



PRODUCT CATALOGUE

BIOMASS SOLUTIONS FOR A MORE
ECOLOGICAL AND ECONOMICAL WORLD



CASE STUDIES

ADA LEWIS HOUSE - WEMBLEY, UK



Ada Lewis House on Empire Way in Wembley is an impressive four to eight storey development, comprising a total of 84 residential dwellings, with mix of 27 private and 57 affordable units, is part of the Brent housing and social care PFI project, an initiative designed to help address the shortage of suitable housing for homeless families in the area.

The pellet store and material handling equipment is located underneath a ramp leading down into the building's underground car park. A series of steel frames supports sheets to form a continuous 'V' shaped hopper along the length of the store. At the bottom of the 'V' there is a full length pressed steel channel that supports a screw auger. The auger passes through the store room wall, on the plant room side, where it is contained in a steel tube. At the bottom end of this tube there is a short vertical stub section, through which wood pellets drop and enter into a second flexible auger. This auger conveys the pellets into the boiler inlet tube.

Access into the pellet store is gained via removable wooden slats located inside the plant room. Inset perspex vision panels are provided in the slats to give a visual indication of the quantity of pellet in the store.

The installed EVO P200 ECO boiler is designed to deliver efficiencies of 94% and is expected to significantly reduce energy costs and carbon emissions in line with Brent Council's commitment to sustainable use of energy in buildings.

The boiler is also recommended under Section 21 of the CAA for Exemption from Section 20 of the CAA as suitable for use in Smoke Control Areas.

Year of installation: 2010



MIDDLETON HALL - BELFORD / UK



Middleton Hall is an exclusive Grade 2 listed property dating back to 1871, lovingly restored to an exceptionally high standard. Set in 30 acres of wooded grounds it has two lakes for private fishing.

The grounds are secluded and reached by a private drive providing beauty and tranquility in all seasons. Its unique setting provided a film set for Catherine Cookson novels.

Heating is provided by a 100kW EVO HS100 ECO wood chip boiler via 4 No. 2,000 litre buffer tanks. Wood chip is supplied by a nearby company thus ensuring a very low carbon footprint and, in addition, helping the local economy.

The boiler room and wood chip store are located in a basement annexe adjacent to the side of the Hall. Deliveries of chip are made by tractor and trailer which tips the material into the store via the hydraulically operated lifting roof. The store can hold up to 10 Tonnes of chip and is equipped with a rotating sweeping floor discharge unit. The boiler equipment requires a 3-phase supply which is provided by a single to 3-phase converter.

All design works, steelwork fabrication, assembly and installation was carried out by EVOWORLD UK.

Year of installation: 2010

New for 2014 – Keba control with full Internet Monitoring



During 2014 all the boilers in our range will be delivered with the latest computer control from Keba. This new graphical touchscreen control pad provides full internet access functionality, allowing remote diagnostics and configuration from any PC. Using the optional Keba remote hosting features, users and installers will have a simple overview of the current status of all EvoWorld boilers.

Remote control with your mobile phone – very simple!



Keep in touch with your system whenever you want – just send a text message to your system and the building is heated.



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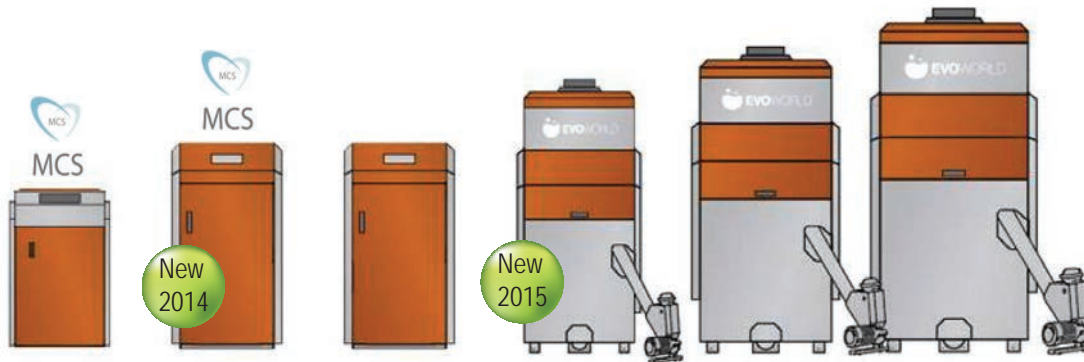
PRODUCT RANGE

Wood chip range:



	performance range kW	max. load kW	cons. at max.** kg/h	part load kW	cons. at part ** kg/h	efficiency %
Wood chip units:						
HS15 ECO	4-15	18	6,9 2	4	1,5 4	94, 0
HS25 ECO	7-25	30	11,5 4	7	2,6 9	93, 9
HS35 ECO	11-35	37	14,2 3	11	4,2 3	95, 3
HS50	13-55	65	25,0 0	13	5,0 0	92, 4
HS75 ECO	23-75	85	32,6 9	23	8,8 5	93, 4
HS100 ECO	30-100	105	40,3 8	30	11,5 4	95, 0
HS120 ECO	36-120	125	48,0 8	36	13,8 5	94, 8
HS150 ECO	45-150	155	59,6 2	45	17,3 1	94, 4
HS200 ECO	50-190	205	78,8 5	50	19,2 3	93, 8
HS500 ECO	150-490	510	196,1 5	150	57,6 9	93, 3

Wood pellet range:



HP14/20/28

P45

P50

P75

P100/120

P150/170/199

	performance range kW	max. load kW	cons. at max. ** kg/h	part load kW	cons. at part ** kg/h	efficiency %
Wood pellet units:						
HP14	4-14	18	2,13	4	0,47	94,9
HP20	8-21	28	3,31	8	0,95	92,8
HP28	8-28	28	3,31	8	0,95	91,
P45 ECO	15-45	55	6,50	15	1,77	96,2
P50 ECO	15-49	55	6,50	15	1,77	96,2
P75 ECO	23-75	85	10,05	23	2,72	93,4
P100 ECO	30-100	105	12,41	30	3,55	95,2
P120 ECO	36-120	125	14,77	36	4,25	94,9
P150 ECO	45-150	155	18,32	45	5,32	94,0
P199 ECO	50-190	205	24,23	50	5,91	93,5

PRODUCT RANGE

STANDARD EQUIPMENT:

	HS25,35	HS50	HS75	HS100	HS200	HS500	MCS HP14/20/28	MCS P45	P50	P75	P100	P200	P500
Boiler Technical Specs													
Lambda sensor (O2 sensor)	■	■	■	■	■	■	■	■	■	■	■	■	■
Primary ventilator	■	■	■	■	■	■	■	■	■	■	■	■	■
Secondary ventilator	■	■	■	■	■	■	■	■	■	■	■	■	■
Exhaust ventilator	■	■	■	■	■	■	■	■	■	■	■	■	■
Automatic start	■	■	■	■	■	■	■	■	■	■	■	■	■
Automatic cleaning system	■	■	■	■	■	■	■	■	■	■	■	■	■
Stainless steel firebox	■	■	■	■	■	■	■	■	■	■	■	■	■
Drop grate	■	■	■	■	■	■	■	■	■	■	■	■	■
Step grate	■	■	■	■	■	■	■	■	■	■	■	■	■
Three pass heat exchanger	■	■	■	■	■	■	■	■	■	■	■	■	■
Safety													
Negative pressure sensor	■	■	■	■	■	■	■	■	■	■	■	■	■
Back burn prevention flap	■	■	■	■	■	■	■	■	■	■	■	■	■
Cell wheel	■	■	■	■	■	■	■	■	■	■	■	■	■
Overload temperature limiter	■	■	■	■	■	■	■	■	■	■	■	■	■
Temperature check firebox feeder	■	■	■	■	■	■	■	■	■	■	■	■	■
Drive empty function firebox feeder	■	■	■	■	■	■	■	■	■	■	■	■	■
Controls													
Micro processor display	■	■	■	■	■	■	■	■	■	■	■	■	■
Time mode	■	■	■	■	■	■	■	■	■	■	■	■	■
External start mode	■	■	■	■	■	■	■	■	■	■	■	■	■
Manual mode	■	■	■	■	■	■	■	■	■	■	■	■	■
VO 2.20 compatible	■	■	■	■	■	■	■	■	■	■	■	■	■
Thermal storage tank management	■	■	■	■	■	■	■	■	■	■	■	■	■
Remote control compatible	■	■	■	■	■	■	■	■	■	■	■	■	■



SPECIAL EQUIPMENT:

	HS25,35	HS50	HS75	HS100	HS200	HS500	HP14/20/28	P45	P50	P75	P100	P200	P500
Boiler													
200 l ash box	□	□	□	□	■	■	□	□	□	□	□	■	■
return temperature control	■	■	■	■	■	■	■	■	■	■	■	■	■
maintenance contract	□	□	□	□	□	□	□	□	□	□	□	□	□
Controls													
GSM remote control dialog function for turning boiler on/off get status and quit errors	□	□	□	□	□	□	□	□	□	□	□	□	□
EVO 2.20 <u>to control:</u> thermal storage tank domestic hot water tank two mixed heat circuits max. 8 modules possible	□	□	□	□	□	□	□	□	□	□	□	□	□
cascade controller for the use of two or more units at the same spot	□	□	□	□	□	□	□	□	□	□	□	□	□
room temperature controller user defined selection of different modes for the heat circuits	□	□	□	□	□	□	□	□	□	□	□	□	□
MCS Approved	□	□	□	□	□	□	■	■	□	□	□	□	□

□ Optionally
■ Standard

PRODUCT RANGE

WOOD CHIP - TECHNICAL DATA:

TYPE	HS25	HS35	HS50	HS100/120/150	HS150/200	HS500 ⁴
Max. adjustable boiler temperature (°C)	85	85	85	85	85	90,00
Permitted operating pressure (bar)	3	3	3	3	3	4,00
CE labeling acc. To low-voltage directive	CE	CE	CE	CE	CE	CE
Total weight (kg)	320	450	450	1050	1350	3900
DIMENSIONS						
Boiler width (mm)	650	650	650	760	890	1220
Boiler depth (mm)	823	910 ¹	910 ¹	1350 ¹	1510 ¹	2830 ¹
Total depth (mm)	1023	990	990	1650	1820	4560
Boiler height (mm)	1160 ²	1310 ²	1310 ²	1770 ²	1960 ²	2350 ²
Boiler tube connection height (mm)	800	840	840	1301	1810	2050
Flow height (mm)	1007	1160	1160	1560	1780	2126
Return height (mm)	327	360	360	410	440	565
Ventilation height (mm)	965	1160	1160	1560	1780	2070
Boiler tube connection diameter (mm)	150	180	200	200	250 / 300	350 / 400
WATER						
Water content (ltr.)	39	55	55	150	225	610
FUEL						
Ash box volume (ltr.)	40	45	45	60	200	200
Max. wood chip size	G 30 - G 50	G 30 - G 50	G 30 - G 50	G 30 - G 50	G 30 - G 50	G 30 - G 50
Max. wood chip water content	w 35	w 35	w 35	w 35	w 35	w 35
ASH REMOVAL						
Ash removal	auto	auto	auto	auto	auto	auto
CONNECTIONS						
Flow (inch)	1 ¼	1 ¼	1 ¼	1 ½	2	4
Return (inch)	1 ¼	1 ¼	1 ¼	1 ½	2	4
EMMISSION DATA						
Required negative pressure at full load (mbar/Pa)	0,1 - 0,3 / 10 - 30 0,1 - 0,3 / 10 - 30 0,1 - 0,3 / 10 - 30 0,1 - 0,3 / 10 - 30 0,1 - 0,3 / 10 - 30					
Required negative pressure at part load (mbar/Pa)	0,0 - 0,1 / 0 - 10 0,0 - 0,1 / 0 - 10 0,0 - 0,1 / 0 - 10 0,0 - 0,1 / 0 - 10 0,0 - 0,1 / 0 - 10 0,0 - 0,1 / 0 - 10					
Combustion chamber temperature (°C)	ca. 1000	ca. 1000	ca. 1000	ca. 1000	ca. 1000	ca. 1000
CO at full load (mg/m ³)	24 ³	63 ³	11 ³	212 ³	53 ³	42 ³
CO at part load (mg/m ³)	31 ³	33 ³	35 ³	48 ³	73 ³	
NOx at full load (mg/m ³)	144 ³	159 ³	103 ³	110 ³	127 ³	162 ³
NOx at part load (mg/m ³)	105 ³	136 ³	n.B.	108 ³	107 ³	
HC at full load (mg/m ³)	1 ³	2 ³	1 ³	4 ³	1 ³	<2 ³
HC at part load (mg/m ³)	1 ³	1 ³	1 ³	1 ³	1 ³	
Dust at full load (mg/m ³)	12 ³	14 ³	21 ³	20 ³	39 ³	57 ³
Dust at part load (mg/m ³)	10 ³	10 ³	n/a	10 ³	5 ³	
ELECTRIC POWER CONSUMPTION						
Supply needed	400 V, AC					
Standby (W)	5	5	5	5	6	6
Power consumption at full load in % of full load	0,5	0,5	0,4	0,4	0,3	0,3
Power consumption at part load in % of part load	0,2	0,2	0,3	0,2	0,1	0,2

1) exkl. exhaust fan / stoker 2) exkl. chimney/box 3) emissions data based on 13 % O2 dry
4) tested with exhaust cleaner (cyclone)

WOOD PELLET - TECHNICAL DATA:

TYPE	HP 14	HP 20	HP 28	P45/50 ECO	P100/120	P150/170/199
Max. adjustable boiler temperature (°C)	85	85	85	85	85	85
Permitted operating pressure (bar)	3	3	3	3	3	3
CE labeling acc. To low-voltage directive	CE	CE	CE	CE	CE	CE
Total weight (kg)	200	220	220	400	1050	1320
DIMENSIONS						
Boiler width (mm)	600	600	600	700	760	890
Boiler depth (mm)	760	760	760	914	1355	1511
Total depth (mm)	1160	1160	1160	1017	1435	1606
Boiler height (mm)	1035	1035	1035	1360	1770	1960
Boiler tube connection height (mm)	775	775	775	835	1289	1810
Flow height (mm)	820	820	820	1164	1574	1780
Return height (mm)	240	240	240	365	409	440
Ventilation height (mm)	775	775	775	835	1289	1780
Boiler tube connection diameter (mm)	130	150	150	180	200	250
WATER						
Water content (ltr.)	24	38	38	55	150	224
FUEL						
Ash box volume (ltr.)	27,5	27,5	27,5	60	60	200
Requirement:	Önorm M7135	Önorm M7135	Önorm M7135	Önorm M7135	Önorm M7135	Önorm M7135
ASH REMOVAL						
Ash removal	Tilt-grate	Tilt-grate	Tilt-grate	Tilt-grate	Step-grate	Step-grate
Flow (inch)	1"	1 ¼"	1 ¼"	1 ¼"	1 ½"	2"
Return (inch)	1"	1 ¼"	1 ¼"	1 ¼"	1 ½"	2"
EMMISSION DATA						
Required negative pressure at full load (mbar/Pa)	0 (+/- 0,1)	0 (+/- 0,1)	0 (+/- 0,1)	0,1 - 0,3	0,1 - 0,3	0,1 - 0,3
Required negative pressure at part load (mbar/Pa)	0 (+/- 0,1)	0 (+/- 0,1)	0 (+/- 0,1)	0 - 0,1	0 - 0,1	0 - 0,1
Combustion chamber temperature (°C)	ca. 1000	ca. 1000	ca. 1000	ca. 1000	ca. 1000	ca. 1000
CO at full load (mg/m³)	42	90	136	18	48	13
CO at part load (mg/m³)	114	114	25	60	109	255
NOx at full load (mg/m³)	81	143	163	111	108	113
NOx at part load (mg/m³)	n.g.	n.g.	n.g.	93	94	81
HC at full load (mg/m³)	1	1	2	1	1	1
HC at part load (mg/m³)	2	3	1	2	1	1
Dust at full load (mg/m³)	4	9	11	7	10	14
Dust at part load (mg/m³)	n.g.	n.g.	n.g.	7	45	17
ELECTRIC POWER CONSUMPTION						
Supply needed	230 V	230 V	230 V	230 V	230 V	230 V
Standby (W)	5	5	5	6	6	6
Power consumption at full load in % of full load	0,6	0,6	0,6	0,3	0,2	0,2
Power consumption at part load in % of part load	0,35	0,35	0,35	0,2	0,1	0,1

1) exkl. exhaust fan / stoker 2) exkl. chimney box 3) emissions data based on 13 % O2 dry

PELLET FEEDING SYSTEM

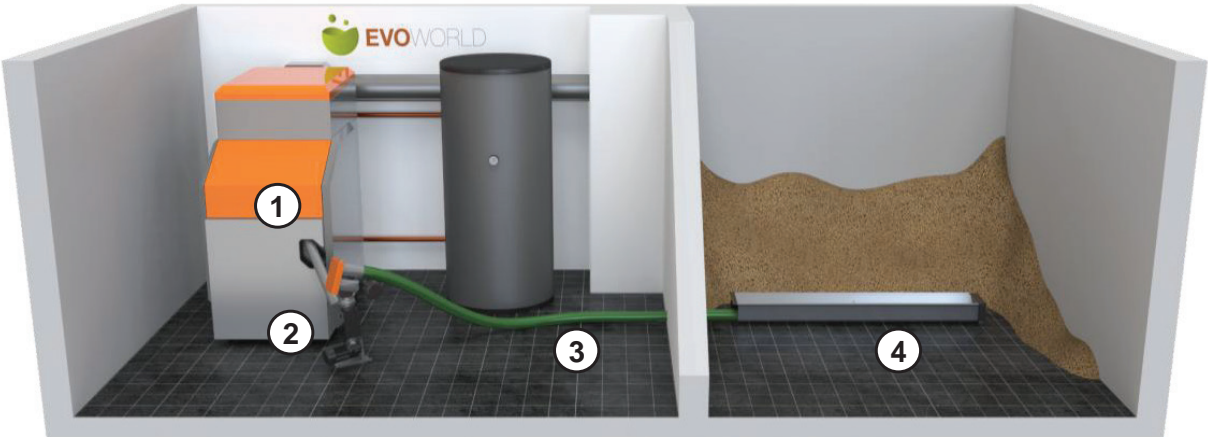
HP14/20/28



New PellBox Store



P45, P50, P100 and P199



PELLET FEEDING SYSTEM IN GENERAL

- Compact floor mounted silo augur with the EvoWorld pellet collector system
- Minimum plant room space required due to the compact dimensions of the boiler and feed system.

DETAILS OF PELLET FEEDING SYSTEM

Pellet collector:

- eccentric cam action works with collector sides to assure free flow of pellets (8 mm open/close function)
- Reduced power consumption due to the lack of heavy loading on the augur.
- Augur can be removed with pellets in the silo

Screw conveyor:

- flexible feeding system (min. radius is 1,5 m)
- Screw sizes:

14 to 28 kW:	39 mm
45 to 199 kW:	63 mm

Back burn prevention:

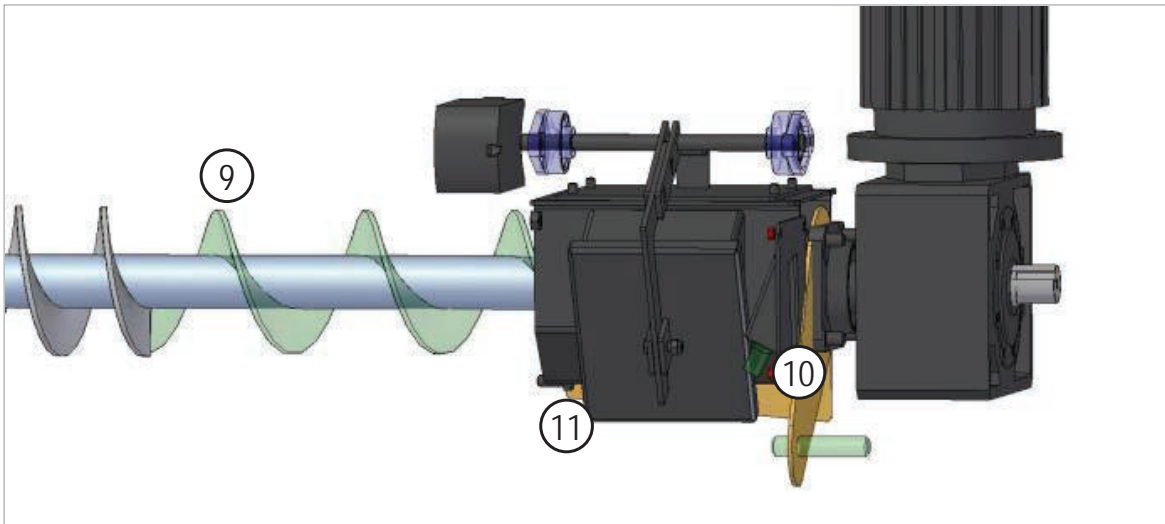
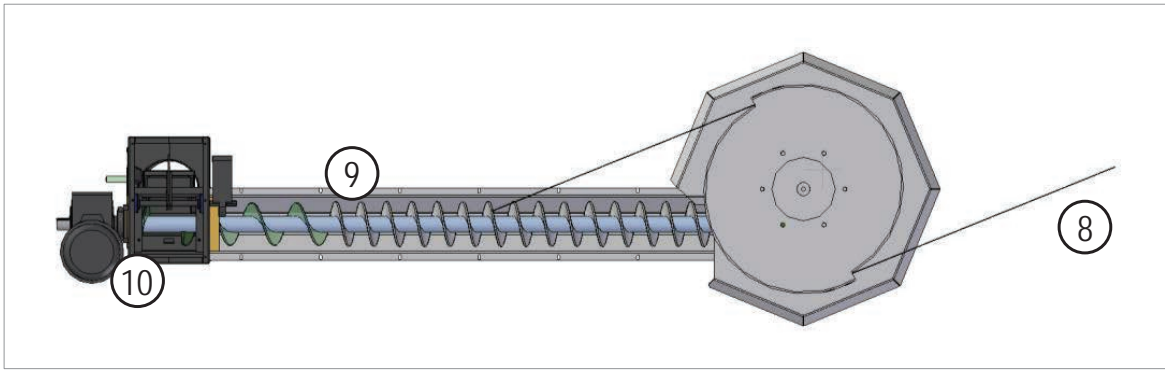
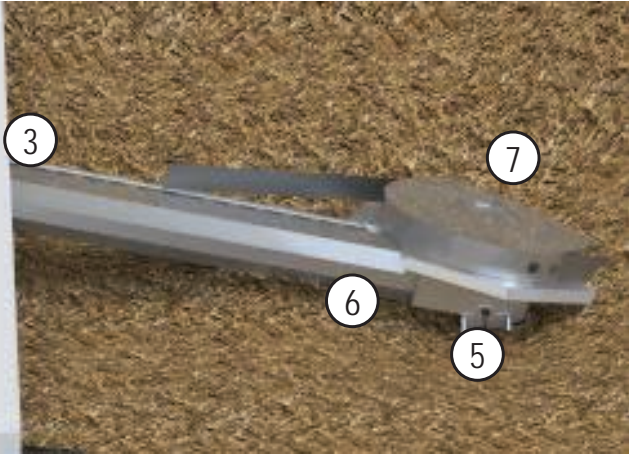
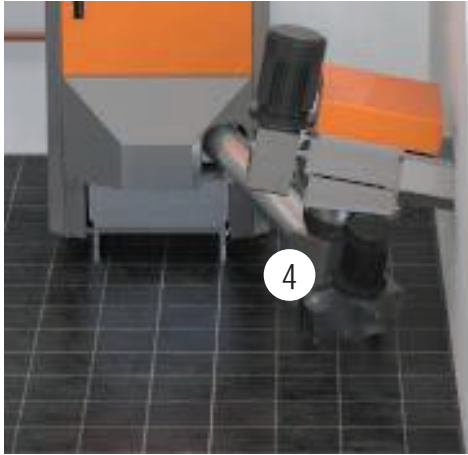
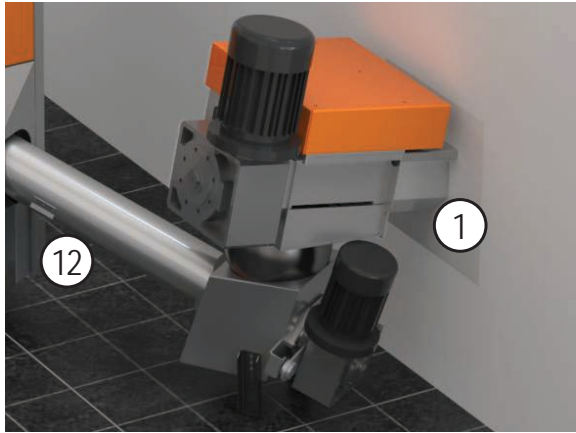
- the cell wheel construction isolates gases or sparks that might reach the main feed auger
- back burn also is avoided by dropping fuel into the combustion chamber via top feed tube (no direct connection)
- Constant negative combustion chamber pressure prevents flare out (controlled by negative pressure sensor)

Needed equipment:



- ① EVOWORLD pellet heating system (15-500 kW)
- ② cell wheel (safety feature; included in price of heating system)
- ③ pellet feeding system (up to 20 ft., longer distances with transfer box)
- ④ pellet collector (2, 2.5, or 3 mtrs long - longer lengths can be achieved by add tubes together)

WOOD CHIP FEEDING SYSTEM



WOOD CHIP FEEDING SYSTEM IN GENERAL

- ① • maximum utilization of the storage room due to compact construction of the combustion feeder and feeding system (bottom edge: 55 cm)
- ② • required space for biomass unit is reduced to a minimum due to the unique concept of the feeding system
- ③ • The augur system can be customised to each individual application
- ④ • stoker mechanism loads the boiler with fuel

DETAILS OF WOOD CHIP FEEDING SYSTEM

Agitators:

- ⑤ • heavy duty angular gear (3000 Nm)
- ⑥ • gear box protected using clutch mechanism
- ⑦ • heavy duty cover panel of the gear box protects against collision with agitating arms
- ⑧ • two or four agitating arms are needed based on the size of the unit

Screw conveyor:

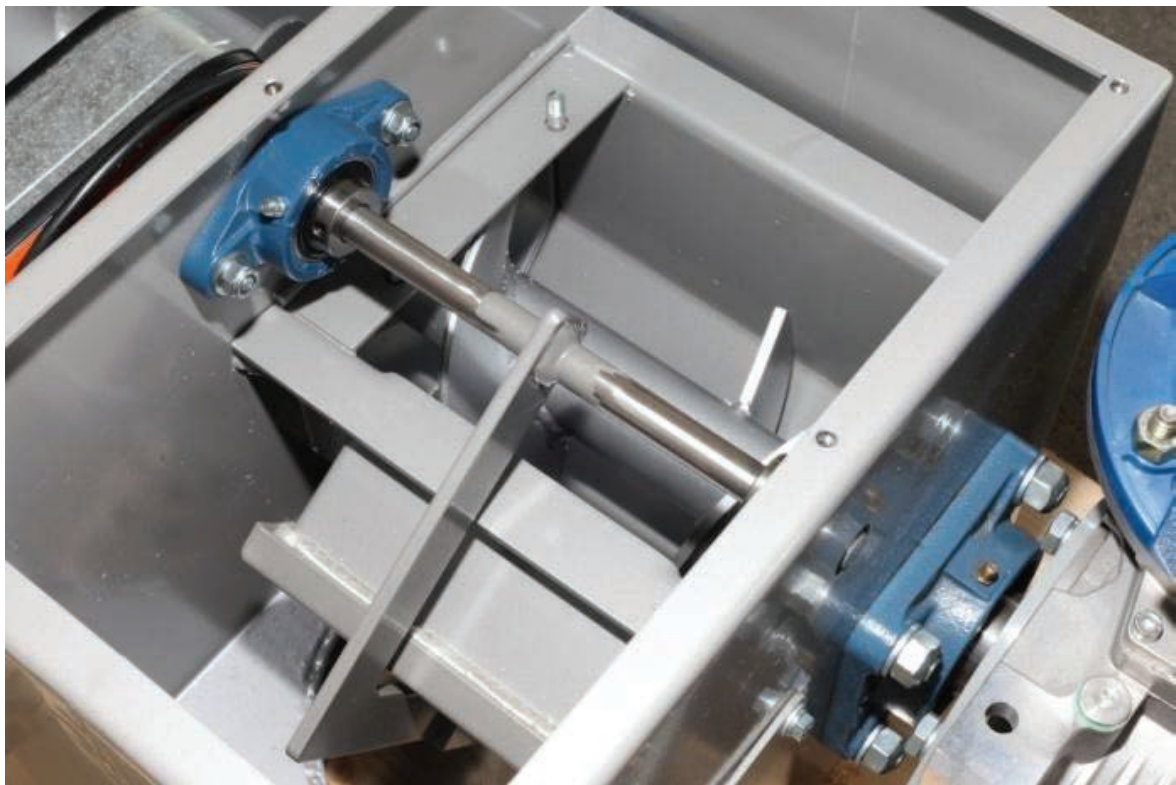
- ⑨ • protection against overfilling by progressive pitch of the screw conveyor with two different pitches inside and outside the boiler room
- ⑩ • counter rotating helix sits at the end of the main feed directing fuel into the main stoker mechanism

Back burn prevention:

- ⑪ • the back burn prevention flap stops gases or sparks going back to the main feed conveyor
- ⑫ • back burn is also detected using a temperature sensor on the stoker mechanism
- Flareout prevention by using a negative pressure sensor



WOOD CHIP FEEDING SYSTEM



DETAILS OF SCREW CONVEYOR SYSTEM

Feeding channel:

- 4 mm steel wall 170 mm width up to 200 kW (500 kW 240 mm)
- special augur trough design avoiding the screw being pushed up against the top plate
- universal joint between the main feed mechanism and the stoker unit provides maximum flexibility for silo location

Combustion feeder:

- less space needed for the whole system due to the special construction of the combustion feeder (60° angled) in combination with two adjustable flanges
- by adjusting the flanges it is possible to have the combustion feeder on the left or on the right hand side
- the combustion feeder screw is mounted with bearings on both sides
- the drive end is protected against dust by an air tight seal

Construction: HS25/35/50/100/120

Channel diameter: 130 mm Screw diameter: 100 mm

HS150/170/200

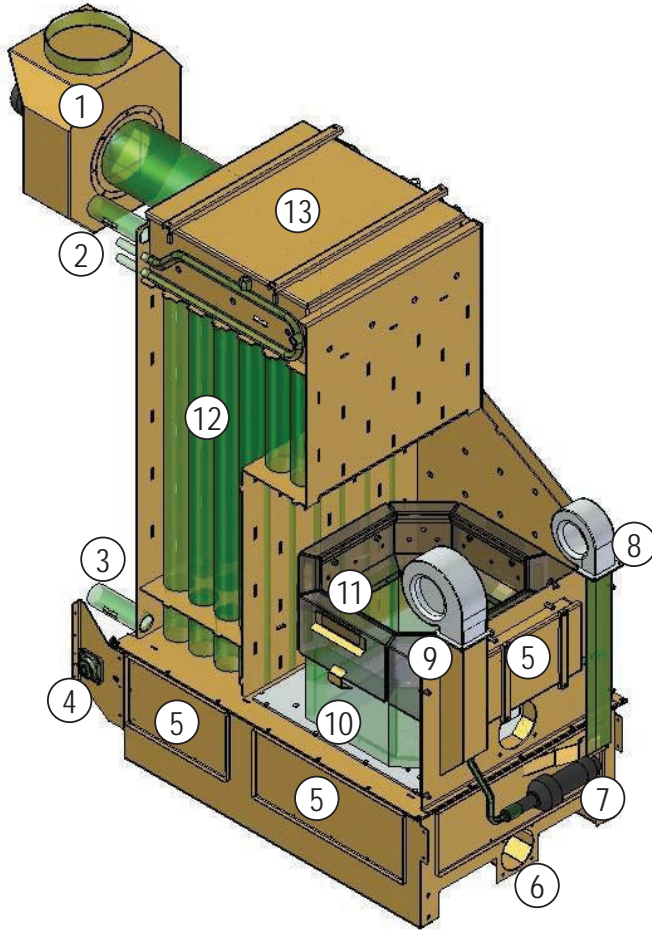
Channel diameter: 160 mm Screw diameter : 135 mm

HS500

Channel diameter: 195 mm Screw diameter : 160 mm

TECHNOLOGY

100/120/200/500 kW



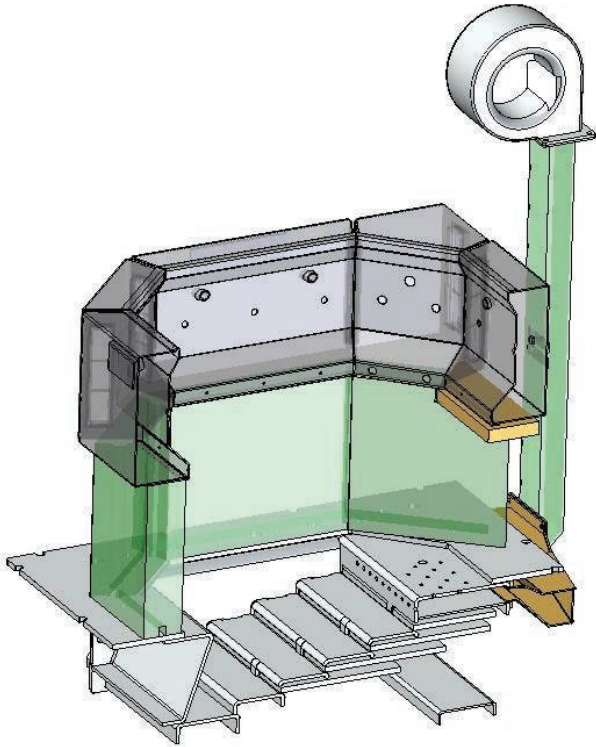
- ① fully modulating EXHAUST FAN
- ② water connection: FLOW (with temperature sensor integrated) and THERMAL VALVE (heat exchanger)
- ③ water connection: RETURN (with temperature sensor integrated)
- ④ CLEANING SHAFT
- ⑤ SERVICE DOORS to maintain the unit
- ⑥ ASH DISCHARGE
- ⑦ HOT AIR GUN
- ⑧ fully modulating PRIMARY FAN
- ⑨ fully modulating SECONDARY FAN
- ⑩ STEP-GRATE combustion system
- ⑪ AFTERBURNING with secondary air
- ⑫ self-cleaning 3-PASS HEAT EXCHANGER
- ⑬ TOP CAP

Containerised Solutions 50-200kW



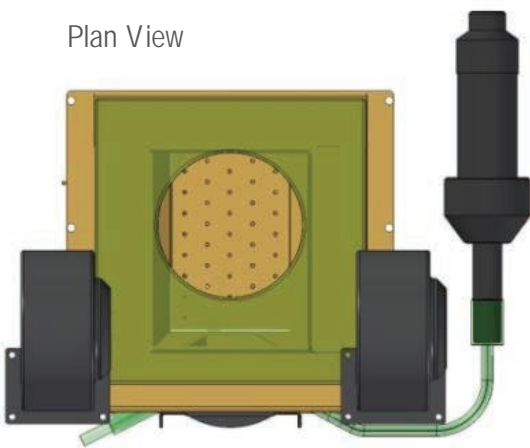


Self cleaning step grate: 100-500 kW

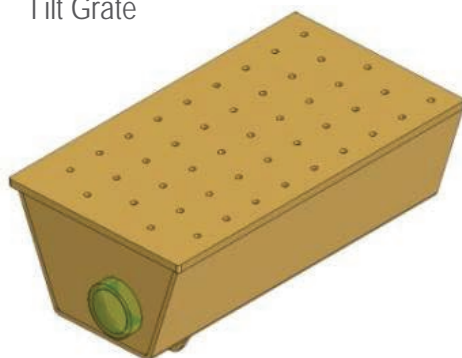


Tilt Grate 14-50kW

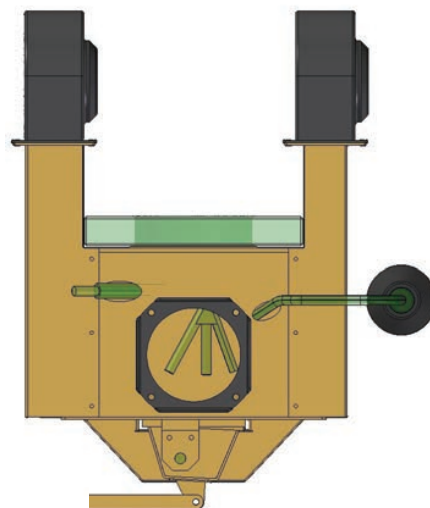
Plan View



Tilt Grate



Front View



TECHNOLOGY

PHOTO SENSORS - SAFETY



to secure a safe start and stop



NEGATIVE PRESSURE SENSOR - EFFICIENCY & SAFETY

controlling the direction of the draft by modulating the fans

O2 probe - EFFICIENCY



Lambda (oxygen) probe for adjusting the fuel feeding times and modulations of fans by reading the residual oxygen in exhaust gas

TURBOLATORS - EFFICIENCY



self-cleaning heat exchanger by twisted TURBOLATORS leads to highest efficiency

INFRARED SENSORS - FEEDING



turns on and off when wood chips are in front or missing

CAPACITIVE SENSORS - FEEDING



turns on and off when pellets are in front or missing

INDUCTIVE SENSORS - CLEANING

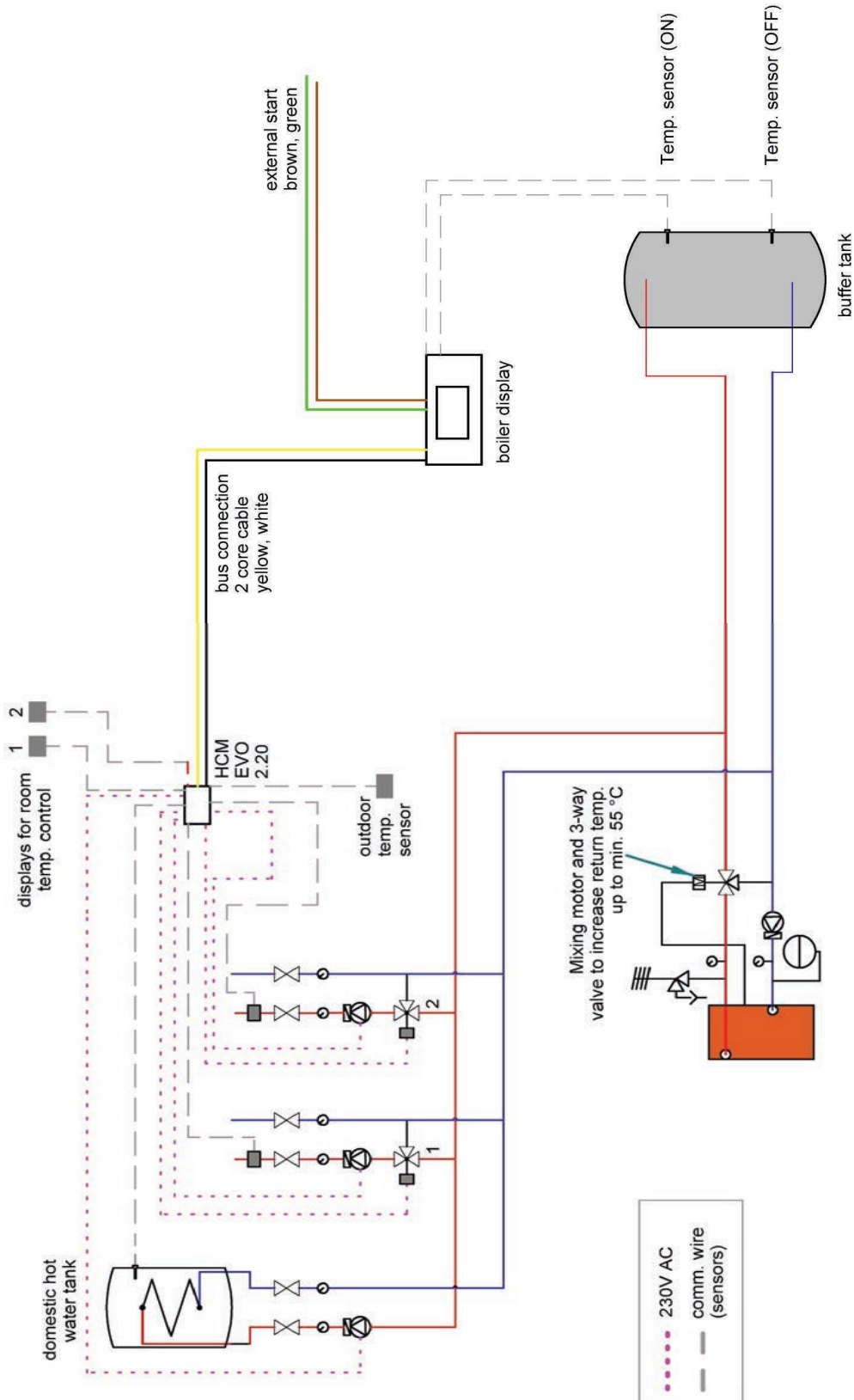


always checking the position of the cleaning mechanism to guarantee safest operation conditions





HYDRAULIC SCHEMATIC



MINIMUM SIZE OF BUFFER TANKS:

	LITERS	GALLONS
14 - 25 kW	500 l	120 gal
35 - 50 kW	1,000 l	250 gal
100 - 200 kW	2,000 l	500 gal
300 - 400 kW	4,000 l	1,000 gal
500 kW	5,000 l	1,200 gal



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SAVING ENERGY AND ENVIRONMENT
 IN MORE THAN 15 COUNTRIES.