












**DIESEL GENERATOR**

# **USER MANUAL**

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## WARNINGS

-  Read and understand all safety precautions and warnings before operating or performing maintenance on the generator.
-  Failure to follow instructions, procedures and safety precautions in this manual may increase the possibility of accidents or injuries.
-  Do not alter or adjust any part of the generator set without prior approval, as Bundu Power will not be held responsible for faults or accidents caused by modifications or alterations.
-  It is very important to regularly carry out checks suggested in this manual to maximise the generators lifespan and prevent accidents from occurring.
-  Never start the generator unless all foreign items are removed from inside the sound attenuated canopy and the doors are securely closed.
-  Do not attempt to operate the generator in unsafe conditions.
-  If the generator set is unsafe to operate, disconnect the battery negative (-) lead to prevent starting the generator until the problem has been rectified.
-  Disconnect the generators negative battery lead prior to attempting any repairs or cleaning the inside of the sound attenuated canopy.
-  Install and operate this generator within the local and national legislation applicable to your territory.

# QUICK START GUIDE

# 1500RPM

- 1 Check the battery is connected (Positive and negative terminals are tightened)
- 2 12 - 50kVA ONLY: Check the battery lock-out switch is in the correct position
- 3 60kVA+ ONLY circuit breakers are all in the up position behind the control screen
- 4 Fill the tank with diesel. The generator will not run without being filled first. If the generator is started without diesel, it will need to be primed again once filled with diesel.
- 5 Switch the screen on with the ON/OFF key.
- 6 Check for any alarms and rectify them before starting.
- 7 Select the AUTO button to place the generator in automatic mode. Be careful as the generator will start without warning if it does not have mains connected. Select RUN to start the generator manually.
- 8 Once started, use the arrow buttons to check the output voltage are correct before connecting load to the generator.

**SINGLE PHASE: +/- 230V**

**THREE PHASE: +/- 230/400V**

- 9 To use the generator in automatic mode, you must have an automatic transfer switch (ATS) installed by a qualified electrician. The ATS should be installed as close to the distribution board (DB) as possible in order to reduce the cost of cabling. The electrician must issue a Certificate of Compliance (COC) on completion of the work.
- 10 A communications cable and electricity supply cable need to be run from the ATS to the generator. Refer to the wiring diagram supplied with the generator. Cable not included.
- 11 All BPD Series generators have a battery charger built into the generator. This allows the generator to be used with a manual transfer switch whilst still keeping the battery charged from the mains power. This must be connected by a qualified electrician.

## NOT STARTING?

If the generator is not starting having been through the above sequence, try the following 3 steps.

### STEP 1

If the generator is cranking but not starting:  
Prime the diesel through the system using the priming pump on the engine.

### STEP 2

If the generator is not cranking but the screen is on,  
it is likely that the battery is flat.

### STEP 3

If the screen does not come on at all, the battery lock out is in the wrong position or the battery is completely flat. For models BPD12 – BPD50, the battery lock-out can be found below the control panel. For models BPD60S3 and larger, the circuit breaker can be found behind the control screen.

# QUICK START GUIDE

# 3000RPM

## STARTING

- 1 Make sure the generator is on level ground.
- 2 Check the battery is connected (Positive and negative terminals are tightened).
- 3 Fill the tank with diesel BEFORE attempting to start the generator. The generator will not run without being filled first. If run without diesel you will have to prime the engine again to run the generator once filled.
- 4 Switch the screen ON with the ON/OFF key.
- 5 Ensure the breaker is in the OFF position.
- 6 Press the Green button on the screen "RUN" and wait for the generator to crank.
- 7 Once started and running, turn the breaker to the ON position to supply power.

## STOPPING

- 1 Switch the breaker to the OFF position
- 2 Allow the generator 1 minute to cool down.
- 3 Press the red STOP button.
- 4 Turn off the screen with the key.

Ensure you keep the battery sufficiently charged if not installed with an ATS and battery charger. Start the generator a minimum of once per month to ensure it is in working order when required.

**NOTE:** If the screen is left in the ON position, the display will go into sleep mode. It will still drain the battery. Ensure you turn off the screen when not in use. If used with an ATS, the screen will remain in sleep mode until needed and the battery will remain charged with a battery charger.

## WARNING

**DO NOT:** Run this generator indoors. The exhaust fumes are dangerous and can cause death. This generator is air-cooled and any restriction to the air-flow of the generator can cause the generator to overheat.

**DO NOT:** Run this generator in a closed room. The hot air will recirculate and cause the generator to overheat. This is a fire hazard.

# INSTALLATION GUIDELINES



## ELECTRICAL INSTALLATION

- 1 Install surge protection.
- 2 Bond generator and automatic transfer switch (ats) to main incoming earth from mains supply.
- 3 Check voltage between neutral and earth (should be no residual voltage).
- 4 Cable should be sized to carry the full load of the generator.
- 5 Ats or manual switch should be sized to carry full load of mains or generator, whichever is highest.
- 6 Check all nuts are tight on mains and generator connectors in ats or manual change over.
- 7 Certificate of compliance (coc) to be issued by the installing electrician.

## CIVIL WORKS

- 8 Generator placed on level concrete surface.
- 9 150Mm thick plinth with wire mesh reinforcing.
- 10 Exhaust and hot air to be directed outside if installed in a room.
- 11 If installed outside it is recommended that the generator is placed under a roof.

## GENERAL

- 12 1M space around the generator for service access.

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The above checklist is provided in order to standardize the installation of your generator set. If the above checklist and following explanations are adhered to, this will reduce the possibility of any issues arising in the future.

Always use qualified personnel for the installation of your generator. Qualified electricians are required by law to do the installation of your generator. Please insist on an ECBSA certified electrician.

# INSTALLATION GUIDELINES



## CHECKLIST EXPLAINED

- 1 Surge protection should be installed on the mains incoming feed to avoid over voltage which could harm your electrical equipment and generator. In addition to protecting your equipment the generator is setup to sense voltage fluctuations within a specific range and turn on and off accordingly (If in automatic mode with an ATS).
- 2 As per the electrical regulation of South Africa. (Bonded neutral earth).
- 3 Any residual voltage found between the neutral and earth will increase the voltage supplied which will eventually have adverse effects on electrical items.
- 4 Cable should be sized to carry the full load of the generator.
  - a BPD SERIES - The communications cable should be 1.5mm (Up to 40m).
    - 3-Phase generators need a 6-core communications cable.
    - 1-Phase generators need a 4-core communication cable.
- 5 The ATS or Manual switch should be sufficiently sized to carry the maximum load from either generator or mains. Our switches are normally sized to the maximum generator output.
- 6 The connections inside the ATS or manual change over switch should all be checked and tightened by the electrician prior to signing off. Transportation of the ATS and generator can often cause these nuts and bolts to become loose.
- 7 A Certificate of Compliance (COC) is required by law to be issued by the installing electrician. This certificate will be needed for your insurance as well as by Bundu Power should there be an issue with the installation of the generator at a later date and for warranty claims.
- 8 The generator operates optimally when on a level surface. The fuel tank and oil are designed to be used on a level surface.
- 9 The concrete slab is required to ensure a solid and level surface for the generator. In some instances, placing the generator on solid paving will also suffice. The reason for the concrete plinth is to avoid any subsidence in the future.
- 10 Should the generator be installed in a room or garage it is imperative that the exhaust gases and hot air are vented out of the room. The generator produces toxic gases which must be expelled from the area. In addition, the room should be well ventilated so that the generator has cool air to cool it down when in operation.
- 11 Installing the generator under a roof is optional but is recommended to avoid any adverse weather damaging the generator. Due to the generator being outside and often in direct sunlight for parts of the day the paint is prone to fade over time.

In addition to this the possibility of water damage from cloud bursts or hail damage is greatly reduced by installing the roof over the generator.

We recommended at least 1m clearance above the generator for the roof.

- 12 One meter of space around the generator is required for maintenance. The technician will require access to both sides of the generator when servicing and inspecting the generator. A service should be performed every 12 months or at the required intervals as per the user manual.

## FAQ

**Q** Do I need to anchor the generator?

**A** No, the generator once placed on the plinth will not move. The only possible reason to need to anchor the unit is for theft.

**Q** Do I need anti-vibration mountings or a rubber mat?

**A** No, the engine is mounted on anti-vibration mountings already so the generator will not move once placed on the plinth. You can place a rubber mat under the generator but it is not necessary.

**Q** I don't have space for 1m around the whole unit?

**A** Each model is different, chat with your sales consultant who can advise the optimal position of the generator within a confined space. Alternatively have a steel framed trolley made to move the generator around easily.

**Q** Will my generator start automatically when the power fails?

**A** If you have installed an automatic transfer switch (ATS) and it has been installed correctly, then yes provided the generator and ATS are in automatic mode.

**Q** The screen stays on all the time?

**A** When the generator is in automatic mode, the screen and indicator lights remain illuminated for 60 mins. This can be adjusted in settings.

**Q** Do I need to do anything once the generator is installed and operational?

**A** You should check that everything on the generator is working at least once a month. Start the generator and check that it is automatically switching over if you have no mains electricity. You should keep maintenance records. Ensure the fuel tank is kept topped up.

**Q** Does the generator include cabling and installation?

**A** Installation and cables are not included.

**Q** Does the generator battery stay charged?

**A** The BPD series and Gas generators have battery chargers built-in. They need to be connected to the mains electricity to keep the generator charged. Please ask your sales consultant if your generator includes a battery charger.

**Q** Can I put the full load onto the generator immediately after starting?

**A** No, the generator needs to be loaded in 50% increments once it has warmed up.

# INSTALLATION & HANDLING

This manual covers the basic procedures to install and maintain your generator. In addition, it outlines the general safety precautions whilst utilizing the generator.

All relevant chapters should be read before attempting to install, lift, move or perform maintenance on the generator. Installation should always be performed by a qualified electrician who will supply you with a compliance certificate on completion (COC).

Electrical work, including earth grounding and insulation should be carried out in compliance with local regulations and laws.

Additional fuel tanks should comply with local regulations and laws.

Generators installed within a structure should have the exhaust fumes vented out of the structure by an air tight exhaust. The exhaust should vent the fumes away from the structure and be capable of very high temperatures.



## WARNING

**FAILING TO VENT THE EXHAUST FUMES OUT OF A STRUCTURE CAN LEAD TO DEATH BY ASPHYXIATION. IT IS IMPERATIVE THAT ALL FUMES PRODUCED BY THE GENERATOR ARE NOT INHALED AT ANY TIME.**

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Never lift or move the generator using the engine or alternator lifting points. Always perform lifts or moves of the generators by using the holes provided at the bottom of the sound attenuated enclosure or the lifting eye's if available.

Ensure the lifting rigging and supporting structure is in good condition and has a capacity suitable for the load. Keep all personnel away from the generator whilst it is suspended.

Ensure that the generator is placed on a level surface. The generator should always be placed on a level and stable surface for transport and operation. If the generator is to be installed in a permanent location a concrete plinth should be used.

Generators mounted on trailers should be fixed to a flat surface. Ensure that the trailer is suitable and capable of sustaining the weight of the generator. Never move the generator while it is running.

# FIRE & EXPLOSION

Fuels and fumes which are used and produced by generators can be flammable and potentially explosive. The proper precautions should be taken whenever dealing with these items to ensure that the risks of explosions are limited. Safety compliance requires a fully charged class BC (Regular dry chemical extinguisher) and class ABC (Multipurpose dry chemical extinguisher) to be installed in the vicinity of the generator. Personnel must know how to operate these devices.

Ensure the generator room is properly ventilated and that the generator has at least 1m open area around it for servicing and ventilation.

Keep the room, the floor and generator clear and clean of debris.

Spills of fuel, oil, coolant or battery acid must be cleaned immediately.

Never store flammable liquids near the engine.

Do not smoke or allow sparks, flames or other sources of ignition around fuel or batteries. Fuel vapours are explosive. Hydrogen gas generated by charging batteries is also explosive.

Turn off or disconnect the power to the battery charger before making or breaking connections with the battery.

Keep tools and other metal objects away from exposed electrical parts such as terminals, to avoid arcing. Sparks and arcing might ignite fuel or vapours.

Do Not refuel the generator while it is running.

Do not attempt to operate the generator with any known leaks in the fuel system.

Only use recommended fuel, oil and coolant.

# SAFETY CONSIDERATIONS



## MECHANICAL

The generator has protective covers for moving parts, but precautions should be taken when working around the generator to prevent bodily harm or damage to the mechanical components of the generator.

Do not attempt to operate the generator without the protective covers. Do not attempt to do any maintenance or modifications while the generator is running.

Keep all body parts away from the generator, its belts and mechanisms at all times. Also ensure that jewellery and hair is kept clear of the moving parts while in operation.

Some moving parts cannot be seen clearly when the set is running.

Keep access doors closed and latched at all times unless specific access is required.

Avoid contact with hot oil, hot coolant, hot exhaust gases and hot surfaces.

Wear protective clothing when working on or around the generator.

Do not remove the radiator cap until the coolant has cooled. Then loosen the cap slowly to relieve any excess pressure before removing the cap completely.



## CHEMICAL

All fuels, oils, coolants, acids and lubricants should be handled with care and any spills in and around the generator should be cleaned up immediately.

Do not swallow or allow skin contact with fuel, oil, battery acid or lubricants. If swallowed seek medical treatment immediately. For skin contact, wash with soap and water thoroughly.

Wear an acid resistant apron and face shield or goggles when servicing the battery. If acid gets onto the skin or clothing, flush immediately with large quantities of water.



## ELECTRICAL

Ensure all electrical equipment and components are correctly installed to prevent damage to the components and the operator. Ensure that these items are regularly maintained.

The generator must be connected to the load only by trained and qualified electricians who are authorised to do so. Connections should be in compliance with relevant electrical codes, standards and other regulations in your country. When required, their work should be inspected and accepted by the inspection agency prior to operating the generator or a certificate of compliance (COC) should be issued.

Ensure the generator is effectively grounded/earthed in accordance with all relevant regulations prior to operation.

The generator should be shutdown with the battery negative (-) terminal disconnected prior to attempting to connect or disconnect load connections.

Do not touch the inter-connecting cables, conductors or electrical components of the generator which are not insulated.

Replace the terminal box and all covers once connected before attempting to start and run the generator.

Ensure that the bolts and connectors securing all cables are securely fastened and are checked to ensure they have not loosened during operation. This applies to the generator and switch-gear.

Connect the generator only to load and that is compatible with its electrical characteristics and that is within its rated capacity. (Correct Hz, Frequency, Voltage and capable of supplying sufficient power for the load)

Be sure all electrical power is disconnected from electrical equipment being serviced.

Keep all electrical equipment clean and dry. Replace any wiring where the insulation is cracked, cut, damaged or degraded. Replace terminals that are worn, discoloured or corroded. Keep terminals clean and tight.

Insulate all connections and disconnected wires.

Use only class BC or class ABC extinguishers on electrical fires.

# ELECTRICAL

## FIRST AID FOR ELECTRIC SHOCK

Do not touch the victim's skin with bare hands until the source of electricity has been turned off.

Switch off power, if possible, or pull the plug or cable away from the victim as quickly and safely as possible. Use the emergency stop button where possible.

If this is not possible, stand on dry insulating material and pull victim clear of the conductor, preferably using non-conductive material such as dry wood. Immediately contact a hospital to treat patients who have been injured.

## ELECTRICAL CONNECTION

The cables connecting the generator with the distribution system should be protected by means of a circuit breaker, fuses or other means to disconnect the generator in case of overload or short circuit. Please refer to installation guidelines.

## ELECTRICAL LOADING

When planning your distribution system, it is important to ensure that a balanced load is placed on the generator (3-Phase). If loading on one phase is excessive in comparison to the other two phases this will cause overheating in the alternator windings, imbalance in the phase to phase voltage output and possible damage to sensitive 3 phase equipment connected to the system. Ensure that no phase current exceeds that of the current rating of the generator.

It may be necessary to reorganise the electrical distribution system if the generator is to be connected to an existing installation. The generator will shutdown if phases are not balanced.

## GROUNDING REQUIREMENTS

Enquire with your local electrical company or supplier as to what the grounding / earthing requirements are in your country. Bundu Power connects the frame of the alternator to the frame of the generator. The earthing of the star point / neutral of the alternator is the responsibility of the electrician installing the generator.

## GENERAL

To ensure the longevity of your generator it is imperative to have a strict and rigorous maintenance regime. At the back of this book there is a program that should keep your generator in optimal running condition. Ensure that all servicing is conducted by a trained and competent technician preferably with experience on generator sets. In addition, records of the servicing regime should be kept. A record can be kept in the back of this manual. These records will allow quick reference and may help diagnosing a problem in the future.

# PREVENTATIVE MAINTENANCE

Depending on the application of each generator the requirement for preventative maintenance operations will vary. The following schedule is outlined with intervals based on the calendar and hours of service. The maintenance requirement should be carried out when the first interval is met (hourly or calendar periods.)

If your generator is used for emergency backup or used about once a week, you should do a minimum of weekly check-ups.

DIESEL ENGINES	1500RPM	3000RPM
PERIOD	Every 12 Months	Every 12 Months
HOURS	Every 250 Hours	Every 100 Hours
OIL (15W40)	✓	✓
OIL FILTER	✓	✓
FUEL FILTER	✓	✓
AIR CLEANER	✓	✓
ONLY USE GENUINE BUNDU POWER PARTS		

- Check all safety devices by electrically simulating a fault to ensure that all systems will function properly, in the event of a fault.
- Clean all battery vent caps.
- Start the generator and observe the control panel and make sure all parameters are operating correctly.
- Tighten all exhaust connections.
- Tighten all electrical connections.
- Refer to the engine maintenance manual for further instructions.



## FAN BELT

- Only use an approved Bundu Power fan belt of the correct dimensions for the generator in question to replace worn or broken fan belts.
- Check the fan belt tension is correct.
- If the belt tension is lower than specified limit, adjust tension by relocating the charging alternator and idle pulley.

# PREVENTATIVE MAINTENANCE

## WATER

- Check the water level by opening the filler cap on the top of the radiator or by reading the gauge level on the top of the radiator, and add water if necessary.
- Replace the radiator filler cap if it is damaged or loose.
- When pouring antifreeze solution, first drain out the old antifreeze from cylinder block and radiator, then flush them with a cleaning solution.
- Check the percentage of antifreeze on the chart below.

ANTIFREEZE SOLUTION (%)	FREEZING POINT (°C)
20	-10
27	-15
33	-20
40	-25
44	-30
50	-40

- If more than 50% of the solution is antifreeze this will cause the engine to overheat. Avoid placing this amount of antifreeze into the engine.
- Add at least 5% antifreeze to the engine to prevent possible engine corrosion in hot weather.

## ENGINE OIL

- Check oil level using oil dip stick and replenish with approved oil if needed. Regular clean diesel motor vehicle can be used (L-ECD grade or 15W40).
- Check oil level on even ground when the engine has cooled. Oil level must be between MAX and MIN lines on the dipstick.
- Engine oil to be changed at specified intervals. The oil filter should be changed simultaneously.

## OIL FILTER

- Check for oil pressure and oil leaks, and repair or replace filter if necessary.
- Replace oil filter element every time engine oil is changed.



## FUEL FILTER

- If the fuel quality is bad ensure you replace the fuel filter more regularly.



## AIR CLEANER

- If air filters are still in good condition, they can be cleaned and reused.
- Clean ONLY using compressed air.

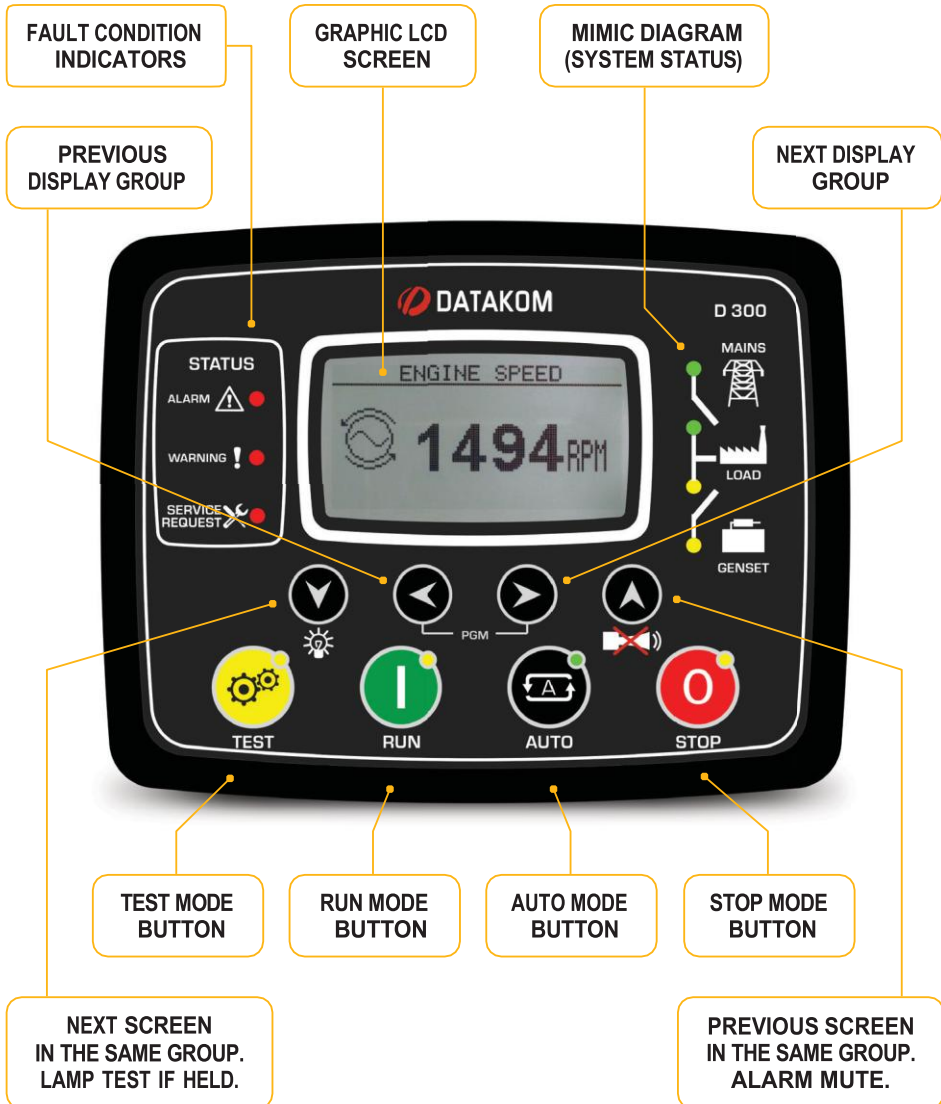


## MAINTENANCE CHECKS

- Check the battery for damage or leaks. Replace the battery if damaged.
- Ensure there is no obstruction of the exhaust pipe.
- Keep the battery away from fire and sources of heat.
- Keep the generator in a well-ventilated area.

# CONTROLLERS

## DATAKOM D300 CONTROLLER (1500RPM)



## BUTTON FUNCTION

	Selects TEST mode. The genset runs and takes the load.
	Selects RUN mode. The genset runs off-load.
	Selects AUTO mode. The genset runs when necessary and takes the load.
	Selects OFF mode. The genset stops.
	Selects next display screen in the same display group. LAMP TEST when held.
	Selects previous display group.
	Selects next display group.
	Selects previous display screen in the same display group. Resets the ALARM RELAY.

# CONTROLLERS



## DATAKOM D300 CONTROLLER LED LAMPS



## SMARTGEN MGC100 CONTROLLER





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