

Power Testing Product Co., Ltd.

Company
presentation

Reliability for Electrical Networks

Power Testing Product Co., Ltd.

Background

- Company founded in 2001
- Personnel with long experience in power industry
- To supply test, monitoring and diagnostics products with an excellent support
- Located in Nonthaburi, Thailand



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Products

- Iris Power , Canada
- Baur , Austria
- Sorem , France
- Vectron , USA
- Sergi , France
- IntelliSAW, USA
- Doble, USA (only for Laos)
- Morgan Shaffer, Canada (only for Laos)
- PD Service, Switzerland



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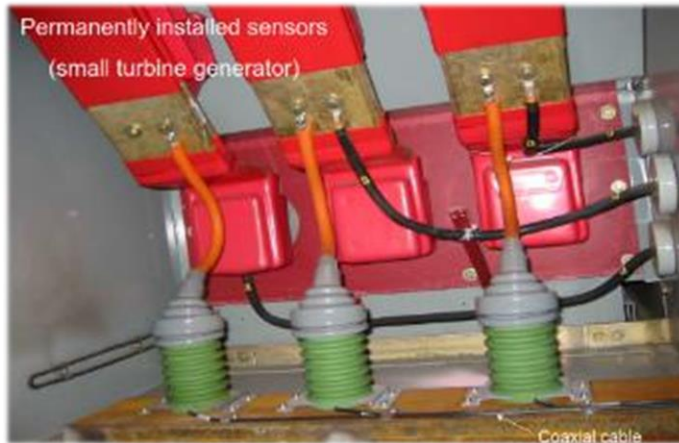
Iris Power

- On-Line Partial Discharge Monitoring of Stator Winding of Rotating Machines
- On-Line Rotor Short-turn Detection
- Wedge Tighten Tester
- Core Loss Tester (ELCID)
- Vehicle Robotic Inspection
- On-Line Rotor Broken Bar Detection

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On-line Partial Discharge Monitoring for Stator Winding of Rotating Machines



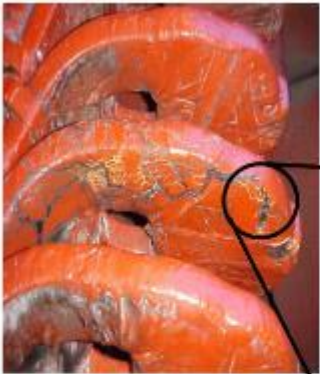
**Nearly 200 generators
installation**

In Thailand & Laos

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Benefit of On-line Partial Discharge Monitoring for Rotating Machines



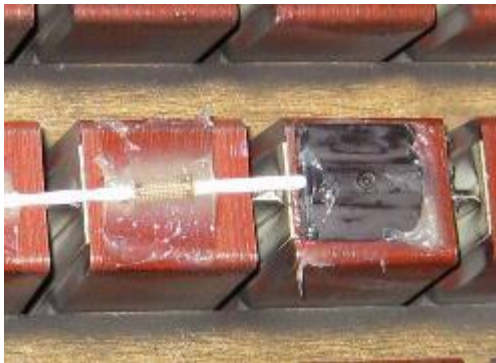
Insulation Damage
from Electrical Tracking



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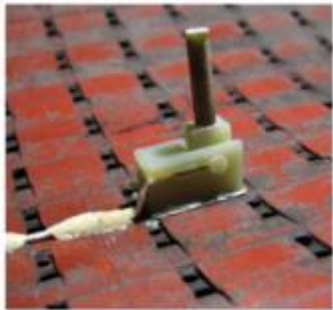
On-line Flux Monitoring for Rotor Short Turn Detection



RFAII-R™ & RFAII-S™



Portable instrument to detect rotor winding insulation problems in round and salient pole synchronous motors and generators



Iris Power FFProbe glued to a turbine generator stator tooth

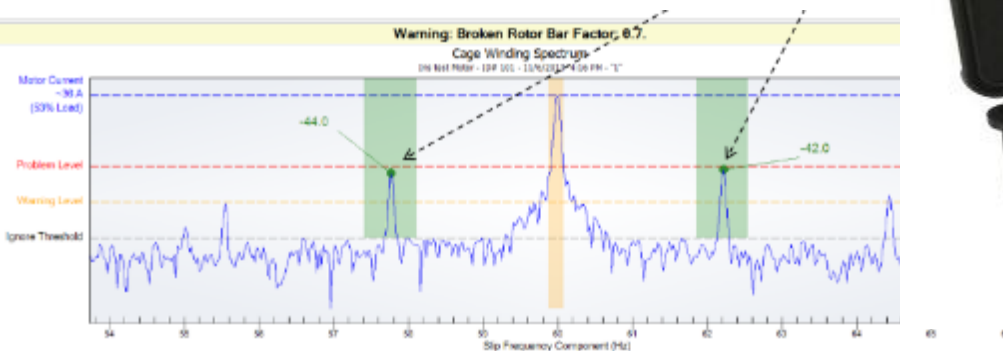
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On-line Broken Bar Detection for MV or LV Induction Motor

MDSP3

A Third Generation On-Line Tool to Find Broken Rotor Bars and Rotor Eccentricity in Induction Motors



02/12/63



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Baur

- Handheld On-Line PD Testing for MV Switchgear
- Insulation Oil Testing System
- HV Tester 25-260 kV DC
- Fault Location System
- VLF Testing System
- On-line PD testing for HV cables

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Handheld online PD detector

PD-SGS



Quick identification of PD activities in switchgear and cable accessories

The BAUR PD-SGS handheld online PD detector is used to conduct rapid initial tests for PD activities on live switchgear. Potential weak points are immediately signalled acoustically and numerically.

- Initial rapid condition evaluation of switchgear and cable accessories during mains operation
- Ideal for quick checks of MV and HV switchgear
- Two integrated sensors:
 - TEV sensor records PD on the surfaces of switchgears
 - Acoustic sensor records PD inside switchgears
- Greater safety for test personnel – switchgear tested for safety risks before starting work

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Results of Partial Discharges
11kV Cast Resin Circuit Breaker
Spouts



11kV Cast Resin CTs



Sectioned Cast Resin CT

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Insulation Oil Testing

Insulating oil testing with the BAUR DPA 75 C

The BAUR DPA 75 C oil tester developed especially for mobile use in the field is one of its kind in the market due to its functionality and excellent user benefits in comparison to the costs. The BAUR DPA 75 C delivers clear and reliable measurement results.



- Compact and robust device for portable use onsite
- Test voltages from 0 to 75 kVrms
- Repeatable breakdown measurements in mineral, silicone and plant oils
- Reliable measurement results due to its short switch-off time (< 10 μ s)

Insulating oil testing with the BAUR DTL C

The established analysis and diagnostic testing of insulating oils with the BAUR DTL C deliver valuable findings in scientific work, research and development. Extensive knowledge on the current state of insulating materials is gaining importance even for the mains network operator.

The BAUR DTL C offers the latest and most precise information for efficient oil management in plants in the electricity and other industries.



- Fully automatic dissipation factor measurement
- Pre-programmed standards
- Maximum accuracy
- Functional design for high efficiency, user-friendliness and safety in the case of minimum space requirement

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HV Tester

Cable testing and diagnostics with the BAUR PGK HB

There are hardly any other longer-lasting, more robust and cost-effective testing devices than the two-piece high-voltage test devices from the PGK HB series. They generate continuous adjustable test voltages with mains frequency or optionally DC with positive or negative polarity. The display instruments for current and voltage, the safety control unit and the regulating transformer for the voltage are integrated in the operating unit.

- Testing of medium- and high-voltage cables
- DC voltage testing of up to 260 kV output voltage with positive or negative polarity
- AC voltage testing - up to 190 kV for switchgear, busbars and insulating elements
- Easy-to-maintain 2-piece design

Cable testing and diagnostics with the BAUR PGK 80

The portable, one-piece PGK 80 high-voltage test device for generating negative DC voltage up to 80 kV is primarily used for onsite testing of paper-insulated mass-impregnated cables in the medium-voltage network. The high voltage is generated through a high-voltage transformer with secondary voltage-multiplier. The internal operating frequency of 20 kHz enables the smallest of device dimensions.

- Continuous adjustable output voltage
- The voltage measurement is done directly at the high voltage output
- Timer of 1-30 min
- Sensitive current measurement for recording the smallest of insulation currents with 6-time range switch, decadal



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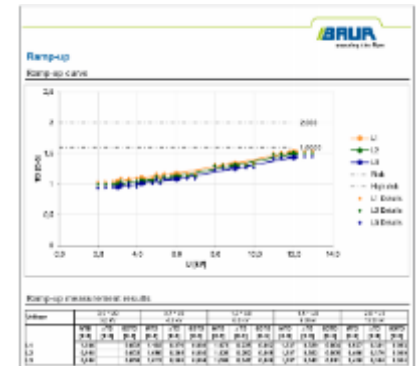
Cable Testing and Diagnostics



Cable testing and diagnostics with the BAUR viola

The portable and powerful viola high-voltage testing and diagnostics device is used for cable and cable sheath testing of medium-voltage cables up to 35 kV and electrical equipment. Another function is insulation testing on electrical equipment.

- High performance and compact
- Precise and non-destructive determination of the cable condition
- Easy and quick test setup
- Automatic testing and diagnostic sequences



Cable testing and diagnostics with the BAUR frida TD

The portable and high performance high-voltage testing and diagnostics device is available in two different configurations:

frida: Used for cable and cable sheath testing of medium-voltage cables and electrical equipment up to 20 kV. Another function is insulation testing on electrical equipment.

frida TD: Expands the functional scope of frida with the tan delta diagnostics and Monitored Withstand Test (MWT) that combines the cable testing and dissipation factor measurement. This allows for an accurate and comprehensive assessment of the cable condition.



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Cable Fault Location

Cable fault location with the BAUR shirla

Shirla the fault location system is used for cable and cable sheath testing as well as for pre-location and pinpointing of cable faults. The pre-location based on the measuring bridge principle according to Murray and Glaser that is designed especially for power cables, also enables pre-location for control and lighting cables. Null balance and evaluation take place automatically.

- Cable and cable sheath testing up to 10 kVc
- Resistance measurement
- Cable and cable sheath fault pre-location with precision measuring bridge
- Adjustable cable sections that can be defined with length, conductor cross-section and material respectively and can be considered in the distance calculation

Cable fault location with the BAUR UL 30

The UL 30 receiver is used together with a ground microphone (BM 30) and a surge voltage generator (SSG, STG) to pinpoint cable faults. With the coil integrated in the BM 30 for runtime measurement, the device determines the time difference between the magnetic and acoustic signal. This particularly offers special advantages when dealing with faults difficult to locate acoustically.

- Built-in speaker
- Splashproof design
- Large, illuminated display
- Lightweight



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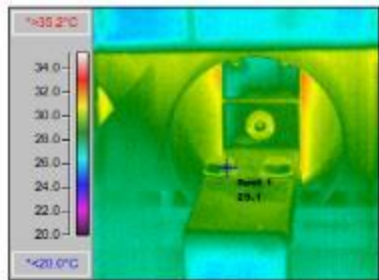
PTP

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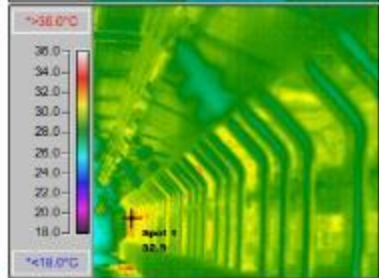


Sorem

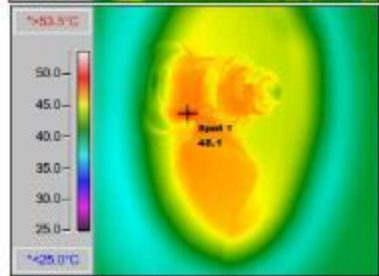
Infrared Window for Temperature Measurement in MV or LV Panel



Busbar Terminations of a Switchgear as seen thru the HVIR Window



Busbar Chamber of a Switchgear as seen thru HVIR Window installed at Busbar chamber



Transformer Terminations as seen thru HVIR Window



- **Best transmission for both band II (2-5µ) and III (7-13µ) spectrum.**
- **Type test with MV Swgr.**
- **UL certificate**

Ref: NbrevisIRWindow/window examples

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Observation window for standard high voltage and low voltage applications

• SOME EXAMPLES OF INSTALLATION:



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Wireless Temperature Measurement & Partial Discharge Alert



REAL-TIME, CONTINUOUS
MONITORING FOR COMMON
ELECTRICAL ASSET
FAILURE MODES

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Wireless Temperature Measurement & Partial Discharge Alert



REAL-TIME,
CONTINUOUS
MONITORING FOR
COMMON
ELECTRICAL
ASSET FAILURE
MODES

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Wireless Temperature Measurement & Partial Discharge Alert

LOCAL MONITORING UNITS



CAM-5

- Monitoring capability
 - Temp, PD (Trend), Ambient
- Touch panel HMI
- Onboard data storage
- Display & log data for 9 connected Readers
- Multiple communication protocols



IRM Reader

- Monitoring capability
 - Temp, PD (RAW), Ambient
- Modbus RTU (RS485)



Industrie
Canada

Industry
Canada



SENSORS



Conductor Temperature

- Passive SAW Technology



Partial Discharge

- UHF PD detection technology



Ambient Temp & Humidity

- Laser cut CMOS technology

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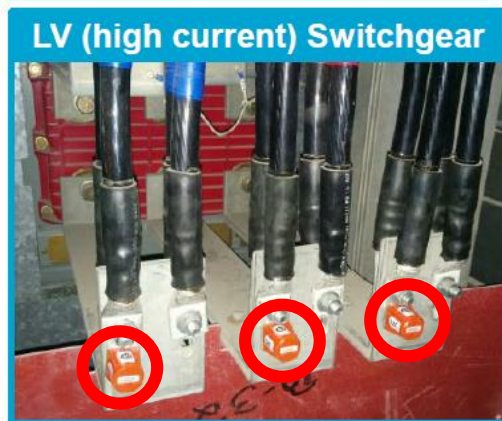
Wireless Temperature Measurement & Partial Discharge Alert

- MV Switchgear
- ISO-Phase Bus Duct
- Generator PT Cabinet
- Transformer
- Generator Circuit Breaker
- LV Switchgear
- LV Distribution Panel
- Motor Control Center
- Motor
- Capacitor Bank

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Wireless Temperature Measurement & Partial Discharge Alert

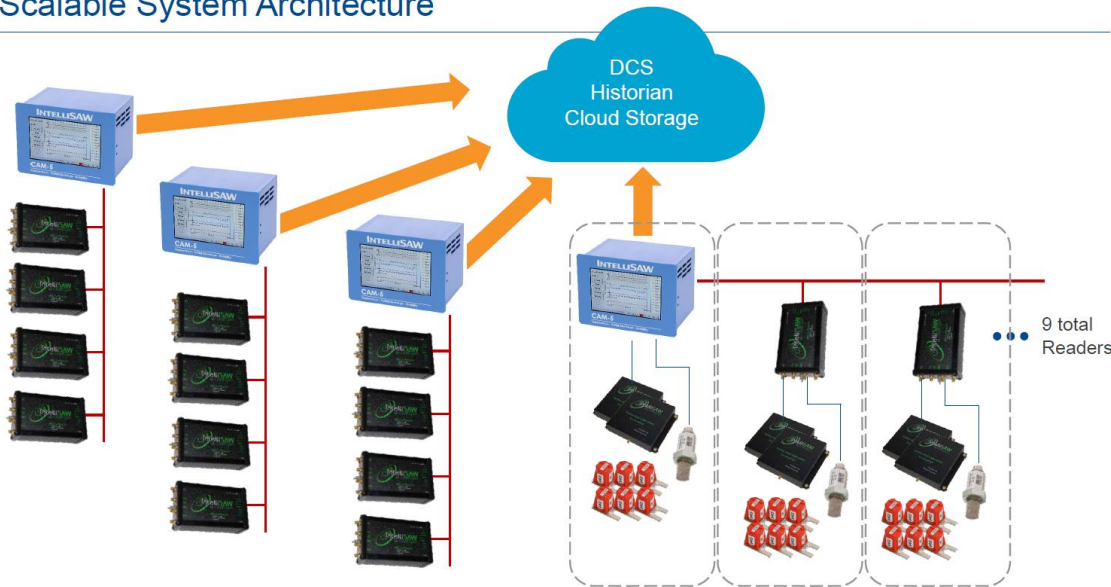


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Wireless Temperature Measurement & Partial Discharge Alert

Scalable System Architecture



Communication

- RS485
- Ethernet
- Ethernet (optional FIBER)

Protocol

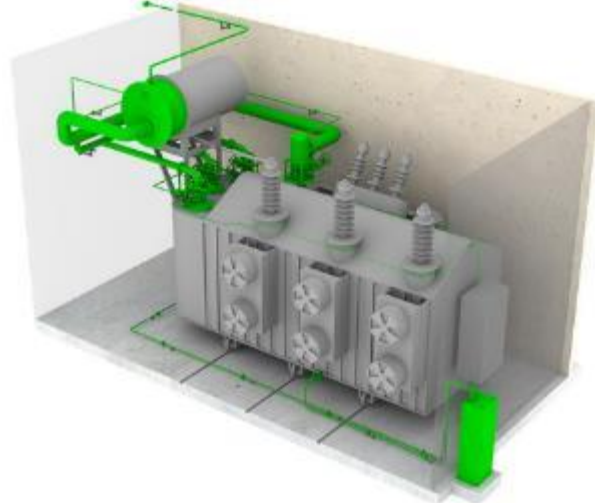
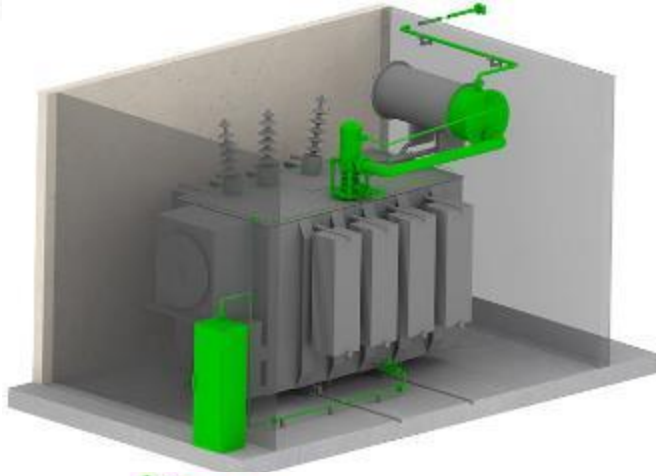
- Modbus TCP
- DNP3 Outstation
- IEC 61850
- SFTP, SSH

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SERGI TRANSFORMER PROTECTOR

The Only Proven Solution Against Transformer Explosion and Fire



Protector:

- Eliminates Costly Plant Outages
- Prevents Fire Damage to the Transformer and Surrounding Equipment
- Prevents Environmental Pollution by Containing the Oil
- Eliminates Risk to Human Life
- Saves Company Reputation
- Activates within 0.5-20 ms

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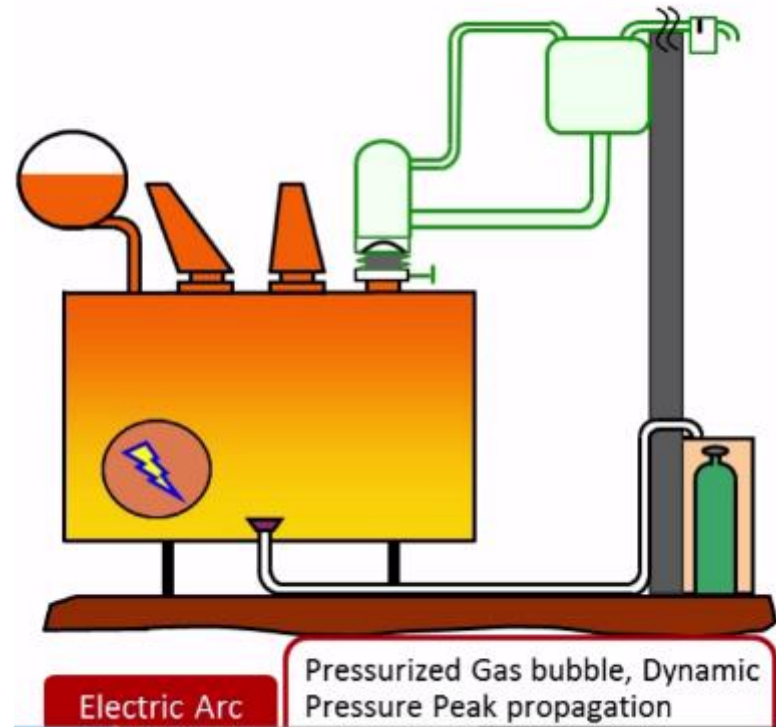


SERGI TRANSFORMER PROTECTOR

The Only Proven Solution Against Transformer Explosion and Fire

Principle:

- The TRANSFORMER PROTECTOR activates within milliseconds depressurizing the transformer main tank.
- Once the depressurization is complete, the transformer is then injected with inert gas to evacuate the remaining explosive gases.
- After the explosive gases have been cleared, the transformer is then safe and ready for repair.



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ONLY FOR LAOS MARKET



World Leader for Test and Monitoring Equipment

Product

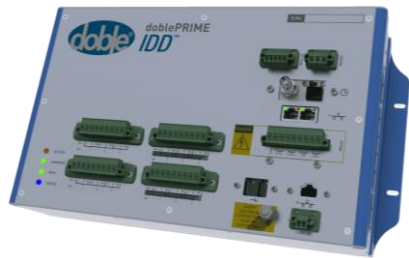
- Bushing Monitor
- Continuously Monitors Partial Discharge
- Portable Moisture in Oil and Dewpoint Analyzer
- Transformer Condition Monitoring System
- Power Factor/Tan-Delta instrument
- High-Voltage Asset Analyzer
- Sweep Frequency Response Analyzer
- Circuit Breaker Analyzer
- Partial Discharge Surveyor
- Dielectric Fault Analyzer
- Surge Arrester Leakage Current Monitor
- Relay Tester

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ONLY FOR LAOS MARKET



World Leader for Test and Monitoring Equipment



Bushing Monitor System

The **doblePRIME IDD** Bushing Monitor provides leakage current and phase analysis for up to 12 bushings, measuring parameters for each bushing individually and together. This intelligent device uses its embedded Expert System to provide you with notifications and alarms based on comparisons between off-line and calculated on-line data. Designed to fit your monitoring program, the **doblePRIME IDD** Bushing Monitor can operate as a standalone device or as part of a **doblePRIME** Condition Monitoring Platform.

Surge Arrester Leakage Current Monitor

The **Doble LCM500 Leakage Current Monitor** can measure condition while a surge arrester is still in service, measuring the quality of the metal oxide blocks and helping manage the risk of failure.

A surge arrester may be inexpensive, but it has an important role in protecting your transformers.

With the LCM500 surge arrester test set, it takes less than 15 minutes to establish that your surge arresters are healthy and the transformer is still protected.



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World Leader for Test and Monitoring Equipment



Partial Discharge Surveyor

The Doble PDS100 Partial Discharge Surveyor is a radio frequency interference (RFI) surveying tool that is designed for partial discharge measurement in a live substation. Without the need for outages, the PDS100 can detect partial discharge (PD) in just a few seconds – making it an ideal tool for a condition based maintenance program.

Partial Discharge Surveyor with EMI Capabilities

The PDS200 Surveyor is a partial discharge surveyor tool with EMI capabilities. It identifies and analyzes radio frequency (RFI) and lower frequency electromagnetic (EMI) emissions. These are associated with faulty or degraded insulation and other system defects.

The PDS200 uses EMI analysis to discriminate between different defects and discharge sources in transformers, cable terminations, high-voltage substation and plant equipment.

Use the PDS200 to quickly make a system wide survey. The PDS200 connects with a variety of sensors for various applications. It can be purchased on its own or as part of a packaged kit



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Introduction to Vanguard Product

Product

- DC Micro-Ohmmeter
- Molded Case Circuit Breaker Tester
- Digital Circuit Breaker Analyzer
- Current Transformer Test Set
- Primary Current Injection Source
- Portable relay test set
- Transformer Turns Ratio Tester
- Load Tap Changer Analyzer
- Vacuum Bottle Tester

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Vanguard Product

EHV Circuit Breaker Analyzer

The **Vanguard DIGITMR S2** is an inexpensive, easy to use digital circuit breaker analyzer. The DIGITMR S2 can be operated stand-alone or can be computer-controlled. It can fully analyze a circuit-breaker's performance by testing the contact time, stroke, velocity, over-travel, and contact wipe. Contact and motion analysis can be performed for all breaker contact operations (Open, Close, Open – Close, Close – Open, and Open – Close – Open). Timing results are recorded and displayed on the 240 x 128 pixels back-lit LCD screen and can also be printed on the built-in 4.5" wide thermal printer.



RFD-200 S3, portable relay test set

The **RFD-200 S3** is a portable relay test set that delivers performance verification testing of electromechanical, electronic, and microprocessor-based protective relays in their operating installations. AC current source with three outputs (10A, 40A, and 100A). NO/NC dry contacts. AC voltage source is available for testing relays up to 250 Vac. A 0 – 300 Vdc voltage source. One volt meter input. Ampere Meters. Auxiliary AC/DC Power Supplies. Built-in Power Resistors.



Power Testing Product Co., Ltd.

ONLY FOR LAOS MARKET
Morgan Shaffer Product



1. Calisto, Online DGA Monitor for Power Transformer

1. 1 gas model, H₂, H₂O
2. 2 gasses model, H₂, H₂O, CO
3. 5 gasses model, H₂, H₂O, CO, CH₄, C₂H₂, C₂H₄
4. 9 gasses model, H₂, H₂O, CO, CH₄, C₂H₂, C₂H₄, C₂H₆, CO₂, O₂, N₂

2. Myrkos, Portable DGA Tester Instrument (for laboratory and field test)

Calisto Reference List in Lao

- Namngum 1 Plant, 11 sets
- NamLeuk Plant, 2 sets
- Nammung 3 Plant, 2 sets
- Xeset 1 Plant, 3 sets
- Xeset 2 Plant, 6 sets



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Partial Discharge Tester and Service



PDSurvival is an economic solution for PD monitoring in MV motor or MV switchgear. It features the latest algorithm, which detects the most severe PD signals in order to optimize effectiveness with limited budget.

- Economic monitoring solution
- Ultra-High-Frequency (UHF) bandwidth: 50MHz~900MHz
- Advanced algorithm designed, eliminating false alarm and reveal the severe PD
- Multi-monitoring modes: stand-alone, network and cloud modes
- Recording PD magnitude, counts and trend for interpretation
- Compact and rough design, which can fit to most environment



PDSimply adopts two characteristics making on-line partial discharge measurement.

- The state of art UHF (Ultra-High-Frequency) PD detection technology avoids the interference of background noise;
- The rule of thumb in identification of partial discharge signals confirms the existence of PDs by PD level and lasting time.
- Can monitor
 - 6 switchgears/cable joints/cable terminations, or
 - 2 rotatory machines, or
 - 1 transformer (primary side and secondary side).
- Include software for stand-alone mode and network mode

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Partial Discharge Tester and Service



PDSolution is a portable instrument specially designed for on-site partial discharge analysis, and it equips with multi-functions.

- PDSolution has the max. 5 GS/s sampling rate, which makes it able to achieve most partial discharge analysis on site.
- Adapting to different PD sensors (HF-VHF-UHF).
- Eliminating background noise by frequency selection (raising measuring frequency band).
- Distinguishing multi-PD sources by time-frequency method.
- Locating PD source with fine resolution by real time mode (oscilloscope).



PDSimply Portable A 6 channel portable PD monitoring unit designed for temporary inspection on HV/MV equipment. Features real-time data processing, display and reporting function, and an optional remote analysis service with one-button upload.

- Complied with IEC TS 62478
- 6 channels, For temporary monitoring: easy to cross-compare different equipment and phases
- Ultra-High-Frequency (UHF) bandwidth: 50MHz – 900MHz, compatible with most PD sensors
- Built-in high pass and low pass filter, can eliminate most background noise
- Multiple display mode: to observe PD in detail more easily
- Easy-link: provide fast connection between measurement instrument and laptop
- 4.4kg compact and rugged design, build for rough environment



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Partial Discharge Tester and Service

Service

PDCare is an integrated automated on-line partial discharge monitoring service which monitors insulation condition of power assets;

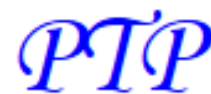
- it detects insulation deterioration and notifies the user with any threat that could lead to catastrophic results.
- PDS engineers, who possess strong understanding of all power system, are providing data analysis from 24/7 monitoring and cross-comparing with same type of equipments and history data.
- PDCare is a preventive maintenance, requires no interruption of service.
- By adopting PDCare, life cycle of equipments can be maximized, meanwhile eliminating unnecessary labor and maintenance expenses.

Partial Discharge Testing

- PD measurements and diagnosis or on-line monitoring are services PDS specialized. For example, for switchgear and transformers, we implement special sensors in your system and run for the monitoring. With our field knowledge, we can assist our clients with best solution.
- Through our years of experience we know how hard it is to always keep employees in increasingly complex issues on the current state of knowledge. Regarding the implementation of measurements and tests as well as the diagnosis of medium and high voltage equipment, you can rely on us. We have thorough understanding of the field and our own research activities are always up to date.

Cable Testing

- Partial discharge activity occurs when there is deterioration in electrical cable. Electrical cable breaks down from several months to years after PD occurs.
- Commissioning tests and diagnostic measurements in the field, for example, medium or high voltage cable testing we offer, includes carry out the entire start-up test, and a partial discharge measurement. We use for the on-site inspections of medium and high voltage cables DAC technology:



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PDP Probe

All-in-one Handheld Solution
for PD Measurement

Power Testing Product Co., Ltd.

Thank you very much

ขอบคุณมากครับ

The logo for Power Testing Product Co., Ltd. (PTP) is displayed in a stylized, blue, serif font. To the left of the logo is a vertical blue bar.

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