

Purchase Order

Original

Advance Paid :

Payment Terms :

Bill submission:

Other Terms:

Installation:

Commissioning:

Rs. 21,60,000/-(10%) by RTGS/NEFT.

10% As advance, 20% with in 4 weeks against drawings, 70% Against delivery prior to dispatch.

Proof of delivery & original invoice must be delivered to Second floor, Soham Mansion, M.G. Road, Secunderabad- 03. Do not send to site.

We reserve the rights to reject the items if not as per the specifications.

Our scope

Commissioning suppliers scope as on the site is ready.

Notes:

1. This is a digitally generated order and no signature is required.
2. In case the vendor is unable to accept the order and supply the material, they must intimate the same by email to purchase@modiproperties.com.
3. Vendors must obtain acknowledgment from site as proof of delivery (POD) on relevant document like DC, e-way bill, packing list, etc.
4. Vendor must send original invoices to our head office (HO) on the address mentioned above. Do not send the original invoices to sites or purchase division office. An acknowledgment on a copy of the invoice will be provided upon request at our HO.
5. We reserve the right to cancel this PO and seek refund of the advance paid in case of delay in delivery or items delivered are not as per specifications, including delivery of defective material.
6. Payment against delivery /installation shall only be made after receipt of original signed invoice at HO.

Requisition Form

Company Name	Crescentia Labs Pvt Ltd			Date	02 Dec 2023
Site Or Phase	GV One			Time	03:14:08
For Use In Flat/Villa/Other	1500kva DG 2 nos- with inbuild isolator			Req.No.	20231202027
Material required before date					

S.No	Description	Qty Required	Qty Available at Site	Order Qty	Last Rate	Inward No	Date
1	EQPT4648-Equipment-Diesel Generator--Misc-Nos.	2.00	0	2.00	6,31,300.00		
Add Spec	1500kva DG						

PO Num	Date	Type	Status
20231202057	02 Dec 2023	PO	Approved

Sno	Role	User	Remarks	Date And Time
1	MEP	Akhil Murthy		02 Dec 2023 03:14:08 pm
2	MEP	M. Ramesh Reddy	System Generated: This Requisition Has Been Approved	02 Dec 2023 03:14:52 pm

Prepared By :- Akhil Murthy

Sign:-

Date :- 02 Dec 2023

Approved By:-

Sign:-

Date:-

Note: On receipt of material at site write inward number and date in last two columns

Procurement/Purchase comparison sheet											
Prepared by: PNBHAKAR 07-12-2023											
Date:											
Sl. No.	SKU	Net rate after discount + GST		Essential Power Tech (Make Perkins Engine & Stamford Alternator)		Starting Generator Pvt. Ltd (Make Baudouin Engine & Compton Greaves Alternator)		Powerstar Ltd (Make Cummins Engine & Stamford Alternator)		SUPERNOVA ENGINEERS LIMITED (Make Perkins Engine & Leroy Smer/Standard Alternator)	
		Qty	Units	Rate	Amount	Rate	Amount	Rate	Amount	Rate	Amount
1	1500KVA DG with inbuilt isolator panel + Battery charger	2	Nos	1,15,64,000	2,31,28,000						
2	Transport charges	1	Nos								
3											
4											
5											
6											
7											
8											
9											
10	Total:				2,31,28,000		2,23,48,000		2,36,00,000	2,16,00,000	2,66,00,000
Notes:											
GVI											
1	Material required for site:										
2	Details of requisition no. required by, etc.:										
3	Transport charges										
4	Delivery period										
5	Advance										
6	Payment terms										
7	Loading cost										
8	Unloading cost										
9	Warranty										
10	Installation & Erection of DG										
11	Commissioning										
12	Cable from 1										


DRAFT
APPROVED BY
07 DEC 2023
SOHAM MODI
MANAGING DIRECTOR

**MODI PROPERTIES PVT. LTD.
VENDOR REGISTRATION FORM**

Name of company/firm: SUPERNOVA ENGINEERS LIMITED			
Office mobile/landline: 9444349659		Office email: k.balakrishna@supernovagenset.com	
Address for communication: First Floor, Shapath Hexa, Opp New Guj High Court, S G Highway, Ahmedabad, Gujarat, 380054		Street:	
Flat/house/office no:		Landmark:	
City/Town/Village: AHMEDABAD		District/State: GUJARAT	Pin code: 380054
Nature of company/firm:		☒ Individual / Proprietorship ☐ Partnership / LLP ☐ Pvt. Ltd. Company ☐ Limited Company ☐ Other	

Contact details:

S No	Contact person for	Name	Mobile	Email
1.	Proprietor/director/partner/ owner	MR. SAMIR VASUDEV MISTRY (CMD)		svm@supernovagenset.com
2.	Sales	MR. K.BALAKRISHNA	9444349659	k.balakrishna@supernovagenset.com
3.	Delivery	MR. PAWANTAK	9374217626	pawan@supernovagenset.com
4.	Commissioning	MR. RAJESH	9394800002	rajesh@supernovagenset.com
5.	Accounts	MR. SUDESH GUPTA	9327140012	spg@supernovagenset.com

Details for payment:

Pan card no: AACCS6758G	GST no: 24AACCS6758G1Z7	Bank a/c no: 915030012832631
Bank Name: AXIS BANK LTD	Branch: CORPORATE BANKING BRANCH, AHMEDABAD	IFSC code: UTIB0001530
Sign of Proprietor/director/partner/ owner:		Date: 06/12/2023

For office use only (do not fill/write).

VRN No.:		Scan Id:
Purchase – Material category/type:		
Approved by	Name	Sign
		Date

Notes: This form to be approved by purchase manager and uploaded on M-codex.

GETTING IN POWER!

*Actual product may vary in appearance



SUPERNOVA
G E N S E T S

Power Up

An ISO 9001 & 14001 Certified Company

Building Generators for Generations



SUPERNOVA
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SUPERNOVA ENGINEERS LIMITED

(An ISO 9001: 2015 certified company)

Reg Office : F-2, B Wing, First Floor, ShapathHexa , Opp. Gujarat High Court, Nr Sola Bridge, Sarkhej – Gandhinagar Highway, A'ad-060
T: +91-79-66111136/37/38/39/40, E: marketing@supernovagenset.com W: www.supernovagenset.com

PROPOSAL

Offer No: SEL/HYD/KBK/1500kVA/23-24/ MPPL /1683-RF.

Date: 02.12.2023

To,
M/s. Crescentia Labs Private Limited
Sy. No. 230 to 243 Thurkapally, Telangana 500078

K.A: Mr. P Prabhakar

Sub: Your requirement Supply of 1500 kVA Open D.G sets for your project.

Dear Sir,

Thank you for your valued inquiry. In this context, we take this as an opportunity to introduce ourselves as one of the leading, renowned, established & proven GENSET manufacturers based in India. The present product range is rolling off, from our most modern assembly line comprises of fuel efficient, rugged & reliable GENSET ranging 10 kVA to 2250 kVA.

The GENSETS manufactured by us undergoes stringent quality measures and as a result of which we produce State-of the-Art finest GENSETS. Against your requirement of Generator, we are pleased to submit our most competitive proposal for 500 kVA Supernova Diesel Generating Set powered by PERKINS Diesel Engine coupled with 500 kVA Leroy Somer/Stamford Alternator along with AMF Logic Control Panel and Acoustic Enclosure. Catalogue attached separately. Detailed scope of supply will be discussed during our meeting.

We hope that you shall find our techno-commercial offer as most competitive and quite in line with your requirement. Please do acknowledge the receipt of our offer immediately.

Assuring you the best of our services and attention at all times.

Thanking you,

Yours faithfully,
For **SUPERNOVA ENGINEERS LTD.**

K.Balakrishna
Sr.Manager –Regional Sales AP & TS
M:9444349659

**SUPERNOVA ENGINEERS LIMITED**

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T: +91-79-66111136/37/38/39/40, E: marketing@supernovagenset.com W: www.supernovagenset.com**TECHNO-COMMERCIAL OFFER**

SR. NO.	DESCRIPTION	QTY. IN NO.	UNIT RATES IN RS.	AMOUNT IN RS.
01	SUPERNOVA DG Set model SP 1500 SILENT DG SET (1500 kVA/ 1200 kWe) comprising Perkins Diesel Engine Model 4012-46TAG2A, Developing 1785 BHP @ 1500 RPM, 4 stroke, water cooled 12 Cylinder In Line, Electronic Governor, Radiator Cooled with Electronic Governor 24V ESE complete with all standard accessories coupled to Leroy Somer AC Generator, 1500 kVA/ 1200kWe, 415V, 50Hz, 0.8 PH, with class 'H' insulation complete in house along with Acoustic Enclosure confirmed to CPCB-2 norms along with all standard accessories like Residential Silencer loose ,990 Ltr. fuel tank loose Outside the Acoustic Enclosure, battery, battery cable, AVM pads, Busduct cutout provision Top entry, first fill of Lube Oil & coolant etc. as per standard scope of supply.	02 NO.	Rs.91,52,542	Rs.1,83,05,084
02	Isolation panel placed on Alternator mount Inside the Acoustic Enclosure with Auto Sync Suitable controller with 2500A Manual fix type ACB along with battery charger.	02 NO.		
03	Freight Up to Turakpally Site Telangana.	02 NO		
	IGST @18%		1647458	32,94,916
	Total			2,16,00,000

Above prices are exclusive of GST. Kindly refer our terms & conditions.

NOTE: EXCLUSION FROM SCOPE OF SUPPLY

- 1 All civil work such as foundation support structure etc.
- 2 Exhaust piping outside the acoustic enclosure.
- 3 Any power cabling between alternator & DG panel & from DG panel to buyer's PCC.
- 4 Any Bus duct, Cable trays, Control cables, Trenching works, Sync panel Etc. at buyer's Scope.

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SUPERNOVA

GENSETS

Power Up

An ISO 9001 & 14001 Certified Company

SUPERNOVA ENGINEERS LIMITED

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- 5 All 4 nos. earthing with earth strips and earth pits Per set.
- 6 Any consumables such as diesel.
- 7 Electrical approval
- 8 Unloading & positioning of the DG set.
- 9 Any approval from the statutory bodies with kwh meter & CTs

TECHNICAL SPECIFICATIONS OF SUPERNOVA DG SET

DG Rating	:	1500kVA
DG Make	:	Supernova
DG Model	:	SP 1500
Dimension L x W x H	:	(9112x 2600 X3760) mm
Weight kgs. (approx)	:	12000 Kgs
Day tank capacity	:	990 Ltrs
Engine make	:	Perkins
Engine model	:	4012-46TAG2A
Rated Output	:	1200 kWe
Site Output in kVA	:	1500
Duty	:	Prime Power
Over Load	:	10% for 1Hr in Every 12 Hrs
No of Cylinders & Arrangement	:	12 Vertical In –Line
No. Of Silencers	:	1 No
Rating (BHP)	:	1785
Speed	:	1500 RPM
Type of cooling	:	Water Cooled / Radiator Cooled
(Bore X Stroke) mm	:	160 X 190
Aspiration	:	Turbocharged
Compression ratio	:	13: 1
Type of Governing	:	Electronic
Fuel System	:	Direct injection systems with unit injectors
Lube Oil Sump Capacity	:	177 Ltrs
Lube Oil consumption	:	0.52 Ltrs/Hr
Lube Oil Grade	:	API CI4 15W/40
Type Of Starting System	:	Battery Starting System (Electric)
Battery Make	:	TATA/ AMRON/ EXIDE/ Etc
Silencer type	:	Residential Type
Battery Voltage	:	24V DC
No. Of Batteries	:	4 No's
Battery Capacity	:	180 AH
Diesel consumption (LPH)	:	

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100% load	:	309 LPH
75% load	:	236 LPH
Controller Make	:	WOODWARD/DEEPSEA
Note: +5% tolerance applicable, Specific gravity of HSD considered		
Alternator make	:	Leroy Somer/Stamford
Class	:	H
Voltage	:	415 V
Frequency	:	50 Hz
(Current)Amps	:	2500

COMMERCIAL TERMS AND CONDITIONS

PRICE: For Site basis (Up to Hyderabad Telangana)

GST: Prices are exclusive of GST (Prevailing rate is @ 18%)

OTHER DUTIES/LEVIES: Ruling as applicable shall be charged at the time of delivery

FREIGHT: Prices are exclusive of freight. Will be charged as applicable.

PAYMENT TERMS: 30% advance along with the confirm Purchase Order and balance with taxes against Performa Invoice prior to dispatch.

UNLOADING: Unloading will be in your scope

INSURANCE: Prices are inclusive of transit insurance up to destination

DELIVERY INDICATION: 10-12 Weeks from the date of receipt of clear techno-commercial order along with advance and approved drawing (as applicable).

VALIDITY: Our offer shall remain valid for a period of 30 days from the date of this offer for placement of order and subject to our confirmation thereafter.

APPROVALS: Approvals from concern authorizes shall be to your account.

INSTALLATION: The installation done, if any, should be through Authorized and approved vendor failing which there will not be any liability against the company under any circumstances.

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G E N S E T S

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ORDER CANCELLATION: In case of cancellation of any order, all direct/indirect expenses incurred by the company in organizing the ordered equipment shall be recovered from the customer. These cancellation charges will be as above or minimum 10% of the order value, whichever is higher.

WARRANTY: We warrant each SUPERNOVA PERKINS GENSET components thereof manufactured by us & its respective principals to be free from defects in materials and workmanship for a period of 18 months from the date of shipment or 12months from the date of Commissioning or 6000 running hours whichever occurs first.

This warranty applies only if the services and spares during the warranty period are entrusted to Supernova Engineers Ltd. The warranty shall become null and void if the services and spares during the warranty are done by any other party.

JURISDICTION & ARBITRATION:

With the acceptance of this proposal by you the contract shall be construed as having been entered into at Ahmedabad (India) alone and no other courts will have jurisdiction to try any or all suits in respect of claims arising out of or under the said contract or in any way relating to the same.

In the event of any disputes or differences arising between the parties out of or relating to the validity, construction, meaning, operation or effect of this offer, or any amendments or other documents relating to this offer, or the breach of the terms of any document agreed to between the parties, the same shall be referred to Arbitration as per the provisions of the arbitration and Conciliation Act 1996 and the arbitration proceedings shall be held at Delhi/New Delhi

NOTE:

Equipment specifications & the prices offered are subject to change without notice. The price, duties & taxes prevailing at the time of delivery of GENSETS from our respective works will be applicable irrespective of when the order was placed, accepted or payment received.

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ALTERNATOR TECHNICAL DATASHEET LSA 50.2 L8

Reference LS : Standard

Nidec Industrial Automation India Private Ltd.
#45, Nagarur, Huskur Road, Off Tumkur Road
Bangalore - 562162. India

General Characteristics

	LSA 50.2 L8		
Alternator Frame	1500	kVA	1200 kW
Rating	3		
Phase	4		
Pole	1500	RPM	
Rated Speed	415	V	
Rated Voltage [L-L] (V)	2086,8	A	
Rated Current	50	Hz	
Frequency	0,8	Lag	
Rated Power Factor	±1%	With 4 % Engine Governing.	
Voltage Regulation	H	Class	
Insulation System	H	Class	
Temperature Rise Limit	2/3		
Winding Pitch	10 % Over Load for 1 hour once in 12 hours		
Over Load	No-Load <3.5%		
Waveform Distortion	40	° C	
Temperature Ambient	1000	m	
Altitude			

Electrical Parameters

Stator Wdg Res(L-L) @20°C	0,002	Ω
Rotor Wdg Res @20°C	0,506	Ω
Excn. Current At No Load	0,80	A
Excn. Current At Full Load	3,50	A

Connection & Controls

Stator Winding	Double layer concentric winding
Control System	Self-regulated and self-excited
Excitation System	Brushless (AREP)
AVR Type	Analogue
AVR Model	R 450

Performance: Efficiency @0.8 p.f

100% Load	95,5	%
75% Load	95,8	%
50% Load	95,7	%
25% Load	94,1	%

ALTERNATOR TECHNICAL DATASHEET LSA 50.2 L8

Reference LS : Standard

Reactance & Time constant

Reactances are Saturated & Per Unit at Rating and Voltage Indicated. Time Constant are In Seconds

Reactances

Short Circuit Ratio	0,358
X_d Dir Axis Reactance	2,794
X'_d Dir Axis Transient Reactance	0,162
X''_d Dir Axis Sub Transient Reactance	0,138
X_q Quad Axis Reactance	1,524
X''_q Quad Axis Subtransient Reactance	0,144
X_l Leakage Reactance	0,081
X_2 Negative Sequence Reactance	0,141
X_0 Zero Sequence Reactance	0,028

Time Constant

T'_d Transient Time Constant	0,180
T''_d Sub Transient Time Constant	0,018
T'_{do} O.C Field Time Constant	3,910
T_a Armature Time Constant	0,027

Mechanical Parameters

Protection	IP 23
Cooling	IC01
Air flow	1,80 m ³ /sec
GD ²	25,05 kg-m ²
Bearing Drive End	NA
Bearing Non-Drive End	BALL 6320 C3
Coupling	Single Bearing (SAE 00-21")
Maximum Over Speed	120% for 2 mins
Dimensional Drawing	AG316096
Machine Dim. L x B x H (mm)	Refer Dimension Drawing

Weight

Weight of Generator	2790 kg
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Note: The rating is industrial and conforms to IS:13364 and IS/IEC: 60034-1
Continuous development of our products entitles us to change specification details without notice

RE: Required a quotation for 1500KVA DG set

From: K BALAKRISHNA (k.balakrishna@supernovagenset.com)

To: prabhakar@modiproperties.com; waseem@modiproperties.com

Cc: procurement@modiproperties.in; jnr@supernovagenset.com; dkd@supernovagenset.com; dsm@supernovagenset.com

Date: Tuesday, November 28, 2023 at 05:42 PM GMT+5:30

Dear Sir,

Good Evening!

This is with the reference to discussion had with Mr. Ramesh Reddy (Mep dept.) on technical queries the following are the clarification:

1. **BHP** – we are offering DG set 1500 kva With BHP of **1785** for this engine(401246TAG2A) which is highest in industry
2. **Cylinders**- As per the Perkins standard we are offering 12 cylinder engine which is proven in all the segments.
3. **Additional warranty** – we are offering **5C warranty** for engine Critical components { I. Connecting rod, II.) Crankshaft, III).Camshaft, IV).Cylinder Head & V.) Cylinder Block }

In addition standard warranty of 24 months for Engine and Alternator or **6000** Running hours, Whichever is earlier

4. **Sync Relay**- We can also supply sync relay for synchronising application for the DG sets.
5. **Service Intervals**- In Perkins DG sets service intervals are every **500** hrs or 1 year, whichever is earlier.
6. **Engine**- In Perkins DG set has State of Art Technology of Common Rail Direct Injection(**CRDI**)

We look forward for your Valuable Order.

Best Regards,
K.Balakrishna



Building Powerful Relationships Sr.Manager- Regional Sales TS & AP

Mobile: 9444349659

Email: k.balakrishna@supernovagenset.com

Web: www.supernovagenset.com

Address : T & A plaza, Madhapur, Hyderabad-500081



 Save paper. Don't print

4012-46TAG1A

973 - 1327 kWm (Gross) @ 1500rpm

4012-46TAG2A

1069 - 1459 kWm (Gross) @ 1500rpm

Electropak

4000

Series

Basic technical data

Number of cylinders	12
Cylinder arrangement	60° Vee
Cycle	4 stroke, compression ignition
Induction system	Turbocharged
Compression ratio	13:1 nominal
Bore	160 mm
Stroke	190 mm
Cubic capacity	45.842 litres
Direction of rotation	Anticlockwise viewed on flywheel
Firing order	1 ^A , 6 ^B , 5 ^A , 2 ^B , 3 ^A , 4 ^B , 6 ^A , 1 ^B , 2 ^A , 5 ^B , 4 ^A , 3 ^B
Cylinder 1	Furthest from flywheel

Note: Cylinders designated 'A' are on the right hand side of the engine when viewed from the flywheel end.

Weight of Electropak

Temperate

Dry	4400 kg
Wet + fuel cooler	5949 kg
Wet - fuel cooler	5933 kg

Tropical

Dry	4400 kg
Wet + fuel cooler	6086 kg
Wet - fuel cooler	6070 kg

Overall dimensions of Electropak

Temperate

Length	3916 mm
Width	1775 mm
Height	2255 mm

Tropical

Length	3915 mm
Width	2198 mm
Height	2258 mm

Moments of inertia

Engine	9.46 kgm ²
Flywheel	9.55 kgm ²
Total engine inertia	19.01 kgm ²

Cyclic irregularity for engine standby power

4012-46TAG1A	1.582
4012-46TAG2A	1.544

Ratings

Steady state speed stability at constant load $\pm 0.25\%$
Electrical rating are based on average alternator efficiency and are for guidance only (0.8 power factor being used).

Operating point

Engine speed	1500 rpm
Static injection timing	See engine number plate
Cooling water exit temperature	< 98°C

Fuel data

To conform to BS2869 class A2 or BS EN590.

Performance

Sound pressure level 1500 rpm 108 / 109 dB(A)

Note: All data based on operation to ISO 3046/1, BS 5514 and DIN 6271 standard reference conditions.

Note: For engines operating in ambient conditions other than the standard reference conditions stated below a suitable derate must be applied.

Note: Derate tables for increased ambient temperature and/or altitude are available, please contact Perkins Applications Department.

Test conditions

Air temperature	25°C
Barometric pressure	100 kPa
Relative humidity	30%
Air inlet restriction at maximum power (nominal)	2.5 kPa
Exhaust back pressure (nominal)	3 kPa
Fuel temperature (inlet pump)	58°C maximum

Note: For test conditions relevant to data on load acceptance, refer to Perkins Applications Department.

General installation

4012-46TAG1A - Temperate

Designation	Units	Baseload power	Prime power	Standby power
Gross engine power	kWb	973	1212	1327
Fan power	kWm	42		
ElectropaK nett engine power	kWm	931	1170	1285
Gross BMEP	kPa	1694	2110	2309
Combustion air flow	m³/min	92	112	120
Exhaust gas temperature after turbo (maximum)	°C	425		
Exhaust gas flow (maximum) at atmospheric pressure	m³/min	280		
Boost pressure ratio	-	2.6	2.93	3.2
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	42	41.5	41
Friction power and pumping losses	kWm	72		
Mean piston speed	m/s	9.5		
Engine coolant flow (minimum)	litres/s	17		
Typical Genset electrical output 0.8pf 25°C (100 kPa)	kWe	884	1112	1221
	kVA	1106	1389	1526
Assumed alternator efficiency	%	95		

4012-46TAG1A - Tropical

Designation	Units	Baseload power	Prime power	Standby power
Gross engine power	kWb	973	1212	1327
Fan power	kWm	64		
ElectropaK nett engine power	kWm	909	1148	1263
Gross BMEP	kPa	1694	2110	2309
Combustion air flow	m³/min	92	112	120
Exhaust gas temperature after turbo (maximum)	°C	425		
Exhaust gas flow (maximum) at atmospheric pressure	m³/min	280		
Boost pressure ratio	-	2.6	2.93	3.2
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	41	40.8	40.3
Friction power and pumping losses	kWm	72		
Mean piston speed	m/s	9.5		
Engine coolant flow (minimum)	litres/s	17		
Typical Genset electrical output 0.8pf 25°C (100 kPa)	kWe	864	1091	1200
	kVA	1080	1364	1500
Assumed alternator efficiency	%	95		

4012-46TAG2A - Temperate

Designation	Units	Baseload power	Prime power	Standby power
Gross engine power	kWb	1069	1331	1459
Fan power	kWm		42	
ElectropaK nett engine power	kWm	1027	1289	1417
Gross BMEP	kPa	1861	2317	2538
Combustion air flow	m³/min	100	120	128
Exhaust gas temperature after turbo (maximum)	°C		455	
Exhaust gas flow (maximum) at atmospheric pressure	m³/min		320	
Boost pressure ratio	-	2.8	3.1	3.4
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	41.9	40.3	37.8
Friction power and pumping losses	kWm		72	
Mean piston speed	m/s		9.5	
Engine coolant flow (minimum)	litres/s		17	
Typical Genset electrical output 0.8pf 25°C (100 kPa)	kWe	976	1225	1346
	kVA	1220	1531	1683
Assumed alternator efficiency	%		95	

4012-46TAG2A - Tropical

Designation	Units	Baseload power	Prime power	Standby power
Gross engine power	kWb	1069	1331	1459
Fan power	kWm		64	
ElectropaK nett engine power	kWm	1005	1267	1395
Gross BMEP	kPa	1861	2317	2538
Combustion air flow	m³/min	100	120	128
Exhaust gas temperature after turbo (maximum)	°C		455	
Exhaust gas flow (maximum) at atmospheric pressure	m³/min		320	
Boost pressure ratio	-	2.8	3.1	3.4
Mechanical efficiency	%	89	91	92
Overall thermal efficiency (nett)	%	41	39.6	39
Friction power and pumping losses	kWm		72	
Mean piston speed	m/s		9.5	
Engine coolant flow (minimum)	litres/s		17	
Typical Genset electrical output 0.8pf 25°C (100 kPa)	kWe	955	1204	1325
	kVA	1194	1505	1656
Assumed alternator efficiency	%		95	

Note: Not to be used for CHP design purposes (indicative figures only). Consult Perkins Engines Company Limited. Assumes complete combustion.

Rating definitions

Baseload power

Unlimited hours usage with an average load factor of 100% of the published baseload power. No overload is permitted on baseload power.

Prime power

Unlimited hours usage with an average load factor of 80% of the published prime power over each 24 hours period. A 10% overload is available for 1 hour in every 12 hours operation.

Standby power

Limited to 500 hours annual usage with an average load factor of 80% of the published standby power rating over each 24 hour period. Up to 300 hours of annual usage may be run continuously. No overload is permitted on standby power.

Emissions capability

All 4012-46TAG1A/2A ratings are optimised to the 'best fuel consumption' and do not comply to Harmonised International Regulation Emission Limits. More information on these statements can be obtained by contacting the Applications Department at Perkins Engines Company Limited.

Energy balance

4012-46TAG1A - Temperate

Designation	Units	Baseload power	Prime power	Standby power
Energy in fuel	kWt	2217	2817	3137
Energy in power output (gross)	kWb	973	1212	1327
Energy to cooling fan	kWm	42		
Energy in power output (nett)	kWm	931	1170	1285
Energy to exhaust	kWt	750	900	1010
Energy to coolant and oil	kWt	252	370	406
Energy to radiation	kWt	67	85	94
Energy to charge coolers	kWt	175	250	300

4012-46TAG1A - Tropical

Designation	Units	Baseload power	Prime power	Standby power
Energy in fuel	kWt	2217	2817	3137
Energy in power output (gross)	kWb	973	1212	1327
Energy to cooling fan	kWm	64		
Energy in power output (nett)	kWm	909	1148	1263
Energy to exhaust	kWt	750	900	1010
Energy to coolant and oil	kWt	252	370	406
Energy to radiation	kWt	67	85	94
Energy to charge coolers	kWt	175	250	300

4012-46TAG2A - Temperate

Designation	Units	Baseload power	Prime power	Standby power
Energy in fuel	kWt	2450	3200	3750
Energy in power output (gross)	kWb	1069	1331	1459
Energy to cooling fan	kWm	42		
Energy in power output (nett)	kWm	1027	1289	1417
Energy to exhaust	kWt	805	1015	1080
Energy to coolant and oil	kWt	288	457	501
Energy to radiation	kWt	74	96	107
Energy to charge coolers	kWt	214	301	423

4012-46TAG2A - Tropical

Designation	Units	Baseload power	Prime power	Standby power
Energy in fuel	kWt	2450	3200	3570
Energy in power output (gross)	kWb	1069	1331	1459
Energy to cooling fan	kWm	64		
Energy in power output (nett)	kWm	1005	1267	1395
Energy to exhaust	kWt	805	1015	1080
Energy to coolant and oil	kWt	288	457	501
Energy to radiation	kWt	74	96	107
Energy to charge coolers	kWt	214	301	423

Note: Not to be used for CHP design purposes (indicative figures only). Consult Perkins Engines Company Limited. Assumes complete combustion.

Cooling system

For details of recommended coolant specifications, please refer to the Operation and Maintenance Manual (OMM) for this engine model.

Nominal jacket water pressure in crankcase ... 170 kPa
Maximum top tank temperature (standby) ... 98°C
Maximum static pressure head on pump. ... 70 kPa

Total coolant capacity

Engine only ... 73 litres
ElectropaK - Temperate (engine and radiator) ... 207 litres
ElectropaK - Tropical (engine and radiator) ... 210 litres
Maximum permissible restriction to coolant pump flow ... 20 kPa
Thermostat operating range ... 71 - 85°C
Temperature rise across the engines (standby power) with inhibited coolant ... 8°C
Coolant temperature shutdown switch setting ... 101°C rising
Coolant immersion heater capacity (2 of) ... 4 kW each

Note: Ambient cooling clearance (standby power) based on air temperature at fan 6 °C above ambient.

Radiator (Temperate)

Radiator face area ... 2.57 m²
Material and number of rows .. Copper, 4 rows (charge air / water jacket)
Material and fins per inch ... Brass, 12 rows (charge air / water jacket)
Width of matrix ... 1.608 m
Height of matrix ... 1.601 m
Weight of radiator ... 1117 kg
Pressure cap setting (minimum) ... 70 kPa

Radiator (Tropical)

Radiator face area ... 3.46 m²
Material and number of rows .. Copper, 4 rows (charge air / water jacket)
Material and fins per inch ... Brass, 12 rows (charge air / water jacket)
Width of matrix ... 2.10 m
Height of matrix ... 1.65 m
Weight of radiator ... 1620 kg
Pressure cap setting (minimum) ... 70 kPa

Water jacket cooling data

Temperate and Tropical

Coolant exit temperature (maximum) ... 98°C
Coolant inlet temperature (minimum) ... Thermostatic control
Coolant inlet temperature (maximum) ... 90°C

Coolant pump

Speed ... 1.4 x e rpm
Method of drive ... Gear driven

Fan

Type ... Axial flow
Diameter (Temperate) ... 1530 mm
Diameter (Tropical) ... 1600 mm
Number of blades ... 12
Material ... Aluminium
Drive ratio ... 0.93:1

Duct Allowance - Maximum additional restriction to cooling airflow and resultant minimum airflow (Standby power applications)			
	Ambient clearance 50% glycol	Duct allowance (Pa)	Min airflow m ³ /sec
4012-46TAG1A - Temperate	35 °C	250	20.2
4012-46TAG1A - Tropical	50 °C	200	32.4
4012-46TAG2A - Temperate	35 °C	250	20.2
4012-46TAG2A - Tropical	50 °C	200	32.4

Lubrication system

Lubricating oil capacity

Total system capacity ... 177 litres
Sump maximum ... 157.5 litres
Sump minimum ... 115 litres
Oil temperature at normal operating conditions to bearings ... 105°C

Lubricating oil pressure

At rated speed ... 400 kPa
Minimum at 80 °C ... 340 kPa
Oil relief valves open ... 400 kPa
Oil filter spacing ... 20 microns
Sump drain plug tapping size ... G1
Oil pump speed ... 2100 rpm
Method of drive ... Gear driven
Shutdown switch pressure setting (where fitted) ... 193 kPa falling
Oil pump flow ... 6 litres/sec

Normal operating angles

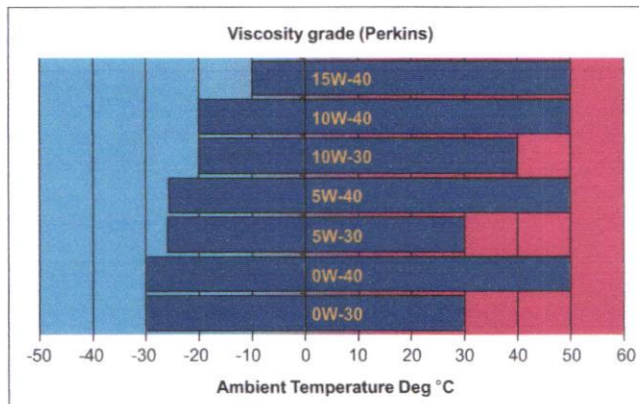
Front and rear ... 5°
Side tilt ... 10°

Oil consumption

Prime power	Units	
After running in (typically after 250 hours)	g/kWhr	0.52
Oil flow rate from pump	litres/sec	6

Recommended SAE viscosity

Multigrade oil conforming to the following must be used: API CH4 15W/40.



Note: For additional notes on lubricating oil specifications, please refer to the Operation and Maintenance Manual (OMM).

Induction system

Maximum air intake restriction of engine

Clean filter	2 kPa
Dirty filter	4 kPa
Air filter type	Medium duty axial flow

Fuel system

Recommended fuel to conform to:	BS2869 Class A2 or BS EN590
Injection system	Direct
Fuel injection pump and injector type	Combined unit injector
Injector pressure	140 MPa
Lift pump type	Tuthill TCH 1-089
Fuel delivery (4012-46TAG1A/2A)	1020 litres/hour
Heat retained in fuel to tank	8 kW
Fuel inlet temperature to be less than	58°C
Delivery pressure	300 kPa
Maximum suction head at pump inlet	2.5 m
Maximum static pressure head	See manual
Fuel filter spacing	10 microns
Governor type	Electronic
Governing to	ISO 8528-12 Class 3 and 4; ISO 8528-5 Class G2
Tolerance on fuel consumption	± 5%

Fuel consumption

4012-46TAG1A (Temperate and Tropical)		
Rating	g/kWh	litres/hr
Standby power	199	306
Prime power	196	276
Baseload power	196	221
75% prime power	195	209
50% prime power	204	151

4012-46TAG2A (Temperate and Tropical)		
Rating	g/kWh	litres/hr
Standby power	201	340
Prime power	200	309
Baseload power	200	248
75% prime power	201	236
50% prime power	203	164

Note: All figures in the table above are based on gross mechanical output with assumed fuel density of 0.862. For fuel consumption based on electrical output of the generating set contact your OEM.

Exhaust system

Maximum back pressure for total system

Exhaust outlet size (internal)	2 x 254 mm
Exhaust outlet flange size	2 x 254 mm Table D
Back pressure for total system at standby power	5 kPa

Note: For recommended pipe sizes, please refer to the Installation Manual.

Electrical system

Type	Insulated return
Alternator	24 volts with integral regulator
Alternator output	55 amps, 28 volts at 20 °C ambient
Starter motor	24 volts
Starter motor type	Axial
Starter motor power	8.2 kW
Number of teeth on flywheel	190
Number of teeth on starter motor	12
Minimum cranking speed (0°C)	120 rpm
Pull in current of starter motor solenoid at -25°C maximum ⁽¹⁾	0 amps
Hold in current of starter motor solenoid at -25°C maximum ⁽¹⁾	9 amps
Engine stop solenoid	24 volts
Hold-in current of stop solenoid	1.1 amps

⁽¹⁾ All leads rated to 10 amps minimum.

Engine mounting

Maximum static bending moment at rear face of block	1356 Nm
Maximum additional load applied to flywheel due to all rotating components	850 kg

Centre of gravity

Bare engine, dry

Forward of the rear face of the cylinder block	771 mm
Above the crankshaft centre line	32 mm

ElectropaK, dry

Forward of the rear face of the cylinder block	1176 mm
Above the crankshaft centre line	32 mm

Cold start recommendations

Temperature range down to -10°C (14°F)

Oil	15W/40 CH4
Starter	2 x 24 volts
Battery	4 x 12 volts x 286 Ah
Max breakaway current	1600 amps
Cranking current	810 amps
Aids	Block heaters
Min mean cranking speed	120 rpm

Note: Battery capacity is defined by the 20 hour rate at 0°C.

Note: The oil specification should be for the minimum ambient temperature as the oil will not be warmed by the immersion heater.

Note: Breakaway current is dependant on battery capacity available. Cables should be capable of handling transient current which may be up to double the steady cranking current.

Noise Data

Noise levels

The figures for total noise levels are typical for an engine running at Standby power rating in a semi-reverberant environment and measured at a distance of one metre from the periphery of the engine.

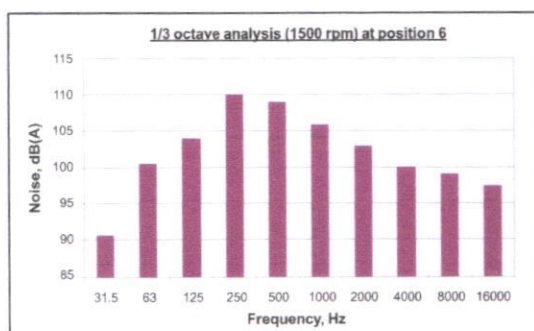
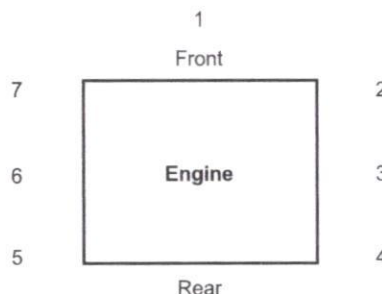
Total noise levels

Sound pressure level re: -20×10^{-6} pa
Speed 1500 rpm Ambient noise level 79 dB(A)

Octave analysis

The following histogram shows an octave band analysis at the position of the maximum noise level.

Position	Noise dB(A)
1	114
2	113
3	111
4	110
5	110
6	111
7	110



Load acceptance (cold)

Engine Type	Initial load acceptance when engine reaches rated speed (15 seconds maximum after engine starts to crank)				2nd load application immediately after engine has recovered to rated speed (5 seconds after initial load application)			
	Prime power %	Load kWm nett / kWe	Transient frequency deviation %	Frequency recovery time seconds	Prime power %	Load kWm nett / kWe	Transient frequency deviation %	Frequency recovery time seconds
4012-46TAG1A	73	800	≤ 10	5	27	291	≤ 10	5
4012-46TAG2A	71	860	≤ 10	5	29	344	≤ 10	5

The figures shown in the table above were obtained under the following test conditions:

Engine block temperature 40 °C
Ambient temperature 25 °C
Governing mode Isochronous
Alternator inertia 50 kgm²
Under frequency roll off (UFRO) point set to 49.5 Hz
UFRO rate set to 16 V/Hz
LAM on / off On

All tests were conducted using an engine installed and serviced to Perkins Engine Company Limited recommendations.

Applied load is a percentage of generator electrical output efficiency as published in the general installation section of this data sheet.

The information given on this Technical Data Sheet is for guidance only. For ratings other than those shown, please contact Perkins Engines Company Limited.

ALTERNATOR TECHNICAL DATASHEET

LSA 50.2 L8

Reference LS : Standard

Nidec Industrial Automation India Private Ltd.
#45, Nagarur, Huskur Road, Off Tumkur Road
Bangalore - 562162. India

General Characteristics

	LSA 50.2 L8		
Alternator Frame			
Rating	1500	kVA	1200 kW
Phase	3		
Pole	4		
Rated Speed	1500	RPM	
Rated Voltage [L-L] (V)	415	V	
Rated Current	2086,8	A	
Frequency	50	Hz	
Rated Power Factor	0,8	Lag	
Voltage Regulation	±1%	With 4 % Engine Governing.	
Insulation System	H	Class	
Temperature Rise Limit	H	Class	
Winding Pitch	2/3		
Over Load	10 % Over Load for 1 hour once in 12 hours		
Waveform Distortion	No-Load <3.5%		
Temperature Ambient	40	° C	
Altitude	1000	m	

Electrical Parameters

Stator Wdg Res(L-L) @20°C	0,002	Ω
Rotor Wdg Res @20°C	0,506	Ω
Excn. Current At No Load	0,80	A
Excn. Current At Full Load	3,50	A

Connection & Controls

Stator Winding	Double layer concentric winding
Control System	Self-regulated and self-excited
Excitation System	Brushless (AREP)
AVR Type	Analogue
AVR Model	R 450

Performance: Efficiency @0.8 p.f

100% Load	95,5	%
75% Load	95,8	%
50% Load	95,7	%
25% Load	94,1	%

ALTERNATOR TECHNICAL DATASHEET

LSA 50.2 L8

Reference LS : Standard

Reactance & Time constant

Reactances are Saturated & Per Unit at Rating and Voltage Indicated. Time Constant are In Seconds

Reactances

Short Circuit Ratio	0,358
X_d Dir Axis Reactance	2,794
X'_d Dir Axis Transient Reactance	0,162
X''_d Dir Axis Sub Transient Reactance	0,138
X_q Quad Axis Reactance	1,524
X''_q Quad Axis Subtransient Reactance	0,144
X_l Leakage Reactance	0,081
X_2 Negative Sequence Reactance	0,141
X_0 Zero Sequence Reactance	0,028

Time Constant

T'_d Transient Time Constant	0,180
T''_d Sub Transient Time Constant	0,018
T'_{do} O.C Field Time Constant	3,910
T_a Armature Time Constant	0,027

Mechanical Parameters

Protection	IP 23
Cooling	IC01
Air flow	1,80 m ³ /sec
GD ²	25,05 kg-m ²
Bearing Drive End	NA
Bearing Non-Drive End	BALL 6320 C3
Coupling	Single Bearing (SAE 00-21")
Maximum Over Speed	120% for 2 mins
Dimensional Drawing	AG316096
Machine Dim. L x B x H (mm)	Refer Dimension Drawing

Weight

Weight of Generator	2790 kg
---------------------	---------

Note: The rating is industrial and conforms to IS:13364 and IS/IEC: 60034-1

Continuous development of our products entitles us to change specification details without notice

GV1 1500 KVA DG Supernova (Perkins)

From: waseem@modiproperties.com <waseem@modiproperties.com>
To: Soham Modi <sohammodi@modiproperties.com>
Cc: Procurement Group <procurement@modiproperties.in>

Soham Sir,

Subsequent to our LOI shared with Supernova to purchase 1500 KVA DG x 2 nos. for GV1 @ Rs. 1.05 cr each, Supernova has reverted with their final offer with Rs. 1.08 cr for each 1500 KVA DG (all inclusive).

For approval.

Regards,

Sayed Waseem Akhtar
Associate Vice President - Cluster Development
Modi Properties | +91 93475 76914
www.modiproperties.com

----- Forwarded Message -----

From: K BALAKRISHNA <k.balakrishna@supernovagenset.com>
To: "waseem@modiproperties.com" <waseem@modiproperties.com>
Cc: 'Procurement Group' <procurement@modiproperties.in>; 'Janardhan' <jnr@supernovagenset.com>;
'dkd@supernovagenset.com' <dkd@supernovagenset.com>; 'dsm@supernovagenset.com' <dsm@supernovagenset.com>; 'Prabhakar P. Purchase' <prabhakar@modiproperties.com>
Sent: Saturday, December 2, 2023 at 04:52:17 PM GMT+5:30
Subject: RE: Required a quotation for 1500KVA DG set

Dear sir,

Greetings of the day!

At the outset, we thank you very much for the minutes of our meeting at your office.

This has reference to the above subject and to the discussions we had with your good selves. We have reworked the costing and are pleased to submit to you the special package prices as requested for supply, and commissioning of DG sets for that find the enclosed sheet and considering you a special case. I've included a breakdown for your convenience.

Proc

PRICE SCHEDULE FOR SUPPLY OF 2x 1500KVA DG SETS WITH ISOLATION PANEL					
S.No.	DESCRIPTION	UNIT	QTY	SUPPLY	
				UNIT RATE	AMOUNT (INR)
1	Supply of 1500 KVA SILENT DG Set comprising of Perkins make engine model 4012-46TAG2A developing 1785 BHP Coupled to 1500 KVA, 415V Leroy Somer make alternator mounted on a common base frame, complete with:	Set	2		
	(a) Fuel tank 990 Ltrs. (Outside Enclosure)				
	(b) Batteries & Leads.				
	(c) AVM pad				
	(d) Silencer.				
	(e) First fill of lube oil.				
	(f) Radiator Cooled				
	(g) Acoustic enclosure for 1500KVA				
2	Isolation Panel Manual Fix type ACB 2500A Placed above the Alternator inside the Acoustic Enclosure with Auto Sync suitable controller with Battery charger.	Set	2		
3	Freight Up to site Turakpally Telangana.	Set	2		
	IGST 18 %	Set	2	16,47,457.65	32,94,915
Total					2,16,00,000
(SEL) NOTE					
1	All Prices quoted For Site Basis. Other Taxes, etc. shall be charged extra.				
2	Our scope is limited to supply of DG Set & Isolation panel only.				
	EXCLUSIONS FROM SUPERNOVA'S SCOPE				
	(i) Installation, commissioning & Unloading/shifting of DG set				
	(ii) Any major or minor civil work like grouting, excavation, backfilling etc.				
	(iii) Exhaust piping & it's support, fuel piping & it's fittings				
	(iv) Power & control cabling, Busduct, earthing strips & pits, cable tray & its trenches				
	(v) Any kind of statutory Approval				
	(vi) Any kind of mandatory/ recommended spares or special tools & tackles				
	(vii) Consumables for site testing, first fill of diesel				

Thank you for sharing the details.

Please consider this email as a letter intent to buy Supernova 1500 KVA DG @ Rs. 1.05 cr each (all inclusive) with SITC at site. We would be placing order for 2 nos. x 1500 KVA DG.

Share us your revised proposal as per the prices indicated to enable us to place you the order.

Regards,

Sayed Waseem Akhtar
Associate Vice President - Cluster Development
Modi Properties | +91 93475 76914
www.modiproperties.com

On Tuesday, November 28, 2023 at 05:42:36 PM GMT+5:30, K BALAKRISHNA
<k.balakrishna@supernovagenset.com> wrote:

Dear Sir,

Good Evening!

This is with the reference to discussion had with Mr. Ramesh Reddy (Mep dept.) on technical queries the following are the clarification:

1. **BHP** – we are offering DG set 1500 kva With BHP of **1785** for this engine(401246TAG2A) which is highest in industry
 2. **Cylinders-** As per the Perkins standard we are offering 12 cylinder engine which is proven in all the segments.
 3. **Additional warranty** – we are offering **5C warranty** for engine Critical components { I. Connecting rod, II.) Crankshaft, III).Camshaft, IV).Cylinder Head & V.) Cylinder Block }
- In addition standard warranty of 24 months for Engine and Alternator or **6000** Running hours, Whichever is earlier
4. **Sync Relay-** We can also supply sync relay for synchronising application for the DG sets.
 5. **Service Intervals-** In Perkins DG sets service intervals are every **500** hrs or 1 year, whichever is earlier.
 6. **Engine- In Perkins** DG set has State of Art Technology of Common Rail Direct Injection(**CRDI**)

Subject: RE: Required a quotation for 1500KVA DG set

Importance: High

Dear Sir,

Greetings from Supernova !

At the outset, we thank you very much for the minutes of our meeting with you and Mr. Waseem Akhtar sir at your office.

This has reference to the above subject and to the discussions we had with your good selves. We have reworked the cost and are pleased to submit to you the most competitive and Special package with best prices as requested for supply of 2 no's (1500 kVA Prime application Silent DG sets with Leroy somer Alternator and Isolation panel with AMF logic along with Trickle battery charger alternator mount type), including freight Up to Turakpally Hyderabad site for that, find the enclosed sheet, and consider you a special case. I've included a breakdown for your convenience.

Thank you so much for taking the time to read this and for all the great reasons why you chose us and Supernova. Once again we want to let you know that we are excited to work with you and your organization and look forward to providing you with world class Supernova Perkins products.

Note : As per the discussion about taking delivery of DG sets, before January 2024 .

Looking forward for your valuable order.

Best Regards,

K.Balakrishna



Building Powerful Relationships Sr.Manager- Regional Sales TS & AP

Mobile: 9444349659

Email: k.balakrishna@supernovagenset.com

Web: www.supernovagenset.com

Address : T & A plaza, Madhapur, Hyderabad-500081



Save paper. Don't print

From: Prabhakar P <prabhakar@modiproperties.com>

Sent: 10 November 2022 12:07

Subject: RE: Required a quotation for 1500KVA DG set

Importance: High

Dear Sir,

Greetings from Supernova !

At the outset, we thank you very much for the minutes of our meeting with you and Mr. Waseem Akhtar sir at your office.

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Note : As per the discussion about taking delivery of DG sets, before January 2024 .

Looking forward for your valuable order.

Best Regards,

K.Balakrishna



Building Powerful Relationships Sr.Manager- Regional Sales TS & AP

Mobile: 9444349659

Email: k.balakrishna@supernovagenset.com

Web: www.supernovagenset.com

Address : [T & A plaza, Madhapur, Hyderabad-500081](#)



Save paper. Don't print

From: Prabhakar P <prabhakar@modiproperties.com>

Sent: 10 November 2023 12:07

To: K BALAKRISHNA <k.balakrishna@supernovagenset.com>

Cc: Procurement Group <procurement@modiproperties.in>

Subject: Re: Required a quotation for 1500KVA DG set

5. Customer Segment wise
6. OEM Certificate

We look forward for further Technical discussion and reaching to the Commercial closure.

Best Regards,

K.Balakrishna



Building Powerful Relationships Sr.Manager- Regional Sales TS & AP

Mobile: 9444349659

Email: k.balakrishna@supernovagenset.com

Web: www.supernovagenset.com

Address : [T & A plaza, Madhapur, Hyderabad-500081](#)



Save paper. Don't print

From: Prabhakar P <prabhakar@modiproperties.com>

Sent: 08 November 2023 10:57

To: k.balakrishna@supernovagenset.com

Cc: Waseem Akhtar Construction <waseem@modiproperties.com>; Procurement Group <procurement@modiproperties.in>

Subject: Required a quotation for 1500KVA DG set

CAUTION: This email is from an external source. Exercise caution when opening attachments or clicking links.

Dear Mr. Balakrishna,

Greetings from MPPL,

1. ALL DIMENSIONS ARE IN mm.
2. FOUNDATION DEPTH TO BE DECIDED ON THE BASIS OF SOIL BEARING CAPACITY.
3. THE HEIGHT OF 200MM ABOVE GROUND LEVEL IS TO BE PROVIDED.
4. STATIC WEIGHT :- 17000 KG
5. DYNAMIC WEIGHT :- 2800 KG
6. TOTAL WEIGHT :- 19800 KG



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SUPERNOVA ENGINEERS LTD. AHMEDABAD
Ph: 079-26407792, 26401450, Fax: 26400004, Email: purchase@supernovagensest.com

Target Price
1,05,00,000/-

1500KVA DG X 2 Nos GV1

Procurement/Purchase comparison sheet									
Prepared by		Md. Anwar		Date		23/1/2023			
1. No. SKU		Additional specs		Qty		Units		Net rate after discount + GST	
2. Transport charges		1500 RPM		2 Nos		1 Nos		Jaskem Limited (Make Cummins Engine & Stamford Alternator)	
3								Essential Power Tech (Make Perkins Engine & Stamford Alternator)	
4								Sterling Generator Pvt. Ltd (Make Baudouin Engine & Compston Groves Alternator)	
5								Powertec Ltd (Make Cummins Engine & Stamford Alternator)	
6								SUPERNOVA ENGINEERS LIMITED (Make Perkins Engine & Leroy Somer Alternator)	
7								M/s GMMCO Ltd (Make Wipac Engine & Leroy Somer Alternator)	
8								M/s GMMCO Ltd (Make Caterpillar Engine & Caterpillar Alternator)	
9								Last purchased (GVTC/Jaskem Limited (Make Cummins Engine & Stamford Alternator))	
10. Total									
11. Material required for site									
12. Details of requisition no., required by, etc.									
13. Delivery period									
14. Advance									
15. Payment terms									
16. Loading cost									
17. Unloading cost									
18. Warranty									
19. Installation & Fraction of DG									
20. Commissioning									
21. Other item									