

NEW

MZS_{SERIES}

MZS05

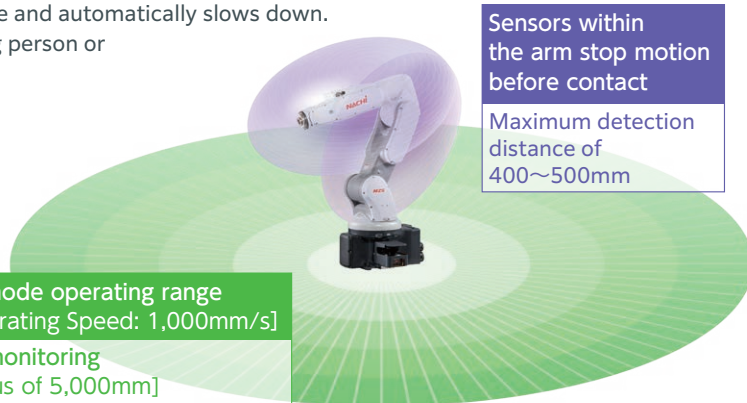
5kg Payload Collaborative Robot

*Stops before colliding, and resumes operation automatically
Best-in-class for high-speed and precision operation
Collaborative robot that achieves both safety and productivity*



Continuous monitoring of area around the robot via multiple sensors Stops before contact*1

Two attached laser scanners constantly monitor the area around the robot. When it senses the approach of a person or object, it switches from non-collaborative mode to collaborative mode and automatically slows down. Furthermore, sensors built into the arm detect an approaching person or object and stop the robot before a collision occurs.



Sensors within the arm stop motion before contact

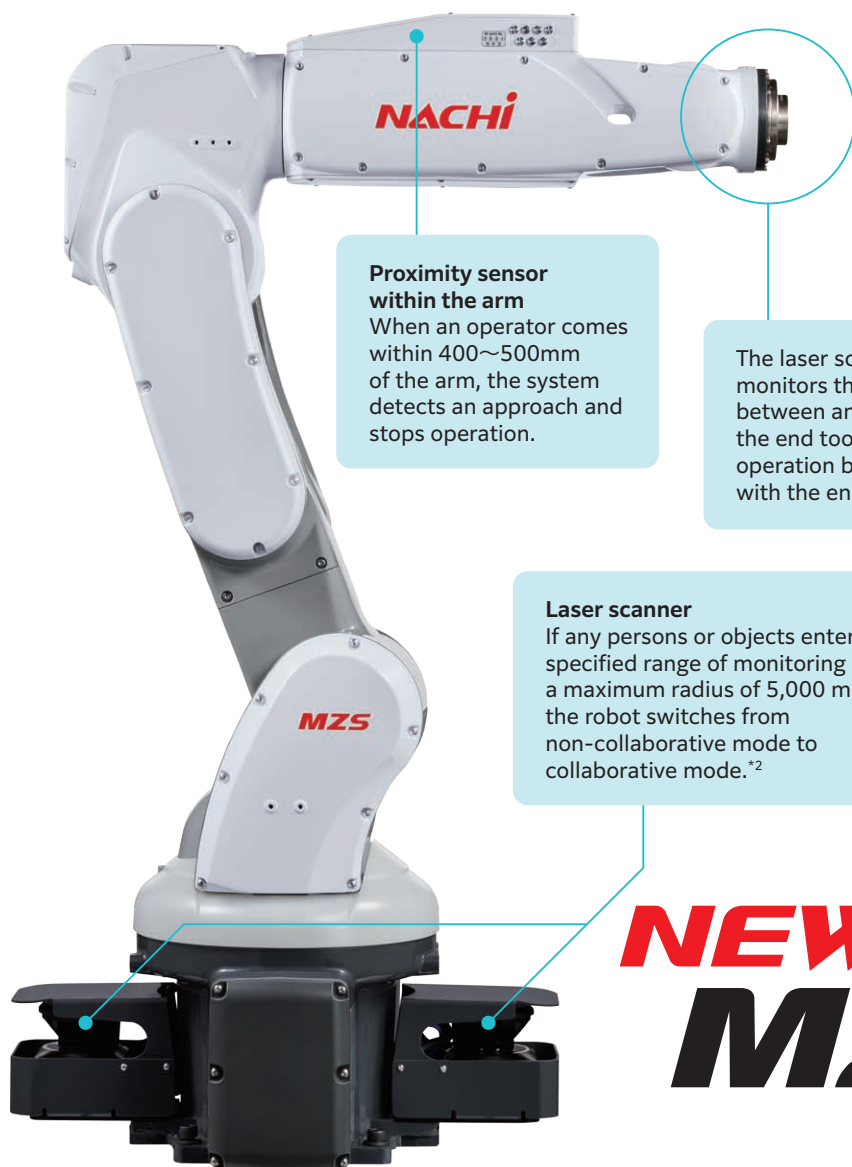
Maximum detection distance of 400~500mm

Collaborative mode operating range
[Maximum Operating Speed: 1,000mm/s]

Laser scanner monitoring
[Maximum radius of 5,000mm]
Detection area can be freely customized

Outside collaborative mode operating range

High-speed operation
[Maximum Operating Speed: 2,500mm/s]



Proximity sensor within the arm
When an operator comes within 400~500mm of the arm, the system detects an approach and stops operation.

The laser scanner calculates and monitors the positional relationship between any persons or objects and the end tool, in order to stop operation before any contact is made with the end tool.

Laser scanner
If any persons or objects enter the specified range of monitoring (up to a maximum radius of 5,000 mm), the robot switches from non-collaborative mode to collaborative mode.*2

NEW MZS05

*1 There is a limit to the function that stops the robot before it makes contact with something else. When introducing the robot, please conduct a risk assessment and use it correctly and safely.

*2 A PC prepared by the user is required to configure the laser scanner.

No need to restart after stopping the robot

Automatically resumes operation

Even if the MZS05 stops operation due to the proximity of persons or objects, it automatically resumes work when the obstruction leaves.*3

If the persons or objects go outside the range of the collaborative mode, it automatically returns to high-speed operation in the non-collaborative mode, so work efficiency is not reduced.

Best-in-class levels of high speed and precision

The MZS05 uses the same mechanism as the MZ series to achieve class-leading high-speed operation and high accuracy.

During non-collaborative operation	Maximum 2,500mm/s
During collaborative operation	Maximum 1,000mm/s*4
Precise positioning repeatability	±0.02mm

Hollow-wrist construction reduces risk of contact

Storing the cables within the arm reduces the risk of contact and ensures that parts will not interfere with each other, increasing reliability. The robot also features a sleek appearance.



Hollow-wrist construction

Useful for a wide range of applications

The slim and compact body and ability to work without safety fencing allows the robot to be installed in narrow spaces. It can be applied in various fields of logistics, such as mounting on AMRs. In addition, with excellent clean performance (ISO Class 4) and a wide range of applications, it can be used in a wide variety of industries, from the electrical and electronic fields as well as food, pharmaceuticals, and cosmetics.



Super safety features

- Contains collision-detection functionality and conforms to various certification standards to ensure safety as a collaborate robot (ISO 13849-1, ISO 10218-1, ISO/TS 15066)
- Product shape and safety software features designed to minimize clamping risk



Offset arm shape for reducing clamping risk



The stopper cover, which reduces the risk of getting pinched, has a built-in LED lamp that clearly indicates the robot's operating status with color, flashing, and a buzzer sound.



Plugs for air tubes



I/O 20 wires, LAN 8-wire single system



Newly designed cabling slit



In addition to the above initial settings, the LED display color can be changed by the customer.

- Blue :Non-collaborative mode
- Green :Collaborative mode
- Purple:Stop as a human is approaching
- Purple blinking & buzzer :Forward detection



*3 After the robot stops due to a collision, the robot must be restored manually.

*4 It is necessary to conduct a risk assessment in accordance with the ISO12100 of the Basic Safety Standards and determine the operating speed according to the collision site.

Basic robot specifications

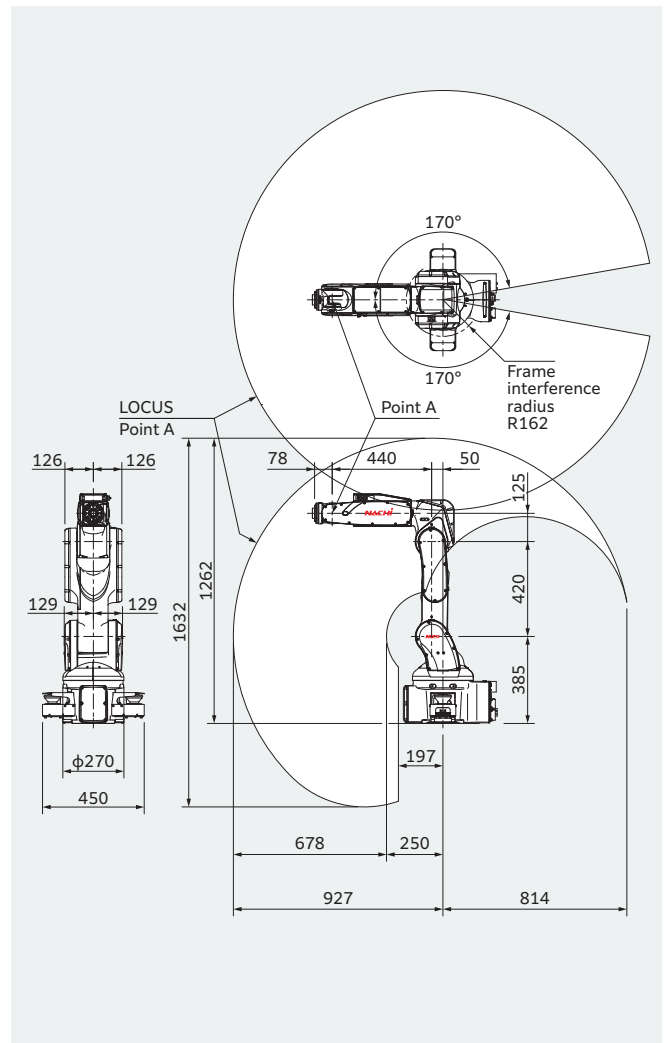
Item		Specifications	
Model		MZS05-01	
Structure		Articulated robot	
Axes		6	
Drive system		AC servo drive	
Maximum motion range	J1		$\pm 2.97\text{rad}(\pm 170^\circ)$
	J2	Factory default	$-2.00 \sim +0.69\text{rad}(-115 \sim +40^\circ)$
		Maximum ^{*1}	$-2.36 \sim +1.40\text{rad}(-135 \sim +80^\circ)$
	J3	Factory default	$-2.49 \sim +1.99\text{rad}(-143 \sim +114^\circ)$
		Maximum ^{*1}	$-2.49 \sim +2.69\text{rad}(-143 \sim +154^\circ)$
	J4		$\pm 3.32\text{rad}(\pm 190^\circ)$
	J5	Factory default	$\pm 1.57\text{rad}(\pm 90^\circ)$
		Maximum ^{*1}	$\pm 2.09\text{rad}(\pm 120^\circ)$
Maximum velocity ^{*2}	J6		$\pm 6.28\text{rad}(\pm 360^\circ/\text{s})$
	J1		$4.71\text{rad/s}(270^\circ/\text{s})$
	J2		$4.28\text{rad/s}(245^\circ/\text{s})$
	J3		$5.42\text{rad/s}(310^\circ/\text{s})$
	J4		$9.60\text{rad/s}(550^\circ/\text{s})$
	J5		$9.60\text{rad/s}(550^\circ/\text{s})$
	J6		$16.58\text{rad/s}(950^\circ/\text{s})$
Tool Center Point(TCP) Speed	During non-collaborative operation		2500mm/s
	During collaborative operation		1000mm/s ^{*3}
Payload weight	Wrist		5kg
Maximum static load torque	J4		16.9N·m
	J5		16.9N·m
	J6		9.4N·m
Maximum moment of inertia ^{*4}	J4		0.49kg·m ²
	J5		0.49kg·m ²
	J6		0.15kg·m ²
Position repeatability ^{*5}			$\pm 0.020\text{mm}$
Maximum reach			927mm
Air tubes	$\phi 6 \times 2$ (conforms to 3-way solenoid valve standard) Operable pressure range:0.1 to 0.5MPa		
Application signal cables	20 or 12 wires(dependent on option selection)		
LAN	None, 8-wire single system, or 8-wire dual system (dependent on option selection)		
Installation ^{*6}	Floor/Inverted		
Installation conditions	Ambient temperature:0°C to 40°C ^{*7}		
	Ambient humidity:20% to 85% RH(no dew or frost allowed)		
	Vibrations: $\leq 0.5\text{G}(4.9\text{m/s}^2)$ or lower ^{*8}		
Protection class ^{*9}	IP54 equivalent ^{*10}		
Clean rating	ISO Class4 equivalent ^{*11}		
Noise level ^{*12}	75dB		
Robot mass	62kg		

1 [rad]=180/π[°], 1[N·m]=1/9.8[kgf·m]

- * Note that the information represented in this document, such as rated values, specifications, and dimensions, are subject to change without notice to improve the product.
- * An explosion-proof version of this product is not available.

- *1: If the J2 and J5 axes are operated at their maximum limits, there is a risk of clamping even without tools or work. To eliminate this risk when shipped from the factory, a robot monitoring unit (RMU50-11, complies with ISO 13849-1) is used to restrict operable range.
Modify the operable range only if you have performed a risk assessment in the actual environment in which the robot is to be used and have determined that the risk is reduced.
Depending on the loaded tools or work, there is a risk of clamping even when the operable range is restricted.
- *2: The maximum speed indicated in the table is the maximum value. Speeds are subject to change depending on factors such as the work program and wrist payload conditions.
These specifications indicate the maximum value for each item in normal recovery mode.
- *3: A risk assessment that is performed according to the basic safety standard ISO 12100 is required, and the speed at which the colliding part operates needs to be determined.
- *4: Note that the moment of inertia varies depending on the wrist payload conditions.
- *5: Conforms to JIS B 8432.
- *6: For installations on an incline ($\pm 30^\circ$), please contact us.
- *7: In a case of usage at no higher than 1,000 m above sea level. Ambient temperature is subject to restrict at elevations that are higher than the allowable range.
- *8: When using the robot for collaborative operation, the robot might stop due to vibrations on the floor or hand. The source of such vibrations must be eliminated before actual use.
- *9: Liquid substances that will degrade the sticker parts on the robot cannot be used.
These include organic solvents, acids, alkaline substances, chlorinated substances, and gasoline-based cutting fluids.
- *10: Environments subject to splashing liquids or mist might trigger the proximity sensors and cause the robot to stop.
- *11: Based on an internal assessment in accordance with ISO 14644-1.
In order to maintain the clean rating, install the robot in a clean room with downflow. Since the robot is not packaged in a dust-proof package, it is necessary to remove dust and dirt from the robot and wipe it clean when it is brought into the clean room.
- *12: This is an equivalent sound pressure level of an A weight as measured according to JIS Z 8737-1 (ISO 11201). (Operation at rated load and maximum speed)

Dimensions and operating range



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- * The specifications are subject to changes without notice.
- * In case that an end user uses this product for military purpose or production of weapon, this product may be liable for the subject of export restriction stipulated in the Foreign Exchange and Foreign Trade Act. Please go through careful investigation and necessary formalities for export.

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