

- > Modern Technology
- > High efficiency
- > Reliability
- > High quality

Automatic pellet boilers from 16 to 260 kW



Pellet Boilers
BIO-STAR



Pellet - Biomass
Boilers **BIO-FIRE**



... the best choice



Economy



Ecology



Safety



Comfort

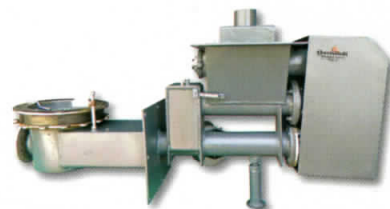
PELLET COMBUSTION TECHNOLOGY



BIOSTAHL - ECOSTAHL
Pellet Burner
16-230 kw series **TLA-SMB**



PELLAS Pellet Burner
10-250 kw series **REVO**



ENERSTAHL
Biomass - pellet
16-260 kw Burner **ESL**

Pellets = Energy = Life = The

Certifications



The circle of nature



Comparison of emissions for different fuels

	SO ₂ (kg)	CO (kg)	CO ₂ (tn)
Oil	200	40	200
Natural gas	10	90	160
Pellet	50	10	10

50%
economy

output
91,3%

I USE
GREEN
POWER

Environment
friendly

PRODUCT OF
303-5
5
HIGHEST CLASS

ventilator

Control
panel

Silo

Tubes
manual
cleaning
lever

Inspection
window

Feeding
mechanism

Oil burner
flange

Pellet
burner

Openable
door

Removal
ash tray

END
OF OIL

BIOSTAR BOILER

5
YEARS GUARANTEE

Operation

The boiler consists of four main parts: body of the boiler, pellet burner, silo and feeding mechanism.

It is a system designed for burning pellet, stored in silo. The fuel is transferred to the horizontal flame burner by the **feeding mechanism with automatic operation.**

The feeding of the silo takes place every 4-7 days.

Advantages:

- Automatic operation.
- High and stable efficiency over 91%.
- European burner, silent operation.
- 4-pass of exhaust gases.
- Heavy construction, reduced dimensions.
- Easy cleaning and maintenance.
- Long reload of the silo period (4-7 days).
- Certified boiler under all European standards (CE, Class 5).
- Proper functioning with pellet of 6, 8 or 10mm diameter.
- Proper functioning with oil or gas burner adjusted on the additional flange.
- Ecological combustion, CO₂ neutral.

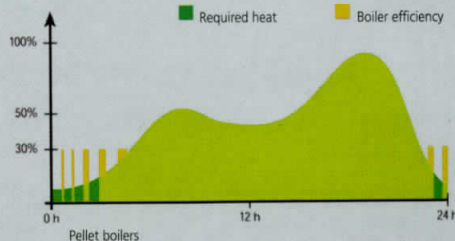
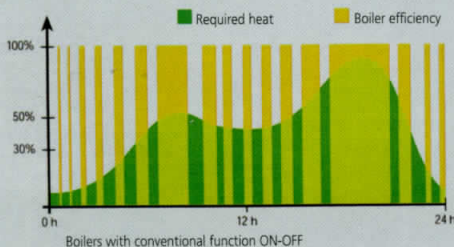


Lamda sonde

Advanced logarithm controls the boiler according to present conditions which provides the best efficiency constantly. It guarantees considerable savings, cleaner heat exchanger and simple regulation.

Weather
regulation

Sanitary
hot water



An important advantage of pellet boilers is that they can operate at part load (up to 30% of the force). They adapt to the current heating conditions. Oil or gas boilers do not have the ability to make this adjustment.

Fuel of the Future



Automatic tubes cleaning system



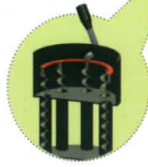
Touch Control Panel

Advanced regulation with touch panel (weather regulation, weekly schedule, intuitive) simple and clear. Helps to customize boilers work to individual needs.

- Modern technology + Comfort
- Mechanical burner cleaning
- Hydraulic equipment
- Automatic ignition, automatic burner cleaning, automatic ash extraction
- Automatic cleaning of the tubes
- Vacuum pneumatic fuel transportation device
- Compact construction
- Regulation through internal network or external server
- Internet



Manual tubes cleaning mechanism

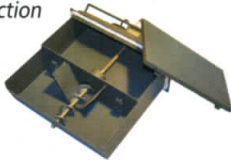


Cleaning of the tubes is effortless with the manual cleaning lever. The ash falls into the drawer located at the bottom of the boiler. The feeding of the silo takes place every 4-7 days. By adjusting the **special gearmotor** may the cleaning of fire tubes can be automated.

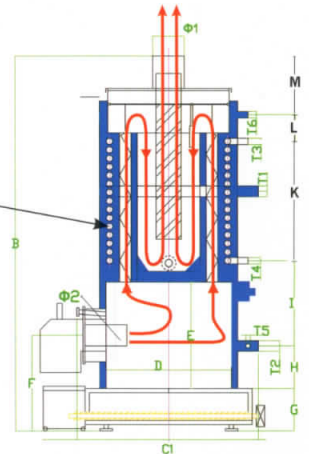
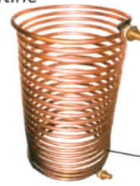
Automatic pellet feeding mechanism



Automatic ash extraction



Copper serpentine for DHW



Silo Dimensions

Silo type	Dimensions (WxDxH) mm	Capacity (lit)
PL-300	400 x 940 x 1290	300
PL-400	500 x 940 x 1290	400
PL-600	700 x 940 x 1290	600



Dimensions - Technical Characteristics of Bio-Star - Biofire - Biotherm boilers

Tünoç	Power	A	B	C	Cl	D	E	F	G	H	I	K	L	M	T1 / T2	T3 / T4	T5	T6	Ø1	Ø2	Temp. max	Work. pressure	Water Content	Heated surface	Back pressure	Comb. chamber vol.	Silo Vol. ume	Silo Dimensions (W x L x H)	Weight Only Boiler	DHW Production (20-25°C)	Chimney Draught	
	kW	Kcal/h	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	in	in	in	in	mm	mm	°C	bar	lit	m²	mm (H, D)	lit	mm	kg	lt/h	Pa		
BIOSTAR 16	16	14.000	650	1560	820	1270	500	500	400	190	70	590	230	150	100	1 1/4"	1/2"	1/2"	1/2"	148	230	90	3	96	2,6	1-2	98	300	400 x 940 x 1290	195	10,1	12
BIOSTAR 23	23	20.000	650	1660	820	1270	500	500	400	190	70	590	230	150	100	1 1/4"	1/2"	1/2"	1/2"	148	230	90	3	110	2,8	1-2	98	300	400 x 940 x 1290	215	12,2	12
BIOSTAR 35	35	30.000	650	1760	820	1270	500	500	400	190	70	590	330	150	100	1 1/4"	1/2"	1/2"	1/2"	148	230	90	3	124	3,0	1-2	98	300	400 x 940 x 1290	235	14,4	12
BIOSTAR 47	47	40.000	650	1860	820	1270	500	500	400	190	70	590	430	150	100	1 1/4"	1/2"	1/2"	1/2"	148	230	90	3	138	3,2	1-2	98	300	400 x 940 x 1290	255	15,7	15
BIOSTAR 58	58	50.000	650	1960	820	1270	500	500	400	190	70	590	530	150	100	1 1/4"	1/2"	1/2"	1/2"	148	230	90	3	152	3,4	1-2	98	300	400 x 940 x 1290	275	15,7	15
BIOSTAR 69	69	60.000	900	1950	1150	1550	685	620	510	250	100	620	450	150	150	1 1/2"	3/4"	3/4"	3/4"	-175	250	90	3	240	5,0	2-3	258	500	550 x 1200 x 1520	350	17,2	17
BIOSTAR 81	81	70.000	900	1950	1150	1550	685	620	510	250	100	620	450	150	150	1 1/2"	3/4"	3/4"	3/4"	175	250	90	3	225	5,4	2-3	258	500	550 x 1200 x 1520	365	17,2	17
BIOSTAR 93	93	80.000	900	2050	1150	1550	685	620	510	250	100	620	550	150	150	2"	3/4"	3/4"	3/4"	175	250	90	3	267	6,2	2-3	258	500	550 x 1200 x 1520	390	19,5	17
BIOSTAR 116	116	100.000	900	2050	1150	1550	685	620	510	250	100	620	550	150	150	2"	3/4"	3/4"	3/4"	175	250	90	3	252	6,8	2-3	258	500	550 x 1200 x 1520	405	19,5	17
BIOSTAR 130	128	110.000	900	2150	1150	1550	685	620	510	250	100	620	650	150	150	2"	3/4"	3/4"	3/4"	175	250	90	3	280	8,0	2-3	258	500	550 x 1200 x 1520	430	19,5	17
BIOSTAR 140	140	120.000	1300	2100	1620	2200	1000	750	700	300	150	850	400	200	200	2"	3/4"	3/4"	3/4"	250	300	90	3	480	10,6	3-4	628	1000	750 x 1200 x 1520	490	22,0	20
BIOSTAR 160	163	140.000	1300	2100	1620	2200	1000	750	700	300	150	850	400	200	200	2"	3/4"	3/4"	3/4"	250	300	90	3	440	11,6	3-4	628	1000	750 x 1200 x 1520	520	25,0	20
BIOSTAR 190	186	160.000	1300	2300	1620	2200	1000	750	700	300	150	850	600	200	200	2 1/2"	3/4"	3/4"	3/4"	250	300	90	3	630	12,6	3-4	628	1000	750 x 1200 x 1520	590	28,0	20
BIOSTAR 210	210	180.000	1300	2300	1620	2200	1000	750	700	300	150	850	600	200	200	2 1/2"	3/4"	3/4"	3/4"	250	300	90	3	590	13,6	3-4	628	1000	750 x 1200 x 1520	620	32,0	20
BIOSTAR 230	230	200.000	1300	2300	1620	2200	1000	750	700	300	150	850	600	200	200	2 1/2"	3/4"	3/4"	3/4"	250	300	90	3	740	14,6	3-4	628	1000	750 x 1200 x 1520	690	35,0	20
BIOSTAR 260	256	220.000	1300	2500	1620	2200	1000	750	700	300	150	850	800	200	200	3"	3/4"	3/4"	3/4"	250	300	90	3	690	15,6	3-4	628	1000	750 x 1200 x 1520	720	38,0	20

• The above data is indicative and may change without warning, if it is required by new improvements.



BIOFIRE boiler



Function/Operation

BIODROP boiler has two main characteristics: A) The reduced width of the unit, which is necessary for small boiler rooms and B) the advanced feeding screw, which combines all the advantages of a combustion system, forwarding and forfeiture, with high safety.



2 axis burner
ESL-2

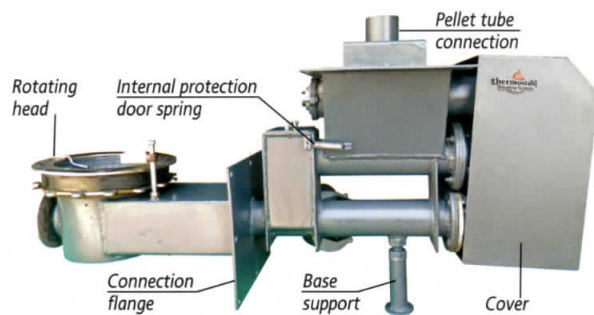


BIO THERM boiler

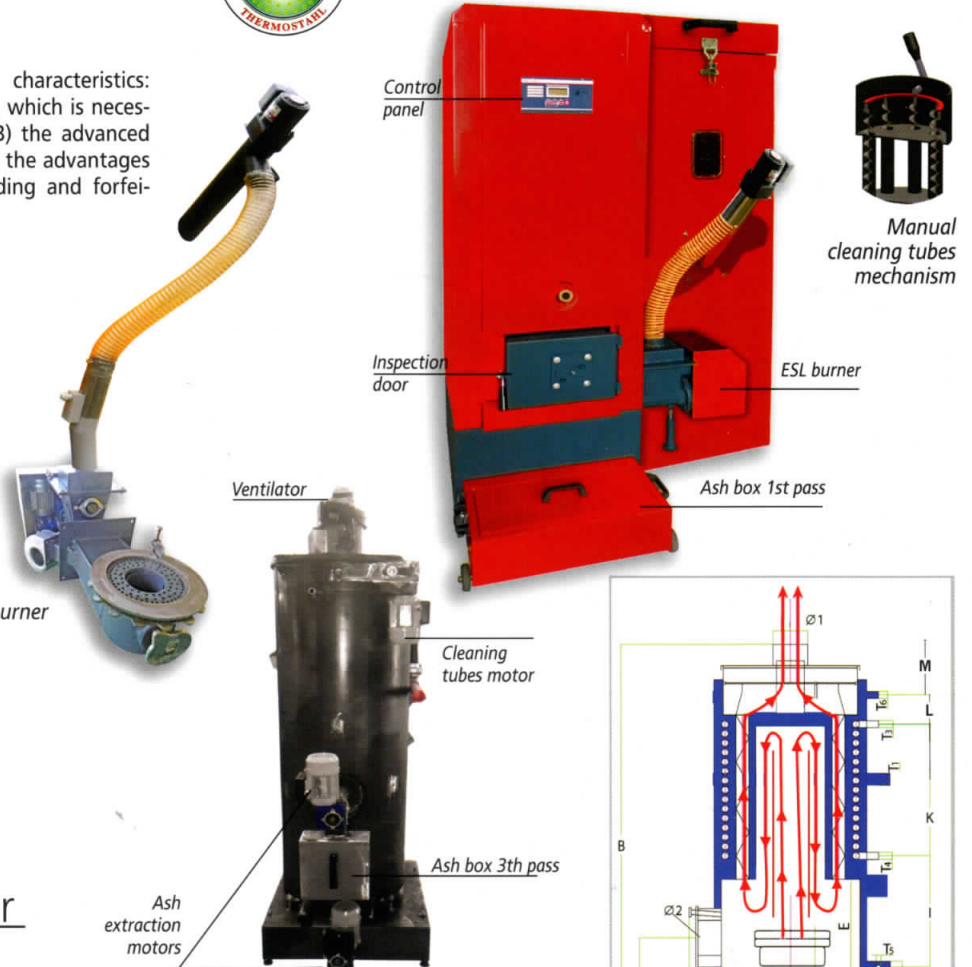
Function/Operation

MINI-BIO boiler is a compact unit which contains the main body of boiler, the feeding system with screw and motoreducer, as well as the silo. The silo (fuel storage tank) is of large capacity in order to feed it approximately every 4 to 7 days (depending on the demand). The filling of the silo is done manually or (optional) by automation. The screw carries the biomass to the burning chamber where it is burned.

Control panel supervises the operation with consecutive starts and stops of the motor. The whole system is controlled by the hydrostat and the room thermostat. Optionally, a system of automatic ignition with electric resistance and automatic cleaning of ashes can be provided.



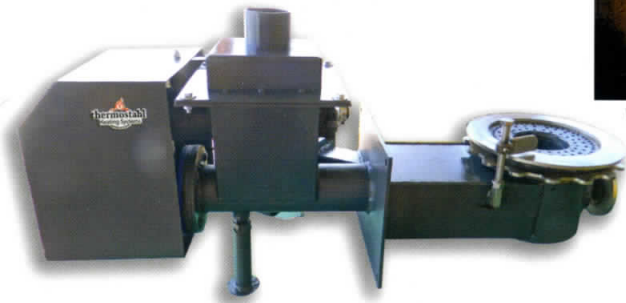
3 axis burner ESL-3 ENERSTAHL



ENERSTAHL series ESL-2 and ESL-3 pellet + biomass burners with vertical flame



Pellet + biomass burner **ENERSTAHL-2**
with 2 axis + feeding system

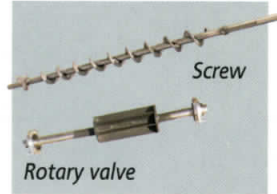
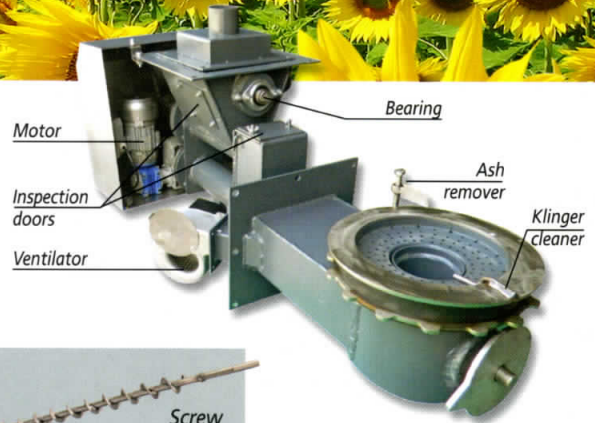


Vertical flame

Operation

The biomass - pellet burner is a combination of pellet dropping and forwarding.

Two motoreducers forward the fuel. The first one forwards biomass from the silo to the screw and the second one forwards it to the combustion chamber. These systems operate independently and they are controlled by the control panel and work simultaneously.



Screw

Rotary valve

Pellet + biomass burner
ENERSTAHL-3
with 3 axis



Transmission system



Klinger Ash

*We use
green
energy*



WHY PELLETS??

PELLETS are environmentally friendly, renewable fuel, manufactured in 100% from natural resources—chips, sawdust and wood waste joined together under high pressure, with no chemical or artificial adhesive. Wood pellets take the form of a small cylinders, 6-10mm wide and 20-50 mm long.



The main advantages of using pellets as a heating fuel are:

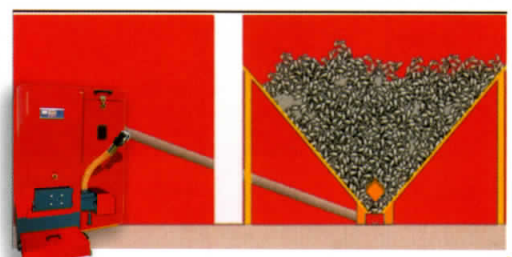
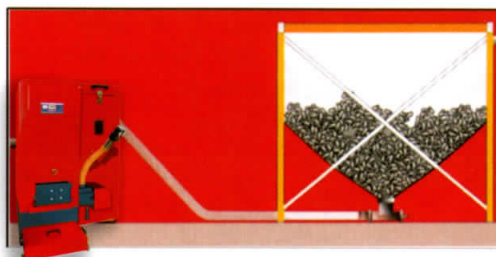
- low moisture (8-12%) and low amount of ash (0,5-1,5%): 1 ton of burned pellet leaves only 10-20kg of ash that can be used as a natural fertiliser
- carbon neutrality and low emissions of substances harmful to the environment
- easiness of transport and storage, "cleanliness" of the fuel: pellets are usually available in 15kg and 25kg bags and do not require any special storage conditions.

Technical characteristics of pellet burners ENERSTAHL

Burner Type	units	ESL 58	ESL 130	ESL 260	
Power	(kW)	16 - 58	69 - 130	140 - 260	
	(kcal/h)	14.000 - 50.000	60.000 - 100.000	120.000 - 220.000	
Fuel		Pellet - Agropellet - Biomass - Grain			
Fuel consumption	(kg/h)	2 - 10	7 - 16	16 - 39	
Electric supply	(V/Hz)	230 / 50	230 / 50	230 / 50	
Auto Ignition Resistance	(W)	350	350	350	
Motor	(W)	2300	2300	2500	
	(W)	120	150	180	
Ventilator	m ³ /h	300	600	1200	
Mounting flange (LxW)	(mm)	290 x 240	360 x 305	490 x 390	
Dimensions	Length	1030	1200	1400	
	Width	(mm)	400	350	490
	Height		500	480	650
Weight	(kg)	48	75	126	
Lamda		1,3 - 1,6	1,3 - 1,6	1,3 - 1,6	
Biomass burner with automatic Klinger cleaner		Yes	Yes	Yes	

• The above data is indicative and may change without warning, if it is required by new improvements.

Automatic feeding systems from a central silo. Biofire - Biotherm boilers are 200mm higher



pellasX PELLET BURNERS - REVO LINE



X Mini REVO - X Mini 35 REVO



X 44 - X 70 REVO



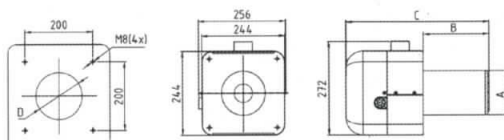
X 100 - X 120 - X 150 REVO

X series Revo

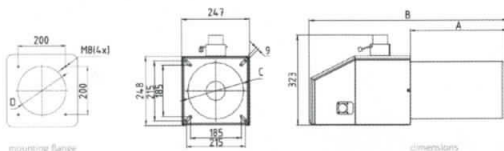
Type		X Mini REVO	X Mini 35 REVO	X 44 REVO	X 70 REVO	X 100 REVO	X 120 REVO	X 150 REVO	X 250 REVO
Power output	kW	5-26	8-35	10-44	15-70	30-100	40-120	50-150	80-250
Current	V/Hz	230 / 50	230 / 50	230 / 50	230 / 50	230 / 50	230 / 50	230 / 50	230/50
Average power consump.	W	50	50	70	85	85	85	85	120
Weight	kg	10	14	21	22	27	29	32	45
Length of feeder	m	2	2	2	2	2	2	2	2
Fuels		agropellet, pellet 6-8mm, oat, dry pits							
Burning efficiency	%	96	96	99	99	99	99	99	99
Efficiency in boiler	%	96	96	96	96	96	96	96	96

• Included: Power regulation-CH pump service-HUW pump service
 Optdonally: Lamda sonde-Roomtemperature sensor-weather automatics

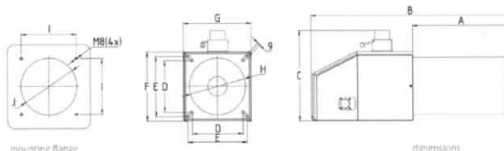
Revo - Line are innovative products on the global market. Their breakthrough technology is about highly advanced rotating combustion chamber. Apart from high burning efficiency, reaching up to 99%, this unique solution of so called rotary burner ensures permanent self - cleaning from dust collecting in the process of combustion. In the Revo - Line we implemented the system of fast firing - up. Similarly to X - Line, firing - up, cleaning, flame control and start after voltage loss are done automatically. Fuels which can be used are: agri - pellet, wooden pellet of low quality, pits and oat.



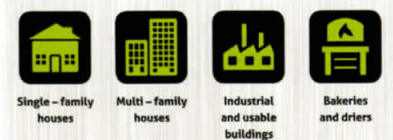
Burner type	D	A	B	C
Pellas X Mini REVO	Ø135	Ø129	193	421
Pellas X Mini 35 REVO	Ø145	Ø140	215	441



Burner type	D	A	B	C
Pellas X 44 REVO	Ø173	250	619	Ø169
Pellas X 70 REVO	Ø173	285	654	Ø169



Burner type	I	J	A	B	C	D	E	F	G	H
Pellas X 100 REVO	Ø210	Ø210	285	654	323	185	215	248	247	Ø204
Pellas X 120 REVO	Ø210	Ø210	355	724	323	185	215	248	247	Ø204
Pellas X 150 REVO	Ø227	Ø225	355	783	387	212	242	315	298	Ø219



Pellet Combustion Technology

Pellet Burner with automatic mechanical cleaning system

APPLICATIONS:

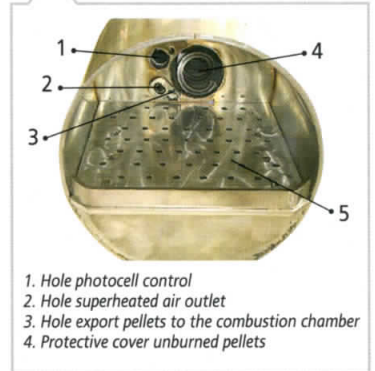
- Houses
- Greenhouses
- Manufacturers
- Bakeries
- Dryers
- Hotels
- Swimming pools
- Industry



ECOSTAHL- BIOSTAHL series TLA and SMB



TLA Burner-ECOSTAHL



1. Hole photocell control
2. Hole superheated air outlet
3. Hole export pellets to the combustion chamber
4. Protective cover unburned pellets

Pellet Burner ECOSTAHL - BIOSTAHL

It is a product of modern design and of advanced structure made of fireproof materials. Its operation is based on fuel supply controlling through the feeding screw and fan, achieving stoichiometric combustion with high performance and low emissions of CO and NOx. The control panel which is incorporated to the burner ensures the smooth and safe operation of the heating system

FEEDING DEVICE

It consists of a screw (Ø70x1500), a tube, the gearmotor and the connection spiral. The motor is controlled by the electronic control panel that regulates the operating time depending on the demand.



Automatic cleaning without extra equipment (compressors - solenoid)

including:

- > Feeder pellet
- > Flange and spiral binding
- > Electronic control panel automatic
- > Cleaning mechanism



Horizontal flame

Technical characteristics of pellet burners ECOSTAHL TLA / BIOSTAHL - SMB

Burner Type	units	TLA-SMB 30	TLA-SMB 40	TLA-SMB 50	TLA-SMB 60	TLA-SMB 70	TLA-SMB 100	TLA-SMB 160	TLA-SMB 230	
Power	(kW)	30	40	50	60	70	100	160	230	
Fuel	(mm)	Wood Pellet / 6-8								
Auto Ignition resistance	(W)	Electrical / 700								
Electric supply	(V/Hz/A)	230 / 50 / 3					230 / 50 / 5		230 / 50 / 7	
Pellet consumption	(kg/h)	1,8 - 5,3	1,8 - 7,5	2 - 10	2,2 - 12	2,4 - 14	10 - 20	15 - 30	25 - 45	
Max. electrical consumption	(W)	25 - 40	25 - 50	30 - 60	30 - 70	40 - 80	40 - 80	45 - 80	50 - 90	
Chimney draught	(mpa)	20	20	20	20	20	20	20	20	
Dimensions	Length TLA-SMB	680/570	690/570	700/693	710/693	720/693	750/833	800/963	950/963	
	Width TLA-SMB	215/230	215/230	215/230	215/230	215/230	215/280	215/340	315/340	
	Height TLA-SMB	310/330	310/330	310/330	310/330	310/330	310/370	310/370	340/370	
	Neck adjustment in boiler TLA	(mm)	Ø102 (boiler hole)					Ø130		Ø150
Weight TLA-SMB	(kg)	16/22	17/22	19/24	22 / 24	24 / 26	28 / 34	32 / 46	35 / 46	



SMB burners BIOSTAHL



• The above data is indicative and may change without warning, if it is required by new improvements.

Technical characteristics of pellet

Length	1 - 3 cm
Diameter	0,6 cm ñ 0,8 cm
Humidity	<10%
Ashes	<0,5%
Calories	4.500 kcal/kg
Density	650 kg/m³
Compression	1,12 kg/dm³

2kg pellets ≈ 1lt oil ≈ 1m³ Natural Gas
 1 kg pellets ≈ 4,9 kWh
 1m³ pellets ≈ 700kg
 1000kg pellets ≈ 1,4m³



Advice:
 > Fill a glass of water with pellet. If they sink, then the pellet quality is perfect.

Blinkers



... in harmony with mother nature

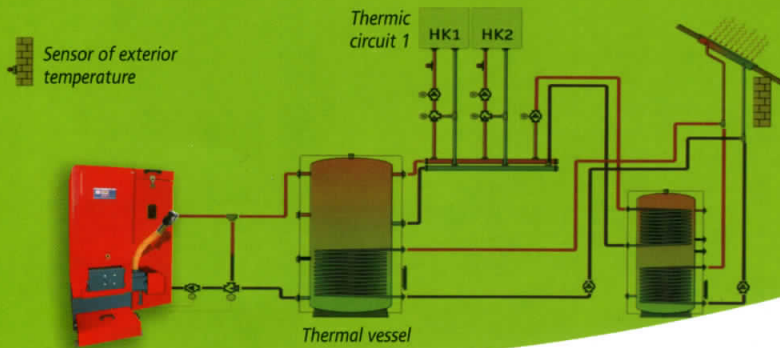
The perfect combination

- Heating system and Domestic Hot Water

All devices cooperate perfectly together and offer high efficiency, eco-friendly performance, reliability, comfort and safety. They combine different energy sources (biomass, oil, solar energy) in order to save energy and reduce the emissions.



Solid-fuel-boilers' installation scheme



Modern Technology Equipment



Illustrations shown here are given by way of example and are not binding.



Factory 1



Factory 2

1962-2018

56 years of action and energy efficiency



thermostahl
GROUP OF COMPANIES

Since 1962

THERMOSTAHL SOLAR L.T.D.

HEATING AND SOLAR SYSTEMS

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