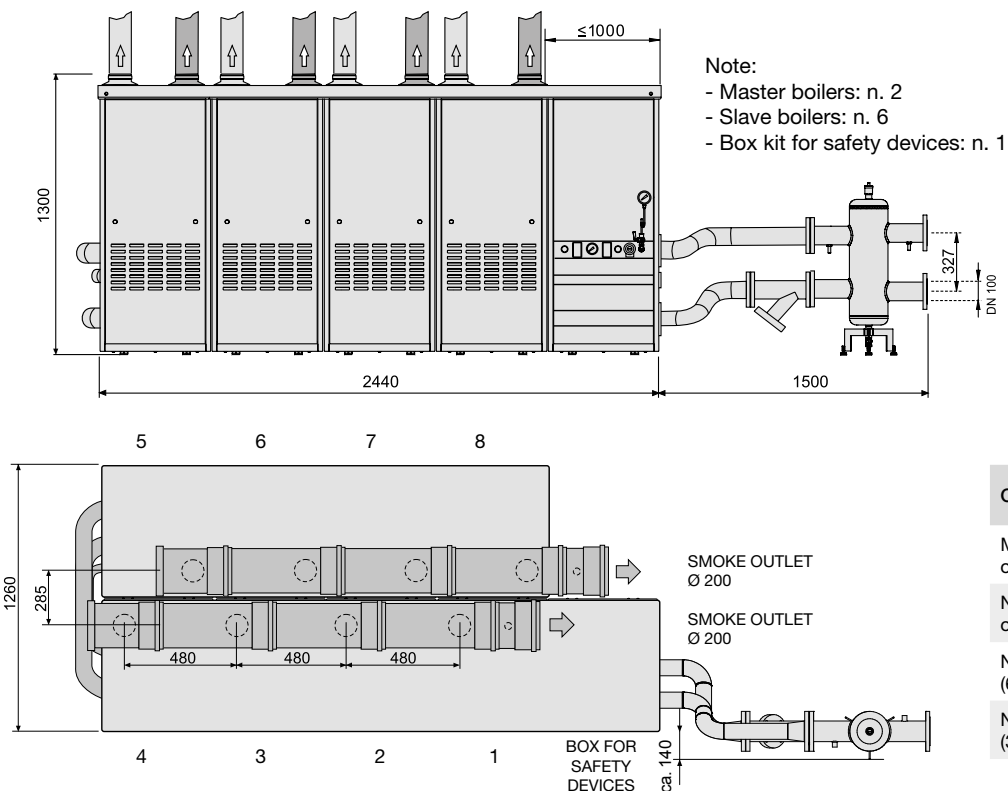
DIMENSIONS BWaf 100-115 IN BATTERY (n.7 boilers 4+3 ON THE OPPOSITE SIDE)

BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



DIMENSIONS BWaf 100-115 IN BATTERY (n.8 boilers 4+4 ON THE OPPOSITE SIDE)

BATTERY + KIT SAFETY DEVICES + HYDRAULIC HEADER + Y FILTER KIT



MATCHING PLATE EXCHANGERS

DIMENSIONS SERIES E 50W

FRONT VIEW

SIDE VIEW

CONNECTIONS

VIEW FROM BELOW

Plates	H	I	L	M
11	400	39	350	441
21	400	74	350	441
27	400	95	350	441
45	400	158	350	441

Connection	D	E	F	G
DN50 - 2"	125	M16	54	99

DIMENSIONS SERIES E 100W

FRONT VIEW

SIDE VIEW

CONNECTIONS

VIEW FROM BELOW

Plates	H	I	L	M	N
55	900	245	750	1110	905
63	900	281	750	1110	905
77	900	343	750	1110	905
87	900	388	750	1110	905

Connection	D	E	F
DN100 - 4"	180	M16	60

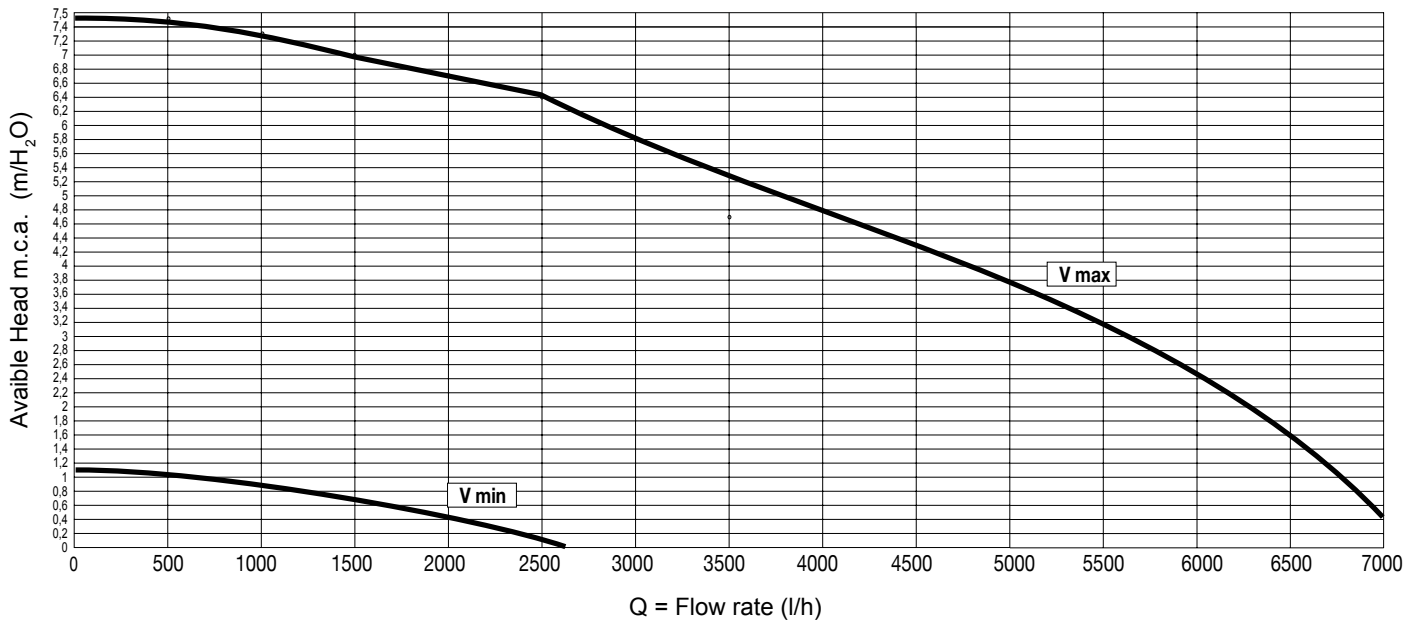
Number of boilers	Model	Number of plates	Pn kW	Δp (m H ₂ O) ^(*) primary / secondary	T. op. °C	Pmax bar	Volume H ₂ O primary / secondary	Connections primary / secondary	Weight kg
1	E50W-21Y	21	115	1,0 / 2,3	-10 / +110	10	4 / 4	DN50 / DN50	144
2	E50W-45X	45	230	2,0 / 4,4	-10 / +110	10	9 / 9	DN50 / DN50	165
3	E50W-45X	45	345	2,0 / 4,4	-10 / +110	10	9 / 9	DN50 / DN50	165
4	E100W-55H	55	460	0,8 / 1,8	-10 / +110	10	27 / 27	DN100 / DN100	367
5	E100W-55H	55	575	1,2 / 2,8	-10 / +110	10	27 / 27	DN100 / DN100	367
6	E100W-77H	77	690	0,9 / 2,2	-10 / +110	10	38 / 38	DN100 / DN100	400
7	E100W-77H	77	805	1,3 / 3,0	-10 / +110	10	38 / 38	DN100 / DN100	400
8	E100W-87H	87	920	0,9 / 2,0	-10 / +110	10	43 / 43	DN100 / DN100	415

(*) Δp alla Pn Primary circuit 80°C - 65°C Secondary circuit 60°C - 70°C

PROTECTIVE BOX FOR OUTDOORS

Number of boilers	Nominal Heat Input kW	Hydraulic connection \varnothing	Model
1÷3	115÷345	DN50	E50-LC550
4÷8	460÷920	DN100	E100-LC900

DIAGRAM OF FLOW RATE/PRESSURE AVAILABLE FOR INSTALLATION



		BWaf 100	BWaf 115
Power supply	kW	99.5	115
Max flow rate demanded l/h (Δt 15 K)	l/h	5700	6600
Portata nominale richiesta (Δt 20 K)	l/h	4280	4950
Potenza in cond. (50/30)	kW	105	120.3
Power supply in condensation (50/30)	l/h	6020	6897
Max flow rate demanded l/h (Δt 15 K)	l/h	4520	5173

approximate data

The Δt between supply and return boiler must never be less than 15 K.

NOTE:

The use of a mixing header fitted between the boiler circuit and the system circuit is always advisable.

It becomes INDISPENSABLE if the system requires flow rates superior to the maximum permitted boiler flow rates, which is to say lower than 15K.

TECHNICAL DATA

ELECTRICAL, HYDRAULIC, INSTALLATION DIAGRAMS AND CONTROLLERS can be unloaded from the web site www.schusterboilers.com at the page of the product

		BWaf 100	BWaf 115
Appliance category		II _{2H3P}	II _{2H3P}
Modulation Ratio		1:5	1:5.8
Nominal Heat Input on P.C.I. Qn	kW	99.5	115
Minimum Heat Input on P.C.I. Qmin	kW	20	20
Nominal Output (Tr 60 / Tm 80 °C) Pn	kW	97.3	111.9
Minimum Output (Tr 60 / Tm 80 °C) Pn min	kW	19.2	19.2
Nominal Output (Tr 30 / Tm 50 °C) Pcond	kW	104.6	120.3
Minimum Output (Tr 30 / Tm 50 °C) Pcond min	kW	21.4	21.4
Efficiency at max. output (Tr 60 / Tm 80°C)	%	97.77	97.32
Efficiency at min. output (Tr 60 / Tm 80°C)	%	95.90	95.90
Efficiency at max. output (Tr 30 / Tm 50°C)	%	105.17	104.31
Efficiency at min. output (Tr 30 / Tm 50°C)	%	107.1	107.1
Efficiency at 30% output (Tr 30°C)	%	107.27	107.21
Combustion efficiency with nominal load	%	97.84	97.73
Combustion efficiency with minimum load	%	98.27	98.26
Heat loss at casing with burner in operation (Qmin)	%	2.38	2.36
Heat loss at casing with burner in operation (Qn)	%	0.07	0.41
Flue gas temperature tf-ta (min)(*)	°C	33.2	33.4
Flue gas temperature tf-ta (max)(*)	°C	44	46.1
Maximum allowable temperature	°C	100	100
Maximum operating temperature	°C	85	85
Flue gas mass flow rate (min)	kg/h	34.31	34.31
Flue gas mass flow rate (max)	kg/h	158.98	184.7
Excess λ air	%	23	23
Flue losses with burner in operation (min)	%	1.73	1.74
Flue losses with burner in operation (max)	%	2.16	2.27
Minimum heating circuit pressure	bar (kPa)	0.6 (60)	0.6 (60)
Maximum heating circuit pressure	bar (kPa)	6 (600)	6 (600)
Water content	l	9	9
Gas Consumption Natural (20 mbar) gas G 20 a Qn	m ³ /h	10.52	12.16
Gas Consumption Natural gas (20 mbar) G 20 a Qmin	m ³ /h	2.11	2.11
Gas Consumption G25 (supply pressure 25 mbar) Qn	m ³ /h	12.24	14.14
Gas Consumption G25 (supply pressure 25 mbar) Qmin	m ³ /h	2.46	2.46
Gas Consumption G31 (supply pressure 37/50 mbar) Qn	kg/h	7.72	8.93
Gas Consumption G31 (supply pressure 37/50 mbar) Qmin	kg/h	1.56	1.56
Max. available pressure at the chimney base	Pa	150	150
Condensate production max	kg/h	15.94	18.51
Emissions			
CO at Minimum Heat Input with 0% of O ₂	mg/kWh	178	209
NO _x at Nominal Heat Input with 0% of O ₂	mg/kWh	40	40
NO _x Class		6	6
Electrical Data			
Voltage/Frequency electric power supply	V/Hz	230/50	230/50
Fuse on main supply	A (R)	4AF 250V	4AF 250V
Insulation degree	IP	X5D	X5D

Room Temperature = 20°C.

(*) Temperatures detected with the unit in operation (Tr 60 / Tm 80°C)


Seasonal Efficiency η_s according to Directive 2009/125/EC for Outputs <= 400 kW. See Erp Table

Standstill heat losses at Δt 30K - P_{stby} - See Erp Table

Standstill electrical consumption - P_{sb} - See Erp Table

DATA ACCORDING TO ErP DIRECTIVE

ELECTRICAL, HYDRAULIC, INSTALLATION DIAGRAMS AND CONTROLLERS can be unloaded from the web site www.schusterboilers.com at the page of the product

			BWAf 100	BWAf 115
NOMINAL HEAT OUTPUT	P_n	kW	97	112
SEASONAL SPACE HEATING ENERGY EFFICIENCY	η_s	%	92	92
SEASONAL EFFICIENCY CLASS IN HEATING MODE			A	A
FOR CH ONLY AND COMBINATION BOILERS: USEFUL HEAT OUTPUT				
USEFUL HEAT OUTPUT in high temperature regime (Tr 60 °C / Tm 80 °C)	P_4	kW	97.3	111.9
USEFUL EFFICIENCY AT NOM. HEAT OUTPUT in high-temperature regime (Tr 60°C / Tm 80°C)	η_4	%	88	87.6
USEFUL HEAT OUTPUT AT 30% OF NOM. HEAT OUTPUT in low-temperature regime (Tr 30°C)	P_1	kW	32	37
USEFUL EFFICIENCY AT 30% OF NOM. HEAT OUTPUT in low-temperature regime (Tr 30 °C)	η_1	%	96.6	96.5
RANGE-RATED BOILER: YES / NO			NO	NO
AUXILIARY ELECTRICITY CONSUMPTION				
AT FULL LOAD	$e_{l_{max}}$	kW	0.145	0.200
AT PART LOAD	$e_{l_{min}}$	kW	0.029	0.029
IN STAND-BY MODE	P_{SB}	kW	0.004	0.004
OTHER ITEMS				
STAND-BY HEAT LOSS	P_{stby}	kW	0.642	0.642
EMISSIONS OF NITROGEN OXIDES referred to GCV	NO_x	mg/kWh	39	42
CONSUMPTION OF ANNUAL ELECTRICITY	Q_{HE}	GJ	304	352