



WORKING KNOWLEDGE BY TERRY MACKENZIE HOY

HOW TO TEST A GENERATOR

For a generator rated at more than 100 kVA you have to synchronise it with the mains power supply and load it. You must locate the generator governor. In older generators, this will be a mechanical device (often made by Woodward), which has a knob that controls the speed of the generator. Start it and see if you can control the speed using the speed control – you don't have to vary it much, a few rpm/Hz will be fine. It's a good idea to attach a meter reading Hz to the electrical output of the generator so you can see that you're actually changing the speed.

In modern generators the governor will be electronic and the speed control will be a trim potentiometer inside the governor box. Having determined you can control the generator speed, create the following set up: three sets of light bulbs, each set being two 220 V incandescent bulbs in series; a circuit breaker rated at the output of the generator; three fuses each rated at the output of the generator. Wire the light bulbs across each phase of the circuit breaker, which we'll call the 'synchronising circuit breaker'.

Wire the output of the generator via the fuses to the input of the circuit breaker. Connect the output of the circuit breaker to the mains supply via a circuit breaker or an isolator. Make sure all the circuit breakers are open. Close the circuit breaker or isolator to the mains supply. Start the generator. You will see that the light bulbs go on and off, dim up/dim down. Trim the generator speed until the lights go on and off very slowly. At the instant that the lights are off, close the synchronising circuit breaker. The generator should now be synchronised.

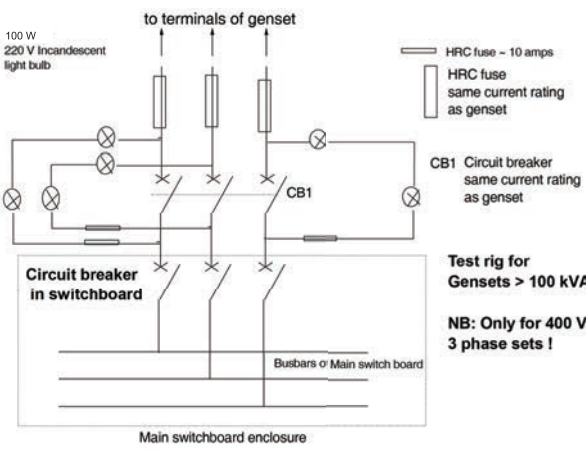
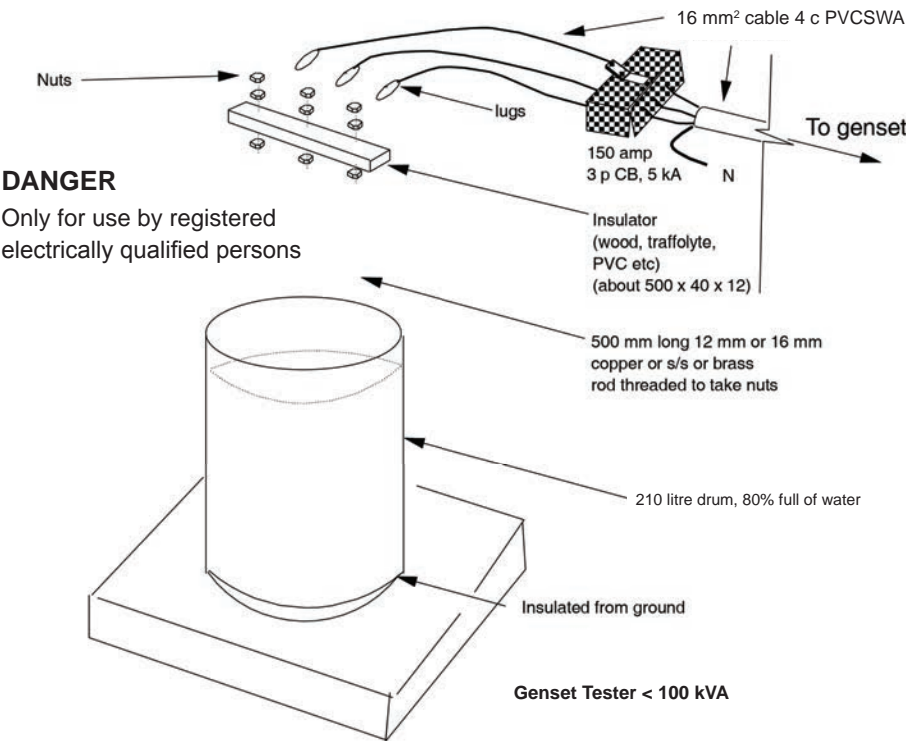
Using the governor try and raise engine speed. The speed will not increase but the generator will start delivering the load to the mains. Keep adjusting the engine speed until full load is reached. For a new

generator, you will probably find that the exhaust lagging starts burning off, giving clouds of blue smoke, but don't worry, it's normal. After the engine has run and the oil pressure and temperature are stable, switch off the synchronising breaker at full load. The engine speed should increase and then settle down to idle. If the over-speed trip operates it should be reset.

If the generator is rated at 100 kVA or less, obtain the following: 210 litre steel drum with the lid removed, 80% full of tap water, mounted on a wooden pallet; 150 amp three-phase circuit breaker, 5 kA; wood strip 500 x 40 x 12 with three holes drilled in it, one at centre others at 200 mm from centre; three 500 mm long metal threaded rods; three 16 mm insulated fly leads. Bolt the threaded rods into the wood so that the tops of the rods are about 20 mm above the wood. Connect the top of each rod on a fly lead and on the output of each phase of the circuit breaker. Connect the generator output to the circuit breaker input and immerse the rods in the water, resting the wood strip on the sides of the drum so that the rods can dangle in the water. Start the generator. Close the circuit breaker. Measure the current in the fly leads – it should be low.

Now add salt to the water, one teaspoon at a time. The generator will gradually load up. If it reaches full load, let it run for a few minutes, stopping when the water boils. If the generator shuts down before reaching full load then it is either not being cooled enough or it has a governor problem. If the generator voltage drops to low load and the voltage collapses, the automatic voltage regulator is not working.

Take care at all times! Stay away from the drum ... and yes, it does work. I've tested many generators like this. Just be cautious and use clean tap water.



MAGNET RECEIVES SUPPLIER AWARD

Magnet Electrical Supplies Durban has been presented by Toyota SA Motors with a 'Supplier Award for Achievement' in the materials and facilities (M & F) consumable suppliers category for 2016. "This coveted award, which is presented annually in recognition of service excellence and integrity, is a tribute the Magnet team is very proud of," says Kumaran Naidoo, Durban branch manager, Magnet Electrical Supplies. "We have achieved this prestigious award with the support of all Magnet divisions in Durban, particularly the internal sales team and projects division.

Magnet Electrical Supplies, which specialises in the supply, implementation and 24-hour support of electrical equipment, has implemented sustainable energy saving solutions at the Toyota Prospecton plant.

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NEW RANGE OF CURRENT AND VOLTAGE SENSING CONTACTORS

GIGAVAC has released its new range of current and voltage sensing contactors. The additions can help to reduce components in monitoring and control systems by integrating the sensing controls within the actual contactors. The voltage and current sensing contactor range includes:

- 350 A and 600 A contactors with over current sensing and automatic trip function. Trip current is settable via an external programming resistor.
- 350 A and 600 A contactors with current sensing outputs. Current proportional to voltage output of 0-5 V or 0-10 V.

- 350A and 600A contactors with low voltage disconnect and auto disconnect function, optimised for vehicles with dual battery (12 V/24 V) systems. The GIGAVAC EPIC® (Extended Performance Impervious Ceramic) sealed ac/dc contactors can be used in any harsh environment, including under water and at temperatures from -55°C to 85°C and can be mounted in any position. They are the preferred contactor (sometimes called a relay or solenoid) for heavy trucks and equipment, buses, emergency vehicles, electric

vehicles, hybrid vehicles, boats, light rail, mining, oil refineries, construction equipment, military vehicles, power management systems for battery charging, fuel cells, battery backup, solar, wind and wave power systems and factory automation where long life and high reliability are needed.

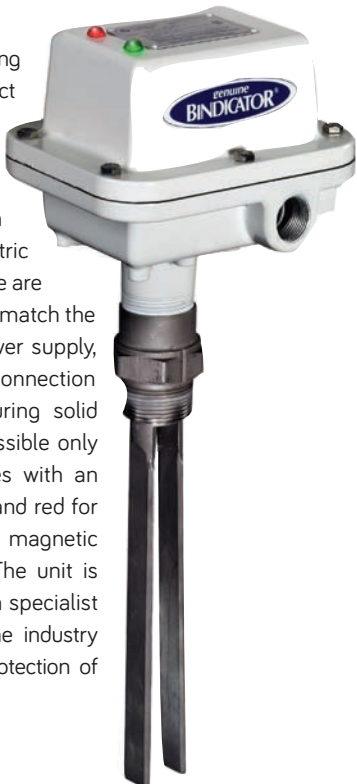
GIGAVAC is represented in South Africa by Denver Technical Products.

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PULSEPOINT II WORKS IN A WIDE RANGE OF APPLICATIONS

PulsePoint II uses vibrating element technology to detect the presence or absence of bulk solid materials. The PulsePoint II can work in a wide range of applications, including those with changing materials, varying dielectric constant and very low density. There are six selectable sensitivity settings to match the application. The non-polarised power supply, 24 V to 240 Vac/dc permits connection without regard to polarity. Measuring solid levels under a liquid surface is possible only with PulsePoint II. The unit comes with an LED indicator: green for power on and red for alarm. A self-test function with a magnetic FOB ensures plant functionality. The unit is available from DRH Components, a specialist electric component supplier to the industry with a focus on the control and protection of electric motors.

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