



Doosan Robotics

PRESS KIT 2019



COMPANY OVERVIEW

The New Generation of Collaborative Robots

Doosan Robotics is a leading manufacturer of collaborative robots (cobots), which are robots designed to work side by side with humans without fences, allowing human workers and robots to perform their tasks in the most efficient way, and thus increasing productivity.

Launched by Doosan Group, Korea's oldest and most prominent conglomerate, Doosan Robotics was founded in 2015 with its head office in South Korea. Since then, Doosan Robotics has been developing its cobot system based on its own technology, incorporating the professional knowledge of the industry's leading researchers. Doosan Robotics has its production site in Suwon with an annual capacity of 10,000 units and operates its Innovation Lab and Prototyping Lab along with R&D center.

Doosan robots are capable of world-class performances, demonstrated by a working radius of 900 to 1,700 millimeters, a load capacity of 6 to 15 kilograms, and sensitive collision detection sensors that ensure the safety of nearby workers. They are equipped with their own torque sensors on all six-joints, providing the industry's best collision sensitivity and carrying out more highly sophisticated tasks that previously required the dexterity of human hands. In recognition of the excellent user experience (UX) provided and their sophisticated, superior product design, Doosan robots received the Red Dot Design Award for two consecutive years – in the "Interface & User Experience" category in 2017 and the "Product Design" category in 2018.

Doosan Robotics is firmly committed to establishing a leading position in the market through its continuous R&D efforts, spearheading the growth of the industry.

ABOUT DOOSAN GROUP

Member of the Doosan Group

Founded in 1896 and currently led by the chairman and CEO Jeong-won Park, Doosan Group is one of the most renowned global companies in Korea, with a 123-year history. While having gone through many changes and significant growth over the years, Doosan started to make bolder, innovative moves in the late 1990s and expanded into new territories at an unprecedented rate and achieved remarkable growth through business acquisitions. As a result, Doosan has been able to establish itself as a world-class infrastructure support business (ISB) provider, with about 40,000 employees in 37 countries, showing an annual growth of 9% for the previous 20 years.


Comprised of over 50 affiliates and subsidiaries such as Doosan Heavy Industries, Doosan Infracore, Doosan Industrial Vehicle, and Doosan Bobcat, Doosan Group has been recognized as the best provider of technological advancements in various industries including machinery, component material, heavy industries, energy and consumer and services.

Most recently, Doosan Group has begun accelerating its digital transformation in line with the Fourth Industrial Revolution. Foreseeing substantial growth in the collaborative robot market in the coming years, the group established Doosan Robotics in 2015, and Doosan Robotics successfully released its first robots after three years of tireless R&D efforts.

As a subsidiary of Doosan Group, Doosan Robotics benefits from Doosan Group's global network and combines the group's international market know-how with the state-of-the-art technologies for cobot development and innovation. Doosan Group supports Doosan Robotics in international sourcing and manufacturing capabilities while maintaining and ensuring compliance with laws, regulatory guidelines and internal control procedures.

Now leading one of Doosan Group's key business areas, Doosan Robotics has the biggest market share of collaborative robots in the Republic of Korea and is showing rapid growth throughout various global markets, including Germany, France, United Kingdom, Italy and China.

DOOSAN ROBOTICS AT A GLANCE

Founded	2015
Headquarters	Republic of Korea
Management	CEO Byungseo Lee
Area of Activity	Doosan Robotics' core business includes the production of collaborative robots to enable effective automation in various industries and the development of the interface and user experience for cobot applications.
Target Group	All-sized enterprises
Vertical Markets	Metal and machinery, automotive, electronics, consumer goods, furniture, pharma and chemistry, plastic and polymers, etc.
Reference Clients	Hyundai Motor Group, POSCO, LG Electronics, LG Chemistry, Continental, etc.
Employees	120 *Around 50% of the employees are dedicated to R&D efforts
Sales Channel	Europe, North America and China *Plan to enter Asia, Oceania and Middle East in 2019
Annual Production Capability	10,000 units
Key Products: M-Series Cobots	M0609: 6kg payload, 900mm reach M0617: 6kg payload, 1,700mm reach M1013: 10kg payload, 1,300mm reach M1509: 15kg payload, 900mm reach
Principal Values	Dexterous Safe Flexible Easy
Applications	CNC machine tending Pick and place Inspection Assembly (screw, gear) Polishing and deburring Gluing and bonding Plastic injection assistance Packaging and palletizing Press forming assistance, and more
Company Contact	79, Saneop-ro, 156beon-gil Gwonseon-gu, Suwon-si, Gyeonggi-do Republic of Korea +82-31-8014-5500 marketing.robotics@doosan.com
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Website	www.doosanrobotics.com/EN/
Social Media	 www.youtube.com/doosanrobotics

COMPANY MILESTONES

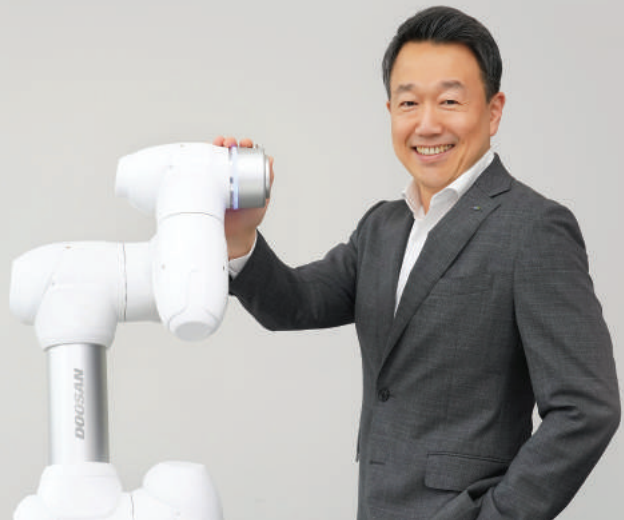
2014	Doosan Group enters the collaborative robot market In December, Doosan Group launches its project to develop robots to drive its future growth driver in line with the Fourth Industrial Revolution.
2015	Doosan Group establishes Doosan Robotics In October, Doosan Robotics is founded.
2017	Doosan Robotics wins the Red Dot Design Award In August, Doosan Robotics is awarded as the Winner in the User Interface Design category of the Communication Design sector of the Red Dot Award 2017. Doosan Robotics launches cobots in Korea at 2017 Roboworld In September, Doosan Robotics participates in 2017 Roboworld Exhibition, the biggest robot exhibition in Korea and presents its four cobot models to the market for the first time. Doosan Robotics establishes the robot manufacturing facility In December, Doosan Robotics begins the first mass production of robots at the smart manufacturing site within Suwon Industrial Complex, where cobots assist in manufacturing other cobots.
2018	Doosan Robotics receives the Red Dot Design Award in Product Design category In April, Doosan Robotics wins the Red Dot Design Award in the Product Design category. Doosan Robotics launches robots in Europe at Automatica 2018 In June, Doosan Robotics first enters the overseas markets after successfully launching its robots at Europe's biggest robotics and automation exhibition Automatica 2018 held in Germany. Doosan Robotics enters Chinese robot market In December, Doosan Robotics advances to Chinese cobot market by signing a distribution agreement with Bozhong Group's Linkhou, China's largest industry automation solution specialist, in Suzhou, China, to supply its collaborative robots in China.
2019	Doosan Robotics attends Automate 2019 and enters North America In April, Doosan Robotics showcases its robots at Automate 2019, North America's largest automation solutions event.

CEO/EXECUTIVE BIO

Mr. Byungseo Lee, Chief Executive Officer of Doosan Robotics, was appointed to his position after serving several roles within Doosan Group. As a founding member of Doosan Robotics, he brings a wealth of expertise from his previous career at Doosan's affiliates, particularly Doosan Heavy Industries. He has been with Doosan Group for more than 25 years and now leads Doosan Robotics based on Doosan group's core values, aiming for the world-class technology and innovation.



Doosan Robotics is leading the Fourth Industrial Revolution with the creation of our collaborative robots. Our robots serve as safe, robust and reliable partners in many industrial applications for all our customers worldwide.



PRODUCTS AT A GLANCE



Robot Arm

Longest reach : 1.7 m
 Highest payload : 15 kg
 Four models
 Torque Sensors on all six axes
 Repeatability : ± 0.1 mm
 Tool Control Point (TCP) Speed : 1 m/s



Teach Pendant

Full-Glass Type (Gorilla Glass)
 10.1 inch Capacitive Touch Screen
 8 mm Slim Cable
 Size : 264 x 218 x 42mm
 Weight : 0.8kg



Controller

Size : 490 x 390 x 287mm
 Weight : 9 kg
 Convenient connectivity:
 - Ethernet, RS232, Modbus
 *Other protocols (e.g. Profinet, Profibus, cc link, etc.)
 are available with gateway device.
 - I/O: 32 Digital, 4 Analog & Flange 12 Digital

PRODUCT LINE UP

Doosan Robotics offers the world's most diversified lineup of robots with a load capacity of 6 to 15 kilograms and working radius of 900 to 1700 millimeters. Customers can select the most optimal solution for their work environment among the various products Doosan provides.



M0609



M1509



M1013



M0617

M0609 is a cobot optimized to perform repetitive tasks at high speeds in a limited space.

M1509 has the highest payload capacity. It is designed for effective handling of heavier objects that pose risk to human workers.

M1013 is a standard model versatile for any application.

M0617 is ideal for operating multiple tasks or carrying out tasks that require long reach.

Payload: 6kg
Reach: 900mm

Payload: 15kg
Reach: 900mm

Payload: 10kg
Reach: 1,300mm

Payload: 6kg
Reach: 1,700mm

Detailed product information and technical specifications can be found at:
<http://www.doosanrobotics.com/en/lineup/>

VALUE-ADDING ENHANCERS

Customers can maximize the performance and production efficiency of their Doosan robots by adding various functions.



Direct Control Unit

The direct control unit maximizes user experience as it lets users select a wide range of teaching modes and save coordinates with a simple five-button operation.



Mobile Base

Mobile Base integrates the robot, Controller and Teach Pendant to allow flexible relocation and movement.

Various apparatuses such as pallet and laser scanner can be installed, and various storage spaces allow convenient storage and usage.



Smart Vision Module (SVM)

Smart Vision Module is an on-board type vision system that can be mounted at the end of the robot. SVM offers inspection of object presence and measurement of position, angle, diameter and length.

All settings are managed in Teach Pendant with an intuitive user interface for easy use.



Stain-Resistant Model

Stain-Resistant Model includes an enhanced anti-stain finish enabling easy maintenance against dirt and stain. (Navy color)



Robot Jacket

Robot Jacket protects Doosan robot from contamination by liquids used during cutter support work, etc.

PU coating forms a 2-stage water barrier which ensures Doosan robot to maintain optimum operation conditions.



Dress Pack

Dress Pack organizes various cables connected to the end tools of Doosan robot allowing efficient operation.

Integrated conduit bracket and holder ensures convenient organization, and it is easy to attach/detach and relocate on the robot.

PRINCIPAL VALUES

Dexterous

Doosan robots are capable of providing high-quality work skills as proficient as human workers with Doosan's torque sensors on all six joints of the robots. These 6 joint torque sensors can easily detect and control force with a high sensitivity of 0.2N. The algorithm enables the robots to perform highly dexterous tasks and be applied in a wide range of processes including screw assembly, polishing and gluing.

These sensors also allow the robots to automatically measure key parameters such as tool weight and gravity direction.

Safe

One of the key benefits of the torque sensors is that they ensure safety in the work environment as they provide the industry's highest level of collision sensitivity.

The robots can automatically identify and work within a virtual safety space as if there were actual fences in place, protecting both the robots and nearby workers. Safety zones can also be established so that the robots can slow down in areas where they cooperatively work with humans. The safety of Doosan robots has been repeatedly approved through NRTL certification in the U.S., CE certifications in Europe, Functional Safety in global and KCS certification in Korea.

Easy

Doosan robots include the intuitive user interface that enable simple and easy programming. The Workcell Manager function on the screen displays all monitoring information in the robots' surrounding environments in an intuitive card view format.

The Task Builder function includes skills which are shown in icons, and which can be easily and simply taught to robots without knowledge of complicated coding or robot language.

Doosan Robotics won the Red Dot Design Award for its intuitive user interface design in 2017 and for its product design in 2018.

Flexible

Doosan robots are extremely flexible and they can be easily installed by automatically detected inclination angles. The robots also automatically measure the tool weight and center of gravity and can calculate the position of the tool center. This enables a convenient integration as Doosan robots require less space for installation and minimal changes in the existing production layout.

APPLICATIONS

Doosan robots can be applied in a wide range of processes and tailored to meet customers' needs. Some of the manufacturing processes that currently integrate Doosan robots include but are not limited to:



Assembly (Screw, Gear)

Traditionally manual assembly tasks such as screw locking and gear assembly



Pick & Place

Simple loading/unloading work such as moving objects between tasks



Polishing and Deburring

Burr removal and surface polishing after processing



CNC Machine Tending

Placing material on pallet after injection into/removal from CNC machine



Inspection

Inspection of parts for internal defects and confirmation of parts assembly



Gluing/Bonding

Spraying of consistent amount of adhesive for gluing and bonding



Plastic Injection Assistance

Detaching item from mold of injection molding machine and loading onto/unloading from pallet



Packaging & Palletizing

Product packaging and palletizing, including transportation and loading of packaged products (e.g. electronics/F&B industries)



Press Forming

Picking up panel for loading onto/unloading from press machine

SELECTED CLIENTS

With a history of working for major brands in the automotive industry, Doosan Robotics is now expanding its application of robots to the consumer goods and industrial goods industries.

Automotive Industry



Industrial Goods



Electronics/Chemicals Consumer Goods & Etc.

