

2022-2023 FFA/GEMC Speech/Demonstration Topic

PROBLEM:

The contestant will be expected to thoroughly explain the operating principle and installation of a single phase 240-volt 1 ½ hp submersible well pump that will be supplying water to the farm shop and livestock watering stations. The 240-volt circuit will consist of overcurrent protection and the supply conductors serving a 240-volt pressure switch, well pump control box, well pump supply conductor and 1 ½ hp submersible well pump. All materials will be mounted on the display board. The pump will be installed in a 4" metal well casing at a depth of 427'. Distance from the service to the well tank, pressure switch and pump control box is 135'. The pump manufacturer recommends limiting voltage drop to 4 percent. All electrical connections will be contained inside of a well house, protected from the elements.

Materials List:

The following list of materials will either be attached to the demo frame or laid out for the contestant to use as they explain the installation of the circuits.

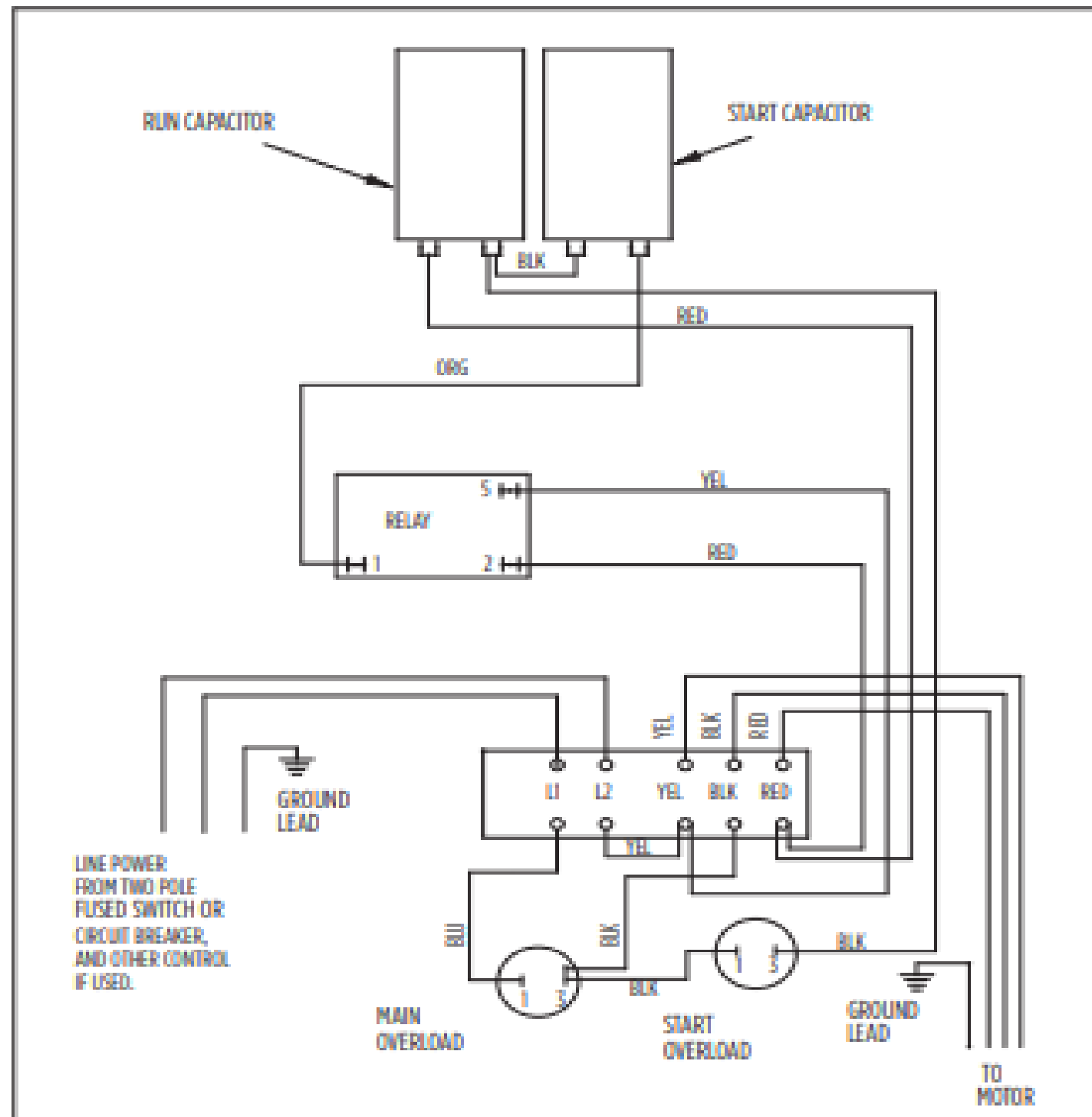
- 1 - Eaton, BR12100 100 Amp Main Breaker Service Entrance Panel
- 3 - 2 AWG Copper THHN insulated conductors, 24" long
- 1 - #6 Soft Drawn Bare Copper Conductor installed
- 1 - 5/8" Grounding Rod attached to display board
- 1 - 5/8" Grounding Clamps
- 1 - 20-amp Double Pole Breaker
- 2 - ½" PVC 90-degree Sweeps
- 4 - ½" PVC threaded male adaptor w/locking ring
- 2 - ½" Schedule 40 PVC Conduit
- 4 - ½" Conduit Straps
- 1 - 40/60 psi Pressure Switch
- 1 - Franklin Electric 1/1 ½ hp 230V Well Pump Control Box
- 1 - 1" Cable Box Connector
- 2 - ¾" x ½" Ridged Conduit Reducing Washer
- 12 AWG Stranded THHN/THWN Single Wire
- 8 AWG Submersible Pump Cable
- Forked Connectors/Crimping Tool
- Milwaukee Cat 3 400 Amp Clamp On Multi-Meter Catalog # 2235-20

References:

2020 National Electrical Code
Student Guide to Wiring
Agricultural Wiring Handbook, 17th Edition
AAVIM Electrical Controls
Franklin Electric Single-Phase Motor and Control Diagram (See Attached)
Square D Pumptrol Pressure Switch Wiring Diagram (See Attached)
Poster Display Board

Single-Phase Motors & Controls

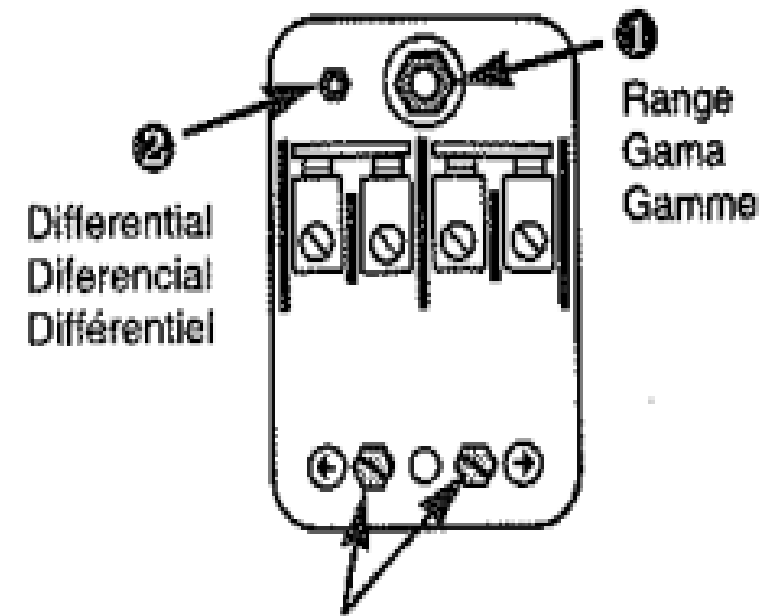
MOTOR MAINTENANCE



1 - 1.5 hp

282 300 8110

(Date Codes 11C19 & Newer)



Grounding provisions: #10-32 screws.
Torque screws to 15–20 lb-in (1.7–2.3 N•m).

Provisiones de puesta a tierra: tornillos no.10-32.
Apriete los tornillos en 1,7–2,3 N•m (15–20 lbs-pulg).

Provisions de m.à.l.t. : vis n° 10-32.

Serrer les vis à un couple entre 1,7 et 2,3 N•m (15 et 20 lb-po).

- CW = en sentido de las manecillas del reloj / sens horaire
- CCW = en sentido contrario de las manecillas del reloj / sens anti-horaire

WIRING DIAGRAM DIAGRAMA DE ALAMBRADO SCHÉMA DE CÂBLAGE

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