



xero|point
hybrid | INTEGRATED BY AKA

HYBRID MARINE POWER

clean and simple

A portfolio of innovation and partnership



AKA's XeroPoint hybrid system is proven to reduce emissions, improve fuel economy and enhance operational performance.

XeroPoint Hybrid - Proven Technology



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CAMPBELL FOSS



RT ADRIAAN



DRYDEN



RT EVOLUTION

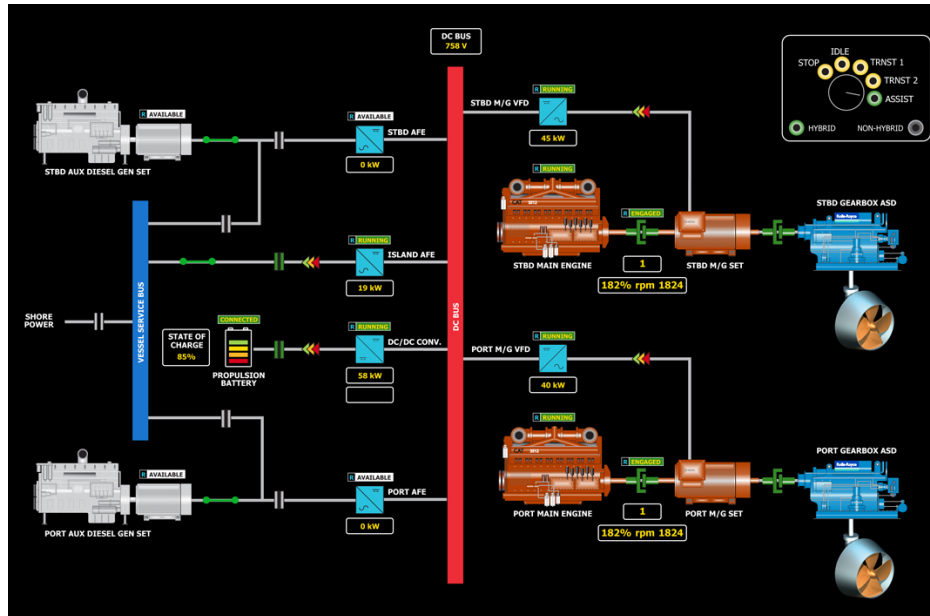


RT EMOTION

Owner	Foss Maritime	Foss Maritime	Kotug International	Bhagwan Marine	Kotug International	Kotug International
Vessel Configuration	Ship Assist Tug	Ship Assist Tug	Ship Assist Tug	Dive Support Vessel	Ship Assist Tug	Ship Assist Tug
Designed to Class / Regulatory Body	USCG	USCG	Lloyds	ABS	Lloyds	Lloyds
Class / Regulatory Notations	EPA Reduced Emissions	EPA Reduced Emissions	Lloyds Green Ship	DP2	Lloyds Green Ship	Lloyds Green Ship
Built	2009	-	-	2014	2014	2015
Retrofit	-	2011	2012	-	-	-
Current Status	Active in Ports of Long Beach/Los Angeles	Active in Ports of Long Beach/Los Angeles	Active in Port of Rotterdam	Active in Western Australia	Active in Port of Rotterdam	Active in Port of Rotterdam
Length	24m	24m	32/29m	57m	32m	32m
Tonnage (Gross/Net)	144/98	144/98	463/138	1500/440	491/147	491/147
Hybrid System	XeroPoint	XeroPoint	XeroPoint	XeroPoint	XeroPoint	XeroPoint
Battery Provision	208 KWhr Lithium Polymer battery bank	65 KWhr Lithium Polymer battery bank	78 KWhr Lithium Polymer battery bank	2x 65 KWhr Lithium Polymer battery banks	2x 39 KWhr Lithium Polymer battery banks	2x 39 KWhr Lithium Polymer battery banks
Main Engines	2x 1342 KW, Cummins QSK50	2x 1894 KW, Caterpillar 3512D	3x 1765 KW, Caterpillar 3512C	2x 950 kW Cummins QSK38-M Generators	3x 1765 KW, Caterpillar 3512C	3x 1765 KW, Caterpillar 3512C
Auxiliary Engines	2x 330 kW, Cummins QSM11, Generators	1x 125 kW John Deere 6081 Generator 1x 350 kW MTU Series 60 Generator	2 x 250 kW Caterpillar C9 Generators 1x 36 kW Caterpillar C 4.4 Harbour Generator	2 x 400 kW Cummins QSK19 Generators 1x 125kW Cummins QSB7 Emergency Generator	1x 450 kW Caterpillar C18 1x 200 kW Caterpillar C9	1x 450 kW Caterpillar C18 1x 200 kW Caterpillar C9
Motor-Generators	2x 900 KW, Siemens inline Motor-Generators	2x 500 KW TECO - Westinghouse inline Motor-Generators	3x 500 KW TECO - Westinghouse inline Motor-Generators	2x 830 KW, 1500 RPM Indar AC Induction Propulsion Motors	3x 500 KW TECO - Westinghouse inline Motor-Generators	3x 500 KW TECO - Westinghouse inline Motor-Generators
Propulsion	Rolls-Royce US205 Azimuthing Stern Drives	Rolls-Royce US205 Azimuthing Stern Drives	3x Schottel Rudderpropeller SRP 1215	2x Schottel STP 550 FP Twin Propeller Azimuth Thruster	3x Schottel Rudderpropeller SRP 1215	3x Schottel Rudderpropeller SRP 1215
Bollard Pull (Ahead/Astern)	64.5/60 tonnes	65/69 tonnes	84/82 tonnes	16 tonnes	80 tonnes	80 tonnes
Total Propulsion Power	3344 KW	3788 KW	5295 KW	1630 KW	5295 KW	5295 KW
Maximum Speed	14+ knots top speed	14+ knots top speed	10 knots transit mode	11 knots	12.5 knots	12.5 knots
Milestones	Worlds First Hybrid Tug Boat	Worlds First Retrofit of Conventional System to Hybrid System	Europe's First Hybrid Tug Boat	World's First Intrinsically Safe Egress Mode	-	-

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PROVEN HYBRID PROPULSION

- Full diesel electric and hybrid solutions for mission critical operations
- For OSVs our XeroPoint Hybrid systems can outperform full diesel electric in both redundancy and efficiency and at less cost
- XeroPoint Hybrid systems are certified by the EPA as an emission reducing technology
- Our systems are class approved for closed bus DP3 operations
- XeroPoint Hybrid systems can be retrofitted to conventional shaft lines to improve system efficiency and redundancy
- Our systems are energy storage ready to allow peak shaving, UPS capability, emergency egress and battery only operations



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