# GENERATOR SET
# MOTOR STARTING

## MOTOR STARTING

The following must be taken into account when motors are started while the load is on the generator set:

- Type of motor
- Method of starting
- Starting current requirement
- Voltage dip limitations
- Sequence in which the motors are started

## FORMULA

The generator set power is calculated as follows:

$$\text{kW gen} = \frac{0.746 \times \text{motor h.p. (output)}}{\cap \text{ motor}}$$

$$= \frac{\text{motor kW (output)}}{\cap \text{ motor}}$$

Where: $\cap$ motor = motor efficiency

## DIRECT ON LINE (D.O.L.) STARTING

In D.O.L. starting the motor is started with the windings connected in DELTA so full voltage is applied directly to the motor terminals on start-up and during running.

## MOTOR STARTING CURRENT

A delta connected motors' starting current is 6 times its full load current.

## ALTERNATOR OVERLOAD CAPACITY

The generator set alternators' overload capacity is 2.5 times its rated output.

## FORMULA

The ratio of generator set kW to motor kW is calculated as follows:

$$\text{kW gen} \times 2.5 = \frac{6 \times \text{motor kWm}}{\cap\ \text{m}}$$

$$\text{kW gen} = \frac{6 \times \text{motor kWm}}{2.5 \times 0.9}$$

$$\text{kW gen} = 2.67 \text{ times motor KWm}$$

## STAR DELTA STARTING

In Star Delta starting the motor is started with the windings connected in Star so the starting voltage is reduced by √3.

## MOTOR STARTING CURRENT AND TORQUE

The starting current is reduced to 2 times its full load current

The starting torque is reduced to 1/3 of the D.O.L. value

## FORMULA

The ratio of generator set kW to motor kW is calculated as follows:

$$\text{kW gen} = \frac{2 \times \text{motor kWm}}{2.5 \times 0.9}$$

kW gen = 0.9 times motor kWm