

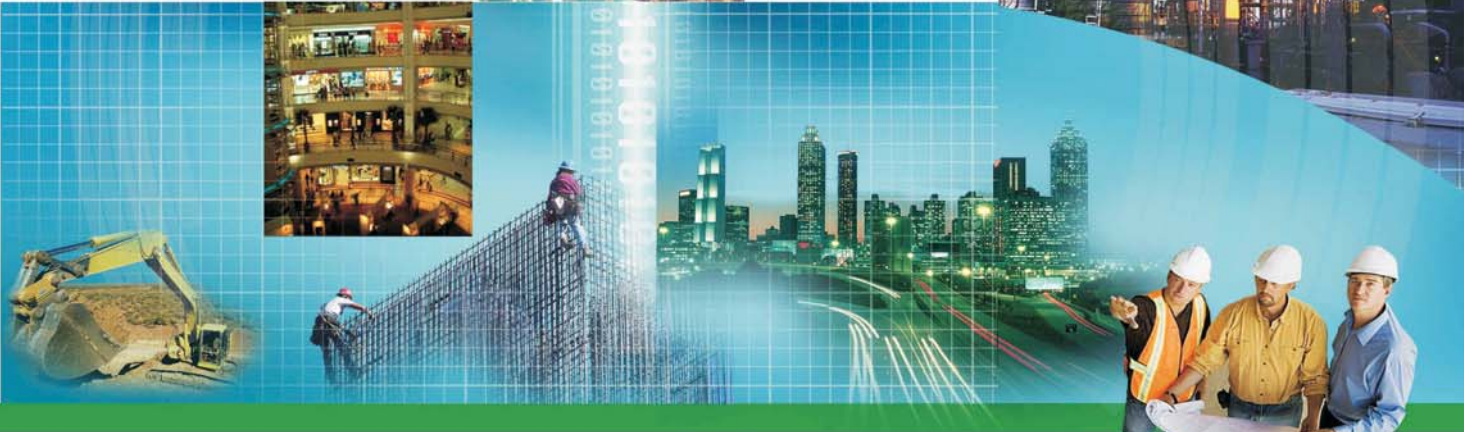


Enriching Lives

KIRLOSKAR GREEN POWER IDEAS

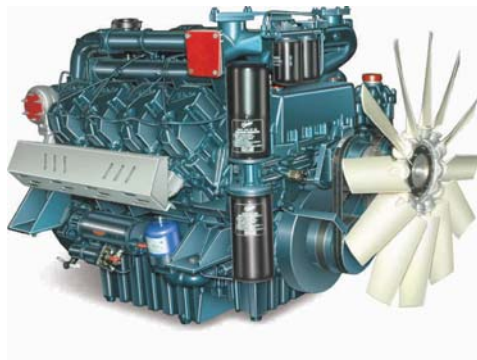
400 kVA DV8 POWERED GENSET

New 4 Valve HPCI Technology



KIRLOSKAR
GREEN
POWER IDEAS

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1. INTRODUCTION

Kirloskar Engines - The driving force

- The brand 'Kirloskar', a rich engineering heritage of over 120 years.
- Kirloskar Oil Engines Ltd is a part of India's premier engineering Kirloskar group, founded in 1946.
- India's largest & leading manufacturer of the widest range of Diesel Engines and applications (3 hp to 11000 hp).
- Kirloskar engines are available in both air cooled & liquid cooled versions.
- Annual engine volumes exceeding 2,30,000.
- Active population of over two million engines worldwide
- Sales exceeding Rs. 2100 cr.
- Dominant market presence in power generation, construction, earthmoving & material handling equipments.
- Our journey towards excellence :
 - ISO/TS 16949 since 2007 by ABS QE, Inc.
 - ISO 14001 certification for EMS systems, since 1999 by TUV NORD.
 - ISO 9001 certification for QMS since 1992 by ABS QE, Inc.
 - OHSAS 18001:2007 certification for Health, Safety & Environment since 2009 by PUV NORD
 - Awarded as 'best energy efficient unit ' by Govt of Maharashtra for Pune & Nashik plants.
 - CII Exim Business Excellence Award for Strong Commitment to Excel.

Kirloskar Green Gensets

- Kirloskar Green' Gensets are acknowledged market leaders in India with full range from 5 kVA to 625 kVA and 1.6 MW to 5.1 MW.
- More than 60,000 Gen-sets across the country provide stable and reliable power for the Indian Telecom Network.
- More than 15,000 Gen-sets deployed along the Indian Borders, supporting the Defence Organizations.
- Large number of Satisfied Customers from Manufacturing, Software, Construction, Infrastructure & Service sectors in 320 kVA to 625 kVA range.



2. PRODUCT SPECIFICATIONS

GENSET PARAMETERS		
Genset Model		KG 400WS
KVA Rating	kVA	400
KW Rating	kW	320
Voltage	V	415
Frequency	Hz	50
Phase		3
Power factor		0.8
Overall Dimensions of gen-set		
Length	mm	5700
Width	mm	2000
Height	mm	2570
Height including silencer	mm	3250
Approximate Dry Weight (with canopy)	Kg	6000
Rated speed	RPM	1500
Method of Starting		Electric (24V)
Fuel consumption at 75% load	Ltr/Hr	61.1*
Lube Oil Consumption % of fuel consumption	%	0.12*
Lube oil change period	Hrs	500
Alternator efficiency at 75% load	%	94.7
DG set Noise level at 1Mtr (with canopy)	dBA	<=75 as per CPCB
Overall thermal efficiency of engines/break thermal efficiency of engines at 100%load	%	43
Mechanical efficiency at 100% load	%	89

Note :

- * Considering Specific gravity of diesel as 0.845 (+5% tolerance applicable as per ISO 3046)
- * Genset Conforms to ISO 8528 standard

In view of continuous product up-gradation, above specifications are subject to change without prior notice



3. PRODUCT FEATURES

Engine Features

- Four valve technology & Central injection system makes 'DV8' the most fuel efficient engine in its class.
- Kirloskar 'DV8' engine is compliant to future emission norms of EU stage 2 level.
- Kirloskar 'DV8' engine can operate on 100 % bio-diesel giving 100 % power & lower emissions.
- Lower lub oil sump capacity as compared to others, lower maintenance cost.
- Enhanced oil change period of 500 Hrs.
- Coolant change after 4000 Hrs.
- Light weight & strong crankshaft material, gives better strength and increases the power train peak cylinder capability by 20 %.
- Gear cover & bell housing is a single piece design resulting in less leakage points & less torsional vibration.
- 'Belly Mounted' engine design reduces the vibrations and thus improves the reliability of engine.
- Most ideal for AMF application as well as for parallel operations.
- Provision of 'Auto Idle run' during start & stop gives time reduces initial friction losses improving life of engine & Turbo charger.
- Indigenously developed fuel injection system, designed in collaboration with 'Bosch', with two feed pump units.
- 'Double feed pump' increases tolerance for low level of fuel in fuel tank, resulting in less chances of air locking.
- Air to air CAC results in less exhaust temperature, hence less load on cooling system thereby improving the reliability of engine.
- Heavy duty Turbo charger, fully matched for varying load conditions.
- Rugged design to meet toughest operating conditions.

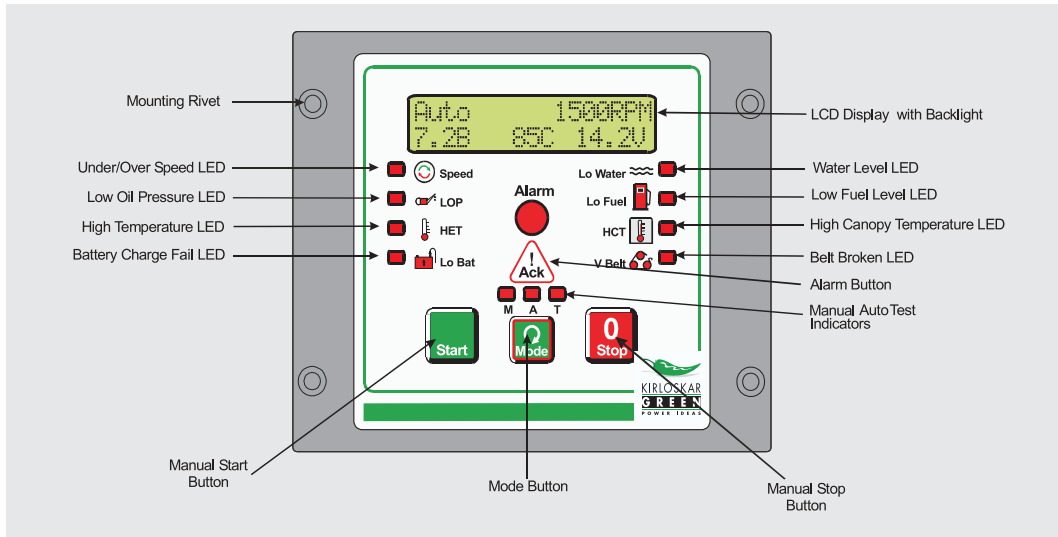
Gen-set Features

- Compact and aesthetically designed, CPCB approved canopy.
- Excellent transient response for sudden loading.
- State-of-art Engine and Gen-set monitoring system.
- Safety control for low coolant level in radiator, as standard feature.
- Engine health monitoring through internet and SMS to operator. (Optional)



4. KG 907 ENGINE CONTROL

Front Panel Features:



Functions

- Monitoring & display indication of engine parameters like :
 - Oil pressure
 - Oil and Coolant temperature
 - Fuel level
 - Engine speed
 - Hour meter
 - Battery voltage etc.
- Display message & Icon based alarm indication for engine parameters.
- Fully configurable digital outputs.
- All parameters are settable & password protected.

Unique Features of KG 907

- Compact & microprocessor based fully configurable control unit.
- High performance LCD display.
- PC interface to monitor the engine performance.
- Integrated AMF functions with built in timers.
- Integrated relays means reduced wiring costs.
- Fuel level monitoring.
- Canopy temperature monitoring.
- Expandable for specialised user applications.
- Adjustable timers allow customisation to specific user applications.
- Auto/Manual & test operation.



5. TECHNICAL DATA SHEET

ENGINE DATA		
Engine model		DV8
Rated output (prime power rating as per ISO 3046)	kW (hp)	360 (490)
No. of cylinders	No.	8
Engine configuration (Inline / V type)		V type
Operating cycle		4 Stroke DI
Displacement	Ltrs	15.91
Bore x Stroke	mm	130 x 150
Aspiration		TA
Compression Ratio		16.5:1
Piston speed	m/s	7.5
Brake Mean Effective Pressure (BMEP)	Kg/cm ²	18.55
Firing order (Starting from gear end)		1-5-7-2-6-3-4-8
Overall dimension (Length x Width x Height)	mm	1603 x1125 x 1410
Block loading capacity (as per ISO 3046-Part4)	%	50%
Engine weight (Dry weight of bare engine)	Kg	1472
FUEL SYSTEM		
Type		Inline
Static Injection timing	Deg BTDC	16±1
Fuel oil		HSD IS 1460
Fuel Filter type		Spin-On
Filtration capacity	Micron	5
Fuel transfer line restriction (maximum allowable)	KPa	100
Fuel transfer pump pressure	Kpa	250
Max lift of fuel transfer pump	m	1
Nozzle opening pressure	Kg/cm ²	260
Specific Fuel Consumption at		
50% load	(g/Hp-hr)	151*
75% load	(g/Hp-hr)	144*
100% load	(g/Hp-hr)	143*

* Declared sfc for well run engine tested at standard conditions (+5% tolerance applicable as per ISO 3046)



(Contd...)

6. TECHNICAL DATA SHEET

LUBE OIL SYSTEM		
Recommended lube oil		K-Oil Super (CF4-15W40)
Lube oil pump		Gear pump
Lube oil sump capacity(Max)	Ltr	41
Lube oil sump capacity(Min)	Ltr	37
Lube oil system capacity	Ltr	47
Angularity Limit of oil sump(along or across crank shaft axis)	Deg	15
Lube oil Pressure range at rated load	bar	4-4.5
Lube oil filter type		Spin-On
Filtration capacity	Micron	12
Lube oil pump flow rate(At 2935 rpm with 3.5 bar pressure)	LPM	130
Lube oil change period	Hrs	500*
COOLING SYSTEM		
Type of cooling		Liquid cooled
Engine coolant flow rate	LPM	560
Coolant pressure	Kg/cm ²	1
Radiator Cooled:		
Qty of coolant (Engine)	Ltr	29
Qty of coolant (Radiator)	Ltr	94
Total qty of coolant (including pipings)	Ltr	123
Cooling/Ventilation Air flow through canopy	m3/min	462
Combustion Air inlet flow	m3/min	33
Total Fresh Air required	m3/min	495
Operating Temperature range of the Thermostat	Deg C	74-88
Maximum Coolant temp allowed	Deg C	104

* First oil change at 50 hrs.

(Contd...)



7. TECHNICAL DATA SHEET

HEAT REJECTION DETAILS		
Heat Rejection to coolant	kW	159.58
Heat Rejection to CAC	kW	70.92
Heat Rejection to exhaust	kW	239.36
Heat Rejection from engine surface	kW	75.7
AIR INTAKE SYSTEM		
Intake filter type		Dry
Dirty element restriction	mm of H ₂ O	635*
Intake manifold pressure	KPa	294
Maximum Intake manifold temperature (at Altitude 1000m & at temp 45 deg)	Deg C	50
EXHAUST SYSTEM		
Exhaust silencer type		Residential
Max. Permissible exhaust back pressure	mm of H ₂ O (kpa)	1172 (11.5)
Exhaust gas flow	kg/hr	2517
Exhaust gas temperature (Max)	Deg C	600
Exhaust Smoke level at 100% load (at NTP condition)	BSU	2
Min exhaust gas pipe size (per bank)(diameter)	mm	106
GOVERNER DATA		
Type		Electronic: Integral with FIP & Isochronous capability
Whether adjustable droop provided		Yes
Transient speed increase for sudden	%	10
100% decrease of load Transient speed decrease for permissible sudden	%	10
increase of load Recovery time	sec	2-3
Speed raise / lower from panel provided		Optional
VALVE MECHANISM		
Type		OHV
Valve clearance at cold: Inlet / Exhaust	mm	0.35
Valve Timing: Inlet open / Inlet close	Deg	1° 27 min BTDC / 11° 27 min ABDC
Exhaust open / exhaust close	Deg	24° 43 min BBDC / 7° 18 min BTDC
OTHER INFORMATION		
Maximum time to start from cold & attain rated Speed & ready to take load	Sec	30
Overload capacity	%	10% for 1 hr in 12 hrs of Operation

* Maintenance of air cleaner element depends on Restriction indicator showing red band or 635 mm of wg pressure whichever will be earlier.



(Contd...)

8. TECHNICAL DATA SHEET

ALTERNATOR DATA		
Make / Model No		KG 354S2
Specification		400kVA, 3ph,415,0.8pf
Insulation class		H
Time permitted to build up rated voltage	Sec	≤ 5
Permissible voltage dip	%	<20
Rating of biggest motor to be started DOL with permissible voltage dip when the generator is Unloaded	KW / 4 pole	65
50% loaded	KW / 4 pole	33
80% loaded	KW / 4 pole	13
Short circuit withstand time	Sec	<10
Short circuit ratio		0.32
Overload withstand capacity	%	Min 150% for 30 sec
TYPE OF COOLING		
Cooling system of alternator		Air
Temp. rise of armature winding	Deg C	<125
Temp. rise of field winding	Deg C	<125
Heating time constant	min	45
Cooling time constant	min	120
Heat Rejection from alternator	KW	20.1
Alternator Air Flow	m ³ /min	55.2
ALTERNATOR EFFICIENCY		
at 100% MCR & rated P.F	%	94.1
at 75% MCR & rated P.F	%	94.7
at 50% MCR & rated P.F	%	95.1
EXCITER		
Type of excitation		Brush Less
Capacity in KW	KW	5.8
Operating voltage & current	V & I	45 / 3
Class of insulation		H
AVR		
Type of AVR		TAVR30
Mounting of AVR		Inside Terminal Box
Voltage regulation	%	±0.8
Response time	msec	<75
Voltage of operation	V	95
Range of voltage adjustment	%	±5

In view of continuous product up-gradation, above specifications are subject to change without prior notice



9. THE CUTTING EDGE

Emission Details

DV8 Engine is ready to meet future emission norms having emission values well below the prescribed CPCB limits.

Parameter	CPCB Limits	KOEL: DV8
Nox (g/kW Hr)	9.2	6.1
CO (g/kW Hr)	3.5	0.38
HC (g/kW Hr)	1.3	0.13
PM (g/kW Hr)	0.3	0.06
Smoke (in m-1)	0.7	0.05
Average Sound level at 1m with canopy (dBA)	75	75

Altitude / Temperature Capability

Ambient Temp Deg C	20	30	38	45
Altitude in meters	2400	1500	1200	900

- Full rated output is available at above corresponding ambient temperatures and altitudes.
- For site conditions other than stated above, please contact KOEL for available power output.

Customer Entitlements

- Assistance for DG set sizing.
- Assistance for DG set installation and clearances from local administrative authorities.
- Joint commissioning by Service & Sales dealer.
- 2 years /5000 hrs. warranty on use of K-oil & K-filters.
- Warranty covers entire Genset subjects to our standard warranty terms.
- 9 free periodic service checks during warranty period.
- First fill of lubrication oil along with DG Set.
- K-Cool super plus coolant, filled in Radiator
- Training on maintenance & operations of DG set.



After Sales Service Support

Customer Care :

Round the clock, at your service, whenever & wherever you need.

After sales service is the key to the long-term viability of any business. We are committed to provide adequate after sales service support & believe in creating enduring relationship with every individual customer we serve. Kirloskar believes in the wise saying "think global & act local" with full dedication, which have helped us, successfully achieve "100 years of great service".

Service Offerings

- Free service checks.
- Authorized Kirloskar Service Dealers in your neighborhood to promptly respond to your service calls, provide extensive after sales support including operational, maintenance & repair contract.
- Single window service for Genset & Customised AMC.
- 24/7 help line service for all our customers, offering timely customer support to deal with inquiries.
- Fully implemented CRM module to provide proactive & quick service response.
- Trained & experienced service team to provide value-added support to the highest standards ensuring customer satisfaction at all times.
- Support systems like Mean Time to Restore, Engine Down Order, First Pick Availability for maximum uptime of Gensets.
- K-oil / K-cool super plus for product life extension.
- Excellent product support through easy availability of spare parts, product training, Re-conditioning and warranty administration.
- Easy and Quick delivery... anywhere anytime.



Help Desk :
Call 1800 233 3344 (Toll-free from BSNL / MTNL)
020-6608 4608 (Other than BSNL / MTNL)
Email : koel.helpdesk@kirloskar.com

Customer assistance is available from our help desk (24 hrs. x 7 days a week) for all after sales & service assistance.

Service Network across the Nation

Where your business operations are far reaching across the country & moreover when they are located in absolute remote places, your business counts on reliability & availability ensuring minimum downtime. Key to the quality of our after sales service is our strong service force, which are always ready to attend your calls anywhere anytime.



KOEL Sales Offices

- **Ahmedabad** : Ground Floor, D Block, Pruthvi Tower, Jodhpur Char Rasta, Ahmedabad - 380015. Phone : +91 (79) 2692 9687, 2692 9689.
- **Bangalore** : 3rd Floor, Shri Lakshmi Complex, 15, St. Marks Road, Bangalore - 560 001. Phone : +91 (80) 2558 7562, 30578164, 30578165. Fax : +91 (80) 2558 7559.
- **Bhubaneswar** : 178 A, Zone-B, Mancheswar Industrial Estate, Bhubaneswar-751010, Orissa. Phone : +91 (674) 2585064, 25860059, 2588047. Telefax : +91 (674) 2588021.
- **Chennai** : Nelson Tower, 1st Floor, 2nd Wing, 51, Nelson Manickam Road, Chennai - 600 029. Phone : +91 (44) 23744661, 23744624.
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