

helix

Mission Critical Electrical Powertrains

Delivering tactical superiority across land, sea and air



Powertrain Advantage



Advanced electric powertrains for the land, sea and air

Proven defence electrification partner

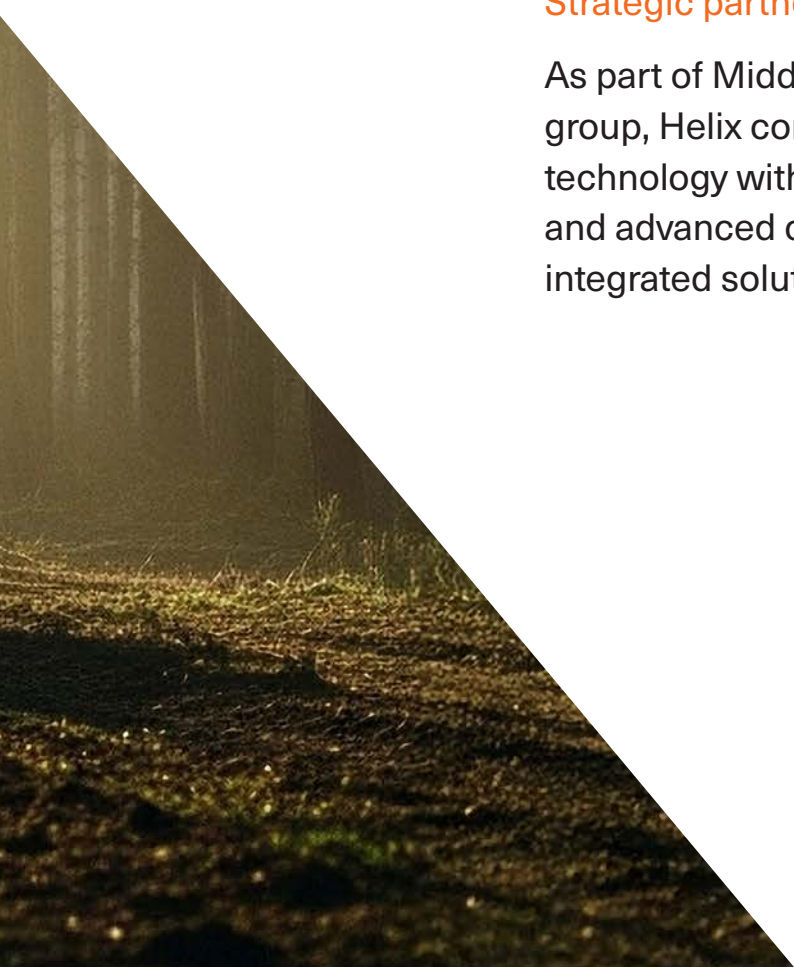
Helix delivers mission-ready electric powertrains engineered for mission-critical defence applications. With automotive racing heritage and aerospace-grade reliability, we provide tactical advantages across sea, air, and land platforms.

Tactical powertrains for modern warfare

Our electric motors and inverters deliver exceptional performance, efficiency, and reliability, specifically tailored for the demanding requirements of defence operations where failure is not an option.

Strategic partnerships for enhanced capability

As part of Middle Ground Capital's defence technology group, Helix combines cutting-edge motor and inverter technology with transmission expertise (Xtrac & Zoerkler) and advanced control software (New Eagle), delivering integrated solutions that exceed military standards



Key differentiators:

- **Combat-Proven Reliability:**
Tested in extreme conditions (-40°C to +85°C)
- **Mission-Critical Performance:**
5,000+ hour MTBF with built-in redundancy
- **Rapid Integration:**
Modular design cuts deployment time
- **UK-Based Design & Manufacture:**
Sovereign capability with secure supply chain
- **System-Level Engineering:**
Integrated powertrain systems for any vehicle type



Why Helix?

Operational superiority through advanced electrification

Industry Leading Specifications

- **Power Density:** >25kW/kg (3x industry average)
 - **Efficiency:** >97% peak efficiency across operational envelope
 - **Thermal Management:** >50% better continuous performance without degradation
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Immediate Tactical Advantages

- **Increased Payload:** Up to 50% more payload, thanks to smaller, lighter powertrains
 - **Extended Range:** Significant increases in mission range vs. diesel equivalents
 - **Instant Response:** Zero delay torque delivery for rapid manoeuvrability
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Stealth & Survivability

- **Silent Operations:** Low acoustic signature for covert missions and loitering
 - **Cold Profile:** Reduction in IR signature vs. conventional systems
 - **Electromagnetic Stealth:** Advanced EMI/EMC shielding for reduced detectability
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Battlefield Reliability

- **Extreme Environment Performance:** IP67 rating, -40°C to +85°C operational range
 - **Distributed Architecture:** Multiple redundancy systems ensure mission continuity
 - **Low- Maintenance Durability:** Long service intervals and few MRO interventions
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Versatility & Flexible Deployment

- **Scalability:** >Modular architecture supports 55kW to >1MW applications
- **Integration:** Expert vehicle integration support with customisable solutions
- **Rapid Deployment:** Upgrade existing vehicle architectures with proven systems

Land

Ground Superiority Through Electric Mobility

Armored Combat Vehicles

- **Survivability Enhancement:** Distributed power architecture reduces single points of failure, providing derate functionality in event of damage failure
- **Silent Watch:** Operation without engine acoustic or thermal signature, enabling improved stealth tactics
- **Instant Mobility:** Zero-delay response for threat evasion - reposition assets and personnel with maximum agility
- **Logistical Advantage:** Reduction in fuel consumption and supply requirements
- **Reduced Maintenance Costs:** Simple, durable electric drives extend maintenance intervals and reduce vehicle-off-road incidences

Unmanned Ground Vehicles

- **Modular Integration:** Scalable from 55kW to 650kW for diverse UGV platforms
- **Compact & Power-Dense:** Smaller powertrains free-up space and payload for mission systems or reduced overall dimensions
- **Extended Missions:** Highly efficient powertrains extract more range from the same power supply
- **Stealth Operations:** Low acoustic signature for covert reconnaissance
- **Rapid Response:** Instant acceleration for threat response or target engagement

Tactical Ground Vehicle Advantage

Helix powertrains provide decisive advantages from modern ground operations, from silent reconnaissance to armoured combat. From electric motor-generator upgrades to new range-extender systems and integrated transmissions, Helix has solutions to augment the capabilities.



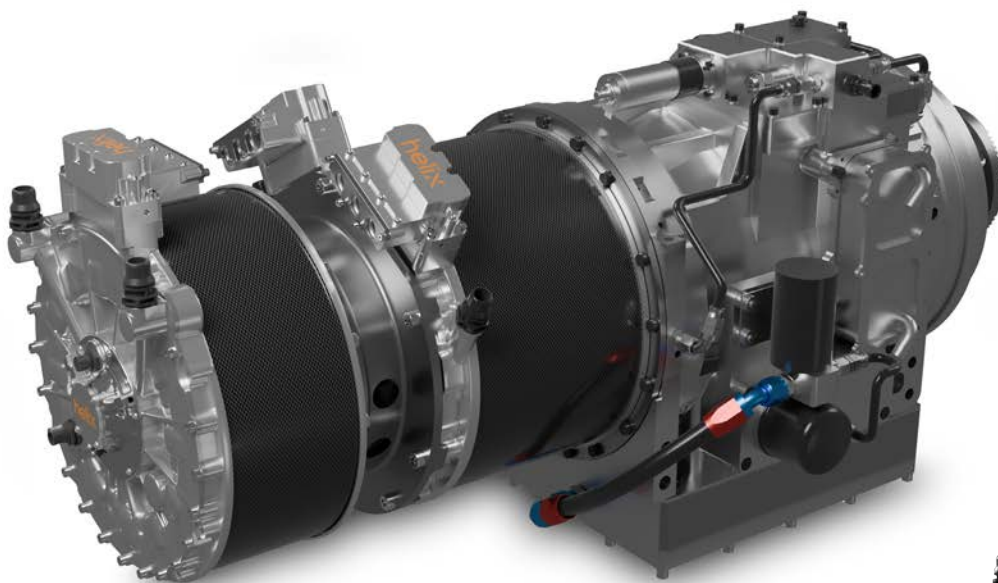
Advancing electrification on all fronts

Helix, Involution Technologies “drop-in” multi axle electric drive unit for 6x4 - 8x4 and 8x8 axle configurations providing upto 240kN traction performance on any terrain and in any climate.

A high-efficiency infinitely variable intelligent transmission with seamless and uninterrupted torque delivery. Up to 650kW peak and 450kW rated power, high launch torque (37kNm prop) at 20:1 constant-power range. Compact and integrated either as an e-Axle or inline EDU.

Key Features:

- Acceleration, gradeability, and VMax exceeding a modern diesel-powered vehicle
- Simple vehicle integration as a stand-alone drive module with TCU
- Durable and robust low-maintenance design
- Low operating cost >km/kWh
- Configurable modules for fleet versatility and line replacement units
- Robust low maintenance design and low service cost



Helix Motor Platforms	Peak Power kW	Peak Launch Torque Nm	Speed Range rpm*
SPC330-150 Through-shaft & SPC 330-75	650	37,000	6,000

* Representative product data for reference only. Consult Helix for precise data for your application.

Sea

Redefining naval power with advanced electrification

Naval Platform Advantages

Helix electric systems provide critical capabilities for modern naval operations, from silent reconnaissance to extended patrol endurance. Helix's electric powertrains enhance maritime capabilities across unmanned underwater and surface vehicles (UUV/USV's), hybrid naval vessels, and marine propulsion systems. Our technology delivers increased mission performance, enhanced stealth, and superior efficiency.

Unmanned Maritime Systems

- **Extended Loitering Time:** augmented autonomous operation capability
- **Silent Running:** Sub-acoustic operation for covert intelligence gathering
- **Enhanced Manoeuvrability:** Precise station-keeping and low-speed control
- **Compact Packaging:** Optimised for power-density & design freedom
- **Modular Integration:** Compatible with existing USV/UUV platforms, 'drop-in' packages.

Surface Vessel Applications

- **Hybrid Propulsion:** Seamless diesel-electric transition for optimal efficiency
- **Rapid Response:** Instant acceleration for threat evasion or target pursuit
- **Silent Watch:** Zero-emission loitering operations
- **Reduced Signature:** Minimized acoustic, thermal, and electromagnetic profiles
- **Flexible Integration:** Configurable installation options for simple integration

Innovative Propulsion Solutions

- **Pod-Drive Integration:** Direct retrofit capability for existing vessels
- **High Efficiency Gen-Sets:** 95%+ electrical efficiency under all load conditions
- **Redundant Systems:** Dual-motor configurations for mission-critical applications



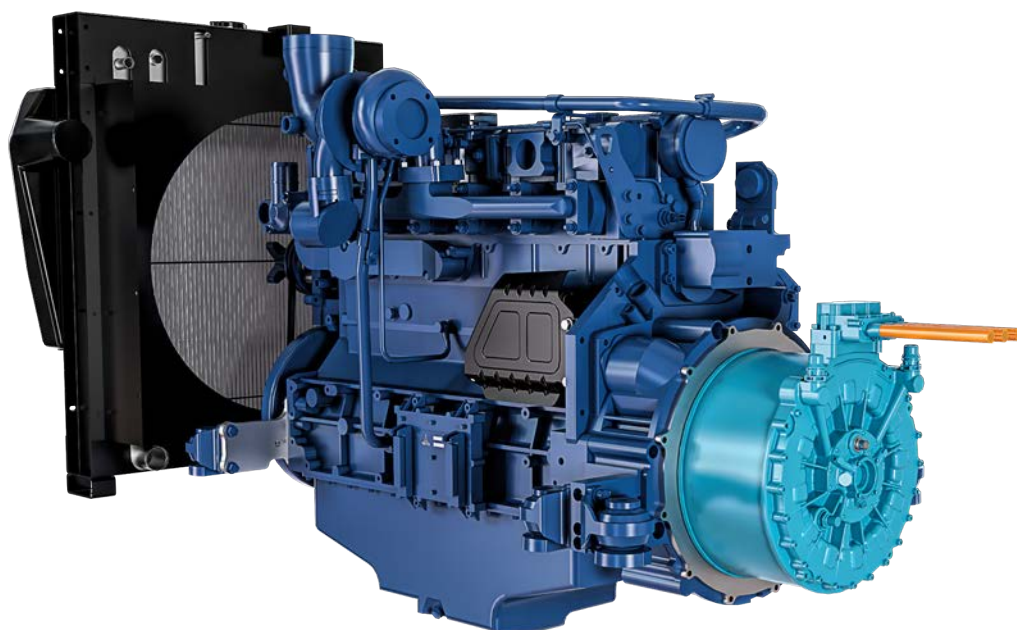
Hybridised generator sets

Hybridised generator sets combine electric and conventional ICE power sources to create flexible propulsion systems offering improved efficiency and reduced emissions compared to ICE alone.

Highly versatile, hybridised generator sets may be tailored to suit specific vessel requirements. Seamlessly transitioning between electric and traditional power, they deliver the best of both worlds, reducing emissions and overcoming challenges in energy storage for the most demanding applications.

Benefits of a Helix hybridised generator set:

- High efficiency, contributing to overall fuel efficiency in a hybrid generator set
- Instantaneous torque
- Reduced noise and vibration compared to ICE alone
- Energy recovery through regenerative braking
- Precise power control, enhancing the overall performance and reliability of the hybrid system
- Integration with energy storage systems, allowing energy storage during low load or surplus power conditions
- Flexible configurations
- Enhanced redundancy



Helix Motor Platform	Continuous Power kW	Continuous Torque Nm	Speed Range rpm*
SPC330-150	585	2,000	6,000

* Representative product data for reference only. Consult Helix for precise data for your application.

Air

Aerospace electrification for next-generation platforms

Advanced Air Mobility & Combat Systems

Helix delivers the power density and reliability required for future air combat and support platforms.

Stealth & Combat Aircraft

- **Next-Gen Performance:** Cutting-edge technology for 5+ and 6th-gen aircraft
- **Tactical Power:** Unrivalled power generation capabilities – 25kW/kg continuous
- **Instant Response:** Zero-lag actuator control for enhanced manoeuvrability
- **Mission Reliability:** Multi-redundancy systems for flight-critical applications
- **Minimise Maintenance:** Longer service intervals for reduced MRO cost

Unmanned Aerial Vehicles

- **Extended Endurance:** >50% increase in mission duration through hybrid systems
- **Payload Optimization:** Lightweight design increases lethal/sensor capacity for same MTW
- **Silent Operation:** Reduced acoustic signature for covert surveillance
- **Cold Profile:** Reduced IR signature vs. conventional systems
- **Mission Ready:** Advanced solutions available for rapid deployment today

More Electric Aircraft (MEA)

- **Precise Control:** Low inertia rotor architecture for ultra-responsive actuation
- **Less Bleed Air:** Powerful electric air compressors provide high mass flow, reducing bleed air
- **Advanced Pumping:** >100,000 rpm motors deliver fuel/oxidiser in minimal space/mass
- **Efficient Integration:** Distributed inverter & integrated cooling/gearing for minimal packaging
- **Upgrade Today:** Compatible with existing aircraft electrical architectures



Helix Motor Platform	Max Power kW	Continuous Power kW	Mass kg	Speed rpm	Max Power Density kW/kg
SPX177	711	660	28.3	25,000	25.12

* Representative product data for reference only. Consult Helix for precise data for your application.

Advanced Air Mobility EPU's

Helix's geared electric power units (EPU's) set new standards for advanced air mobility by delivering high prop-shaft torque and power at significantly lower mass and reduced diameter compared to direct-drive motors.

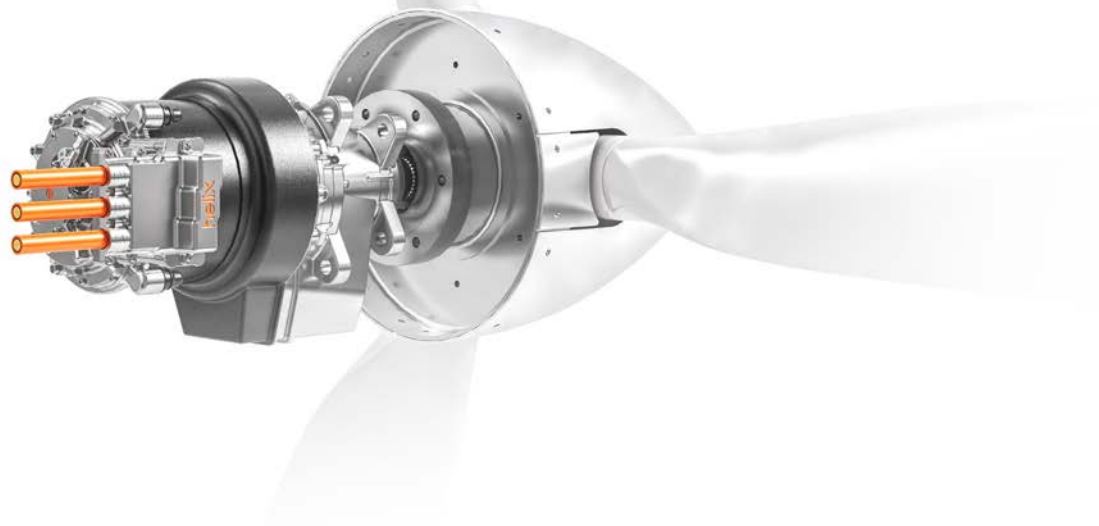
This compact, lightweight design directly increases mission range by allowing more onboard energy storage and reduces drag for improved cruise efficiency.

With transmission efficiencies exceeding 98% thanks to advanced oil-jet lubrication, Helix EPU's outperform direct-drive units, especially at high speeds, resulting in lower energy consumption and further range extension. Integrated oil pumps and cooling systems within the motor design ensure the lightest, most compact, and airframe-friendly solution available.

Helix offers tailored EPU options for lift, cruise, and tiltrotor applications:

- Lift EPU's deliver over 100kW for take-off and landing, with up to 1600Nm torque below 1000rpm, contributing to reduced aircraft noise signature
- Cruise EPU's provide up to 400kW maximum power and 250kW continuous power at higher propeller speeds, enabling superior power density and lighter bearing systems ideal for AAM and CTOL aircraft

By combining industry-leading power density, efficiency, and integrated cooling, Helix EPU's offer unmatched performance, reliability, and operational flexibility for next-generation electric and hybrid aircraft.



Helix Scalable Core Technology Motors

Helix's Scalable Core Technology Motors deliver industry-leading performance through a modular platform architecture.

These ultra-high-performance radial flux motors offer peak power from 150kW to 2000kW, torques up to 2000Nm, and speeds reaching 30,000 RPM with >98% efficiency. Manufactured in-house using patented rotor and cooling technologies, they have power

record-breaking applications including Formula E, VW's ID.R Pikes Peak champion, and hypercars like Lotus Evija, Czinger 21C and Aston Martin Valkyrie. Available in off-the-shelf and customer-specific variants, this scalable approach ensures rapid deployment, cost efficiency, and seamless integration across all sectors including defence.

Current core technology platforms

Series	Model	Peak Power [kW]	Continuous Power [kW]	Peak Torque [Nm]	Continuous Torque [Nm]	Mass [kg]	Max Speed [rpm]
SPX	177-45	150	120	120	77	13.7	23,500
	177-80	250	200	200	135	19	23,500
	242-50	250	203	250	165	23.2	17,000
	242-94	400	300	470	286	31.3	17,000
	242-175	400	300	925	566	51	8,700
	330-75	210	210	670	600	48	6,000
	330-95	400	300	1000	615	51.4	6,000
	330-150	250	208	1670	1268	67.8	2,000

Latest core technology platforms*

Series	Model	Peak Power [kW]	Continuous Power [kW]	Peak Torque [Nm]	Continuous Torque [Nm]	Mass [kg]	Max Speed [rpm]
SPC	177-40	150	79	105	59	14	23,500
	177-80	250	159	210	127	20	23,500
	177-160	357	300	400	260	31	23,500
	242-50	250	204	270	159	27	17,000
	242-100	400	300	500	325	39	17,000
	242-175	600	482	975	587	57	17,000
	330-75	340	300	800	677	50	6,000
	330-150	650	585	2000	1380	74	6,000

* Due for market release Q2 2026

Advanced inverter technology

Sitting between the energy store and motor, the inverter is an essential component in any electric propulsion unit.

Helix has developed its own high efficiency inverters. With high-performance water cooling and proprietary control software, they deliver optimised output. Combined, Helix motor and inverter technology delivers reliability, dynamic performance and extended real world battery range.

Features

- 1200V Silicon Carbide power stage
- Proprietary inverter & motor control algorithm
- High velocity direct water cooling
- Aluminium housing
- Peak Power >550kW
- Peak Phase Current >750 Arms
- Mass 10.5kg



Our latest CTI-4 800V Silicone Carbide inverter

X-Division

Beyond Scalable Core Technology

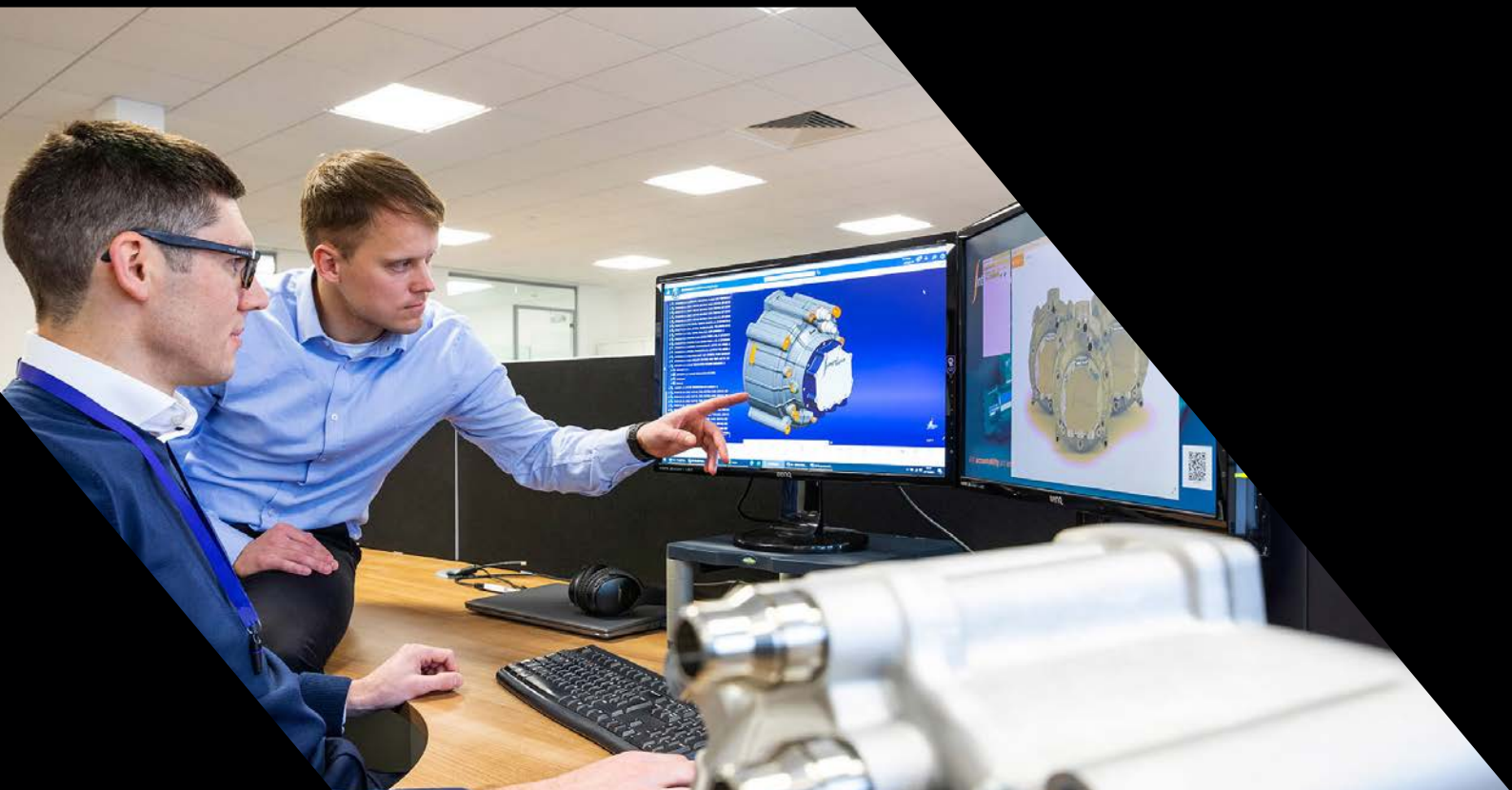
With Helix X-Division, you're not just acquiring a powertrain; you're gaining an undeniable edge.

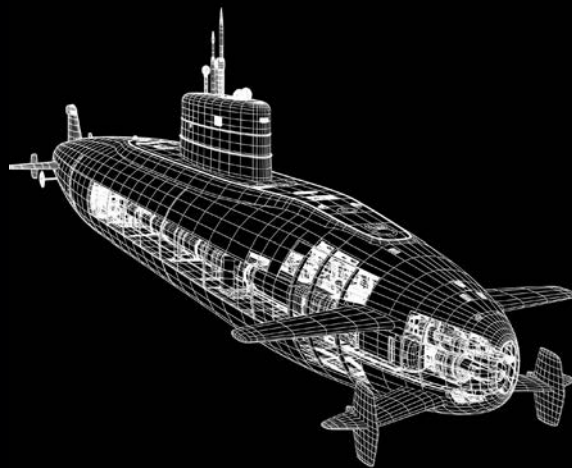
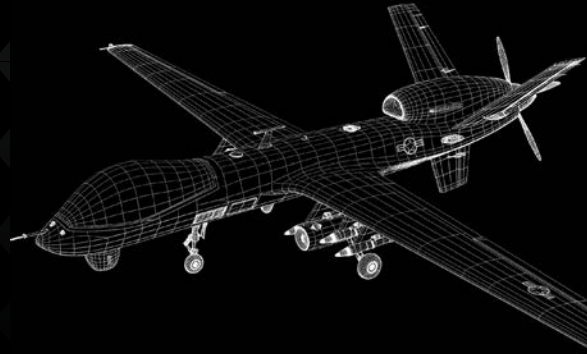
We engineer bespoke, cutting-edge electric powertrain solutions that push the absolute limits of performance, enabling you to confidently launch products that lead the future of Defence and redefine industry benchmarks.

- **Unmatched Technology:** Developing cutting-edge electric powertrain technology, including advancements in Scalable Integrated Motor and Inverter (SIMI).

- **Tailored Collaboration:** From complex integration to compatibility with extreme environments, we partner with you to meet your toughest challenges.
- **Flawless Precision:** Achieving ultimate control mastery through innovative techniques like Dynoless testing.
- **Competitive Edge:** Maintaining and advancing technological leadership through internal projects and partnerships with forward-thinking clients.

Partner with us to transform your vision into market-leading reality, knowing your solutions are powered by the pinnacle of innovation.





Helix: Tactical Powertrain Advantage

helix

Powertrain Advantage

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Part of the MiddleGround Capital group of companies.

Defence/20250801/EN