



Shop Tech Talk September 2011

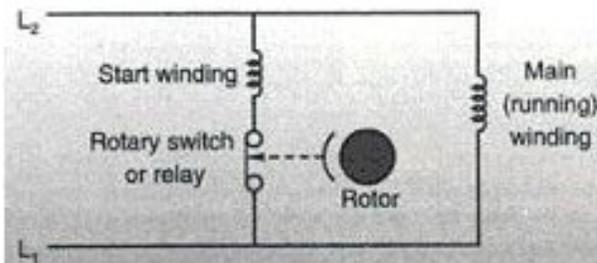
Identification & Advantages Of The Different Types of Single Phase Motors



Split Phase Motors



SPLIT PHASE

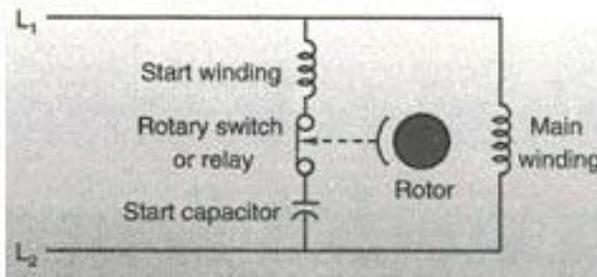


| <u>Starting Current</u> | <u>Starting Torque</u> | <u>Start Capacitor</u> | <u>Switch</u> | <u>Best Applications</u> |
|--------------------------|--|------------------------|---------------|--------------------------------------|
| High-700 to 1,000% rated | Low-100 to 175% rated load | No | Yes | Small grinders, small fans & blowers |
| Note: | For thermal protection it is difficult to find a protector with trip time fast enough to prevent start-winding burnout | | | |
| Note: | Avoid any applications requiring high cycle rates or high torques | | | |

Capacitor Start / Induction Run Motors



CAPACITOR START / INDUCTION RUN



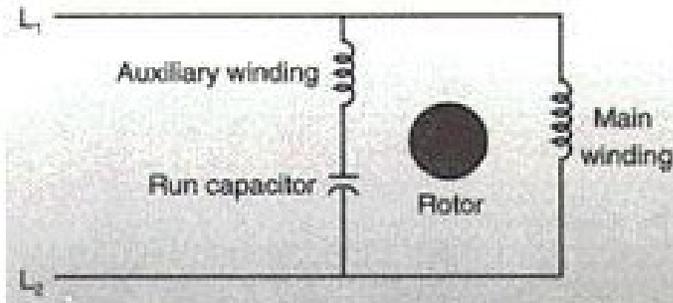
| <u>Starting Current</u> | <u>Starting Torque</u> | <u>Start Capacitor</u> | <u>Switch</u> | <u>Best Applications</u> |
|---------------------------|--|------------------------|---------------|--|
| 450 to 575% rated current | 200 to 400% of rated load | Yes | Yes | "Workhorses" of Gen Purpose single phase industrial motors |
| Note: | Use them on a wide range of belt-drive applications like small conveyors, large blowers and pumps, as well as many direct-drive or geared applications | | | |
| Note: | Higher cycle rates & reliable thermal protection | | | |

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Permanent Split Capacitor Motors



PERMANENT SPLIT CAPACITOR

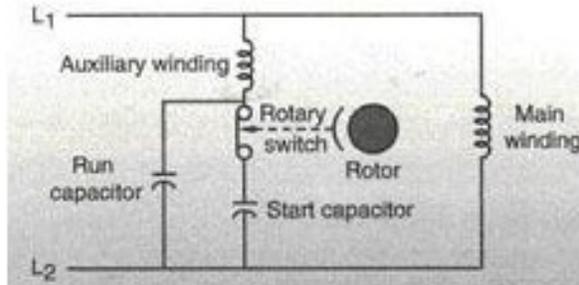


| <u>Starting Current</u> | <u>Starting Torque</u> | <u>Start Capacitor</u> | <u>Switch</u> | <u>Best Applications</u> |
|------------------------------|--|------------------------|---------------|---|
| Low <200% rated load current | Low-30 to 150% rated load | No | No | Gate & garage door operators, fans, blowers |
| Note: | Excellent for applications with high cycle rates. Need no starting mechanism so can be reversed easily. Considered most reliable single phase motor because no starting switch needed. | | | |
| Note: | Not for hard to start applications. Breakdown torque typically somewhat lower than with cap start motors. | | | |

Capacitor Start / Capacitor Run Motors



CAPACITOR START / CAPACITOR RUN



This type combines the best of the capacitor-start/induction-run motor and the permanent split capacitor motor. It has a start-type capacitor in series with the auxiliary winding like the capacitor-start motor for high starting torque. And, like a PSC motor, it **also has a run-type capacitor** that is in series with the auxiliary winding after the start capacitor is switched out of the circuit. This allows high breakdown or overload torque. Another advantage of the capacitor-start/capacitor-run type motor: It can be designed for lower full-load currents and higher efficiency. Among other things, this means it operates at lower temperature than other single-phase motor types of comparable horsepower. The only disadvantage to a cap-start/cap-run motor is its higher price, mostly the result of more capacitors, plus a Starting Switch.

But it's a real powerhouse, **able to handle applications too demanding for any other kind of single-phase motor.**

These include **woodworking machinery, air compressors, high-pressure water pumps, vacuum pumps and other high torque applications requiring 1 to 10 hp.**

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