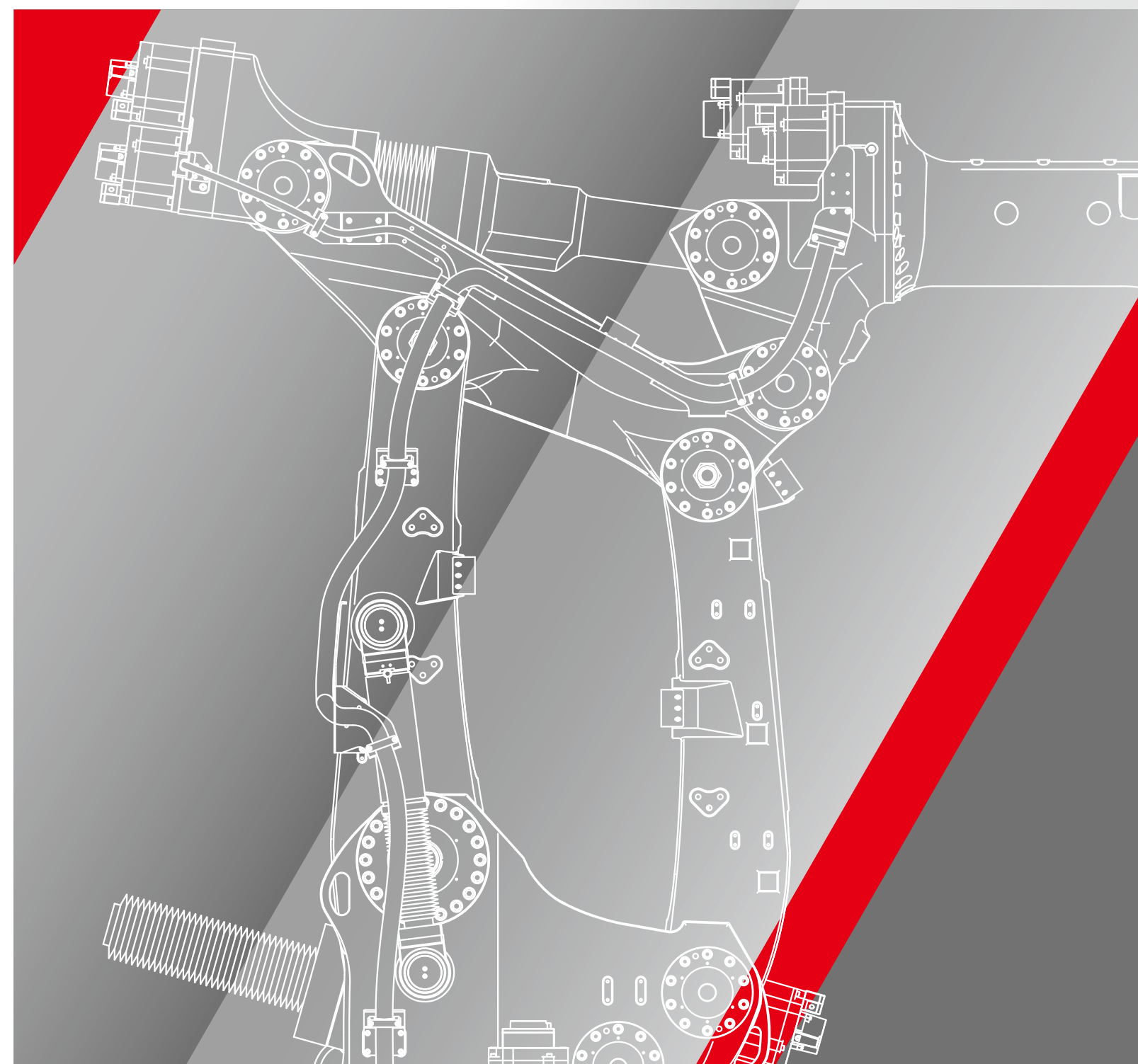


# Kawasaki Robot

## M series

Extra large payload robots up to 1,500 kg



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\* Materials and specifications are subject to change without notice.

## Kawasaki Robot



### 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.



ISO certified in Akashi Works and Nishi-Kobe Works.

# Maximum payload 1,500 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 1,500 kg. Its superior design gives it the power to lift and manipulate heavy loads with great ease and high accuracy. Kawasaki’s own mechanism makes the waist more compact and allows it to support a larger payload capacity.

### Features

#### Compact profile

The MX adopts a new link structure for the JT3 (upper and lower arms), while the MG adopts Kawasaki’s own hybrid link mechanism and ball screws for the JT3. Two large motors to drive them make the counterweight unnecessary and the robot’s waist compact.

#### High wrist torque

The MG15HL have superb wrist torque. This torque increases the offset distance from the twist flange surface to the center of gravity of a workpiece. Its application offers excellent results when working with off-centered workpieces.

#### High rigidity

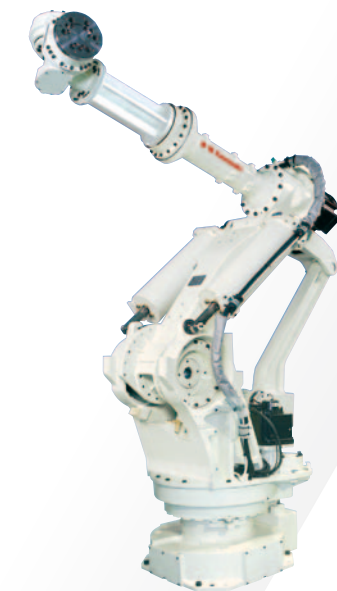
The second and third axes that affect the accuracy of hand motions use highly rigid ball screws with minimal backlash. This reduces arm deflection while enabling high positioning accuracy. (MG)

#### Wide motion range

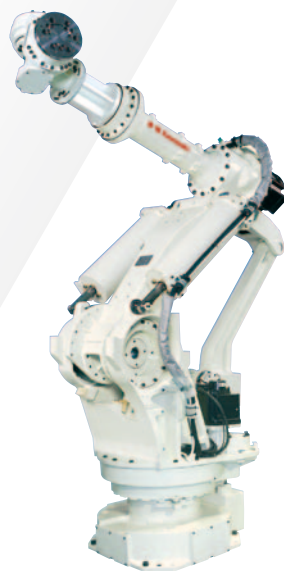
Kawasaki’s original hybrid link mechanism along with the ball screws used in the second and third axes ensures a wide work envelope when the arm moves forward. (MG)

#### Many variations

Four MX models (6-axis type, 350 - 700 kg) and two MG models (6-axis type, 1,000 - 1,500 kg) are floor mounting types. The MT400N (6-axis, 400kg) is a shelf mounting type. These models are for assembling and handling applications.



MX350L



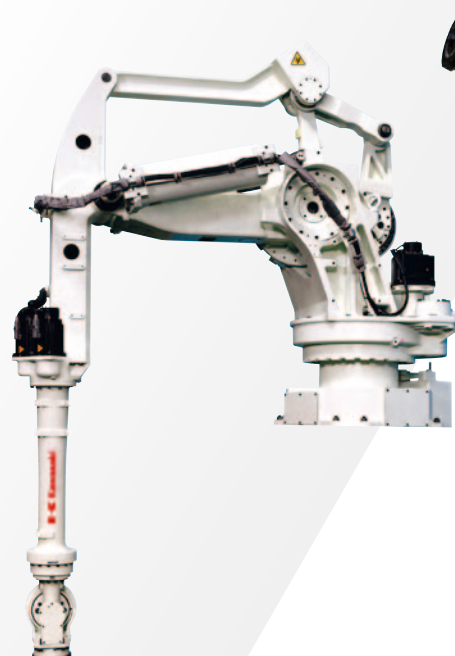
MX420L



MX500N



MX700N



MT400N



MG10HL



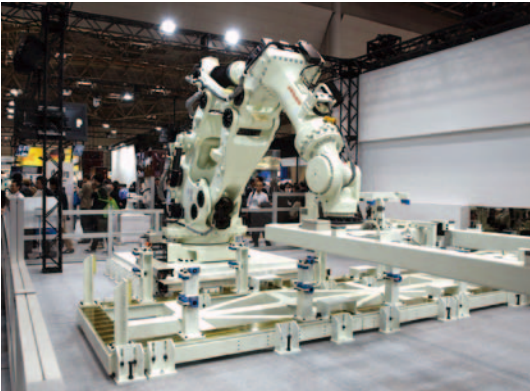
MG15HL



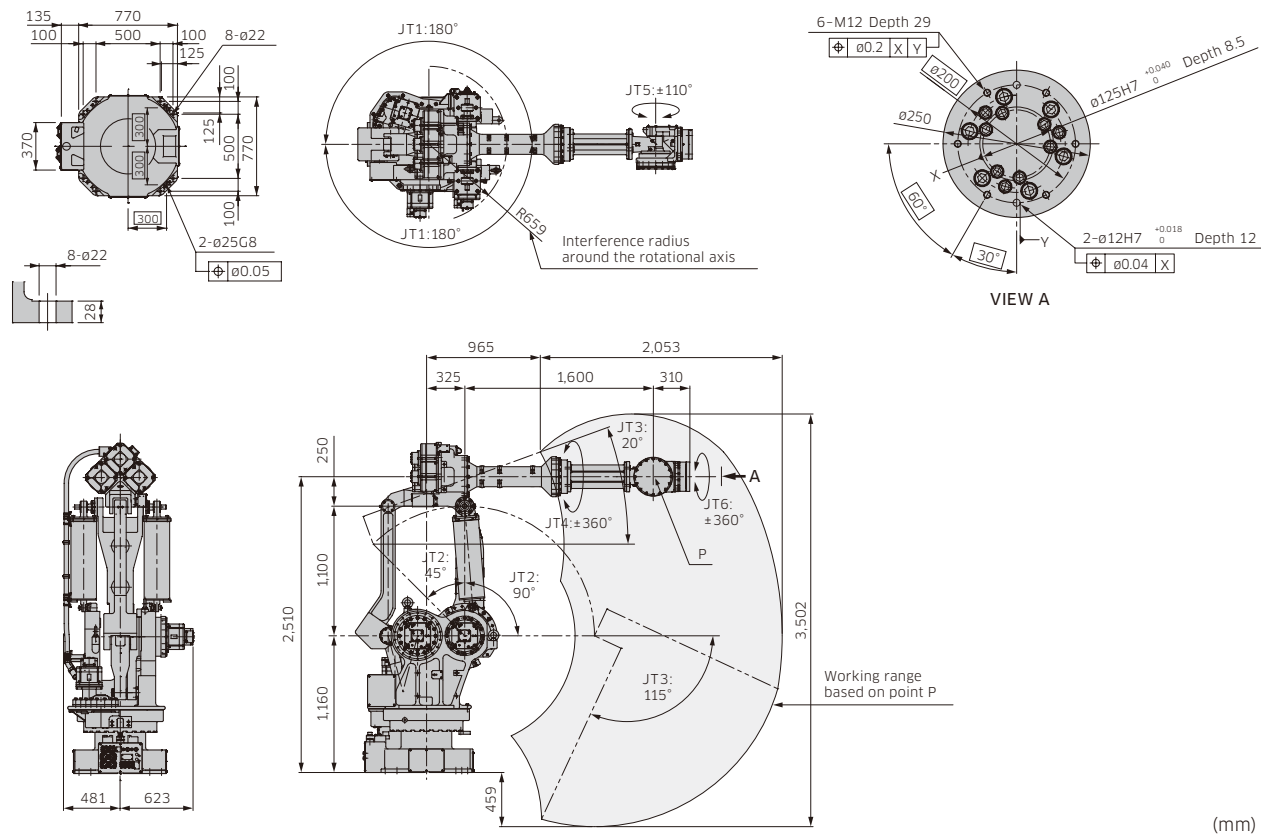
			MX350L	MX420L	MX500N	MX700N
Type			Articulated robot			
Degree of freedom (axes)			6			
Max. Payload (kg)			350	420	500	700
Max. Reach (mm)			3,018	2,778	2,540	2,540
Repeatability (mm)			±0.5 (at the tool mounting surface)			
Motion Range (°)	Arm rotation	(JT1)	±180	±180	±180	±180
	Arm out-in	(JT2)	+90 - -45	+90 - -45	+90 - -45	+90 - -45
	Arm down-up	(JT3)	+20 - -115	+20 - -125	+20 - -130	+20 - -130
	Wrist swivel	(JT4)	±360	±360	±360	±360
	Wrist bend	(JT5)	±110	±110	±110	±110
	Wrist twist	(JT6)	±360	±360	±360	±360
Max. Speed (°/s)	Arm rotation	(JT1)	80	80	80	65
	Arm out-in	(JT2)	70	70	70	50
	Arm down-up	(JT3)	70	70	70	45
	Wrist swivel	(JT4)	80	80	80	50
	Wrist bend	(JT5)	80	80	80	50
	Wrist twist	(JT6)	120	120	120	95
Moment (N·m)	Wrist swivel	(JT4)	2,740	3,290	3,920	5,488
	Wrist bend	(JT5)	2,740	3,290	3,920	5,488
	Wrist twist	(JT6)	1,960	1,960	1,960	2,744
Moment of Inertia (kg·m²)	Wrist swivel	(JT4)	400	400	400	600
	Wrist bend	(JT5)	400	400	400	600
	Wrist twist	(JT6)	250	250	250	388
Mass (without Options) (kg)			2,800	2,800	2,750	2,860
Driving Motor			Brushless AC servo motor			
Mounting			Floor			
Environmental Condition	Ambient temperature (°C)		0 - 45			
	Relative humidity (%)		35 - 85 (No dew, nor frost allowed)			
Built-In Utilities			Pneumatic pipings (ø12 x 2 lines)    Wirings for valves to drive hand (DC24V x 7 circuits)			
Option			Adjustable mechanical stopper JT1/JT2/JT3 Limit switch JT1/JT2/JT3    Internal signal harness Double solenoid valve (3 circuit/2 circuit) F.R.L. combination (Air cleaning equipment)			
Controller			E04			

			MT400N	MG10HL	MG15HL
Type			Articulated robot		
Degree of freedom (axes)			6		
Max. Payload (kg)			400	1,000	1,500
Max. Reach (mm)			3,503	4,005	4,005
Repeatability (mm)			±0.5 (at the tool mounting surface)	±0.1 (at the tool mounting surface)	
Motion Range (°)	Arm rotation	(JT1)	±180	±150	±150
	Arm out-in	(JT2)	+15 -- -135	+90 -- -40	+90 -- -40
	Arm down-up	(JT3)	+106 -- -30	+30 -- -110	+30- -110 *
	Wrist swivel	(JT4)	±360	±360	±360
	Wrist bend	(JT5)	±120	±120	±120
	Wrist twist	(JT6)	±360	±360	±360
Max. Speed (°/s)	Arm rotation	(JT1)	80	65	65
	Arm out-in	(JT2)	70	33.5	33.5
	Arm down-up	(JT3)	70	37.5	37.5
	Wrist swivel	(JT4)	70	65	36
	Wrist bend	(JT5)	70	65	36
	Wrist twist	(JT6)	130	80	80
Moment (N·m)	Wrist swivel	(JT4)	2,150	8,800	15,000
	Wrist bend	(JT5)	2,150	8,800	15,000
	Wrist twist	(JT6)	980	4,410	4,410
Moment of Inertia (kg·m²)	Wrist swivel	(JT4)	200	1,800	2,250
	Wrist bend	(JT5)	200	1,800	2,250
	Wrist twist	(JT6)	147	1,200	1,200
Mass (without Options) (kg)			2,600	6,500	6,550
Driving Motor			Brushless AC servo motor		
Mounting			Shelf	Floor	
Environmental Condition	Ambient temperature (°C)		0 - 45		
	Relative humidity (%)		35 - 85 (No dew, nor frost allowed)		
Built-In Utilities			Pneumatic pipings (ø12 x 2 lines) Wirings for valves to drive hand (DC24V x 7 circuits)	-	
Option			Adjustable mechanical stopper JT1/JT2/JT3 Limit switch JT1/JT2/JT3	Adjustable mechanical stopper JT1 Limit switch JT1/JT2/JT3 Internal signal harness Double solenoid valve (3 circuit/2 circuit) F.R.L. combination (Air cleaning equipment)	
Controller			E02	E58	

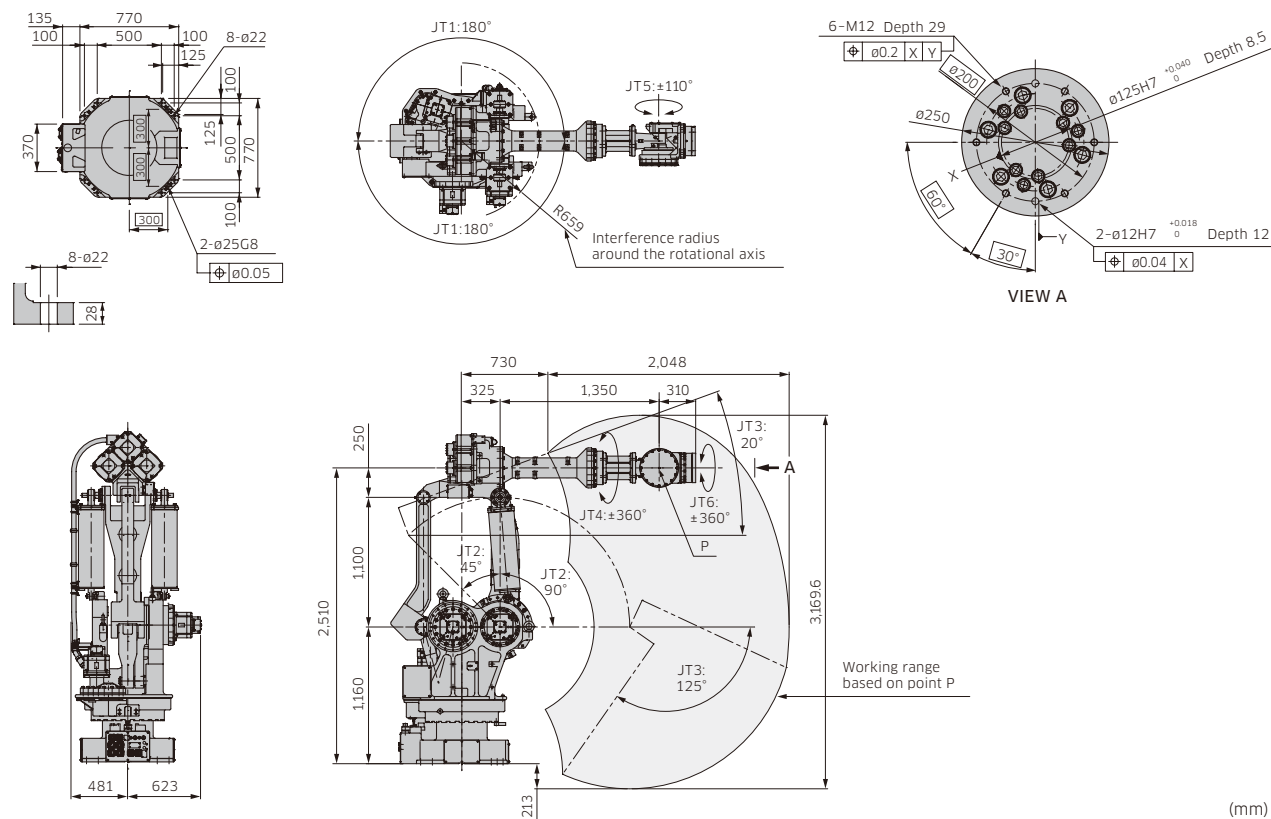
\* : The maximum ranges of motion depend on the payload and the torque.



## MX350L

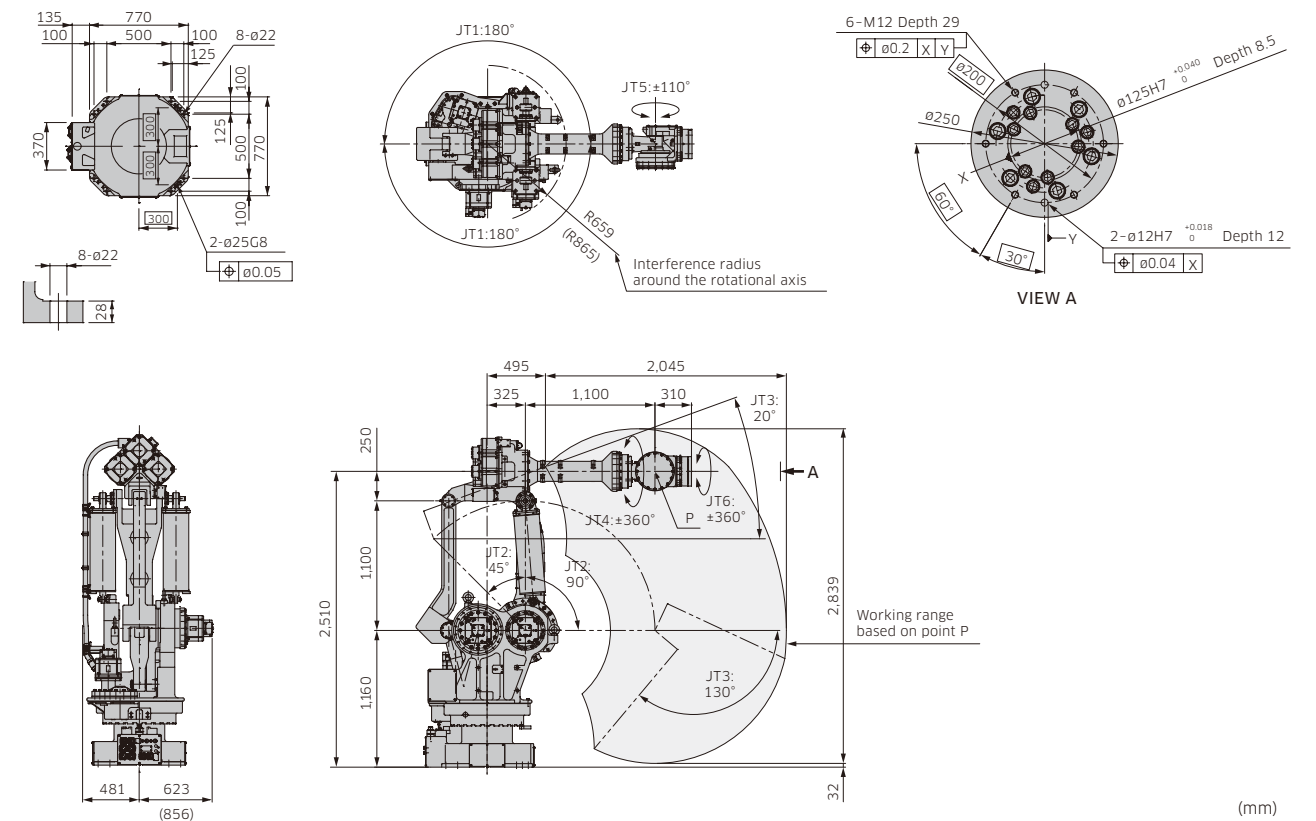


## MX420L

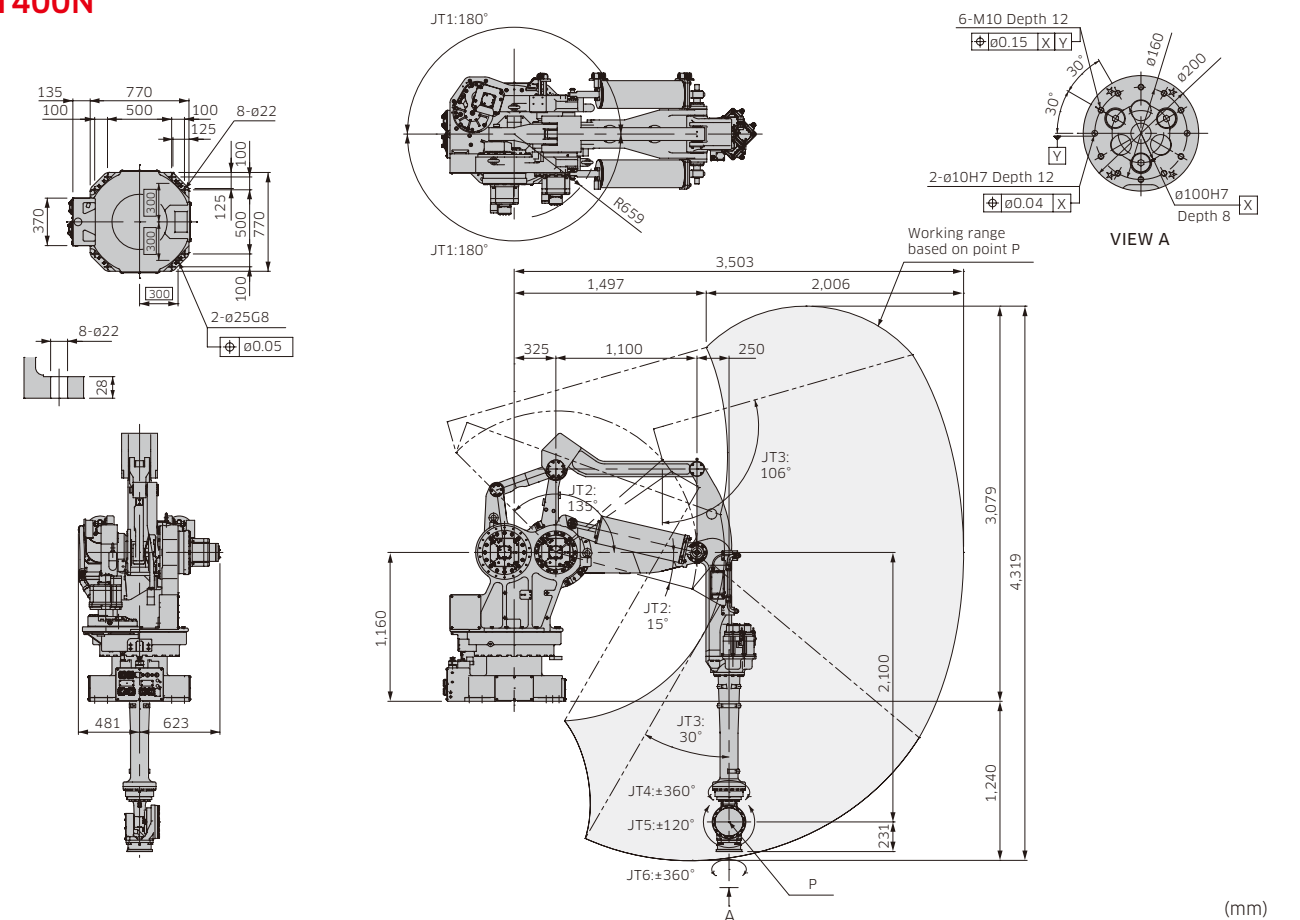


**MX500N / 700N**

\* Figures in ( ) represent MX700N.



## MT400N





**Installation Dimensions**

The top left drawing shows the base plate with dimensions: 730, 600, 425, 80, 60, 1200, 425, 80, 60, 425, 80, 60, 425, 80, 60. It also shows mounting holes: 16-ø33, 2-ø25G8, and a tolerance of ±0.06.

**Top View**

The top right drawing shows the top of the robot arm with dimensions: 150°, 150°, 11(5+3/60), 11(6+3/60). It also shows a mounting hole: 16-M16 Dp34, a tolerance of ±0.3 X Y, and a tolerance of ±0.06 X.

**Side View**

The bottom left drawing shows the side profile of the robot arm with dimensions: 400, 490, 674, 674.

**Working Range**

The large central drawing shows the working range of the robot arm. It includes dimensions: 1.957, 1.057, 600, 210, 1.750, 435, 3.533, 1.400, 950, 1.036, 1.242, 4.005, 2.779, 3.821, 4.416, 595. It also shows angles: 110°, 110°, 110°, 110°, 110°. A point P is marked on the end effector. The text "Working range based on point P" is present. An inset shows two configurations of the end effector.

The E-Controller, with unprecedented quality and compact size, was created in response to customer demand. Kawasaki's collaboration of past achievements and experience has lead to the development of the most technically advanced controller available. This industry leading design provides increased performance and easy operation that exceeds expectations.

## Compact

Small footprint of the E controller makes it easy to achieve high-density layouts. And overall volume has been reduced greatly compared with the previous model. As a result, an upright-position installation or stacked installation is possible, in order to save installation space.

## User-friendly operation system

The operation system has now fully developed into a more user-friendly design. The operator can turn on the motors and activate the cycle start all from the teach pendant, thereby realizing a more convenient system control. The two information screens can be displayed simultaneously, enabling the operator to view different types of information easily (for example, positional and signal information).

## Abundance of functions

The large variety of unique functions makes it possible to support a wide range of applications. These functions can be combined and easily configured within a system to suit a particular application. Likewise, the built-in Kawasaki "AS Language" provides sophisticated robot motion and sequence controls.

## Incorporating the latest technologies

The enhanced CPU capacity allows for more accurate trajectory control, faster program execution, and quicker saving and loading of files, and countless other advantages. In addition, the memory has been expanded to answer the need for higher program storage capacity. A USB port is equipped as a external storage conduit.

### Easier maintenance

With modular components and fewer cables, Kawasaki has developed a controller that is compact and easy to maintain. A host of maintenance functions are available, including the DIAG function for self-diagnostics, a maintenance support function that can handle not only hardware errors but also application errors. In addition to the DIAG function, there are other additional functions, such as a Web server that enables engineers to perform remote diagnostics.

## Highly expandable

With the use of additional amplifiers and multi axis controller, the E04 controller can support up to 16 external axes, and the E58 up to 17. Numerous communication fieldbuses can be used to control peripheral devices. Advanced systems can easily be built by using Kawasaki K-Logic sequencer software and the user-customized interface panel on the teach pendant.

## Global Unified Specification

The E04 is a universal controller equipped with an optional transformer unit to cope with different primary power sources worldwide.



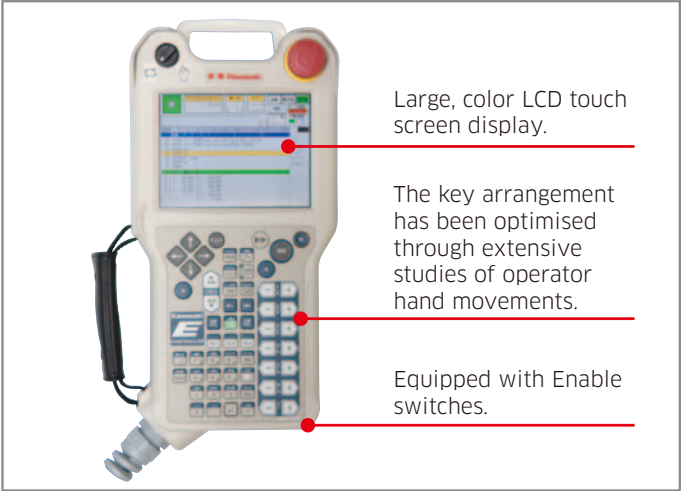
**E04**

\*Option

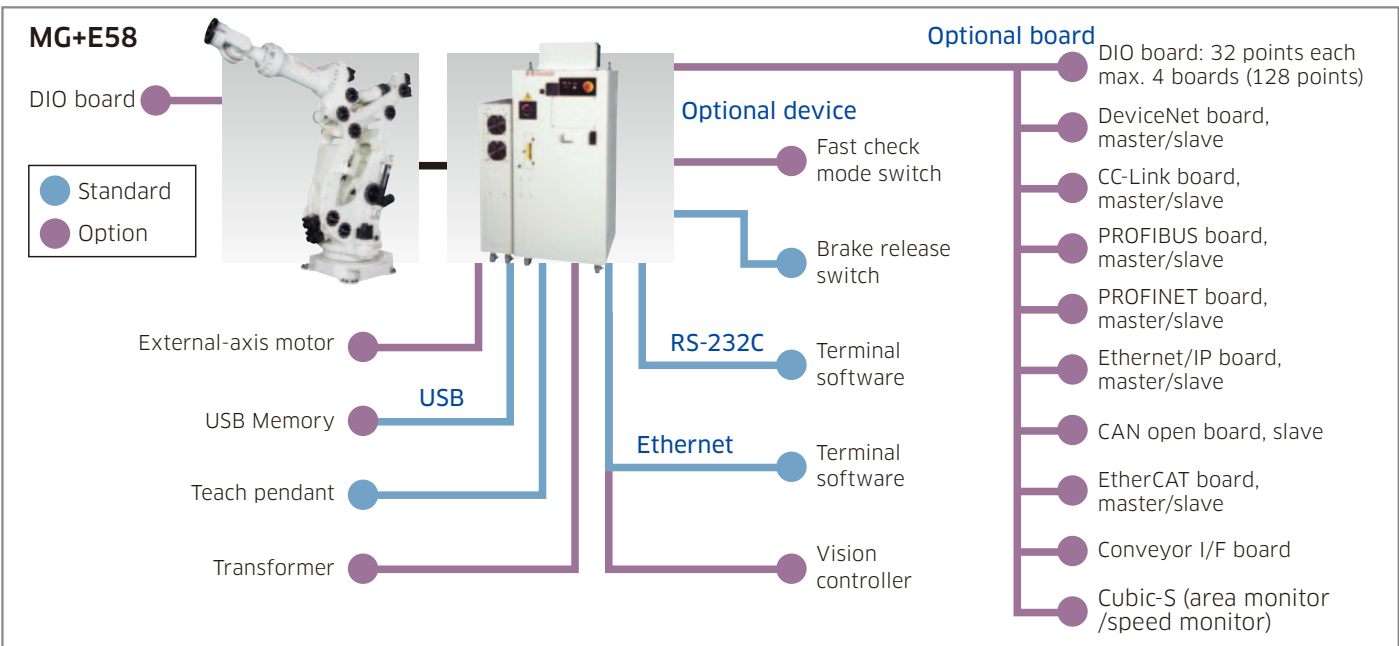
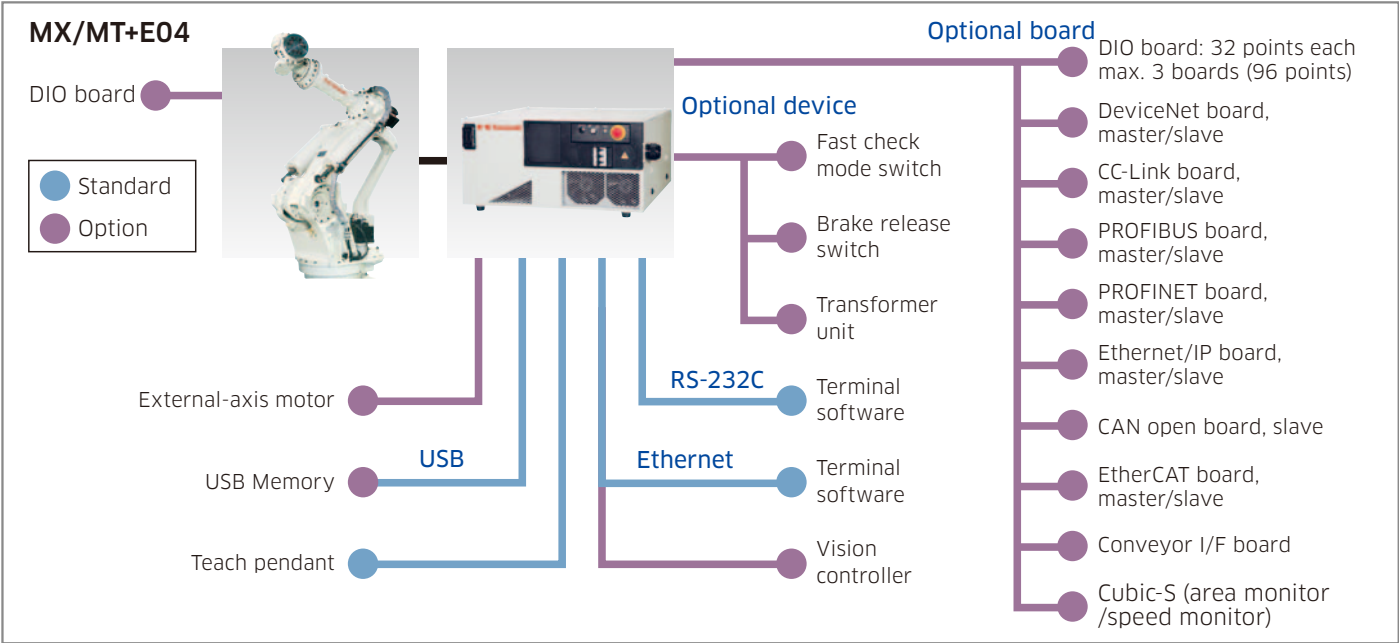


E58

Teach pendant



System configuration diagram



Specifications

	Standard		Option
	E04	E58	
Dimensions (mm)	W550×D580×H278	W755×D550×H1,370	E04: Transformer unit: W580×D580×H178
Structure	Enclosed structure / Indirect cooling system		
Number of controlled axes	6	9	E04: Max. 16 (adding external amplifier) E58: Max. 17 (adding external amplifier)
Drive system	Full digital servo system		
Coordinate systems	Joint, Base, Tool		Fixed tool point
Types of motion control	Joint/Linear/Circular Interpolated motion	Joint/Linear motion	E58: Circular Interpolated
Programming	Point to point teaching or language based programming		
Memory capacity (MB)	8		
General purpose signals	External operation	Motor power off, Hold	
	Input (Channels)	32	
	Output (Channels)	32	
Operation panel	E-Stop switch, teach/repeat switch, control power light (Cycle start, motor-on, hold/run, and error reset are activated from the teach pendant.)		Fast check mode switch
Cable length	Teach pendant (m)	5	10, 15
	Robot-controller (m)	5	10, 15
Mass (kg)	40	165	E04: Transformer unit: 45 E58: When built-in transformer: 215
Power requirements	AC200-220V ±10%, 50/60Hz, 3ø		(E04) *When using transformer unit AC380-415V ±10% } (selectable) AC440-480V ±10% } 50/60Hz, 3ø (E58) *When built-in transformer AC380-415V ±10% } (selectable) AC440-480V ±10% } 50/60Hz, 3ø
	Class-D earth connection (Earth connection dedicated to robots), leakage current: Maximum 100mA		
Environmental condition	Ambient temperature (°C)	0 - 45	
	Relative humidity (%)	35 - 85 (no dew, nor frost allowed)	
Body color	Munsell 10GY9/1 equivalent		
Teach pendant	TFT color LCD display with touch-panel, E-Stop switch, teach lock switch, Enable switch		
Auxiliary storage unit	-		USB Memory
Interface	USB, Ethernet (100BASE-TX), RS-232C		

External view & dimensions

