



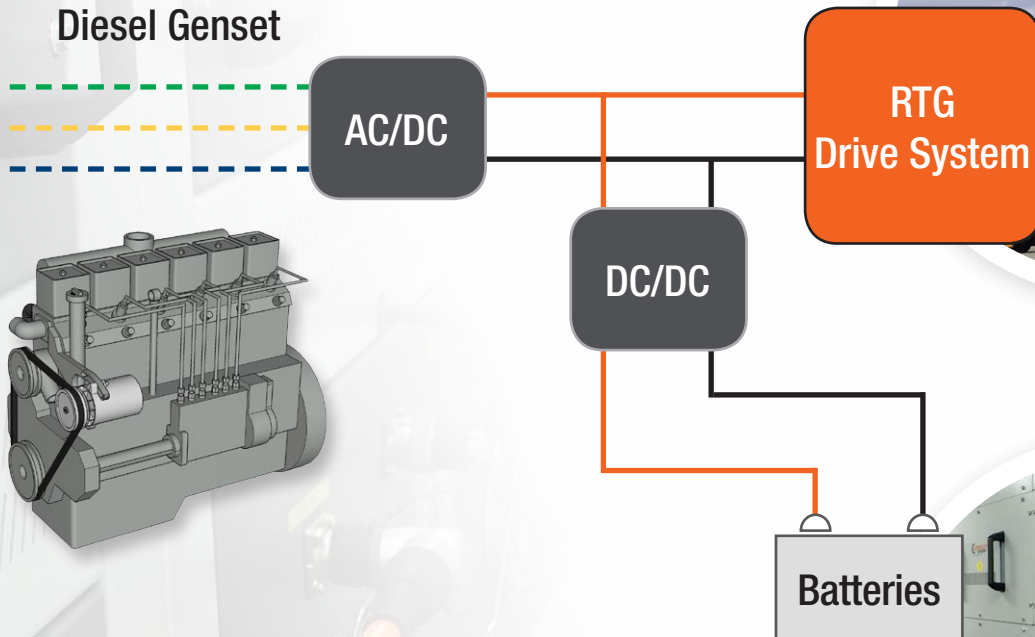
# Hybrid-RTG

The Fuel Saving Solution

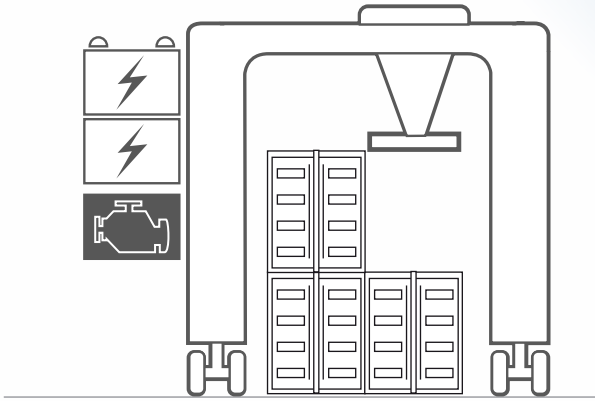


DELACHAUX GROUP

# Hybrid-RTG with small diesel genset and big battery pack



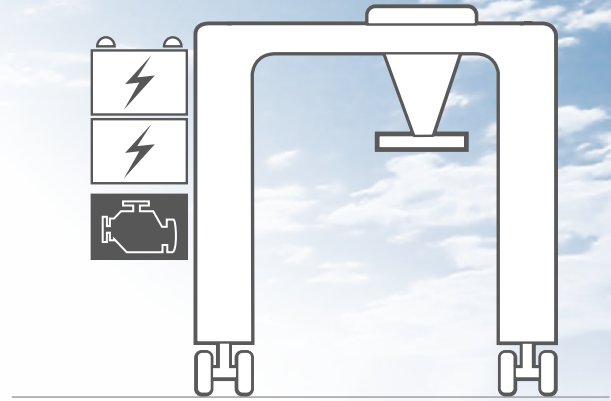
# Stacking Yard



In Conductix-Wampfler Hybrid RTG systems the battery pack is the main power supply and connected through a very efficient DC/DC converter to the DC bus of RTG drive.

All energy consumed by the hoist, gantry, trolley and the auxiliaries in the stack and during block changes is provided by the sufficiently sized battery system.

# Block changing



Regenerated energy from the motors during e.g. lowering a container can be recovered and is fed back to the battery system through the DC/DC converter. If the battery system reaches its low level State of Charge (SOC) the small size genset will be started to recharge the battery system until it attains its upper level of SOC again.

During the charging process the RTG can be operated without any limitation. The fully charged battery system supports more than 30 container moves\* or an idling period of 2-4 hours\*\* before the battery system is recharged again.

\* based on an average container weight of 12t

\*\* depending on the actual ambient conditions

# Benefits

- Up to 60% fuel saving compared with a conventional genset
- Energy efficiently recovered in the battery system e.g. during lowering operation
- Engine can be downsized to 100 kW
- Maintaining full operational flexibility in the yard
- Reduced maintenance cost and less refueling operations
- Independent from grid power availability
- Reduce environmental impact: Emission reduction of CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>x</sub>, particulates + noise





# Technical Details

## Battery Pack

- Battery type: Li-ion
- Energy stored in battery system: 100 kWh\*
- Approximate moves operated when battery system fully charged and no charging from genset: 30
- DC/DC converter: 250 kW (bi-directional)
- Designed battery system lifetime: 8 years\*\*
- Warranty (batteries): 5 years
- Remote monitoring and diagnosis

## Diesel Genset

- Typical rating: 100 kW
- Very compact noise canceling housing
- Dedicated control system for the autonomous operation
- Emission standards: EU stage III (stage IV on request) or US Tier 3 standard (US Tier 4f on request)

\* up to RTG requirement

\*\*200 moves per day, 350 working days per year.

# www.conductix.com

Conductix-Wampfler has just one critical mission: To provide you with energy and data transmission systems that will keep your operations up and running 24/7/365.

We reduce **Emission** from your **RTGs**!

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