Specsheet CHD-400

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SDK Engineering

CHD-400
400kW

The Combined Hybrid Drive-400, is the link between the electric motor, the internal combustion engine and the battery-pack. If the batteries run empty, the range extender with integrated logic takes care of starting, stopping, charging and discharging. And adjusts the system towards maximum efficiency without compromising on ease of use and/ or power.

Features & Benefits

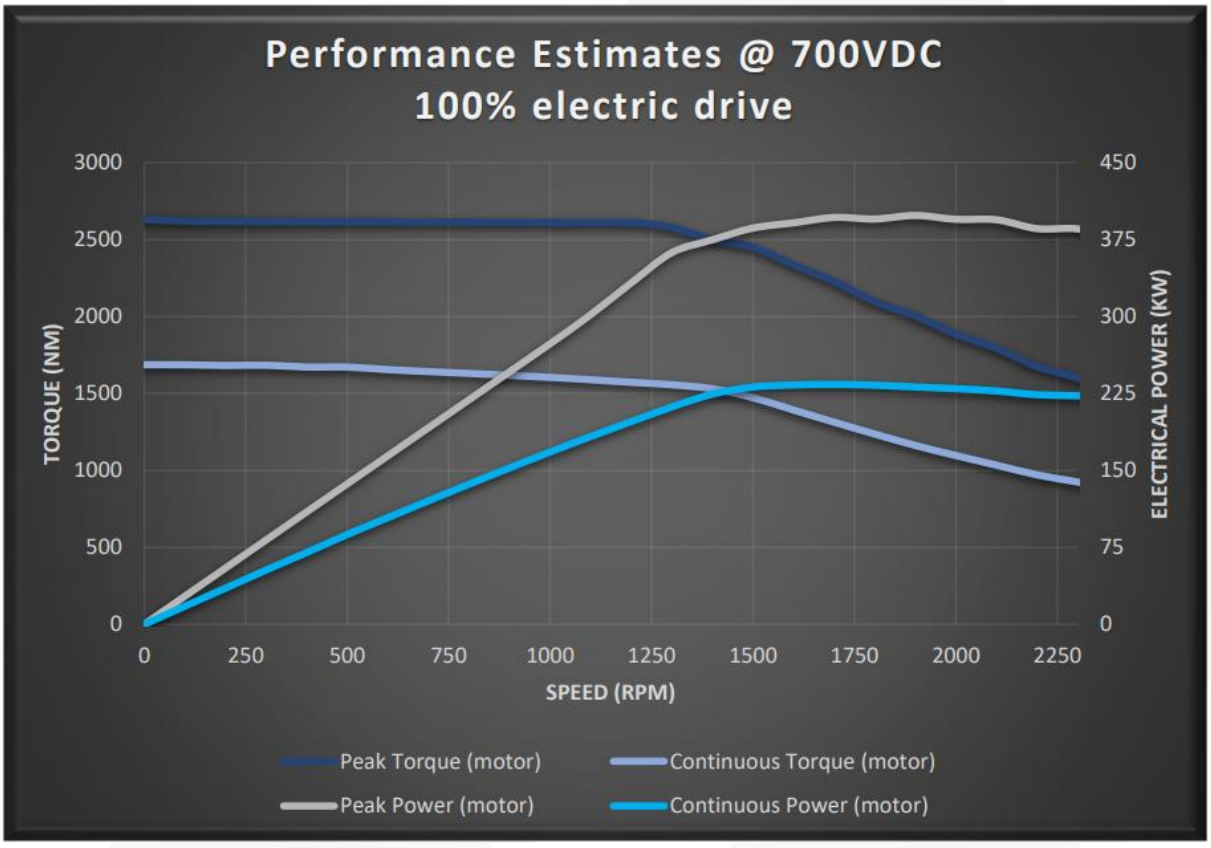
- Combines the advantages of a 100% electric drive , with the autonomy of the conventional internal combustion engine drive.
- 100% electric drive, without compromising on ease of use and/ or power.
- The battery-pack can be charged externally, or internally by the "range-extender".
- No downtime due to an empty battery-pack.
- 24-hours of operation, without (heavy) electrical connection is no problem.
- If the internal combustion engine has to charge the battery's, then this is automatically done at the most efficient way as possible.
- Integrated logic for starting, stopping, charging and discharging the batteries.
- No problems with the internal combustion engine due to low load, when the engine is running, it always runs at an optimal load.
- Installation length equal to that of a Caterpillar C7.1.
- Flexible installation options, due to "Multi position e-motor configuration''.
- This installation could also be installed in combination with the currently installed internal combustion engine.
- 100% compatible with hydrogen internal combustion engines.
- Ideal for re-fit and new machine construction.
- A low-maintenance installation.

Application possibilities

- Industrial non-road
- Maritime (subject to classification)

Technical specifications

Electric motor	400 kW (225kW nominal (PM)
Combustion engine	Caterpillar C3.6, EU Stage V, 100kW, 4 cylinder ‘’range-extender’’
Modular battery pack	267kWh Battery-pack
Installation length	1455mm ± 40mm
Installation	Due to the construction of the CHD, the e-motor can be placed on the same side as the internal combustion engine between ± 90º and ± 270º with steps of ± 30º (depending on the location of the CEM). The e-motor can also be placed between 0º and 360º on the power take off side, with steps of ± 30º degrees.
CHD flywheel housing Size	SAE 3 flywheel housing.
CHD Flywheel Size	SAE 10 and 11-1/2 inches



The above installation includes (but is not limited to) the following components:

- **Caterpillar C3.6, 100kW, EU Stage V engine**

- **12 battery modules (total 267kWh capacity) (separate supplied)**
  Each battery module consists of:
  - +/- 22.3kW/h, 134.4V, Lithium battery
  - Cooling water connection
  - IP67 BMS Canbus connection
  - IP67 housing
  - IP67 vent valve
  - Internal fire extinguishing grenade
  - IP67 High Voltage Amphenol Connectors

- **Active BMS system (separate supplied)**
  - Stainless steel and aluminum housing
  - Reading of, among others:
    - Individual cell temperature monitoring
    - Battery module temperature monitoring
    - Individual cell voltage measurement
    - Current power consumption
    - Current SOC value
    - Current SOH value
    - Current remaining KwH and Ah values
    - Total pack voltage
    - Automatic charger detection and control (Canbus)

- **1 x 20kW canbus controlled lithium battery chargers IP67 (separate supplied)**
  - Automatic cell voltage balancing
  - Charging current adjustable to the available 400V AC connection (between 16A and 32A)

- **1.6kW DC/DC (800V-24V) converter (separate supplied)**

- **400** kW **(220kW nominal) PM electric motor**[1]
  - Weight 190KG
  - Oil lubricated and cooled rotor
  - Integrated heat exchanger for cooling water

- **Canbus controlled motor controller**
  - Water-cooled

- **CHD400, clutch housing**
  - SAE 3 Flywheel housing
  - Electric (800NM) coupling for the connected combustion engine
  - Internal torsion-vibration damper(s)
  - Low maintenance
  - Two-sided Multi position electric motor mounting pad

- **Cooling package**
  - Radiator and aftercooler for the diesel engine

[1] Voltage, speed and temperature dependent.

- Radiator for the electric motor and inverter
- High efficient fan with high back pressure capacity
- Electric motor (5.5kW)
- IP66 Inverter for cooling fan e-motor control (Supplied separately)
- Integrated logic for control over canbus
- Expansion tank(s) (Delivered separately)

Cool/heat system batteries (separate supplied)

- Thermal management unit, for ideal battery temperature climatizing.

Control cabinet with 7" color screen and PLC

- 7" TFT color screen (*optional: vertical mounting possible*)
- Easy to interact with current machine logic (same as a conventional diesel internal combustion engine)
- Reading of, among others:
  - Speed
  - Required power
  - Available power
  - Battery capacity
  - Connected charging cable
  - Remaining run time at current power
  - Temperatures and pressures
  - Force start of charge/discharge cycle with the diesel internal combustion engine.
  - Running hours
  - Service intervals
  - Current SOC, Voltage and Current

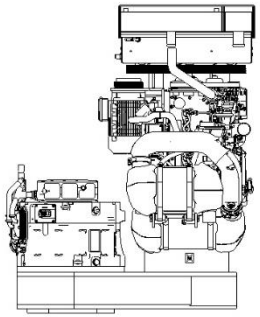
High Voltage connectors (separate supplied)

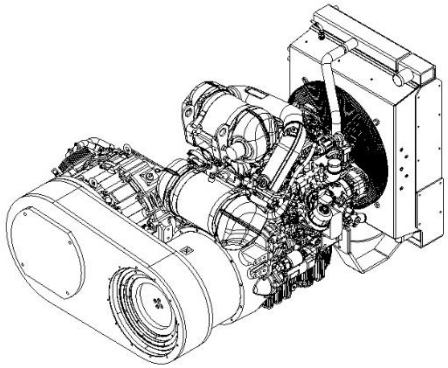
- For the batteries
- For the Inverter
- For the chargers

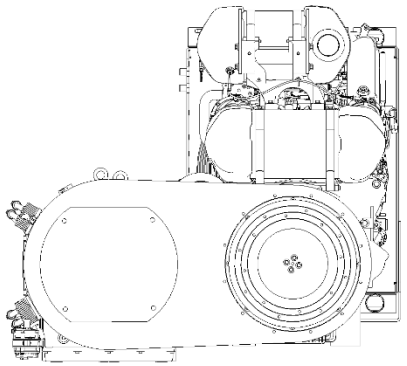
Cooling water connection couplings for the batteries (separate supplied)

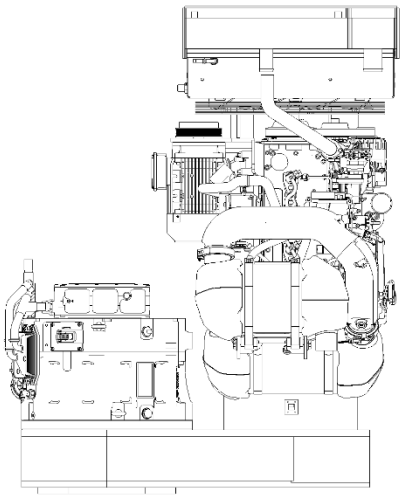
Commissioning, and installation supervision (2 days)

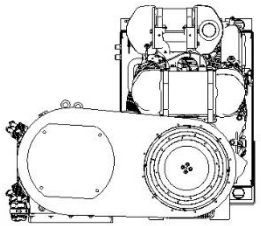
AutoCad drawings CHD-400 multi position setups REAR MOUNT

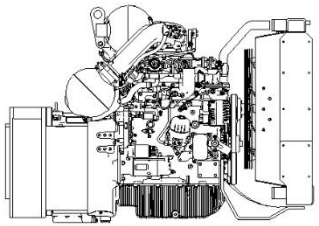


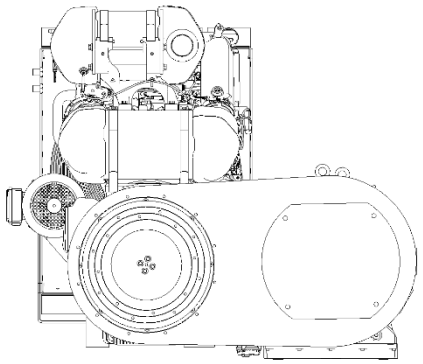


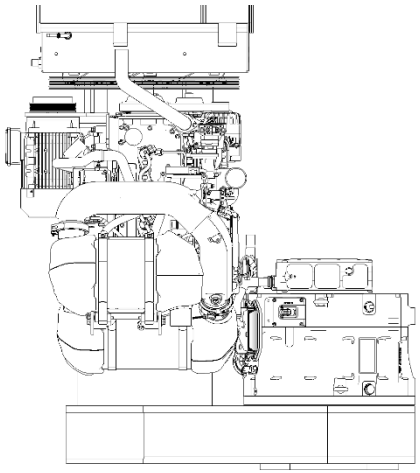


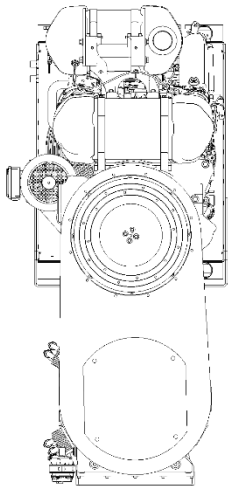


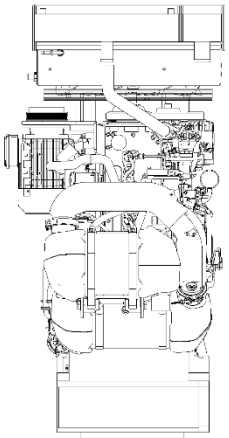




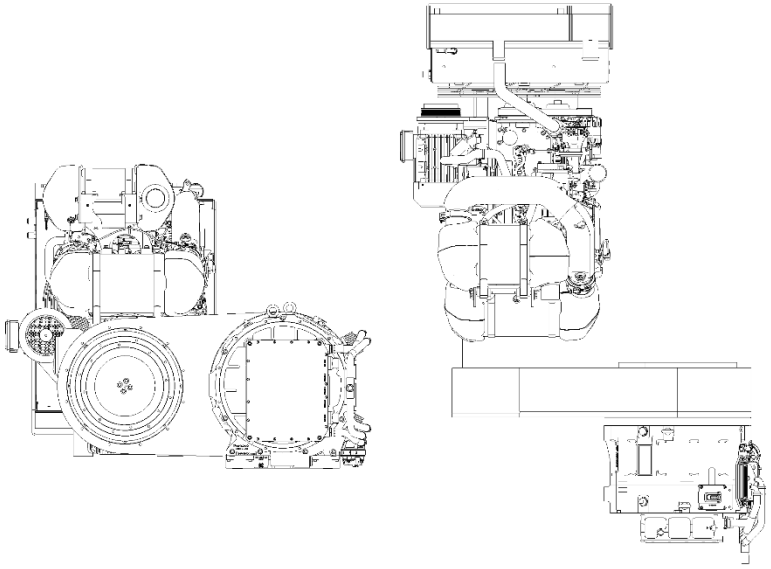


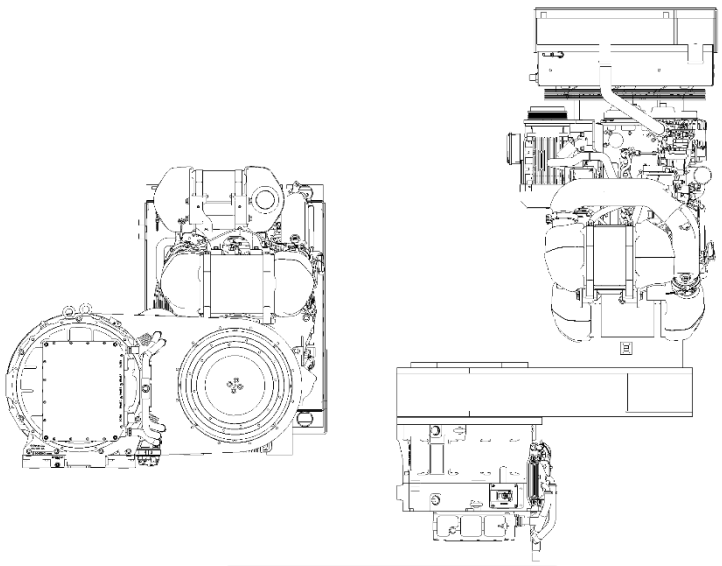


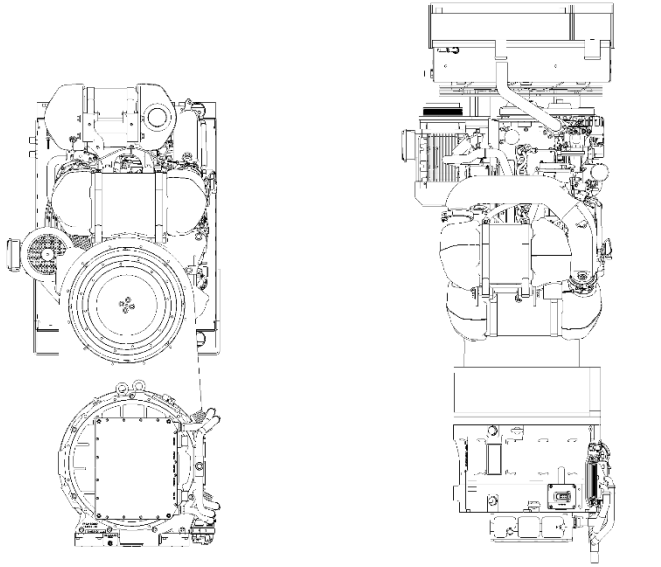


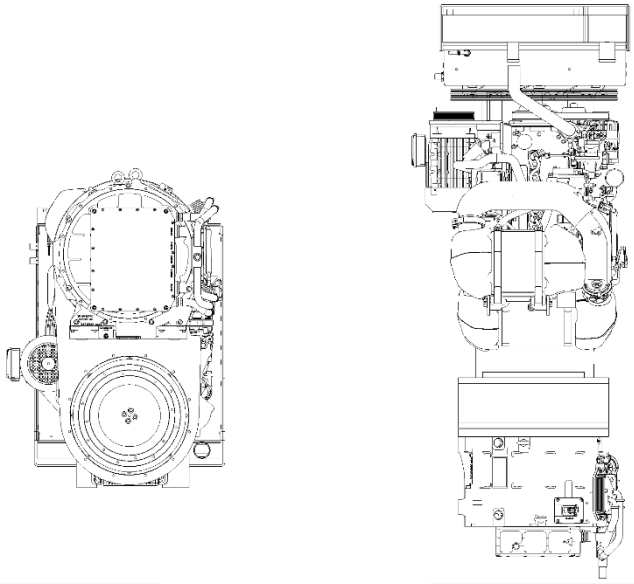


AutoCad drawings CHD-400 multi position setups FRONT MOUNT

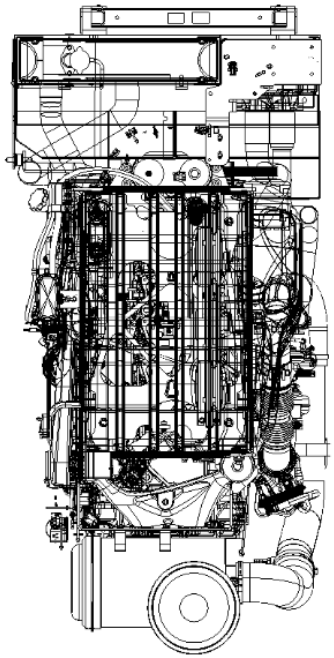


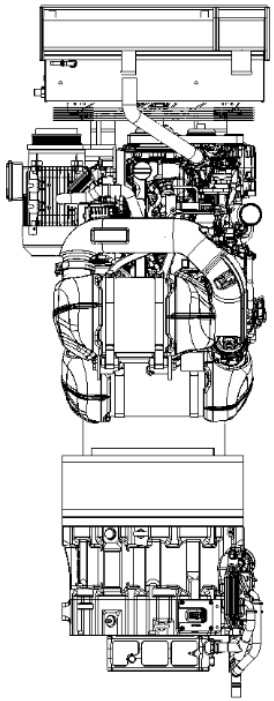


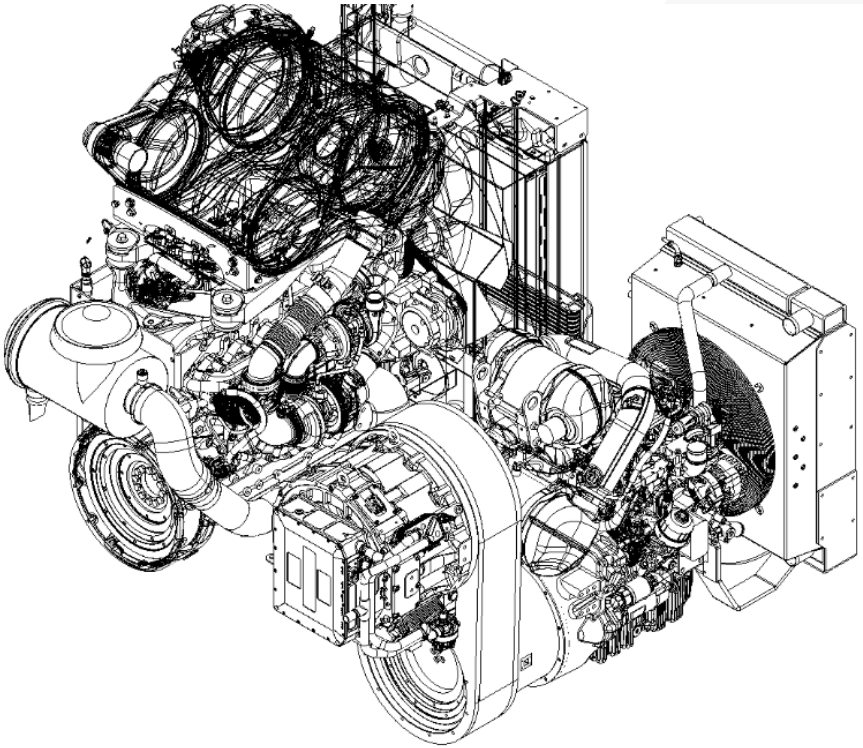


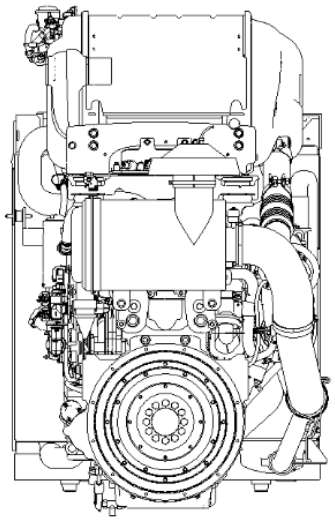


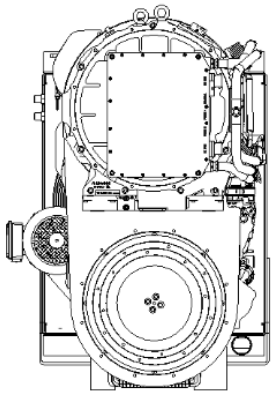
*AutoCad drawings CHD-400 compared to Caterpillar C7.1 EU Stage V

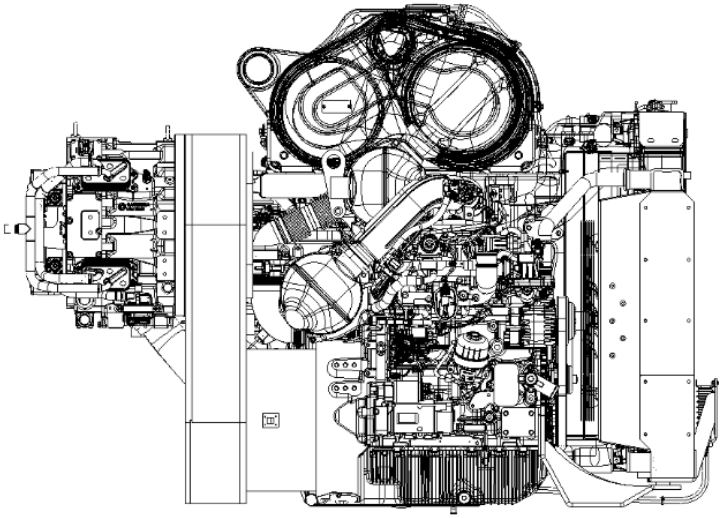


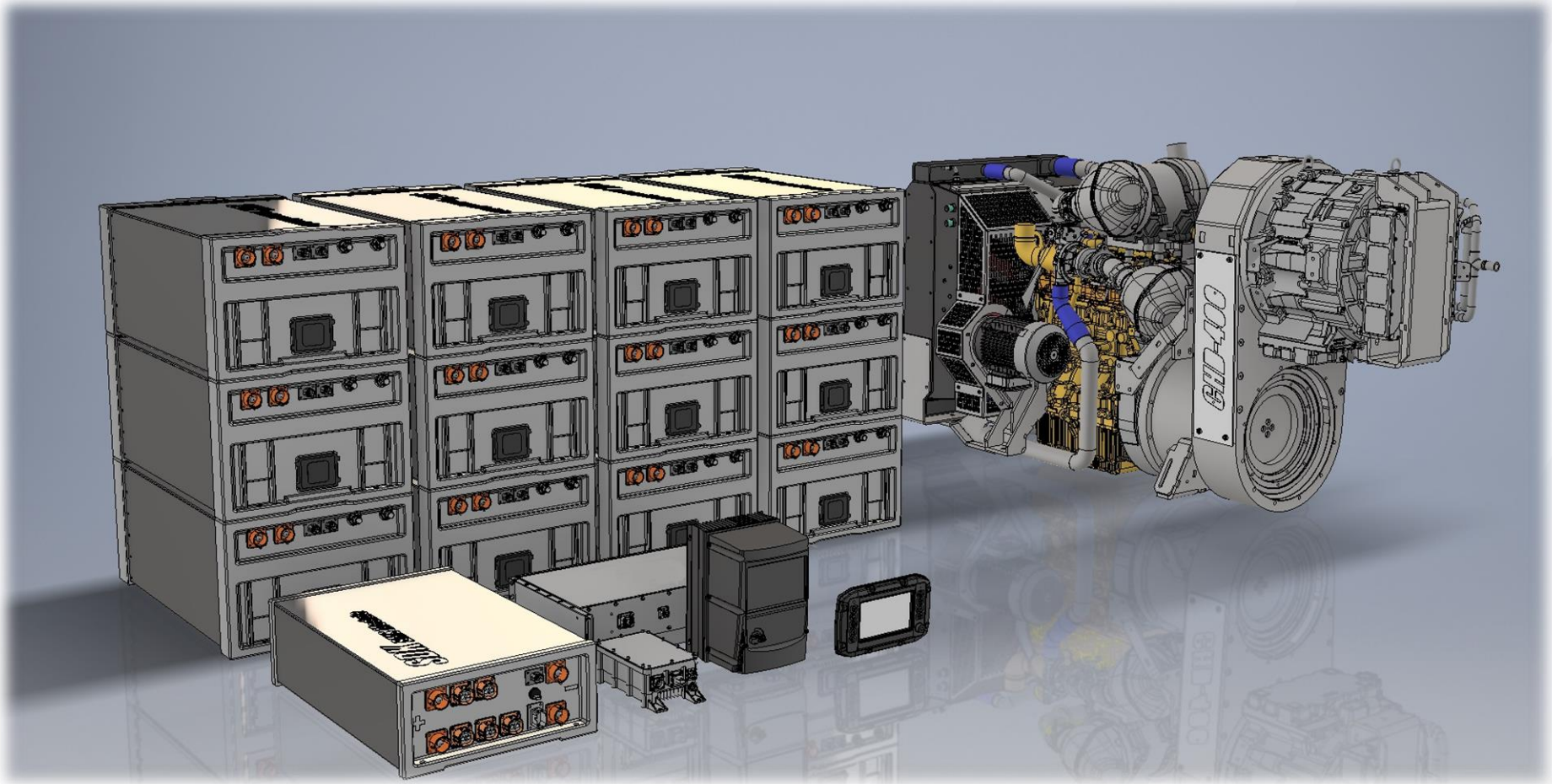











CHD-400

Optional to deliver

- Electric PTO with SAE B connection pad
- Electric AC Compressor
- Electric Cabin Heater
- Other make/ model/ power of combustion engine (also with Gas, BioGas, H2)
- Modulair expandable batterypack
- Higher load capacity
- Remote monitoring and online support

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