

# FRANKLIN AID



Franklin Electric



Franklin Application/Installation Data (AID) ... For The Professional Driller-Installer

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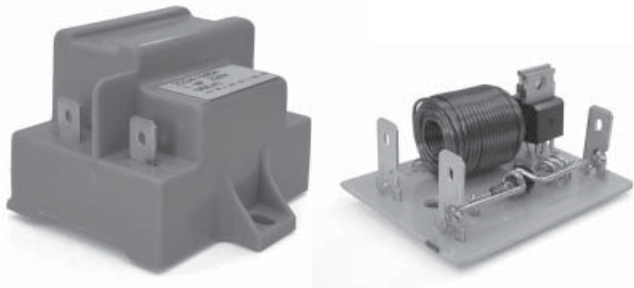
## Control Boxes – More than meets the Eye...

A Control Box is a Control Box, right? After all, there's just not that much there ... a relay and a capacitor in a box, right?

Wrong. In the case of Franklin Electric Control Boxes, there's much more to the story, and Franklin boxes are more highly engineered than most people realize. In this issue of Franklin AID, we'll take a look inside the Franklin Electric QD Control Box and the "blue" QD Relay. You'll see why it's really your only option for a Franklin submersible motor.

The "QD" in QD Control Box comes from "Quick-Disconnect". That is, when the lid is removed, the control box components are automatically disconnected from the system. This makes troubleshooting a snap. For example, insulation and winding resistance can be measured right there, in the base of the QD Control Box (**of course, before removing the QD Control Box lid, always disconnect power, lock it out, and verify power is disconnected**).

Although updated many times, the basic configuration of the QD Control Box has been around since 1962. Remarkably, every QD Control Box manufactured by Franklin has been "backward compatible", both electrically and physically, to every previous version. That is, the lid from a 2006 QD Control Box will work with 1996 QD Control Box base and Franklin motor, or with a 1970 QD base and motor, and so on .... This makes it easy on you, the water systems professional.



### The "BLUE" Relay

What really makes today's QD Control Box remarkable is the QD Relay, sometimes referred to as just the "blue relay". Debuting in 1992, more than 5 million of these remarkable devices have been produced, and over the years, its quality has been nothing less than phenomenal. It's probably one of the most trustworthy components ever put into a water system.

Although from the outside, there's not much to see, the inside of the QD Relay is a different story. There are 3 components, as seen in the picture: The coil acts as a surge arrester, protecting the QD Relay and the motor from electrical surges. The other 2 components, the triac and the reed switch, work very closely together. A triac is an electronic, solid-state switch, and triacs are used in countless applications besides submersible motors. A triac can be turned "on and off" electronically, and because it has no moving, mechanical parts, it's extremely reliable. Sealed in a glass tube is the third component - the reed switch. This is what "turns" the triac on and off. It's a very low voltage device, so there's no "arcing and sparking" when it opens and closes.

All of the QD Relay components are hermetically sealed inside the QD Relay case using a potting compound. This makes the QD Relay impervious to just about everything, including moisture, insects, and corrosion.

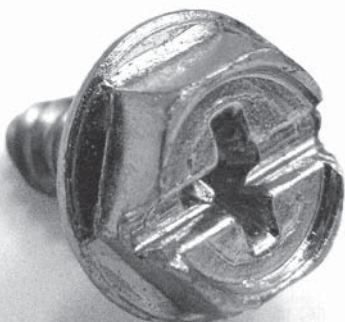
### The QD Relay and the Franklin Motor – Working Together

So how does all of this relate to the motor? Well, like just about all single-phase motors, Franklin Electric submersible motors have 2 sets of windings: a run winding (also called the main winding), and a start winding (also sometimes called the auxiliary winding).

When the motor is started, both the start and main winding are energized. This configuration, along with the start capacitor in the Control Box, provides excellent starting torque. For example, the starting torque of a 1 Hp Franklin Electric 3-wire submersible motor is 2½ times its running torque.

However, a motor has completely different electrical properties at start-up than when it is up-to-speed and running. Because of this, as the motor approaches running speed, the start capacitor and the start winding must be disconnected, and the motor operated on the run winding alone. The timing of this is critical: Take the start winding and start capacitor out of the circuit too soon, and you sacrifice starting torque. Leave them connected for too long, and the current, or amperage, in the motor and in the capacitor will be too high for too long.

So, the job of the QD Relay is to remove, or disconnect, the start capacitor and start winding as the motor reaches running speed. The QD relay does this at just the right time, so that it provides optimal motor performance, both in terms of starting and running. The QD Relay "knows" when to do this by looking



## COMING SOON

Speaking of QD Control Boxes, look for a change in the lid screw of this product. The new screw will not only accommodate a slotted screwdriver or a hex driver like it does now, but also a Phillips screwdriver. One note – the hex portion of the lid screw will be larger, going from a hex size of 1/4" to 5/16".

at the phase difference between the incoming voltage and the current in the start winding.

To provide the absolute best performance, QD Relays are actually designed by rating. That is, a ½ Hp, 115 volt QD Relay is designed for a ½ Hp 115 volt Franklin motor, a 1 Hp 230 volt QD Relay is designed for a 1 Hp 230 volt motor, and so on.

By the way, if the control box has a run capacitor, the start capacitor or capacitors are disconnected just like the above. However, the start winding and the **run** capacitor(s) stay connected and working, even when the motor is at running speed. This is called a “cap start / cap run” design.

#### What about Franklin 2-Wire motors?

Franklin’s 2-Wire motor is actually very similar to the 3-Wire motor. The difference is that the “switch” is actually located in the motor itself. In Franklin’s 2-Wire motor, this component is called a “BIAC”, and it also contains a triac, which switches

the start winding out of the circuit at just the right time. Since a 2-Wire motor does not utilize a start capacitor, it will have less starting torque than a 3-Wire motor of the same rating. Nevertheless, starting torque on a Franklin 2-Wire motor will still be 1½ times greater than the running torque.

#### What does this mean to you, the Water Systems Professional?

So remember, like most things, your submersible installation is only as good as the weakest link. Don’t let your Control Box be that weak link. You’ve got too much time, money and your reputation tied up in a submersible installation. Use a Franklin Electric Control Box for a Franklin motor.

And, one final reminder: Since a Franklin motor has been designed to operate with a Franklin Control Box, we can promise warranty coverage only when a Franklin Control Box is used.



### Meet Randy Woodland, Field Service Engineer

At the first of the year, Randy Woodland took over Field Service responsibilities in the West Central region for the retiring Mike Daniels.

Randy is truly an expert, bringing a wealth of water systems experience to his new position. He joined the industry in 1980, and became a member of the Franklin Electric team in 2004 as a Territory Manager.

Randy is responsible for providing Technical Service on Franklin Electric water systems products in the states of Montana, Wyoming, Colorado, Utah, and New Mexico.

A lifelong Colorado native, Randy and his wife, Bonnie, reside in Johnstown, just north of Denver. In his spare time, Randy enjoys fishing and restoring British sports cars.

Randy can be reached at 970-371-1275, or at his email address, [rwoodland@fele.com](mailto:rwoodland@fele.com).

## TOLL-FREE HELP FROM A FRIEND

Phone Franklin's toll-free SERVICE HOTLINE for answers to your installation questions on submersible pump motors. When you call, a Franklin expert will offer assistance in troubleshooting submersible systems and provide immediate answers to your motor application questions.

**Franklin Electric SERVICE HOTLINE 800-348-2420 FAX 260-827-5102**  
**[www.franklin-electric.com](http://www.franklin-electric.com)**



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