Technical information

A wide range of AC motors with both synchronous permanent magnet versions and asynchronous single-phase or three -phase versions.
Synchronous motors rotate at a fixed and precise speed, independent of variations in load and supply voltage.
Asynchronous motors are characterised by a speed of rotation that is dependent on the load applied to the shaft. The unloaded speed is proportional to the frequency of the single or three phase supply (230/400V-50Hz).
AC motors are often used for applications where the speed and operating torque are fixed and are directly powered by mains voltage. They are designed to have a long working life, necessary for many applications.
The following information is given as a guide to choosing an AC motor:

❑TYPE

PERMANENT MAGNET SYNCHRONOUS MOTOR
- double wound stator
- multi-polar magnet and radial magnetisation rotor
- bi-directional rotation via the use of an internal de-phasing capacitor

SQUIRREL CAGE ASYNCHRONOUS MOTOR
- multi-recessed triple-wound stator
- squirrel cage rotor
- single-phase or three-phase versions

❑LIFE EXPECTANCY

Depends on usage, principally limited by life expectancy of the bearings.

❑OVERHEATING

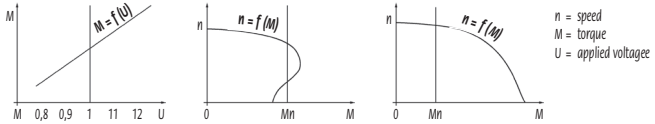
SYNCHRONOUS MOTORS
- convection cooling, motor can block rotor without risk of deterioration
- isolation quality class B.

SQUIRREL CAGE ASYNCHRONOUS MOTORS
- incorporated ventilator cooling
- isolation quality class E.

❑ CHARACTERISTICS

The performance of AC motors is shown by the graphs given below which are given as a guide only as actual performance will depend on temperature, stability of the supply voltage and frequency and of the circuit capacitance.

Synchronous motor **Asynchronous single-phased motor** **Asynchronous three-phase motor**



❑ ELECTRONICS

These speed controllers operate by varying the frequency of the power supply to an asynchronous three-phase motor. In order to maintain a constant torque, the ratio of the supply voltage and frequency ration is kept constant. As output voltage remains constant above 50Hz, the torque will drop as the speed rises. To avoid reducing the efficiency, motors should not be run at a frequency higher than 150Hz.

When connected to a motor with internal ventilation, it is also recommended to avoid working permanently at supply frequencies lower than 20 Hz. This is because as the fan is not turning as fast, the motor may overheat and be damaged or destroyed.

Variable frequency drives can produce electrical interference. To protect sensitive equipment nearby these units conform to applicable EMC standards.

❑ WIRING DIAGRAM

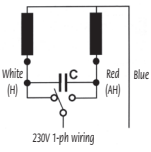


Diagram 1

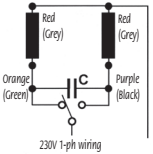


Diagram 2

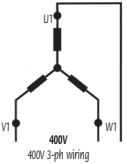


Diagram 3

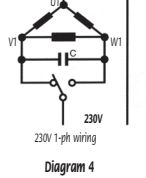


Diagram 4

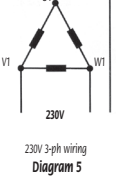


Diagram 5