SOKEN

PARTIAL DISCHARGE ANALYZER

DAC-PD-9

Electrical equipment such as power transmission and distribution equipment critical for social infrastructures and factories that operate 24 hours a day is demanded of high reliability even when used under severe conditions. Recent years have seen attempts to diagnose the accurate remaining lifespan during periodic inspections, and realize use of such equipment beyond the design life-cycle through implementation of appropriate maintenance. In addition, equipment diagnostic techniques as means of preventive maintenance have also become essential to prevent the sudden breakdown of electrical equipment. To meet the expectations for these electrical equipment diagnoses, Soken Electric Co., Ltd. has developed Digital Partial Discharge Analyzer DAC-PD-9 that incorporates the very latest digital technology.

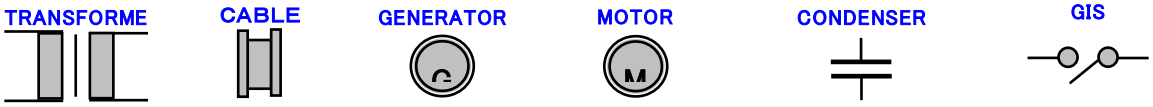
Partial Discharge Analyzer
Model DAC-PD-9

PD Analyzing Software

Covering widely required tests by IEC standards, DAC-PD-9 is an analyzer with a wide-band amplifier. The set incorporates the same conventional testing functions as low-frequency (narrowband), wide-band and tuned measuring instruments do. Moreover, it is also capable of ultra wide-band measurements (up to 40 MHz). DAC-PD-9 allows a selection of optimum frequency bands suitable for any type of test specimens to enable quantitative and reproducible partial discharge measurements. In addition, the set can sample in time-series all data to enable statistical and quantitative measurements.

Test Specimen

●HV Transformer ●Power Cable ●Generator, Motor, Coil ●Capacitor, Bushing ●Circuit Breaker, Switch



SOKEN ELECTRIC CO., LTD.

DAC-PD-9
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Features

- Digital technology enables determination of the true polarity of partial discharges.
- All parameters such as cumulative frequency and net peak are displayed in real time.
- Discharge pulses of positive and negative electrodes can be counted simultaneously.
- Center frequencies and frequency bandwidths can be freely selected for measurement.
- The large-capacity memory enables long-term data storage.

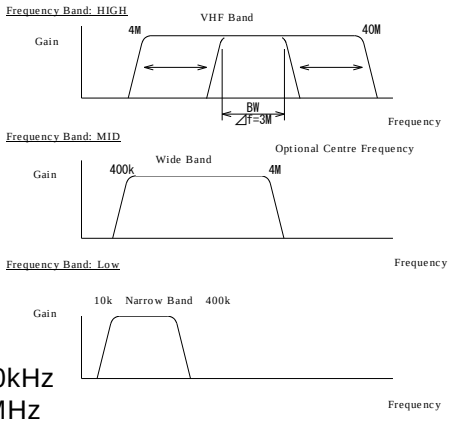
Variable Measuring Frequency

The evaluation of partial discharge largely depends on selection of frequency bands. Taking into account the propagation characteristics and electrical structure of test specimen, and paying attention to the noise environment and data reproducibility, the optimal frequency band should be selected

●Frequency Band: Low Band :20kHz - 400kHz
MID Band :400kHz - 4MHz
HIGH Band :4MHz - 40MHz

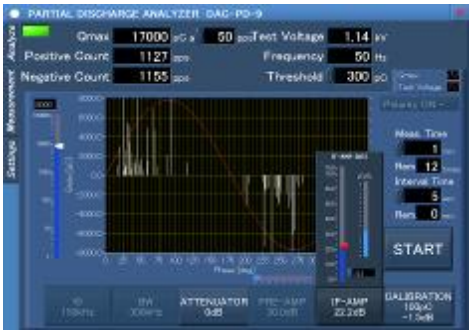
●Center Frequency :40kHz - 40MHz

●Frequency Band Range
LOW Band :30kHz,50kHz,100kHz,300kHz
MID Band :300kHz,500kHz,1MHz,3MHz
HIGH Band :300kHz,500kHz,1MHz,3MHz



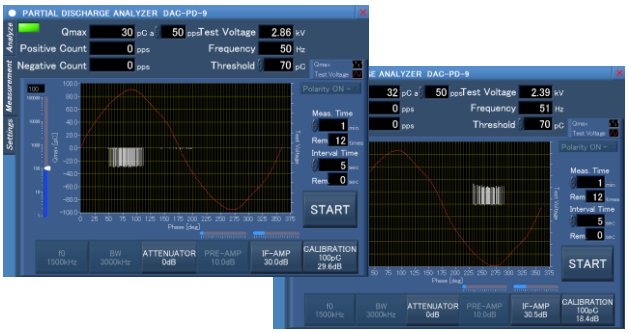
Partial Discharge Analyzing Software

Data such as Q, Phase and Time obtained by DAC-PD-9 can be saved in PC with USB interface to analyze and evaluate.



Polarity Judgment

Auto-Judging in polarity of partial discharge waves in a wide band.



Numerical Evaluation of Partial Discharges by a digital sampling

●Average discharge current I

The average discharge current is expressed in coulombs per second(C/s) or in amperes(A).

$$I = \frac{1}{T_{ref}}(|q_1| + |q_2| + \cdots + |q_i|)$$

●Discharge power P

Where an *ui* is instantaneous value of the test voltage at the instant occurrence of the individual apparent charges magnitude as *qi*.

The discharge power is expressed in watts (W) and becomes the cause of the electric power loss of the sample.

$$P = \frac{1}{T_{ref}}(q_1 \cdot u_1 + q_2 \cdot u_2 + \cdots + q_i \cdot u_i)$$

●Quadratic rate D

The quadratic rate is expressed in (coulombs)2 per second (C2/s), and the partial discharge magnitudes will be accentuated and displayed.

$$D = \frac{1}{T_{ref}}(q_1^2 + q_2^2 + \cdots + q_i^2)$$

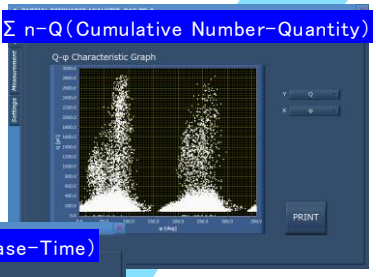
SOKEN

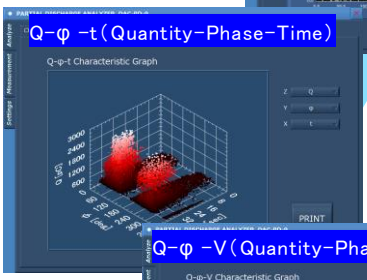
■Digital PD Analyzer DAC-PD-9

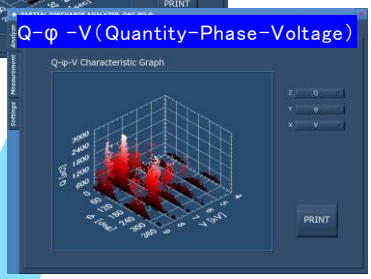
- TFT liquid crystal and touch keys enable simple, visual operation.
- Compact (W320 xD350 x H150mm) and lightweight (10 kg).
- Interface with USB and LAN.
- The analyzer can be used by itself for measurement independent of a PC.
- Measured data is stored in USB memory.

■Analysis

Partial Discharges can be displayed visibly in 2D or 3D graphics for analysis.







■Calibrator DAC-CP-2

- ●Output Voltage :5V、50V
- ●Lamp Time :<20nS
- ●Generating Pulses :0～10000pC
- ●Repetition Frequency :50Hz
- ●Power Source :Battery 7.2V
- ●Size :W170×H60×D110(mm)
- ●Weight :800g, approx.

■Detector DAC-PDE-2

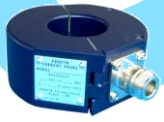
- ●Applicable Frequency Band :10kHz - 4MHz
- ●Max. Applicable Current :Balance Circuit 5A :Un-balance Circuit 1A
- ●Size :W170×H70×D110(mm)
- ●Weight :1kg, approx.

■Detector and Divider DAC-PDE-6

- ●Applicable Frequency Band :10kHz - 400kHz
- ●Max. Applicable Current :Balance Circuit 5A :Un-balance Circuit 50mA
- ●Test Frequency :50/60Hz
- ●Test Voltage Dividing Capacitor :2μF
- ●Size :W180×H100×D120(mm)
- ●Weight :2.3kg, approx.

■Coupling Capacitor

	DAC-LCC-15	DAC-LCC-30	DAC-LCC-50
Rated Voltage(kV)	15	30	50
Rated Current(A)	3	3	3
Capacitance(pF)	1000	1000	600
Hight(mm)	512	702	912
Weight(kg)	8	13	15



■Clamp-type High Frequency CT

- ●Measuring Frequency Band : 10kHz - 100MHz
- ●Max. Current :39.3A
- ●Aperture :31Φ

DAC-PD-9
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Specifications

Partial Discharge Measuring Unit

Maximum Partial Discharge	Measuring Range	1 -100000pC	
	Phase Resolution	1 deg.	
	Evaluted Inception Frequency	10 - 400pps	
Allowable Repetition Frequency Rate	Measuring Range	0 - 9999pps	
	Polarity	Auto Judgement	
Frequency Range Low Band : 20kHz-400kHz MID Band : 400kHz-4MHz HIGH Band : 4MHz-40MHz	Center Frequency	40kHz - 40MHz	
	Frequency Range Width	LOW	30kHz,50kHz,100kHz,300kHz
		MID	300kHz,500kHz,1MHz,3MHz
		HIGH	300kHz,500kHz,1MHz,3MHz
	Gain	LOW	-40dB to 74dB
		MID	-40dB to 74dB
		HIGH	-40dB to 104dB
Input Characteristic	Input Impedance	50Ω	
	Input Voltage Range	0 - 2 Vp-p	
Memory		Max.3000 Cycles (Number of sycles Power Source Frequency)	

Voltage Detection(Torigger source)

Input Characteristic	Input Impedance	1MΩ
	Input Voltage Range	0 - 20Vrms
	Input Frequency Range	50/60Hz

Interface/Power Source

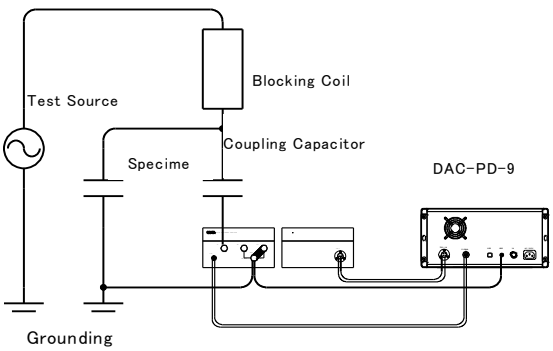
Interface	USB 2.0/1.1 or equivalent B type、LAN
External Memory Function	USB
Size and Weight	W320×D350×H150(mm) Approx. 10kg
Power Source	AC100V-240V ±10% 50/60Hz
Ambient Temperature/Humidity	0 - 40℃ / 20 - 85%(No Dew)

Partial Discharge Analysing Software

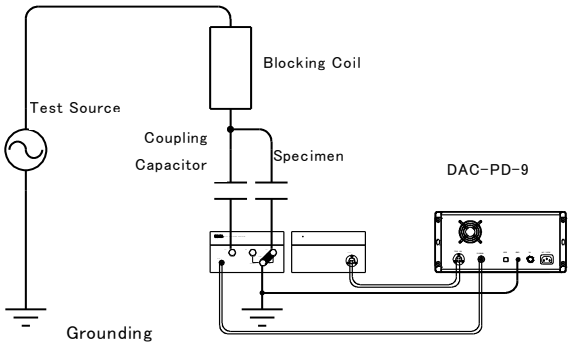
System Requirements	OS Windows XP, 7

Connection Diagram

●GST(Grounded Specimen Test)



●UST(Un-grounded Specimen Test)



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