

Allied Motion

Motion Solutions That Change the Game



Advanced Motion Solutions For Aerospace & Defense

Advanced Motion Control Solutions for Aerospace & Defense

Allied Motion products are in use in wide ranging aerospace industry and defense system applications. Allied Motion possesses the expertise, products, and global presence to provide you with the motion solutions you need in today's highly competitive world.



Specialized Motion Control Solutions are Our Specialty

Allied Motion provides motion solutions to a wide range of companies throughout the world. Our motion products and systems are employed in aerospace and defense, commercial, and industrial markets. The key industries we serve in those markets are summarized further below.

Allied Motion's COTS and custom brushed DC and brushless DC motor technology is commonly used by OEM's and Tier-1's for commercial aircraft actuator motors, high speed drone surface control, munition control, ground vehicles, weapons and many other defense applications.

Our patented automated winding technology ensures consistent performance in harsh environments and extreme temperatures.



For gear motor and gear box applications, our ITAR-approved manufacturing facilities produce all our internal & external gears domestically using high tolerance power skiving CNC's, gear hobbing automation and state of the art gear inspection equipment delivering up to AGMA 11 precision.



Why Choose Allied Motion to be Your Motion Solution Provider?

A 70+ Year History of Application Success!

For 70+ years, Allied Motion's technology has supported both rotary and linear motion applications for munitions, ground vehicles, as well as manned and unmanned military and commercial aircraft programs.

Application Assistance

Allied's application engineers help you with product selection and integration.

Global Reach Solution Centers

Three strategically located Solution Centers – North America, Europe, Asia – offer local support to make it easy to do business with us. "We speak your language."

Advanced Technology Products

Allied Motion develops advanced-technology products that enable our customers to "change the game." We strive to produce the most compact, innovative products with the highest performance at a competitive price.

Lean Enterprise: Allied Systematic Tools (AST)

Allied Systematic Tools (AST) is our set of lean enterprise business tools that drive continuous improvement. AST insures that our customers receive the highest quality products and service at the best possible price.

Quality

Our commitment to continuous quality improvement by applying Lean Six Sigma principles and by achieving ISO and AS certifications is a way of life at Allied Motion.

Example Allied A&D Solutions

Munition Programs

*fin control/seeker motion/
high-G gun hardened applications* 4-5

Military Aircraft & Ground Vehicle Programs

*fuel pumps, gimbal control, SATCOM,
door actuation...* 6-7

Commercial Aircraft

*fuel pumps/HVAC/auto pilot/
door actuation/anti-vibration/
pitch trim control/pilot controls/
miscellaneous actuation operations* 8

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Munition Programs

Allied Motion's library of mil-spec qualified motors & actuators for fin control, seeker motion and high-G gun hardened applications support new and legacy munition programs.



Programs with Allied Motion Solutions:

- AGM-88 HARM
- AGM-65 Maverick
- AGS-155
- AGM-154 JSOW
- AIM-120 AMRAAM
- BGM TOW Launcher
- GMLRS
- M-47 Dragon Anti-Tank
- MIM-72A Chapparral
- Paveway III
- RIM 66 Standard Missile
- SM-2
- Stormbreaker (SBDII)
- Tactical Tomahawk

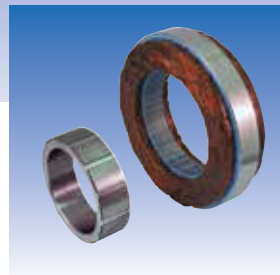
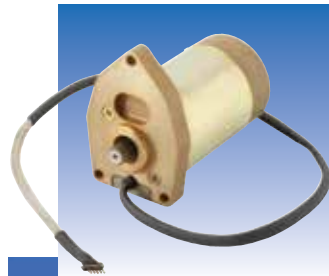
Missile Fin Control Actuation Systems

Allied Motion's actuators, controllers, motors and gear boxes are commonly specified for new and legacy munition programs. We offer a number of unique electro-mechanical based solutions with mil-spec brushed DC or brushless DC motors with integrated gearing to achieve precise fin rotation where performance matters.

Allied Motion also has a library of mil-aero qualified gear motor actuators rated for ballistic shock and demanding environments. Our in-house life cycle verification, environmental testing, magnetics expertise and simulation capability continue to position Allied Motion as a preferred supplier for missile steering control.

Missile Seeker Control

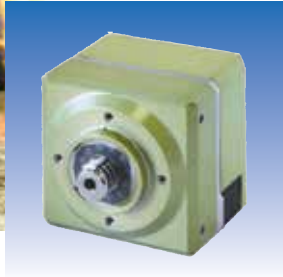
Allied Motion's frameless torque motors, as well as our brushed and brushless DC motors are used to provide roll, de-roll and nod motion for missile seeker applications.





Mid-Range Munition Guidance Motors

The Mid-Range Munition (MRM) is a precision guided munition fired from a tank. The MRM will autonomously attack battlefield targets with pinpoint accuracy at beyond line-of-sight ranges of 8+ km.

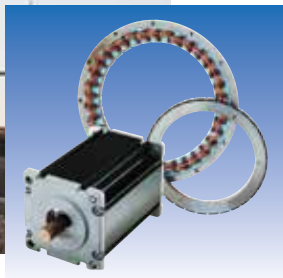


Allied Motion engineers developed special motor-encoder units capable of withstanding very high g-forces. The motors control the motions of an “eyeball” seeker head platform nestled in the nose of the MRM projectile.



Mobile Weapons Platform Motors

Remotely operated weapons platforms enables a gunner to remain protected inside his or her vehicle while accurately operating this computer-stabilized, laser-aimed, remotely-mounted weapon.



Allied Motion’s frameless Megaflux torque motors control three sets of azimuth and elevation axes, while our Quantum servo motor powers the weapon’s cocking actuator. The result is fast, accurate firing with the weapon’s operator safely controlling the weapon remotely.



Missile Seeker Optical Motor-Encoder

Allied Motion engineers have designed a high resolution optical motor-encoder limited-angle actuator to meet the extremely demanding requirements of modern standoff weapons. The CM-900 positions an infrared imaging seeker, a critical part of the weapon’s precision autonomous guidance system.



The CM-900 includes an 18-bit absolute encoder and limited-angle torque motor. The encoder has a high bandwidth 2000 Hz (word rate) serial interface for high resolution and high speed positioning.

Military Aircraft and Ground Vehicle Programs

For flight surface control, our COTS and custom mil-spec brushed DC and brushless DC motors can be integrated into linear and rotary actuators.



Programs with Allied Motion Solutions:

- CH-47 Chinook Rotorcraft
- CH-53 Super Stallion Rotorcraft
- F-35 Joint Strike Fighter
- HH-60 Pave Hawk Rotorcraft
- Joint Multi-Role Rotorcraft
- KAI
- KC-10 Extender Tanker
- MQ-1 Predator UAV
- V-22 VTOL

Auxilliary Unit Fuel Pump Motor

In the control of gas turbine engines used in aircraft auxiliary power units that must operate at tens-of-thousands of rpm, fuel pump frequency response and reliability are two key design parameters.

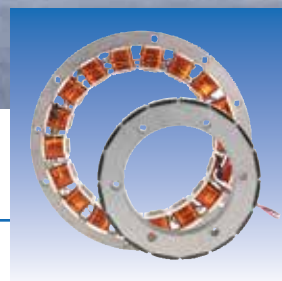
Allied Motion engineers worked with the manufacturer of this gerotor-type turbine fuel pump to optimize the parameters of the pumps motor, an Allied Motion Megaflux brushless torque motor, which resulted in an economical solution that exceeded performance and reliability goals.



UAV Gimbal Motion Control Motors

Advanced micro-gimbals with high performance inertial stabilization technology are found on both land-based and aerial platforms such as military surveillance UAVs.

The full motion EO imager system shown here attains continuous pan, $+40^{\circ}$ – -220° tilt and 200°/sec slew rates using custom-designed Allied Motion brushless torque motors.





Pilot Cooling System Pump Motors

Pilots in military helicopters wear special flight suits featuring microclimate cooling. Cooling fluid is pumped through the suits by a special pump system driven by a brushless DC motor.

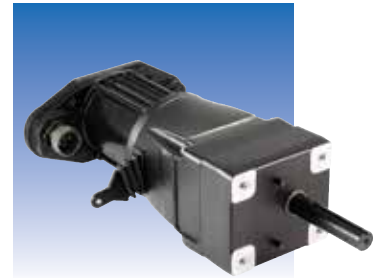
Allied Motion helped the pump and cooling unit manufacturer achieve required system reliability with a custom KM 54 brushless DC motor solution. Featuring integrated drive electronics within the motor to keep connections to a minimum, the motor also features a specially designed housing that has a high IP54 protection level.



Door Actuation

For the opening and closing of doors used in aircraft fueling, landing gear, munition launch, as well as ground vehicles, performance is just as important as reliability.

Allied Motion offers mil-aero qualified linear actuators and gear motors used to open, close and latch doors on a number of aircraft, ground vehicles, marine, underwater, munition launch and refueling applications.



Mobile SATCOM Motion System

Broadband communications with on-the-move vehicles on land, at sea, or in the air, are now a reality thanks in part to advanced motion systems that enable very accurate satellite tracking, even as vehicles experience high dynamic levels of motion and vibration.

Allied Motion's frameless Megaflux torque motors enable tightly integrated yaw, pitch and roll axes in SATCOM antenna systems. Mated servo drives are also integrated with the motors in some cases making for extremely compact designs.



Commercial Aircraft

Allied Motion's frameless torque motors, DC motors & actuators support the single aisle, long range and biz jet market for fuel pumps, HVAC, auto pilot, door actuation, anti-vibration, pitch trim control, pilot controls and other misc actuation.



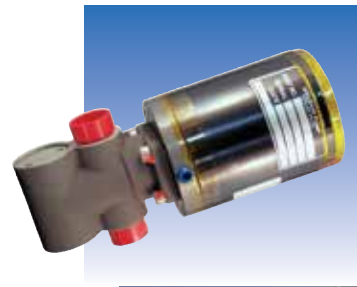
Programs with Allied Motion Solutions:

- Airbus
- AgustaWestland/Leonardo
- Boeing
- Bell
- Cessna
- Cirrus
- Embraer
- Eurocopter
- Jiangsu A-Star
- Fuji Heavy Industries
- Honda
- Ikana
- LET
- Pilatus
- Piper
- Sikorsky/Lockheed Martin

Emergency Fuel Boost Pump Motors

Many small propeller-driven aircraft benefit from a two-speed pump that maintains fuel pressure while cruising, and is able to boost fuel delivery for takeoff and landing.

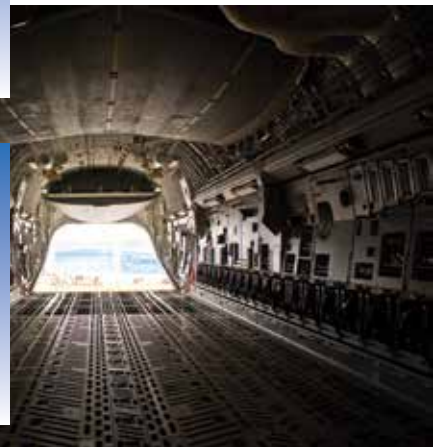
An aircraft pump manufacturer consulted Allied Motion for such a two-speed fuel pump motor solution. Allied's design team engineered a unique solution in which a standard Endurance 25 brushed DC motor was modified to accept two different voltages. This enabled our customer to supply a reliable two-speed pump that doesn't stall, as was the case with some other motors tried previously in the same application.



Cargo Loading Systems

Aircraft cargo loading systems are equipped with several motors to enable freight loading and unloading automation.

Allied Motion engineers have developed servo-controlled motors and frameless torque motors used within the positioning unit on commercial wide body and narrow body aircraft cargo loading systems. With Allied Motion, your performance and reliability goals are exceeded.



Robotics/Unmanned Vehicle Motion Solutions

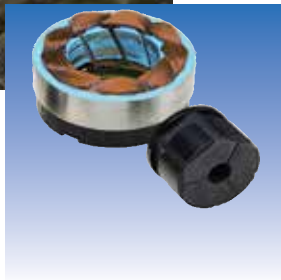
Allied Motion's products and systems are in use in a very wide range of unmanned vehicle-related applications such as AGV traction and steering, military tracking and fire control, gimbal motion control, satellite tracking and many others.



Multi-Mission Robot Control Motors

Accommodating multiple heavy payload types, and able to perform multiple mission types (explosive ordnance disposal, route clearing, reconnaissance, and more), multi-mission robotics are designed to rapidly negotiate rough terrain and even climb stairs while handling heavy payloads.

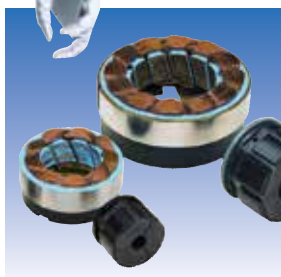
Allied Motion supplies rugged frameless brushless DC torque motors used in robotic arm motion, as well as outer-rotor BLDC motors for track chassis motion on multi-mission robots.



Dual-Arm Military Robot Motors

Shown here mounted on the robot's mobile base is a dual-arm robotic manipulator system that is capable of lifting 110 lb (50 kg) and handling a myriad of field missions with human-like handling abilities.

Each arm assembly utilizes Allied Motion brushless torque motors to achieve 20 degrees of freedom, giving the arm unmatched dexterity. The arm has a load capacity of 50+ lb (22.7 kg) and a total mass of only 16 lb (7.3kg).



Standard Products



- Brushed DC Motors
- Brushless Direct Drive Torque Motors/
Outer Runner Motors
- Gear Motors
- Gear Trains
- Mil-Aero AC Motors
- Mil-Aero Blowers
- Vehicle Traction and Steering

Custom & Specific Purpose Products

A recognized strength of Allied Motion is our willingness and ability to develop custom motion control products and systems to meet the specific needs of customers with critical, highly specialized performance criteria. We may start with one of our standard products and modify it as needed, or as often is the case we start with a "clean sheet" and develop exactly what is needed when a modified standard will not suffice.

Shown at right is a sampling of some of the custom and specific purpose products we've developed for our customers.



Allied Motion Solution Centers



Allied Motion maintains Solution Centers in three geographically strategic locations to assist our customers with all aspects of their product selection and buying decisions. These three facilities assure you of local support no matter your location around the globe.



Each Solution Center is manned by experienced application engineering and customer service teams, which are available to provide:

- Application analysis assistance
- Detailed product information and documentation
- Standard product selection
- Product customization and options guidance
- Specification development assistance for custom-design products
- Price quotations
- Ordering, order status and shipment information
- Logistics assistance



For assistance with all of your motion applications, contact us at one of our continental Allied Motion Solution Centers.

Allied Motion also has a global network of factory trained selling partners to serve you. Call us; we'll put you in touch with an Allied Motion sales partner near you.



Allied Motion Solution Center NA



Motion Solutions That Change the Game

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