



ENERSOL BIOPOWER PVT LTD

Established in 2013 by Mr. Rai Singh Dahiya, a grassroots innovator in biomass gasifier technology, our company is renowned for its small-size biomass gasifiers, smokeless biomass stoves, and other renewable energy products.



TURNING WASTE INTO WATTS FROM FIELD TO FUEL

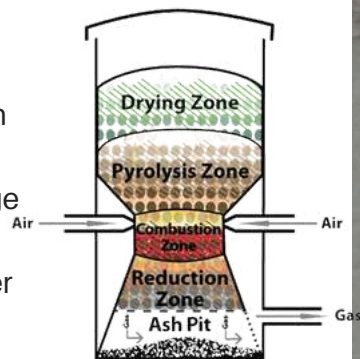
2KVA ESB-R BIOMASS GASIFIER

Specially designed for Research Institutes

The ESB-R02 2kVA biomass gasifier is ideal for research institutes and catering to small-scale electricity requirements. Featuring patented technology, the ESB-R02 biomass gasifier is designed to be compact, user-friendly, and low maintenance, making it a convenient solution for various applications.

ESB-R 2KVA GASIFIER DESIGN

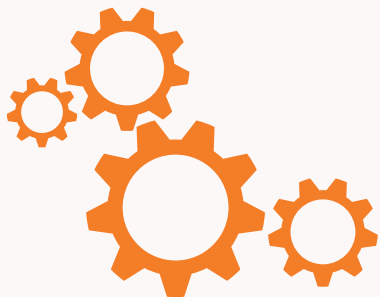
- Simple design.
- Low tar contents as most of the tar is burnt in combustion zone.
- Best option for usage in gas engines.
- At lower loads, fewer particles in the gas.



KEY FEATURES OF ESB-R02

ESB-R02 2KVA biomass gasifier has some unique features which makes it advantageous than other available models in the market. Some of them are listed below:

- ✓ Most suitable for research institutions.
- ✓ Smallest, portable, and soundproof gasifier system.
- ✓ Maximum atomization with automatic initial firing.
- ✓ Accessible to both urban and rural communities.
- ✓ Utilizes dry filtration, eliminating the need for water and costly purification plants.
- ✓ Reliable, rugged, and compact design and costly purification plants.
- ✓ Low maintenance and easy operation.



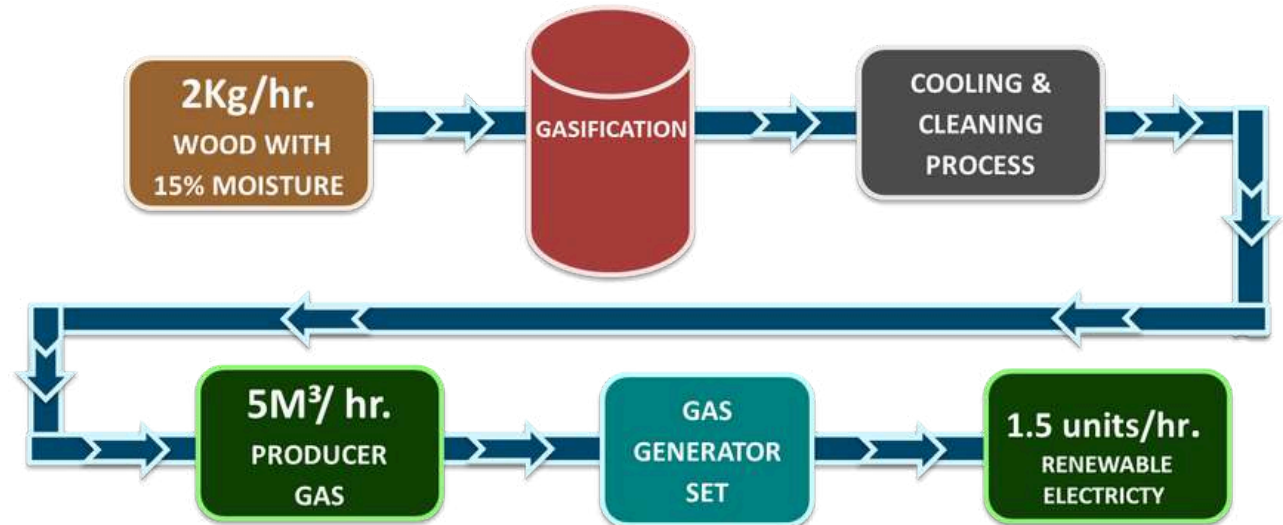
WORKING PARAMETERS

- ✓ 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



TECHNICAL DETAILS OF ESB-R MINI02

BASIC PARAMETERS

Parameter	-	Detail
✓ Brand name	-	Enersol Biopower®
✓ Model name	-	ESB-R Mini02
✓ Model no.	-	ESB-R02
✓ Capacity	-	2KVA (1.5KW)
✓ Gasifier type	-	Downdraft Gasifier
✓ Accepted fuel	-	100% Biomass
✓ Accepted moisture in biomass	-	Less than 20%
✓ Auxiliary Power Details	-	Cooling fan Vibrator motor Water pump Distillation Pump

Parameter	-	Detail
✓ Gas in 1kg 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 kgs/kw-hr.
✓ Char generation	-	5-7%

BIOMASS GASIFIER OUTPUT

Parameter	-	Detail
✓ Biomass consumption	-	up to 2.10kg/hr.
✓ Gas Flow (NM ³ /hr.)	-	4.20NM ³
✓ Peak Rated Thermal Output	-	4,410Kcal - 5,250Kcal/hr.
✓ Continuous Duty Rated Thermal Output (80%)	-	3,530-4,200Kcal/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

BIOMASS FEEDING SYSTEM

PARAMETER	-	DETAIL
✓ Start-up	-	Manual
✓ Biomass feeding system	-	Manual Feeding
✓ Feeding Frequency	-	Every 1.5-2 hrs.
✓ Ash removal system	-	Manual Feeding
✓ Frequency of removing ash	-	Every 2-3hrs.
✓ Biomass consumption an hr.	-	up to 2.10kg/hr.
✓ Acceptable biomass size	-	1-2cm
✓ Acceptable moisture content	-	less than 20%
✓ Ash content	-	up to 5-10%



BIOMASS GASIFIER COMPONENTS & BIULD MATERIALS

PARAMETER	-	DETAIL
✓ 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)
✓ 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)

FILTER MAINTENANCE

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	20 ltr. Approx.	
✓ Water level	Need to maintain minimum 75% water level all the time	



ESB-R 2KVA PRODUCER GAS GENERATOR

TYPICAL GAS COMPOSITION

GAS NAME	AVERAGE PERCENTAGE	IN ESB-R Mini02
✓ Carbon dioxide (CO ₂)	10-15%	10.2%
✓ Hydrogen (H ₂)	15-20%	18.9%
✓ Carbon monoxide (CO)	20-25%	21.4%
✓ Methane (CH ₄)	2-5%	3.4%
✓ Nitrogen (N ₂)	40-50%	46%

PARAMETER	DETAIL
✓ Dimension	- L3 x H3 x W2.5 (In feet)
✓ Weight	- 120kg approx.



PRODUCER GAS GENSET DETAILS

PARAMETER	DETAIL
✓ Make	- Enersol Biopower®
✓ Fuel mode	- 100% producer gas
✓ Capacity	- 2KVA/ 1.5KW
✓ Power factor	- 0.8 P.F.
✓ Number of cylinder	- Single cylinder
✓ Phase	- Single phase
✓ Rated current	- 6amps (single phase)
✓ Bore x stroke	- 70 x 54mm
✓ Voltage	- 220V
✓ Frequency	- 50Hz
✓ Max RPM	- 3300RPM
✓ Lubrication system	- Dura-lube splash lubrication
✓ Lube oil capacity	- 0.60ltrs
✓ Governor	- Mechanical
✓ Control panel	- Basic control panel



GASIFIER PICTURES



CONNECT US ON YOUTUBE



- <https://www.youtube.com/watch?v=OD9ueNYjf1Q>
- <https://www.youtube.com/watch?v=pbSpC4cl8GI>
- https://www.youtube.com/watch?v=_Ee0_gxwpGc&t=31s
- <https://www.youtube.com/watch?v=fjULT8k4Ayg>
- <https://www.youtube.com/watch?v=fjULT8k4Ayg>
- <https://www.youtube.com/shorts/pSmLx4dQAoQ>
- <https://www.youtube.com/watch?v=-XmU5L6lytM>
- <https://www.youtube.com/watch?v=2jYnwcBU1lk>
- <https://www.youtube.com/watch?v=LKDlbvXdHyM>
- <https://www.youtube.com/watch?v=7MVHph7NfkY>

AWARDS & EXHIBITIONS



OUR PRESTIGIOUS PARTNERS



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www.enersolbiopower.com
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