

Fluke F700013P Clone Instructions

Thank you for purchasing our F700013 custom quad analog switch replacement. In order to successfully install the device, you will need desoldering equipment (a vacuum solder extractor & solder wick), a soldering microscope, micro-fine soldering iron, PCB vise or holder, water-soluble liquid or gel flux, water-soluble flux solder 20mil diameter, fine tweezers and a steady hand.

With Fluke using 5-700013 custom IC switches and rather cryptic diagnostics, it may be difficult to determine exactly which, if any, 700013 is defective. You may want to consider removing all three U301, U302 & U303 devices and socket the device positions. You will then have the flexibility to swap devices in the debugging process. Always put extracted 700013 ICs into machined-pin sockets for safe handling, insertion & removal.

If you have not yet removed the defective 700013 DIP device, now is the time to prepare the Fluke motherboard for IC removal. Following the service manual instructions, remove the bottom protective shield to expose the underside of the main PCB. This is a critical stage of the repair. You need to use solder removal techniques that are quick and do not overheat the PCB. It is very easy to damage solder pads or surrounding guard rings.

In order to remove an IC, you need to get all of the solder out of the through-hole quickly and with minimum heat. Use a vacuum extractor and solder wick as needed. Use plenty of flux. Once the holes look clear, gently wedge the IC from the topside to release the pins. If it is stubborn, do more solder removal from the bottom.

Once the IC is removed, you must clean the top and bottom of the PCB to a spotless condition with water, alcohol & acetone. Solder in the machined pin socket paying close attention to the location of pin #1. Re-clean the top and bottom of the PCB as done above.

Re-assemble the meter to a point that you can test the clone HC700013P, respecting static discharge control. Insert the clone HC700013P device and power on the meter. You should have a reasonably normal display. Pressing the SRQ button for a few seconds will initiate the 21-step self test. Hopefully your meter now passes all tests. But if not, recheck your repair and note the failing tests. It is always possible that you have either multiple 700013 failures or defects in other parts of the meter.

Further fault tracking is beyond the scope of these instructions, but the manual is very detailed in diagnostic procedures. Again, you may want to consider socketing all U301, U302, U303 devices in order to exchange them.

If you suspect U402 and U403 in the *ohms current source*, you must follow the same procedures as outlined above. Note that if the ohms current source is defective, it will likely impact many other tests, and should be corrected or verified first.

Please refer to the following photos as guidance.

Calibration: Once passing tests, and depending on your needs, DIY or professional calibration might be in order. Though the impact on accuracy is likely minimal, the original 700013 on-resistance is 1500-2000 ohms, while modern DG212 switches are <100 ohms. We cannot predict how this 20:1 lower resistance affects previous calibrations with the original part. We believe it small though, considering the DC scaling circuit resistances.

HCI

HC700013P-v2

