PD20 Acoustic Imaging Camera for Partial Discharge on Power Systems

PD damage could cause a massive 85% of disruptive failures in HV and MV equipment

Substation failure can cause severe outcomes, including injury or fatality, creating outages and halting production.

Cables, underground cables and switchgear are not easy to test during routine maintenance. However, if problems occur, Partial Discharge (PD) causes flashover and loss. It will damage the High Voltage switchgear and cabling and cost many repairs, replacements, and production halts. We can predict Power system issues from warning signs, most notably Partial Discharge (PD). Detecting and measuring PD activity gives insight into the condition of HV assets without the need for shutdowns or invasive testing methods.

Partial Discharge (PD) is a failure of part of the insulation system to withstand the electrical field. It can result from poor design, workmanship, defective materials, contamination, or ageing. This failure results in a high frequency, unipolar discharge and accompanying current that flows through or on the surface of the insulation from the conductor to the ground. This current pulse is low energy due to its short (microsecond) duration, but it can negatively affect the insulation and eventually cause catastrophic failure.





PD20, the acoustic imaging camera, is a professional product for sound source localisation. With 128 Low-noise MEMS microphones and an adjustable bandwidth range from 2 kHz to 65 kHz, PD20 provides an easy and effective way to locate pressurised air leaks in industrial environments or detect partial discharge in high-voltage systems. Using a large 7″ 1024 x 600 LCD touch screen, the results presented on top of a digital picture allow you to find the source of the problems quickly. The maximum operating distance could reach 100 meters, ensuring you stay in a safe space to inspect the high-voltage equipment. By adopting this lightweight and easy-to-use tool, you can discover potential safety risks, minimise troubleshooting, and save extra equipment failures and downtime costs.

Features

- 128 MEMS microphones
- Locating defects (electrical, vibration, leakage)
- One-handed operation for flexibility
- 8 megapixel HD camera clearly shows defects
- Real-time display of the discharge level on-screen
- Automatic determination of the type and severity of PD according to tested equipment
- Testing frequencies from 2KHz ~ 65KHz
- Testing range from 0.3m ~ 100m
- Photos and videos for recording abnormal spots

Due to our policy of continual product development, we reserve the right to amend the specifications of all mentioned products without notice.

Why is acoustic imaging testing necessary?

The grid system has many devices and a complex structure. With the growth of equipment operation time, equipment is gradually ageing. It is easy to cause faults in equipment, resulting in large area blackouts, reducing the reliability of the entire grid and causing inconvenience to society.

How do acoustic cameras detect power equipment?

Based on the anomalies localised on the acoustic camera's screen, it becomes more visible as the electrical equipment deteriorates. It also has a multipoint detection mode, effectively covering every hidden area and improving detection efficiency.

How do we determine defects?

If there are apparent acoustic signals on the equipment, this indicates an anomaly. The abnormal electrical equipment should be repaired or replaced according to the outage plan. The defect is serious if there are multiple anomalies and must be repaired or replaced immediately.

Can I see multiple anomalies on the screen?

Multiple partial discharges, abnormal vibration, or leakage can be displayed simultaneously. Methods for detecting live equipment UV Camera, IR Camera, and All-in-one PD detector.











Problems with a usual testing method

Usual Method for Detecting PD: It is challenging to locate the PD for open equipment.

Usual Method for Detecting Gas Leakage: IR cameras are expensive with limited applications.

Problems with a usual method: It isn't easy to locate the anomalies using the standard method, and the positioning equipment is too expensive to use on a large scale.

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TECHNICAL SPECIFICATIONS

ACOUSTIC PARAMETERS

Acoustic Measurement	128 low-noise MEMS microphones
F.O.V.	70°
Dynamic Range	> 120dB
Bandwith	2kHz ~ 65kHz, Adjustable
Acoustic image framerate	25FPS
Measuring Distance	0.3m ~ 100m
Functions Type	Power Grid, Mechanical Vibration, Gas Leakage

PHYSICAL & BATTERY DATA

Dimensions	316mm×196mm×106mm
Weight	1.1kg
Battery Capacity	6700mAH@7.2V
Battery Life	4 hours
Port	USB Type-C interface, USB PD protocol
Capacity Factor	Max. power 20W

ENVIRONMENT PARAMETER

Working Condition	-10°C ~ +50°C, 10% ~ 95% non-condensing
Storage Temperature	-20°C ~ +40°C
Charging Temperature	10°C ~ +45°C

USER INTERFACE

Display	Size: 7”, 1024 x 600; Colour : 24-bit RGB; Brightness : 1,000cd/m^2
Input Device	Touchscreen
Video image resolution	1640 x 1234 VIDEO
Video Frame Rate	25 FPS
Acoustic image framerate	30 FPS

COMMUNICATION & STORAGE

External Storage	64GB SD Card
Internal Storage	8GB, Emergency storage only
Data Storage Format	jpg / mp4

CAMERA

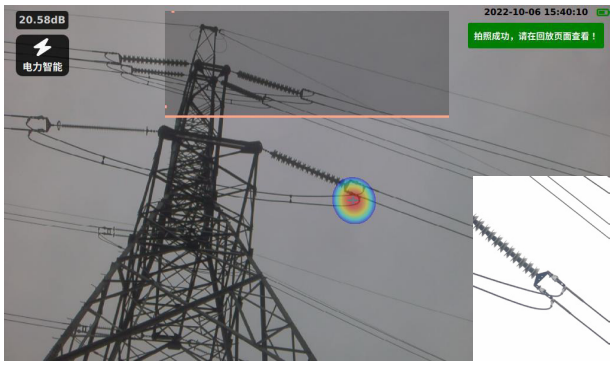
F.O.V.	70°
Focal Length	3.04mm (Fixed)
Pixels	8 Million
Battery	6Wh Lithium battery

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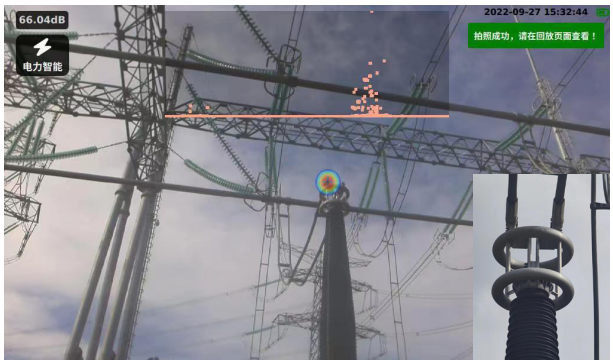
DEFECTS EXAMPLES IN FIELD TESTING

Examples on Transmission Lines





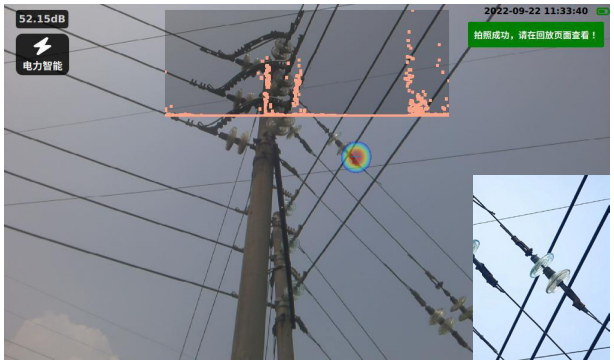
Examples in Substations



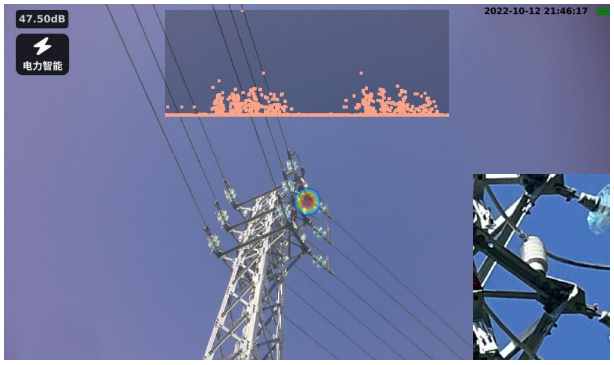


Examples in Distribution Lines









Focus Acoustic Camera, Making Sound And Defects Visible At A Glance

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