SHMS Danfysik Quench Detector Setup Procedure

Rev B
March 30, 2015
Steven Lassiter

Equipment:
Isolation transformer
Dual channel chart recorder
Calibrated voltage source (battery operated)
Leads
Multi-meter

Procedure:

Initial Setup: Disconnect magnets voltages taps from Quench Detector if needed to reduce signal noise.

Main coils channels in Bucked Mode:

Set dwell time to 0 milli-sec. (Can be raised later).
Pre-balance the coil's channels using an isolated calibrated voltage source.
Start with a +10 mV source; adjust gain and levels until both sub-channels, (upper and lower) interlock at the same level.
Reverse polarity and repeat adjustment.
If gains and balance differ significantly when reversing the polarity, average the difference.
Repeat process until upper and lower interlocks are in close agreement.

Current Leads channels in Absolute Mode:

Set dwell time to 0 milli-sec.
Wire calibrate voltage source for single voltage input.
Set voltage to 80 mV.
Adjust gain until interlock is generated.
Reverse Polarity and verify interlock repeats at same threshold, adjust balance if needed.

Main coil channels calibration when connected to Magnet.

Re-connect magnets voltage taps to QD if they were unconnected previously.
PSU should be limited to low currents <10% of Maximum operating current.
Connect isolated chart recorder to test points 1 and 2. Use both channels of chart recorder: channel 1 of chart recorder to upper channel of QD, channel 2 of chart recorder to lower channel of QD.
Set chart recorder scale and chart speed as needed.
Ramp Magnet and observe output. Swap positive and negative leads on one of the channels to get signals to lie on top of each other.
Adjust balance until upper and lower channels overlay.

If interlocks occur, reduce gain until balance can be adjusted.
Alternative to using Chart recorder is to measure across test points 2&3 of QD channel during a slow ramp up and adjust balance until voltage is zero +/- few mV.
Ramp the magnet down and test that the voltage still lies around the zero volt.
If ramp up and down are not symmetrical, adjust so that the average is zero volts.
Using the isolated calibrated voltage source, apply an increasing signal to one of the QD channels. Note voltage when interlock turns on.
Set isolated voltage source to 10 mV and adjust gain until interlock comes on/goes off.
Remove voltage cables and continue to ramp magnet. Monitor voltages on chart recorder and control screens.
Reverse Magnet PSU polarity and ramp magnet, monitored and record voltages.