

ABSTRAK
DETEKSI DAN KARAKTERISASI *PARTIAL DISCHARGE ISOLATOR*
***OUTDOOR* TERPOLUSI DEBU UREA MENGGUNAKAN**
SENSOR UHF

(2026: xv + 59 Halaman + Daftar Gambar + Daftar Tabel + Lampiran)

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Kontaminasi debu urea pada isolator outdoor dapat menurunkan kualitas isolasi dan memicu terjadinya *Partial Discharge* (PD). Penelitian ini bertujuan mendeteksi dan mengkarakterisasi aktivitas PD pada isolator outdoor terpolusi debu urea menggunakan sensor *Ultra High Frequency* (UHF). Pengukuran dilakukan secara online di PT Pupuk Sriwidjaja (PUSRI) menggunakan Megger PD Scan, kemudian data dianalisis dengan MATLAB melalui waveform, FFT, STFT, dan PRPD. Hasil penelitian menunjukkan bahwa sensor UHF mampu mendeteksi aktivitas PD dengan baik tanpa mengganggu operasi sistem. Analisis sinyal menunjukkan adanya perbedaan amplitudo dan pola PRPD pada setiap titik pengukuran yang dipengaruhi oleh tingkat kontaminasi debu urea. Kombinasi sensor UHF dan analisis MATLAB terbukti efektif untuk pemantauan kondisi isolator serta mendukung pemeliharaan berbasis kondisi.

Kata kunci: *Partial Discharge*, Sensor UHF, Isolator *Outdoor*, Debu Urea.

ABSTRACT
DETECTION AND CHARACTERIZATION OF PARTIAL DISCHARGE IN
OUTDOOR INSULATORS POLLUTED WITH UREA DUST USING UHF
SENSORS

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Urea dust contamination on outdoor insulators can reduce insulation performance and trigger Partial Discharge (PD). This study aims to detect and characterize PD activity on urea dust-contaminated outdoor insulators using an Ultra High Frequency (UHF) sensor. Online measurements were conducted using the Megger PD Scan, while the acquired data were analyzed using MATLAB through waveform, FFT, STFT, and PRPD analyses. The results show that the UHF sensor is capable of detecting PD activity without interrupting system operation. Variations in signal amplitude and PRPD patterns at each measurement point indicate the influence of urea dust contamination on PD activity. This method is effective for monitoring the condition of outdoor insulators and supports condition-based maintenance.

Keywords: Partial Discharge, UHF Sensor, Outdoor Insulator, Urea Dust.