CAUTIONS TO BE TAKEN TO ENSURE SAFETY

- For those persons involved with the operation / service of your system, including Kawasaki Robot, they must strictly observe all safety regulations at all times. They should carefully read the Manuals and other related safety documents.
- Products described in this catalogue are general industrial robots. Therefore, if a customer wishes to use the Robot for special purposes, which might endanger operators or if the Robot has any problems, please contact us. We will be pleased to help you.
- Be careful as Photographs illustrated in this catalogue are frequently taken after removing safety fences and other safety devices stipulated in the safety regulations from the Robot operation system.

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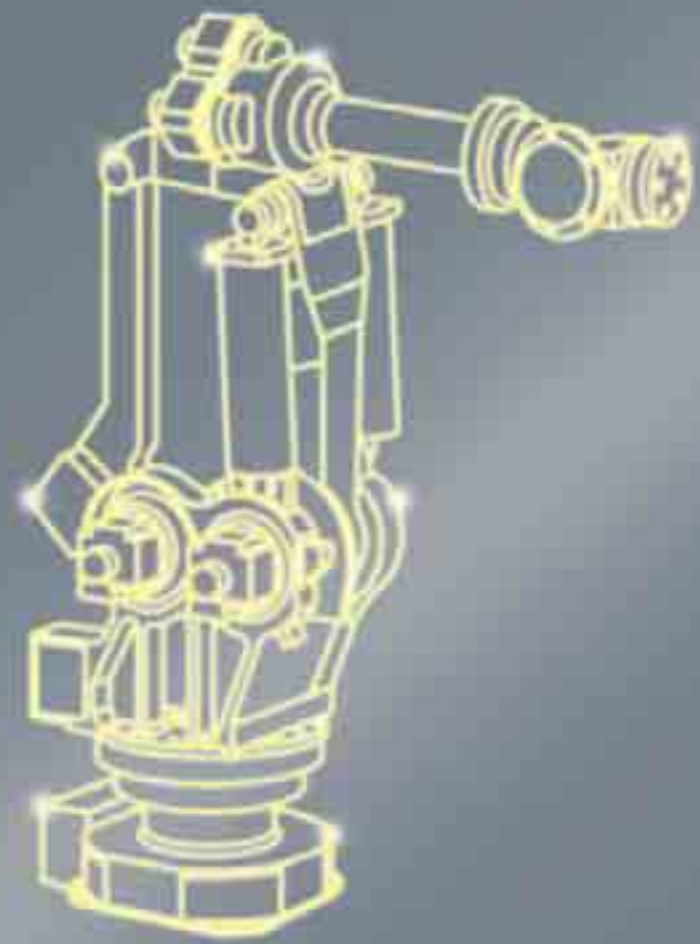
Kawasaki Robot M series

Kawasaki Robot

Simple and friendly

M series

Japan & Asia



KAWASAKI HEAVY INDUSTRIES, LTD.

Maximum payload 500 kg
Incorporating a compact profile design with long reach and high wrist torque

The “M series” – this powerful robot developed by Kawasaki Heavy Industries, a pioneer of industrial robot manufacture, has a maximum payload of 500 kg. Its superior design gives it the power to lift and manipulate heavy loads with great ease and high accuracy. Its Profile is compact through use of an advanced link structure in JT3 for up and down arm movement. Using advanced design techniques in motor technology, the unit has achieved a wrist torque of 3,920 N·m. The “M series” robot is ideal for lifting engines, manipulating car bodies, handling of large tools between processes in the automotive field, the movement of large castings, rocks, construction materials, and large domestic appliances in general industrial field.

M series

MX500N
Max. Payload : 500kg
Max. Reach : 2,540mm

Simple and friendly
Kawasaki Robot

Features

1 Compact profile
High payload robots conventionaly require a large counterbalance weight which increases interference and reduces the work envelope. Innovative design of an advanced link structure (patent pending) by Kawasaki has reduced interference and increased work envelope by eliminating the function of this redundant counterbalance.

2 High wrist torque
A high wrist torque of 3,920 N·m has been achieved with the MX500N robot by utilising the high power motors, normally only used in the major axes, across all 6 robot axes. This enables the rated payload to be carried at a significant offset from the wrist flange surface.

3 Fully equipped safe design
With collision detection and vibration suppression control software the robot can manipulate large loads smoothly and safely.
In addition, a mechanical stopper and limit switch are provided as options for the major axes.

4 Selectable model variations
Three models are provided: the MX500N (maximum payload of 500 kg) as the basic robot with a maximum reach of 2,540 mm.The MX420L (maximum payload of 420 kg) with an extended arm giving an additional 250 mm of reach. And the MX350L (maximum payload of 350 kg) with an increased reach of 500 mm. These arm extensions can be convertible after operation. In addition, the MD400 is also available (maximum payload of 400kg), a 5-axis palletising robot with a fixed JT4 (wrist rotation) and maximum reach of 3,140 mm.

MX420L
Max. Payload : 420kg
Max. Reach : 2,778mm

MX350L
Max. Payload : 350kg
Max. Reach : 3,018mm

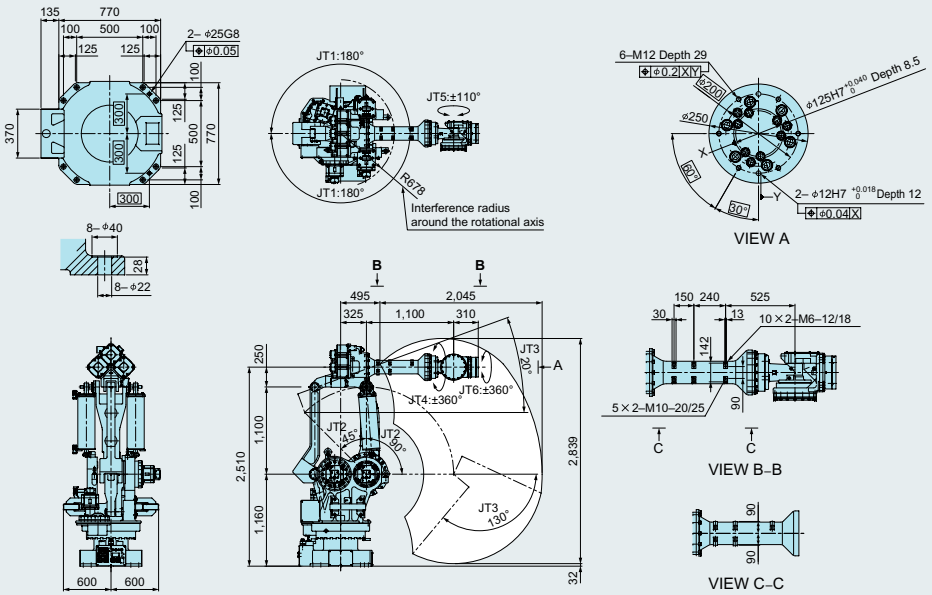
∗A pocket for forklift equipped with by a product of photographs is optional wearing product.

• Standard specifications

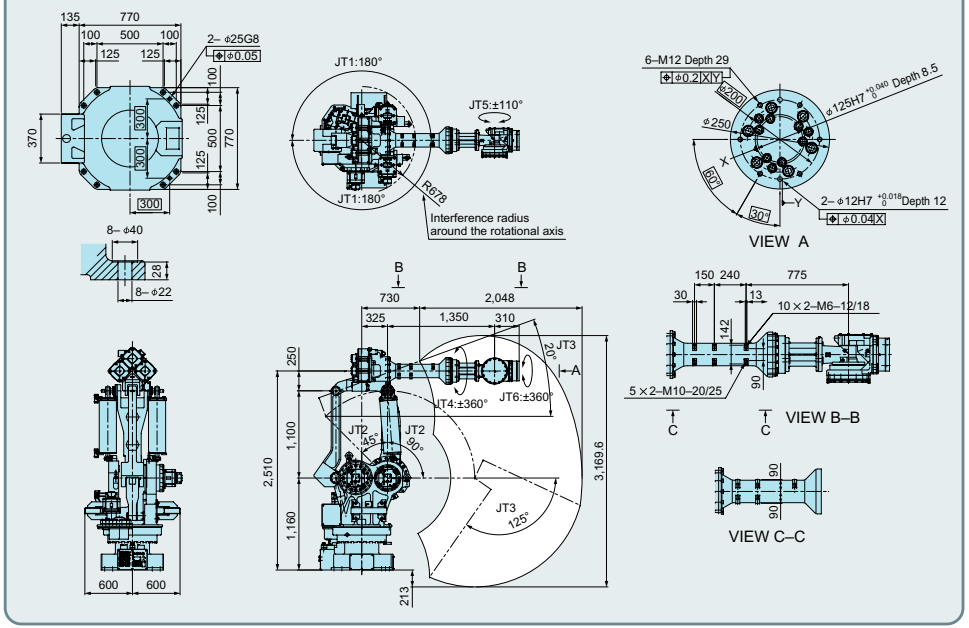
Model		MX500N		MX420L		MX350L	
Type		Articulated Robot					
Degree of freedom		6					
Motion Range & Max. Speed	Operating Axis	Motion Range	Max. Speed	Motion Range	Max. Speed	Motion Range	Max. Speed
	Arm Rotation (JT1)	±180°	80°/s	±180°	80°/s	±180°	80°/s
	Arm Out-in (JT2)	+90°~−45°	70°/s	+90°~−45°	70°/s	+90°~−45°	70°/s
	Arm Down-Up (JT3)	+20°~−130°	70°/s	+20°~−125°	70°/s	+20°~−115°	70°/s
	Wrist Swivel (JT4)	±360°	80°/s	±360°	80°/s	±360°	80°/s
	Wrist Bend (JT5)	±110°	80°/s	±110°	80°/s	±110°	80°/s
	Wrist Twist (JT6)	±360°	120°/s	±360°	120°/s	±360°	120°/s
Repeatability		±0.5mm (at the tool mounting surface)					
Max. Payload		500 kg		420 kg		350 kg	
Max. Reach		2,540 mm		2,778 mm		3,018 mm	
Max. Speed		Max. 2,000 mm/s in Linear Motion					
Moment	Wrist Swivel (JT4)	3,920 N•m		3,290 N•m		2,740 N•m	
	Wrist Bend (JT5)	3,920 N•m		3,290 N•m		2,740 N•m	
	Wrist Twist (JT6)	1,960 N•m		1,960 N•m		1,960 N•m	
Moment of Inertia	Wrist Swivel (JT4)	400 kg•m²		400 kg•m²		400 kg•m²	
	Wrist Bend (JT5)	400 kg•m²		400 kg•m²		400 kg•m²	
	Wrist Twist (JT6)	259 kg•m²		259 kg•m²		259 kg•m²	
Driving Motor		Brushless AC Servomotor					
Mass (without options)		2,750 kg		2,800 kg		2,800 kg	
Installation		Floor mounted					
Environmental Condition		(Temperature) 0~45°C (Humidity) 35~85% No dew, nor frost allowed					
Built-In utilities		Pneumatic pipings (12×2 lines) Wirings for valves to drive hand (DC24V ×7 circuits)					
Option		Adjustable mechanical stopper JT1 / JT2 / JT3 Limiy switch JT1 / JT2 / JT3 Internal signal harness Double solenoid valve (1 circuit / 2 circuit) Single solenoid valve (1 circuit / 2 circuit) Double solenoid valve (1 circuit) & single sollenoid valve (1 circuit) F.R.L.combination (sir cleaning equipment)					
Recommended Controllers		D44					
Body color		Munsell 10GY9/1 equivalent					

•Motion Range & Dimensions

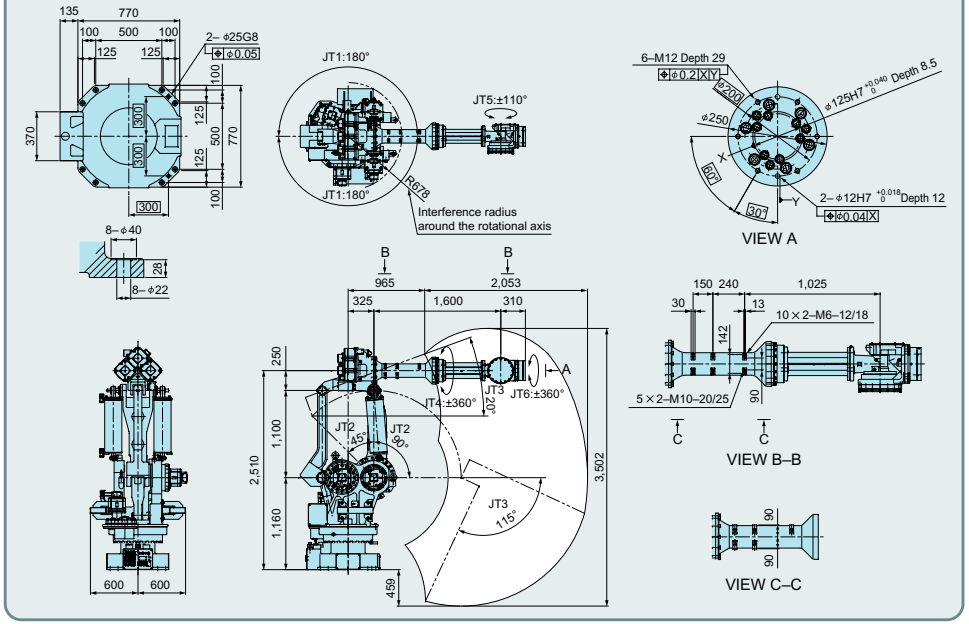
MX500N



MX420L



MX350L



•Motion Range & Dimensions

D Controller D44

•Features

1 Ergonomic Operation

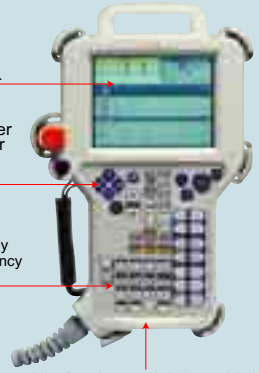
• User Friendly Teach Pendant

The ergonomically designed, “highly responsive,” key arrange ment is developed through the research based on finger movement of the operator. With a 6.4-inch (170 mm) TFT color LCD screen and a large, easy-to-read touch pan el, the teach pendant provides a comfortable operating environment.

Screen selection and operation is compatible with controllers of previ ous generations. Using Kawasaki’s own editing menus enable robot teaching very quickly and effectively.

Teaching screen
Simple teaching can be performed by ‘single touch’ screen selection.

Teach pendant



2 Ergonomic Functions

Various software is provided that is compatible with a number of applications such as handling, palletizing, spot welding, servo welding, high performance vision and arc welding.

In addition, the high level ‘AS’ programming language gives access to an extensive range of commands enabling a much higher level of sophistication for both robot motion and system process control.

3 High Performance

Processing power is provided by high-speed 64bit RISC dual processors. Operational performance, cycle time and path precision has been improved by the utilisation of a fully digital servo system. In addition, system faults have been kept to a minimum by the use of collision detection/stopping and path replay retention after an emergency stop.

4 Simple System Upgrades*

*Refer to the diagram on the page on the right

• Peripheral Device Control

Interfacing to peripherals is achieved by the use of standard I/O connections as well as a number of fieldbuses such as Interbus, CC-Link and DeviceNet etc. Connection to peripherals is straightforward and offers system flexibility.

In addition, an advanced integrated system can be created at minimal cost through use of K-Logic, an internal PLC with a peripheral control sequencer.

• Network

The controller is also compatible with network communication via Ethernet allowing data communication with a host computer and program up-loading / down-loading to be performed with great ease. In addition, a Web server feature enables analysis of the robot’s status via an intranet / Internet connection to be achieved.

• Multiple-Axes Control

With a 6-axis unit, a maximum of 2 axes can be added within the existing control cabinet. The addition of 3 or more axes (more than 9 axes including the manipulator unit) can be performed with SSCNET-compatible motors. A multi-axis system that matches the customer’s need can be easily achieved.

5 Ease of Maintenance

A reduction in internal wiring and the incorporation of modular component assemblies simplifies maintenance and reduces the time for repair or replacement.

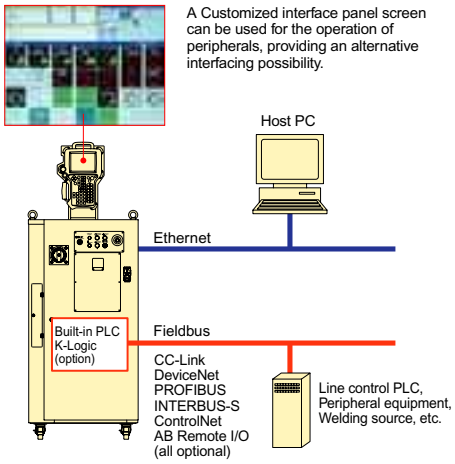
In addition, maintenance support features such as ‘Data Storage’ offer support in identification of the cause when a problem occurs. Maintenance software support features display recovery procedures when a fault occurs, and a Web server provides the potential for remote diagnosis to be utilized.

•Specifications

		Standard	Option
Model		D44	
Structure		Self-Standing Main Enclosure	
Number of Controlled Axes		6 Axes	Max. 16 Axes (Please contact us when using 7 Axes or more.)
Servo Motor		AC Servo Motor	
Position Detector		Absolute Encoder	
Drive System		Full Digital Servo System	
Programming		Block Teaching or AS Language	
Coordinate Systems		Joint, Base, Tool	Fixed Tool Point
Types of Motion Control		Joint, Linear, Circular Interpolated Motion	
General Purpose Signals	External Operation Signals	External Motor Power Off, External Hold	
	Input Signals	32 Channels (Includes Dedicated Signals)	64/96/128 Channels (Includes Dedicated Signals)
	Output Signals	32 Channels (Includes Dedicated Signals)	64/96/128 Channels (Includes Dedicated Signals)
Memory Capacity		1MB (Includes System Memory): Approx. 5,000 steps	4MB (Includes System Memory): Approx. 35,000 steps
External Strage		PCMCIA Card Slot	FDD
Communication Interface	PC, Network etc.	RS-232C	RS-485, Ethernet (Please contact us.)
	Fieldbus		CC-Link, DeviceNet, PROFIBUS-S, ControlNet, AB Remote I/O (Please contact us.)
Teach Pendant			6.4 in. TFT Color LCD with Touch Panel, 640×480 VGA, Emergency Stop SW., Teach Lock SW., Deadman SW. 58 Hard Keys (Robot Manual Operation Keys, Cursor Keys, etc.)
Operation Panel		Basic Switches: Motor Power ON, Cycle Start, Error Reset, Emergency Stop, RUN/HOLD, TEACH/REPEAT, etc.	
Cable Length	Teach Pendant	5 m	10 m, 15 m
	Robot-Controller	5 m	10 m, 15 m
Dimensions		W600 × D550 × H1,200 (mm)	
Weight		120 kg	190 kg (with Transformer)
Power Requirements		AC200/220V ± 10%, 50/60Hz, 3-Phase, 11 KVA	AC380/400/415/440/460/480V ± 10%, 50/60Hz, 3-Phase, 5.4 KVA
		Less than 100 Ω max. Leakage Current 100 mA	Less than 100 Ω max. Leakage Current 10 mA
Ambient Temperature / Humidity		0-45°C, 35-85%RH without Condensation	
Color		Munsell 10GY9/1 equivalent	

Standard Accessories include: PC Connection Terminal Software, PCMCIA Card Slot
Optional Accessories include: T eaching pendant holder, Motor brake release switch mounted in the controller, Plug for automatic operation without the teaching pendant, RS-232C cable (1.5 m and 3 m) for PC connection, PC Card for data storage

Communication via system scalability



•External View and Dimensions