



TD-65E - Tan Delta Bridge

Diagnostic testing for cables rated to 35kV

TD-65E

TD-65E Tan Delta bridge is designed to work with and communicate wirelessly via the XBee protocol to the VLF-34E or VLF-65 to form a complete cable diagnostic system. This system offers high end features such as wireless communication, data acquisition, and report generation using the supplied E-Link PC software. Designed to perform Tan Delta testing, also known as Tan δ , Dissipation Factor or Loss Angle on 5 to 35kV primary cables to the worlds standards; IEEE 400, IEEE 400.2, IEEE 433, DIN VDE 0276, CENELEC HD620 S1, NEETRAC CDFI, & others. Tan Delta testing is a non-destructive diagnostic test to measure the degree of deterioration of shielded MV/HV cable insulation. The results reveal how contaminated, damaged, or water tree strewn the insulation has become. Tan Delta is an off-line test on de-energized cables using an AC power source, in this case a very low frequency (0.1Hz) hipot to provide the test voltage to the cable while the Tan Delta bridge records the results. The test voltage is increased in steps while readings are monitored to avoid possible cable failure should the TD numbers indicate severe degradation.

Model	TD-65E
Input	Two Alkaline "D" cell batteries required—Four supplied NiMH rechargeable "D" cell batteries acceptable – Not included
Metering	Voltage: 1-65kVp(46kVrms), $\pm 1\%$ Accuracy, 0.1kV Resolution Current: 0-150mA _p (106mA _{rms}), $\pm 1\%$ Accuracy, 1uA Resolution Tan Delta: 0.1Hz -0.01Hz, 5nF-10uF, 1.0 x 10 ⁻⁴ Accuracy, 1.0 x 10 ⁻⁵ Resolution
PC Interface	XBee 802.15.4 (wireless, ~30ft range)
PC Software	E-Link remote control and report generation software
Cable Lengths	20ft/6.1m VLF output cable terminated with MC connector, 10ft/3m TD output lead terminated with red banana clip, 20ft/6.1m green/yellow test lead, 2in/51mm x 5in/127mm toroid, 1 1/2in/38mm aluminum ball with banana socket
Size	TD Transducer w/ Tripod: 7in/152mm x 8in/203mm x 18in/457mm TD Carrying Case: 22.5in/572mm x 15in/381mm x 11.75in/298mm
Weight	TD Transducer with Tripod: 7lb/3.2kg TD w/ Carrying Case and Accessory Bag: 40lb/18.14kg



Condition Assessment Criteria *All numerals are 10-3 per Section 5, Tables 4 & 5 of IEEE 400.2-2013

Condition Assesment	PE Based Insulation (PE, XLPE, WTRXLPE)			Unidentified Filled Insulation (EPR)			Mineral Filled Insulation (EPR)		
	No Action Required	Further Study Advised	Action Required	No Action Required	Further Study Advised	Action Required	No Action Required	Further Study Advised	Action Required
Stability for TD (Standard Deviation)	< 0.05	0.05 to 0.5	> 0.5	> 0.1	0.1 ro 1.3	> 1.3	< 0.1	0.1 ro 1	> 1
	And	Or		And	Or		And	Or	
Tip Up (TD1.5U0 – TD0.5U0)	< 5	5 to 80	> 80	< 5	5 to 100	> 100	< 4	4 to 120	> 120
	And	Or		And	Or		And	Or	
Mean TD @ U0	< 4	4 to 50	> 50	< 35	35 to 120	> 120	< 20	20 to 100	> 100