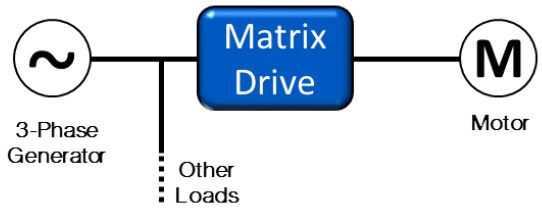
Generator Sizing for Matrix Drives

This document describes how to calculate generator capacity for Matrix Drives.

Configuration



Matrix Drive Input Power Supply Capacity

$$P_{in}(kVA) = \frac{\sqrt{3} * I_{in} * V_{in}}{1000} * K$$

Pin	:	Matrix Drive Rated Input Power (kVA)
Iin	:	Matrix Drive Rated Input Current (A)
Vin	:	Matrix Drive Rated Input Voltage (V)
K	:	Generator Capacity ratio: 2.0

Note: The generator capacity selection must maintain voltage and frequency tolerances as specified in the Matrix Drive technical manual's specification section.

Generator Capacity

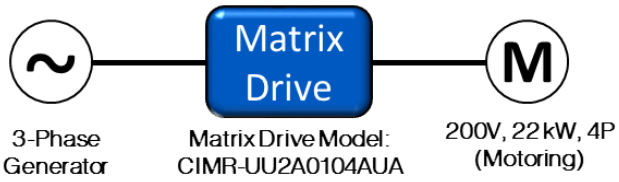
The minimum generator capacity for a Matrix Drive must exceed Pin (Matrix Drive kVA) as defined in the above equation. Additional loads such as control power supplies should be added separately to select the generator capacity.

Precautions

Matrix Drive technology allows for full, continuous, and automatic regeneration back onto the line. Ensure the generator is sized to operate with the expected regenerative loading. Most generators can tolerate 10% regenerative loading. Since deceleration is the most common contributor of regenerative energy, the drive's deceleration time may need to be extended to reduce the regenerative power to 10% or less of the generator capacity.

Generator Capacity Sizing Example

Configuration



Matrix Drive Input Power Supply Capacity

$$P_{in}(kVA) = \frac{\sqrt{3} * I_{in} * V_{in}}{1000} * K$$

Pin	:	Matrix Drive Rated Input Power (kVA)
Iin	:	Matrix Drive Rated Input Current (A)
Vin	:	Matrix Drive Rated Input Voltage (V)
K	:	Generator Capacity ratio: 2.0

Note: The generator capacity selection must maintain voltage and frequency tolerances as specified in the Matrix Drive technical manual's specification section.

When using the normal duty rated CIMR-UU2A0104AUA, substitute values defined in the specification section of the Matrix Drive manual were used to obtain the following result:

$$P_{in}(kVA) = \frac{\sqrt{3} * 95\ \text{A} * 200\ \text{V}}{1000} * 2.0 = 66\ (\text{kVA})$$

Generator Capacity

According to the above calculation, the generator capacity for the Matrix Drive should be no less than 75 kVA. Any additional loads such as control power supplies should be added separately to select the generator capacity. Also, ensure provisions are made to accommodate the regenerative power from the motor that is described in the precautions section of the previous page.