**Doosan**

# DOOSAN ROBOT SERIES

Switch on the Future

**Doosan Robotics**

**Doosan Robotics**
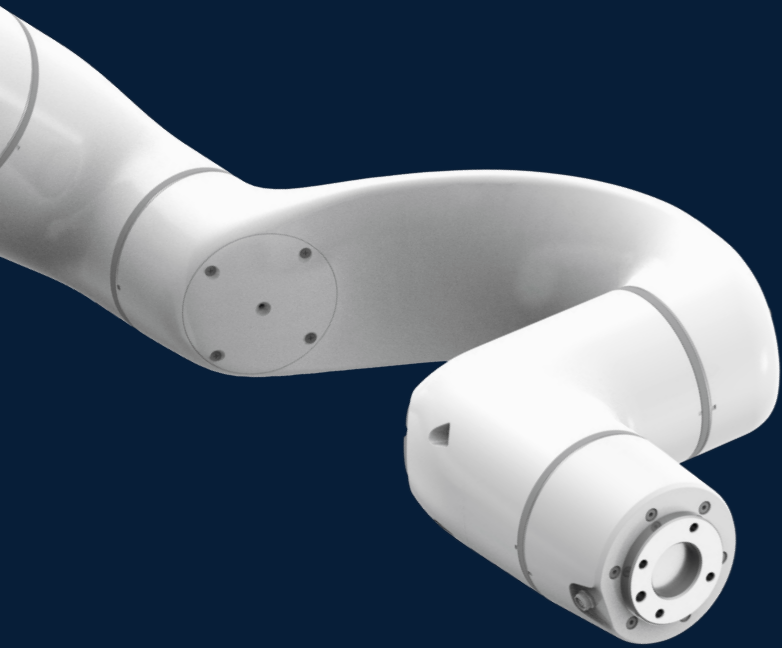
# DOOSAN HERITAGE

## Super SAFE

- **Space restriction and five workspace settings to fully protect operators**

  | Space Limit | Cooperation zone | Crushing Prevention Zone | Sensitivity reduction zone | Tool Orientation Limit Zone | Custom zone |

  Improve efficiency and ensure operator safety by setting various zones in accordance with the site application

- **Outstanding product safety certified by international organizations**
  Doosan collaborative robots feature industry-leading designs, which meet international criteria and boast the highest level of safety in the business. NRTL (US), CE (Europe), KCs (Korea)

## Super EASY

- **Intuitive, one-touch programming**

  Doosan collaborative robots automatically recognize attached peripherals and suggest templates for ideal work processes in everything from simple material handling to machine tending. Interfaces also provide pre-programmed skills commonly used in each application, which make it incredibly easy to teach the robot, even for beginners

- **Cockpit to quickly and easily teach robots**

  Through the cockpit (Direct teaching button), direct teaching is incredibly easy as it's possible to select various teaching modes and even save coordinates with simple button operations.

## Super FLEXIBLE

- **Doosan Mate maximizes applications and use scenarios**

  With a variety of industry-leading partner products from grippers to sensors and software, Doosan Mate allows for seamless compatibility and an array of automation solutions optimized for customer needs. All products registered in Doosan Mate are compatible with Doosan robots allowing for instant installation and immediate operation

- **Convenient communication connections**

  Doosan collaborative robots can be connected even without a gateway, allowing for seamless integration with various types of industrial equipment and systems.

# DOOSAN ROBOT LINE-UP

**High-Power**
## H-SERIES
H2515 · H2017
The H-Series is the most powerful collaborative robot on the market! Its incredible payload of 25 kg and 6-axis torque sensor, along with its high performance from low electrical power, enable sophisticated and safe work

**Masterpiece**
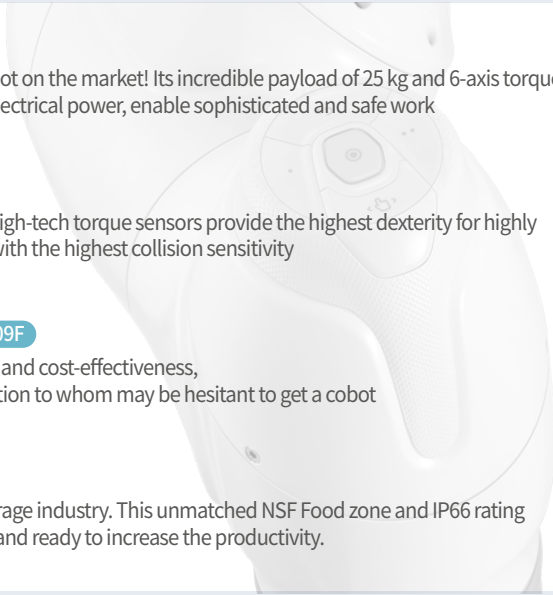## M-SERIES
M1509 · M1013 · M0617 · M0609
M-SERIES is the highest quality premium cobot! 6 high-tech torque sensors provide the highest dexterity for highly sophisticated tasks and ensure the upmost safety with the highest collision sensitivity
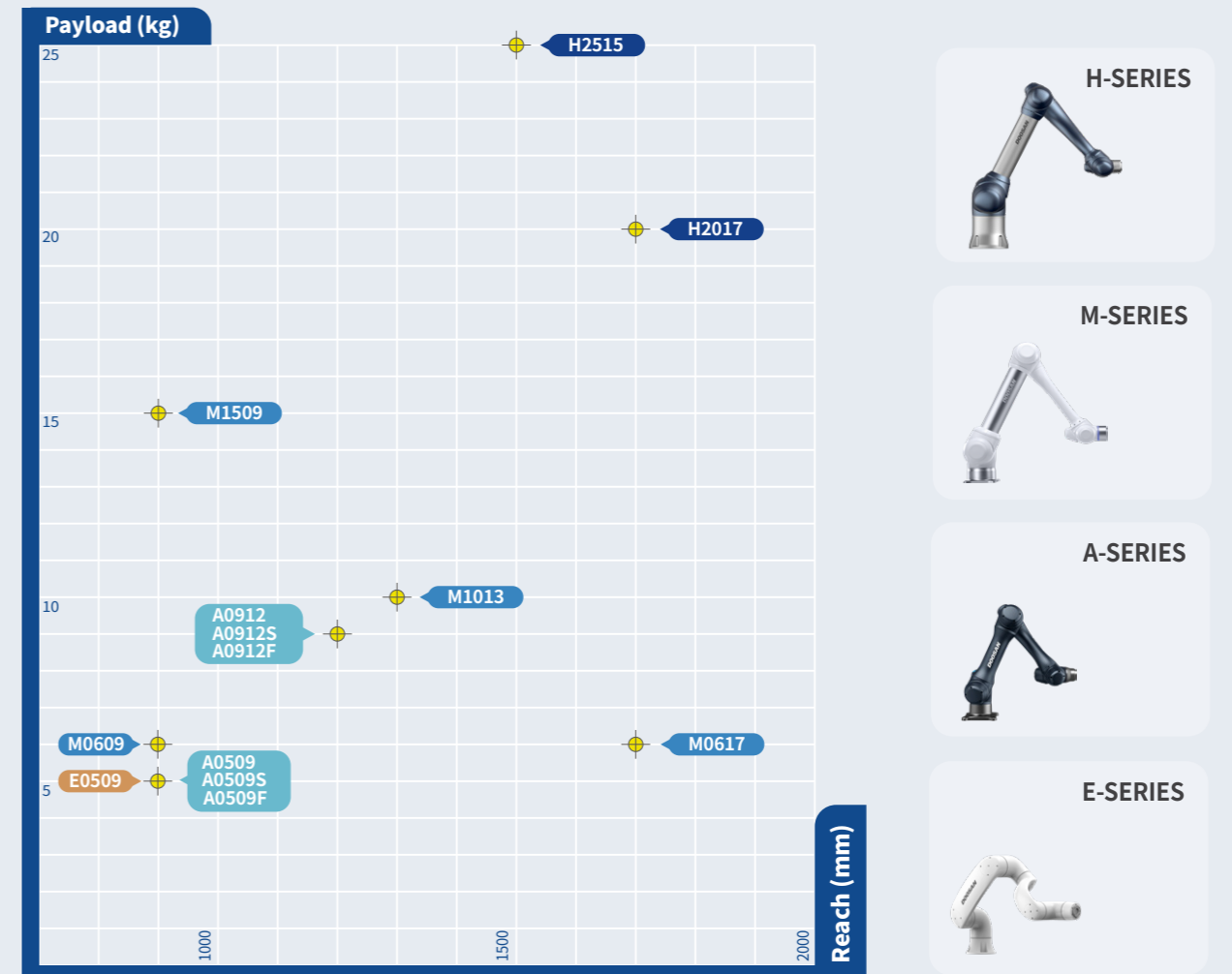
**Agile**
## A-SERIES
A0912 · A0912S · A0912F · A0509 · A0509S · A0509F
A-SERIES can go anywhere! With its superior speed and cost-effectiveness, A-SERIES promises a simple solution and a satisfaction to whom may be hesitant to get a cobot

**Edge**
## E-SERIES
E0509
E-SERIES is the most optimal cobot in Food & Beverage industry. This unmatched NSF Food zone and IP66 rating accredited cobot is highly adaptable in any spaces and ready to increase the productivity.

**Payload (kg)** / **Reach (mm)**

- 25 — H2515
- 20 — H2017
- 15 — M1509
- 10 — M1013, A0912 / A0912S / A0912F
- 5 — M0609, A0509 / A0509S / A0509F, E0509, M0617

(Reach axis: 1000, 1500, 2000)

H-SERIES
M-SERIES
A-SERIES
E-SERIES

High-power
# H-SERIES

The H-Series is the most powerful collaborative robot on the market! Its incredible payload of 25 kg and 6-axis torque sensor, along with its high performance from low electrical power, enable sophisticated and safe work

**H2515**
Payload 25kg
Reach    1500mm

**H2017**
Payload 20kg
Reach    1700mm

## I KEY FEATURES

### High⁺ Payload

H-SERIES boasts the highest payload among existing collaborative robots, allowing for efficient and organized work through the simultaneous handling of objects of various weights

### High⁺ Reach

With a wide working radius and superior efficiency for multiple work processes and remote palletizing, the H-SERIES is perfect for many work environments

### High⁺ Energy Efficiency

H-SERIES' built-in Gravity Compensator enables cost-effective operation for a wide range of applications with half the power consumption of comparable 6-axis articulated robots

**25** kg          **1700** mm          **1/2**

## I MAIN APPLICATIONS

### Palletizing
Stacking and palletizing heavy objects for logistics and automated procedures

### Machine Tending
Feeding the CNC machine to load/unload objects into the pallet

### Managing Heavy Objects
Stacking, transporting, and handling multiple objects simultaneously in fast-paced production scenarios like those found in logistics and fabric industries

### Assembling Heavy Parts
Assembling heavy or bulky parts such as engines, shock absorbers, etc.

### Assembling Automotive Bodies
Assisting automotive production line assembly for body parts like doors, lift gates, etc.

### Inspection
Inspecting internal/external defects and assembly quality

### Welding
Welding parts together with the precision of a skilled welder

### Film Production
Can be used at professional broadcasting sites to assist safe and precise camera movements

# Masterpiece
# M-SERIES

M-SERIES is the highest quality premium cobot*!*
6 high-tech torque sensors provide the highest dexterity for highly sophisticated tasks and ensure the upmost safety with the highest collision sensitivity

**M1509**
Payload 15kg (+2kg)
Reach   900mm

**M1013**
Payload 10kg (+2kg)
Reach   1300mm

**M0617**
Payload 6kg (+2kg)
Reach   1700mm

**M0609**
Payload 6kg
Reach   900mm

*Depending on the automatic acceleration adjustment, M1509 can handle up to 17 kg, M1013 up to 12 kg, and M0617 up to 8 kg

## KEY FEATURES

### Master⁺ Safety
With six high-tech torque sensors, M-SERIES can detect subtle force changes to provide superior safety

### Master⁺ Force Control
The high-tech torque sensor provides the highest level of force control and compliance control for safe and precise work

### Master⁺ Setup
The Smart Setup function allows quick installation and immediate operation, as it automatically measures inclination angles, tool position and weight

**6** Torque Sensors          **0.2** N          **12** Minutes

## MAIN APPLICATIONS

### Assembling Power Tools
Reliable performance on various power tool assembly lines, including screw and nut fastening

### Machine Tending
Feeding the CNC machine to load/unload objects into the pallet

### Welding
Welding parts together like a skilled welder

### Polishing & Deburring
Burr removal and surface polishing after processing

### Palletizing
Stacking and palletizing heavy objects for logistics and automated procedures

### Gluing & Bonding
Consistently spraying adhesive for gluing and bonding

### Plastic Injection Support
Detaching objects from injection mold and loading them onto pallets

### Press Forming
Picking up panels for loading/unloading from a press machine

# Agile
# A-SERIES

A-SERIES can go anywhere!
With its superior speed and cost-effectiveness,
A-SERIES promises a simple solution and a satisfaction to
whom may be hesitant to get a cobot

**A0912S**  *Model with Force Sensor*
Payload 9kg
Reach    1200mm

**A0509S**  *Model with Force Sensor*
Payload 5kg
Reach    900mm

**A0912**
Payload 9kg
Reach    1200mm

**A0509**
Payload 5kg
Reach    900mm

**A0912F**  *Dedicated F&B Model*
Payload 9kg
Reach    1200mm

**A0509F**  *Dedicated F&B Model*
Payload 5kg
Reach    900mm

## I KEY FEATURES

### A⁺ Speed

2x joint speed enhances productivity, efficiency, and effectiveness

### A⁺ Customization

The A-SERIES line features options like a cost-effective universal model, a precision force control model, and a model specifically for the food and beverage industry.

### A⁺ ROI

10% faster work speed on average and competitive pricing means quicker ROI

**×2** Axis Speed

**3** Options

**10%**

## I MAIN APPLICATIONS

A0509S · A0912S

A0509F · A0912F

**Machine Tending**
Feeding the CNC machine to load/unload objects into the pallet

**Polishing & Deburring**
Burr removal and surface polishing after processing

**Assembly**
Traditional assembly tasks like screw driving and gear assembling

**Service**
Safely and repeatedly performs pre-defined tasks in accordance with user needs in service industries like medical and food and beverage

*Dedicated F&B Model*

A0509 · A0912

**Air Blowing**
Spiral and multi-angle composite spray motions for exterior cleaning of finished products

**Pick & Place**
Simple loading/unloading objects between tasks

**Inspection**
Inspecting internal/external defects and assembly quality

**Gluing & Bonding**
Consistently spraying adhesive for gluing and bonding

## KEY FEATURES

### Edge⁺ Sanitation

With NSF certifications and IP66 accreditation, E-SERIES ensures maximum hygiene and sanitation

### Edge⁺ Portability

With all-in-one packaging just 2/3rds smaller than existing cobots, Edge is easy to transport and install in any area

### Edge⁺ ROI

E-SERIES is a cost-effective automation solution, ensuring rapid ROI in as few as 14 months for coffee applications

**NSF**

**2/3** rds smaller packaging

**14** months ROI

## MAIN APPLICATIONS

F&B

### Coffee

Makes up to three cups of espresso in 15 seconds by pouring water into a dripper just like a barista

### Ice cream

Scoops ice cream and delivers it right to customers

### Deep Frying

Easily fries food in 170° C, 224° F oil

### Noodles

Boils and cooks a variety of noodle dishes such as rice noodles and udon with consistent quality

# Edge
# E-SERIES

E-SERIES is the most optimal cobot in Food & Beverage industry
This unmatched NSF Food zone and
IP66 rating accredited cobot is highly adaptable in
any spaces and ready to increase the productivity

**E0509**

Payload 5kg
Reach    900mm

# DOOSAN ROBOT APPLICATION

## ▍Manufacturing

**Pick & Place**
Simple loading/unloading objects between tasks

**Press Forming**
Picking up panels for loading/unloading from a press machine

**Polishing & Deburring**
Burr removal and surface polishing after processing

**Assembly**
Traditional assembly tasks like screw driving and gear assembling

**Gluing & Bonding**
Consistently spraying adhesive for gluing and bonding

**Air Blowing**
Spiral and multi-angle composite spray motions for exterior cleaning of finished products

**Packaging & Palletizing**
Stacking and palletizing heavy objects for logistics and automated procedures

**Inspection**
Inspecting internal/external defects and assembly quality

**Machine Tending**
Feeding the CNC machine to load/unload objects into the pallet

**Welding**
Welding parts together with the precision of a skilled welder

**Plastic Injection Support**
Detaching objects from injection mold and loading them onto pallets

**Managing Heavy Objects**
Stacking, transporting, and handling multiple objects simultaneously in fast-paced production scenarios like those found in logistics and fabric industries

**Assembling Heavy Parts**
Assembling heavy or bulky parts such as engines, shock absorbers, etc.

**Assembling Automotive Bodies**
Assisting automotive production line assembly for body parts like doors, lift gates, etc.

## ▍Food & Beverage

**Deep Frying**
Easily fries food in 170° C, 224° F oil

**Coffee**
Makes up to three cups of espresso in 15 seconds by pouring water into a dripper just like a barista

**Ice cream**
Scoops ice cream and delivers it right to customers

**Noodle**
Boils and cooks a variety of noodle dishes such as rice noodles and udon with consistent quality

## ▍Others

**Charging Electric Vehicles**
Connecting the plug to the charging terminal of an electric vehicle

**Hygienic Scientific Applications**
Sprays disinfectant, handles UV lamps and works in tandem with autonomous driving robots

**Film Production**
Can be used at professional broadcasting sites to assist safe and precise camera movements

**Construction Perforation**
Combats labor shortages by automating repetitive and precise perforation processes

**Medical Treatment**
Assists advanced medical applications such as surgical assistance, rehabilitation, and support
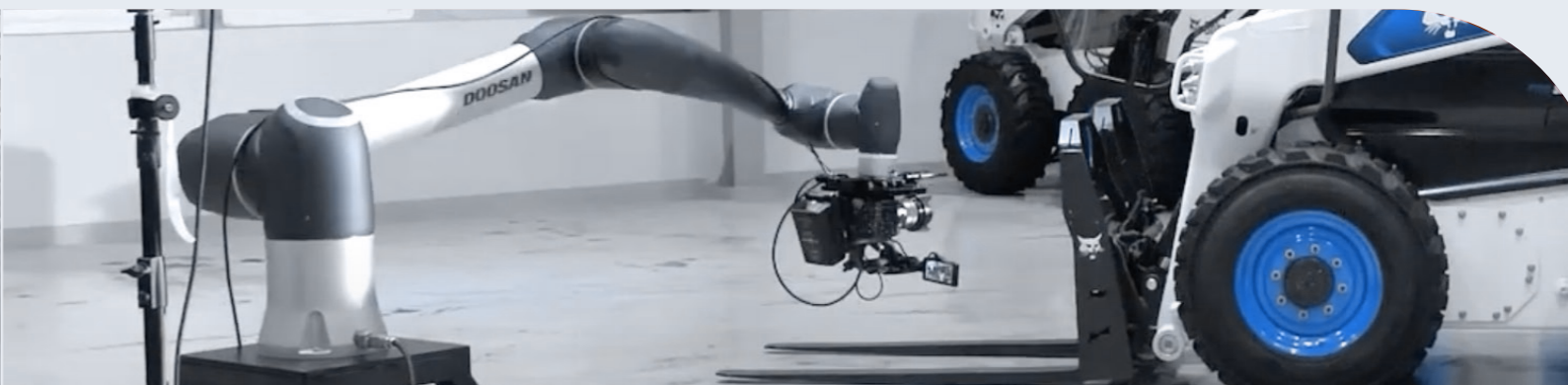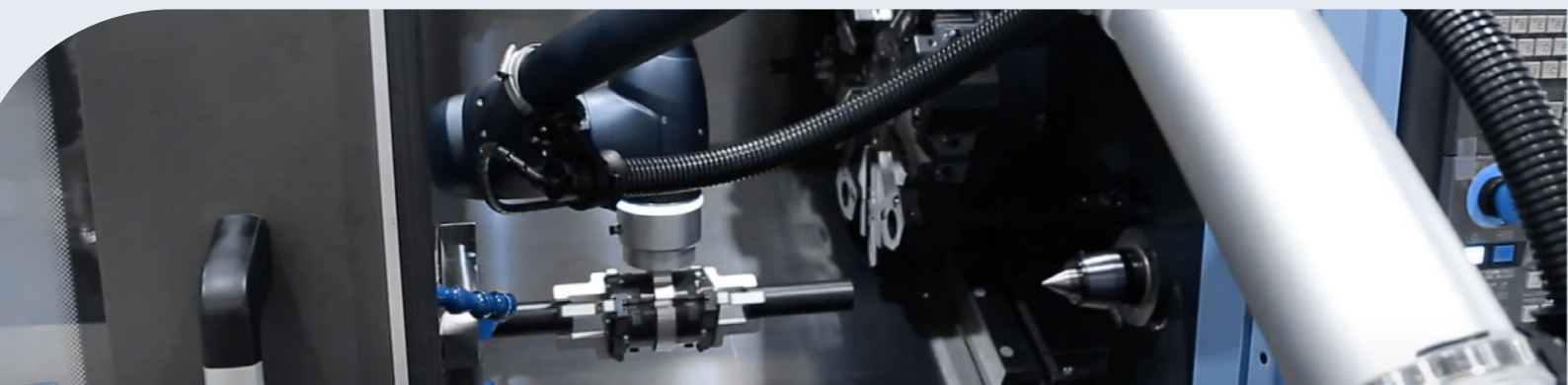
## Technical Specification

| Manipulator | High-Power **H-SERIES** | | Masterpiece **M-SERIES** | | | | Agile **A-SERIES** | | | | | | Edge **E-SERIES** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Model | H2515 | H2017 | M1509 | M1013 | M0617 | M0609 | A0912S | A0509S | A0912 | A0509 | A0912F | A0509F | E0509 |
| Payload | 25 kg (55.1 lb) | 20 kg (44 lb) | 15 kg (33 lb) | 10 kg (22 lb) | 6 kg (13.2 lb) | 6 kg (13.2 lb) | 9 kg (19.8 lb) | 5 kg (11 lb) | 9 kg (19.8 lb) | 5 kg (11 lb) | 9 kg (19.8 lb) | 5 kg (11 lb) | 5 kg (11 lb) |
| Reach | 1,500 mm (59 inch) | 1,700 mm (66.9 inch) | 900 mm (35.4 inch) | 1,300 mm (51.1 inch) | 1,700 mm (66.9 inch) | 900 mm (45.4 inch) | 1,203 mm (47.2 inch) | 903 mm (35.4 inch) | 1,200 mm (47.2 inch) | 900 mm (35.4 inch) | 1,200 mm (47.2 inch) | 900 mm (35.4 inch) | 900 mm (35.4 inch) |
| Weight | 77 kg (169.8 lb) | 79 kg (174.2 lb) | 33 kg (72.8 lb) | 34 kg (75 lb) | 35.5 kg (78.3 lb) | 27.5 kg (60.6 lb) | 31 kg (68.3 lb) | 21 kg (46.2 lb) | 31 kg (68.3 lb) | 21 kg (46.2 lb) | 31 kg (68.3 lb) | 21 kg (46.2 lb) | 22.5 kg (49.6 lb) |
| Repeatability | ±0.1 mm | ±0.1 mm | ±0.03 mm | ±0.05 mm | ±0.1 mm | ±0.03 mm | ±0.05 mm | ±0.03 mm | ±0.05 mm | ±0.03 mm | ±0.05 mm | ±0.03 mm | ±0.05 mm |
| Power Consumption (Typical) | 290W | | 390W | | | 370W | 440W | 370W | 440W | 370W | 440W | 370W | 210W |
| Mount Position | Floor | | Any Orientation | | | | | | | | | | |
| Degree of Freedom | 6 | | | | | | | | | | | | |
| Tool Speed | Over 1 m/s | | | | | | | | | | | | |
| Temperature | 0 ~ 45 °C | | | | | | | | | | | | |
| Noise | < 65 dB | | | | | | | | | | | | < 60 dB |
| Protection Rating | IP54 | | | | | | | | | | | | IP66 |

### Joint Movement  (Range : °   |   Max Speed : °/s)

| | H2515 | H2017 | M1509 | M1013 | M0617 | M0609 | A-SERIES | | | | | | E0509 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J1 | ±360° \| 100°/s | | ±360° \| 150°/s | ±360° \| 120°/s | ±360° \| 100°/s | ±360° \| 150°/s | ±360° \| 180°/s | | | | | | ±360° \| 120°/s |
| J2 | ±125° \| 80°/s | | ±360° \| 150°/s | ±360° \| 120°/s | ±360° \| 100°/s | ±360° \| 150°/s | ±360° \| 180°/s | | | | | | ±360° \| 120°/s |
| J3 | ±160° \| 100°/s | | ±150° \| 180°/s | ±160° \| 180°/s | ±165° \| 150°/s | ±150° \| 180°/s | ±160° \| 180°/s | | | | | | ±155° \| 150°/s |
| J4 | ±360° \| 180°/s | | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 360°/s | | | | | | ±360° \| 225°/s |
| J5 | ±360° \| 180°/s | | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 360°/s | | | | | | ±155° \| 225°/s |
| J6 | ±360° \| 180°/s | | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 225°/s | ±360° \| 360°/s | | | | | | ±360° \| 225°/s |

### Other Features

| | H / M-SERIES | | | | | | A-SERIES | | | | | | E0509 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Flange Interfaces | D-in 6, D-out 6, DC 24V (Max.3A) by two connectors (X1, X2) | | | | | | D-in 2, D-out 2, RS-485(Psuedo), DC 24V (Max.3A) by one connector (X1) | | | | | | |
| Force & Compliance Control | Yes by built-in Joint Torque Sensors in each joint | | | | | | Yes by built-in 6-axis force sensor at flange | | X, Y, Z direction only by current control | | | | |
| Other Options | Cockpit Advanced Features (SW) | | | | | | | | | | | | Cable Holder (Fits both 4Φ and 6Φ) |

### Certification

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Robot Safety | KCs, CE, NRTL, EN ISO 10218-1, EN ISO 13849-1 PLe Cat.4 for emergency stop, PLd Cat.3 for other safety functions | | | | | | | | | | | | |
| Food Safety | N/A | | | | | | | | | | NSF Splash Zone | | NSF Food Zone Non contact |

## Controller

| Compatibility | **H-SERIES · M-SERIES** | | | **A-SERIES** | | **E-SERIES** | |
|---|---|---|---|---|---|---|---|
| Model | CS-01 (AC) | CS-01P (AC) | CS-02 (DC) | CS-03 (AC) | CS-04 (DC) | CS-05 (AC) | CS-06 (DC) |
| Dimensions | 525(W) x 287(D) x 390(H) mm | 577(W) x 241(D) x 422(H) mm | 462(W) x 218(D) x 295(H) mm | 482(W) x 214(D) x 375(H) mm | 482(W) x 214(D) x 375(H) mm | 440(W) x 400(D) x 91.2(H) mm | 440(W) x 400(D) x 91.2(H) mm |
| Weight | 13 kg | 17 kg | 12 kg | 13 kg | 13 kg | 9 kg | 9kg |
| Protection Rating | IP 30 | IP 54 | IP 20 | IP 40 | IP 40 | IP 20 | IP 20 |
| Power Supply | 100~240 VAC , 50~60Hz | | 20-60 VDC | 100~240 VAC , 50~60Hz | 20-60 VDC | 100~240 VAC , 50~60Hz | 20-60 VDC |
| Cable Length | 6 m (default) , 3 m (option) | | 3 m (default), 6 m (option) | 6 m | 6 m | 6 m | 6 m |
| Communications | ModbusTCP (Master/Slave), ModbusRTU (Master), PROFINET IO (Device), EtherNet/IP (Adapter), TCP/IP, RS-232/R-S422/RS-485 using USB to Serial converter (not included) | | | | | | |
| Interfaces | D-in 16, D-out 16, A-in 2, A-out 2, External Encoder, DC 24V 2A | | | | | | |
| Programming | Built-in Teach Pendant (IP40, 11.1 inch display, 0.8kg, 4.5m/2.5m cable)<br>DART-Platform for Windows (free PC software, MS Surface compatible)<br>DART-Studio(DRL, Simulator),  App Builder | | | Optional Teach Pendant (IP40, 11.1 inch display, 0.8kg, 4.5m cable)<br>DART-Platform for Windows (free PC software, MS Surface compatible)<br>DART-Studio(DRL, Simulator),  App Builder | | DART-Platform for Windows (free PC software, MS Surface compatible)<br>DART-Studio(DRL, Simulator),  App Builder | |
| Other Options | N/A | | | Smart Pendant, Emergency Button | | | |

# Doosan Robot Value Adding

Various features and functions can be added to maximize the performance and production efficiency of collaborative robots
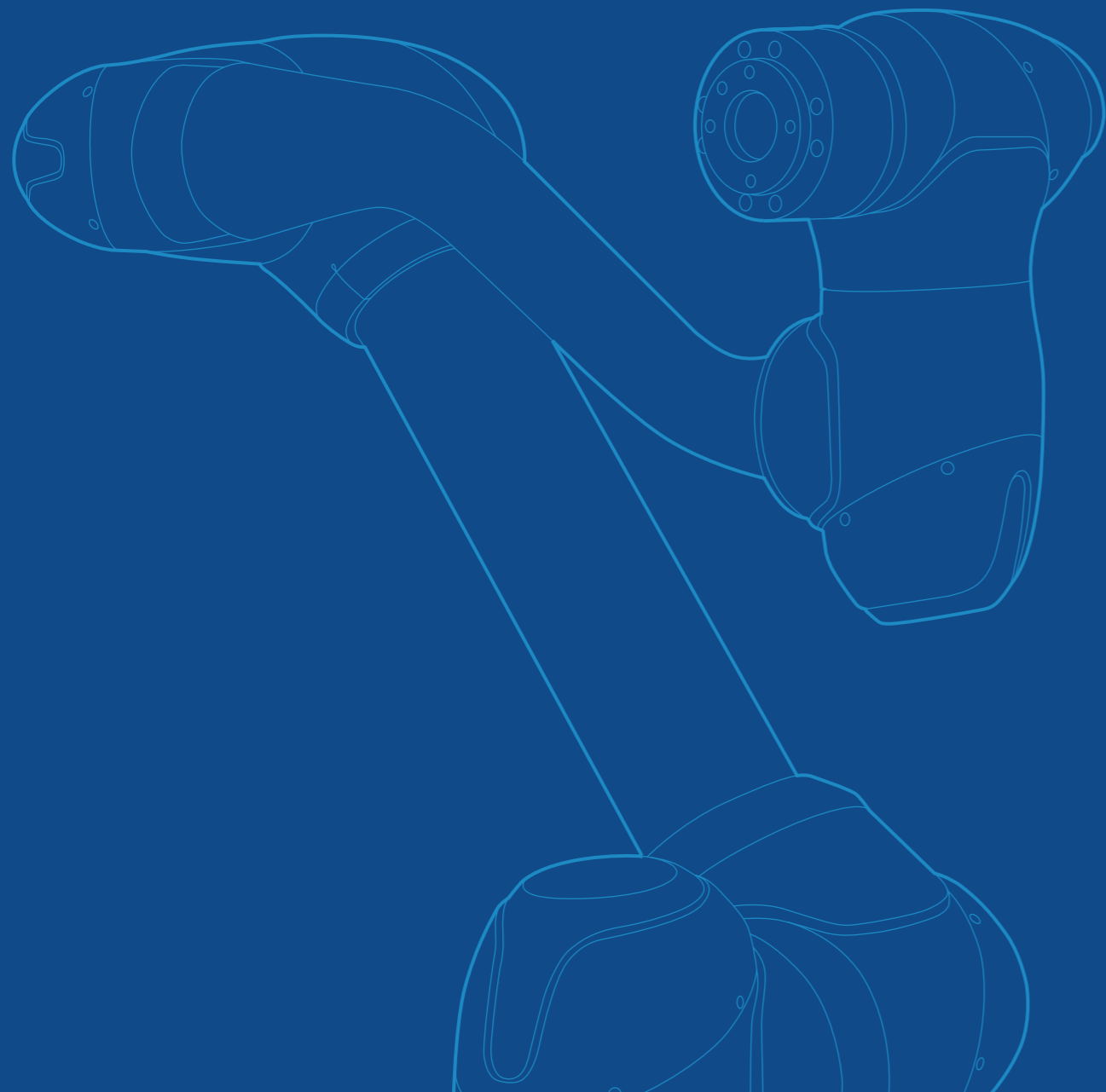
## VALUE ADDING | 01 Operation Option

### DART-Platform
Applicable to all SERIES

DART-Platform, the Doosan Robotics user software, enables intuitive robot teaching along with a wide range of programming actions on a PC

-A separate PC is required for installation and use of the DART platform

### Smart Pendant
Option one for E·A-SERIES

Smart Pendant is a simple interface featuring familiar function buttons including Home Position, Servo ON/OFF and Start/Stop for intuitive use

-If Smart Pendant is installed, a separate PC is required to run the DART-Platform

### Teach Pendant
Standard for M · H-SERIES, Optional for A-SERIES

The Doosan Teach Pendant allows for PC-like interfacing with the inclusion of the DART-Platform. It is capable of configuring various applications from simple programming to advanced control algorithms

-Teach Pendant Soft Cover (Optional)

# VALUE ADDING | 02 Controller Option

## H·M-SERIES Controller

### Specification

| Models | CS-01 (AC) | CS-01P (AC) Hardened IP |
|---|---|---|
| Dimension | 525(W) X 287(D) X 390(H) mm | 577(W) X 241(D) X 422(H) mm |
| Weight | 13 kg | 17 kg |
| Material | Plastic | Zinc Plated Steel |
| Protection Rating | IP30 | IP54 |

*Water and dust protection ratings for electrical enclosures

### Specification

| Models | CS-02 (DC) |
|---|---|
| Dimension | 462(W) X 218(D) X 295(H) mm |
| Weight | 12 kg |
| Material | Zinc Plated Steel |
| Protection Rating | IP20 |

## A-SERIES Controller

### Specification

| Models | CS-03 (AC) I CS-04 (DC) |
|---|---|
| Dimension | 482(W) X 214(D) X 375(H) mm |
| Weight | 13 kg |
| Material | Zinc Plated Steel |
| Protection Rating | IP40 |

## E-SERIES Controller

### Specification

| Models | CS-05 (AC) I CS-06 (DC) |
|---|---|
| Dimension | 440(W) X 400(D) X 91.2(H) mm |
| Weight | 9 kg |
| Material | Zinc Plated Steel |
| Protection Rating | IP20 |

# VALUE ADDING | 03 Accessories

## Mobile Base

Mobile Base organizes and integrates the robot, controller and Teach Pendant allowing flexible portability. Other devices such as pallet and laser scanners can also be installed and multiple storage compartments allow for convenient tool stowing and usage

### Specification

| Dimension | 850(W) X 600(D) X 825(H) mm |
|---|---|
| Weight | 166 kg |
| Material | Top Plate - Stainless Steel |
| Compatible Robot Models | M-SERIES / A-SERIES / H-SERIES* |

*Additional fixing work is required to apply the H-SERIES
*Some specifications may be changed to improve performance

## Dress Pack

Dress Pack easily organizes various cables used for end-of-arm tooling to allow for efficient operation. Integrated conduit brackets and holders ensure convenient organization and easily attach/detach for relocation on the robot

### Specification

| Configuration \ Model | M0609 / M1013 / M1509 A0509 / A0509s / A0912 / A0912s | M0617 H2017 / H2515 |
|---|---|---|
| Conduit | 1EA (3M) | 1EA (3M) |
| Dress Kit | 3 EA | 4 EA |
| Color | Black, White | |
| Conduit Size | Φ23, Φ29 | |

## Robot Jacket

Robot Jacket protects robots from contamination by liquids used during cutter support work and more. PU coating forms a two-stage water barrier tthat ensures the robot will maintain optimum operating conditions

### Specification

| | Full Cover Jacket | | | | | Head Cover Jacket |
|---|---|---|---|---|---|---|
| Dimension | M0609 A0509 A0509s | M1509 | M1013 A0912 A0912s | M0617 | H2017 H2515 | |
| | 1560 mm | 1840 mm | 2100 mm | 2240 mm | 3240 mm | 305 mm |
| Material | Spandex & Carbon Fiber | | | | | |
| Color | Navy | | | | | |
| Thickness | 0.55 ± 0.02mm | | | | | |
| Protected Range | Liquid such as water and paint (85℃ ± 5℃) | | | | | |

Head cover jacket

# VALUE ADDING | 04 Software

## DART-Studio

The simulation and offline programming features in DART-Studio provide fast and varied robot programming on a PC

-A separate PC is required for installation and use of the DART-Studio
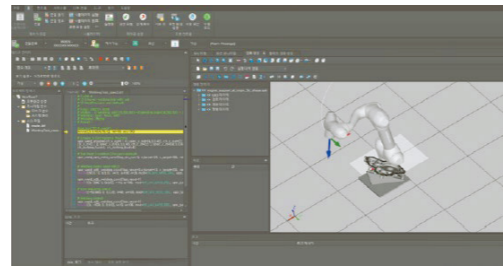
## API

A systematic Doosan Robot Framework Library is available for robot application developers to create higher-level controllers and programs for their own purposes
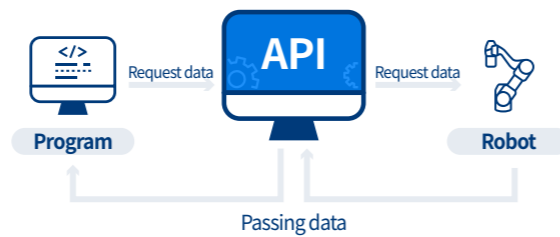


## ROS

ROS is an operating system for developing robot application programs. It provides various libraries and debugging tools for the implementation of necessary functions and the development environment

-ROS support for various platforms such as Windows and Amazon AWS Robomakers

-Provision of Doosan ROS package for ROS Kinetic / ROS Melodic / ROS Noetic package ROS 2 Foxy
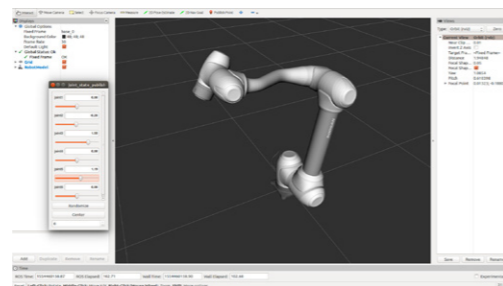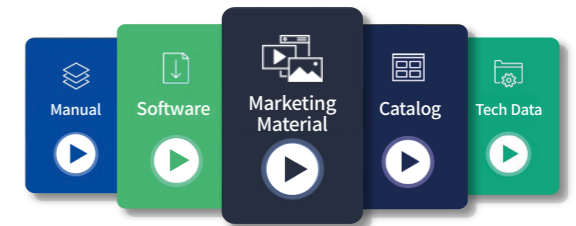
# VALUE ADDING | 05 Service

## Robot LAB

### Resources

Doosan provides a wealth of resources including user software, product catalogs, troubleshooting guides and technical materials for creating robot systems

### Training

Doosan is proud to offer training courses on system configuration and overall operations such as the installation, programming and maintenance of Doosan robots.
We also provide step-by-step online learning materials from basics for beginners to advanced applications for professionals

## EcoSystem

### Doosan Mate

Meet our partners from end effectors to safety devices to automate your work process with Doosan's collaborative robots

Scan this QR code to discover Doosan Mates products

# GLOBAL NETWORK

Doosan Robotics continues to expand its global presence,
offering prompt service through dealer networks across many countries

HQ

DR Americas

100+