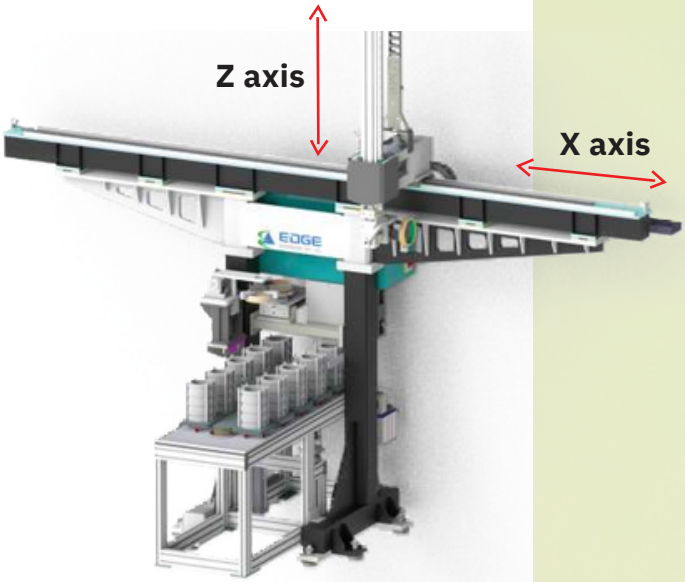
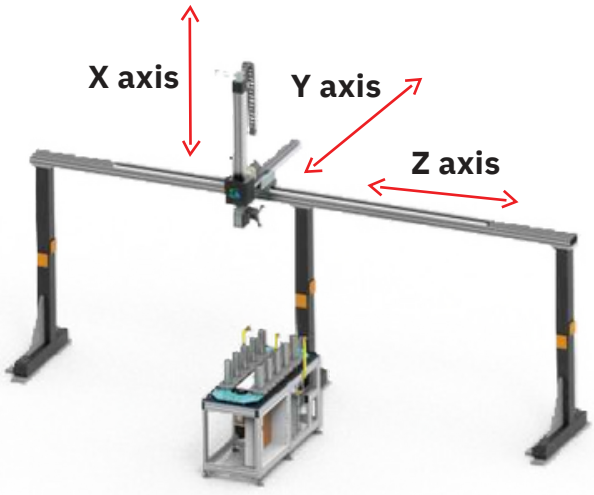

EDGE®
AUTOMATION PVT. LTD.
Committed to Excellence

we are expert in developing **3-4 axis Gantry** system for **CNC** machine automation including wear offest with **higher payload capacity** and **high speed**, our Gantry system compliance rigid structure with easy and user **friendly operation** and almost negligible maintenance.



Gantry for CNC



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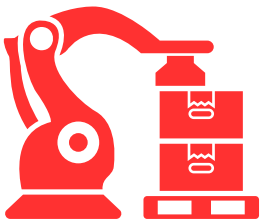
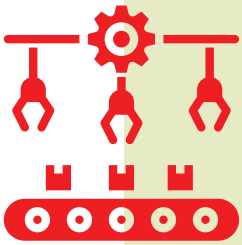
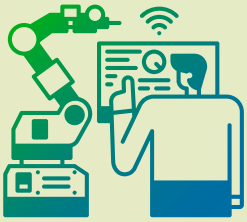
SUITABLE APPLICATION



PACKAGING & PALLETIZING



MATERIAL SORTING



QUALITY INSPECTION

MACHINE TENDING

SPECIFICATION

• PAYLOAD	20 Kg to 40 Kg
• NUMBER OF AXIS	2 - 4
• GRIPPER	3 -2 POINT PNEUMATIC
• LINEAR MOTION	LM GUIDEWAYS
• TRANSMISSION	RACK AND PINION
• CONTROL SYSTEM	PLC MOTION CONTROL

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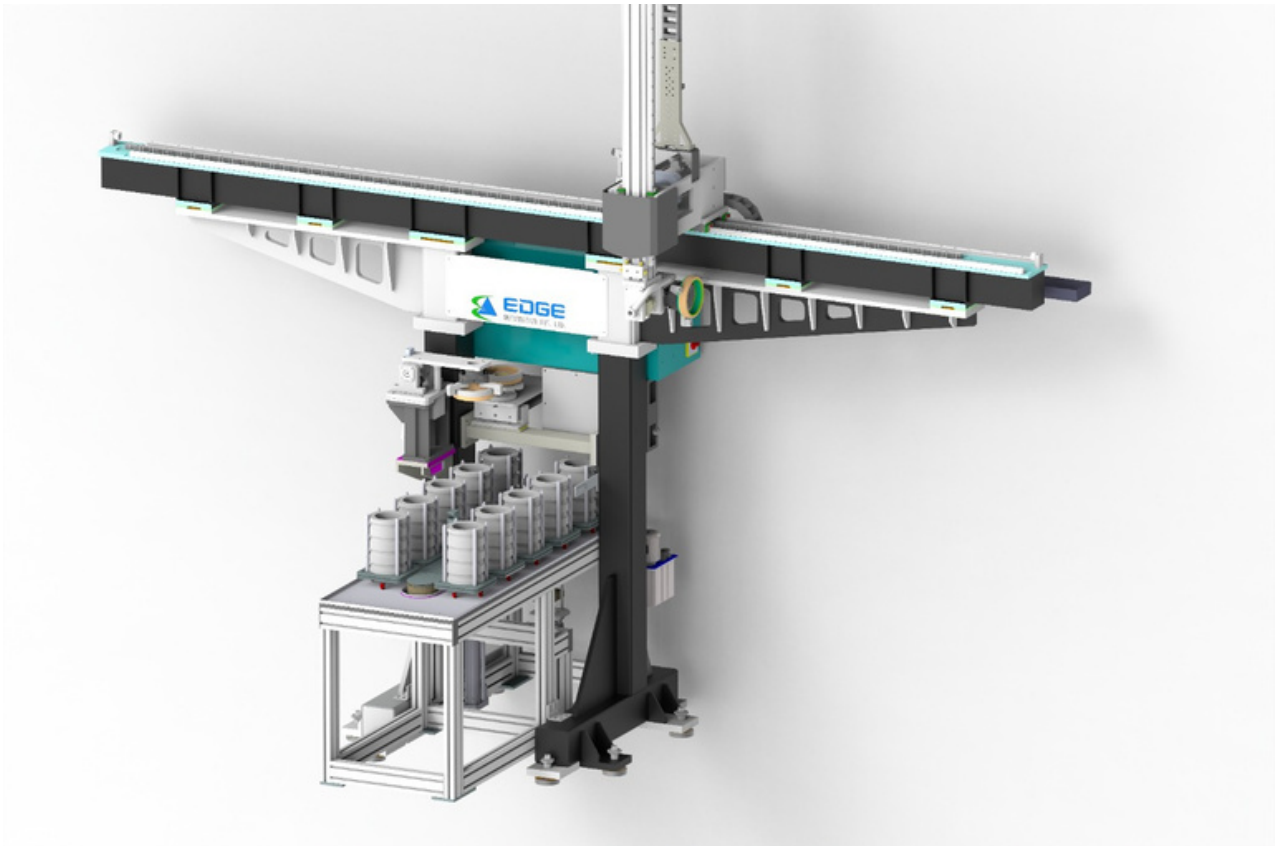
WHY GANTRY AUTOMATION

- QUICK R.O.I.
- NO EXTRA FLOOR SPACE REQUIRED
- SPARES AVAILABLE EASILY
- REDUCE MANPOWER ISSUES
- BOOST PRODUCTIVITY
- USER FRIENDLY AND EASY OPERATION
- EASY TO INTEGRATE WITH NEW & EXISTING MACHINES



MITSUBISHI ELECTRIC INDUSTRIAL ROBOT

Evolved intelligence realizes advances in work procedures, cooperation between people and robots, and e-F@ctory-compatibility, making next-generation manufacturing a reality.

With globalization and increasingly diverse consumer needs in the market, the manufacturing industries face a time of considerable change. It is no longer enough for industrial robots to simply perform a single task. Industry now demands robots with the capacity and flexibility to readily take on more sophisticated tasks. The MELFA FR series provides new, more intelligent solutions that underpin “next-generation manufacturing”, offering a simpler approach to advanced and flexible production. These robots can handle all your automation needs.

MELFA FR Series

“Next-generation intelligent functions” make it simple to carry out work that has always defied automation. “Safe, collaborative work applications” allow robots and people to work together with high levels of safety. “FA-IT integration functions” support next-generation manufacturing. With these 3 key features, the FR Series is capable of handling virtually all your automation needs.

Intelligence
[Nex t- generation intelligence]

Int e gr a tion
[FA-IT integration]

Safety
[Safe, collaborative work applications]

Greater advances in intelligent technology

“MELFA Smart Plus” offers greater accuracy and shorter startup times, making installation simpler and more advanced tasks possible through more sophisticated force sensors and enhanced cooperation with vision sensors.

Enhanced cooperation through e-F@ctory

Connection and integration with a wide range of FA equipment, such as the MELSEC iQ-R series. These machines support the “e-F@ctory” integrated FA solution for seamless integration of robots and IT systems.

Improved safety through collaborative work applications

A comprehensive range of safety functions, including position and speed monitoring and monitoring of the X, Y and Z components, allow work to be conducted in collaboration with people.

Making difficult automation possible

Intelligent technology means that it is now possible to automate processes that previously could only be handled by humans due to the difficulty of the tasks involved. And using “Smart Plus”, this can be achieved with ease.

Promoting smarter factories

The integration of e-F@ctory machines enables flexible manufacturing tailored to the type of production. This improves productivity and maintainability and reduces the TCO (Total Cost of Ownership).

Even higher productivity

Safety functions make collaborative work applications possible, for automation that is simpler and safer. The reductions in required space and stoppage times mean that factories can offer both productivity and flexibility.

MELFA Smart Plus

Function expansion options further broaden the range of possibilities of the MELFA FR series, offering performance beyond your expectations.

Integration with the MELSEC iQ-R series PLCs enables more advanced tasks!

Integrating these robots with the Mitsubishi Electric MELSEC iQ-R PLCs simplifies startup and improves productivity and maintainability, ensuring that you maximize the potential of the FR series.

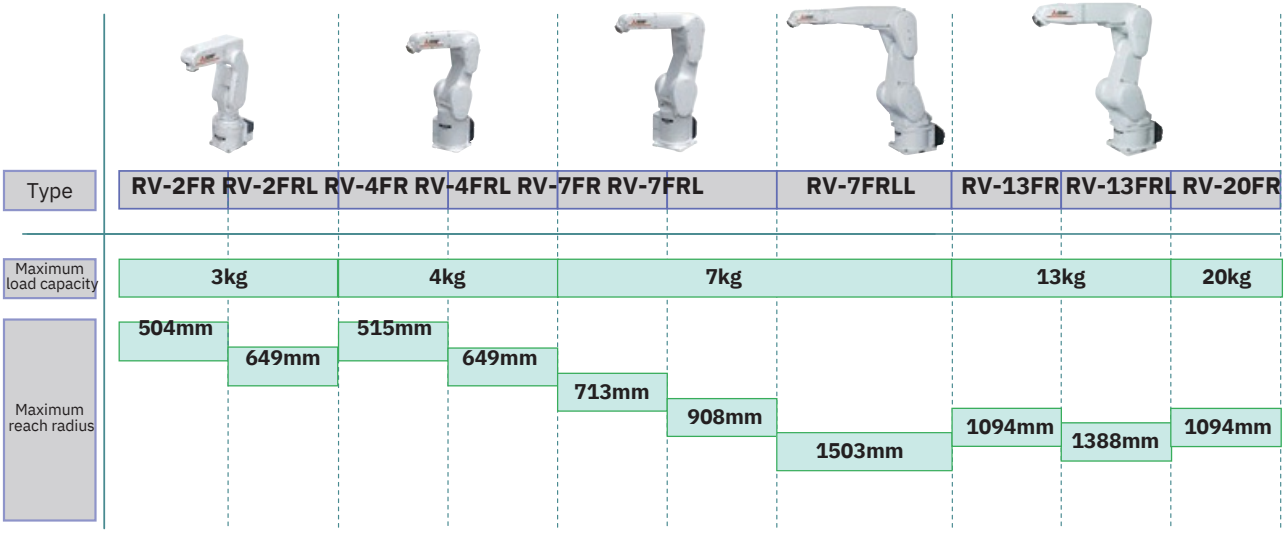
MELFA FR
SERIES

Vertical, multiple-joint type robots

RV-FR SERIES

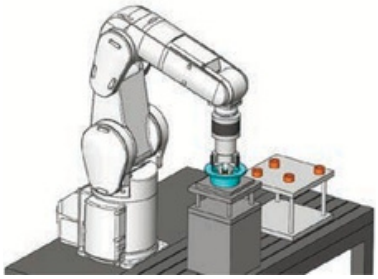
•Optimized arm length and 6 joints for a broader range of movement support complex assembly and process operations.
•Compact body and slender arms capable of covering a large work area and large load capacity.
Suitable for a broad range of layouts, from transporting machine parts to assembling electrical components.
•Designed to withstand environmental conditions, making it ideal for a wide range of applications without having to worry about the installation environment.

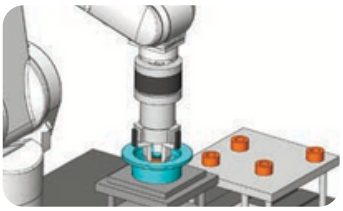
Vertical, multiple-joint type (RV) series



Assembly work (case study)

Fitting a coupling onto a spindle (insertion task with H7h7 tolerance)

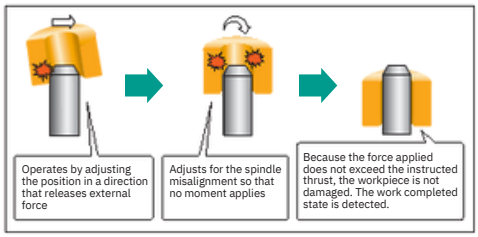




Key Points!

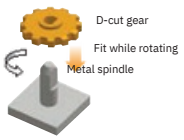
- Insertion is by fitting along the Z axis in the soft state while rotating in the θ axis direction.
- Force is specified where both are aligned on the same axis.
- Once they are aligned on the same axis, operation switches to positional control mode and the parts are assembled into their installed positions.
- The parameters required for this work can be set freely.

Operation overview



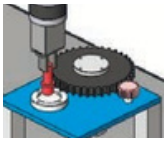
Related case studies

D-cut part insertion work



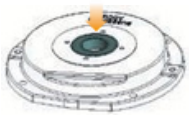
Insert to assemble by matching the gear phase to the D-cut spindle (10mm dia.)

Gear assembly work



Assembly by meshing a flat gear and pinion gear

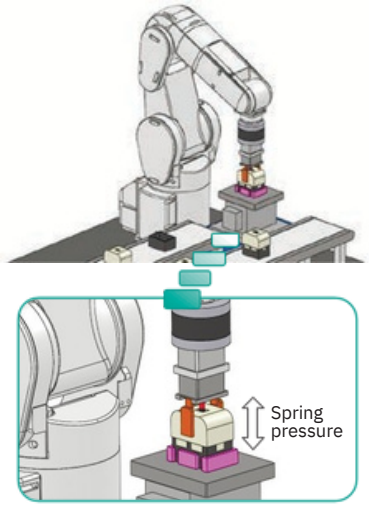
Bearing insertion work



Insertion of bearing

Force inspection (case study)

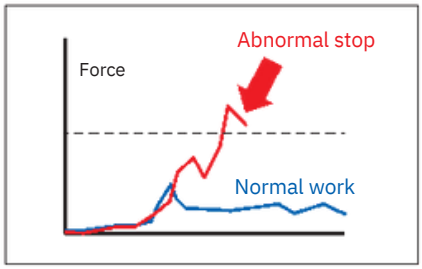
Fitting of a part where the force must be managed and the spring pressure inspected



Key Points!

- The fitting assembly and spring pressure inspection are carried out on one machine.
- Force is inspected at the fitting operation stop position.
- The spring pressure is inspected in the force log.
- Productivity is improved due to assembly reliability and automatic testing.

Spring pressure inspection waveform

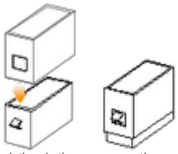


Related case studies

Spindle size inspection

A spindle workpiece is inserted into a gauge to inspect the size

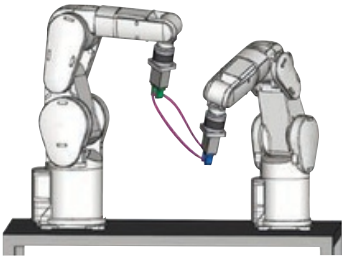
Snap mechanism part assembly work



Measures variations in the pressure on the snap mechanism part and assembles the part with the correct force

Transportation (case study)

Belt transportation and installation on a pulley

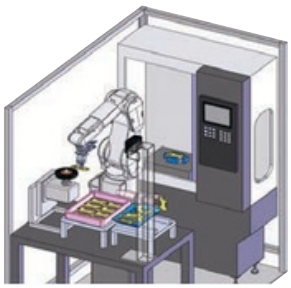


Key Points!

- The belt is transported using force control and coordinated work.
- Quality is assured without applying load to the workpiece.
- Suitable for work to install belts on pulleys using force detection.

Deburring and polishing (case study)

Deburring work on machines and plastic parts



Key Points!

- Force detection and force control are used to deburr curved surfaces on mold parts.
- Achieves smooth machining without causing unevenness in the part's machined surfaces.

Intelligence
[Next-generation intelligence]

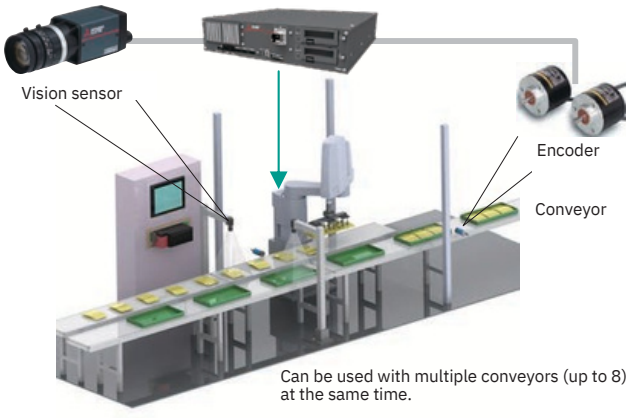
Greater advances in intelligent technology

Tracking

•Transport, alignment, and installation work, etc. can be performed while a robot is tracking workpieces on the conveyor without stopping the conveyor.
•Different variations can be selected, including vision tracking in combination with a vision sensor, tracking in combination with an opto-electronic sensor, etc.

•Programs can be created easily in robot language (MELFA BASIC).
•Standard interface function.
(Separate encoder and vision sensor required.)

•No need for a positioning device
•Reduce cycle time
•Reduce system costs



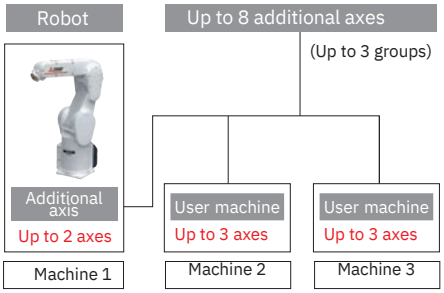
Can be used with multiple conveyors (up to 8) at the same time.

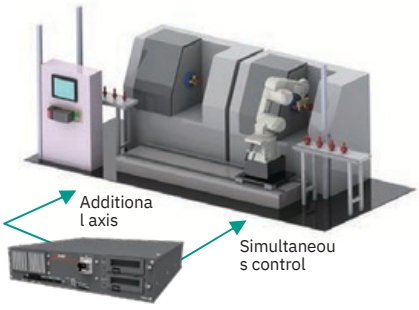
Additional axis function

•The layout can be set up to include the robot traveling axis and turntable as well as user machines separate from the robot such as loaders and positioning devices.
•Up to 8 additional axes can be controlled excluding the robot.
•Additional axes and user machines can be operated from the robot teaching pendant without any additional motion control hardware. The same JOG operation as for the robot can be used. Robot language can be used for control operations.

•The robot controller has compatibility with the MELSERVO (MR-J4-B, MR-J3-BS) servos.
•Standard interface function
(Separate servo amplifier and servo motor required.)

•No need for a dedicated control device



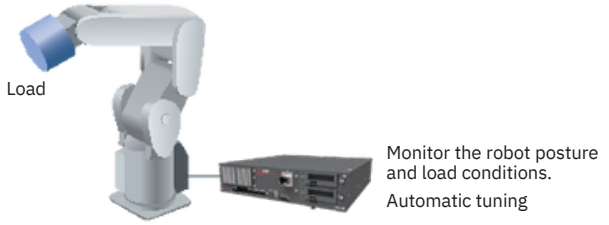


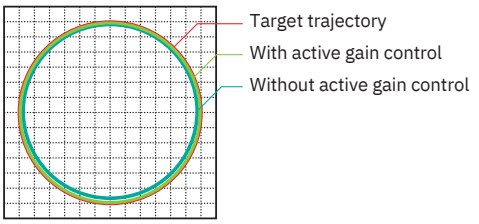
Improved accuracy

Active gain control

•Optimal motor control tuning set automatically based on robot operating position, posture, and load conditions.
•Improves tracking accuracy for the target trajectory.

•Active gain control is a control method that allows the position gain to be changed in real time.
•This is effective when traveling straight and sealing work requiring high accuracy.

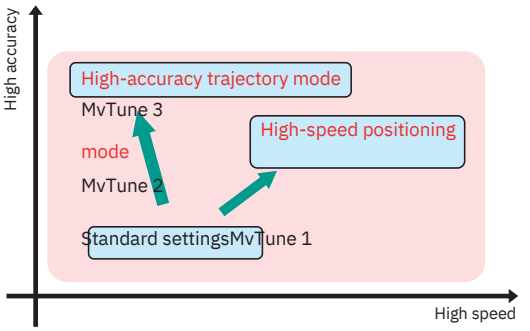




Operating mode setting function

•Trajectory priority mode/speed priority operation can be set in programs to match customer system requirements.
•Optimal motor control tuning set automatically based on robot operating position, posture, and load conditions.
•Improves tracking accuracy for the target trajectory.
•This is effective when traveling straight and sealing work requiring high accuracy.

• Improve trajectory accuracy
• Improve vibration-damping performance

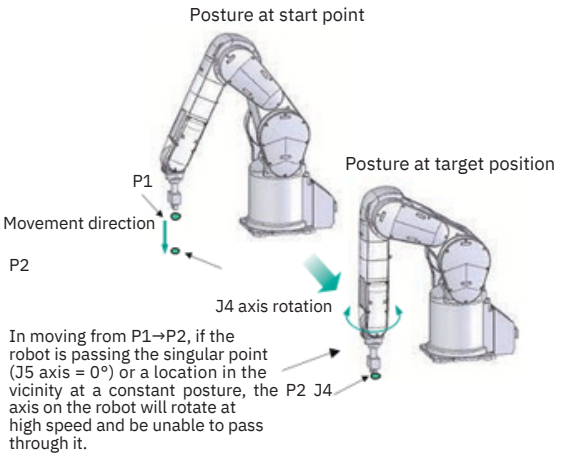


Other functions

Function for passing through the singular point

•The robot can be made to pass through the singular point. This allows for greater flexibility in the layout of robots and surrounding areas.
•Teaching operations can be performed more easily as there is no longer any need to cancel operations due to the presence of the singular point.

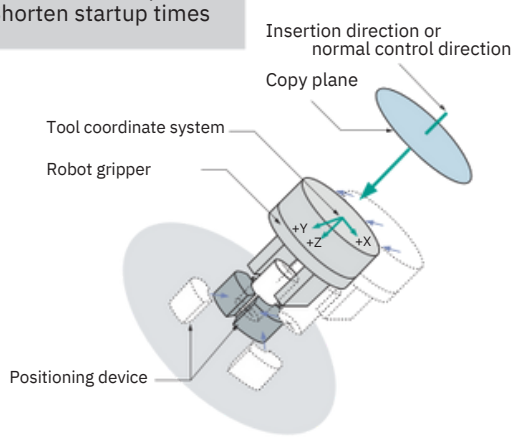
What a singular point is:
There is an unlimited number of angles at which the J4 and J6 axes can be set such that the angle of the J5 axis is 0° when linear interpolation operations are performed using position data from a joint coordinate system. This point is the singular point and is the point at which the robot cannot be operated at an assigned position and posture under normal conditions. The position at which this occurs is referred to as a singular point.



Orthogonal compliance control

•This function reduces the rigidity of the robot arm and tracks external forces. The robot itself is equipped with a compliance function, which makes special grippers and sensors unnecessary.
•This allows the amount of force generated through interference during chucking and workpiece insertion to be reduced and external movement copying forces to be controlled.
•The compliance direction can be set arbitrarily using the robot coordinate system, the tool coordinate system, etc.
•This is useful in protecting against workpiece interference and cutting down on stoppage.

•Reduce tooling costs
•Shorten line stop times
•Shorten startup times



Intelligence
[Next-generation intelligence]

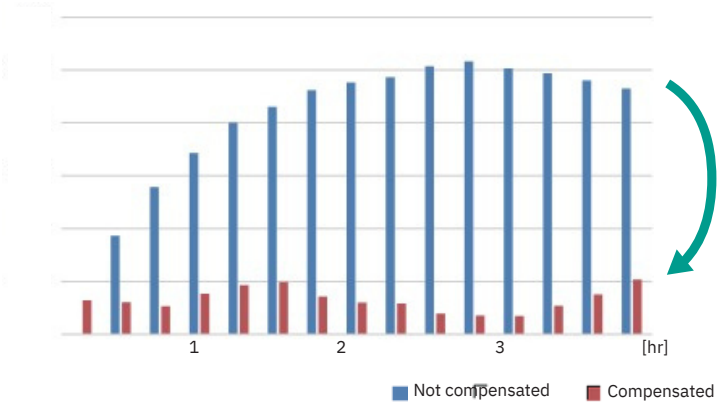
Greater advances in intelligent technology

Robot mechanism temperature compensation function

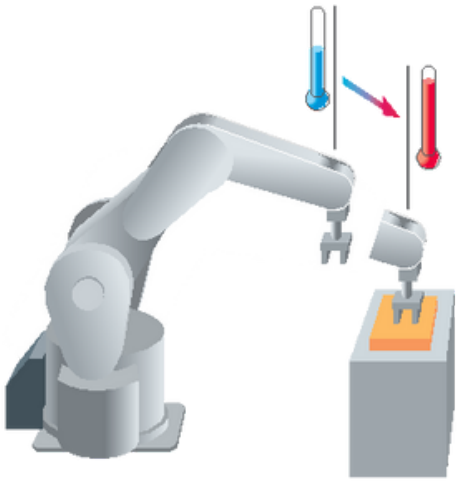
MELFA Smart Plus

•Monitors the robot arm temperature and automatically compensates for deviations caused by thermal expansion in the arm.
•Positional errors due to thermal expansion in the arm when seasonal or time-period-related temperature changes arise are reduced to 1/5th* of previous levels.
(Under Mitsubishi Electric measurement conditions)
*It may change depends on models and enviroment around the robot.

Range error relative to start position



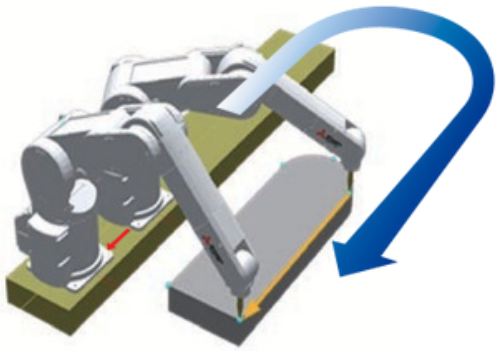
Thermal expansion estimated and corrected



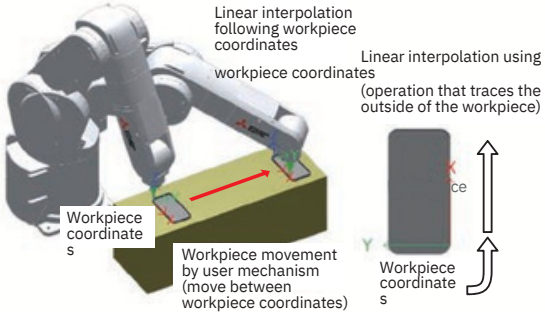
Coordinated control for additional axes

MELFA Smart Plus

•Allows synchronized operation where a robot is installed on an additional axis (linear axis) and its speed relative to the workpiece is specified.
•Supports machining of large workpieces using linear, circular or spline interpolation that exceeds the robot's range of movement.



•Allows synchronized operation where tracking of the robot and workpieces on an additional axis (linear axis) is specified.
•Linear or circular interpolation while the workpiece is being transported allows operations such as precision sealing workand surface inspections.



Calibration assistance function

Automatic calibration

MELFA Smart Plus

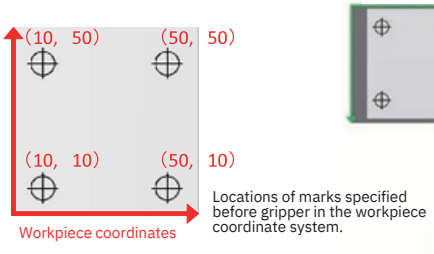
Commands for calibrating the robot and 2D vision are included. This automates the teaching work required for existing calibration and allows calibration to be conducted using robot programs.
A function is also provided that uses screen deviation to compensate for vision sensor mounting error, ensuring more accurate calibration.

	Current method (manual)	Automatic calibration
Working time (minutes)	20	1
Calibration accuracy (mm)	±0.2	±0.05

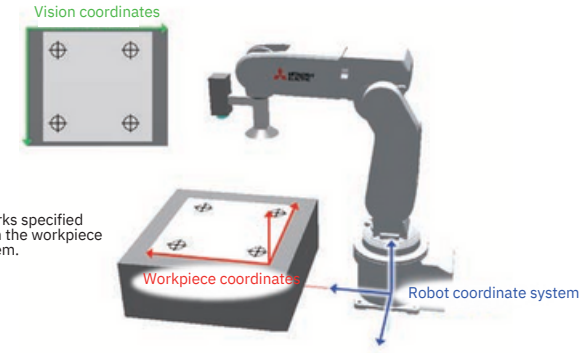
(Mitsubishi Electric measurements)

Workpiece coordinate calibration

Features 2D vision sensors mounted on the robot gripper and commands that calibrate work coordinates defined on the work palette, automating the teaching work required for existing calibration and allowing calibration to be conducted using robot programs. This simplifies tasks such the calibration of work palettes and robots installed on dollies or automated guided vehicles (AGVs).



Calibration worksheet



Inter-robot relational calibration

Coordinated work can be simplified by running robot programs to calibrate workpiece coordinates that are shared among multiple robots fitted with 2D vision sensors on their grippers.

Company Facility

Factory Building

Corporate Office

We have our corporate office situated in Rajkot City

We are a team of more than 36 people who are highly educated and industry experts, we can be the best partner in the engineering solutionprovider.

Machine Assembly Shop

Tool Room

We have land of over 21500 Sq. Ft. in a well developed and highly engineering GIDC- Shapar

Our Vision

EDGE has grown by Customer Referrals and not by forceful Sales/Marketing. Based on our superior designs and quality build of machines our Customers speak for us! EDGE believes in QUALITY (Engineering Excellence!) Vs Quantity (Topline growth at any cost)

ENGINEERING SOLUTIONS WE OFFER

Manufactures of:

- Gantry Solution For CNC Loading Unloading
- HMI Cabinet & Console Accessories
- Special Purpose Machine
- Aluminium Profile Structures
- All Types Of Conveyor
- Sheet Metal & Fabricated Components
- Robotic CNC Machine Tending
- Range of Products :
- Pneumatic Spares & Service
- Pneumatic Panel, Fittings & Tubing
- Ele. & Mech. Maintenance Products
- Maintenance Welding Alloys

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