



PT Global Twin Star



Global Twin Star

PT Global Twin Star Product Catalog 2022

- testing instrument
- protection & control
- control relay panel
- high voltage equipment
- testing & assement
- installation & commissioning



PT.Global Twin Star

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PT GLOBAL TWIN STAR – PRODUCT CATALOG 2022



PT Global Twin Star is established in 2008 and we focus on testing instruments, protections & relays, and monitoring systems for utility of industries.

We provide you with the latest & proven technology products which are backed up by manufacturer. We also provide in house technical support, system designing and training to support your business, empowering you seamlessly with our ultimate solutions to solve the problem

CERTIFICATE AND ACCREDITATION

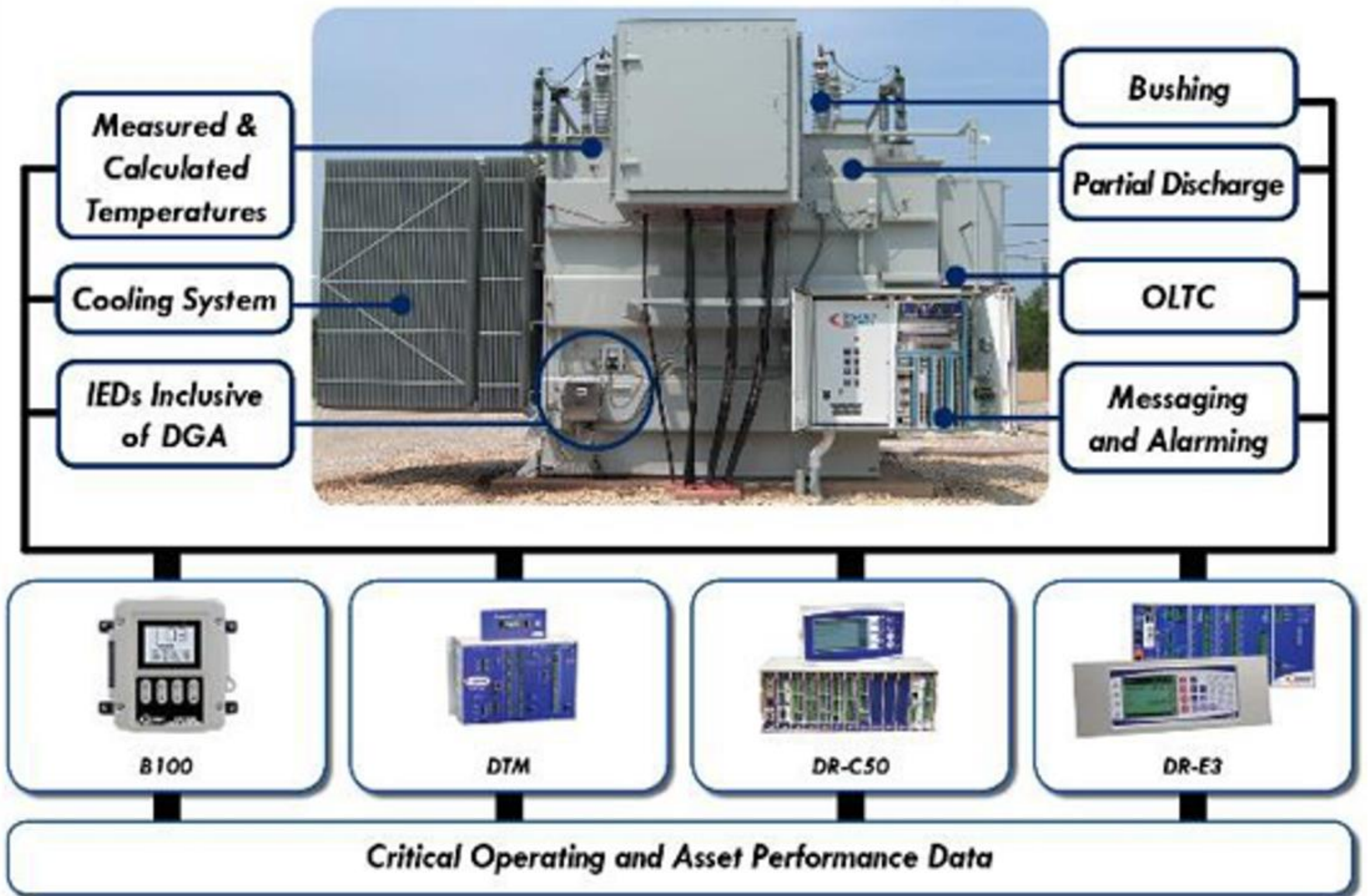
   <p>Certificate of Registration</p> <p>This is to certify that the Occupational Health and Safety Management System of</p> <p>PT. GLOBAL TWIN STAR. Ruko Union Square Kav. 21, Gading Serpong km. 7, Kel. Pakualam Kec. Serpong Utara, Tangerang Selatan, Indonesia.</p> <p>Has been independently assessed and is compliant with the requirements of:</p> <p>OHSAS 18001:2007</p> <p>For the following scope of activities: Provision of engineering, procurement, construction for electrical and other related works including trade</p> <p>Certificate Number: HS 0766</p> <table border="0"> <tr> <td>Initial Registration Date</td> <td>05th February 2018</td> </tr> <tr> <td>Issue Date</td> <td>05th February 2018</td> </tr> <tr> <td>1st Surveillance on or before</td> <td>04th February 2019</td> </tr> <tr> <td>2nd Surveillance on or before</td> <td>04th February 2020</td> </tr> <tr> <td>Recertification Due on or before</td> <td>04th January 2021</td> </tr> <tr> <td>Certificate Expiry Date</td> <td>04th February 2021</td> </tr> </table> <p><small>(Subject to the company maintaining its system to the required standard)</small></p> <p> Authorized Signatory</p> <p></p> <p><small>This certificate is the property of ACM Limited and shall be returned immediately on request.</small></p>	Initial Registration Date	05 th February 2018	Issue Date	05 th February 2018	1 st Surveillance on or before	04 th February 2019	2 nd Surveillance on or before	04 th February 2020	Recertification Due on or before	04 th January 2021	Certificate Expiry Date	04 th February 2021	   <p>Certificate of Registration</p> <p>This is to certify that the Quality Management System of</p> <p>PT. GLOBAL TWIN STAR. Ruko Union Square Kav. 21, Gading Serpong km. 7, Kel. Pakualam Kec. Serpong Utara, Tangerang Selatan, Indonesia.</p> <p>Has been independently assessed and is compliant with the requirements of:</p> <p>ISO 9001:2015</p> <p>For the following scope of activities: Provision of engineering, procurement, construction for electrical and other related works including trade</p> <p>Certificate Number: QM 0766</p> <table border="0"> <tr> <td>Initial Registration Date</td> <td>05th February 2018</td> </tr> <tr> <td>Issue Date</td> <td>05th February 2018</td> </tr> <tr> <td>1st Surveillance on or before</td> <td>04th February 2019</td> </tr> <tr> <td>2nd Surveillance on or before</td> <td>04th February 2020</td> </tr> <tr> <td>Recertification Due on or before</td> <td>04th January 2021</td> </tr> <tr> <td>Certificate Expiry Date</td> <td>04th February 2021</td> </tr> </table> <p><small>(Subject to the company maintaining its system to the required standard)</small></p> <p> Authorized Signatory</p> <p></p> <p><small>This certificate is the property of ACM Limited and shall be returned immediately on request.</small></p>	Initial Registration Date	05 th February 2018	Issue Date	05 th February 2018	1 st Surveillance on or before	04 th February 2019	2 nd Surveillance on or before	04 th February 2020	Recertification Due on or before	04 th January 2021	Certificate Expiry Date	04 th February 2021
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Substation Transformer Monitors

From sensors to software, Dynamic Ratings helps utility and industrial customers improve transmission substation systems reliability, leading to increased maintenance savings and reduced outages. We design, manufacture and integrate innovative sensors, monitors, and controls for data collection, analysis, and diagnostics. With the use of our asset management tools, our customers realize maximum benefit from online transformer and bushing monitoring.

- 1. DR-C50 – User Configurable Transformer Monitoring
- 2. B100 OTI/WTI digital
- 3. BHM Bushing Monitoring
- 4. PDM Partial Discharger Monitoring for Transformer
- 5. RMM Partial Discharge for Motor & Generator
- 6. Circuit Breaker Performance Monitoring
- 7. Switchgear and Cable Monitor
- 8. Breather health check
- 9. ibridge
- 10. VaultSafe dan SubSafe
- 11. Metrix software

Transformer Asset Health Monitoring





The C50 provides:

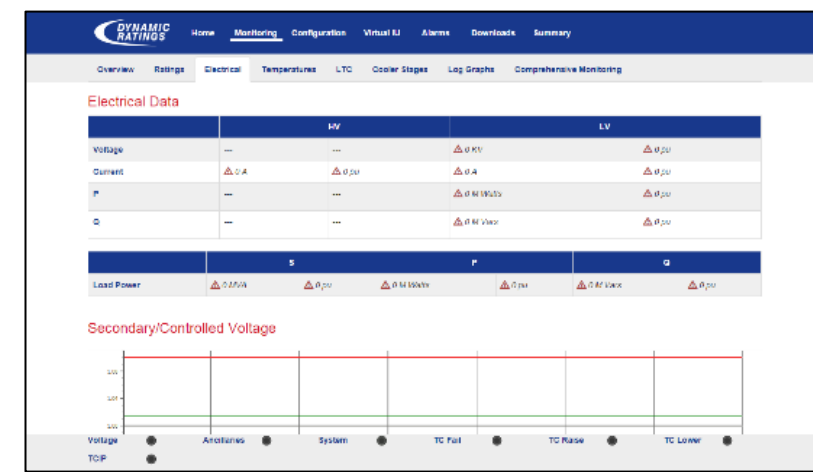
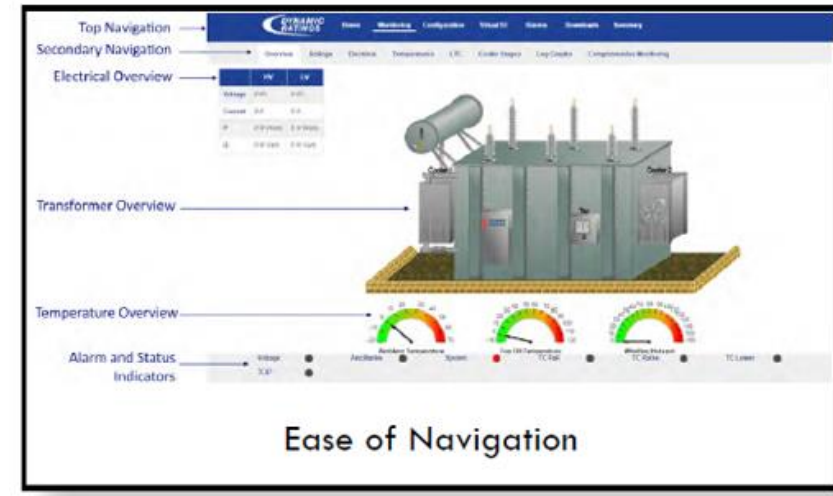
- A Modular design allows for future expansion
- Bushing Health Monitoring and PD Support
- DGA Monitoring and Diagnostics
- Provisioned with Windows compatible Configuration Software
- Stores the transformer definition profile, monitored data & SCADA points.
- Acts as an alarm and data logger
- Provides expert modeling, calculations & analytics using industry standards.
- Has built-in web server accessed using Ethernet (and USB-Ethernet).
- Provides communications & secure access.
- Compatible with the iBridge IED Communication Solutions

AFFORDABLE. EFFECTIVE. CONVENIENT.

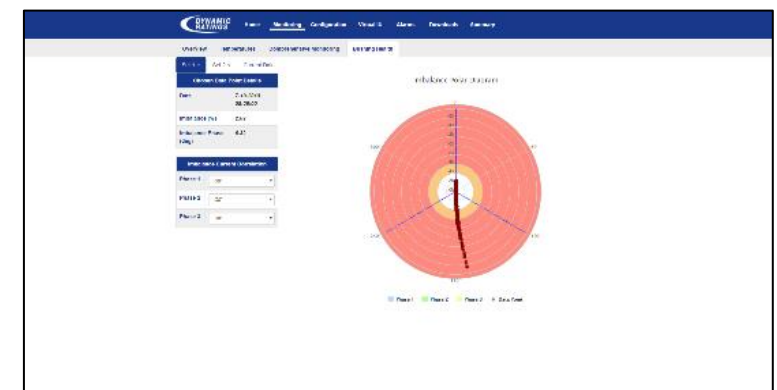
ASSET MONITORING MADE EASY.



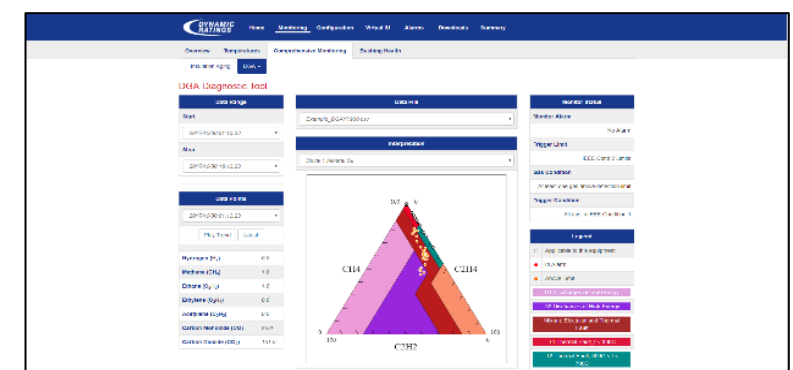
Main Dashboard



Electric Data



Bushing Health & PD Monitor



DGA IED Analytics

MONITORING

- **Temperatures**
 - Top & Bottom Oil
 - Winding Hot Spots
 - Ambient
- **Bushing Health**
 - Partial Discharge Monitoring
- **Cooling System**
 - Fan/Pump Current
 - Status Inputs
 - Loss of Power
- **Data Logging**
- **System Health Monitoring**
 - Internal Self-Checking
- **Tap Changer**
 - Position
 - Operation Counters
 - Temperature Differential
 - Drive Motor Monitoring
 - Contact Wear
 - Reversing Switch Operation
 - Hunting
- **Communications to Third Party Devices**
 - DGA and Moisture
 - Fiber Optic Temp.
 - Smart Device Integraton

CONTROL

- **Cooling Control**
 - Automatic Control
 - Winding Temp
 - Top Oil Temp
 - Form C Relay Output for Fail-Safe Control
 - Cooling Stage Sequencing
 - Automated Cooler Exercising
- **Device Control**
 - Local (User Display or Hardwired Controls)
 - Remote (via SCADA)
- **Voltage Control**
 - Paralleling Options
 - Master/Follower
 - Reverse Reactance
 - Circulating Current
 - Line Drop Compensation
- **Alarms**
 - Standard Alarms and Trips
 - Configurable Misc. Alarms
 - Major/Minor Groups

COMMUNICATIONS

- **iBridge Networking Solution**
 - Use snap-on inductive couplers to transmit data over existing wires
 - Seamlessly transmit and deliver data from the C50, IEDs, RTUs, cameras, and more
 - 128-bit encryption for enhanced security
- **USB Connectivity**
 - USB connection for local device configuration
 - Automatic config & data download to USB drive
- **Ability to Test SCADA**
 - Serial (Half or Full Duplex)
 - Fiber, RS-485, RS-232
 - Protocols: DNP 3.0, Modbus, IEC 61850
 - Ethernet
 - Copper, 10/100 Base T; Fiber, 100 Base FX; Ethernet over USB
 - Protocols: IEC-61850, DNP 3.0, Modbus
 - DNS
 - SCADA Test Utility

B100 ETM with Hydrogen Monitoring



Shown with H₂ Sensor

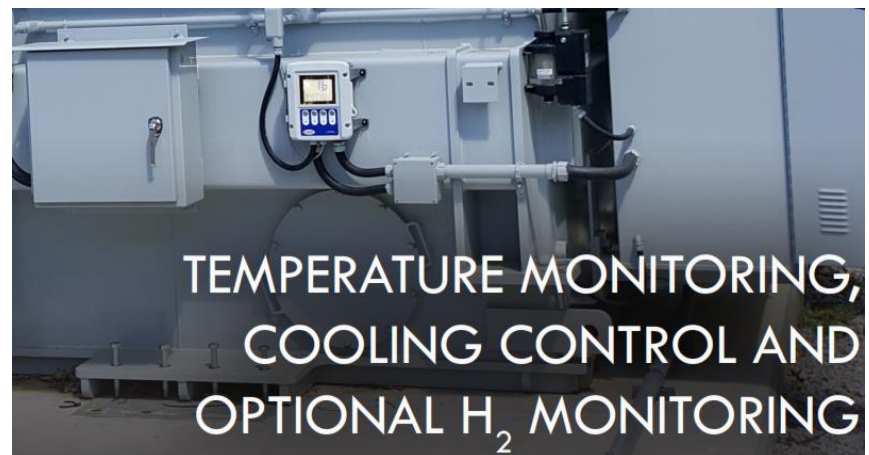
The pairing of Dynamic Ratings' B100 with a hydrogen sensor introduces the most complete, cost effective transformer monitoring solution available.

The integration of these devices allows the asset owner to have real-time access to vital transformer data, such as

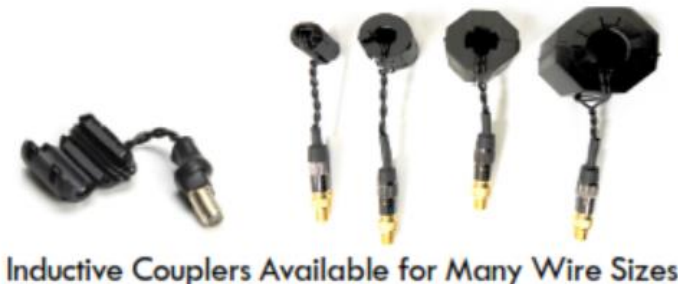
- Top oil temperature
- Calculated winding hot spot
- Ambient temperature
- Insulation loss of life calculation
- Hydrogen monitoring



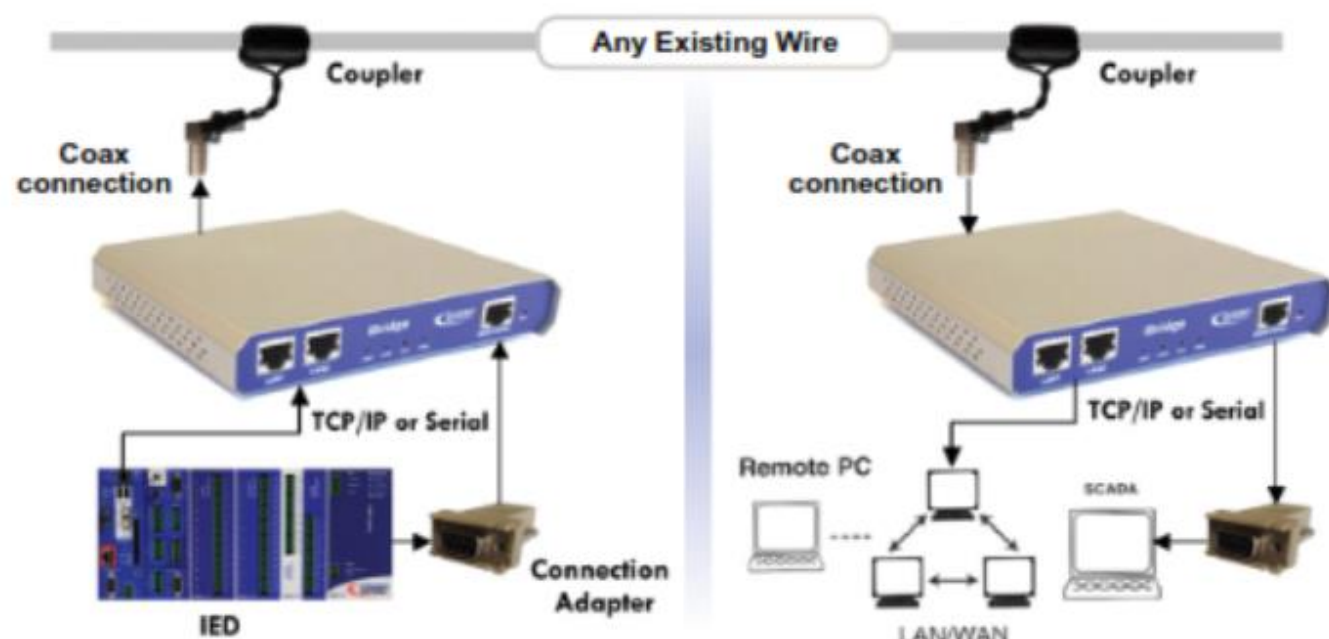
- Large, Digital Temperature Display
- Display Oil and 3 Winding Temperature
- Tap Changer Temperature Monitor (Option)
- Max Temperature Reached



iBridge – Networking and Communications Solution

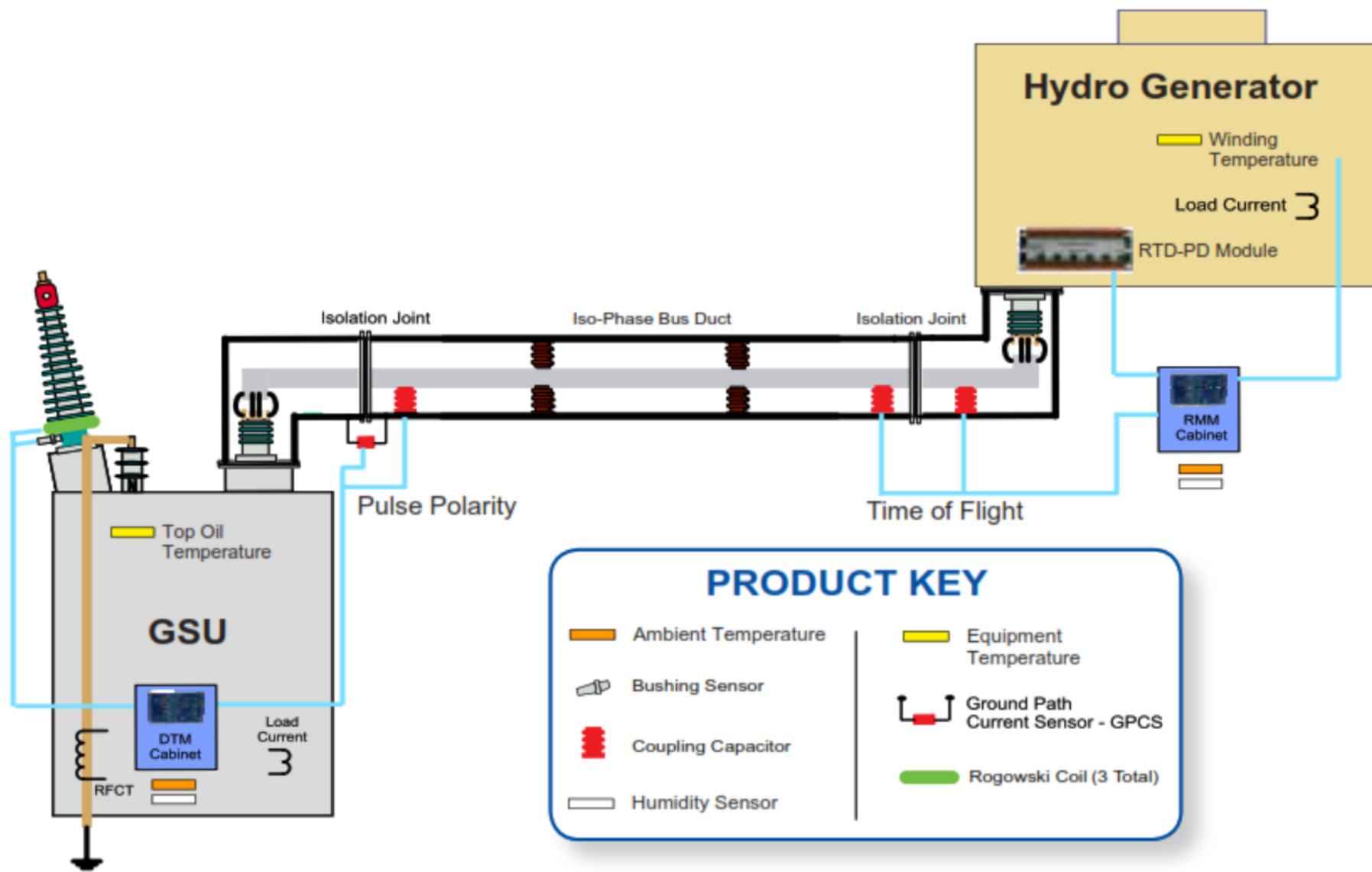


Installing data connections in a substation can be expensive and time consuming. The Dynamic Ratings iBridge product saves time and money while avoiding the security concerns associated with wireless antenna systems. The iBridge inductively couples the data onto existing conductors, providing the ability to send serial and ethernet based data utilizing hardware that can be installed in just a few minutes.





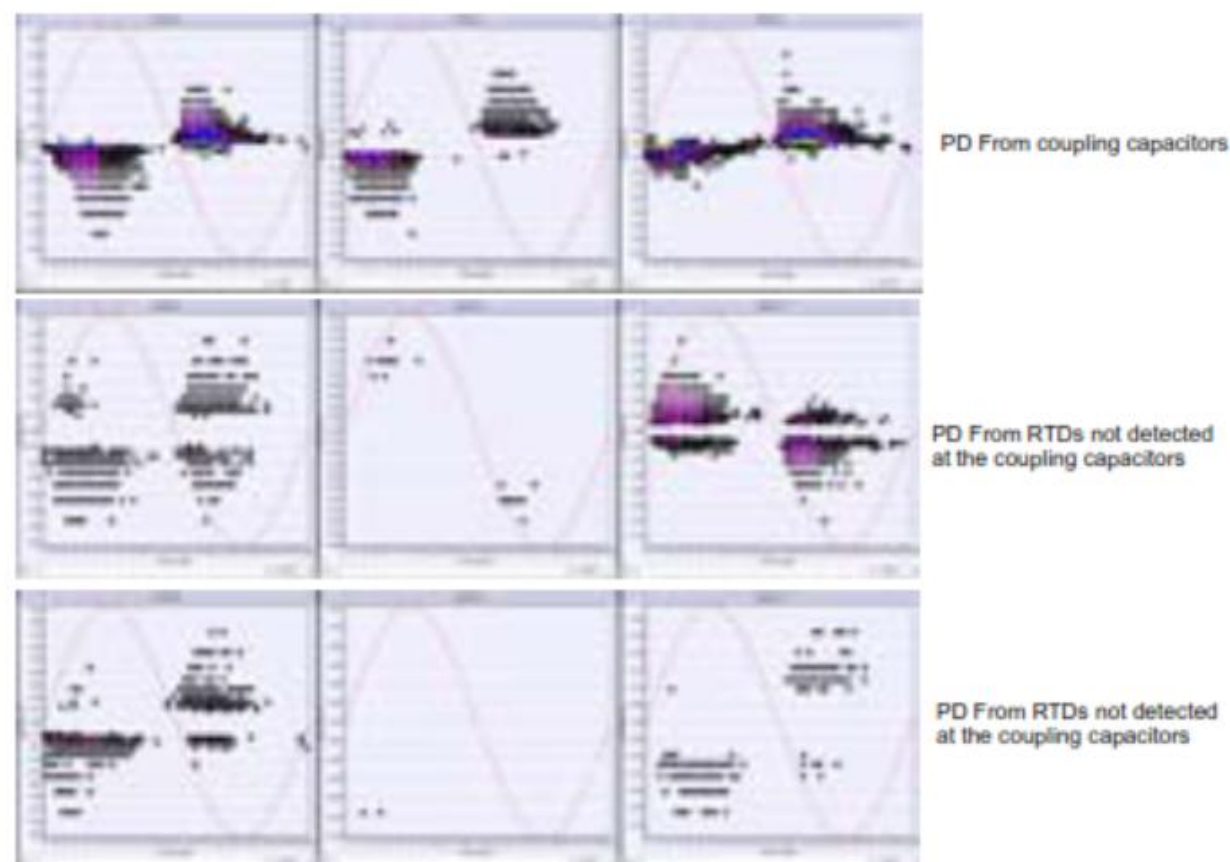
The rotating machine monitor (RMM) is a continuous partial discharge monitor, which also monitors, stores, and correlates operating dynamics. All industry accepted partial discharge graphical results and IEC defined quantities are measured, calculated and recorded. The RMM provides information as to the health of the stator winding insulation in medium and high voltage motors and generators, and can be used on variable frequency drives (VFD).



Since the coupling capacitors alone only provide 10-15% winding coverage, the system was upgraded to reuse six existing RTDs as additional PD sensors, thus expanding the coverage. The RMM is now detecting PD that is occurring deeper in the winding, which was not being detected previously. Using both of these complementary sensors, the customer is receiving more information therefore making better decisions as to the health of the equipment.

In conjunction with monitoring the generators, the customer decided to monitor the Isolated Phase Bus Duct and the Generator Step-up Transformer (GSU) by installing the Dynamic Ratings Diagnostic Transformer Monitor (DTM).

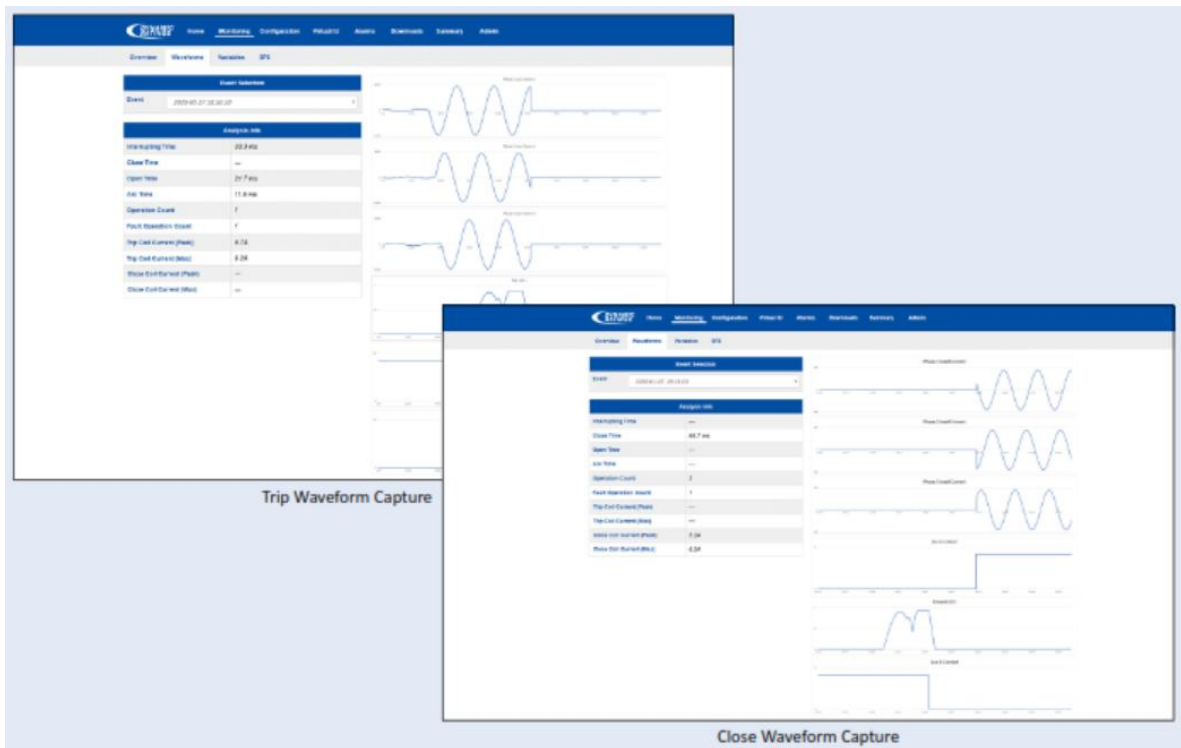
PD From coupling capacitors
 PD From RTDs not detected at the coupling capacitors
 3D Phase Resolved
 Polar Phase Resolved
 PD From RTDs not detected at the coupling capacitors
 This complete system monitors the generator, bus duct, and transformer. The customer has further reduced their off-line maintenance costs for these critical assets.



BPM – BREAKER PERFORMANCE MONITOR



Dynamic Ratings Breaker Performance Monitor (BPM) is the most comprehensive breaker monitoring solution available. With the inclusion of high-speed waveform capture, the BPM combines the most effective offline and online testing methods into a highly customizable online monitoring package, resulting in a monitor capable of performing the Advanced analytics required to detect operating Deficiencies well in advance of breaker failure.



Features & Benefits

High speed waveform capture of operating coils and main contacts	Complete diagnosis of the breakers' mechanical and electrical systems with every operation. Waveform analysis allows for graphical comparison of breaker operations. This allows for detailed analysis of first trip open and close times, identification of latch and bearing performance, lubrication issues, auxiliary contact condition and fault current values.
Gas monitoring for SF6 and dry air	Multi-parameter sensors monitor density, temperature and humidity in insulating gasses. Alarms alert asset owners of leakage rates, trending of time till lock out and mass gas loss.
Trip coil integrity monitoring	Monitoring of trip coil integrity provides the ability to detect changes in the trip circuit resistance, indicative to the condition of the trip coil and related components.
Interrupter condition	Precise cumulative I ² T calculations allow internal inspections to be scheduled on an as needed basis. Reducing both the cost and manpower associated with time based cyclic maintenance schedule.
Cabinet heater monitoring and environmental conditions monitoring	Current and voltage monitoring of heaters to detect failures which can often occur between maintenance cycles, leading to condensation in control cabinets which causes corrosion of control wiring, short circuits, and premature aging of electrical components.
Charging motor starts, currents and runtimes	Provides data concerning the condition of the stored energy system.
Environmental	Provides temperature for ambient, control cabinets and SF6 gas
Modular construction	Configure your monitor with only those modules required for your application
Multiple communication options	Easy integration via DNP, Modbus or IEC 61850 using Ethernet (Fiber & Copper) or Serial (Fiber, RS485 & RS232) ports.

AC and DC DIELECTRIC HIGH POTENTIAL (HIPOT) TEST SYSTEMS

Applications

- Verify electrical insulation integrity and safety in any type of electrical apparatus
- Perform Dielectric Breakdown Tests, Dielectric Withstand Tests, Insulation Resistance Tests, Partial Discharge Tests

Phenix offers

- Ratings from 1 kV to over 1 million volts AC or DC
- Basic or advanced computerized control options
- Rugged design for field, industrial, and laboratory settings
- Stand-alone, modular, caster-, truck-, trailer- or skid-mounted
- Models meeting specific standards such as ASTM D149 for material testing and ANSI A92.2 for insulated work platforms
- Units integrated with Partial Discharge Detectors
- Stackable DC test sets up to 600 kV DC and custom systems with voltage levels up to 1.5 million volts DC
- Oil insulated or epoxy cast high voltage transformers



AC, Cascade Type, 400 kV, 800 kVA



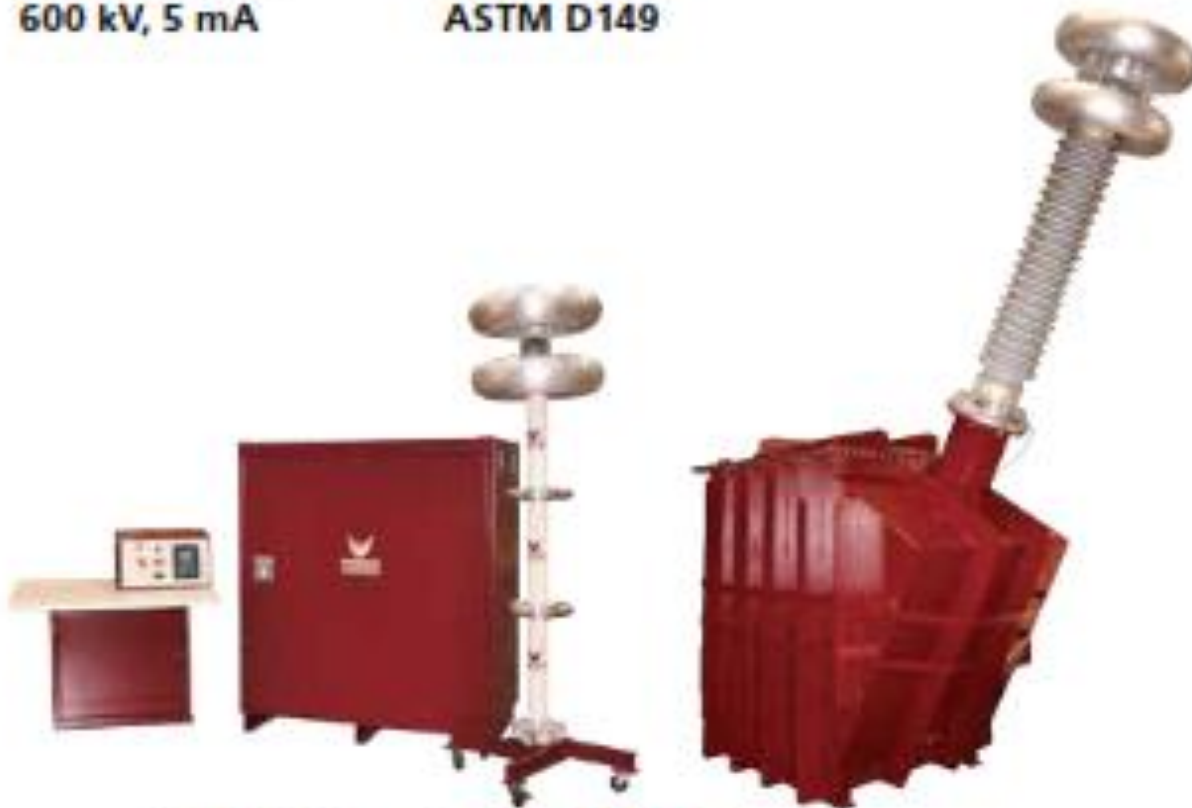
Stackable DC,
600 kV, 5 mA



AC, 100 kV,
ASTM D149



AC, Tank Type,
75 kV, 20 kVA



AC, Tank Type, 300 kV, 150 kVA



DC, 1200 kV, 20 mA

PORTABLE TEST EQUIPMENT

Easy to transport and set-up, Phenix Technologies offers a wide variety of Portable Test Equipment that is durably built for years of dependable service.

- **AC Hipots**
 - 6CP Series (15-200 kV)
 - 600P Series (5-15 kV)
 - BK Series (36-180 kV) for Aerial Lift, Elevated Platform, Insulated Boom
 - Vacuum Interrupters (40-60 kV)
- **DC Hipots** (40-200 kV)
- **AC/DC Hipot/Megohmmeters** and **Insulation Analyzers**
- **Oil Dielectric Testers** (60-100 kV)
- **High Current Test Sets** (1000-5000 A)
- **Transformer Turns Ratio, Winding Resistance, Current Transformer Testers**
- **Micro-Ohm Meters** (10-200 A)
- **Ground Jumper Tester**
- **Earth Resistance Testers**
- **AC/DC Kilovoltmeters** (50-300 kV)
- **Variable Voltage Power Supplies**
- **Partial Discharge/Corona, Radio Influence Voltage Measurement**
- **Tangent Delta Measurement**
- **Ground/Discharge Sticks**

PHENIX Technologies also offers various complimentary items including:

- **Cable Fault Locators**
- **Standard Capacitors**
- **Coupling Capacitors**
- **Voltage Dividers**
- **Motor Generator Sets**



Aerial Lift Test Set
Model BK 130/36



AC/DC Kilovoltmeter
200 kV



AC Hipot 30 kV



DC Hipot 75 kV



Benchtop AC Hipot
5 kV



Microhmmeter
200 Amp



Ground Stick

MOTOR TEST SYSTEMS

Applications

- Testing motors to ensure quality production/rewind
- Testing the stator and armature steel

Phenix offers

- Motor Test Systems rated from 100 kVA to 10 MVA for load and no-load testing of all types of AC & DC motors, including traction motors, synchronous motors, and induction motors
- Core Loss Test Sets rated to test up to 20,000 HP motors
- Water-Brake Dynamometers to provide the load for the motor under test



125 kVA Core Loss Tester



100 kVA



200 kVA



5000 kVA



1000 kVA



ELECTRICAL PROTECTIVE RUBBER GOODS TEST SYSTEMS

Application

- Testing utility worker protective equipment including rubber gloves, sleeves, overshoes/boots, hoses, hoods, switch sticks, and blankets

Phenix Offers

- Single-position, portable testing equipment
- Test systems configured for optimal efficiency
- Multiple test stations powered from one power supply
- Complies with latest ASTM, IEC, and OSHA standards
- Washers and Dryers for cleaning protective equipment



Glove Tester



Washer



Dryer



Blanket Tester



1. VLF Test Sets
2. VLF Diagnostic System
3. Transformer Oil Tester



VLF Cable Testing



HVA28 & HVA28TD

Output voltage 29 kV_{peak}, 21 kV_{rms}
Load 0.5 μF @ 0.1 Hz @ 20 kV_{rms}
Weight 14 kg / 31 lbs



HVA34-1 & HVA34TD-1

Output voltage 34 kV_{peak}, 24 kV_{rms}
Load 1.5 μF @ 0.1 Hz @ 24 kV_{rms}
Weight 39 kg / 86 lbs



HVA45 & HVA45TD

Output voltage 45 kV_{peak}, 32.3 kV_{rms}
Load 0.9 μF @ 0.1 Hz @ 32 kV_{rms}
Weight 39 kg / 86 lbs



HVA30-7

Output voltage 34 kV_{peak}, 24 kV_{rms}
Load 6.0 μF @ 0.1 Hz @ 24 kV_{rms}
Weight 57 kg / 125.6 lbs



HVA34

Output voltage 34 kV_{peak}, 24 kV_{rms}
Load 0.5 μF @ 0.1 Hz @ 24 kV_{rms}
Weight 19.5 kg / 43 lbs



HVA40-5

Output voltage 45 kV_{peak}, 32 kV_{rms}
Load 5.0 μF @ 0.1 Hz @ 27 kV_{rms}
Weight 57 kg / 125.6 lbs



HVA54-3

Output voltage 54 kV_{peak}, 38 kV_{rms}
Load 3.0 μF @ 0.1 Hz @ 36 kV_{rms}
Weight 57 kg / 125.6 lbs



HVA60

Output voltage 62 kV_{peak}, 44 kV_{rms}
Load 1.0 μF @ 0.1 Hz @ 44 kV_{rms}
Weight 57 kg / 125.6 lbs



HVA68-2

Output voltage 68 kV_{peak}, 48 kV_{rms}
Load 2.0 μF @ 0.1 Hz @ 44 kV_{rms}
Weight 57 kg / 125.6 lbs



HVA90

Output voltage 90 kV_{peak}, 64 kV_{rms}
Load 1.0 μF @ 0.1 Hz @ 64 kV_{rms}
Weight 127 kg / 280 lbs



HVA94

Output voltage 94 kV_{peak}, 66 kV_{rms}
Load 0.9 μF @ 0.1 Hz @ 66 kV_{rms}
Weight 128 kg / 282.2 lbs



HVA120

Output voltage 120 kV_{peak}, 85 kV_{rms}
Load 0.5 μF @ 0.1 Hz @ 85 kV_{rms}
Weight 198 kg / 436.5 lbs



HVA200

Output voltage 200 kV_{peak}, 141 kV_{rms}
Load 0.6 μF @ 0.1 Hz @ 141 kV_{rms}
Weight ca. 950 kg / 2.094 lbs



Innovation in High Voltage

VLF Cable Testing and Diagnostics & Transformer Oil Testing

VLF Cable Diagnostic



TD DIAGNOSTICS

In connection with hipot testers of the HVA series, systems for Tan Delta (and Partial Discharge) measurements can be built. They are either integrated into the high voltage source (HVA models), into the PD diagnostic system (PD models) or available as dedicated external device to upgrade existing HVA hipot systems. Tan Delta measurements are performed with resolution of 1×10^{-5} with an accuracy of $\pm 1 \times 10^{-4}$.

TD SYSTEMS



TD30
Operating voltage (sine wave)
34 kV_{peak}, 24 kV_{rms}
Tan Delta (resolution/accuracy)
 $1 \times 10^{-5} / \pm 1 \times 10^{-4}$



TD60-MC
Operating voltage (sine wave)
62 kV_{peak}, 44 kV_{rms}
Tan Delta (resolution/accuracy)
 $1 \times 10^{-5} / \pm 1 \times 10^{-4}$



TD90-MC
Operating voltage (sine wave)
90 kV_{peak}, 64 kV_{rms}
Tan Delta (resolution/accuracy)
 $1 \times 10^{-5} / \pm 1 \times 10^{-4}$



TD120-MC
Operating voltage (sine wave)
120 kV_{peak}, 85 kV_{rms}
Tan Delta (resolution/accuracy)
 $1 \times 10^{-5} / \pm 1 \times 10^{-4}$



PD DIAGNOSTICS

b2 electronics offers the widest range of solutions on the market, **from portable and modular PD instruments up to trailer-mounted systems** for voltages up to 141 kV_{rms}. PD diagnostics **can be carried out simultaneously with the TD diagnostics**. This saves time and prevents pre-conditioning of the cable by the first of two sequential tests.

PD & PDTD SYSTEMS



PD30-E
Operating voltage (sine wave)
34 kV_{peak}, 24 kV_{rms}
PD localization (resolution/accuracy)
0.1 m / 1 %



PD60-2 & PDTD60-2
Operating voltage (sine wave)
62 kV_{peak}, 44 kV_{rms}
PD localization (resolution/accuracy)
0.1 m / 1 %



PD90-2 & PDTD90-2
Operating voltage (sine wave)
90 kV_{peak}, 64 kV_{rms}
PD localization (resolution/accuracy)
0.1 m / 1 %



PD120-2 & PDTD120-2
Operating voltage (sine wave)
120 kV_{peak}, 85 kV_{rms}
PD localization (resolution/accuracy)
0.1 m / 1 %



PDTD200-2
Operating voltage (sine wave)
200 kV_{peak}, 141 kV_{rms}
PD localization (resolution/accuracy)
0.1 m / 1 %



BA75
max. Output voltage 75 kV_{rms}
Weight 22 kg (incl. battery)



BA80
max. Output voltage 80 kV_{rms}
Weight 22 kg (incl. battery)



BA100
max. Output voltage 100 kV_{rms}
Weight 32 kg (incl. battery)

Transformer Oil Testing

Electrical metrology

Circuit breaker testing	ACTAS
Resistance measurement	PROMET
Protection relay testing	ARTES
Meter testing	METES
Digital fault recording	SHERLOG
Power quality analysers	EPPE
Power sources	EPOS


Circuit Breaker Testing – ACTAS P260/P360


Portable Switchgear Test Systems
 Flexible and compact test systems for carrying out tests on medium-, high- and extra-high-voltage switchgear.

Resistance measurement - PROMET


PROMET SE - High-accuracy, compact micro-ohm meter

PROMET L100 High-accuracy micro-ohm meter for ohmic and inductive loads

PROMET L10 is a compact, battery-operated micro-ohm meter for ohmic and inductive loads.

Automatic Relay Test System - ARTES


ARTES 600
 Compact test system for highly complex test tasks. 4 voltage outputs and 6 current outputs which can provide particularly high output power



ARTES 460
 Compact test system for three-phase tests, can be used as a universal tool for testing digital protection relays.

Digital Fault Recorder Systems for professional event analysis


The measuring devices of the **SHERLOG** range combine the monitoring functions of a high-class digital fault recorder with the features of a power quality analyser in a single system.



SHERLOG CRX is a **multi-functional** measurement and analysis system for comprehensively monitoring electricity supply systems. It combines the monitoring functions of high-resolution digital **fault recorders, power quality analysers, phasor measurement units, continuous data recorders** and **event recorders** in one device.

The Multi-Functional Three-phase Signal Generator - EPOS


EPOS 360 is the multi-functional three-phase generator which comes into its own whenever maximum power and high signal accuracy are required.



EPOS CV voltage sources are designed to output single or three-phase AC/DC voltages especially for high power values.

Power Quality Analysers - EPPE


EPPE CX
 Stationary monitoring system for panel mounting. Measurement inputs for 4 voltages, 4 currents as well as 5 additional sensor inputs make the device extremely flexible to use.



EPPE PX
 The portable solution in a carrying case, has been specially developed for mobile measurements and installation monitoring.

Meter test systems


METES 320 is an on-site measuring instrument for testing single and three-phase meters and for power quality measurement.

DryTrans is a brand under the AVACO banner specializing in custom engineering and design of On-Line Continuous Moisture Management Systems for Oil Filled Transformers. Transformers are one of the most important capital assets that a utility can own. Maintaining a healthy transformer is a core practice of any maintenance program.

There are many variables that affect the life expectancy of the transformer. The most important of all being the moisture content in the solid and liquid insulation. Moisture in the transformer is the enemy and its presence is directly related to the dielectric strength of the oil and the paper.

Excessive moisture has a direct correlation on the age of a transformer. Existing technical papers and authorities around the world have linked the life of the transformer to the life of the solid insulation. Any attempt to protect the solid insulation will increase life and slow the ageing process.

At DryTrans, we believe in a healthy, reliable and well-maintained network. The goal is to optimize the performance of transformers, extend life, protect the environment, and create a safe and efficient workplace.



MODEL TR5: The SMALLEST and Most RELIABLE Moisture Management System for 5 MVA Transformers and under.
Flow Rate: 300 - 500 LPH
Moisture Removal Capacity: 3 - 5 Liters
Compact Design



MODEL TR20: A ROBUST Moisture Management System for < 20 MVA Transformers.
Flow Rate: 100 - 500 LPH
Moisture Removal Capacity: 5 - 7 Liters
Enclosed and Rugged Design



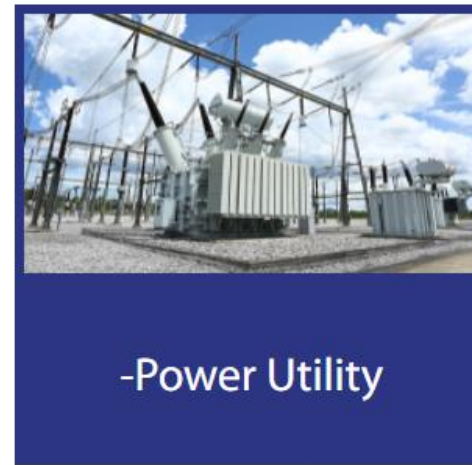
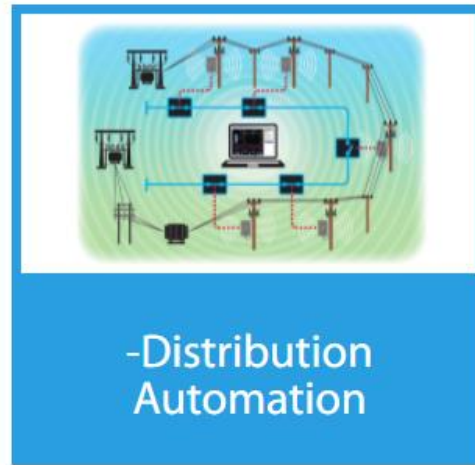
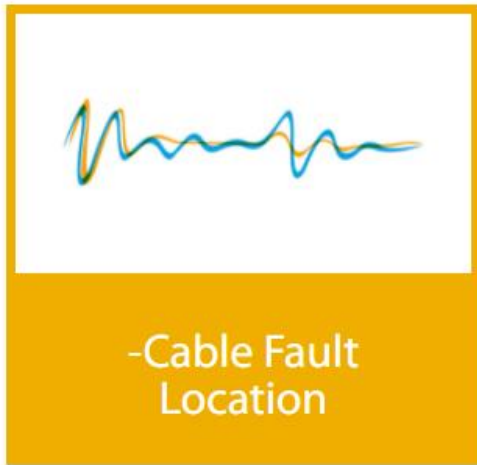
MODEL TR50: A ROBUST & RELIABLE Moisture Management System for < 50 MVA Transformers.
Flow Rate: 100 - 500 LPH
Moisture Removal Capacity: 10-12 Liters
Enclosed and Rugged Design



MODEL MMS90: A SMART Moisture Management System for 50 MVA Transformers and above.
Flow Rate: 100 - 500 LPH
Moisture Removal Capacity: 10-12 Liters
SMART Communications and HMI Interface

OUR SOLUTIONS

Kehui's product developments are characterised by the use of top quality components, exhaustive testing and innovative thinking. The quality of the products is underlined by the company's certification to ISO 9001.



Transmission Line & Cable Fault Location

XC-2100E

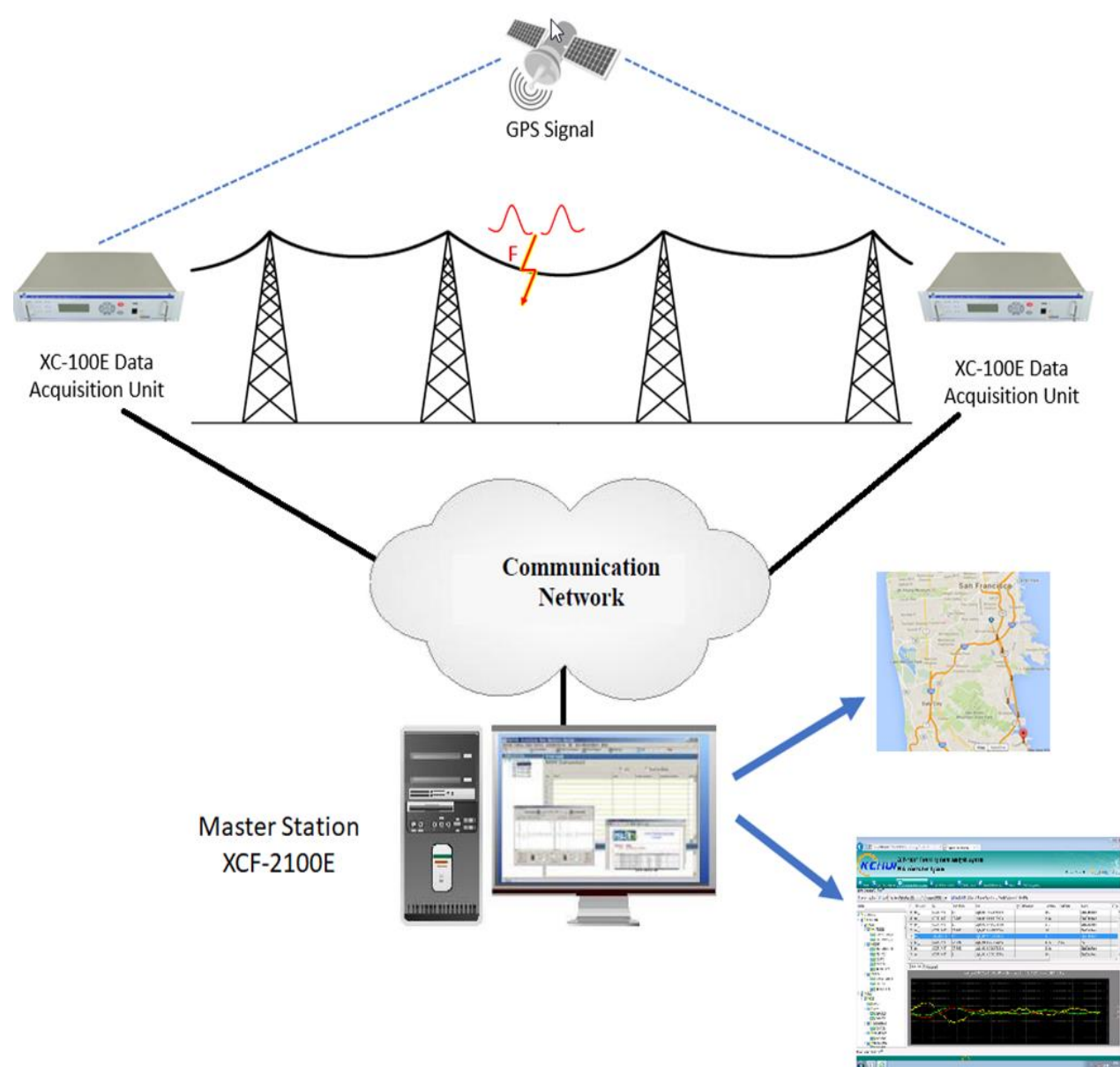


T-GPS



XC-2100E Travelling Wave Fault Location System

Transmission systems are at the heart of the power network and their availability is essential to the reliability of the system. When a fault does occur, it can be difficult to locate, particularly on long remote lines. Conventional fault locators work on the principle of measuring the impedance of the loop through which the fault current flows. In most cases, this includes a return path through the ground for which knowledge of the actual impedance is hard to obtain and is often estimated, leading to inaccuracies in the measurement of the distance to the fault. By utilising travelling waves, created when the fault occurs, the XC-2100E can measure the fault position independently of impedance and identify the fault point much more accurately.



	XC-100E Travelling Wave Fault Locator - Data Acquisition Unit
Analogue inputs	3 - 24 channels configurable for 1 - 8 lines
Current inputs	Clip-on CT or direct line CT connection
	Nominal: 1A or 5A
	Burden: <math><0.2VA (I_n = 1A)</math>, <math><0.4VA (I_n = 5A)</math>
	Overload withstand: 4I _n continuous, 40I _n for 1s
Voltage inputs	From line VT/PT
	Nominal: 110V ± 10%
	Burden: <math><0.4VA</math>
	Overload withstand: 2V _n continuous, 2.5V _n for 10s
Digital inputs	5 dry contacts (standard, extendable to a maximum of 16)
Communications port	1 Serial port, 2 Ethernet ports + 1 maintenance Ethernet port, 1 modem RJ-45
GPS time synchronisation	Internal GPS module time accuracy: 100ns
LCD display	Number of pixels: 256 x 64; dimensions: 132 x 39 mm
Memory space:	8GByte, 1000 records minimum
Power supply	85 - 264V, 50/60 Hz AC or 90 - 260V DC (other ranges available)
Dimensions	483 x 323 x 83 mm (2U, 19" Rack)
Weight	4kg – 6kg depending on the number of optional extras

CABLE FAULT LOCATION

T-P22 AND T-P23 LOW VOLTAGE FAULT LOCATOR FOR FINDING PERMANENT AND INTERMITTENT FAULTS ON LIVE CABLES

The Kehui T-P22 and T-P23 have been designed for locating all types of low voltage cable fault, but especially the difficult and troublesome transient and intermittent fault. It is especially suitable for branched cables. The difference between the two devices is the T-P22 has a current channel in addition to the three voltage channels.



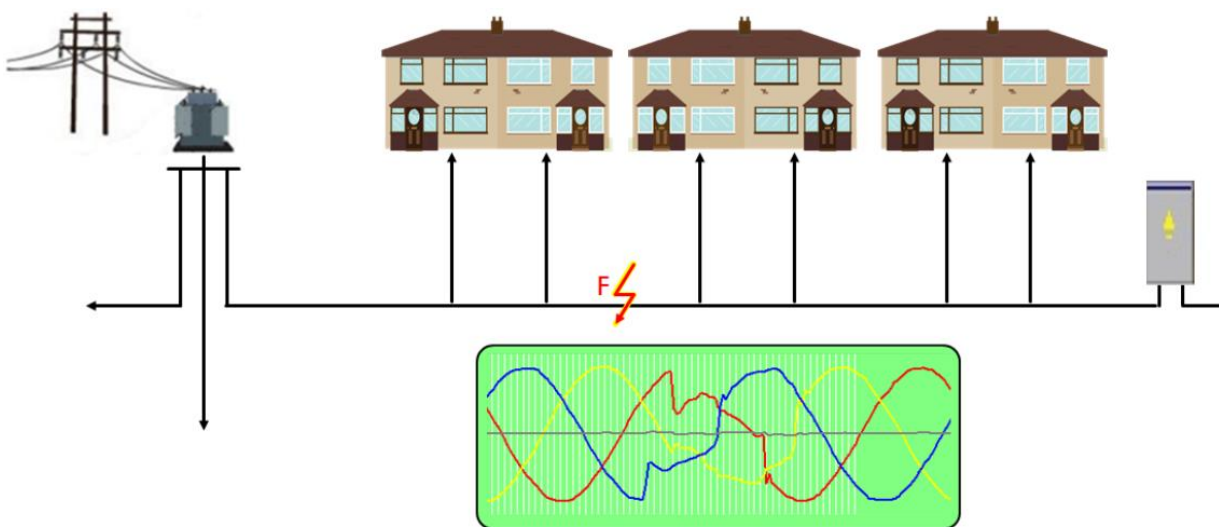
T-305E HIGH VOLTAGE SURGE GENERATOR

The T-305E high voltage surge generator, is used for locating high impedance and flashing faults on distribution cables. It works in conjunction with a cable fault locator for pre-locating the fault position and then with a pinpointer to find the precise fault location. It is applicable for different cable fault location techniques



T-906 POWER CABLE FAULT LOCATOR

Fault Pre-location As the fault (F) is unlikely to exhibit a low resistance, it is usually necessary to modify the fault to create a situation where the it is suitable for pre-location techniques to be applied. This is carried out using a surge generator to inject energy in to the cable.



T-506 PINPOINTER

The T-506 is used together with a high voltage surge generator, to pinpoint high resistance and flashover faults on power cables. It utilises an Application (App) running on an Android device, connected wirelessly to a hand-held sensor. The sensor detects magnetic and audio signals emanating from the faulted cable.



PZG Fault Passage Indication

The PZG series distribution line fault locating system is composed of three acquisition and/or indicating units (one per phase), and a pole-mounted collection unit. The system gives a visible, flashing indication of the passage of fault current, whilst collecting data to locate the fault and Comtrade waveforms for subsequent analysis. It will also monitor the switch position and provide measurements of current, voltage, and temperature. This data can then be used for automated fast supply restoration, or can be transmitted to a remote master station for appropriate action to be taken.



PZK-560F Demarcation switch controller

The demarcation switch controller is used for the measurement and control of the connection between the power utility and the consumer on a medium voltage distribution line. It can detect and respond to faults on the user side. It can also be used for tees from overhead lines and cable ring circuits providing commands for the operation of the switch, together with its measurement and control. The equipment is available in panel-mounted or bell-type format, suitable for installation on overhead lines and cables.





GREENJACKET®

Greenjacket Prevents Wildlife Caused Outages

- Precise-Fit animal protective covers for substations
- Greenjacket take the time to create a solution that is customized to the unique needs and dimensions of our customers' equipment.
- Improve your power system reliability

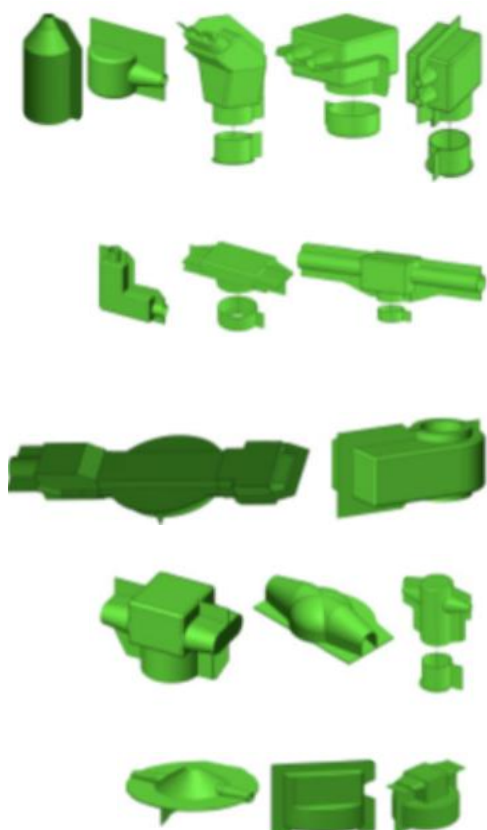
The Impact of Animal Outages

As consumer demand for reliable energy increases, the global electric utility industry needs to minimize interruptions and increase reliability. Although outages related to weather or acts of nature are hard to anticipate, animal-caused power outages are preventable..



Greenjacket Custom Designed Cover-up Over 600 Product Designs

Applications: Able to Cover any type of substation or powerline equipment



- Greenjacket Bushing Covers
- Greenjacket Bus and Flat Bar Covers
- Greenjacket CT Covers
- Greenjacket Drive Arm Covers
- Greenjacket Expansion Joint Covers
- Greenjacket Insulator, Post Insulator Covers
- Greenjacket Lightning Arrestor Covers
- Greenjacket Terminator Covers
- Greenjacket PT VT Covers
- Greenjacket Recloser Covers
- Greenjacket Transformer Covers
- Greenjacket Connector Covers
- Etc.

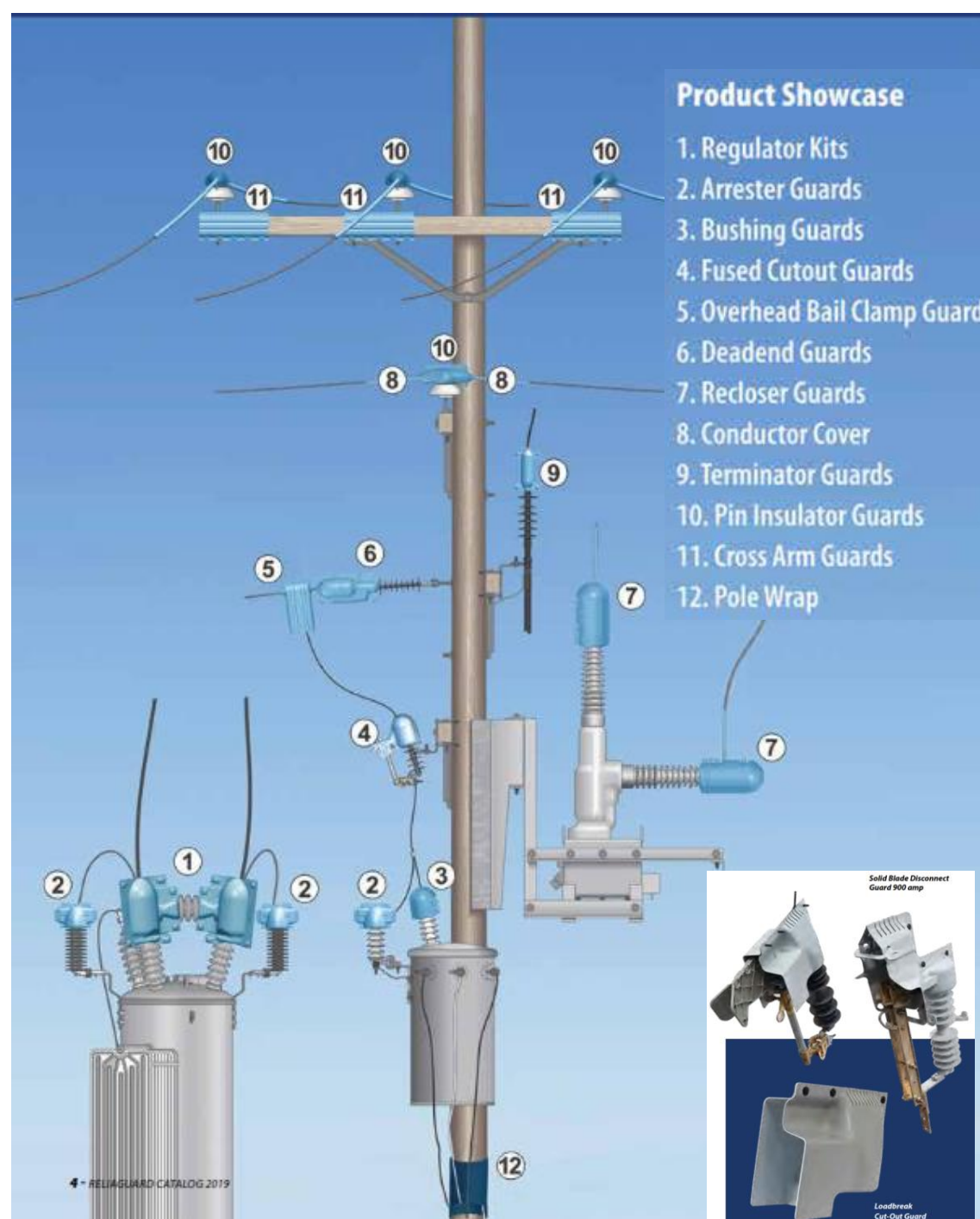


Protect Your Assets from Wildlife Contact



WILDLIFE CONTACT CAUSES 3 MAJOR RISKS

When an animal bridges the gap from phase to phase or phase to ground an arc/flash can occur resulting in a power outage, equipment damage and wildlife electrocution – Reliaguard can prevent these contacts with its range of protective guards and conductor cover.



BUSHING GUARDS



LIGHTNING ARRESTER GUARDS



CABLE TERMINATOR GUARDS

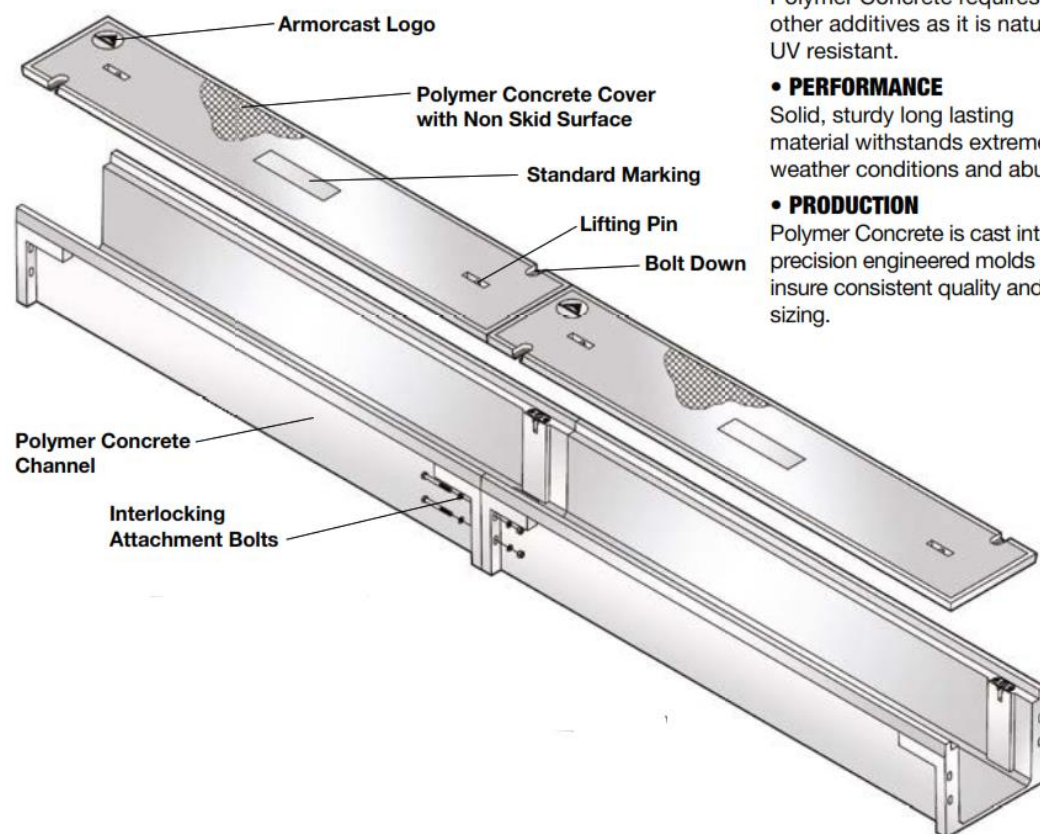
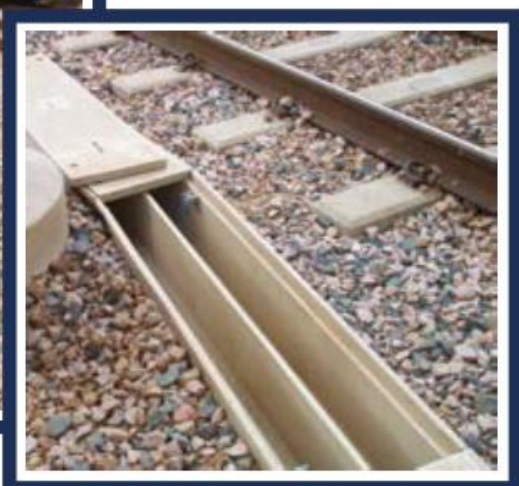


VOLTAGE REGULATOR KITS



POLYMER CONCRETE CABLE TROUGH

Armorcast Products cable trough are manufactured using high density polymer concrete material. Cable trough provide railroad, mass transit and power plants with durable and cost effective enclosures for power and fiber optic cables. Cable troughs are installed in areas subject to occasional heavy vehicular traffic. The heavy-duty design of the trough and cover assembly can withstand sidewall pressure due to heavy vehicles and train loading and has a tremendous strength to weight ratio as well as high impact resistance. Cable troughs can be supplied with optional dividers to segregate electric and telecommunications cables. They are quickly connected with bolts without the need to remove cover and can be field cut to easily adapt to different field conditions. High density polymer concrete is resistant to UV chemicals, freezes or thaws and does not conduct electricity.



- **UV RESISTANCE**
Polymer Concrete requires no other additives as it is naturally UV resistant.
- **PERFORMANCE**
Solid, sturdy long lasting material withstands extreme weather conditions and abuse.
- **PRODUCTION**
Polymer Concrete is cast into precision engineered molds to insure consistent quality and sizing.

FEATURES

Armorcast Products Cable Trough are manufactured using high strength polymer concrete material. Cable Trough provide Railroad, Mass Transit and Power Plants with durable and cost effective enclosures for cable and fiber optic cables. Install in areas subject to occasional heavy vehicular traffic. The heavy-duty design of the trough and cover assembly can withstand sidewall pressure due to heavy vehicles and train loading and has tremendous strength to weight ratios as well as high impact resistance. Cable Trough can be supplied with optional dividers to segregate electric and telecommunications cables. They are connected with interlocking bolts and can be field cut to modify and adapt to different field conditions. Polymer concrete is not affected by chemicals, quick freezes or thaws and does not conduct electricity, no grounding is necessary. Cable Trough is lightweight and the interlocking system makes installation quick and simple. Does not require heavy-duty equipment.



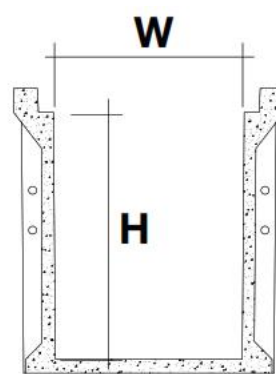
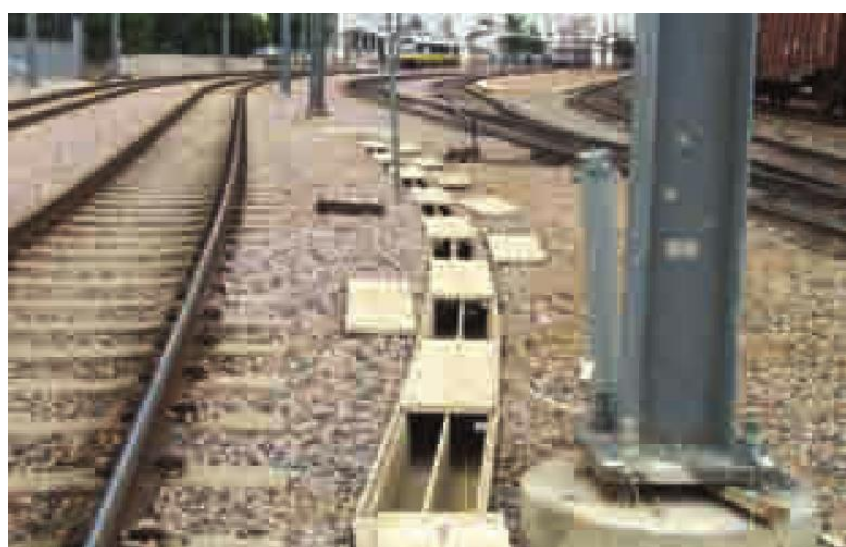
ARMORCAST PRODUCTS COMPANY

CABLE TROUGH ASSEMBLY STANDARD DIMENSIONS

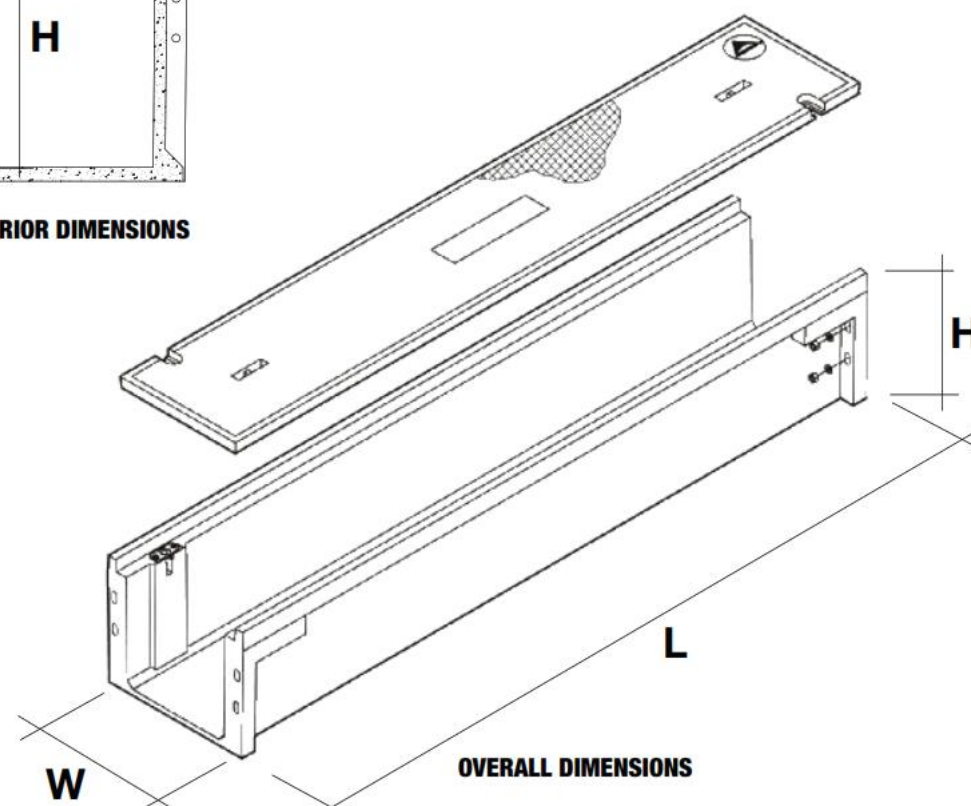
POLYMER CONCRETE

NOMINAL SIZE W x L x H	INTERIOR WIDTH	INTERIOR HEIGHT	OVERALL WIDTH	OVERALL HEIGHT	PART NUMBER	APPROX. WEIGHT
6" x 8" x 60"	6.25"	7.875"	11"	9.625"	A6001301	105lbs.
12" x 8" x 60"	12"	7.5"	17"	9.875"	A6001303	225 lbs.
12" x 16" x 60"	12"	15.5"	17"	17.875"	A6001304	275 lbs.
20" x 12" x 60"	20.25"	12"	25"	14.375"	A6001306	335 lbs.
20" x 16" x 60"	20.25"	16"	25"	18.375"	A6001307	355 lbs.
30" x 12" x 60"	30"	12"	35"	14.375"	A6001309	325 lbs.

TROUGHS ASSEMBLIES INCLUDE: Interlocking Attachment Bolts, Protection Rods,



INTERIOR DIMENSIONS



OVERALL DIMENSIONS



Eliminate 99.996% virus & bacteria* in the air

HEPA
H14

Capacity
690 CFM

IoT
Ready

2-Way
Discharge

Design refers to national & international standards:

- ISO 14644
- ASHRAE
- EN 1822

Analysed by a National Laboratory ^c.

Can filter particles 10 times smaller than ordinary filters (H14 PM 0.3 micron)

Sistem Filtrasi – Standard Industri

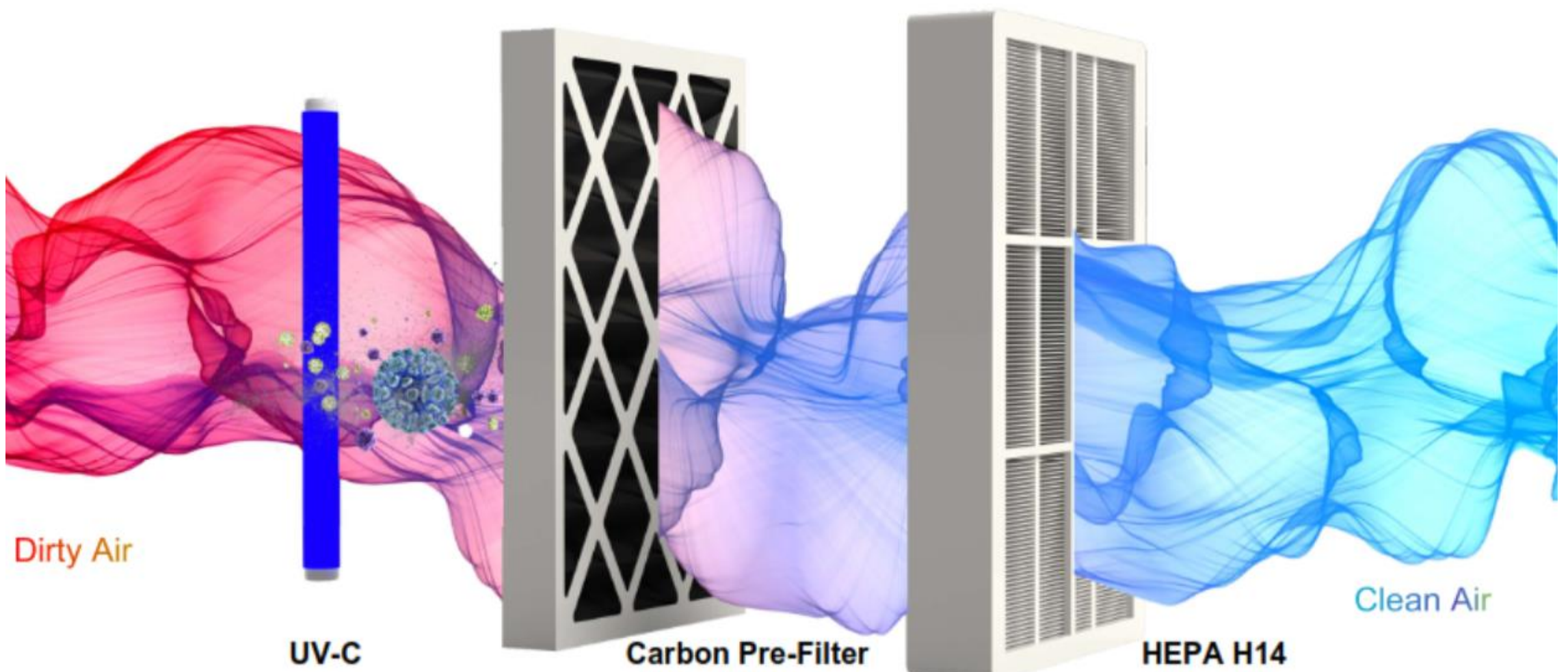
Udara kotor yang mengandung debu dan organisme tersaring dengan system High Efficiency Particulate Air filter kelas H14 sebanyak 99.996% dari partikel berukuran 0.3 μm dan teranalisa oleh laboratorium SUCOFINDO untuk PM 2.5.

Filter ini mampu untuk menangkap virus, bakteri dan organisme lainnya yang melayang di udara.

HEPA Filter akan terus di-disinfeksi dengan lampu UV selama beroperasi sehingga memperpanjang keawetan dan memastikan tidak ada virus, bakteri atau organisme berbahaya yang dikembalikan ke udara.

Dengan konstruksi padat dan ringkas, janganlah penampilan mengecoh anda. Karena kemampuan API VirusProtector dapat mencakup sampai dengan 400 meter persegi*. Dan untuk aplikasi rumah sakit, API VirusProtector telah memenuhi dan melampaui standar Kementerian Kesehatan RI dan Internasional dengan memberikan 20 kali pergantian udara ruangan per jam (Air Change rate per Hour)**.

Untuk kenyamanan dan keamanan pengguna, API VirusProtector juga disertai dengan Indikator UV Light dan Indikator Pergantian Filter untuk kemudahan pemeliharaan.



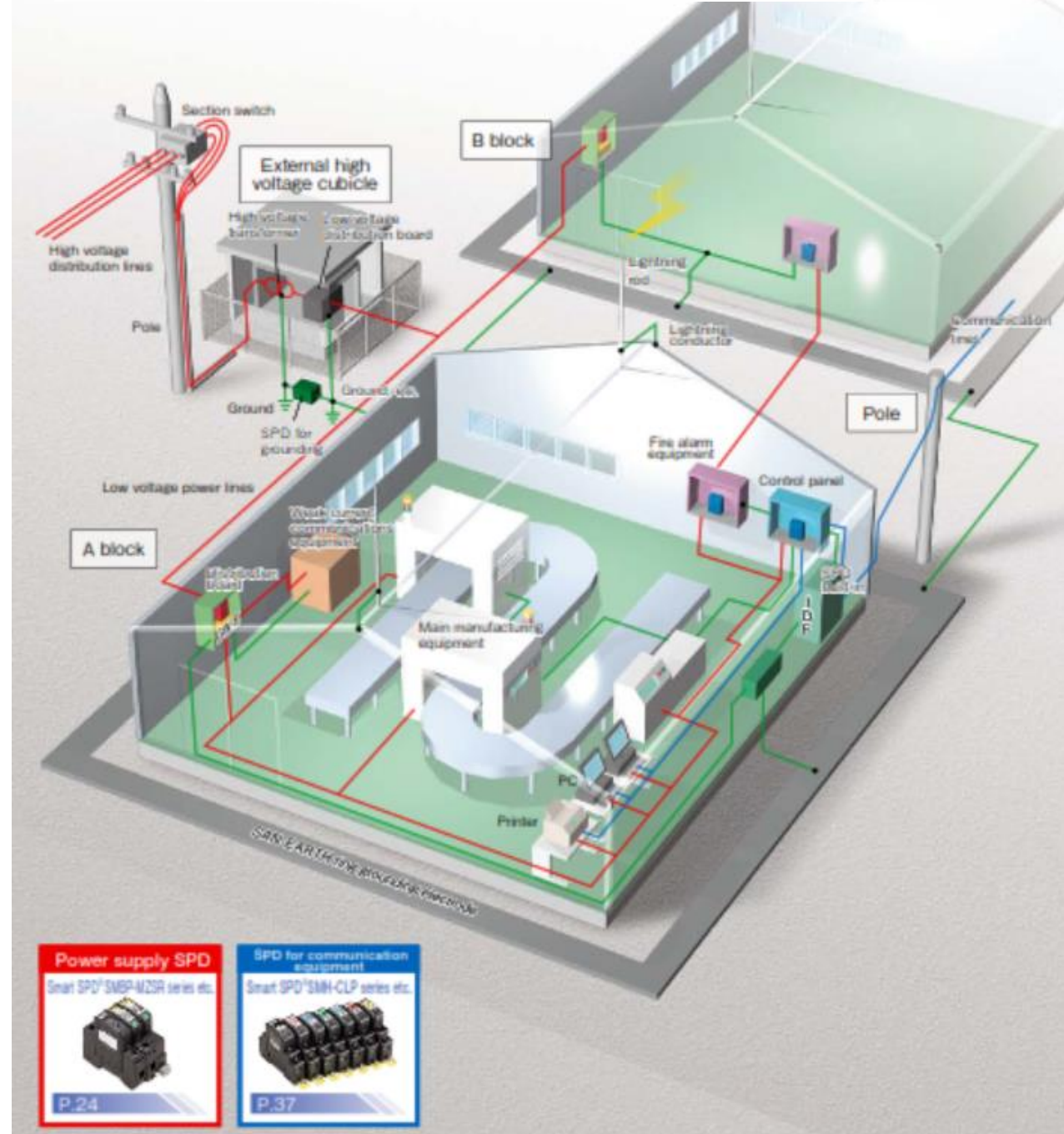
Lightning protection for solar power installations

- Power supply SPD
- SPD for communication equipment
- SPD for LAN



Lightning protection for factories

- Power supply SPD
- SPD for communication equipment



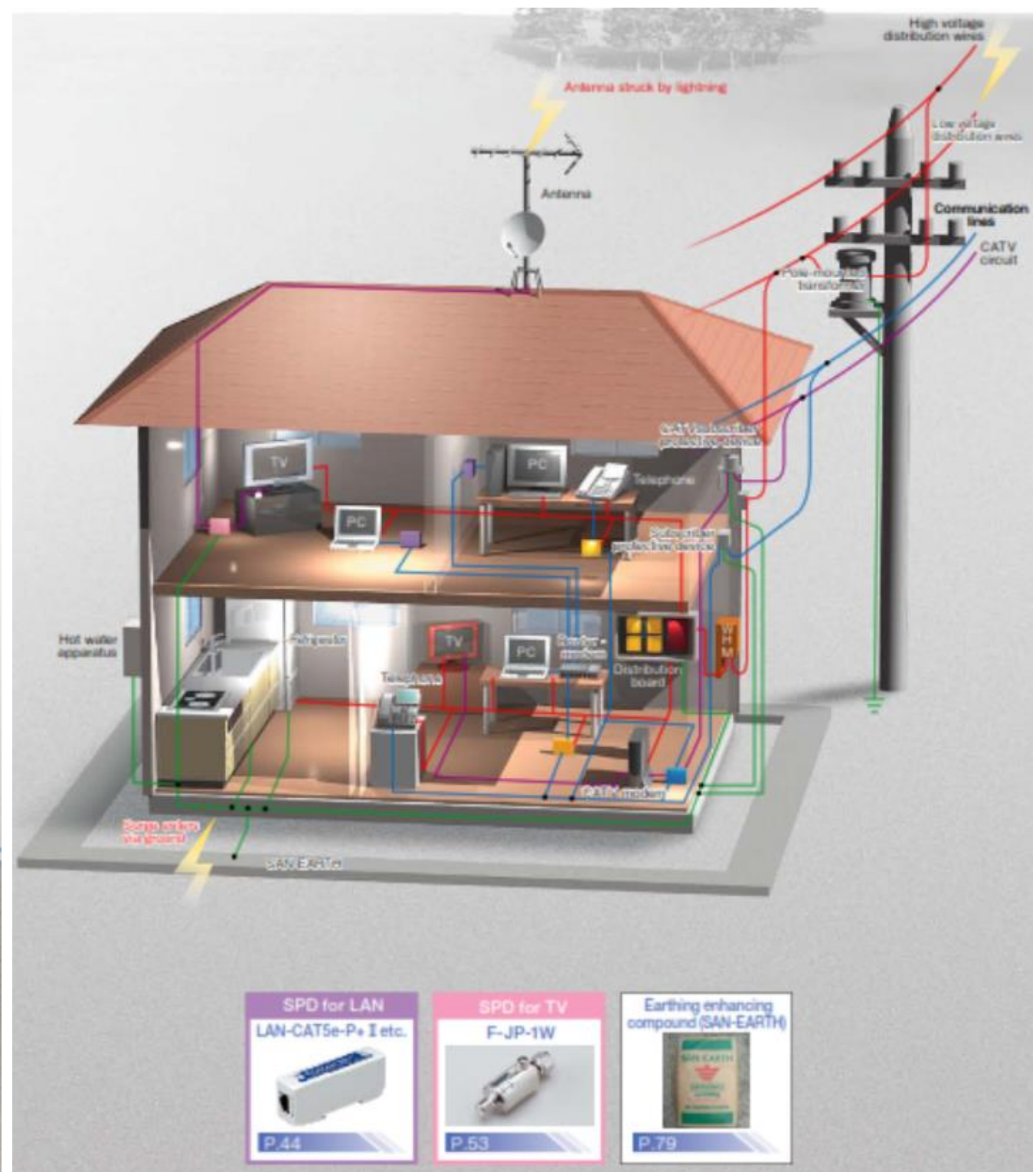
Lightning protection for buildings

- Power supply SPD
- SPD for communication equipment
- SPD for LAN



Lightning protection for houses

- SPD for LAN
- SPD for co-axial connectors
- Power supply SPD
- SPD for communication equipment



Power supply SPD Smart SPD™ SMP-MZR series etc. P.24	SPD for communication equipment Smart SPD™ SMH-CLP series etc. P.37	SPD for LAN LAN-CAT5e-P+ II etc. P.44	Earthing enhancing compound (SAN-EARTH) P.79
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Power supply SPD Smart SPD™ SMP-MZR series etc. P.24	SPD for communication equipment Smart SPD™ SMH-CLP series etc. P.37
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Power supply SPD Smart SPD™ SMP-MZR series etc. P.24

SPD for LAN LAN-CAT5e-P+ II etc. P.44	SPD for TV F-JP-1W P.53	Earthing enhancing compound (SAN-EARTH) P.79
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SAN-EARTH® M5C Conductive Concrete (Ground Enhancement Material)

SAN-EARTH® M5C is used to build conductive concrete grounding electrodes. SAN-EARTH M5C electrodes provide the low resistance ground that is essential to any lightning protection system. Good grounds are possible even where soil resistivity is high.

Applications:

- Cellular Telephone Sites
- Wind Farms
- Electric Power Substations
- Central Office Facilities
- Microwave Towers
- Electric Transmission Systems
- Computer Systems



Sankosha LAN Surge Protectors

Features:

- Gigabit Ethernet In-Line Protection
- Complies with IEC 61643-21, 61000-4-5
- IEEE 802.3ab Compliant
- Cat5e and Cat6 Performance Ratings
- Connectors: RJ45 In/Out (Line/Equip)
- 35mm DIN Rail or Surface Mountable
- Lead-Free (RoHS Compliant)
- All pins protected

Applications:

- 10/100/1000 Base-T Ethernet
- Transportation / Traffic Systems
- Power Over Ethernet (PoE)
- Wireless Client Devices
- Surveillance Cameras
- IP Security and Phone Systems
- Advertising Billboards / Displays
- Network Appliances



Power supply SPD IEC Class I (Type 1)

- Low voltage power supply circuits in switchboards and distribution boards (AC 100V/200V) / AC 400V / 300VDC
- Power supply circuits in control equipment (AC 100V/200V) / AC 400V / 300 VDC



Power supply SPD IEC Class II (Type 2)

- Smart SPD® System
- Maximum discharge current up to 40 kA (induction lightning waveform 8/20 μs)
- Lightning surge current measurement, Replacement recommendation display function
- Lightning surge information display function (3 phases-Small, Middle, Large with date, hours, minutes and seconds)
- Remote monitoring via LAN (for Windows PC)
- Deterioration display function (warning contact output terminal attached)
- External view M5
- DIN rail mountable (35 mm)



Power supply SPD IEC Class II (Type 2)

- Maximum discharge current up to 140kA (induction lightning waveform 8/20μs)
- Deterioration display function
- DIN rail mountable (35mm)
- Low voltage power supply circuits in switchboards and distribution boards (AC 100V/200V/400V)
- Power supply circuits in control equipment (AC 100V/200V/400V)



SPD for communication equipment

- Smart SPD®
- SPD deterioration display
- Lightning surge current measurement
- Remote monitoring with contact output
- Recognition of line type by label color
- Capable to choose driving power source (external power (DC24V) or battery)

Operation



Operation		Display	State
External power	Battery		
Alltime lighting	Press button one-time	Green	Normal
		Yellow	Replacement recommendation
		Red	Replacement
Press button twice		Blink	Surge operation count number red: Hundreds digit Yellow: Tens digit Green: Ones digit

GFUVE Electronics designs and manufactures electrical measurement and test instruments since 2005. It combined science, industry and trade together as one high-tech enterprise. GFUVE mainly produces high voltage ammeter recorder, IEC61850 test suite software, energy meter test equipment, reference standard meter, phantom load power source, relay test set, CT PT analyzer, transformer test, High voltage test set, electrical calibrator, power analyzer and intelligent digital meter, transducer, current probe, split core ct, current transformer, voltage transformer and handheld terminal etc.



New Products »



Power Meter »



Ammeter Recorder »



Split Core Current Transformer »



Current Probe »



Energy Meter Calibration »



Electrical Calibration »



Relay Tester »



Transformer Test »



Power Quality Analyzer »



Phase Angle Meter »



Power Source »



Reference Standard »



Power Transducer »



Digital Meter »



IEC 61850 Testing Software »



BeiDou/GPS Time Server »



HV Test Set »

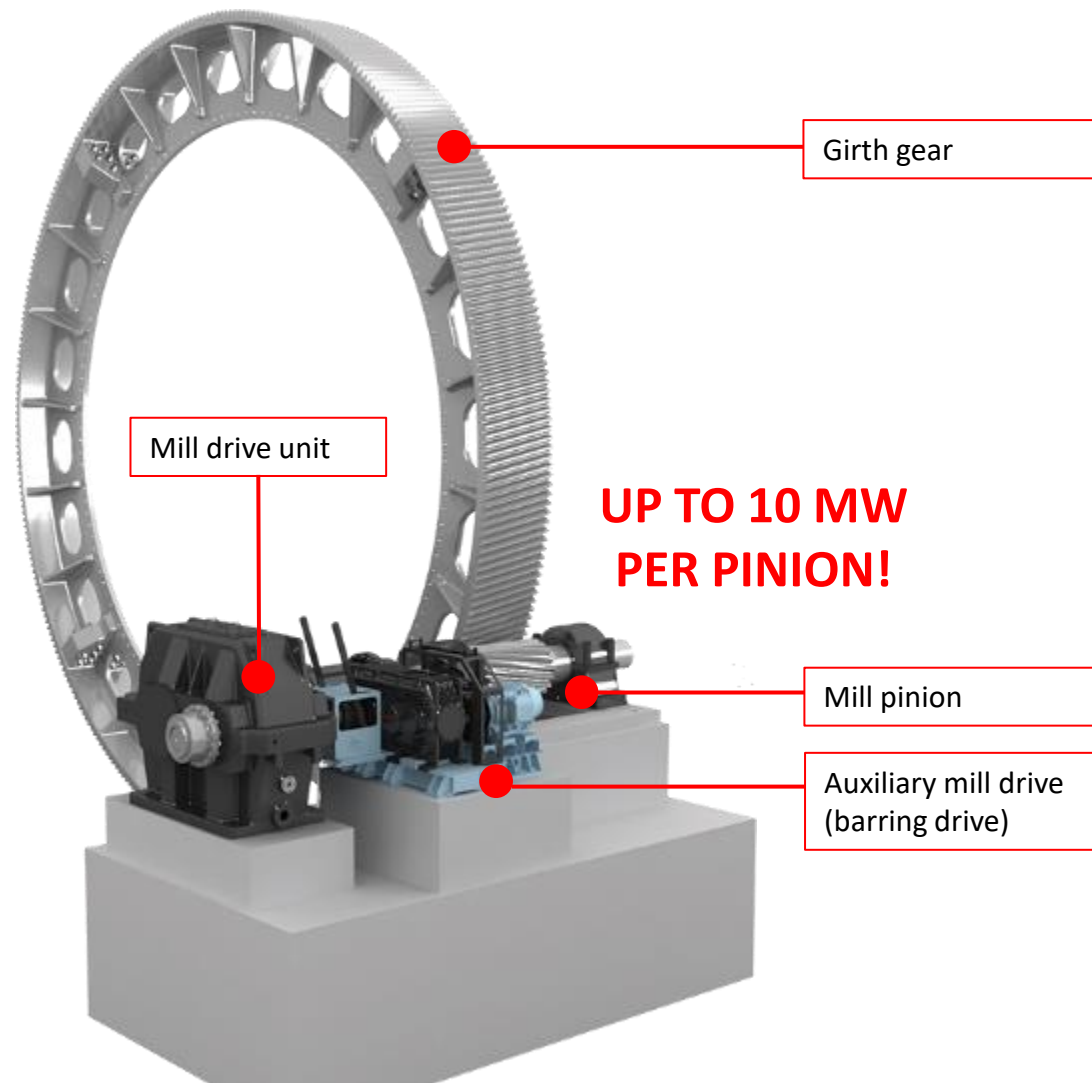


Current transformer »



voltage transformer »

GEARBOX: Products, Service and Repair

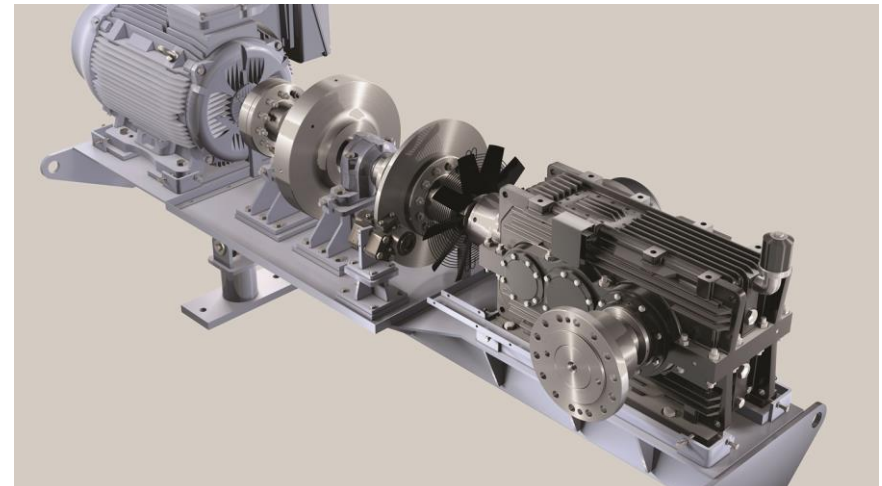


- Mill Drive System can comprise all the elements shown here
- David Brown Santasalo is one of few manufacturers in the world able to design, manufacture, install and maintain all these elements
- This means we can be a “one stop shop” for a full system, keeping responsibility in one place
- We can often optimise the individual components, matching ratios to our design and manufacturing capabilities, to give an optimum overall package

Gearbox



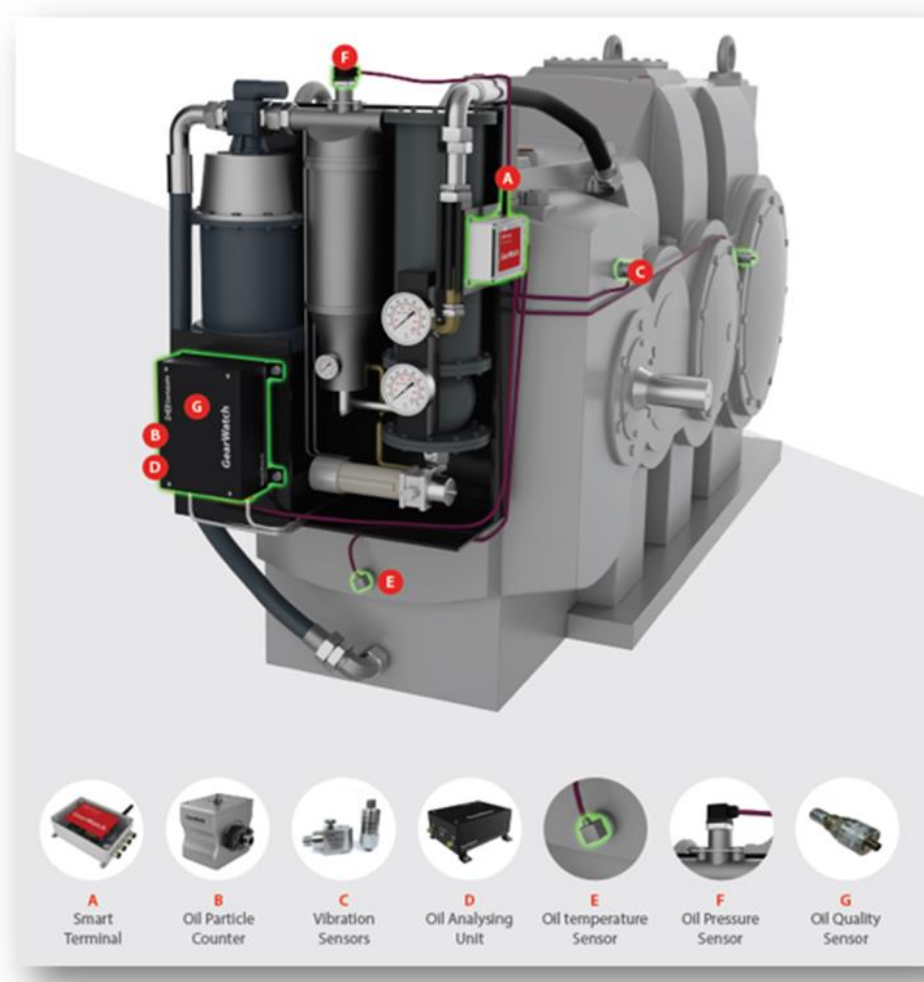
Conveyor Gearbox



DB Santasalo GearWatch

The Future of Gear Unit Condition Monitoring Solutions

- Cost efficient solution
- Detection of defects at an early stage through particle counting
- Effective maintenance planning
- Improved process reliability & extension of gear unit’s lifetime
- Developed from the industrial gear condition monitoring point of view with experience of the decades
- Cloud based server
- Analysis support by gearbox and drive train experts
- Available in three different packages; Standard, Oil Monitoring and Pro



DBS GearWatch Oil Monitoring

Oil analyzing unit combines early detection of the wear process with Particle Counter and proactive approach to operation with Oil Quality measurements:

- Particle counter
- Oil Quality sensor:
 - Water saturation
 - temperature

DBS GearWatch Pro

Tailored monitoring system for gear units and drive trains with selected parameters:

- Oil particle counter
- Vibration
- Rotational speed
- Temperature
- Oil quality
- Oil pressure
- Load

Electrical systems & services



Low-voltage distribution

- Panelboards and safety switches
- IEC and NEMA/ANSI ratings
- Hazardous area transformers
- NEMA 1 and 3, IP66 and IEC and NEC hazardous area solutions



Medium- and low-voltage switchgear

- Metal-clad and gas-insulated medium-voltage switchgear to 38 kV, 3000 A
- Metal-enclosed low-voltage switchgear to 600 V, 6000 A
- Integral motorized breaker racking
- Arc Quenching switchgear
- ANSI and IEC, arc classified option



Medium- and low-voltage motor control centers

- Medium-voltage ratings to 13.8 kV, 800 A
- Low-voltage ratings to 600 V, 3200 A
- Both NEMA/ANSI and IEC certified motor control centers
- Freedom, arc-resistant and FlashGard MCCs



Capacitor banks, filters and voltage regulators

- Low-voltage capacitor solutions
- Medium-voltage capacitor solutions
- Passive and active filters
- Medium- and low-voltage regulators



Medium- and low-voltage drives

- Medium-voltage ratings to 4160 V, 12000 hp, optional 15 kV input
- 24-pulse 2.4 kV and 4.1 kV with encapsulated technology
- Low-voltage ratings to 690 V, 2200 hp
- 6- and 18-pulse converter
- IEEE® 519 harmonic compliance



Power and distribution transformers/busway

- Liquid-filled to 12 MVA (ANSI)
- Non-segregated medium- and low-voltage busway
- FR3 environmentally-friendly fluid
- NEMA 4X Class I Division 2 hazardous location transformer



Low-voltage circuit protection

- Hazardous area and marine circuit breakers
- Molded-case industrial breakers
- Bussmann™ series current-limiting fuses
- Arcflash Reduction Maintenance System™
- Arcon fault protection system
- Low-voltage air circuit breakers



Meters and relays

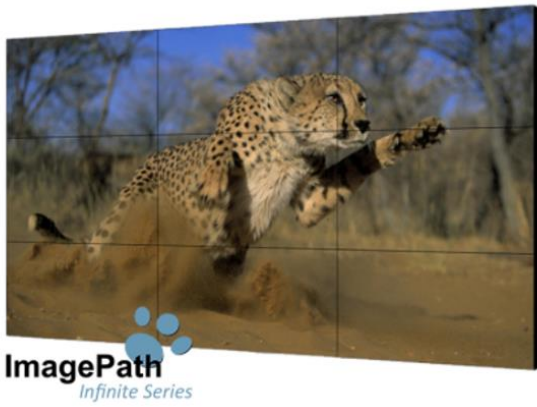
- Revenue grade energy monitors
- Panel meters
- Motor and feeder protective relays
- InsulGard partial discharge relays



Overhead distribution equipment

- Single- and three-phase reclosers
- Overhead cutouts
- Grid Advisor™ Series II smart sensor
- Single- and three-phase switches

Video Wall Display



- ImagePath Infinite VW5502**
- High superior detail quality
 - Bezel to Bezel 0.4 mm (btb 0.8mm)
 - 24/7 operation support
 - Industrial grade quality
 - High Precision Video Wall Bracket (OPVB)



Video Wall Processor



- ImagePath RealView**
- Advanced Crossbar technology
 - Robust FPGA video data process technology
 - Multi-window overlay ability
 - Multi input and output formats
 - No PC vulnerabilities
 - IP streaming decode support
 - Low power consumption
 - Fast start up within 5 seconds, Low capture & display latency
 - HDCP support for DVI/HDMI
 - Support 4K input capture
 - Input signal preview
 - Support Control by Windows OS and iPad

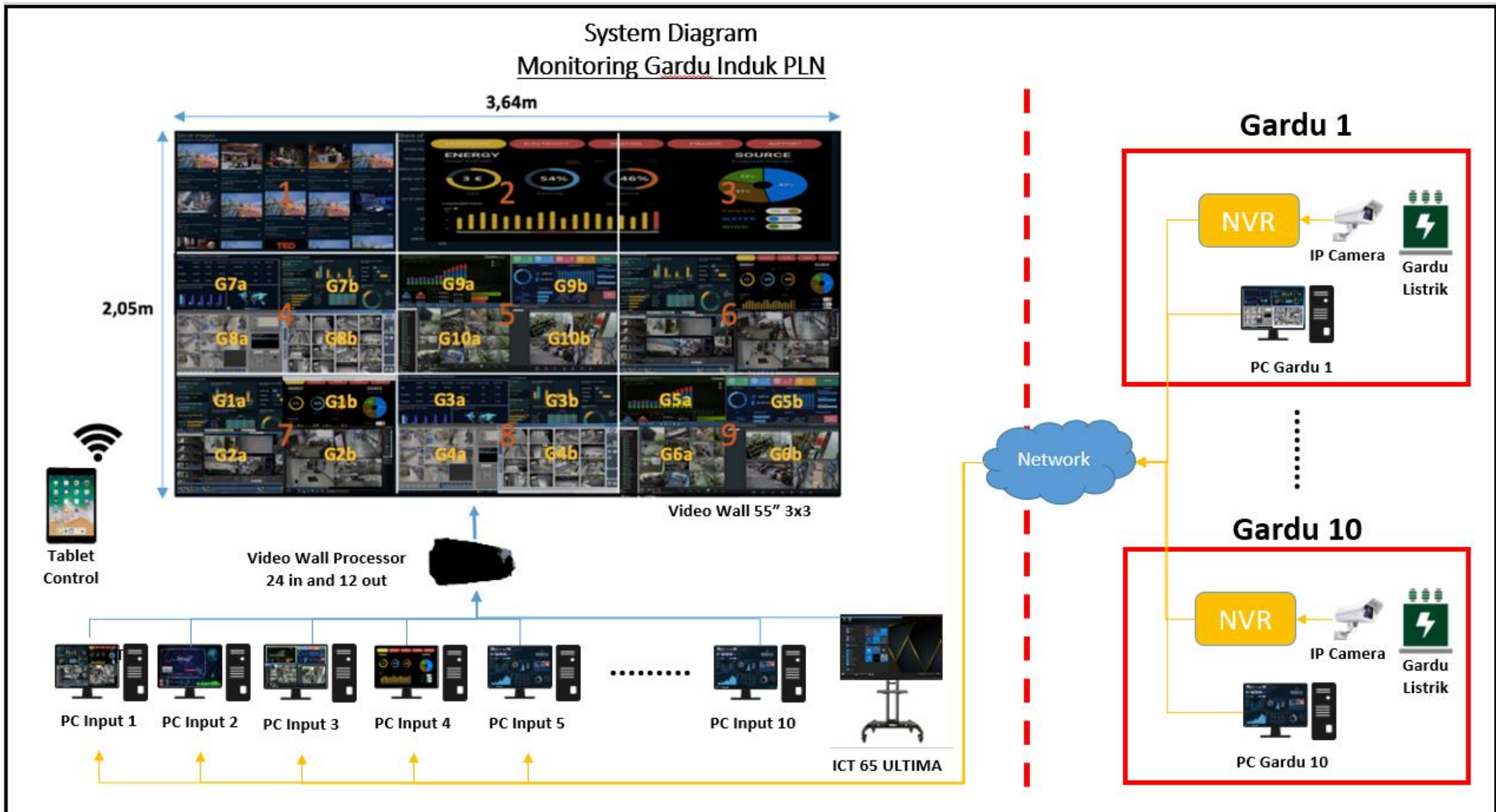


Display Inteactive

ImagePath ICT Ultima



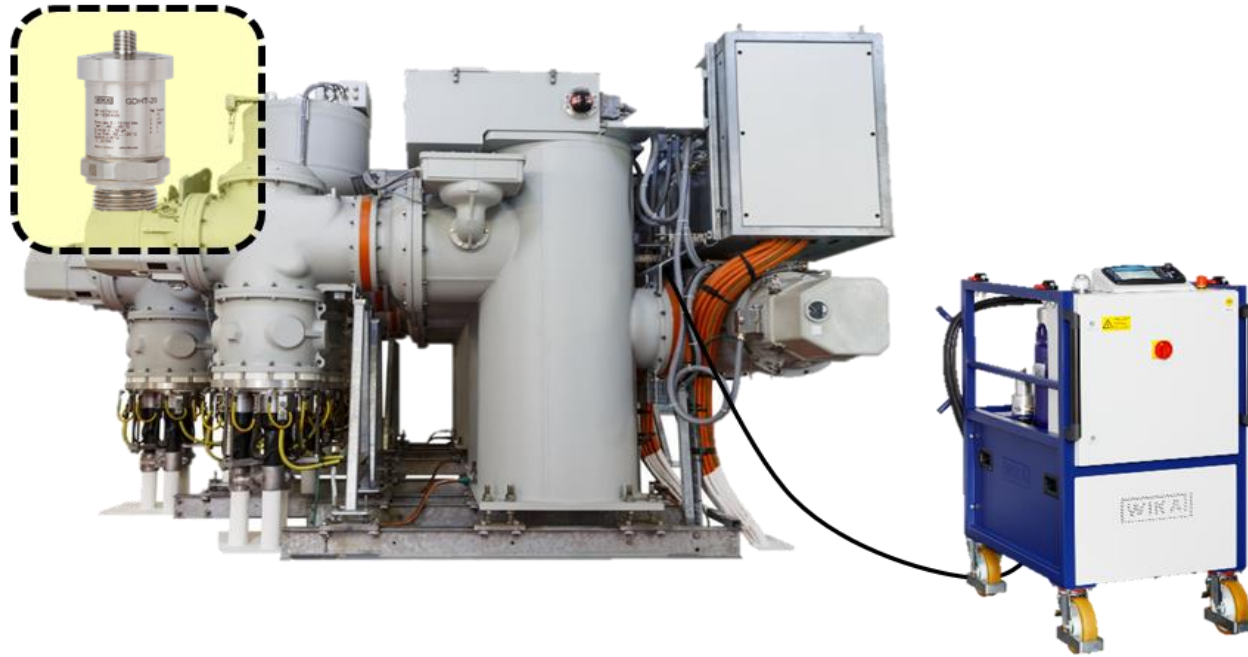
- Multi Touch with 4K Resolution
- Touch Screen Writing Pen or Finger
- Tempered Glass 4mm Protection, Anti-Glare
- Built-in Apps Annotation & White Board
- Built-in Speaker 10W x 2
- Support Duplicate Display with HDMI
- Support Mirroring Display with Apps
- Support Quad View Mirroring Display
- OPS Intel Processor Core i5
- Support Video Conference Apps



SF6 ONLINE MONITORING



- Online monitoring with **WIKAI GDHT-20** sensor
- Decision based on **continuous data**



- SF₆ gas service by **WIKAI GAD-2000**
 1. A small amount of SF₆ is recovered
 2. Filter SF₆ gas
 3. The dried SF₆ is filled back into compartment
 4. Process is repeated until desired values are reached

World Assets Map > Substation View > Bay View

Software - letzte 7 Tage



The Hirschmann IT High Performance and Multi-purpose Switches Portfolio Set the Standard for Quality, Reliability and Service

MTS2600 Series Switch - MAMMUTHUS Layer2 Gigabit Ethernet Switch with 10G Uplink Ports

Entry-level access and port extension switch

MTS2600 series switch is the entry level access switch in Mammuthus series, providing sufficient performances and flexible functions. 10 Gigabit port is available so uplink speed to core switch is assured.

All RJ45 ports in MTS2600 series switch support auto-negotiation and MDI/MDI-X, and all SFP+ slots can work under 1/10G mode. All SFP+ slots support 1G and 10G MTS SFP modules, including fiber and UTP/STP*.

* detailed information please see SFP chapter in this brochure.

For higher port density and performance at access level, MTS2600 supports stacking and downlink-oversubscribe design, in which 24 GE access ports couples with 4 10G SFP+ uplink ports. Since the MTS2600 series switch supports ERPS and have hardware based broadcast control, the switch can be deployed in ring topology.



MTS2700 Series Switch - MAMMUTHUS Layer3 PoE/PoE+ Gigabit Ethernet Switch with 10G Uplink Ports

Access/aggregation switches that have comprehensive function with PoE/PoE+

MTS2700 series switches provides a whole set of access solution, which is able to support complex network design. The switches can prevent unauthorized network access or mitigate the impact of network attacks via plenty of security features.

All RJ45 ports in MTS2700 series switches support PoE/PoE+ function, which are able to provide up to 30W power supply for the PoE PD device, such as webcam, IP telephone etc. What's more, modular PSUs can provide FRU and the device can work properly under maximum temperature up to 55°C.

MTS2700 switches have comprehensive L2/L3 feature set, which can provide flexible, reliable and secure choice for network planning. Network consultant can enhance network security via DAI/DHCP snooping or can optimize multicast via IGMP snooping or can use broadcast control to ensure the network stability when UMB flooding.



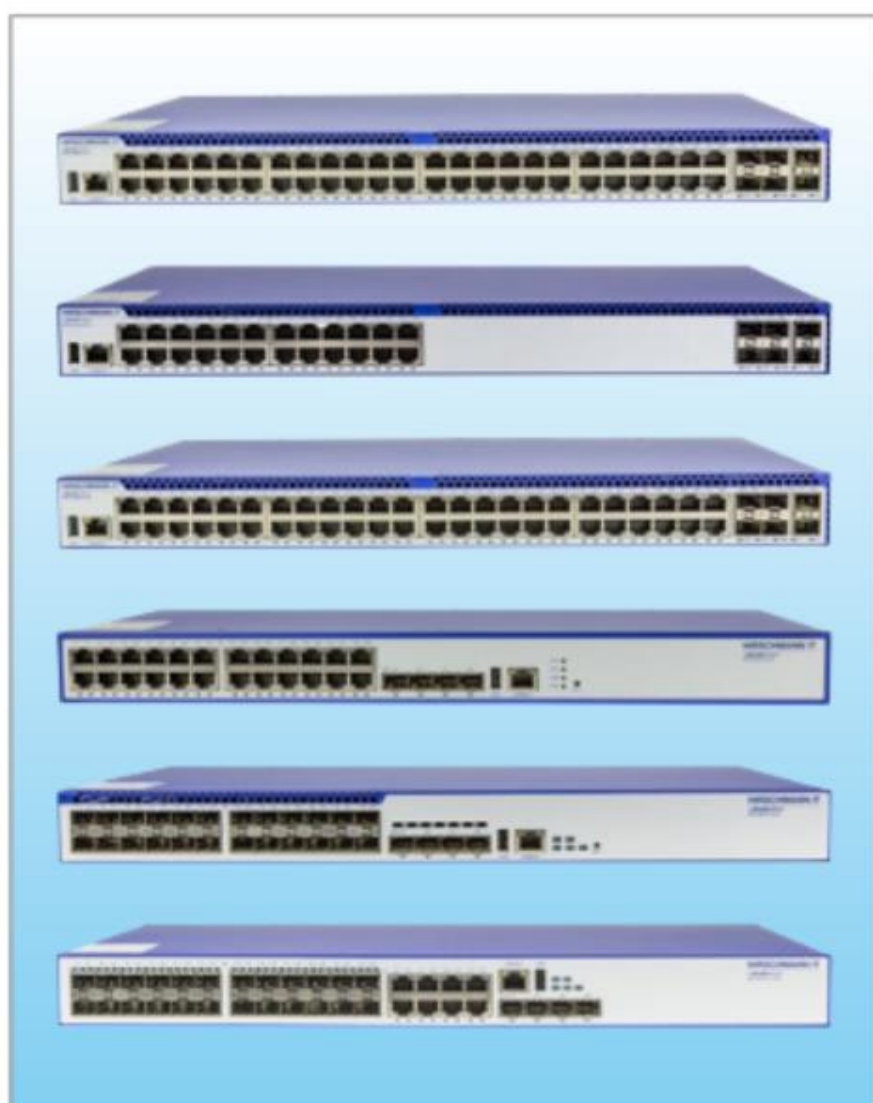
MTS2800 series switch - MAMMUTHUS Layer3 Gigabit Ethernet Switch with 10G Uplink Ports

Access/aggregation switches that can offer comprehensive L2/L3 feature sets

MTS2800 series switches provide a whole set of access and aggregation solution. All switches in this series are equipped with redundant PSUs. The switches has compact mechanical design with low noise which can fit in with 600mm x 600mm compact cabinet. In addition, the switches can work properly under maximum temperature up to 55°C.

All the RJ45 ports in MTS2800 series switches support auto-negotiation and MDI/MDI-X. The switches can be applied to various working situations such as desktop, ELV room and data aggregation layer. The switches have 4 or 6 SFP+ slots and support stacking configuration, which can eliminate single point of failure and provide MC-LAG.

MTS2800 series switches have comprehensive L2/L3 feature sets and furthermore can provide flexible, reliable and secure choice for network planning. The general security and flow control technology such as DAI, DHCP snooping, IGMP snooping and 802.1x that the switches have can help administrator to deploy a secure & robust network infrastructure.



PT Global Twin Star also provide solutions such:

CONTROL RELAY PANEL



ELECTRICAL ENGINEERING & CONSTRUCTION





PT.Global Twin Star

**Ruko Union Square, Kav21, Gading Serpong
Tangerang 15325, Indonesia**

**Telp. : 021 5399 032, Email: info@gl2star.com
021 5312 9050, johny.santoso@gmail.com
021 5312 9051, johny.santoso@gl2star.com
Fax. : 021 5399 187 Mobile : +62 811 960 780,**