

## HKP Motors Power Ambulance Cots for Emergency Patient Transport



Motorized ambulance cots are medical devices that assist emergency medical service (EMS) providers. They're designed to safely load, unload and transport patients in and out of an ambulance. The cots are motorized to ease the physical strain on EMS personnel and to enhance patient safety during the process.

Motorized ambulance cots feature the following elements:

- **Frame:** motorized cots require a sturdy frame that can support the weight of the patient.
- **Motorized Actuators:** cots are equipped with motorized actuators, which convert electrical energy into mechanical movement. These actuators allow for powered adjustments to the cot's height, angle and position.
- **Control Panel:** allows EMS personnel to raise, lower, tilt and adjust the cot.

- **Power Source:** cots are typically powered by rechargeable batteries, which can be quickly replaced to ensure that the cot is always ready to use.
- **Adjustable Height:** facilitates the transfer of a patient between the cot and other surfaces, such as a hospital bed or emergency room stretcher.
- **Patient Restraints:** integrated restraints or belts help to ensure patient safety by restraining the patient's movement during transport.
- **Locking Mechanisms:** secure the cot in place during transport and when stationary.



### Application Description:

Small slot-less BLDC motors power the hydraulic assembly. Load sensor and bumper detection technology reduces the chance of cot damage and medic or patient injury. The BLDC slot-less motor must provide enough kinetic energy to drive the hydraulic pump and bumper for precise speed and position control.

### Application Challenges:

- A small slot-less BLDC motor can reduce the weight of the cot.
- High output torque and overload capacity are needed to lift heavier patients.
- Voltage below 36V makes the device safer by avoiding electric shock.
- Excellent sealing is needed to avoid leakage of hydraulic oil under high pressure.
- Stable and consistent torque makes the patient more comfortable.

### Typical Current Motion Solutions:

#### HKP ES series BLDC motor with Seal cap and special front axle:

HKP's ES030A series brushless DC motor is a high torque density model brushless motor with a slot-less design in a NEMA 14 configuration. It is offered in 2 motor lengths with continuous torque from 0.029 - 0.041 Nm.



### Features:

- Speeds up to 8,000 RPM
- DC bus voltage up to 60 Vdc
- NEMA 14 configuration
- Eight standard windings – Special windings available
- 4 Pole Rare Earth design.

Applications like these can require a wide range of motor sizes with different output capabilities. HKP can customize motor designs to any application requirement. For this application, HKP designed a customized slot-less motor, with output speeds exceeding 20K rpm and 400W of power. HKP's designers also provided customized sealing test services, with a custom sealing test platform and tooling, which ensured that the motor would not leak under a wide range of operating conditions.

To learn more about HKP's wide range of motors, [click here for our DC Motor Checklist](#), or view any of these videos:

- [Pittman Express Motor Calculator Tutorial](#)
- [How Motor Curves are Created and How to Use Them](#)
- [When should a gearbox be used in your DC motor application?](#)

To learn more about which motor is best for your application, Contact Us Today.

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