Kirloskar

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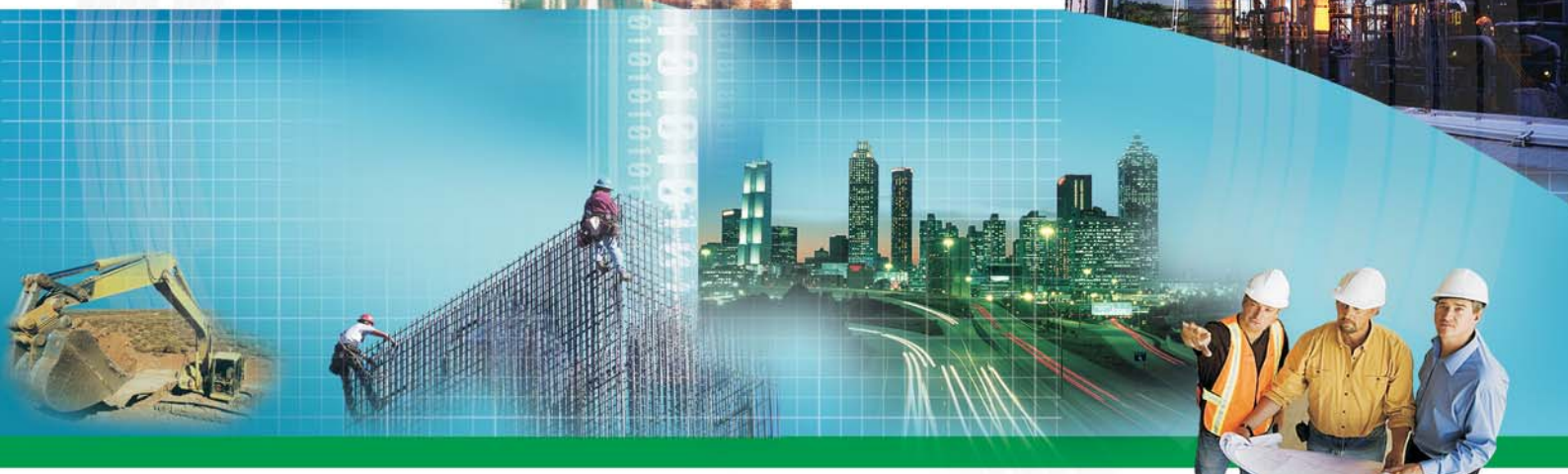
KIRLOSKAR GREEN POWER IDEAS

600 & 625 kVA DV12 POWERED GENSET

New 4 Valve HPCI Technology



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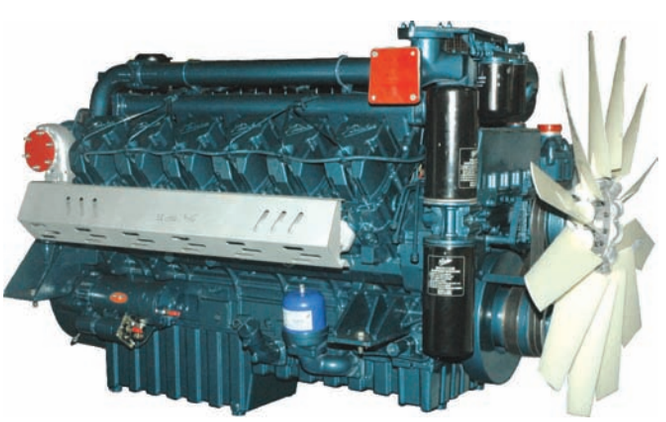

1. INTRODUCTION

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.

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2. PRODUCT SPECIFICATIONS

DV 12 powered Gen-set Technical specifications

GENSET PARAMETERS			
Genset Model		**KG600WS3**	**KG625WS3**
KVA Rating	kVA	600	625
KW Rating	kW	480	500
Voltage	V	415	415
Frequency	Hz	50	50
Phase		3	3
Power factor		0.8	0.8
Overall Dimensions of gen-set			
Length	mm	6670	6670
Width	mm	2000	2000
Height	mm	2750*	2750*
Height including silencer	mm	3450	3450
Approximate Dry Weight (with canopy)	Kg	7500	7500
Genset static load (Max)	Kg	8450	8450
Rated speed	RPM	1500	1500
Method of Starting		Electric (24V)	Electric (24V)
Overload capability (for 1hr in 12 hrs operation)	%	10	10
Fuel consumption at 75% load	Ltr/Hr	91.9**	96**
Lube Oil Consumption % of fuel consumption	%	0.12^	0.12^
Lube oil change period	Hrs	500	500
Alternator efficiency at 75% load	%	95.7	95.7
DG set Noise level at 1Mtr (with canopy)	dBA	<=75dba as per CPCB norms	<=75dba as per CPCB norms
Overall thermal effiency of engines/break thermal effiency of engines at 100%load	%	42.86	42.86
Mechanical effiency 100% load	%	88	88

Note :

* Height of genset including silencer

** Considering Specific gravity of diesel as 0.845(+5% tolerance applicable as per ISO 3046) for well run Genset

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

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3. PRODUCT FEATURES

Engine Features

- Four valve technology & Central injection system makes 'DV12' the most fuel efficient engine in its class.
- Kirloskar 'DV12' engine is compliant to future emission norms of EU stage 2 level.
- Kirloskar 'DV12' 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)

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4. KG 545 GEN-SET CONTROLLER

Gen-set Metering Parameters	Engine Metering Parameters	Electrical Safeties (Along with Metering)	Mechanical Safeties (Along with Metering)
Phase/Line voltage	Oil Pressure	Genset Under/Over voltage	Under/Over speed
Line current	Engine coolant Temperature	Battery Under/Over voltage	Low Lube oil pressure
Frequency	Fuel Status	Under/Over frequency	High Lube oil Temperature (optional)
Average Voltage	Engine speed	Phase Failure	High engine coolant temperature
Average Current	Oil Temperature (optional)	Phase sequence reverse	Charging Alternator fail
Phase kW & Total kW	Canopy Temperature	Over Current	Low coolant level
Kwh & PF	Engine run Hours	Over kW	Low fuel level
kVA / kVAr	Total starts	High Earth Current	High canopy temperature
Earth fault current	Battery condition monitoring	Mains monitoring	Start/Stop fail

Unique features of KG 545 Gen-set Controller

- State of the art Compact Microprocessor based fully configurable technology.
- Integration of all engine and alternator parameters.
- For ease of viewing, high performance graphical LCD and prominent display.
- Event logging history (stores last 100 events with date time stamp and complete measurement values) for ease of maintenance/service & preventive maintenance annunciation.
- Remote monitoring of entire gen-set (optional).
- Remote start/stop provision (optional).
- Capability of withstanding wide range of operating temperatures (-20 to 70 Deg. Cel.).
- Canopy temperature monitoring.
- Individual touch buttons for Manual, Auto and Test mode.
- LED indications for gen-set status and alarms.
- Battery condition monitoring.
- Statistical cumulative counters like No. of starts, Engine run Hrs, kWH.
- Setting provision for different parameters and access to set parameters on front panel.
- Common controller for AMF and manual operation.
- Additional provision for three spare digital inputs & two spare digital outputs.
- Manual control for Mains & DG set contactor.

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5. TECHNICAL DATA SHEET

ENGINE DATA			
Engine model		**DV 12**	**DV 12 SR1**
Rated output (prime power rating as per ISO 3046)	kW (hp)	532.13(723)	552(750)
No. of cylinders	No.	12	12
Engine configuration (Inline / V type)		V type	V type
Operating cycle		4 Stroke DI	4 Stroke DI
Displacement	Ltrs	23.88	23.88
Bore x Stroke	mm	130 × 150	130 × 150
Aspiration		TA	TA
Compression Ratio		16.5:1	16.5:1
Piston speed	m/s	7.5	7.5
Brake Mean Effective Pressure (BMEP)	Kg/cm^2	18.73	18.73
Firing order (Starting from gear end)		1-12-5-8-3-10-6-7-2-11-4-9	1-12-5-8-3-10-6-7-2-11-4-9
Overall dimension (L (HSG to Fan pulley) x W x H)	mm	1827 × 1125 × 1410	1827 × 1125 × 1410
Block loading capacity (as per ISO 3046-Part4)		45%	On request
Engine weight (Dry weight of bare engine)	Kg	2100	2100
FUEL SYSTEM			
Type		Inline	Inline
Static Injection timing	Deg BTDC	16 ± 1	16 ± 1
Injectors hole Nos. x Size	mm	7 × 0.248	7 × 0.268
Fuel oil		HSD IS 1460	HSD IS 1460
Fuel Filter type		Spin on	Spin on
Filtration capacity	Micron	5	5
Fuel transfer line restriction (maximum allowable)	KPa	100	100
Fuel transfer pump pressure	Kpa	250	250
Max lift of fuel transfer pump	m	1	1
Nozzle opening pressure	Kg/cm^2	260	260
Specific Fuel Consumption at			
50% load	(g/Hp-hr)	150*	150*
75% load	(g/Hp-hr)	144*	144*
100% load	(g/Hp-hr)	143*	143*

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

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6. TECHNICAL DATA SHEET

LUBE OIL SYSTEM			
Recommended lube oil		K-Oil Super	K-Oil Super
Lube oil pump		Gear Pump	Gear Pump
Lube oil sump capacity(Max)	Ltr	50	50
Lube oil sump capacity(Min)	Ltr	40	40
Lube oil system capacity	Ltr	57	57
Angularity Limit of oil sump (along or across crankshaft axis)	Deg	15	15
Lube oil Pressure range at rated load	bar	4-4.5	4-4.5
Lube oil filter type		Spin on	Spin on
Filtration capacity	Micron	12	12
Lube oil pump flow rate (At 2935 rpm with 3.5bar pressure)	LPM	130	130
Lube oil change period	Hrs	500*	500*
COOLING SYSTEM			
Type of cooling		Liquid cooled	Liquid cooled
Engine coolant flow rate	LPM	700	700
Coolant pressure	Kg/cm^2	1	1
Radiator Cooled:			
Total qty of coolant (including pipings)	Ltr	144 ± 10 %	144 ± 10 %
K-Cool super(Water:		50:50	50:50
Cooling/Ventilation Air flow through canopy	m3/min	596	600.6
Combustion Air inlet flow	m3/min	49	53
Total Fresh Air required	m3/min	645	653.1
Heat Exchanger cooled:			
Qty of coolant (HE + CAC + pipings)	Ltr	On request	On request
Raw water Flow rate across Heat exchanger	LPM	On request	On request
Raw water Flow rate across CAC	LPM	On request	On request
Raw water pressure	Kg/cm^2	On request	On request
Ventilation Air Flow required to carry out radiated heat in case of Acoustic enclosure installations	m^3/min	On request	On request
Operating Temperature range of the Thermostat	Deg C	74-88	74-88
Maximum Coolant temp allowed	Deg C	104	104

* First oil change at 50 hrs.

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7. TECHNICAL DATA SHEET

HEAT REJECTION DETAILS			
Heat Rejection to coolant	kW	213.1	221.6
Heat Rejection to CAC	kW	108.6	112.9
Heat Rejection to exhaust	kW	358.0	372.3
Heat Rejection from engine surface	kW	117.5	122.2
AIR INTAKE SYSTEM			
Intake filter type		Dry	Dry
Dirty element restriction	mm of $H2^O$	635*	635*
Intake manifold pressure	Kpa	310	310
Maximum Intake manifold temperature (at Altitude 1000m & at temp 45 deg)	Deg C	75	75
EXHAUST SYSTEM			
Exhaust silencer type		Residential grade	Residential grade
Max. Permissible exhaust back pressure	mm of H2O (kpa)	1175 (11.5)	1175 (11.5)
Exhaust gas flow	kg/hr	3026	3147.04
Exhaust gas temperature (Max)	Deg C	600	600
Exhaust Smoke level at 100% load (at NTP condition)	BSU	2	2
Min exhaust gas pipe size (per bank)(diameter)	mm	127	127
GOVERNER DATA			
Type		Electronic :Integral with Fip & Isochronous capability	Electronic :Integral with Fip & Isochronous capability
Whether adjustable droop provided		Yes	Yes
Transient speed increase for	%	<10	<10
sudden 100% decrease of load			
Transient speed decrease for	%	<10	<10
permissible sudden increase of load Recovery time	sec	<5	<5
Speed raise / lower from panel provided		Optional	Optional
VALVE MECHANISM			
Type		OHV	OHV
Valve clearance at cold: Inlet / Exhaust	mm	0.35	0.35
Valve Timing: Inlet open / Inlet close	Deg	1° 27 min BTDC/ 11° 27 min ABDC	1° 27 min BTDC/ 11° 27 min ABDC
Exhaust open / exhaust close	Deg	24° 43 min BBDC/ 7° 18 min BTDC	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	30
Overload capacity	%	10% for 1 hr in 12 hrs of Operation	10% for 1 hr in 12 hrs of Operation

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

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8. TECHNICAL DATA SHEET

ALTERNATOR DATA		600 kVA	625 kVA
Make / Model No		354L1	354L2
Specification		600kVA, 3ph, 415V, 0.8pf	625kVA, 3ph, 415V, 0.8pf
Insulation class		H	H
Time permitted to build up rated voltage	Sec	⩽ 5	⩽ 5
Permissible voltage dip	%	<20	<20
Rating of biggest motor to be started DOL with permissible voltage dip when the generator is Unloaded	KW / 4 pole	100	103
50% loaded	KW / 4 pole	50	52
80% loaded	KW / 4 pole	20	21
Short circuit withstand time	Sec	<10	<10
Short circuit ratio		0.37	0.36
Overload withstand capacity	%	Min 150% for 30 sec	Min 150% for 30 sec
TYPE OF COOLING			
Cooling system of alternator		Air	Air
Temp. rise of armature winding	Deg C	<125	<125
Temp. rise of field winding	Deg C	<125	<125
Heating time constant	min	40	40
Cooling time constant	min	100	100
Heat Rejection from alternator	KW	22.6	22.6
Alternator Air Flow	m^3/min	55.2	55.2
ALTERNATOR EFFICIENCY			
at 100% MCR & rated P.F	%	95.5	95.5
at 75% MCR & rated P.F	%	95.7	95.7
at 50% MCR & rated P.F	%	95.9	95.9
EXCITER			
Type of excitation		Brush Less	Brush Less
Capacity in KW	KW	7.1	7.1
Operating voltage & current	V & I	60 & 3.5	60 & 3.5
Class of insulation		H	H
AVR			
Type of AVR		TAVR30	TAVR30
Mounting of AVR		Inside Terminal Box	Inside Terminal Box
Voltage regulation	%	±0.8	±0.8
Response time	msec	<75	<75
Voltage of operation	V	95	95
Range of voltage adjustment	%	±5	±5

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

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9. THE CUTTING EDGE

Emission Details

DV12 Engine is ready to meet future emission norms having emission values well below the prescribed CPCB limits.

Parameter	CPCB Limits	KOEL: DV12
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.

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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, 2586059, 2588047. Telefax : +91 (674) 2588021. ● **Chennai :** Nelson Tower, 1st Floor, 2nd Wing, 51, Nelson Manickam Road, Chennai - 600 029. Phone : + 91 (44) 23744661, 23744624. ● **Cochin :** No. 39/2694 A1, Anugraha, Panthiyil Lane, Warriam Road, Cochin - 682016. Phone : +91 (484) 2385757, 2385758. Fax: +91 (484) 2385756. ● **Guwahati :** 29,G & B Road, Pan Bazzar, Guwahati - 781 001. Phone : +91 (361) 2736016, 2736017. Telefax : +91 (361) 2736015. ● **Indore :** 203, Goldstar Complex, Opp Treasure Island, 576, MG Road, Indore - 452001. Phone : +91 (731) 3913108, 3913109, 3913110, 3913111 Telefax : +91 (731) 3913112. ● **Jaipur :** 21, Sudarshan Pura, Industrial Area, Bais Godwn, Jaipur - 302006. Phone : +91 (141) 2210405, 2214149, 2214150. Fax : +91 (141) 2214149. ● **Kolkata :** 8th Floor, Poonam Building, Flat Nos. 8A & 8B, 5/2, Russel Street, Kolkata - 700 071. Phone : +91 (33) 2217 0858, 2217 0860, 2217 0861. Fax : +91 (33) 2217 0859. ● **Lucknow :** 498 / 143 KA, Faizabad Road, Near IT Collage Chauraha, Upper Floor of State Bank of Indore, Lucknow - 226 007. Phone : +91 (522) 2741440/42/43. Fax : +91 (522) 2741441. ● **Ludhiana :** Plot No. 12, NPC Tempo Union Street, Near Arjun Gas Godown Sherpur Chowk Ludhiana - 141003. Phone : +91 (161) 254 6667, 2546669. Fax : +91 (161) 2546753. ● **New Delhi :** 404, 4th Floor, Surya Kiran Building, 19, Kasturba Gandhi Marg, New Delhi-110001. Phone : +91 (11) 23711786, 47195200, 47195202, 47195217, 47195205. Fax : +91 (11) 23710159. ● **Secunderabad :** 5-2-220 to 222, 2nd Floor, Padmavathi Tower, Hyder Basti, Opp. Andhra Bank, Ranigunj, Secunderabad- 500003. Phone : +91 (40) 27534197, 27534176. Telefax : +91 (40) 27534170.

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Stamp of Authorised Representative

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