

QUALITROL® TEV Sensor

Cable partial discharge measurement



Ensuring the reliable continued operation of power cables

- No outage required for installation
- Can be used in conjunction with HFCT for condition monitoring of power cables and their termination boxes
- Permanent magnets help in easy installation on metal clads
- Calibrated sensors enable the user to measure surface discharges accurately
- Sensitive to partial discharge activities occurring outside the cable
- Ideal for cable terminations condition monitoring
- Aids in separating out PD activity inside the cables from that outside
- Multiple sensors can also be used to locate external PD activity using Time of Flight method

Product Summary

Description Transient Earth Voltage (TEV) sensors are used to detect radio frequency pulses emanating from termination. It is a magnetically attached capacitive coupling antenna type sensor

Application Application of TEV together with HFCT can help in identifying cable internal or external PD. It can be attached magnetically to the outer surface of metal clad switchgear or cable box near small openings or vents. Those PD pulse emerging out from terminations can be detected by this sensor



QUALITROL®
Defining Reliability

QUALITROL TEV Sensor - Cable partial discharge measurement

Ensuring the reliable continued operation of power cables

- Failure in cable insulation is generally preceded by partial discharge and subsequent degradation phase. Detecting partial discharge at the early stage of degradation helps in preventing sudden failure

No outage required for installation

- Permanent magnets allow the sensor to be clamped on metalclad
- Slots are available to tie the sensor or install permanently
- Totally non intrusive way to monitor PD activity at terminations

Can be used in conjunction with HFCT for condition monitoring of power cables and their termination boxes

- Used along with HFCT for successful monitoring of cable condition
- Helps in separating out internal cable PD activity from external PD
- Its usage makes analysis easier so that external PD activity is easily separated out from internal cable PD activity

Calibrated sensors enable the user to measure surface discharges accurately

- Each sensor is calibrated carefully and provided with specification and calibration sheets
- Sensitivity is mentioned in mV/V so that system can report the external PD activity in terms of decibels which is most commonly used unit for external PD activity
- Wide frequency band and fast rise time characteristics enables the sensor to measure high frequency external activity successfully

Aids in separating out PD activity inside the cables from that outside

- During PD measurements, external discharges are also captured by HFCT and can be mistakenly understood as internal PD
- Cable internal discharges are considered more dangerous as they tend to grow and damage the cable faster than external PD activity
- However, external PD activity cannot be left unnoticed, HFCT and TEV can help in capturing both internal and external PD activity
- Multiple TEV sensors can also be used to locate external PD activity using Time of Flight method

Other key benefits

- Superior quality - rugged and reliable design
- Easy usage

Why partial discharge measurement in power cables?

- Failure in cable insulation is generally preceded by a degradation phase which may last for months or several years
- Any insulation degradation results in the inception of partial discharges (PD) at degradation site(s)
- PD analysis and localisation helps in determining the insulation health and subsequently the life of power cables

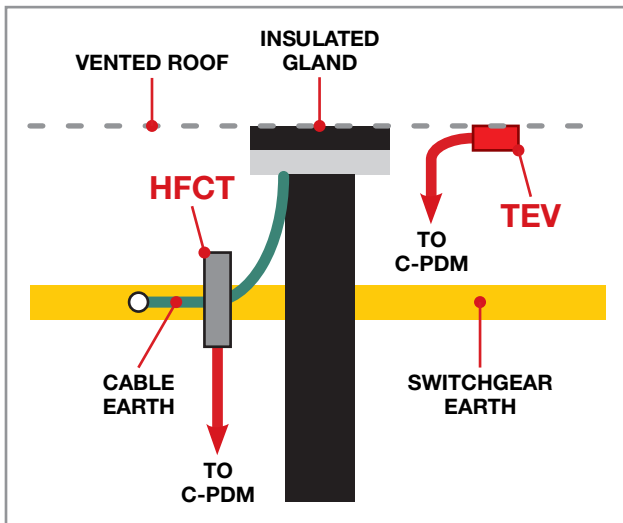
Why QUALITROL Expert diagnostic and testing services?

- More than 25 years of experience in providing PD monitoring systems and services to utilities across the world
- World wide presence provides quick turn around times
- Long term serviceability assurance helps in formulating longer service contracts
- Cross team integration increases the accuracy of results and confidence of operator / asset manager
- Highly accurate PD detection and localisation system for power cables
- Greater emphasis on health and safety during PD measurements surveys

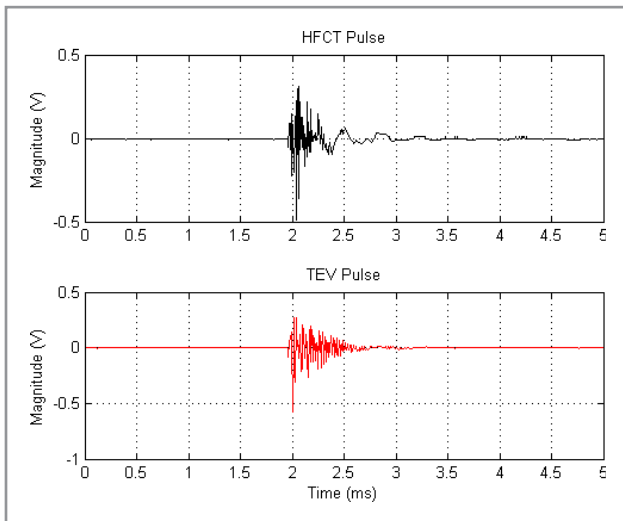
TEV application

Overview and HFCT/TEV installation

- The TEV can be used alone for detecting cable termination defects
- For comprehensive assessment and confident PD measurement it should be used together with HFCT (high frequency current transformer) sensor. HFCT will be able to detect the cable PD as well as limited external activity. This sensor can help in differentiating cable PD versus external PD
- The metal housing must not be double skinned and there must be vents/openings in metal enclosure for electromagnetic signals to emerge on outer surfaces of switchgear housing



HFCT and TEV installation overview



HFCT and TEV synchronous pulses

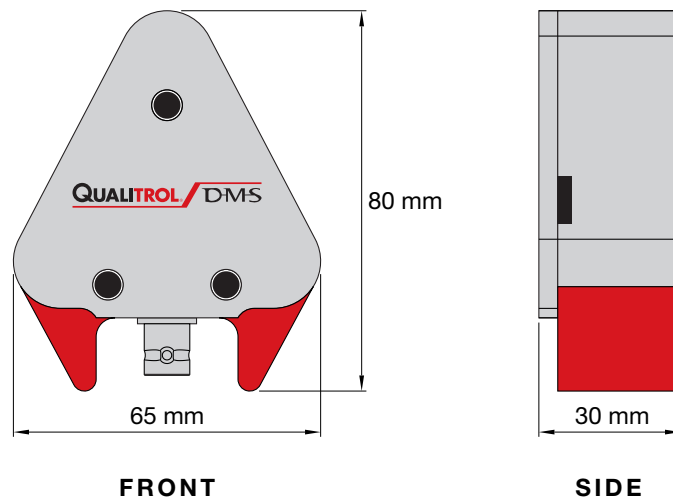


HFCT and TEV installed



TECHNICAL SPECIFICATIONS

Materials	Case	HDPE material
	Magnets	Permanent magnets or slots for tying up the sensor
Performance	Sensitivity	100 mV/V
	Frequency Response (-3dB)	1 MHz - 50 MHz
	Rise time	Less than 10ns
	Recommended load	50 Ω
Comms	Ports	BNC female
Mechanical	Dimensions	H x W x D: 80 mm [3.15"] x 65 mm [2.56"] x 30 mm [1.18"]



QUALITROL® Field Services

QUALITROL® provides on-site commissioning/start-up and comprehensive maintenance contracts to all customers worldwide. To further improve reliability, an extended warranty is available on selected products commissioned by QUALITROL®.

QUALITROL® Educational Services

QUALITROL® professional training (designed to achieve hands-on performance based objectives) prepares operations, maintenance, and engineering personnel to install, test, configure, operate and maintain QUALITROL® products.

QUALITROL® Accelerated Delivery

QUALITROL® provides accelerated delivery on many products and services including replacements, spare parts and repairs.

About QUALITROL®

Established in 1945, with continual improvement at the core of our business, QUALITROL® provides smart utility asset condition monitoring across the globe. We are the largest and most trusted global leader for partial discharge monitoring, asset protection equipment and information products across generation, transmission and distribution. At QUALITROL® we are redefining condition monitoring technology for Electric utilities assets.

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