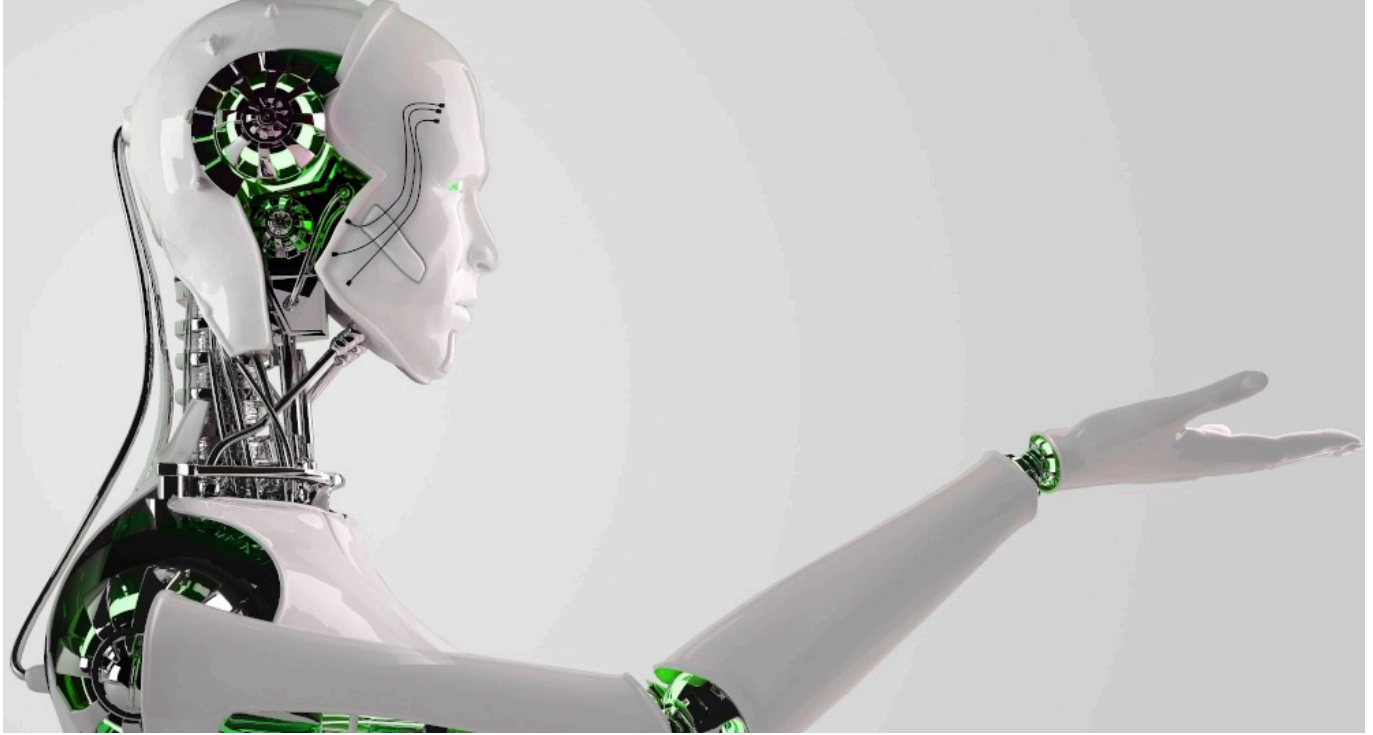


TECH OFFER

Robotic Actuators for Human-Robot Interaction



KEY INFORMATION

TECHNOLOGY CATEGORY:

Infocomm - Robotics & Automation

Manufacturing - Assembly, Automation & Robotics

Electronics - Actuators

TECHNOLOGY READINESS LEVEL (TRL): **TRL8**

COUNTRY: **SINGAPORE**

ID NUMBER: **TO174909**

OVERVIEW

Cutting-edge researchers are developing mobile robots that can engage with individuals in ever-changing surroundings, where constant physical interaction occurs with people and the environment. The design of robots for physical Human-Robot Interaction is an exceptionally demanding task, as it necessitates the incorporation of highly responsive and self-aware movement, strong torque capabilities, and agility, all while ensuring dependable and safe operation.

The robotic actuators presented here offer high dynamic efficiency and control bandwidth to enable the creation of agile and efficient robots. These actuators incorporate electric motors that produce high torque with greater efficiency, aiming to achieve human-tier capable robots for physical Human-Robot Interaction.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology involves the development of higher torque electric motors with lower power consumption and weight. These are integrated into robotic actuators with high dynamic efficiency allowing smoother and easier speed control. These actuators enable responsive and self-aware movement, strong torque capabilities, and agility, ensuring dependable and safe operation for robots engaging in physical interaction with people and the environment.

Specifications:

- Rated torque: 3.7 Nm @ 2 A, 48 VDC
- Peak torque: 12.5 Nm @ 14 A, 48 VDC
- Max speed @ Rated torque: 450 rpm @ 48 VDC
- Max speed @ Peak torque: 180 rpm @ 48 VDC

POTENTIAL APPLICATIONS

Human-Robot Interaction actuators and electric motors have potential applications in various fields such as healthcare, manufacturing, logistics, and service industries. It can be used to create advanced mobile robots capable of interacting with individuals in dynamic environments, assisting with tasks that require physical interaction and adaptability.

UNIQUE VALUE PROPOSITION

- Unparalleled dynamics: The actuator has an integrated 5:1 mechanical transmission, which allows it to boast best-in-class response, easier control, and impact absorption capacity.
- Integrated Proprioception: It is fitted with a proprietary torque sensor capable of measuring external torques at a resolution down to 0.1 Nm.
- Tailor-made digital products: The digital twin based design process allows faster response based on customer needs. The proprietary mechanical transmission has been designed to be inherently safe in the event of external torque overload. This improves physical safety of users and bystanders, whilst avoiding permanent damage to the actuator.

The actuator is also available in different configurations to allow easier integration with existing solutions.

- Plug-and-Play version. This version comes with CNC-machined structural components made of 7075-T6 aluminium. An anodized layer ensures maximum electrical protection and wear resistance. High-precision, single-row, steel bearings provide an axial/radial load capacity of 1000N/1000N.
- Frameless version. This provides the strictly necessary - stator and rotor with a convenient mechanical interface for seamless integration.