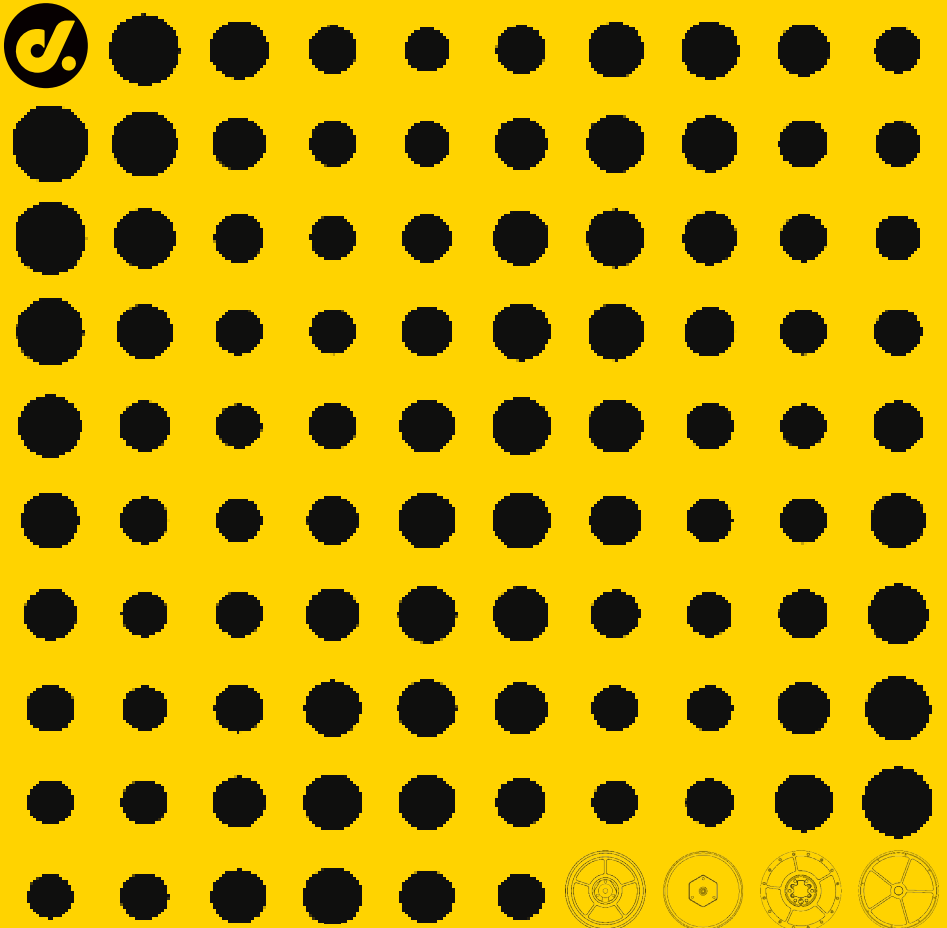


COMPANYPROFILE





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About us

Direct Drive Tech is located at Dongguan Songshan Lake High-tech Development Zone. We specialize in developing robot actuators, aiming to create highly efficient power solutions and unreplaceable market advantages for customers.

Direct Drive Technology is committed to using direct drive actuators to replace the reduction gears in any machine, making the original delicate and noisy traditional robot reborn. We have a complete set of technologies for robot joints from sensors, drivers to motor bodies. Various choices are enabled by the unique direct drive solutions, providing outstanding performance.

So far, Direct Drive Tech mainly focus on home care robot, AGV/AMR, Gym facilities industry, etc. Direct Drive Tech using unique direct drive precise&powerful motion solution, thereby dedicated to help many other industries to boost different products.

Direct drive precision actuator expert

Breakthrough in new material

The performance of the permanent magnet and silicon steel is boosted

Technology reserve

20 years of expertise and experiences

Optimized Design

Evolution of manual optimization to machine learning

Reliable supply chain

Improve self evolution speed

Development

2018

DDT was founded in Hongkong, with the purpose of eliminating reduction gearboxes and creating direct and precise power solutions.

2019

DDT moved from Hongkong to Dongguan Songshan Lake XbotPark. With industry leading technologies, we formed partnership with top companies in the fields of domestic robots, AGV/AMR, and fitness equipment.

2020

DDT completed a Pre-A round financing of millions of dollars, with an enterprise valuation of more than hundreds of millions of dollars. The round was led by 5Y Capital and followed by Miracleplus, and Dami Ventures. Previously, DDT also received a seed round investment from robotics expert Professor Li Zexiang.

2021

2020-2021: DDT completed the development of M6 and M15, while launched Diablo bipedal-wheeled robot, demonstrating the vast applications of direct drive technologies.

2022

With the mission to directly drive the world, DDT is the leader in robotics actuators, and will continue to focus on the replacing of reduction gearboxes with direct and precise power solutions.





Compete production capability

120 patents

Independent **IQC**

Daily production capacity of
3000 pieces

Advantages

CONQUER THE TIME AND BARRIERS

We understand as market demand continues to grow, robot designers and developers face increasing pressure to do in each operational cycle. Not only do they have to consider time constraints, but they also must improve product performance and think about the next generation of products even before they build the current ones, with high expectations but a restrained budget. And motion functionality is critical for robots, and if we can directly help engineers at each robotics company overcome the obstacles they encounter, we can significantly improve the effectiveness of their work. Therefore, we help our customers primarily through the following ways.

Professional Solutions

In many cases, the best solution is not set in stone. We have more specialized application knowledge and can modify or customize a more suitable solution based on the customer's product portfolio, providing a better foundation for product design.

Excellent Location

Our production and R&D facility is in Dongguan, with natural production and manufacturing advantages. This advantage can speed up our delivery process and supply anytime and anywhere according to our customers' needs.

Outstanding Team

We are a technology-driven team. Most of our R&D staff come from highly educated talents from Hong Kong University of Science and Technology, Tsinghua University, Xi'an Jiaotong University, Zhejiang University, Hunan University and other institutions of higher learning in China and abroad, as well as industry experts from well-known companies such as DJI, Luo Axis and IBM.

Professional Certification

Gold Medal of Geneva International Invention Exhibition
Gold Medal at Invention Asia 2019
Gold Medal of Dare To Change Business Pitch Competition

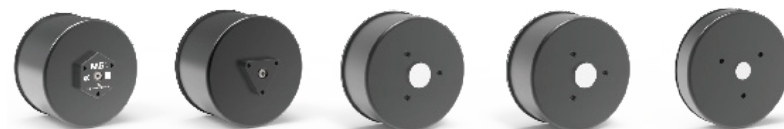


Solutions

Currently, DDT serves domestic robots, industrial and commercial robots, and fitness equipment industries.

Domestic Robots

For small wheeled domestic robots such as Roomba, mopping robots, and home service robots, DDT provides direct-drive travel wheels and sweeping and mopping modules. The travel wheels are designed with hub motors, while the sweeping and mopping modules are boldly designed with a flat structure, and the sensing drive control is integrated into both the travel wheels and the sweeping and mopping modules.



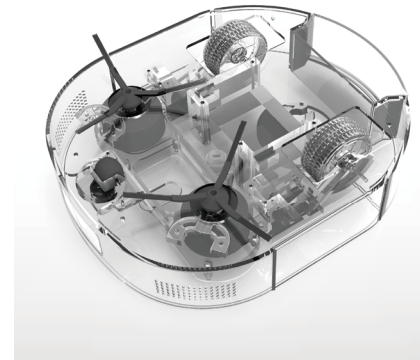
▲ M6 series direct drive motor

Products

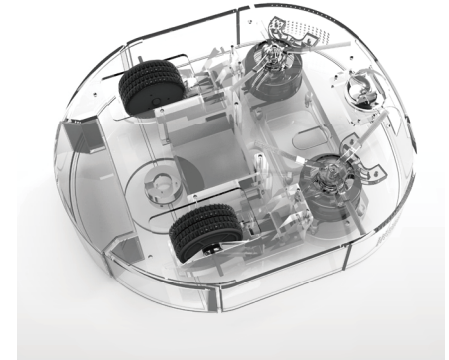
M6 series direct drive motor

M6 is a high-reliability permanent magnet synchronous motor with an integrated driver, which can be widely used in robots, AGV platforms, automation equipment and other fields. The unique motor design, and the use of rare earth permanent magnet materials ensure that the motor has a larger torque output and a smaller torque ripple, which delivers high-performance for low-speed/high-torque applications. The driver adopts the field-oriented control (FOC) algorithm, and matches with the high-precision angle sensor to realize precise torque and position control. The motor has a set of reliable motor OBD monitoring and protection mechanism to ensure the operation stability of the motor.

After repeated testing, DDT's solution offers



▲Cleaning robot wheel



▲Traveling robot wheel



ZERO NOISE

The ultimate silence without noise (close to the ambient noise in a bedroom environment), winning a better user experience for the mid-to-high-end market, while also facilitating the implementation of voice control functions.



SMALLER FORM FACTOR

Since there is no transmission reducer and external brush motor, DDT modules save at least 60% of the installation space, improving the utilization of space in the middle of the robot, allowing the installation of wider sweeping modules and improving the efficiency of the sweeping task.



PRODUCT LIFE

In addition, there is no plastic wear and tear and brush motor carbon build-up, which can exponentially increase product life.



LONGER BATTERY

Compared with the plastic gearbox and brush motor solution, the direct drive solution is more efficient in power management. Without energy loss to mechanical friction, it can achieve a 30% increase in battery life.



Solutions

Currently, DDT serves domestic robots, industrial and commercial robots, and fitness equipment industries.

Industrial & Commercial Robots

DDT provides direct-drive drive wheel modules for AGV/AMR, indoor&outdoor distribution and cleaning robots, and other commercial wheeled robots. The drive wheels are flange-connected for easy installation, the integrated sensor-drive-control system is easy to integrate quickly, and the large bearings ensure long-lasting reliability.



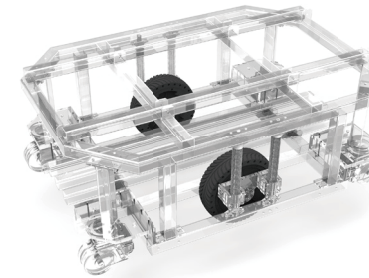
▲ M15 series direct drive motor

Products

M15 series direct drive motor

M15 motor is a high-reliability permanent magnet synchronous motor. Its application scope includes robots, AGV platforms, automation equipment, etc. To ensure that the motor has a larger torque output and a smaller torque ripple, the unique motor design, and the rare earth permanent magnet materials have all been optimized for direct drive operation at low speed and large torque. The integrated driver uses the field-oriented control (FOC) algorithm, and matches with the motor's built-in high-precision angle sensor to achieve precise control of the motor torque and motor position, motor speed as well as silence operation. The driver has a reliable motor OBD monitoring and protection mechanism to ensure the operation stability of the motor.

Compare to traditional methods, DDT's unique products can offer the benefits of



▲ AGV/AMR



▲ Robotic



EASIER MAINTENENCE

DDT provides direct-drive drive wheel modules for AGV/AMR, indoor-outdoor inspection, distribution and cleaning robots, and other wheeled robot industries. The drive wheels are flange-connected for easy installation, and the integrated sensor-drive-control system is quick and easy to install, and the large bearings ensure long-lasting reliability.



HIGHER EFFECIENCY

With no friction in the drive mechanism, the direct-drive solution has higher efficiency in power utilization and can provide a 30% increase in battery life. The robot gains longer work time and saves time from returning to recharge, hastening the speed in recovering cost. Our modules support braking energy recovery, which can significantly increase the range of the robot.



ALL-IN-ONE SOLUTION

Our modules have higher space utilization and faster solution generation. The modular design makes product design more agile, and reduces wheeled robot chassis design period by at least 20%. Companies can be more comfortable with the time to meet the challenges of complex requirements.



Solutions

Currently, DDT serves domestic robots, industrial and commercial robots, and fitness equipment industries.

Fitness Equipment

We provide resistance and damping motors for various types of fitness equipment. The direct-drive motor solution can generate the load force for fitness use, enough to replace 30 to 120kg fitness counterweight.

Products

M07 series direct drive motor

M07 is a high-reliability permanent magnet synchronous motor with an integrated driver, sensors, and high customizability. M07 is agile, compact, reliable, powerful and offers great bang for bucks.

The unique motor design, and the use of rare earth permanent magnet materials ensure that the motor has a larger torque output and a smaller torque ripple, which delivers high-performance for low-speed/high-torque applications. The driver adopts the field-oriented control (FOC) algorithm, and matches with the high-precision angle sensor to realize precise torque and position control. The motor has a set of reliable motor OBD monitoring and protection mechanism to ensure the operation stability of the motor.

M07 series direct drive motor



Substitution for cast iron



Complete digitalization



Over current protection



Customized fitness curve



Precise control of output torque

- ▲ Scooters
- ▲ Ab wheel
- ▲ Synced belt wheel
- ▲ Sweeping robots
- ▲ Robot actuators



Products

M11 series direct drive motor

M11 is a high-reliability permanent magnet synchronous motor with an integrated driver, sensors, and high customizability. M11 is agile, compact, reliable, powerful and offers great bang for bucks.

The unique motor design, and the use of rare earth permanent magnet materials ensure that the motor has a larger torque output and a smaller torque ripple, which delivers high-performance for low-speed/high-torque applications. The driver adopts the field-oriented control (FOC) algorithm, and matches with the high-precision angle sensor to realize precise torque and position control. The motor has a set of reliable motor OBD monitoring and protection mechanism to ensure the operation stability of the motor.

M11 series direct drive motor



High price-performance ratio



Tunable sensors



Overcurrent protection

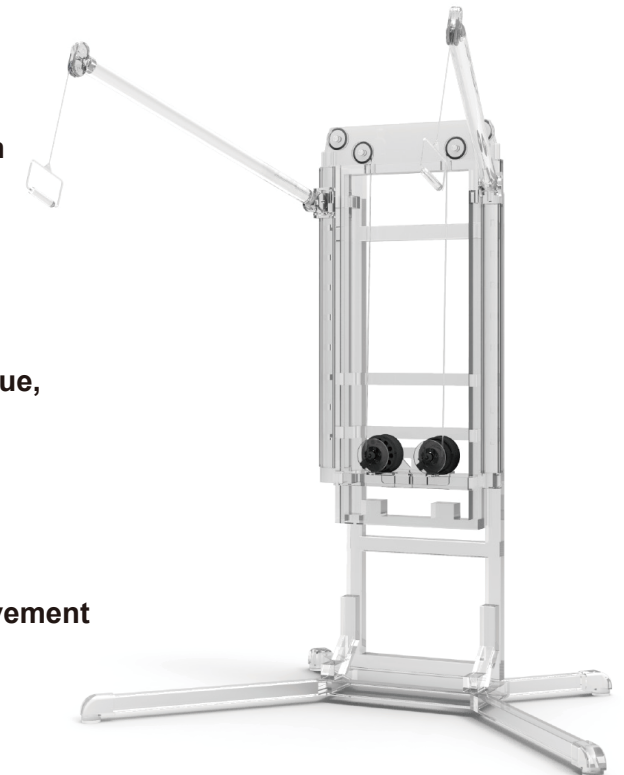


Precise control of torque, speed, and location



Support cartesian movement

- ▲ Fitness equipment
- ▲ AGV, AMR
- ▲ Electric wheelchair
- ▲ Segway





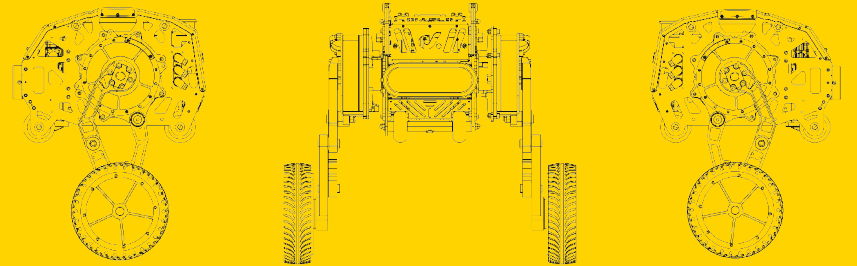
Solutions

Currently, DDT serves domestic robots, industrial and commercial robots, and fitness equipment industries.

DDT created our first bipedal wheeled robot - Diablo

Bipedal wheeled robot

Without traditional wear and tear from mechanical reducers, direct drive solutions offer longer product life and makes the whole system more reliable. Flange connection also makes the maintenance easier.

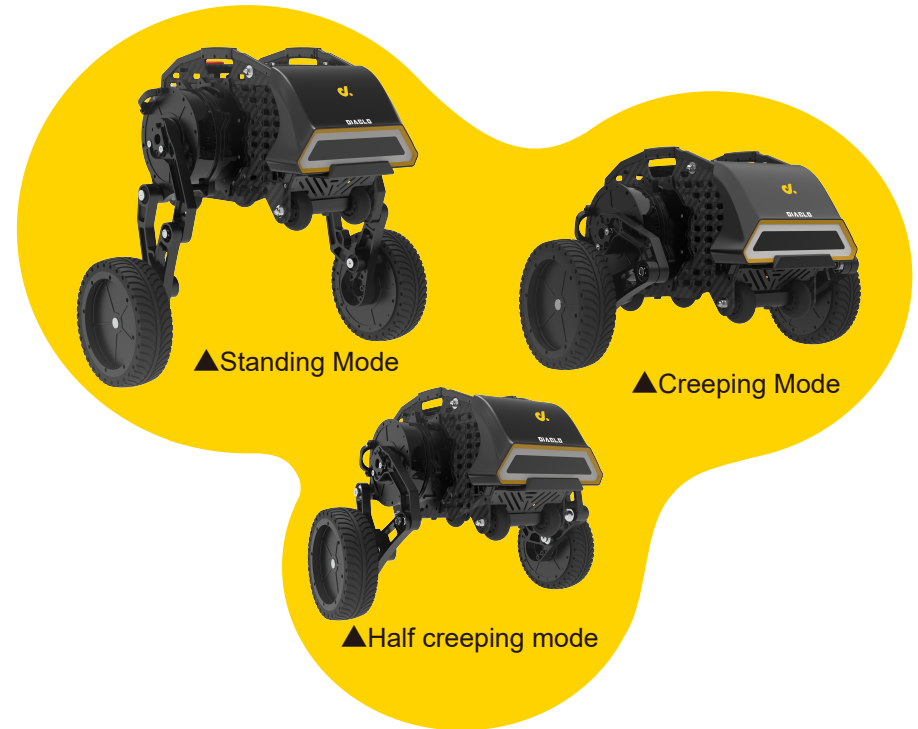


Products

Diablo Specification:

DIABLO is a flexible two-wheeled robot and it is also an open development platform. The robot is driven by 6 M1502A direct-drive robot joints that can move easily and freely. Largely enhanced the performance. The open development ecology able to provides perfect interfaces for various of applications. Whether you need quiet companionship, secret inspection, dexterous passage, or smooth transportation, DIABLO is always an ideal carrier.

DIABLO product features



Lower operation noise

Diablo is created with 6 independent M1502A direct drive motors. Compared to traditional mechanical reducer solutions, diablo is completed quite when operating.



Better utilization of space

Modular design makes our products more flexible when it comes to design. The time to design the chassis for a wheeled robot can be shorted by 20%, giving our customers more time when overcoming difficult challenges.

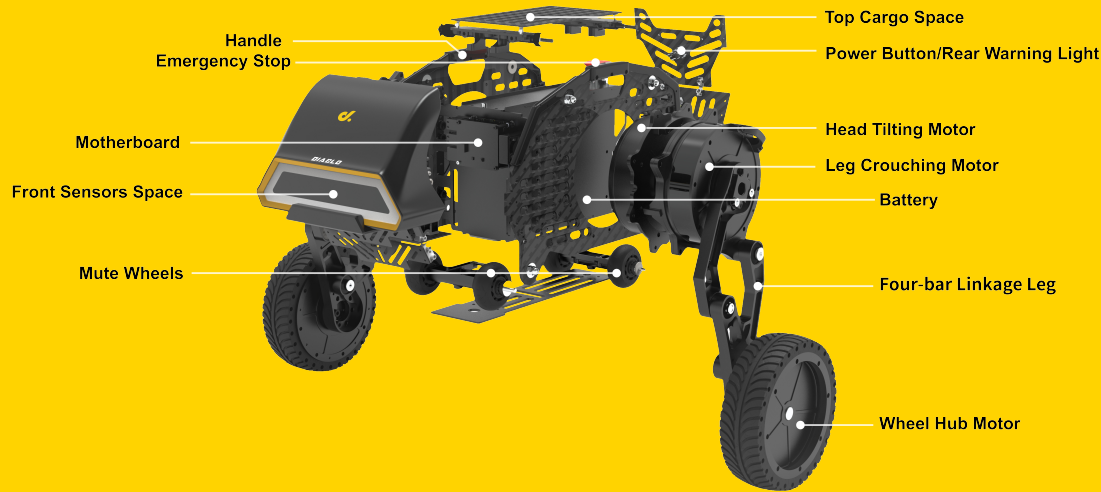
Higher Efficiency



With no friction in the drive mechanism, the direct-drive solution has higher efficiency in power utilization and can provide a 30% increase in battery life. The robot gains longer work time and saves time from returning to recharge, hastening the speed in recovering cost. Our modules support braking energy recovery, which can significantly increase the range of the robot.

Multiple sensors integrated

The body remains stable when crossing obstacles



Realizable function

- Load
- Move heavy stuff
- Delivery food
- Go and Get
- Accompany
- Jump
- Dance programming

Self-weight | **23kg**

Fastest turning speed (autorotation speed) | **2.4 rad/s**

Payload of Creep | **>100kg**

Max speed | **7.2km/h**

ZERO NOISE

Maximum jump height | **14cm**

Standing load | **5-10Kg**

Standing Mode & Creeping Mode

Can adjust the height up to 10cm for crossing barriers

Ground impact resistance

Self balance when landing

Stable body

Regardless of the road, the body is always stable

Obstacle crossing , Robot self balance

Single foot lift with external forces 24cm

Maximum standing height over an obstacle

Can pass through 5cm barrier



Segment of Robot market

01 Industrial robots

AGV /AMR

Welding robots Packaging robots
Palletizing robots Other robots

02 Service robots

Domestic robots
Commercial robots
Education and Entertainment robots

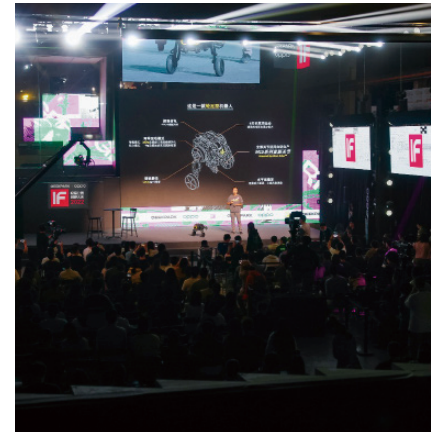
Aiding Robots Medical service robots
Vending robots Surgical robots
Auxiliary robots Other robots

03 Special Robots

Emergency rescue robots Emergency rescue robots
Other robots

Completed

Potential field



▼ Sharing, Geeker Park

▼ Frequent sharing session of our technology



▲ Trade show



Technology sharing ▼



Direct drive precision actuator expert

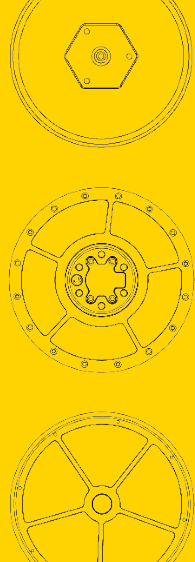
For purchasing robot or collaboration please contact

Tel: +86-13632786501

For purchasing motors or collaboration please contact

Tel: +86-18566773120

Email: MKT@directdrivetech.com



T-MALL



Wechat

Visit our website for more information

en.directdrive.com

Dongguan Direct Drive Technology Limited

No. 206, 207, 208, 2nd Floor, Building 3, South District, Digital Technology Industrial Park, CIMC Industrial City, No. 1, Yile Road, Songshan Lake High-tech Development Zone, Dongguan , Guangdong Province, China

 **Direct Drive Tech**