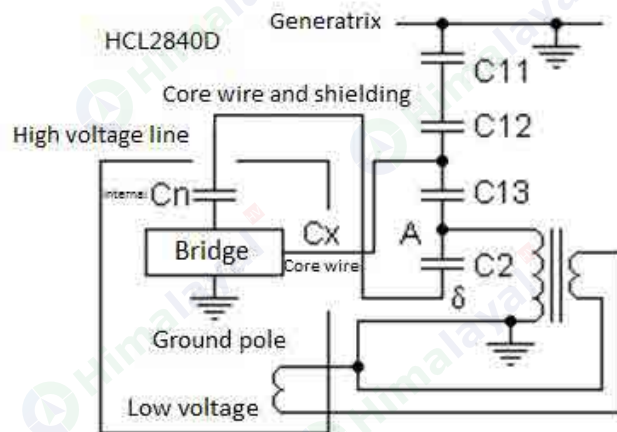


HCL2840D Non-dismantled High voltage lead Applied to CVT

Auto-excitation Measurement and Potential

CVT auto-excitation measurement with HCL2840D is quite convenient, conduct wiring in accordance with diagram below. If C_1 is single stage capacitor, generatrix is cannot be grounded; if C_1 is multiple stage capacitor, high voltage lead not necessarily dismantled, generatrix can be grounded, C_{11} and C_{12} can be measured with both regular tangent and inversed wiring, auto-excitation measurement can be applied to C_{13} and C_2 .

I. Wiring in accordance with diagram below:



II. Measurement and potential

During CVT auto-excitation measurement, the instrument measures C_{13} first then C_2 after automatic inversed winding, meanwhile automatically calibrate impact of voltage dividing.

While measuring C_{13} , high voltage is added to high voltage line core wire and shielding, low voltage is added to C_2 line core wire and shielding.

While measuring C_2 , low voltage is added to high voltage line core wire and shielding as well as C_2 line core wire and shielding.

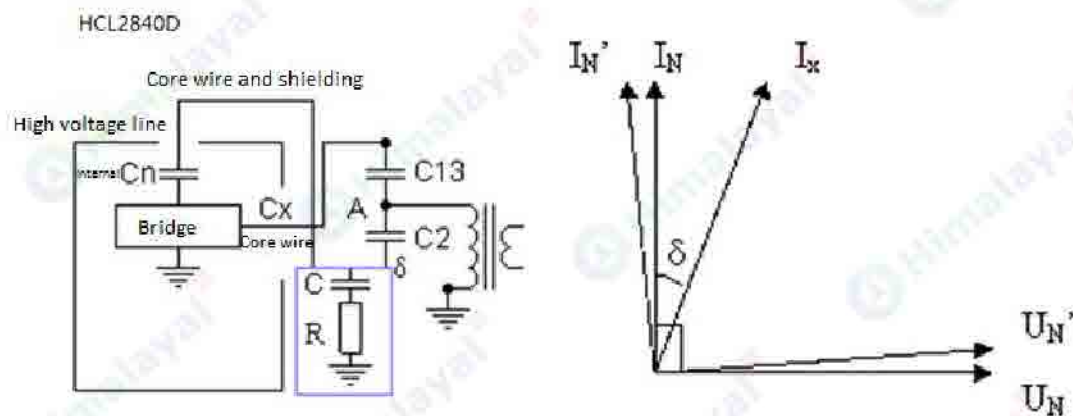
III. The reason to measure C_{13} first then C_2

As it's known that C_{13} capacitance is smaller, approximately 20000 pF; C_2 capacitance is larger, at least 40000pF; C_N is 50pF standard capacitor. While measuring C_{13} , connect C_2 and C_N in serial as one standard capacitor, according to capacitor cascade formula: $C_{\text{cascade}} = (C_2 C_N) / (C_2 + C_N)$, due to $C_2 \gg C_N$, $C_{\text{cascade}} \approx C_N$, C_2 has little influence on test outcome, thus negligible. On the contrary, if C_{13} is measured first, by reason that C_{13} capacitance is small, after connected in serial to internal C_N , C_{13}

dielectric loss is included, causing standard arm dielectric loss increase which will lead to C_2 dielectric loss reduction, thus cause error in measurement.

IV. Auto-excitation measurement with high voltage line on the ground can cause dielectric loss increase

High voltage line ought to be suspended during auto-excitation measurement, otherwise extra dielectric loss to the ground can cause dielectric loss increase, use thin cable to connect high voltage socket and CVT test object and suspend it.



Content in the blue frame on the diagram above shows RC cascade model of extra stray capacitance with cable on the ground, advancing voltage U_N at point δ into U_N' , current I_N into I_N' , I_x phase remains the same, causing increase in angle δ , namely increase in dielectric loss. Users can derive through formula.