

New Addition to Lineup of RocoMo-V, Automated Guided Vehicle (AGV) Equipped with Collaborative Robot

Keywords Automated Guided Vehicle (AGV), Collaborative robot, Wireless-charging

Abstract

A model equipped with a 20 kg payload robot CRX-20iA/L has been added to the lineup of RocoMo-V, an Automated Guided Vehicle (AGV) equipped with a small collaborative robot made by FANUC CORPORATION. It can work safely alongside human workers. As the payload of the robot increases, the operating range has been limited so that the AGV does not become unstable due to the robot's movements. This restriction has achieved stable transfer even with the maximum load without compromising the conventional functions of RocoMo-V (omnidirectional travel such as forward/backward movement, lateral movement, diagonal movement, spin turns, and travel in a minimum aisle width of 800 mm). This increase in payload capacity allows it to be introduced to sites that were not previously possible. It also supports wireless charging (charging current 30/60 A), and by reducing wear parts, it is expected to have an advantage in working under clean room environments.

1 Preface

In recent years, there has been a demand for workload-saving (reducing the workload per person by improving work efficiency) and labor saving (reducing personnel and improving productivity) through automation at various sites. Although automation using industrial robots has been implemented, their positions are fixed, safety fences are required for operation, and transport and loading/unloading between processes require human labor or other equipment.

Therefore, we have been offering RocoMo-V, an Automated Guided Vehicle (AGV) equipped with a collaborative robot that can carry 10 kg or 14 kg. This product integrates a collaborative robot and an AGV. This time, we have adopted a 20 kg portable robot ahead of our competitors and added it to RocoMo-V series lineup. This article introduces the features of RocoMo-V – an AGV with a 20 kg payload robot.

2 Specifications

Fig. 1 shows the names of each part of

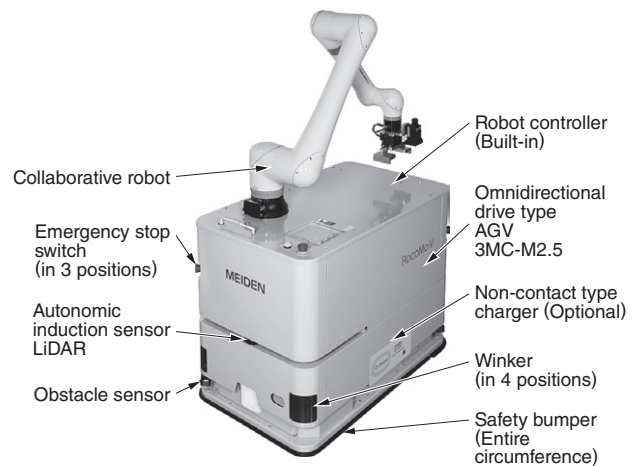


Fig. 1 Names of Each Part of RocoMo-V

The external appearance of RocoMo-V and its device allocations are shown.

RocoMo-V. Fig. 2 shows its external shape. Table 1 shows its specifications.

This time, we have added a small collaborative robot CRX-20iA/L manufactured by FANUC CORPORATION (This robot can carry up to 20 kg), and RocoMo-V has non-contact wireless charging

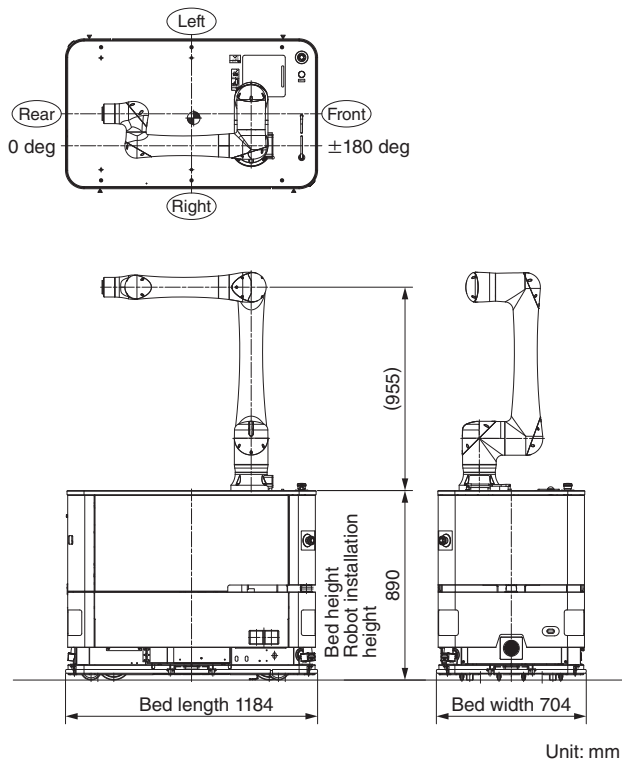


Fig. 2 External Shape of RocoMo-V

External shapes and major dimensions are shown.

Table 1 Specifications of RocoMo-V

A list of RocoMo-V specifications is shown.

Item		Specifications
AGV	Induction system	Multi-induction system (Magnetic induction, laser induction, SLAM induction)
	Drive & steering system	Powered wheels steering system
	Traveling direction	Omnidirectional (Forward/backward moving, traversing, slantwise motion, spin turn)
	Maximum loading capacity	64 kg (Mass of cargo + robot hands)
	Maximum speed	Forward/backward: 60 m/min, Traversing: 30 m/min
	Stopping accuracy	±10 mm (Magnetic induction, laser induction) ±50 mm (SLAM induction, conditional)
	Gradability	2% (5 m continuous)
	Road condition	Step 2 mm or less, groove width 10 mm or less, undulation 7 mm or less
	Charging system	Auto-charging (Standard: contact type, Optional: non-contact wireless type)
	Safety devices	Bumper, obstacle sensor, signal horn, winker, emergency stop switch, human detect function during robot in action (optional)
Robot	Collaborative robot	CR-14iA/L, CRX-10iA/L, CRX-20iA/L made by FANUC CORPORATION
	Control unit	R-30iB Mate Plus, R-30iB Mini Plus made by FANUC CORPORATION

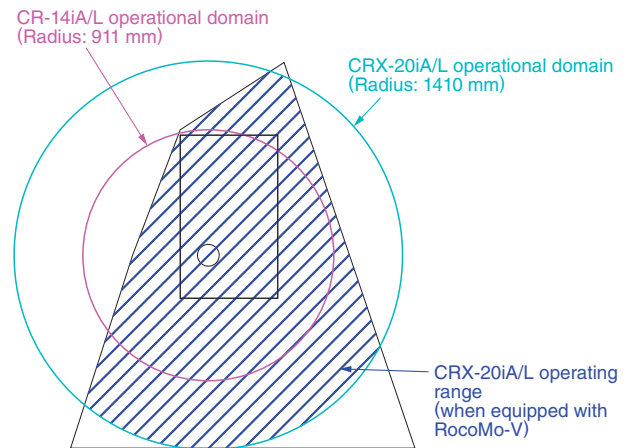


Fig. 3 Operating Range

The operating range of the new CRX-20iA/L, that of the conventional CR-14iA/L, and movable range of the CRX-20iA/L equipped with RocoMo-V are shown.

(charging current 30 A/60 A). Non-contact wireless charging generates less dust due to moving parts and wears less compared to conventional contact-type chargers that use actuators, so adopting this system is expected to improve maintainability and provide advantages in clean environments.

3 Features

3.1 Operating Range

When the CRX-20iA/L is mounted on RocoMo-V with a payload of 20 kg, the moving range of the AGV with its maximum mass can cause a large inertia depending on the speed and posture, which can cause the AGV body to briefly come off the ground, tip over, or cause the transfer position to shift. Therefore, the operating range is limited by the robot controller settings to ensure stable operation, while the arm length of the CRX-20iA/L ensures a wider operating range than the CR-14iA/L mounted on RocoMo-V with a payload of 14 kg. The operating range is shown in **Fig. 3**.

3.2 Wireless Automatic Charging Device

The wireless charging device D-Broad made by Daihen Corporation is installed to realize non-contact wireless charging. There is no difference in the size of the ground equipment between 30 A and 60 A charging.

4 Postscript

RocoMo-V now comes with a 20 kg payload

robot, making it possible to introduce it to sites that require handling of heavy workpieces that could not be handled by the previous model robot. In addition, it also comes with the non-contact wireless charging device, so it can be expected to work even under clean room environments.

Going forward, we intend to continue to meet

our customers' needs and provide the optimal AGV system.

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