

Powered by Nature

Hybrid Generator Sets



Hybrid Generator

Teksan Hybrid Generator is a clean energy system powered by nature, which is easily configurable to meet requirements in a wide range of power.

Optimum
Energy Solutions

High Savings in
Operating Costs

Remote Monitoring
and Control System

Your Benefits

Green
Energy

Corporation-Specific
Wide Range of Solutions



Why Choose Teksan Hybrid Generators



Reduced Maintenance Costs

Our products continue to work up to **1000 hours** without the need for maintenance and technical service.



Tailor-made Solutions

We offer different solutions to **customer demand**.



Remote Monitoring

With our remote monitoring feature, the number of **site operations has been reduced**. Service support at longer intervals and minimum number of technical staff



Affordable Investment

Investment **payback** period **down to 2 years**.



Ultra Silent Canopy

Decreased sound level from **65 dBA @1m** is provided with custom design solutions.



Reduction in OPEX

With the contribution of renewable energy use, generator **operating time has been reduced by 80%**. With the use of variable speed engine and fuel optimization algorithm, **65% fuel savings** are achieved.



HYBRID GENERATORS

UNSTABLE GRID AREAS



■ Low Noise Level with Dedicated Designed Exhaust System

■ Variable Speed Diesel Generator Set
■ Hybrid Control Unit with Remote Monitoring System

■ 800 L Included Double Wall Fuel Tank



■ 20U Free Space for Telecom Customer Equipments

ALL IN ONE
COMPACT DESIGN
FOR TELECOM
APPLICATIONS



MINIMUM
CARBON
FOOTPRINT

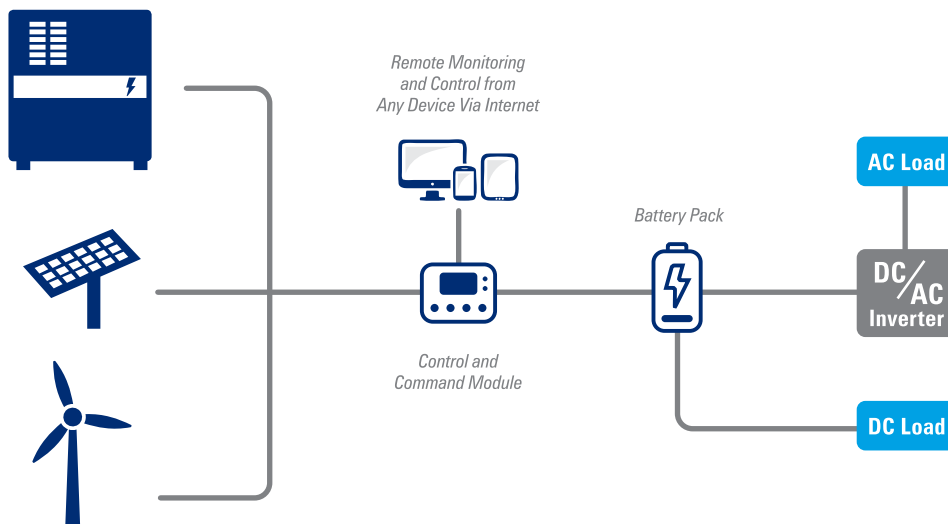
Field of Application

- Areas with power outages
- Locations with daily scheduled power outages up to 8 hours
- Locations having short-time power outages up to 16 hours in total on a daily basis

The Objective of the Solution

- Optimum solution for lower OPEX and CAPEX
- 100% facility utilization at lower costs
- Minimizing diesel engine running time and fuel consumption
- Emergency power supply meeting up to several weeks period without refueling when there is no grid connection





How It Works

- The main power supply is the central grid.
- In case of any grid outage, the load is powered from batteries for up to 8 hours.
- If the grid outage continues for more than 8 hours, the diesel generator starts up automatically and continues to supply the load. While the generator supplies the load, it charges the storage batteries at the same time.
- When the grid power comes back, the generator stops and automatically transfers the load to the grid.
- Batteries are fully charged with the grid.
- Grid-generator changeover operates trouble-free and does not cause fluctuation.

| UNSTABLE GRID AREAS | | | | |
|--|-----|-----|------|------|
| Average Load | kW | 2 | 4 | 6 |
| Maximum Permanent Load | kW | 3 | 6 | 10 |
| Battery Capacity | Ah | 500 | 1000 | 1600 |
| Generator Power | kVA | 12 | 26 | 39 |
| DC Power | kW | 9 | 18 | 27 |
| Fuel Tank | lt | 800 | 800 | 1000 |
| OPTIONAL FAST CHARGE SOLUTION | | | | |
| Generator Power | kVA | 26 | 51 | 77 |
| DC Power | kW | 18 | 36 | 51 |
| Optional Solar Energy System Configuration | | | | |
| Total Solar Power | kWp | 6,4 | 12,8 | 25,6 |

HYBRID GENERATORS

OFF GRID AREAS



Field of Application

- Off grid areas
- Locations where emission and fuel consumption should be minimized
- Optimized solution based on both OPEX and CAPEX for off grid areas

How It Works

- The main power source is solar / wind energy (if applicable)
- If solar energy is insufficient, the batteries balance the load.
- When the batteries are discharged, the generator will start and supply the load
- The generator will stop after the batteries are charged

The Objective of the Solution

- Providing the most suitable solution for off grid facilities
- Reducing engine running time and maintenance costs
- Lower fossil fuel consumption
- Low number of site visits due to low generator running time and fuel consumption

| | | | | |
|---|-----|-----|------|------|
| Average Load | kW | 2 | 4 | 6 |
| Maximum Permanent Load | kW | 3 | 6 | 10 |
| Battery Capacity | Ah | 500 | 1000 | 1600 |
| Generator Power | kVA | 12 | 26 | 39 |
| Rectifier Power | kW | 9 | 18 | 27 |
| Fuel Tank | lt | 800 | 800 | 1000 |
| Optional Solar Energy System Configuration | | | | |
| Total Solar Power | kWp | 6,4 | 12,8 | 25,6 |

PURE SOLAR FOR OFF GRID AREAS



- 48VDC Long Cycle Life Batteries
- Thermally Customized Battery Cabinet
- Door Open Alarm for Unauthorized Access

- Easy to Transport
- Lifting Option with Forklift and Crane



- Easy Connection for Solar Panel Integration

- 48VDC Air Conditioner for Batteries
- Customized Cooler Capacity for High Ambient Temperature

Field of Application

- Off grid sites with extremely limited access
- Low power consumption facilities

How It Works

- The main power source is solar energy
- Batteries are charged during daylight hours
- Power is supplied from the batteries at night and on cloudy days

The Objective of the Solution

- Reduce operating costs
- Reduce site visit to minimum

| Average Load | kW | 2 | 4 | 6 |
|-------------------|----------------|------|------|------|
| Total Solar Power | kWp | 16 | 32 | 48 |
| Floor Space | m ² | 80 | 160 | 240 |
| Battery Capacity | Ah | 3000 | 6000 | 9000 |

HYBRID GENERATORS

TECHNICAL SPECIFICATIONS

| | TJ 3000 HD | | | | TJ 6000 HD | | | | TJ 10000 HD |
|---------------------------------------|---------------------------|------|------------------|------|-----------------------|------|------------------|------|-----------------------|
| MAXIMUM LOAD | 3.000 W | | | | 6.000 W | | | | 10.000 W |
| Average Load | 2.000 W | | | | 4.000 W | | | | 6.000 W |
| Optimized Load Range | 1.000 - 3.000 W | | | | 3.000 - 6.000 W | | | | 6.000 - 10.000 W |
| Nominal Output Voltage | 48 VDC | | | | | | | | |
| AC Output Power (optional) | 250 - 3.000 VA | | | | 250 - 5.000 VA | | | | 250 - 9.000 VA |
| ENGINE | | | | | | | | | |
| Make | Perkins | | Deutz | | Perkins | | Deutz | | Perkins |
| Model | 403D-11 | | F2M-2011 | | 404D-22 | | F3M-2011 | | 1103A-33TG |
| Output Power at 1800rpm | 10,3 kW | | 15,0 kW | | 21,6 kW | | 23,3 kW | | 32,2 kW |
| Cooling Type | Water | | Oil | | Water | | Oil | | Water |
| Operating Speed | 1300-2000 rpm | | | | | | | | |
| Fuel | Diesel | | | | | | | | |
| Standard Maintenance Interval | 500 hours | | | | | | | | |
| Increased Maintenance Interval (opt.) | 1.000 hours | | | | | | | | |
| ALTERNATOR | | | | | | | | | |
| Technology | Brushless Synchronous | | Permanent-Magnet | | Brushless Synchronous | | Permanent-Magnet | | Brushless Synchronous |
| Model | TAL040 D | | PMG140K/18-90 | | TAL040 F | | PMG140K/18-180 | | TAL042 C |
| Output Power at 1800rpm | 9 kW | | | | 18 kW | | | | 30 kW |
| DEEP CYCLE BATTERY | | | | | | | | | |
| Technology | Lead Acid / Li-Ion | | | | | | | | Li-Ion |
| Type | AGM Nano Carbon / LiFePO4 | | | | | | | | LiFePO4 |
| Nominal Capacity | 500 Ah | | 500 Ah | | 1.000 Ah | | 1.000 Ah | | 1.600 Ah |
| Rated Voltage | 48 V | | | | | | | | |
| DoD (Depth of Discharge) | 80% | | | | | | | | %80 |
| Cycle Life (25 °C @ %80 DoD) | 3.200 / 5.000 | | | | | | | | 5.000 |
| Maintenance Requirement | No | | | | | | | | |
| Running Temperature (°C) | -15 to 45 / -10 to 55 | | | | | | | | |
| SIZE | | | | | | | | | |
| | PERKINS | | DEUTZ | | PERKINS | | DEUTZ | | PERKINS |
| | LEAD CARBON | LFP | LEAD CARBON | LFP | LEAD CARBON | LFP | LEAD CARBON | LFP | LFP |
| Weight | 2313 | 1775 | 2348 | 1810 | 3267 | 2191 | 3307 | 2231 | 2800 |
| Dimensions (WxLxH) | 1506x2550x2000 | | | | 1506x2550x2000 | | | | 1607x2800x2160 |

Standard Features

| | | | |
|------------------------------|---------------------|----------------------------------|-------------------|
| DC Power Distribution | | Communication Interface | RS232/ RS485 |
| Critical loads (BLVD) | 3x63A, 2x32A, 2x16A | System Operating | 0°C / +45°C |
| Non-critical loads (LLVD) | 1x63A, 2x32A, 2x16A | Remote Monitoring/Control | 2G/3G/4G/Ethernet |
| Internal Fuel Tank | 800 litres | Location Tracking | GPS |

Optional Features

| | | |
|---|----------------------------|---|
| 230V AC Output | 250VA- 6.000VA | Solar Energy Kit -1 (panel, MPPT charger, fusebox) |
| Residual Current Protection | For 230V AC circuit | 6,4 kWp optimized for TJ3000 |
| Auto-Transfer Switch | Auto-Transfer Board | 12,8 kWp optimized for TJ6000 |
| Free Contacts for External Signals | 8 Inputs / Outputs | 25,6 kWp optimized for TJ10000 |
| Increased Operating Temp. Range | -20°C /+55°C | Solar Energy Kit -2 (panel, MPPT charger, fusebox) |
| Load Priority Selection | Critical / Non-critical | Can be optimized acc. to the project req. |
| Increased Maintenance Interval | 1.000 hours | IP Protection Class |
| External Fuel Tank | up to 5000 liters | Can be optimized acc. to the project req. |
| External Battery Capacity | up to 2000Ah | Super Silent Cabinet |
| Multiple User Support | Power measurement per user | Can be optimized acc. to the project location |
| | | Dust Filters |
| | | Can be optimized acc. to the project location |
| | | Improved Security |
| | | Can be optimized acc. to the project location |

Additional Options on The Site

- Increased rectifier power output by adding extra modules
- Adding an external fuel tank without any modifications
- Increasing the discharge time by adding an external battery group
- Power output increase with additional hybrid generator paralleling
- Increased Solar Panel Capacity for sites with low solar radiation

| | TJ 3000 HD | | | TJ 6000 HD | | | TJ 10000 HD | |
|---|------------|----------|----------|------------|----------|----------|-------------|----------|
| EXPECTED PERFORMANCE VALUES (LOAD) | 1,0 kW | 2,0 kW | 3,0 kW | 4,0 kW | 5,0 kW | 6,0 kW | 6,0 kW | 10,0 kW |
| Battery Discharge Time (hours) | 16,8 | 8,4 | 5,6 | 8,4 | 6,7 | 5,6 | 9 | 5,4 |
| Battery Charge Time (hours) | 4 | | | | | | 4,4 | 4,8 |
| Battery Cycle per Day | 1,16 | 1,94 | 2,51 | 1,94 | 2,25 | 2,51 | 1,79 | 2,36 |
| Expected Battery Life (years) | 9,5 | 5,6 | 4,4 | 5,6 | 4,9 | 4,4 | 7 | 5,1 |
| Genset Running Hours per Day (hour) | 4,6 | 7,7 | 9,9 | 7,7 | 8,9 | 9,9 | 8,6 | 11,4 |
| Engine Maintenance Period (days) (per 500h / per 1000h) | 108 / 216 | 65 / 130 | 50 / 100 | 65 / 130 | 56 / 112 | 50 / 100 | 58 / 116 | 43 / 86 |
| Fuel Consumption per Day (liters) | 10,4 | 20,1 | 29,3 | 38,7 | 47,5 | 56 | 51,2 | 81,9 |
| Fuel Transfer Period (days) | 77 | 40 | 27 | 21 | 16 | 14 | 19 | 12 |
| HYBRID + SOLAR SYSTEM | | | | | | | | |
| Recommended Solar Power (kWp) | 6,4 | | | 12,8 | | | 25,6 | |
| Number of Solar Panels (pcs) | 16 | | | 32 | | | 64 | |
| Genset Running Hours per Day (hour) | 1,4 | 5,2 | 6,7 | 4,2 | 5,5 | 6,8 | 5,4 | 8,2 |
| Engine Maintenance Period (days) (per 500h / per 1000h) | 357 / 714 | 96 / 192 | 74 / 148 | 119 / 238 | 90 / 180 | 73 / 146 | 92 / 184 | 60 / 120 |
| Fuel Consumption per Day (liters) | 2,7 | 11,7 | 20,7 | 22,6 | 30,3 | 40,3 | 31,1 | 53,9 |
| Fuel Transfer Period (days) | 296 | 68 | 38 | 35 | 26 | 20 | 32 | 18 |
| Solar Energy Rate (%) | 78,9 | 45,3 | 31,9 | 45,3 | 37,9 | 31,8 | 51,1 | 37 |
| Expected Battery Life (years) | 10 | 7,5 | 5,7 | 7,4 | 6,1 | 5,6 | 9,8 | 6,8 |



Some of our References in the Telecommunications Industry

- | | | | |
|---------------------------|------------------------------|------------------|----------------------|
| ■ Airtel | KONGO | ■ Saudi Telecom | SAUDI ARABIA |
| ■ Alkan Telecom | EGYPT | ■ Sultan Telecom | KUWAIT |
| ■ Alsys Telecommunication | ROMANIA | ■ Telecel | BURKINA FASO |
| ■ Brt Media | CYPRUS | ■ Turkcell | TURKEY |
| ■ Camusat | TANZANIA | ■ Turk Telekom | TURKEY |
| ■ Helios Tower | KONGO | ■ Tigo | D.R. CONGO |
| ■ Iceland Telecom Ltd. | ICELAND | ■ Ucell | UZBEKISTAN |
| ■ JV Coscom | UZBEKISTAN | ■ Uganda Telecom | UGANDA |
| ■ Kazakh Telecom | KAZAKHISTAN | ■ Ums | UZBEKISTAN |
| ■ Magticom Ltd. | GEORGIA | ■ Vodacom | D.R.CONGO / TANZANIA |
| ■ Mts | BELARUS / UZBEKISTAN | ■ Vodafone | THE NETHERLANDS |
| ■ Newroz Telecom | IRAQ | ■ Xpress Telecom | JORDAN |
| ■ Orange | SENEGAL / MALI / IVORY COAST | ■ Yemen Telecom | YEMEN |
| ■ Ooredoo Telecom | ALGERIA | ■ Zain | SUDAN |





Hybrid Generators, which provide environmentally friendly efficient energy, are preferred in many areas thanks to their remote monitoring system.



Remote Telecom Base Stations



Oil Well-heads & Signalization Nodes



Off-shore Platforms



Remote Military Platforms



Meteorological Measurement Stations



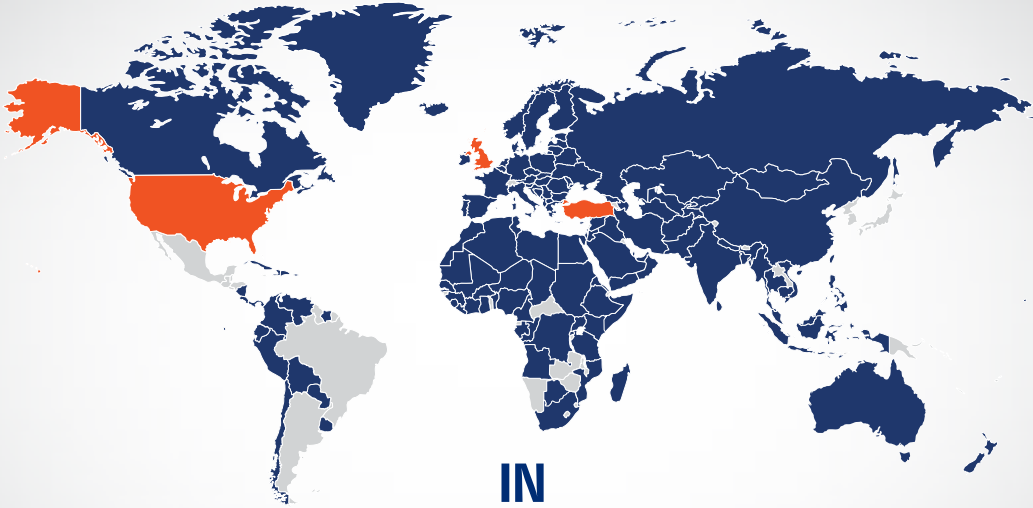
Residential Areas without Electricity Grid Connection



Outdoor Events & Camping



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