

## **Use of Palm Switches with QuadTech Hipot Testers**

Operator safety is an important aspect to consider when dealing with high voltage devices and instruments such as hipot testers. To improve operator safety there are a number of features manufacturers have incorporated into today's high voltage test equipment. For example, today's digital hipot testers produce less output current than the typical analog 500VA hipot tester used in the past. Today's instruments also incorporate interlocks, ground fault interruption (GFI) and remote I/O. Regardless of the high voltage device or instrument, there is no substitute for proper training of employees when it comes to safety.

One safety feature that will be discussed in this application note is the use of palm switches that can reduce the possibility of an operator coming in contact with high voltage. The basic operation of a palm switch requires the operator to use both hands to initiate a test and if one or both of the hands are removed while testing, the test is immediately stopped. The switches are usually placed directly in front of the operator spaced shoulder width apart. Spacing the switches prevents an operator from trying to press both buttons down with one hand or object.

Figure 1 illustrates a set of Auxiblock 30mm Palm Switches manufactured by Baco Controls Inc of Cazenovia NY, and distributed by McMaster Carr. A Parts List is included for reference. Figures 3 through 5 illustrate this set of palm switches connected to three of QuadTech's Hipot Testers.



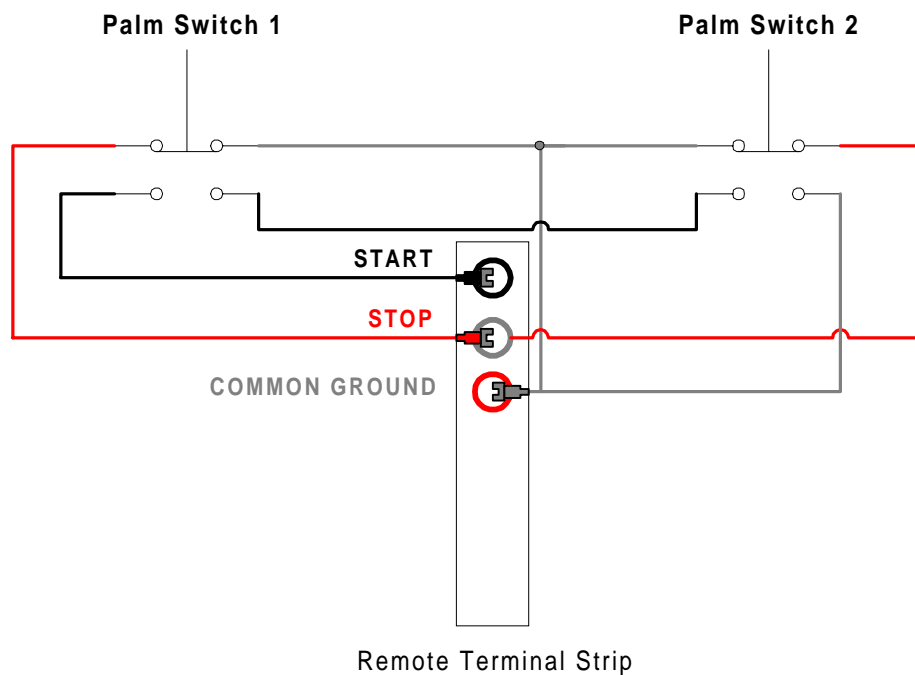
**Figure 1: Baco Controls Palm Switches**

## Parts and Wiring

### Parts List: Auxiblock 30mm Series Palm Switches

Quantity	Part Number	Description	Price each (USD)
2	T12AD01	Red 40mm Mushroom Head Spring Return Button	\$15.57
2	233E	Clip with Locking Lever for Contact Modules	\$ 0.75
2	23E01	Contact Module NO Single Contact	\$ 4.32
2	23E10	Contact Module NC Single Contact	\$ 4.32
2	BPA301	Nema 4 High Impact ABS Enclosure	\$ 27.15
<b>Additional Items</b>			
2	Heyco 3213	Cord Connectors	
20 (Feet)		Multiconductor Cable (4 conductor 22/24 guage)	

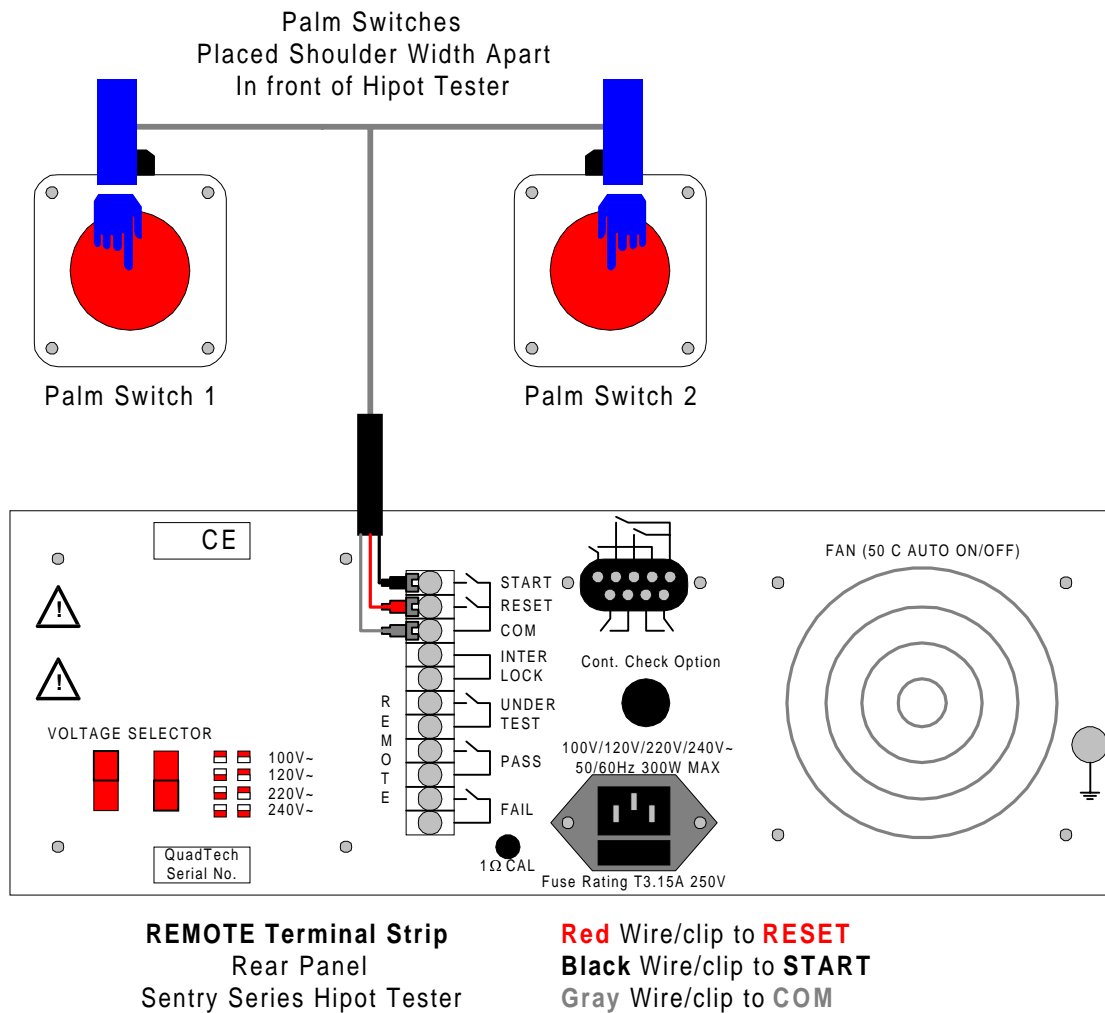
**Manufactured by: Baco Controls Inc**  
 67 Albany Street Cazenovia, NY 13035 315-655-8372  
**Distributed by: McMaster Carr**



**Figure 2: Wiring Diagram of Auxiblock 30mm Series Palm Switches**

## Sentry Series Connection

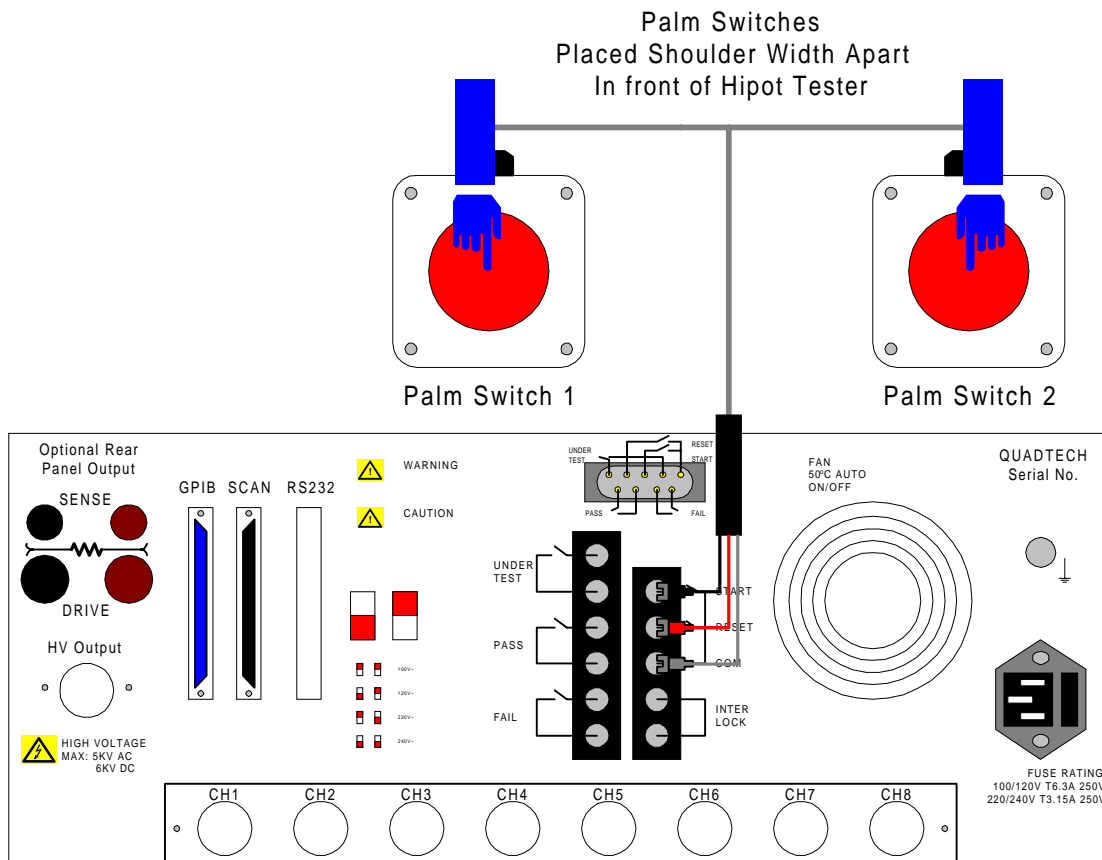
The Sentry Series of Hipot Testers are capable of generating an output voltage as high as 6000VDC (5000VAC) to the device under test. To protect the operator from potentially hazardous levels of energy, use the Palm Switch configuration illustrated in Figure 3. There is no High Voltage applied to the Output Terminals and DUT until BOTH switches are pressed simultaneously. The operator cannot touch the DUT or test leads if both hands are on the palm switches. SAFE, quick and effective.



**Figure 3: Connection of Palm Switches to a Sentry Series Hipot Tester**

## Guardian 6000 Series Connection

Figure 4 illustrates the Auxiblock Palm Switches connected to QuadTech's Guardian 6000 Electrical Safety Analyzer. Connection is via the REMOTE terminal strip on the rear panel of the Guardian 6000. The Guardian 6000 can perform five tests (AC Hipot, DC Hipot, Insulation Resistance, Leakage Current and Ground Bond) with a single test connection. This can effectively reduce test time and increase product throughput. With the use of the palm switch setup, the operator needs only to connect the DUT, press both palm switches, then disconnect the DUT. Test results can be output to a computer via the GPIB terminal. A fast and cost effective mode of testing but most importantly a SAFE test setup.



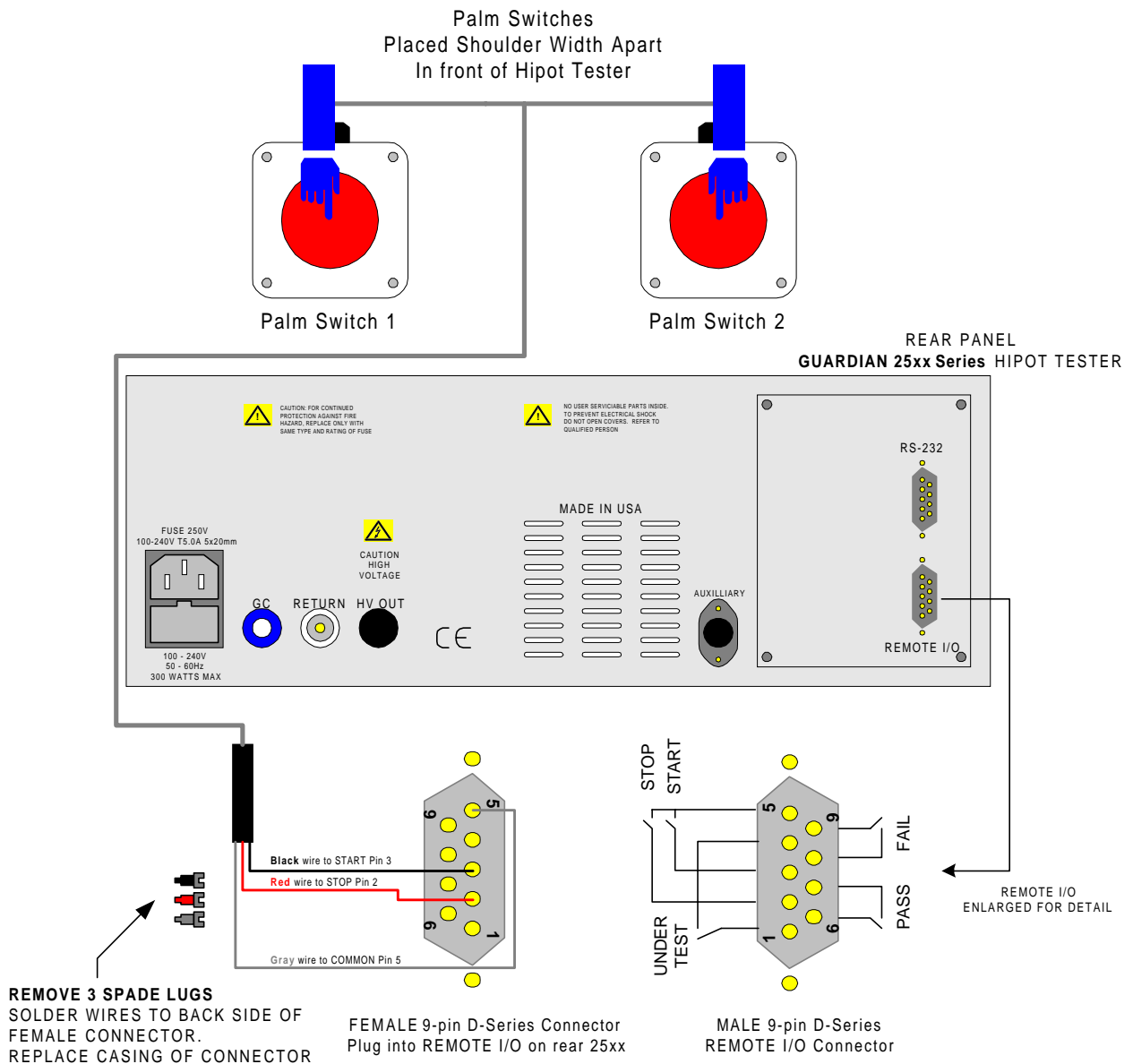
**REMOTE Terminal Strip**  
Rear Panel  
Guardian 6000 Electrical Safety Analyzer

**Red Wire/clip to RESET**  
**Black Wire/clip to START**  
**Gray Wire/clip to COM**

**Figure 4: Connection of Palm Switches to Guardian 6000 Electrical Safety Analyzer**

## Guardian 2500 Series Connection

Figure 5 illustrates the connection of the Auxiblock Palm Switches to the Guardian 25xx Series Hipot Tester. Connection is made to the REMOTE I/O on the rear panel via a female D-series 9 PIN connector. Remove the spade clips from the end of the palm switch wires. Open casing of female connector and from the back side, solder the double red wire to pin 2 (STOP). Solder the black wire to pin 3 (START). Solder the gray wire to pin 5 (COMMON). Replace casing of female connector and plug the new assembly into the REMOTE I/O terminal on the rear panel of the Guardian 25xx instrument.



**Figure 5: Connection of Palm Switches to Guardian 25xx Series Hipot Tester**

## **Conclusion**

As you can see, it is easy to adapt the palm switch configuration to the Hipot Tester being used. Give QuadTech a call and let our Applications Engineers discuss your Electrical Safety Testing instrumentation and accessory needs. If you have an application specific test and measurement need, and can't commercially find an instrument that does the job, call us. We can modify our instrumentation to fit your testing needs and we'll have a solution back to you in 48-hours or less. We would be happy to design a test setup that's safe, accurate and fast to meet your production and laboratory requirements.

The information presented here is subject to change and is intended for general information only

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