



# Single-Phase Motors & Controls

## MAINTENANCE

### Indication Of Cables When Color Code Is Unknown (Single-Phase 3-Wire Units)

If the colors of the individual drop cables cannot be found, measure with an ohmmeter:

- Cable 1 to Cable 2
- Cable 2 to Cable 3
- Cable 3 to Cable 1

Find the highest resistance reading.

The lead not used in the highest reading is the brown lead.

Use the brown lead and each of the other two leads to get two readings:

- Highest is the BLACK lead
- Lowest is the BLUE lead

#### EXAMPLE:

The ohmmeter readings were:

- Cable 1 to Cable 2–6 ohms
- Cable 2 to Cable 3–2 ohms
- Cable 3 to Cable 1–4 ohms

The lead not used in the highest readings (6 ohms) was  
Cable 3–Brown

From the yellow lead, the highest reading (4 ohms) was  
To Cable 1–Black

From the yellow lead, the lowest reading (2 ohms) was  
To Cable 2–Blue

	3 Wire			PSC
	AUST	EUR	USA	EUR
Main / Run Winding	Blue	Blue/Grey	Black	Blue/Grey
Start / Aux Winding	White	Black	Red	Brown
Common	Red	Brown	Yellow	Black

### Single-Phase Control Boxes

#### Checking and repairing Procedures (Power On)

**WARNING:** Power must be on for these tests.  
Do not touch any live parts.

#### A. VOLTAGE MEASUREMENTS

##### Step 1. Motor Off

1. Measure voltage at L1 and L2 of pressure switch or the line contactor.
2. Voltage Reading: Should be  $\pm 10\%$  of motor rating.

##### Step 2. Motor Running

1. Measure voltage at load side of pressure switch or line contactor with pump running.
2. Voltage Reading: Should remain the same except for slight dip on starting. Excessive voltage drop can be caused by loose connections, bad contacts, ground faults, or inadequate power supply.
3. Relay chatter is caused by low voltage or ground faults.

#### B. CURRENT (AMP) MEASUREMENTS

1. Measure current on all motor leads.
2. Amp Reading: Current in Black lead should momentarily be high, then drop within one second to values on Page 13. This verifies relay operation. Current in Blue and Brown leads should not exceed values on Page 13.
3. Relay failures will cause black lead current to remain high and overload tripping.
4. Open run capacitor(s) will cause amps to be higher than normal in the blue and brown motor leads and lower than normal in the black motor lead.
5. A bound pump will cause locked rotor amps and overload tripping.
6. Low amps may be caused by pump running at shutoff, worn pump, or stripped splines.
7. Failed start capacitor or open relay are indicated if the red lead current is not momentarily high at starting.

**CAUTION:** The tests in this manual for components such as capacitors, and relays should be regarded as indicative and not as conclusive. For example, a capacitor may test good (not open, not shorted) but may have lost some of its capacitance and may no longer be able to perform its function.

To verify proper operation of relays, refer to operational test procedure described above in Section B-2.