

# HYBRIDRIVE® ENERGY STORAGE SYSTEM (ESS)

BAE Systems HybriDrive® Energy Storage System (ESS) is based on lithium-ion nano-phosphate technology and uses an advanced battery module design to provide very high power and energy density in a compact, lightweight enclosure. The system delivers power during acceleration and peak power demands and accepts power (regenerative braking energy) during deceleration.

The use of lithium-ion technology enables the system to be substantially smaller and lighter than other energy storage options and unlike other technologies does not require air conditioning to cool the batteries. The significantly reduced system weight contributes to improved fuel economy, reduced brake wear and allows for greater weight capacity for passengers.

BAE Systems specifically uses a nano-phosphate version of lithium-ion chemistry for its thermal stability and the modular construction enables easy servicing.

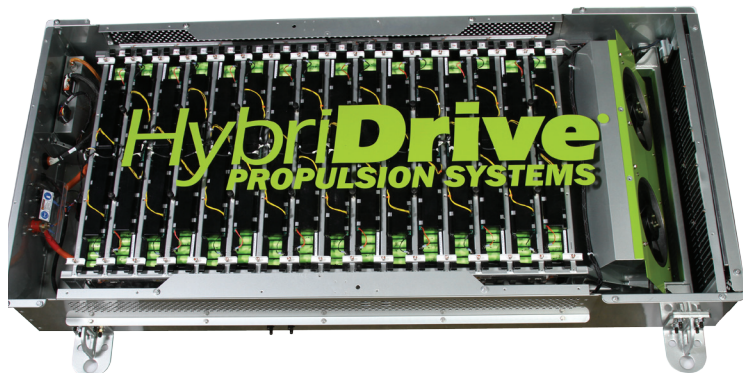
ESS is available for both the HDS 200 and HDS 300 systems.

## Features

- Best power density of any commercially available solution
- Nano-phosphate technology
- Lower weight
- Design life — 6+ years
- Ambient air-cooled
- Supports future enhanced-efficiency options
  - Full electric accessories
  - Engine stop/start mode
  - EV mode for zero-emission zones
- Cold-weather option for operation below 14°F (-10°C)

## Benefits

- Improved regenerative energy recovery and thus fuel economy
- Improved safety through the use of nano-phosphate technology
- Longer battery life decreases total life-cycle cost
- Does not require air-conditioning to cool batteries
- Path to zero-emission technology
- Better reliability and performance



Single air-cooled enclosure 84 x 41 x 12 inches (213cm x104 cm x 30 cm)  
16 individual modules each at 18 lbs (8.2 Kg)

# HYBRIDRIVE<sup>®</sup> ENERGY STORAGE SYSTEM (ESS)

## HybriDrive Energy Storage System (lithium-ion)

### Ratings

- Peak power:  $\pm 200$  kW
- DC bus output voltage: 500 - 700 V DC (635 V DC nominal)
- Operating temperature: -40°F to 125°F (-40°C to 52°C); cold-weather kit required below 14°F (-10°C)

### SIZE

- Height: 12 inches (303 mm)
- Width: 41 inches (1,041 mm)
- Length: 84 inches (2,135 mm)
- Weight: 800 lbs (363 kg), +50 lb (+23kg) with cold-weather option

### COOLANT — ambient air

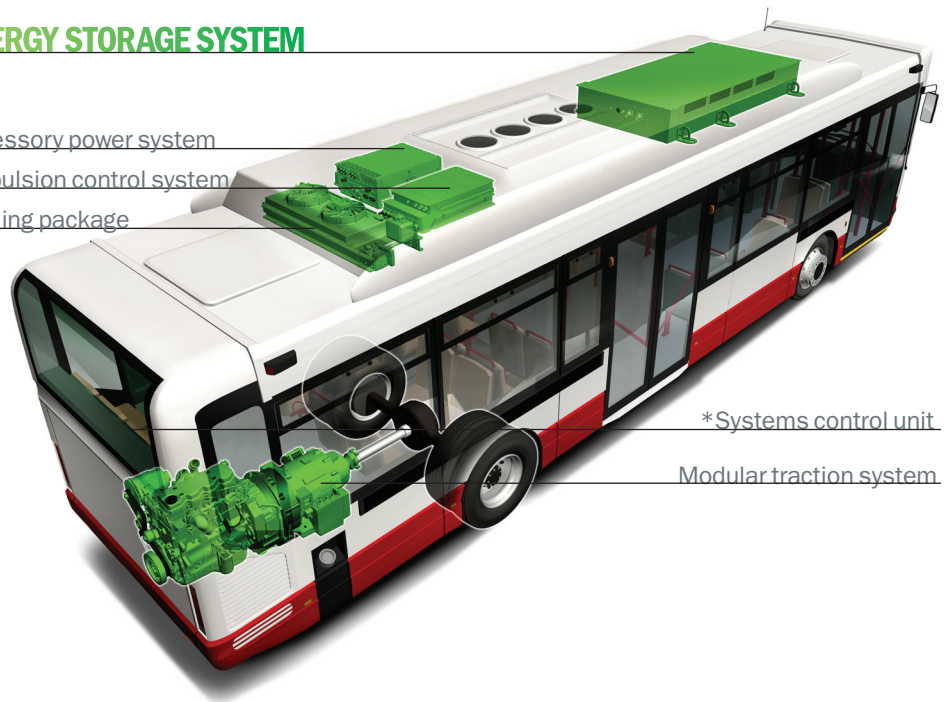
- Forced ambient air
- Provided by dual-integrated variable speed fans

## ENERGY STORAGE SYSTEM

Accessory power system

Propulsion control system

Cooling package



*\*Position may vary depending on OEM*

HybriDrive propulsion system components are sold as part of our HDS family of products and are available through BAE Systems qualified OEMs. Components are not sold separately.

BAE Systems  
600 Main Street  
Johnson City, New York 13790

BAE Systems  
Marconi Way  
Rochester Kent ME1 2XX

www.hybridrive.com

This document gives only a general description of products and services and except where expressly provided otherwise shall not form part of any contract. From time to time, changes may be made in the products or conditions of supply.

**Published work © 2011 BAE SYSTEMS. All rights reserved.**

The information contained in this document is proprietary to BAE SYSTEMS unless stated otherwise and is made available in confidence; it must not be used or disclosed without the express written permission of BAE SYSTEMS. This document may not be copied in whole or in part in any form without the express written consent of BAE SYSTEMS which may be given by contract.

BAE SYSTEMS is a registered trade mark of BAE Systems plc.