Kirloskar Green Gensets

Enriching Lives

R Series

Liquid Cooled Silent Gensets

20 to 82.5 kVA

Salient Features of Genset

■ **Customized Product Range**
- Ready to use gensets in R Series are available in the range from 20 to 82.5 kVA.
- R Series gensets are powered by most efficient liquid cooled engines.
- Custom built to ensure your exact power needs.
- Synchronization option available with electronic governing for running the R Series gensets in parallel operation to ensure optimum usage of generator sets capacity in varying load patterns.

■ **Smart Aesthetics**
- State - of - the - art competitive design.
- Compact in size with smaller footprint – saves money on installation / space.
- Aesthetically superior and fully integrated weather proof acoustic enclosure.
- Dynamic design with highest quality workmanship acoustics with PU based UV resistant powder coating for superior finish and durability.

■ **Highest Reliability**
- Superior reliability ensuring un-interrupted, continuous quality power for smooth operation.
- Electronic governor with isochronous and synchronous governing for reliable, stable and paralleling operations as optional feature.
- Exceedingly rugged and durable design.
- Lowest lifecycle cost of ownership.
- Safety against operation on low lub oil, high coolant temperature, over speed, low fuel level, weak battery, low voltage, over load and high frequency.
- State - of - the - art technology for trouble free operations in low / high ambient temperature, high humidity and high altitudes.
- State - of - the - art – compact – Micro-processor based fully configurable genset controller with LCD display, events logging and optional AMF feature.

■ **Unmatched Performance**
- Low fuel and lub oil consumption ensuring excellent fuel economy and lowest operating cost.
- Low noise and vibration levels.
- High fuel efficiency at part operating loads.
- Long operating life K-cool super plus coolant for better engine cooling/ corrosion free coolant galleries.
- K-oil Super for best lubrication performance and engine life.

■ **Environment Friendly**
- The power to preserve, save environment and the earth – Kirloskar Green Power Ideas.
- Gensets conforms to lowest noise pollution norms as laid down by MOEF / CPCB.
- Genset Engine conforms with the latest stringent MOEF exhaust emission norms and international emission standards.
- 100% Bio-diesel compatibility with 100% power option.

■ **Maintenance friendly design and Ease of Operation**
- Ready to use – connect, distribute and use product.
- Dynamic, high performance and weather proof modular design ensuring lowest maintenance cost.
- Easy serviceability for routine, preventive, predictive maintenance, replacement and overhauls.
- Ensures longer maintenance intervals in its class.
- Easy availability of spare parts and wide spread service network across the Nation.
- Minimum cost for maintenance, spares & services, ensuring lowest operating cost.
- Smart genset control system for closely monitoring, metering and protection of the engine and genset performance.
- Competitive Annual Maintenance Contracts through Nationwide network of authorised service dealerships.
- Close looped Nationwide CRM network for before in time services.
- Single window services for complete genset.
- Pan India single point AMC options.

KIRLOSKAR GREEN POWER IDEAS

R Series

Kirloskar Green Gensets

Standard Features

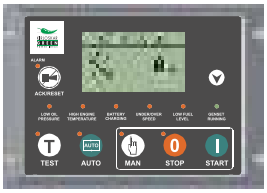
■ Engine

- Efficient liquid cooled technology
- Offering a comprehensive range with power output range covering from 20 to 82.5 kVA
- 2, 3 and 4 cylinder compact configurations
- Most compact, extremely robust and rugged design
- 500 Hours of longer lub-oil change period
- Lowest fuel consumption in it's class
- Complies with latest emission norms of MOEF
- 100% Bio-diesel compatibility option with 100% power for lower emission

■ Alternator

- Most efficient, CE certified Kirloskar Green Alternator
- Compact design with sealed bearings for longer life and lesser maintenance
- Best in class efficiency
- Positive voltage build-up
- Special windings to reduce harmonics
- Electronic AVR
- High short circuit current capacity up to 300%, ensuring controlled regulation even at variable loads
- Well balanced rotating components and lowest vibration levels
- Epoxy gel coating to suit various environment conditions
- CT fitted alternators as option for better performance and safety

■ KG 934 Genset Controller



- State - of - the - art, compact Micro-processor based fully configurable genset operating, monitoring, metering and protection control system with LCD display
- Complete safety for gensets on operating faults
- Real time and event logging facility for performance monitoring
- AMF option in the controller with control for Mains and DG Set circuit breakers
- User friendly operating systems on manual, auto and test modes with soft touch buttons
- Provision for additional digital inputs and digital outputs
- Compatibility for remote monitoring, remote start-stop and BMS options

■ Acoustic Enclosure

- Smart, standardized and dynamic Kirloskar Green Power Ideas modular design for optimum performance and ease of serviceability
- Aesthetically designed weather proof, sound proof acoustic enclosure meeting stringent and latest MOEF noise pollution norms
- PU Based powder-coated enclosure, manufactured on high-tech special purpose CNC machines to ensure highest quality on fit-form-finish-function and durability
- Specially designed with adequate air flow to operate at full load, even at 50 deg. C air inlet temperature
- Noise and thermal Insulation material conforms to UL94, HF1 class for flammability
- Green passivated / black ionized corrosion / rust resistant hardware for manufacturing to withstand salt Spray and corrosion test as per ASTM B-117
- Designed for low noise, high reliability, lowest vibrations and user friendly ready to use installations

■ Optionals

- Remote start, remote monitoring and BMS
- Auto mains failure panel
- Cold starting aid
- Synchronization and parallel operations of multiple gensets
- Bio-diesel compatibility
- Special air filtration system for dusty atmosphere
- Facility for external agency inspection as per custom and IS standards
- PMG for non-linear load conditions
- Power house design support with load pattern study

Overall Specifications of R Series Genset

Range 20 to 82.5 kVA

DG Set Specifications

Parameters	Unit	Genset Model						
		KG20WS4	KG25WS5	KG30WS	KG40WS	KG50WS	KG62.5WS2	KG82.5WS2
Prime Rating at 0.8 pf	kVA (kW)	20 (16)	25 (20)	30 (24)	40 (32)	50 (40)	62.5 (50)	82.5 (66)
Voltage	V	415	415	415	415	415	415	415
Frequency	Hz	50	50	50	50	50	50	50
Overall Dimensions with canopy (L x W x H)	mm	2050 × 950 × 1220	2380 × 950 × 1230	2380 × 950 × 1230	2650 × 1050 × 1605	3350 × 1190 × 1650	3240 × 1140 × 1585	3240 × 1140 × 1585
Dry Weight of genset with canopy (Aprox)	kg.	925	1100	1250	1520	1500	1900	1950
Electrical starting system	Volt-DC	12 V	12 V	12 V	12 V	12 V	12 V	12 V
Battery Capacity	Ah	1 x 88	1 x 88	1 x 88	1 x 100	1 x 100	1 x 100	1 x 100
DG set Noise level as per CPCB Norms	dBA	< 75	< 75	< 75	< 75	< 75	< 75	< 75

Engine Specifications

Parameters	Unit	Engine Model						
		2R1040	3R1040	3R1040	4R1040	4R1190	4R1040T	4R1040TA
Rated output (Prime rating as per ISO 3046)	kW (hp)	20.6 (27)	30.9 (42)	30.9 (42)	41.2 (56.1)	45.6 (62)	61 (83)	77.2 (105)
No. of cylinder	Nos.	2	3	3	4	4	4	4
Bore × Stroke	mm	105×120	105×120	105×120	105×120	110×125	105×120	105×120
Aspiration		NA	NA	NA	NA	NA	T	TA
Governing Class as per ISO 3046		M3	M3	M3	M3	M3	M3	M3
SFC at 75% load*	(g/Hp-hr)	157	157	157	155	156	156	150
SFC at 100% load*	(g/Hp-hr)	174.9	158	158	155	153	155	151
Lub oil Consumption*	LPH	0.015	0.015	0.015	0.035	0.035	0.04	0.05
Lub oil change period**	hrs	500	500	500	500	500	500	500
Lub oil Sump capacity	Ltrs	4.5	7.5	7.5	9.5	9.5	9.5	9.5
Engine coolant capacity	Ltrs	10	12	12	18	18	24	24

Alternator Specifications

Parameters	Unit	Alternator Model						
		KG 184A	KG 184B	KG 184C	KG 184E	KG 204D	KG 224A	KG 224D
Rating	kVA	20	25	30	40	50	62.5	82.5
Insulation Class		H	H	H	H	H	H	H
Protection		IP23	IP23	IP23	IP23	IP23	IP23	IP23
Time to built up rated voltage at rated RPM	sec	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
Alternator Efficiency at 75% load	%	88.5	89.8	90.5	90.8	90.8	91.8	92.5
Alternator Efficiency at 100% load	%	87.1	88.8	89	89.2	89.7	91	91.4
Voltage Regulation	%	1% with 4% Engine Governing	1% with 4% Engine Governing	1% with 4% Engine Governing	1% with 4% Engine Governing	1% with 4% Engine Governing	1% with 4% Engine Governing	1% with 4% Engine Governing
Wave form Distortion at No load & at Non-distorting balance linear Load	%	< 1.8 & < 4	< 1.8 & < 4	< 1.8 & < 4	< 1.8 & < 4	< 1.8 & < 4	< 1.8 & < 4	< 1.8 & < 4
Permissible transient voltage dip at full load 0.8 pf lag***	%	< 18	< 18	< 18	< 18	< 18	< 18	< 18

In view of continuous product updation and design changes, all above specifications and dimensions are subject to change without prior notice.

Notes :

- Genset ratings as per ISO 8528 performance class is G2.
- Prime Power Rating is the maximum power available continuously for a variable electrical load for unlimited number of hours per year under standard operating conditions.
- For the site conditions other than standard operating conditions, consult KOEL for available prime power.
- *+5 % tolerance as per ISO 3046. For LPH calculation specific gravity of diesel is considered as 0.845.
- All canopy dimensions have tolerance of ± 50 mm.
- ** First oil change at 50 hours.
- Single phase genset option available upto 40 kVA.
- ***Permissible transient % voltage dip at full load 0.8 pf lag (alternator tested alone) as per IS 4722.

SCOPE OF SUPPLY:

Factory assembled DG Set comprising of "KOEL GREEN" make above model Diesel Engine directly coupled to "KIRLOSKAR GREEN" make Alternator mounted on Common Base Frame, Complete with Standard Control Panel, Fuel Tank, Battery with Leads, AVM Pads and Acoustic Enclosure [C A N O P Y] as per CPCB Norms & along with First fill of K-Oil & K-Cool.

WARRANTY	**The Warranty of the offered DG Set is applicable as per KOEL Policy. However The DG Set comprising of Engine & Alternator carries a warranty against defective material Manufacturing defects for a period of 24 months from the date of supply or 5000Hrs whichever occurs earlier. The terms of KOEL warranty policy will have precedence under all circumstances & the Warrantee Will Be applicable if customer sources K-Oil K-Cool and avail the services from authorized service dealers**
INSURANCE	Extra at cost, if required.
Note	If the order is cancelled after one month, for whatever reason may be the advance amount will not be refunded

INSTALLATION

Unloading of "D G" and installation work like Exhaust Piping, Earthing, Cabling, Change Over Switch initial Battery Charging, Diesel Oil has to be arranged by Customer.

COMMISSIONING

Commissioning of DG Set shall be done by our service engineer

- **After First Oil Change Next LUB Oil Change Period is 500 hrs/3 Months whichever is earlier**
- **Free 1+ 3 Service Check (CSP Check) as per KOEL Policy**

SALIENT FEATURES OF KOEL GREEN DG SETS

- Low ownership costs due to competitive upfront investment, optimal fuel and Lube Oil & Parts consumption.
- The best Lube oil Change interval in its class.
- Diesel Engines meeting the CPCB norms for emission.
- Branded Sound Proof Enclosures with standard warranty & serviced by Company service dealer
- The only DG set brand to offer consistent deliverables (All DG Plants & most Service Dealers are ISO 9001 certified.
- The most extensive After Sales Service Network rated the best in the industry (according to a survey* conducted by AC neilsen) with:

  - Complement of trained engineers
  - Easy parts availability with first pick at above 95% level.
  - Specially formulated Lube, the K-Oil for longer Change intervals.
  - Single Window Support for providing support Engine, Alternator and acoustic enclosure, another unique KGPI advantage.
  - Value added Service like Annual Maintenance Contracts, Stand-by DG Sets, Customer training program – to name a few.

- Industry best Warranty

** The Customer Satisfaction Survey conducted by AC Nielsen, an independent market research firm of international repute, has placed KOEL at the top of the charts consecutively for 2 years in a row. Our Customer Satisfaction Index (CSI) is one of the best in the world in manufacturing sector.*

Specification of KOEL GREEN Canopy

Acoustic Enclosure

KOEL GREEN Acoustic enclosure shall be powder coated and fabricated out of 16 SWG CRCA MS sheet. The silent canopy shall be of nut bolt type construction. Critical processes of punching are done on CNC machines to maintain dimensional accuracy of holes within 0.1 mm. Powder coating is done after seven-tank surface preparation process of sheet metal. Canopy panel and doors shall have inside lining of FIRE-RETARDANT foam as acoustic material up-to **200** KVA & rock wool for high ratings. Four hinged doors shall be provided to canopy, one door shall have glass window for control panel.

Base Frame

Base frame is fabricated either in ISMC channel or in sheet metal. The base frame will be primer coated and painted. The base frame is rugged n construction and designed for mounting KOEL
engine and KG alternator close coupled, with cross members mounted on AVM. The base frame shall have provision for mounting of acoustic enclosure & control panel on in it. The base frame is having provision of lifting hook for convenient lifting of complete set, i.e. along with canopy, engine and alternator.

Color scheme

The base plate and top is painted with OXFORD BLUE / PEPSI BLUE, the canopy is powder coated with IVORY color.

Performance Parameters

The sound level, when measured in green field condition (ISO 3744 OR 8528 PT 10) at 1-metre distance shall be less than 75 - DBA or as per CPCB norms.
The average stabilized hot air temperature rise with in the canopy is maintained within 7°C above ambient temperature.

KOEL GREEN SILENT CANOPY FEATURES

- RTU canopy kits, which can be assembled on site within a time period of 90 minutes.
- Canopy fabricated on imported machines with dimensional accuracy of 0.1 mm.
- Canopy is powder coated after passing through seven tank processes.
- Canopy is lined with acoustic foam / rock wool, which is non-igniting / Fire Retardant (confirming to BS 4375/BIS 7888).
- No grouting required on the ground, only a level surfaces capable of withstanding the DG weight.
- Designed for installation in open-air conditions.
- Lockable doors provided.
- Lockable fuel filling arrangement provided external to the canopy.
- Residential silencer.
- Externally accessible emergency stops button.
- The exhaust gases shall be taken out through a suitable flexible pipe to prevent any back pressure on the engine.

Exhaust System:

The exhaust system and noise suppressor shall be provided with thermal insulation by using fire retardant / non igniting foam conforming to BIS 7888/BS 4375 to prevent excess heat radiation on the engine and safe for operator.

Silencer:
Absorption type non-resistance Residential Silencer insulated from inside with glass wool shall be provided to suppress exhaust noise from the engine.

Wiring and Lighting:
PVC Copper wire concealed in flexible conduit with florescent tube light/bulb with MCB shall be provided.

Surface Treatment – Painting:
The enclosure surface shall be suitably treated for degreasing, derusting and phosphating. High quality powder coat treatment / paint shall be used.

Fuel Tank:
Fuel tank shall be fabricated out of 14SWG CRCA MS Sheet and is part of base frame. It is duly painted and fitted with inlet and outlet connections. Float gauge and fuel float switch is provided.
Kirloskar Brand Stickers with Green band as per Kirloskar design.
Canopy lights: One No. DC bulb to be fitted with suitable toggle switch and wiring.

Emergency Push Stop Button
The canopy shall have provision of emergency push button, which shall be housed in a protective enclosure with a glass front.

SPECIFICATION FOR STANDARD MANUAL CONTROL PANEL

SCOPE OF SUPPLY:

The standard control panel is fabricated from 16 SWG sheet and powder coated after seven tank treatment process. The panel is equipped with:

- (A) Digital Genset Control Unit
  Digital Control Unit Specially Designed to standardize most of control Panels components in Single Unit.

Salient Features of Controller

S. No	Display Parameters	Mechanical Safeties	Electrical Safeties
1	Engine Running Hours	Under / Over Speed	Under / Over Voltage
2	Lub. Oil Pressure	Low Lube Oil Pressure	Under / Over Frequency
3	Water Temperature Centigrade & Fahrenheit	High Engine Coolent temperature for liquid cooled engines	Phase Failure
4	Battery Voltage	High Cylinder Head temperature for Air cooled engines	Phase sequence reverse
5	Phase Voltage	Fan Belt failure for Air cooled Engine	Over Current
6	Line Current	Low coolant level for liquid cooled engines	Over KW
7	Frequency	Low fuel level (alarm)	-
8	Average Voltage	High canopy temperature	Battery Charging Failure
9	Average Current		Low Fuel Level
10	KW		
11	K Watt Hour Meter		
12	KVA		
13	KVAR		
14	Power Factor	Fuel Level in Liters	Number of Engine starts

(B) The Control Panel is equipped with MCB/MCCB of Suitable rating
(C) The Control Panel consist with CT, PT along with Aluminum bus bars & wires.

a). Set of Push Buttons

(a) Engine start/stop,
(b) Emergency Stop