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Author	Gareth Lloyd
Product	AC Motors

Title	3 phase AC motor correct star / delta connections

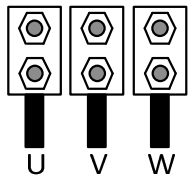
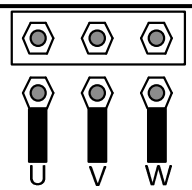
Summary	This document gives information on the correct star / delta connection of 3 phase AC motors

When connecting a 3 phase motor to an AC inverter drive, it is important that the motor terminal box connections are correct for the supply voltage being used.

Generally up to 3kW, the motor is wound for 230V delta, 400V star.

Generally above 3kW, the motor is wound for 400V delta, 690V star.

Please check your motor nameplate for the correct connection.

Inverter Supply Voltage	Motor Nameplate Voltages	Connections	
230V	230V / 400V	Delta △	
400V	400V / 690V		
400V	230V / 400V	Star ⅄	

The usual issues when the wrong connections are made:

230V AC drive connected to a 400V star connected motor or 400V AC drive connected to a 690V star connected motor:
The motor will probably run if starting a lightly loaded motor. If the motor tries to start a heavy load or if a heavy load is applied to the motor while running, the motor will stall due to a lack of torque and the drive will trip on an over current or I x t trip.

400V AC drive connected to a 230V delta connected motor:
On enable, the drive will either trip on an over current trip or the drive will go into current limit and trip on an I x t trip.

Further Information

Generally motors up to 3kW can be connected to inverter drives of the following voltage ratings:

- 230V single phase input, 230V three phase output – Motor connected in delta (200V)
- 400V three phase input, 400V three phase output – Motor connected in star (400V)

These motors can also be DOL (Direct-On-Line) started using a contactor with the motor connected in star (400V).

Generally motors above 3kW can be connected to an inverter drive of the following voltage rating:

- 400V three phase input, 400V three phase output – Motor connected in delta (400V)

Star-Delta Starting

Motors above 3kW (400V/690V) can also be star-delta started using a start-delta starter contactor arrangement.

The star-delta starter connects the motor in the star winding (690V) during starting and then switches over to the delta winding (400V) for normal running.

NOTE: Although the motor has a 690V winding, 690V is not connected to the motor, only 400V is connected to the motor. The 690V winding allows a lower starting current than if the motor was started using the delta winding (400V).