



Diagnostic testing for cables rated to 35kV

TD-65E

Features and Benefits

The High Voltage, Inc. TD-65E Tan Delta bridge is designed to work with and communicate wirelessly via the XBee protocol to the VLF-65E to form a complete cable diagnostic system. Together they offer high end features such as wireless communication, data acquisition, and report generation using the supplied E-Link PC software. This system is 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 performed 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 testing is performed with the cable off-line where an AC power source, in this case a very low frequency (0.1Hz) hipot, provides the test voltage to the cable while the Tan Delta device 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



Model VLF-65E

Intuitive menu driven user interface.



TD-34E VLF-34E VLF-65E TD-65E

Specifications



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, 1 μ A Resolution Tan Delta: 0.1Hz -0.01Hz, 5nF-10 μ F, 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

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

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