

ESB-R28 28KW BIOMASS GASIFIER



TURNING WASTE INTO WATTS



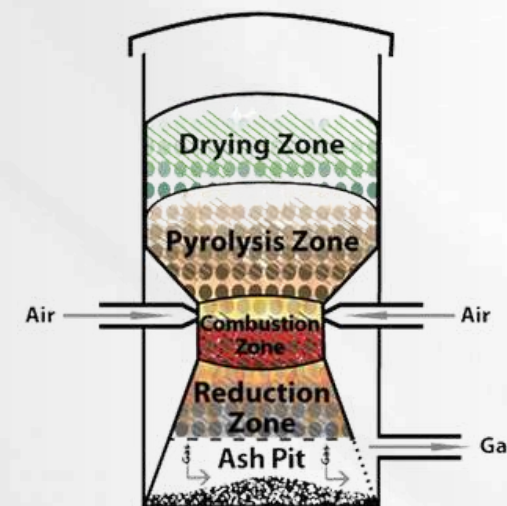
FROM FIELD TO FUEL



ESB-R28 BIOMASS GASIFIER DESIGN

The **ESB-R28** is a **28kW biomass gasifier**, compact, reliable, and easy to operate. It efficiently converts biomass into clean energy, making it ideal for small-scale power needs. With **low maintenance and high efficiency**, it ensures cost-effective and eco-friendly operation. Suitable for remote areas, farms, and small businesses, it supports various biomass fuels. The ESB-R28 is a sustainable and dependable power solution.

- Simple design.
- Low tar contents as most of the tar is burnt in combustion zone.
- Best option for usage in gas engines.
- At lower loads, fewer particles in the gas.



ENERSOL BIPOWER PVT LTD

Founded in 2013 by **Mr. Rai Singh Dahiya**, a pioneer in **biomass gasifier technology**, our company specializes in **small-scale biomass gasifiers, smokeless biomass stoves, and renewable energy solutions**. Committed to **sustainability and innovation**, we provide efficient, eco-friendly, and reliable energy products. Our expertise in **biomass technology** has established us as a leader in the **renewable energy sector**.



KEY FEATURES OF ESB-R28

ESB-R28 28KW biomass gasifier has some unique features which makes it advantageous than other available models in the market. Some of them are listed below:

- ✓ **Compact & Reliable** – Designed for easy installation and consistent performance.
- ✓ **High Efficiency** – Optimized fuel utilization for maximum energy output.
- ✓ **Eco-Friendly** – Uses biomass to produce clean and sustainable energy.
- ✓ **User-Friendly Operation** – Simple controls requiring minimal technical expertise.
- ✓ **Low Maintenance** – Durable construction with reduced servicing needs.
- ✓ **Versatile Fuel Compatibility** – Supports various biomass fuels like wood chips, pellets, and agricultural waste.
- ✓ **Ideal for Small-Scale Applications** – Perfect for farms, remote areas, and small businesses.
- ✓ **Sustainable Energy Source** – Uses biomass, a renewable and eco-friendly fuel.
- ✓ **Reliable Power Supply** – Ensures consistent energy generation for various needs.



Most reliable & rugged system



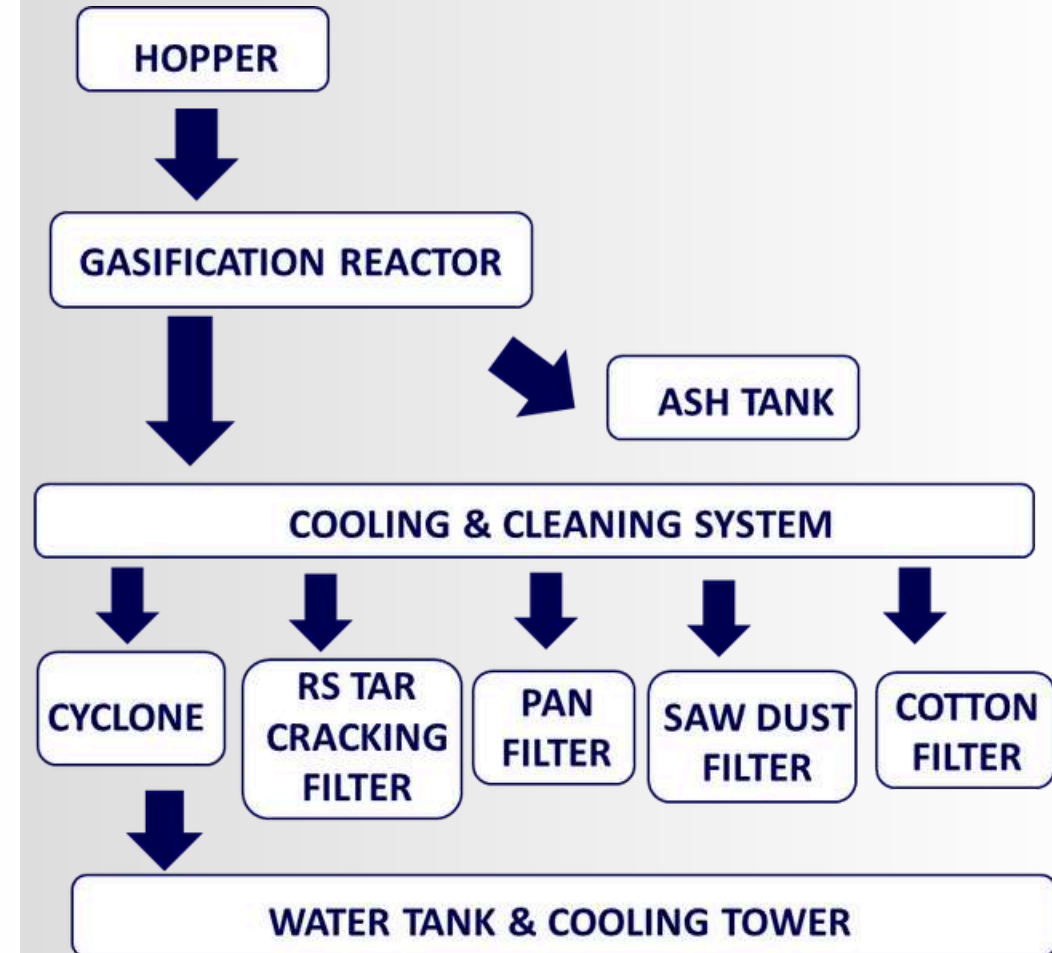
Compact system



Accepts all kind of biomass



BASIC STEPS INVOLVED



WORKING PARAMETERS

- ✓ ESB-R Biomass Gasifier can operate at any type of agricultural or forest waste residues with limited moisture in feedstock. To know more about acceptable feedstock, kindly refer the “ESB-R Biomass Gasifier Catalogue” enclosed with this quotation.
- ✓ The gasifier works with producer gas which is basically manufactured ‘ON-LINE’.
- ✓ Clean all the filters and do the required maintenance on time for better performance of gasifier.
- ✓ Since Gasifier being a new technology equipment, we advise clients to get properly acquainted with all operational aspects & optional items of Gasifier like biomass characteristic (recommended moisture level, its bulk density, size etc.) as well as suitability of optional items like wood dryer, wood cutter etc. and any other associated accessories.

TECHNICAL SPECIFICATIONS

Model Name
ESB-R
Bio-28

Model No.
ESB-R28

Auxiliary Power
3.5HP

Weight
3-3.5Ton

Dimension (Genset)
L8feet
W4feet
H6feet

Dimension (Gasifier)
L18feet
W15feet
H20feet



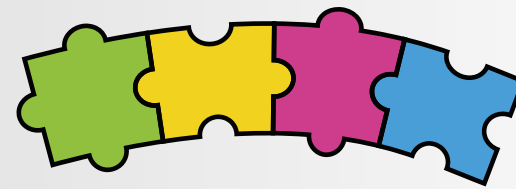
BASIC PARAMETERS

Brand	-	Energol Biopower®
✓ Type of Gasifier	-	Downdraft
✓ Fuel	-	100% Biomass
✓ Manpower Required	-	1nos
✓ Auxiliary Power Details	-	Vibrator Motor, Cooling Fan, Water Pump, Distillation tank pump, Gearbox RS filter pump,



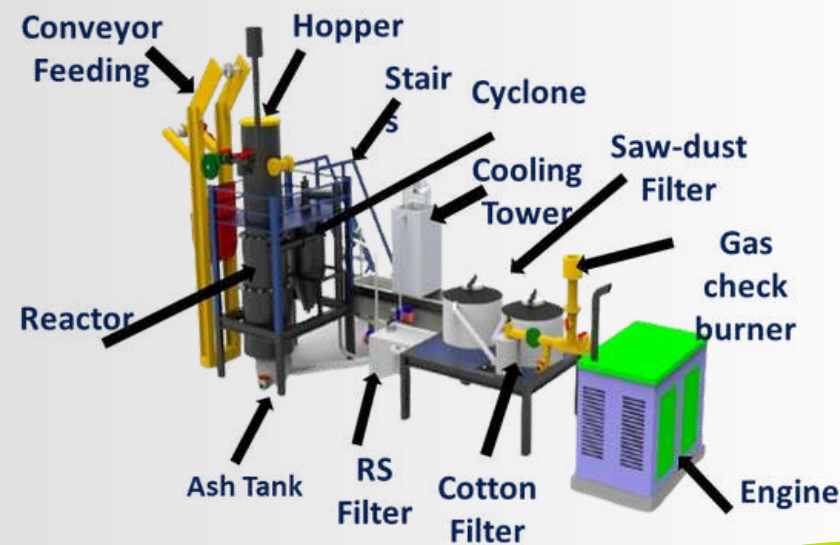
BASIC PARAMETERS

PARTICULAR	DESCRIPTION
✓ Start-up	- Automatic ignition
✓ Biomass feeding system	- Manual / automatic
✓ Feeding Frequency	- Every 1.5-2 hrs.
✓ Ash removal system	- Manual
✓ Frequency of removing ash	- Every 1.5-2hrs.
✓ Biomass consumption an hr.	- up to 42kg/hr.
✓ Acceptable biomass size	- 2 X 2"
✓ Acceptable moisture content	- less than 20%
✓ Ash content	- up to 5-10%



ESB-R28 BIOMASS GASIFIER PARTS

PARTS NAME	MADE OF
✓ Hopper	- Mild Steel (MS Sheet)
✓ Reduction chamber	- Stainless Steel (SS Sheet) & Ceramic bricks
✓ Ash storage tank	- Mild Steel (MS Sheet)
✓ Ash removal tank	- Mild Steel (MS Sheet)
✓ Cyclone	- Mild Steel (MS Sheet)
✓ Scrubber	- Stainless Steel (SS Sheet)
✓ RS Filter to remove tar	- Mild Steel (MS Sheet) & Stainless Steel (SS Sheet)
✓ Distillation tank	- Stainless Steel (SS Sheet)
✓ Saw-dust filter	- Stainless Steel (SS Sheet)
✓ Pan filter	- Stainless Steel (SS Sheet)
✓ Water tank	- Mild Steel (MS Sheet)
✓ Cooling tower	- Aluminum sheet with PVC fills
✓ Cotton filter	- Stainless Steel (SS Sheet)



TECHNICAL SPECIFICATIONS

PARTICULAR	DETAILS
✓ Gas in 1 kg wood with 15% moisture	- up to 2NM ³
✓ Wood Calorific Value	- 2100K-2500kcal/kg
✓ Bulk density	- 200kg/m ³
✓ Biomass consumption kg/kw/hr.	- 1.4 ± 0.2
✓ Char generation	- 5-25%





GAS COMPOSITION

Carbon monoxide (CO)
21.4%

Hydrogen (H₂) - 18.9%

Nitrogen (N₂) - 46%

Methane (CH₄) - 3.4%

Carbon dioxide (CO₂) - 10.2%

FILTER CLEANING

FILTER NAME	CLEANING TIME	REMARK
✓ Cyclone	Every 40-50 hrs.	Ash to be removed
✓ Scrubber filter	Every 25-30 hrs.	To be checked
✓ Saw-dust filter	Every 80-100 hrs.	Replace sawdust /coconut husk etc.
✓ Distillation tank	Every 2-3hrs.	Extra water need to be removed
✓ Pan filter	Every 80-100 hrs.	To be cleaned
✓ Cotton filter	Every 80-100 hrs.	Replace cotton fabric
✓ Water tank capacity	700-800ltrs. Approx.	
✓ Water level	Need to maintain minimum 75% water level all the time	



BIOMASS GASIFIER OUTPUT

PARTICULAR	- DETAILS
✓ Biomass consumption	- up to 42kg/hr.
✓ Gas Flow (NM ³ /hr.)	- 84NM ³
✓ Peak Rated Thermal Output	- 88,200Kcal - 1,05,000Kcal/hr.
✓ Continuous Duty Rated Thermal Output (80%)	- 70,500Kcal- 84,000Kcal/hr.
✓ Average Gas Calorific Value (Kcal/Nm ³)	- ≥1,100
✓ Gasification Temperature	- 1050 – 1100°C
✓ Temperature of Gas at Gasifier Outlet (°C)	- 300 to 500°C
✓ Indicative Gasification Efficiency (Hot gas mode)	- >85%
✓ Indicative Gasification Efficiency (Cold gas mode)	- >75%
✓ Turn Down Ratio	- Not less than 50% of rated capacity



PRODUCER GAS GENSET SPECIFICATIONS

Model Name
ESB-R
BIO-GEN28

Model No.
ESB-RBG28

Capacity
35KVA
(28KW)

Producer gas Consumption
84M³ /hr.

Ignition System
Spark Ignition

Battery
Exide



PARAMETERS	DESCRIPTION
✓ Make	- Energol Biopower®
✓ Fuel mode	- 100% producer gas
✓ Power factor	- 0.8 P.F.
✓ Starter	- 12V starter
✓ Frequency (Hz)	- 50Hz
✓ Voltage (V)	- 415v
✓ Phase	- Three
✓ Rated current (amps/phase)	- 45 Amps at 100% 36 Amps at 80%
✓ Governor	- Mechanical / Electronic
✓ Acoustic enclosure (Soundproof canopy)	- Provided

PARAMETERS	DESCRIPTION
✓ Stroke	- Four stroke engine
✓ Bore x stroke(mm)	- 107 x 120
✓ Rated speed	- 1500RPM
✓ Cooling system	- Water cooled radiator
✓ Number of cylinder	- 6nos.
✓ Lube oil sump capacity	- 18ltrs.
✓ Lube oil change period	- 1 st change:50-80hrs. 2 nd change: 150-200hrs. Subsequent changes: every 250-300hrs.
✓ Alternator	- Energol Biopower® / Kirloskar / Mahindra etc.

CONTROL PANEL DETAILS

PARAMETERS	DETAILS
✓ Control pressure gauge	- Yes
✓ Water temperature gauge	- Yes
✓ Starting switch	- Yes
✓ Hour meter	- Yes
✓ Multi meter (Energy, Voltage, Amps, & Frequency indicator)	- Yes
✓ Phase indicator lamp	- Yes
✓ Overload relay contractor	- Yes
✓ Voltage low/high cutoff protection	- Yes
✓ Frequency low/high cutoff protection	- Yes
✓ Phase loss protection	- Yes
✓ Battery charging indicator	- Yes





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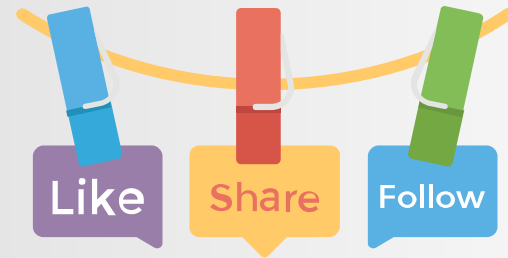


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