

YASKAWA

Robot Assistants

Collaborative and Easy-to-Use



Masters of Robo Motion and Cont



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Contents

High Speed Collaboration	6
MOTOMAN HC Series	8
Programming for Any Experience Level	10
Fast Learning Curve	12
Industrial Robot Controllers.....	14
Safe Work Assistant	16
Safety Controller & Offline Simulation	18
One Robot – three Modes – endless Possibilities	20
Automation applications	22
High Reach and Payload	24
Intelligent Lattice Box Handling	26
Machine Tending	28
Ideal for Sensitive Environments	30
Welding Made Easy – Weld4Me.....	32
Automated Assembly	34
Compact and Lightweight Design	36
Ecosystem Partner Program	38
Yaskawa Total Customer Support (TCS)	40
List of technical Specifications of all Models	42
List of all Safety Functions	44

SAFE





YASKAWA



EASY

HIGH SPEED

Collaboration

FAST >> 2000 $\frac{\text{mm}}{\text{s}}$ Maximum Speed*

The efficient, high-speed MOTOMAN HC Series provides superior performance with increased axis speeds, surpassing other cobots in its class to deliver maximum productivity.

AGILE >> Torque Sensors in each Joint

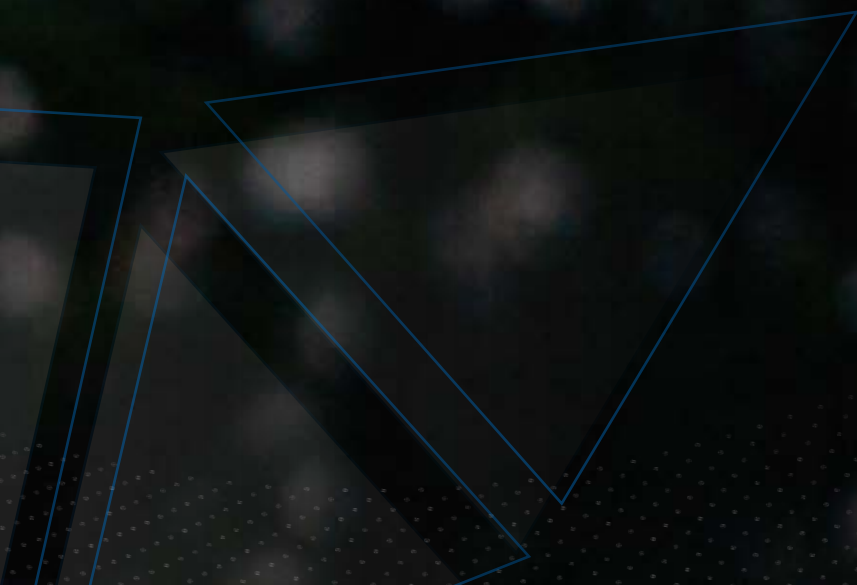
Whether used in coexistence or direct collaboration – the HC Series with progressive sensor technology operates without a fence at peak performance speed. Highly-sensitive sensors immediately detect contact situations and initiate a counter movement that reduces the forces and pressures applied.



POWERFUL >> Industrial Sigma-7 Servos

Sigma-7 products set a new industry standard in servo capability, with features that continue Yaskawa's 25-year reputation for redefining the possibilities in motion automation.

*linear motion, depending on payload



MOTOMAN HC Series

MOTOMAN HC10 Series

MOTOMAN



10 kg
payload



1,379 mm
reach



± 0.05 mm
repeatability



HC10DTP Classic

- Direct Teaching



HC10DTP

- Direct Teaching
- Food grade grease
- Protection class IP67
- Available as welding cobot



HC10DTFP

- Direct Teaching
- Food grade grease
- Protection class IP67
- Powder-coated surface

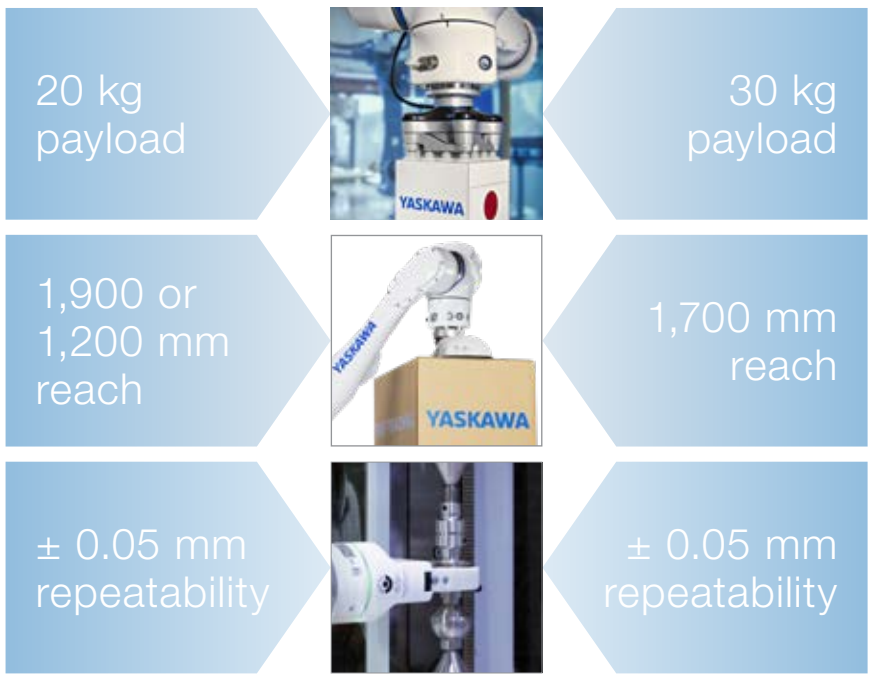


When you hear the term “industrial robots”, you may associate this with images of welding or painting processes at automobile plants. Now however, robots are used in many more fields and across applications including logistics, pharma and food manufacturing. In recent years, skilled labour shortages at manufacturing sites have become an increasing challenge globally so that automation, utilizing robots has become increasingly significant. In addition, the needs for the utilization of robots are diversifying these days as we assign multiple jobs to one robot, not just make it repeat a simple single task as before.

Nevertheless, there are still challenges for the small and mid-sized company to install robots as the working area for humans has to be separated from industrial robots by a safety fence, which requires sufficient space and additional installation costs. The Yaskawa human collaborative robot (HC10) is a new generation of robotics that is capable, affordable, versatile, simple to use and built with the industrial strength for which Yaskawa products are known. These robots are for customers looking for easy automation, a robot to automate tasks, that can work in close proximity to humans.

HC20DTP Series

MOTOMAN HC30PL



HC20DTP

- Direct Teaching
- Food grade grease
- Protection class IP67

HC20SDTP

- Direct Teaching
- Food grade grease
- Protection class IP67
- Short-arm Variant for confined Spaces

HC30PL

- Palletizing Specification: Payload Increase, Axis Limitation
- Direct Teaching
- Food grade grease
- Protection class IP67



Programming for any Experience Level



Intuitive Direct Teaching (DT)

This intuitive programming method is the perfect entry into programming. Simply move the robot flange by hand, record the motion points and operate the gripper actuation by pressing the respective DT buttons. Code is automatically generated in the background on your pendant.



Innovative Smart Pendant

Our latest pendant does not compromise between ease of use and capability. The 10-inch touchscreen is operated like a smartphone with features such as a blend in sidebar, large intuitive buttons or split screen mode. Seamless direct teaching integration makes programming with collaborative robots particularly user-friendly.



Classic Teach Pendant

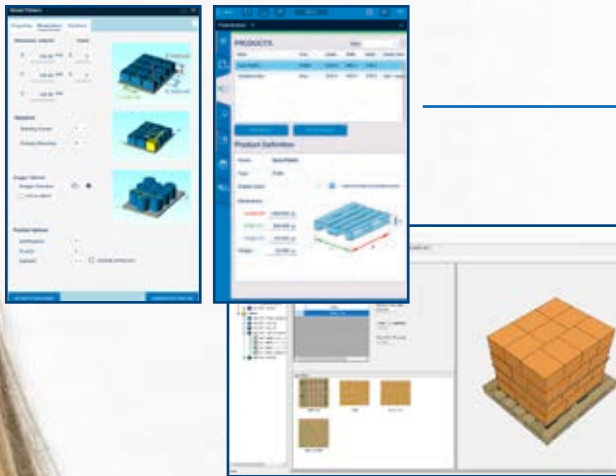
With over 40 years of experience in robotic applications, this latest pendant has the proven performance for complex tasks. With full access to our function portfolio, the robust industrial design and the combination of haptic feedback and touchscreen operation, programming possibilities are limitless.







Fast Learning Curve



Application-specific Wizards

Application wizards are designed to simplify the steps and decisions you need to make in order to have a working robot program. It is about hand guiding the tip to a sequence of positions, recording and playing back the sequence.



Smart Frame Technology

Our technology determines the user's orientation relative to the robot, supplementing existing three dimensional coordinate system. This intuitive jogging method works by tilting the smart pendant in the desired programming direction.

Integrated Help Menu

Whenever you face challenges with programming your job, the integrated assistance explains the single functions in detail to you.



Industrial Robot Controllers



Classic YRC1000 Controller

The YRC1000, is a fast and flexible controller for MOTOMAN robots that combines a high performance robot controller into a small footprint cabinet. In addition to the typical Yaskawa controller functionality, this new controller generation enables increased robot speeds and higher path accuracy.



Space-saving YRC1000micro Controller

Powerful and precise, the compact YRC1000micro controller minimizes installation space whilst optimizing performance. Its small footprint and lightweight are ideal for installations with high-density layouts, where stacking of controllers may be required.



90+ Industrial Robot Functions

The YRC1000 controller series includes over 90 optional function packages for industrial robots.



Safe Work Assistant

The MOTOMAN HC series with PLd Cat. 3 certificate utilizes 25 safety functions to keep your operator safe. Particular attention was paid to the sensor technology in each joint for increased sensitivity.

PLd Cat. 3

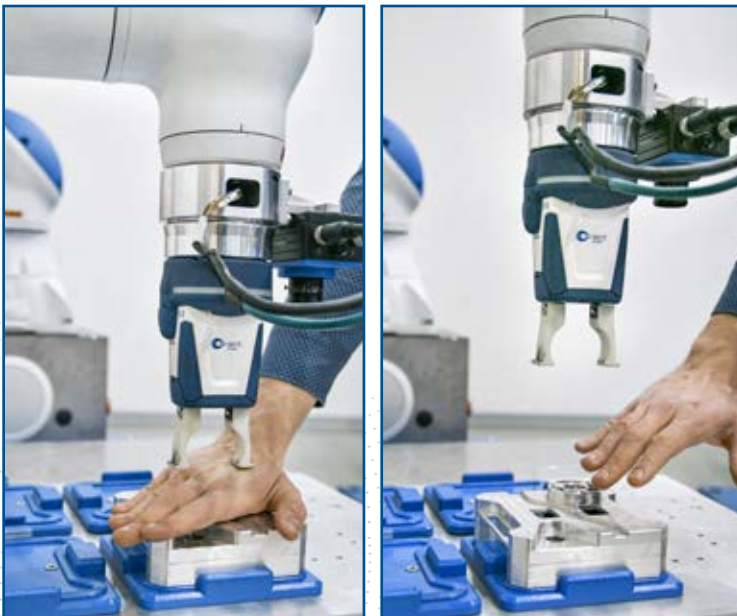
Performance Level d Category 3
Certificate according to
EN ISO 13849-1

25

Hardware and
Software
Safety Functions

Retract & Clamp Release Function

Our unique safety technology helps detect clamping situations and can react before injury. An immediate robot retract reaction reduces the applied pressure, while the following free drive motion enables the operator to free himself.





Torque Sensors in each Joint

Each joint is monitored by a single sensor system, that can sense its environment. When a collision occurs, the HC executes a safe stop. The robot's sensitivity is adjustable to adapt to the respective production environment. From sensitive measurement tasks to heavy workpiece handling: the HC robot acts accordingly.

Rounded Edges without Pinch Areas & internal Media routing

Pushback Function

The robot can be pushed away smoothly whilst in motion, i.e. if the robot is in the way of the operator during manual process. After push back, the robot moves back to it's last position and continues his work.



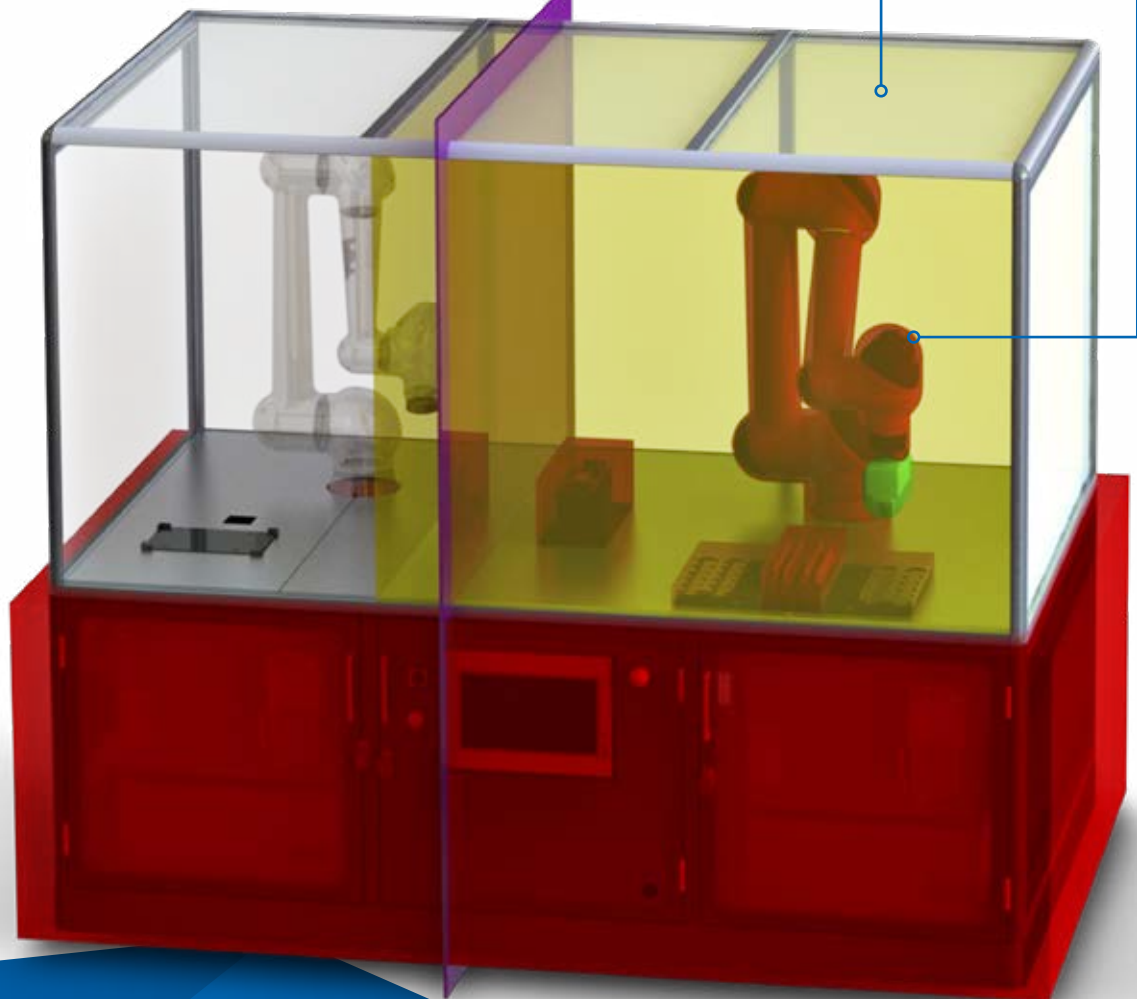
Safety Controller & Offline Simulation

The powerful Functional Safety Unit monitors the robot's movements and sensors and is the control centre of your safety settings. With the simple interface, speed levels and 3D safety areas are quickly defined.

3D Area and Plane Definition

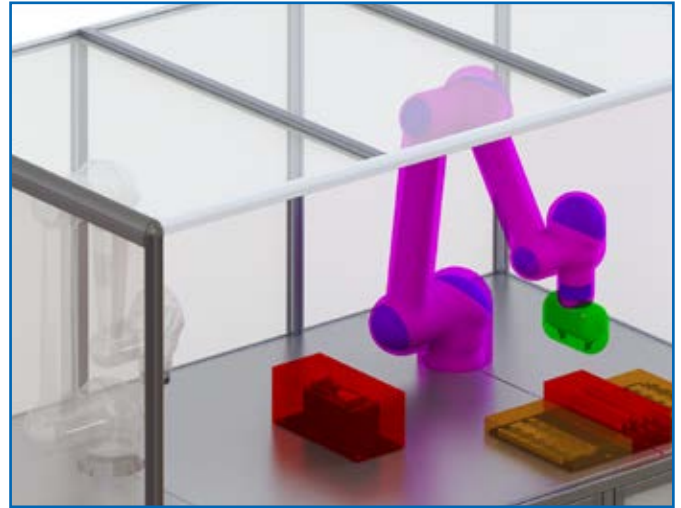
Create safe working areas and individual speed levels:

- Yellow areas to limit the robot's movement area
- Orange areas to reduce the robot operating speed
- Red areas to ensure collision-free operation
- Planes to lock robots to each other

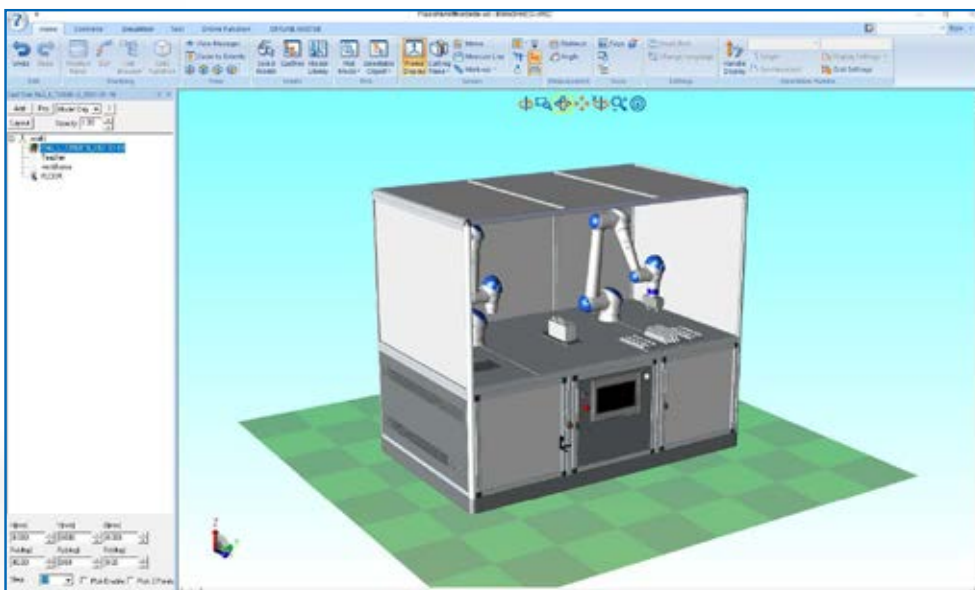


High-precision Envelope Curves

The robot and tool envelope can be designed very exactly using multiple geometrical elements. This enlarges the available operating space of the robot and increases the safety of the whole application.



Offline programming, 3D simulation and Virtual Robot Control all make it easy to build and simulate a robotic cell without ever installing a robot. Yaskawa provides MotoSim EG-VRC and MotoSize for building and simulating your robot cell.



Main features are:

- Offline programming of your whole robot cell
- Minimisation of setup, non-productive and commissioning times
- Full control functionality and simulation of the Yaskawa product family, including robots, gantries, tracks and positioners

One Robot – three Mode

Our hybrid robots react to the present situation by adjusting their operating speed. In combination with external safety devices, such as pressure sensitive mats or laser scanners, HC robots detect the proximity to the operator and adjust their speed accordingly. This hybrid operation concept provides your application maximal profitability while not compromising occupational safety.

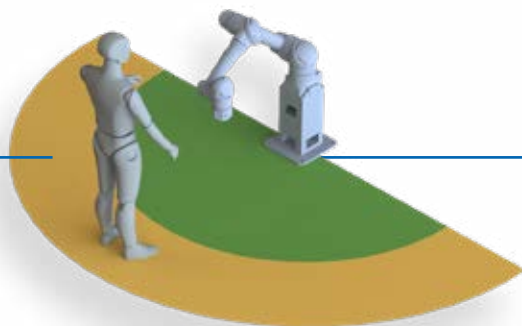
Collaborative Mode

During direct interaction with the operator, the robot moves in collaborative speed. While classic industrial robots would stop at close proximity, cobots can continue their operation. The torque sensors in each joint guarantee safe operation during the interaction phases.



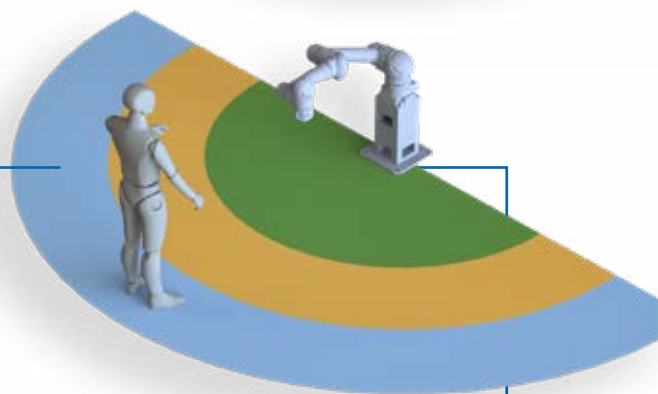
Speed-Reduced Mode

When entering the robot's operating space, the distance is detected and the robot starts to slow down until the collaborative mode is activated at very high proximity. After leaving this area, the robot switches to industrial mode and works in full-speed.



Full-Speed Mode

As manufacturer of industrial robots, Yaskawa put all its engineering knowledge in the HC series to provide a cobot on industrial robot level. Besides the robust design, the robot can also operate in industrial speed up to 2 m/s.



s – endless Possibilities



Whether machine loading, palletizing or welding – the cobots from Yaskawa work reliably in all common automation applications:

Palletizing Page 24/25

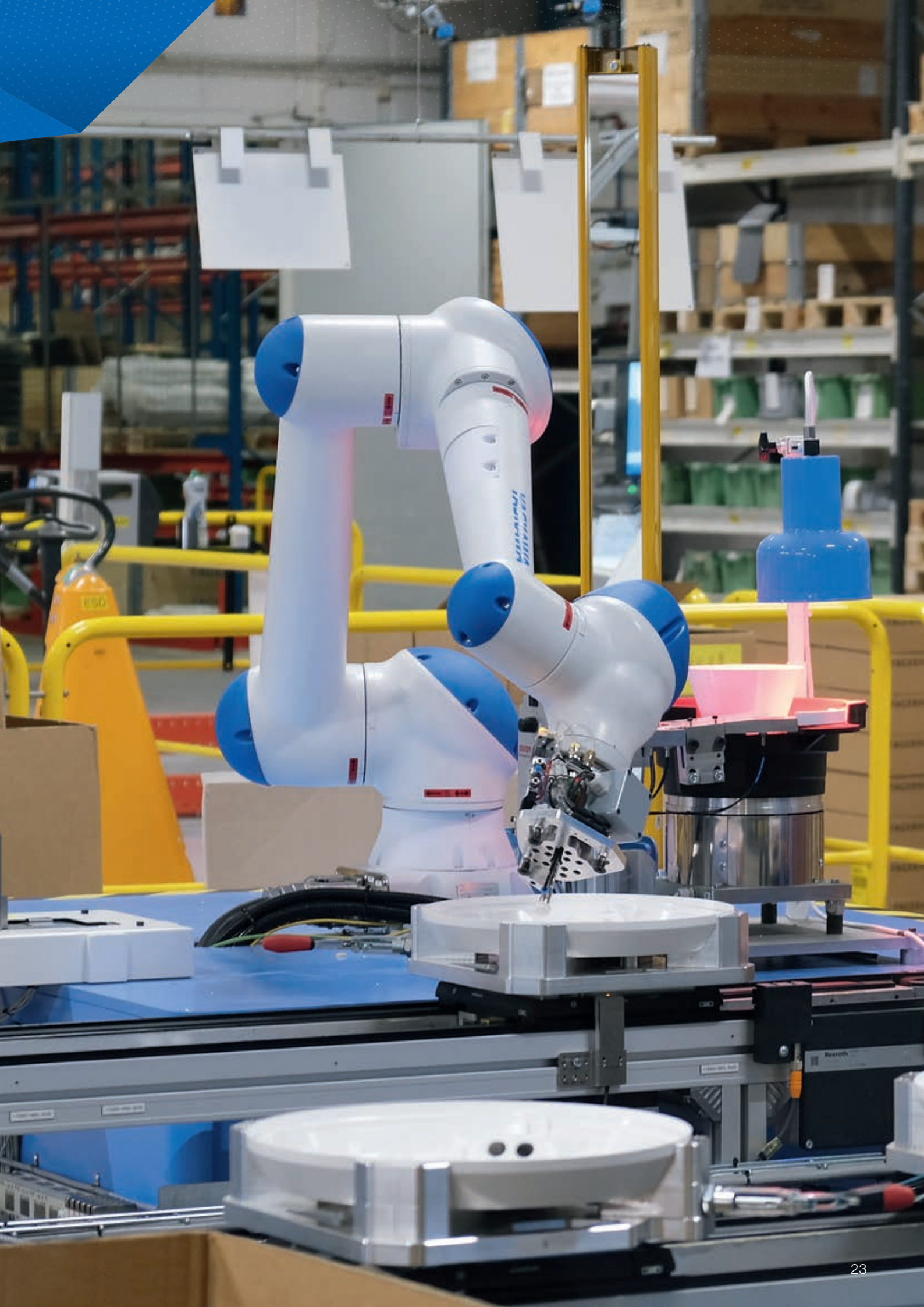
Material Handling Page 26/27

Machine Tending Page 28/29

Food & Pharma Page 30/31

Welding Page 32/33

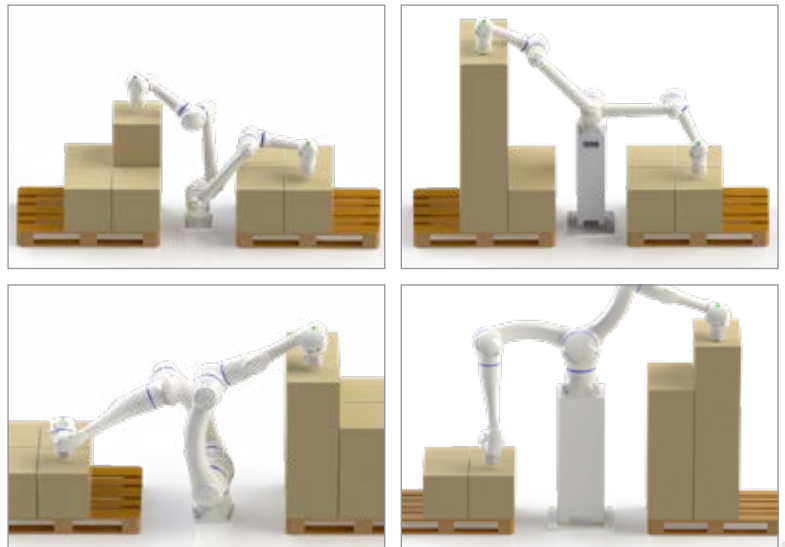
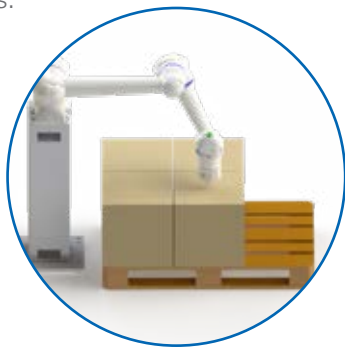
Assembly Page 34/35



High Reach and Payload

Operation below Basis

When adding a robot riser stand, the manipulator can grip below its own base, leading to increased stacking heights of the pallets.



Smart Pendant with Pallet Builder

Designed to facilitate fast deployment of palletizing cells, the easy-to-use Pallet Builder extension app features an intuitive user interface that enables quick development and optimization of palletizing jobs. The included product database is scalable to meet your business needs, with guided prompts for cell configuration as well as pallet pattern setup and programming. This no-code platform is ideal for enterprises with little to no programming experience.



Plug & Play Accessories

Our Smart Series program cooperates with various 3rd party companies, providing our customers a wide range of easy-to-use accessories.

Large Working Area

The operating range of HC robots is designed to reach the long side of a pallet without the need of a robot pedestal.



Intelligent Lattice Box Handling

Modular software solutions for complex motion and handling processes



Automated part recognition

- Vision & AI-based detection of the pick position



Automated box recognition

- Vision & AI-based detection of the place position
- Automatic detection of box placement irregularities



Automated path generation

- AI-based path generation between pick and place position
- Automatic pattern stacking creation



Machine Tending – even in Rough Environment



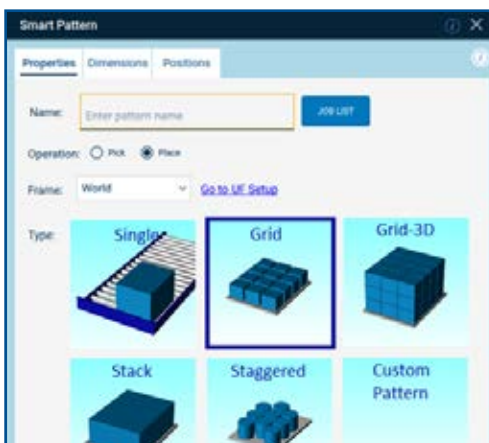
Easy to clean

The high IP67 protection class of our robots makes it easy to clean the robot after operation.



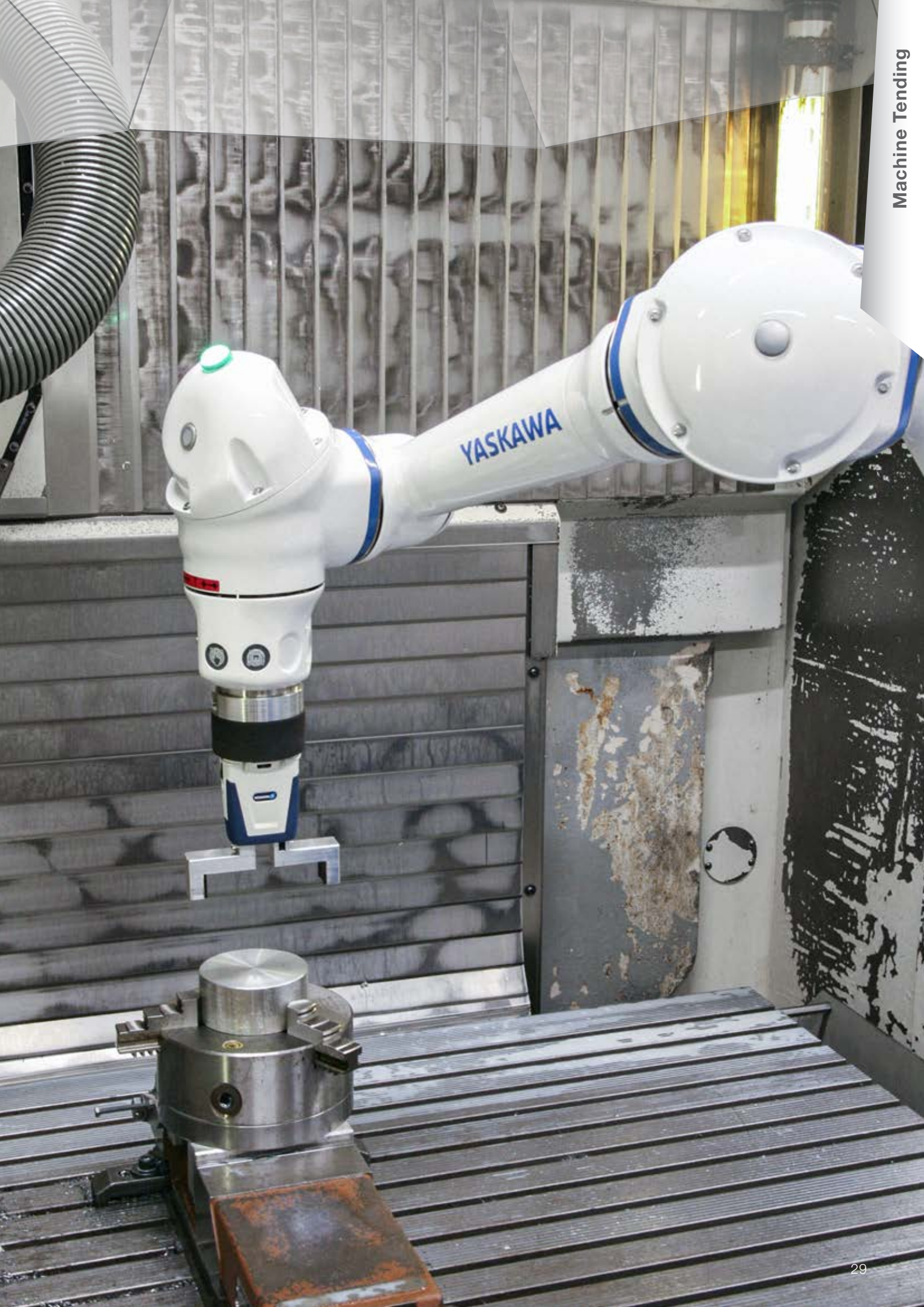
Dust and Dirt Protection

The robust industrial design makes our IP67 robots the perfect choice for industrial jobs, such as machine tending or welding.



Smart Pattern

The Smart Pattern extension is a graphical interface for Smart Pendant to quickly generate jobs to handle parts in specific pattern(s). The interface supports common applications that require patterns (i.e. machine loading/unloading, stacking, unstacking, case packing, etc.).





Ideal for Sensitive Environments



Food Grade Grease in all Joints

Our DTP and DTFP models are upgraded with food grade grease to handle food or pharmaceutical products standards.



Powder-coated Surface

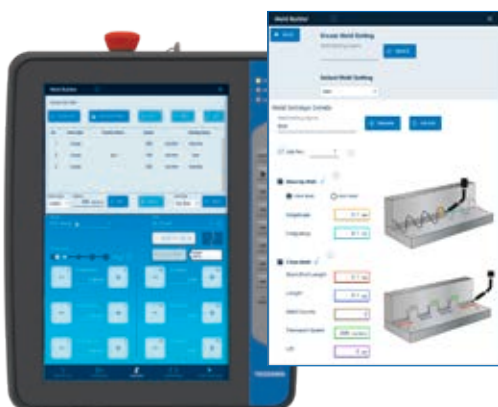
The special DTF chemical proof coating and VITON seals allow cleaning the robot with acid or alkaline detergents as well as disinfecting the robot with H_2O_2 .

Welding Made Easy – Weld4Me



Hand Guiding

Intuitive new teaching method for collaborative robots. This hand-guiding facilitates easy programming for fast implementation of the robot system. Simply move the robot flange by hand and record the motion points with the easy-to-use programming buttons.



Weld Builder

The Weld Builder is a software to extend the Smart Pendant for the creation and execution of welding operations in combination with the Weld4Me cell. With this intuitive interface, creating welding programs becomes accessible to everyone. All common seam types can be welded without programming knowledge – efficiently and with consistent quality. The welding commands are learned via the Hand Guiding and Direct Teaching Buttons or entered directly via Smart Pendant. The Dry Run function can be used to test the created weld path.



Standard Arc-Welding System Weld4Me CE

The turnkey, easy-to-operate robotic cell. Weld4Me CE for MIG/MAG welding is ideal for small batches and requires little space. The collaborative welding station ensures consistently high weld high weld quality and is easy to install. This improves your welding quality and productivity compared to manual welding.



Weld4Me Custom Systems

In addition to the Weld4Me CE turnkey robotic welding cell, YASKAWA offers the world's first custom Cobot welding system: **Weld4Me Custom System**

Possible components:

- Two integrated fully synchronous external robot axis
- Yaskawa 2 m track for small cobots
- Yaskawa single axis positioner with counter bearing



Munting, Fitting and Screwing

- **Reliable precision through internal sensors:**
Join a workpiece with a specific pressure by measuring occurring forces.
- **High rigidity of the cobot**
enables more flexibility in tasks.
- **Automated screwing**
with adjustable tightening torque.
- **Intelligent Process Design.**
Collaborative mode is on until 4mm finger clamping area.
Below 4mm, collaborative mode is deactivated for bolt tightening.
- **Direct Teach and Hand Guiding**
make programming sequences accessible to everyone.
- **Safe Operation**
Safe collaborative stop at contact.

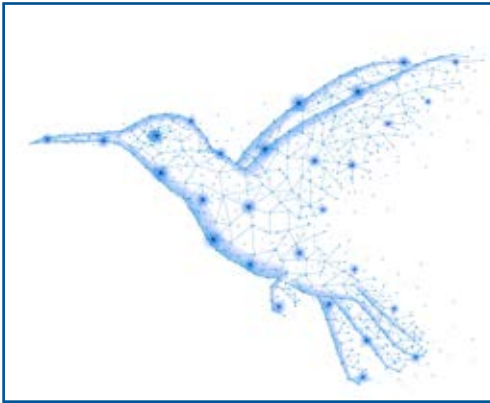




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Compact and Lightweight Design



Optimal Payload-Weight-Ratio

The HC series is designed to save more than 50% of weight compared to industrial robots. Less moved masses are especially important during the direct collaboration with the operator.



Operation on Linear Axis and Gantries

Low manipulator weight requires less massive gantry steelwork and reduces typical fabrication costs compared to classic automation solutions.



AGV Operation

Low manipulator weight and collaborative design allows the integration into AGV fleet solutions.

Ecosystem Partner Program

Yaskawa has partnered with industry leaders to provide interfaces to several robot accessories and total robotic solutions. By this, Yaskawa helps customers – that are new to robotics – to start their automation story today, as well as robot experts to find new possibilities of intelligent robotic systems.



1. Receive your ready-to-install Package



2. Install the Gripper on your Robot

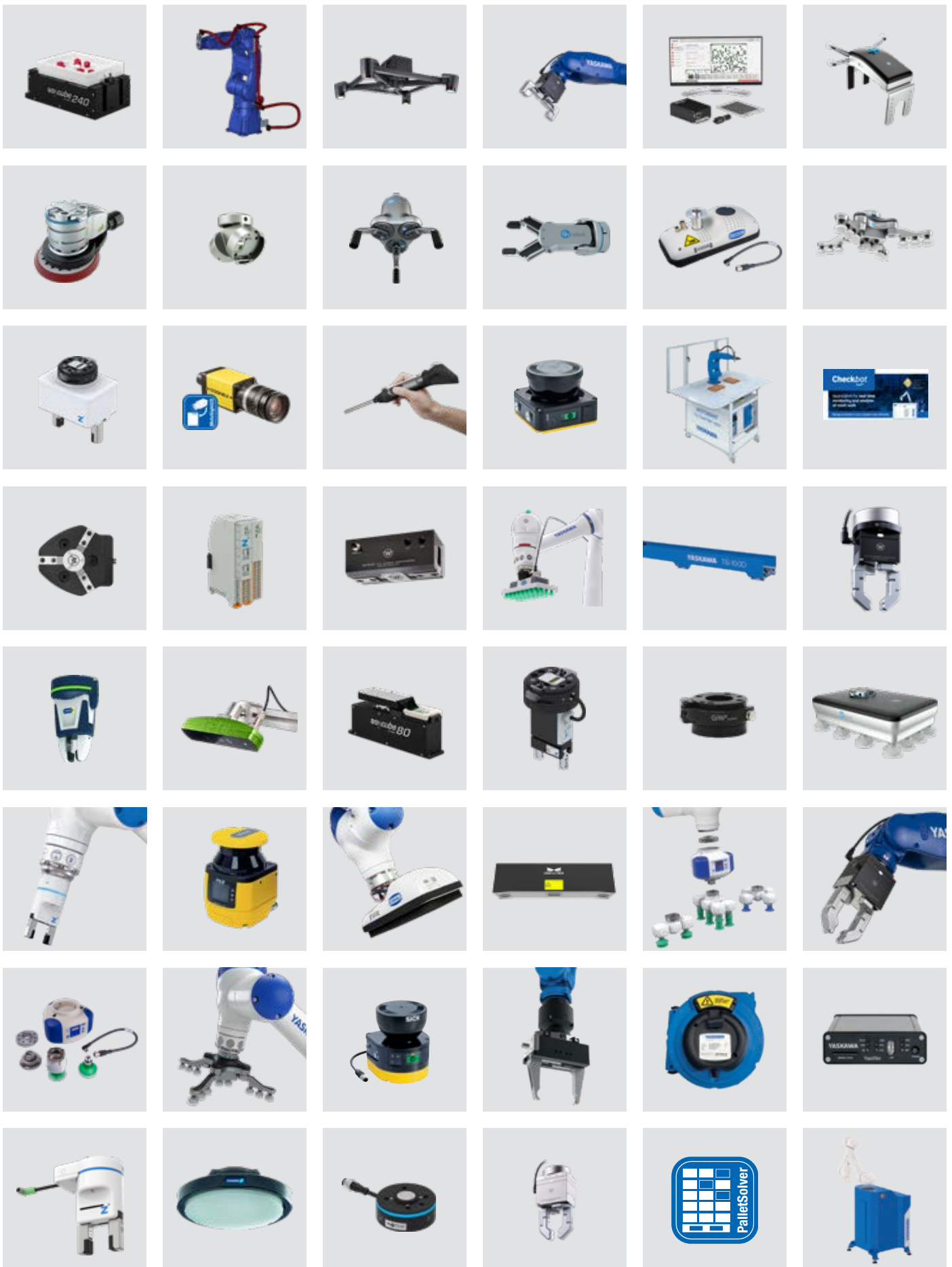


3. Configure on the Smart Pendant



**Join our
Ecosystem**





Yaskawa Total Customer Support (TCS)

Yaskawa supports you throughout the entire product lifecycle with service products and services tailored to your needs. The 360 all around support, the TOTAL CUSTOMER SUPPORT, not only refers to the Yaskawa products and systems but also to your applications and processes. Through our global service network, Yaskawa is always close to you to ensure your success, because customer satisfaction is our top priority!

As soon as you consider acquiring an automation solution or robot for your company, that is where we come in. With many years of expertise in this field, and in-house coverage of all areas, we are able to offer comprehensive service that truly deserves the name "Total Customer Support".

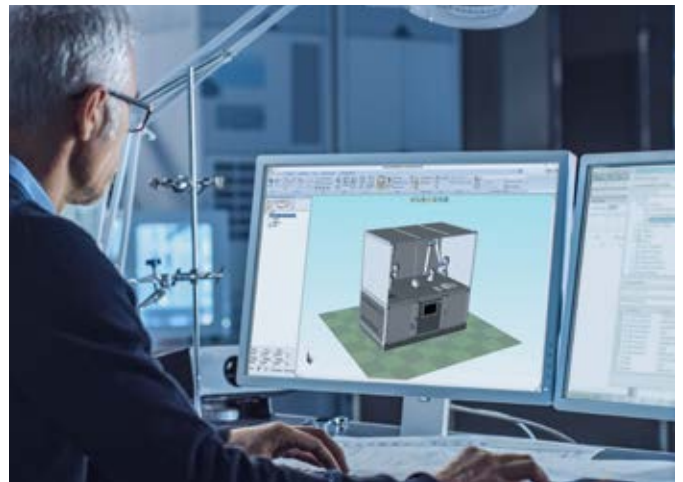
E-Learning



- HC programming Training with Teach and Smart Pendant
- FSU Webinar

Become familiar with our programming language completely online. Our academy provides e-learning for Teach and Smart Pendant and the configuration of the Functional Safety Unit.

Cell Design



- 3D Simulation
- Reachability Studies
- Cycle Time Optimization
- Prototyping

Even if you have only a vague notion of your automation solution, Yaskawa will draw up a concept for you and integrate the required components as a turnkey system.

Safety Consulting



- Initial Analysis
- Feasibility Test
- CE Support
- Crash Course Collaborative Design

Safety made easy – Yaskawa can advise you during the planning phase and support you in the CE process from defined safety zones to flexible safety concepts.

Personal Advice



- In-Process Engineering Services

Our company's commitment to customer satisfaction starts with your dedicated sales specialist, there to support your project through to its completion.

In Class Training



- On Site
- In our Academies

The Yaskawa Academy offers a broad range of courses to suit the level of knowledge of the participants – from beginner to expert.

Aftersales



- Hotline
- Maintenance and Repair
- Overhauls and Refurbishments

Our experienced technicians are only a phone call away to provide you with fast and competent advice on every aspect of your robot system.

List of technical Specifications of all Models



HC10DTP Classic

Specifications						
Axes	Maximum motion range [°]	Maximum speed [°/s]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	6
S	±210	130	–	–	Max. payload [kg]	10
L	±180	130	–	–	Repeatability [mm]	±0.05
U	±290	180	–	–	Max. working range R [mm]	1370*/1200**
R	±210	180	27.4	0.78	Temperature [°C]	0 to +40
B	±180	250	27.4	0.78	Humidity [%]	20 – 80
T	±210	250	9.8	0.1	Weight [kg]	48
					Power supply, average [kVA]	1.0



HC10DTP

Specifications						
Axes	Maximum motion range [°]	Maximum speed [°/s]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	6
S	±210	130	–	–	Max. payload [kg]	10
L	±180	130	–	–	Repeatability [mm]	±0.05
U	±290	180	–	–	Max. working range R [mm]	1370*/1200**
R	±210	180	27.4	0.78	Temperature [°C]	0 to +40
B	±180	250	27.4	0.78	Humidity [%]	20 – 80
T	±210	250	9.8	0.1	Weight [kg]	58
					Power supply, average [kVA]	1.0



HC10DTFP

Specifications						
Axes	Maximum motion range [°]	Maximum speed [°/s]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	6
S	±210	130	–	–	Max. payload (on U-axis) [kg]	10
L	±180	130	–	–	Repeatability [mm]	±0.05
U	±290	180	–	–	Max. working range R [mm]	1370*/1200**
R	±210	180	27.4	0.78	Temperature [°C]	0 to +40
B	±180	250	27.4	0.78	Humidity [%]	20 – 80
T	±210	250	9.8	0.1	Weight [kg]	58
					Power supply, average [kVA]	1.0



HC20DTP Classic

Specifications						
Axes	Maximum motion range [°]	Maximum speed [°/s]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	6
					Max. payload [kg]	20
S	±210	80	–	–	Repeatability [mm]	±0.05
L	±180	80	–	–	Max. working range R [mm]	1900*/1700**
U	+247/–67	120	–	–	Temperature [°C]	0 to +40
R	±210	130	58.8	4.0	Humidity [%]	20 – 80
B	±180	180	58.8	4.0	Weight [kg]	140
T	±210	180	29.4	2.0	Power supply, average [kVA]	1.5



HC20SDTP

Specifications						
Axes	Maximum motion range [°]	Maximum speed [°/s]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	6
					Max. payload [kg]	20
S	±210	105	–	–	Repeatability [mm]	±0.05
L	±180	90	–	–	Max. working range R [mm]	1412*/1200**
U	±290	135	–	–	Temperature [°C]	0 to +40
R	±210	130	58.8	4.0	Humidity [%]	20 – 80
B	±180	180	58.8	4.0	Weight [kg]	97
T	±210	180	29.4	2.0	Power supply, average [kVA]	1.5



HC30PL

Specifications						
Axes	Maximum motion range [°]	Maximum speed [°/s]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	6
					Max. payload [kg]	30
S	±210	80	–	–	Repeatability [mm]	±0.05
L	±180/–154	80	–	–	Max. working range R [mm]	1700/1600*
U	+247/–67	120	–	–	Temperature [°C]	0 to +40
R	±15	112	–	–	Humidity [%]	20 – 80
B	±15	132	–	–	Weight [kg]	140
T	±210	180	–	2.0	Power supply, average [kVA]	1.5

List of all Safety Functions

- 1 Individual Axis Range Limitation
- 2 Individual Axis Speed Monitoring
- 3 Safety Range Limitation
- 4 Safety Speed Limitation
- 5 Tool Angle Monitoring
- 6 Tool Change Monitoring
- 7 Robot Range Display
- 8 Power Limit Function
- 9 Force Limiting Function
- 10 Pushback / Avoidance Function
- 11 Retract Function
- 12 Clamp Release Function
- 13 Self Interference Function
- 14 Tool Interference Function
- 15 Emergency Stop
- 16 External Emergency Stop
- 17 Safeguard Stop
- 18 Password Protection Function
- 19 Operation Mode Switch
- 20 Robot Operation Digital Output
- 21 Hybrid Operation Digital Output
- 22 Safety I/O's to Switch Functions
- 23 Safety Feedback Signals
- 24 Operation Running Output Signal
- 25 Safety Circuit for Monitoring External Safety Devices



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Kennerfeld
Leafcup Refreshing Mint



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All drawing dimensions in mm.
Technical data may be subject to change without previous notice.
Please request detailed drawings at robotics@yaskawa.eu.

Robot Assistants
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