

APPLICATIONS BULLETIN



SINGLE PHASE SWORDFISH

Operating Swordfish with single phase motors requires addition care compared to the normal 3 phase situation.

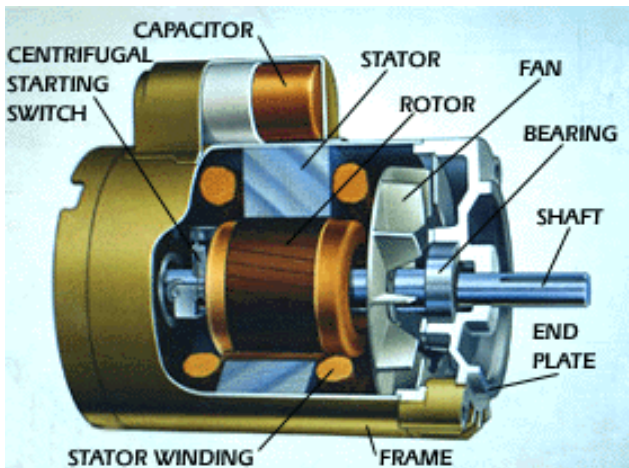
ADDITIONAL DATA

VOLTAGE..... _____ VAC

MOTOR CURRENT (FLA)..... _____ amp

STARTER TYPE..... _____ (fill in type)

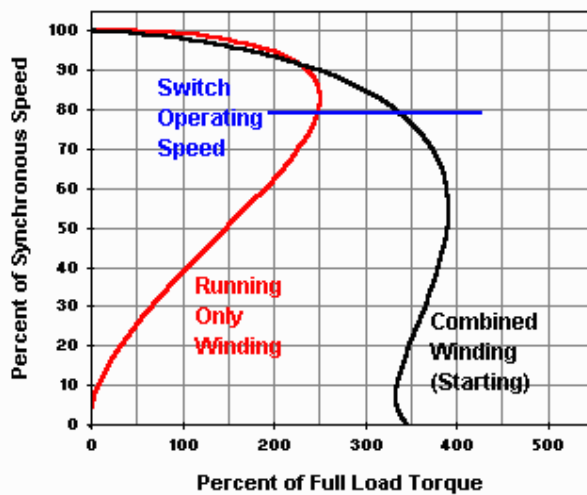
Single phase motors can be either 240VAC or 480VAC in Australia. This is due to the resident voltage supplied in the electrical grid. To start these motors there is usually a capacitor which provides low speed torque to enable the motor to start.



To keep the centre component or "rotor" of an electric motor spinning, the magnetic poles of the electromagnets surrounding the rotor must rotate around it. That way, the rotor will be perpetually chasing the rotating magnetic poles. With single phase electric power, producing that rotating magnetic environment isn't easy. Many single phase motors use capacitors to provide time-delayed electric power to some of their electromagnets. These electromagnets then produce magnetic poles that turn on and off

at times that are delayed relative to the poles of the other electromagnets. The result is magnetic poles that seem to rotate around the rotor and that start it turning. While the capacitor is often unnecessary once the rotor has reached its normal operating speed, the starting process is clearly rather complicated in a single phase motor.

General Purpose Capacitor Start



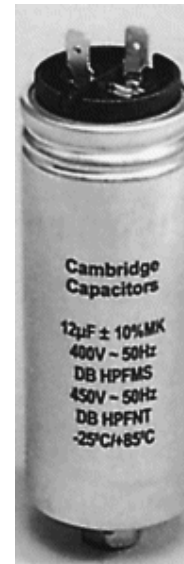
Because of its improved starting ability, the capacitor start motor is recommended for loads which are hard to start. The motor has a capacitor in series with a starting winding and provides more than double the starting torque with one third less starting current than the split phase motor.

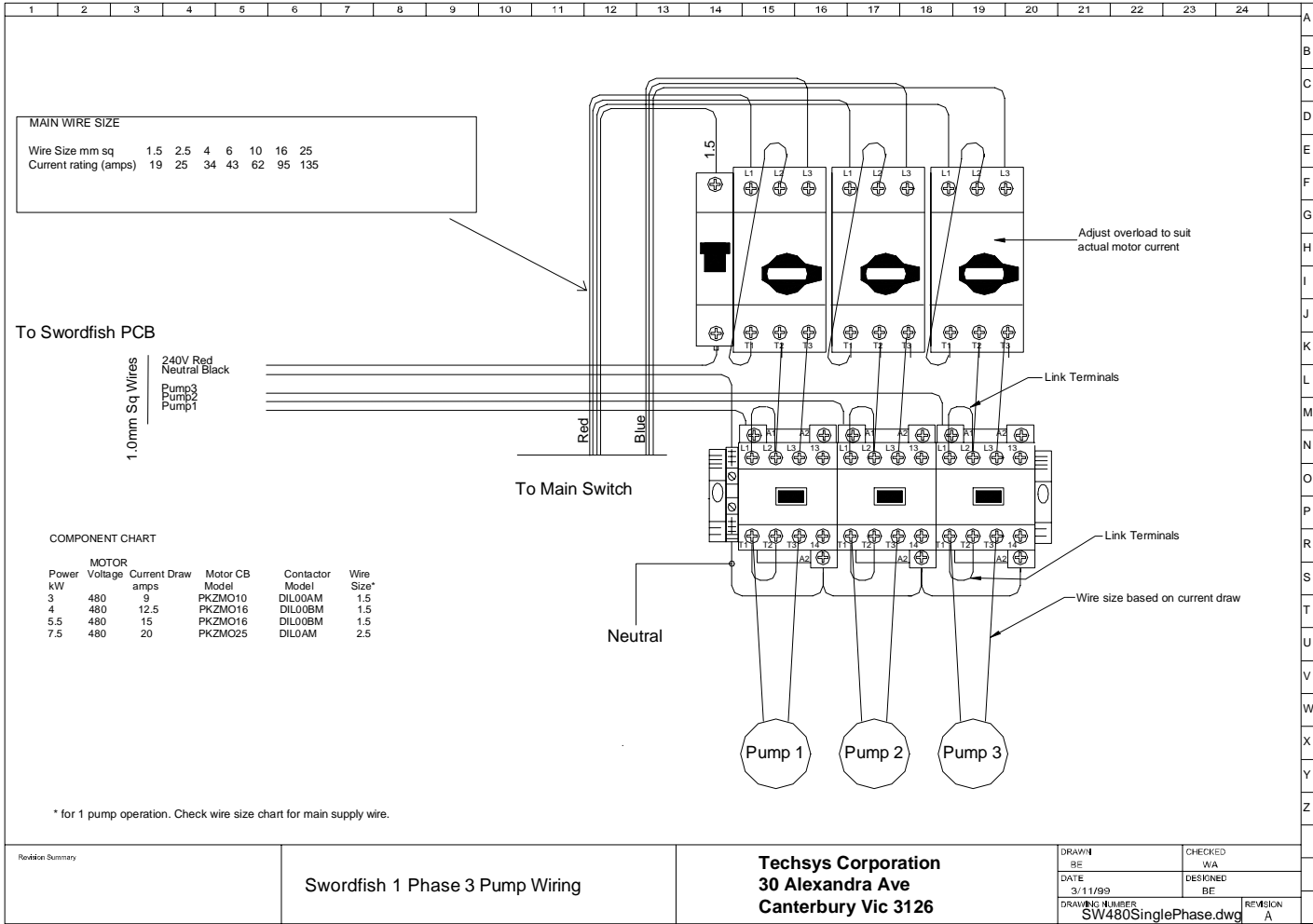
It has good efficiency and requires starting currents of approximately five times full load current. The capacitor and starting windings are disconnected from the circuit by an automatic switch (centrifugal switch) when the motor reaches about 75% of its rated full load speed.

In order to start and run a single phase motor there needs to be a voltage applied to the motor. This is done in exactly the same way as a three phase motor : - with a contactor.

The Swordfish controller uses a contactor to switch power onto the windings of the motor to start it.

Usually a standard Swordfish unit is used to do this and the only difference between the three phase and single phase switchgear is the motor full load current draw and the minor wiring changes required to operate the switchgear satisfactorily. The two alternative circuit diagrams are listed below.



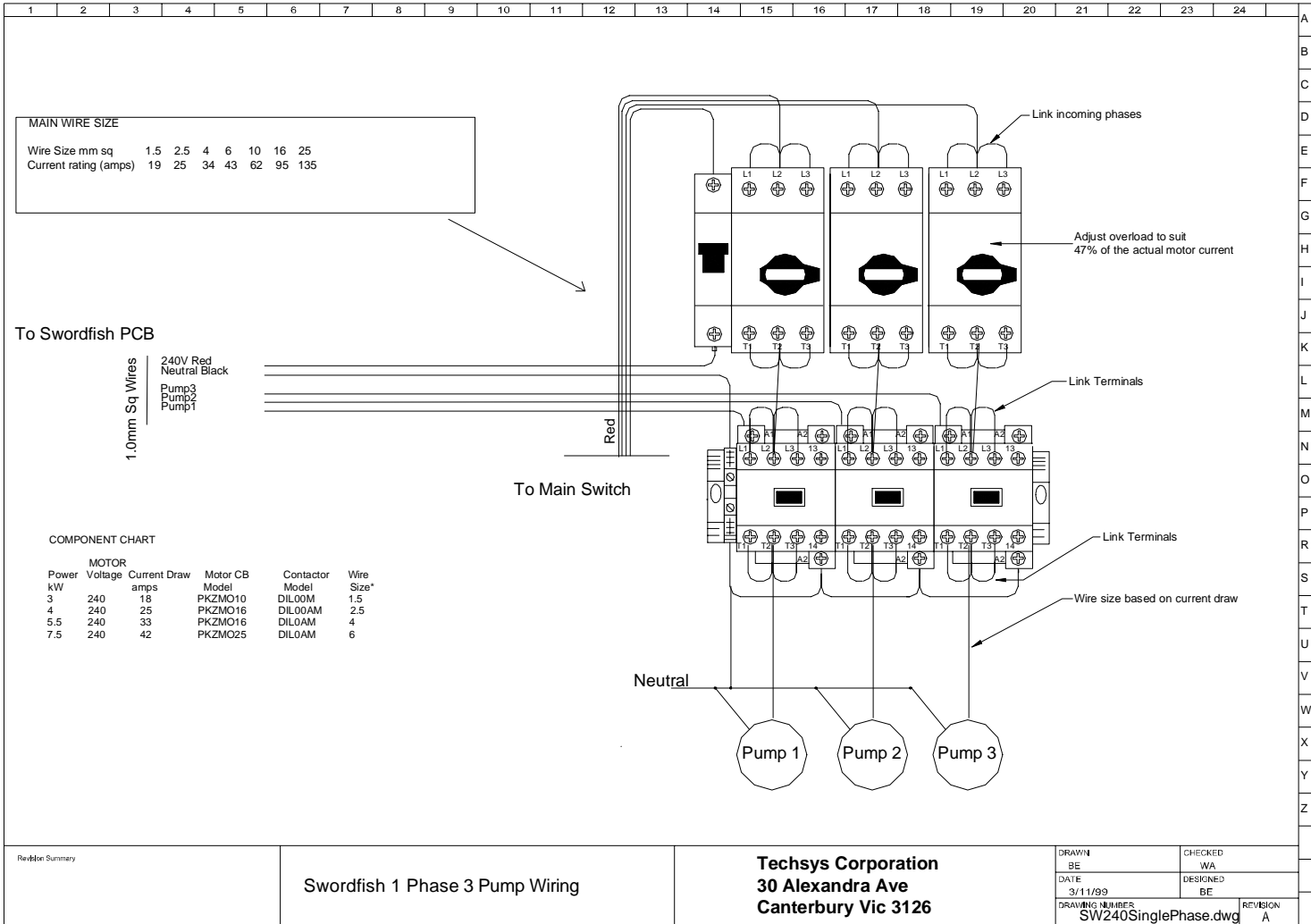


Revision Summary

Swordfish 1 Phase 3 Pump Wiring

Techsys Corporation
30 Alexandra Ave
Canterbury Vic 3126

DRAWN BE	CHECKED WA
DATE 3/11/99	DESIGNED BE
DRAWING NUMBER SW480SinglePhase.dwg	REVISION A



MAIN WIRE SIZE

Wire Size mm sq	1.5	2.5	4	6	10	16	25
Current rating (amps)	19	25	34	43	62	95	135

To Swordfish PCB

1.0mm Sq Wires
 240V Red
 Neutral Black
 Pump3
 Pump2
 Pump1

To Main Switch

COMPONENT CHART

MOTOR		Current Draw amps	Motor CB Model	Contactor Model	Wire Size*
Power kW	Voltage				
3	240	18	PKZMO10	DIL00M	1.5
4	240	25	PKZMO16	DIL00AM	2.5
5.5	240	33	PKZMO16	DIL0AM	4
7.5	240	42	PKZMO25	DIL0AM	6

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Swordfish 1 Phase 3 Pump Wiring

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