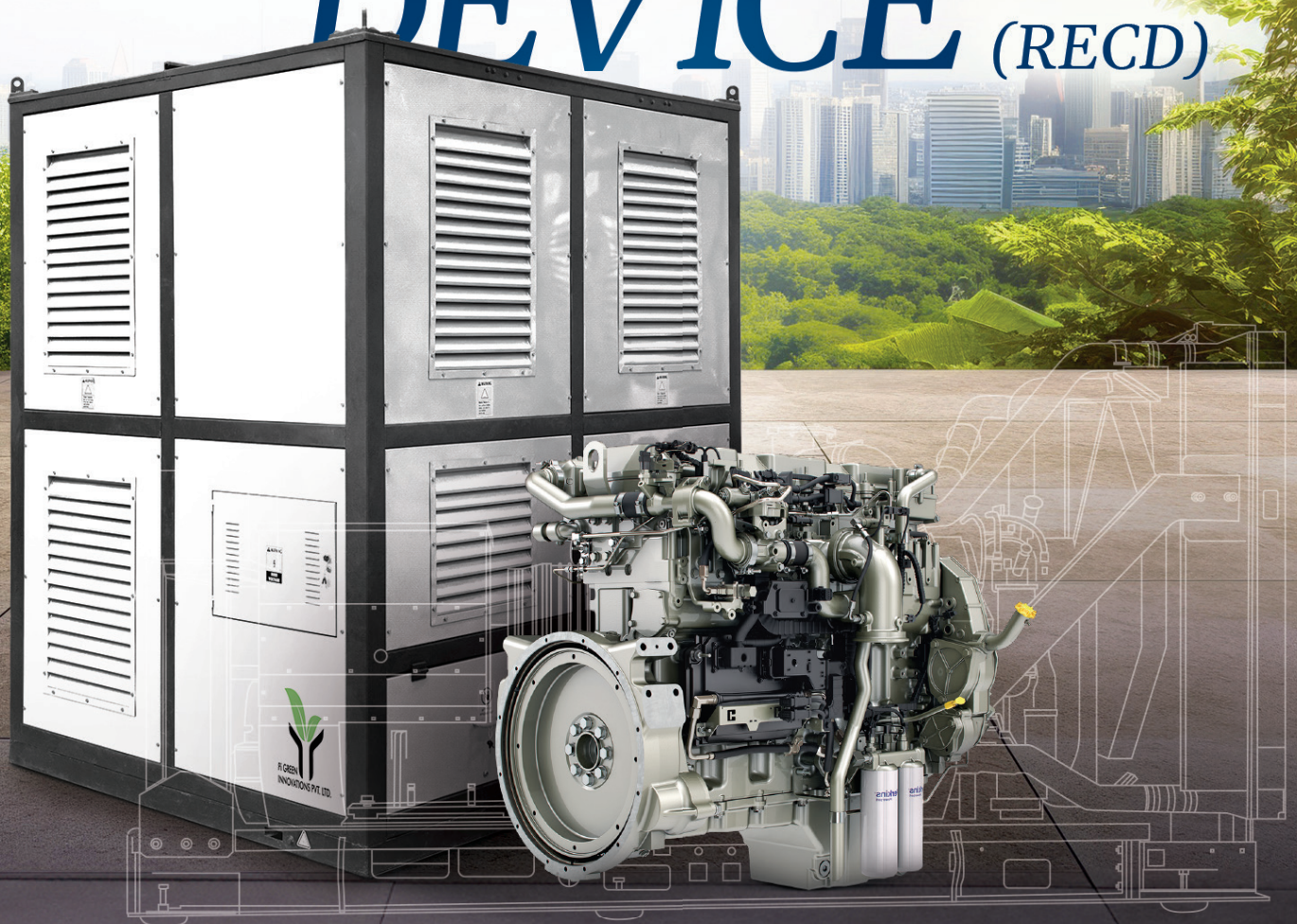


RETROFIT EMISSION CONTROL DEVICE (RECD)



 **Perkins®**

*For generator sets powered by
Perkins diesel engines*

A solution that supports the environment

Enabling Particulate Matter (PM) reduction on diesel powered generators

Perkins, in agreement with Pi-Green, is introducing a pioneering filterless technology for PM reduction for diesel powered generating sets. The Pi-Green Retrofit Emission Control Device (RECD) is based on filterless technology and is highly efficient in improving air quality. These RECDs are compliant with the NGT order, dated 6th August 2019 in O.A 681/2018 as declared by the manufacturer*. It uses Electrostatic Precipitation (ESP) to enable the collection of sub micron particulates at oppositely charged surfaces and form into larger clusters through the process of agglomeration. The collected soot is removed at optimal intervals using a patented scraping mechanism.

Captures PM with more than 70% efficiency



No manual cleaning



No water



No choking



No chemical



No replacement



No solvent



Low maintenance



No filter

Features and advantages:

- Operates as soon as the generator set is started
- Ensure Optimised Electrostatic Precipitation (ESP) with flow conditioning and current discharge management
- Expect high efficiency with consistent PM separation
- Low back pressure with almost zero adverse impact on engine operation
- Minimal electrical energy consumption ensures lower impact on operational parameters and reduced maintenance and minimal thermal insulation
- No need for thermal management, unless you have a set surface temperature limit
- Diagnostic-capable and ready; transmits data and fault codes with cloud-based push notifications for users
- Use the collected or trapped soot as a raw material for paints and other industries
- Say goodbye to periodic maintenance with the durable standardised aesthetic enclosure and a modular design. Requires minimal thermal insulation
- Works robustly in a wide spectrum of operating conditions



Durability and performance

- Extremely durable thanks to no moving parts
- No chemicals, which means minimal ageing, carefully designed routings, forced cooling wherever required, redundancy in cooling arrangement, adequate service protocols to maintain efficiency
- Optional installation of serviceable electrodes for very corrosive environmental applications (coastal applications)



Structural and environmental durability

- Robust components build with stringent quality requirements
- Generator set-like bedframe-based installation, protection from environmental factors such as heat-resistant paint on internal units, galvanised and powder-coated sheets and structural members for enclosure, thermal management for power and control unit, well-designed seals and interfaces



Installation aspects

- Installation checklist as well as pre-order site survey for feasibility (for larger independent installations)

*Note: The RECDs for gensets rated higher than 800 kW are not mandated to be certified by any CPCB approved labs. For generator sets rated lesser than 800 kW, Type approval certification pending with ARAI.



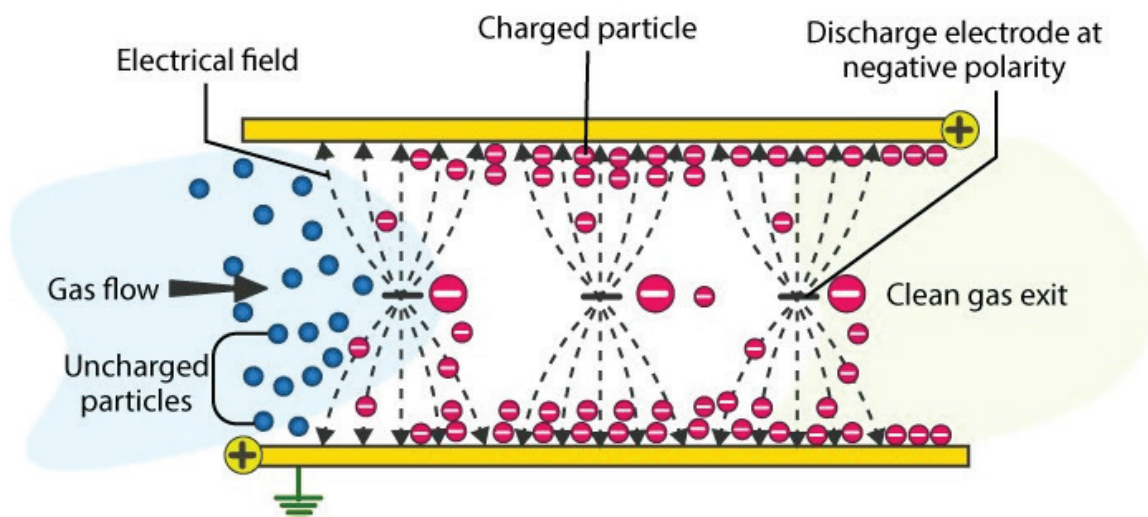
Technology comparisons and advantages:

Technology	PM capture efficiency	Initial cost	Operational cost	Prominent failure mode	Impact on engine	Ease of maintenance	Robustness to exhaust challenges
Diesel Oxidation Catalyst (DOC)	20-45%	Low	Negligible	Face plugging	Negligible	Not serviceable	No
DOC+Partial Flow Filters or Partial Oxidation Catalyst (PFF / POC)	40-75%	Moderate to high	Moderate (fuel penalty due to back pressure)	Crack, melting, thermal event	Variable back pressure (~30 kPa)	Ash cleaning	No
DOC+Diesel Particulate Filter (DPF)	>90%	High	High (fuel penalty due to back pressure and regeneration)	Crack, melting, thermal event	Variable back pressure (up to 40 kPa)	Ash cleaning soot removal	No
Water / solvent-based exhaust scrubbers solution	NA	High	Moderate to high (wash fluid and chemical replenishment)	Fouling and engine hydro-lock	Back pressure because of Heat Exchanger	Frequent service	Probably yes
Filterless solution for RECD [#]	75-95%*	Moderate	Negligible (periodic soot collection)	None	Low back pressure - design control	Easy service	Yes



Operating principle:

- RECD is installed after the diesel generator set muffler without disturbing the existing setup
- Exhaust gases enter the RECD and are confronted with electrical discharge created through a high voltage DC field
- Passing through the field, particulate matter acquires an electrical charge and is attracted to the oppositely charged electrode
- PM gets agglomerated on the collector electrode and forms substantially higher particle-size clusters
- Agglomerated PM is periodically scrapped and collected using a patented mechanism for environmentally safe disposal



Perkins authorised distributors:

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Product manufactured by Pi-Green Innovations Pvt Ltd, recommended for use on diesel generator sets powered by Perkins Engines, available only through Perkins authorised dealers.

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