



DX200

DYNAMIC ENERGY-EFFICIENT MULTIPLE ROBOT CONTROLLER

KEY FEATURES

Patented multiple robot control; up to 8 robots/72 axes with coordinated motion between devices

- Application flexibility
- Higher productivity
- Lower integration costs

Integrated cell (system-level) control capabilities

High reliability and energy efficiency

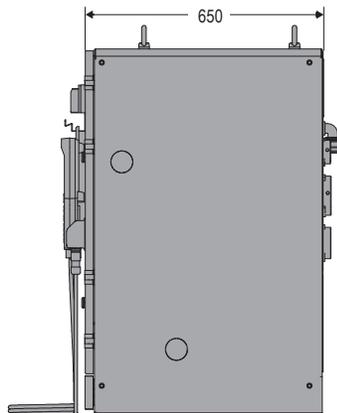
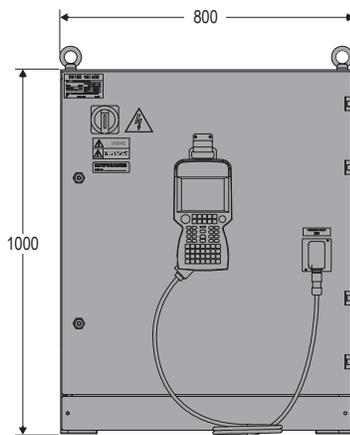
Easy maintenance with reducer status check function, hardware life diagnostic function, enhanced troubleshooting and alarm recovery, and improved Mean Time To Repair (MTTR)

Powerful programming with minimum keystrokes

Convenient compact flash slot and USB port facilitate memory backups

- Features robust PC architecture, providing system-level control for robotic workcells.
 - Built-in ladder logic processing; 4,096 I/O addresses
 - Variety of fieldbus network connections
 - High-speed E-server connection
 - I/F panels (10) shows HMI on pendant
- Often eliminates need for separate PLC and human machine interface (HMI). Delivers significant cost savings at system level, while decreasing workcell complexity and improving overall reliability.
- Patented multiple robot control, as well as I/O devices and communication protocols. Dynamic interference zones protect robot arm and provide advanced collision avoidance.
- Advanced Robot Motion (ARM) control provides high performance, best-in-class path planning and dramatically reduces teaching time. Supports coordinated motion for multiple robots and auxiliary/external axes.
- Small, lightweight Windows® CE programming pendant features color touch screen with multiple window display capability. Programming features are designed to use minimum number of keystrokes.
- Conserves power consumption from 38% - 70% depending on application and robot size.
- Compliant to ANSI/RIA R15.06-2012 and other relevant ISO and CSA safety standards.
- Available with Category 3 Performance Level d (PLd) Functional Safety Unit (FSU).
 - Multiple zones with inside and outside position monitoring
 - Speed limiting and stand-still monitoring
 - Multiple tool interference and angle checking
- DX200 control cabinet allows for up to three auxiliary/external axes and can be remote-mounted. Top- or side-mount expansion options available.

DX200 CONTROLLER



All dimensions are metric (mm) and for reference only. Please request detailed drawings for all design/engineering requirements.

STANDARD I/O - NPN

Forty optically isolated inputs, 32 transistor outputs, 8 relay contact outputs (configured to optimize each application), and four break-out cards are provided as standard. PNP I/O available.

I/O EXPANSION - DX200

The DX200 supports I/O expansion via:

- EtherNet/IP
- DeviceNet
- Profibus-DP
- Mechatrolink II
- CC-Link
- Remote I/O
- Discrete I/O
- Analog I/O
- Other networks available

CONTROLLER

Dimensions	DX200: 800 (w) x 1000 (h) x 650 (d) (31.5" x 39.4" x 25.6")
Approximate Mass	150-250 kg (330.8-551.3 lbs.)
Ambient Temperature [°C]	-0° to 45° C (32° to 113° F) (operation)
Humidity [%]	90% max. non-condensing
Primary Power Requirements	3-phase, 240/480/575 VAC at 50/60 Hz
Digital I/O	4,096 inputs and 4,096 outputs
NPN - Standard	Standard I/O: 40 inputs / 40 outputs consisting of 24 user inputs / 24 user outputs
PNP - Optional	32 Transistor Outputs; 8 Relay Outputs Max. I/O (optional)
Position Feedback	Absolute encoder
Program Memory	JOB: 200,000 steps, 10,000 instructions CIO Ladder Standard: 20,000 steps
Interface	Ethernet (10 BASE-T / 100 BASE-TX)
Multiple Robot Control	Ability to control up to 8 robots / 72 axes
Protection Rating	IP54

SAFETY FEATURES

Safety Specs (Category 4 PLe)	Controller Safety-Rated Emergency Stop & Safety Gate inputs. Programming Pendant includes: Safety-Rated Emergency Stop Pushbutton, 3-Position Enable Switch with key-lock and Manual Brake Release built into programming pendant. Meets ANSI/RIA R15.06-2012 and CSA Z434-03
Standard Software Features	Arm interference, collision detection, machine lock, and safety interlock
Functional Safety Unit (Category 3 PLd SIL2)	Position monitoring (32 zones), speed limiting, tool monitoring, graphic pendant set-up.

PENDANT

Pendant Dimensions	169 (w) x 314.5 (h) x 50 (d) (6.6" x 12.4" x 2")
Pendant Display	5.7-inch full-color touch screen, 640 x 480 (VGA)
Pendant Languages	English, German, Japanese, Spanish, Chinese
Pendant Weight	.998 kg (2.2 lbs)
Coordinate System	Joint, rectangular, cylindrical, tool, 63 user-coordinate frames
Windows® Menu-Driven Interface	User-selectable touch-screen menu, multiple windows supported; one Compact Flash slot; one USB port (1.1)
Pendant O/S	Windows® CE
Protection Rating	IP65

PROGRAMMING

Programming Language	INFORM III, menu-driven programming
Robot Motion Control	Joint motion, linear, circular, spline interpolation
Multiple Device Control	Parallel Start, Twin Synchronous, Multiple Group Combinations, Station Coordinated Moves (positioners), Bases (tracks and gantries)
Programmable Logic Control	Ladder monitor, ladder programming, I/F pendant display, address naming, expanded logic operands
Device Instructions	Application specific (arc and spot welding, handling, general purpose)
I/O Instructions	Discrete I/O, 4-bit and 8-bit manipulation, analog output, analog input, analog scaling, sloping

MAINTENANCE

Maintenance Functions	System monitor, internal maintenance clocks
Self-Diagnostics	Classifies errors and major/minor alarms and displays data; monitors reducers for predictive wear; alerts when major power components reach design life
User Alarm Display	Displays alarm messages for peripheral devices
Alarm Display	Alarm messages, alarm history provides instruction of how to repair fault
I/O Diagnosis	Permits simulated enabled/disabled input/output

YASKAWA

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MOTOMAN MH12, MH12F

Handling & General Applications
with the MH-series



The flexible, high speed 6-axis robot MOTOMAN MH12, MH12F with its payload up to 12 kg is newly added to the YASKAWA product line MOTOMAN MH-series. By realising the highest motion performance in its class, YASKAWA is contributing to the productivity development.

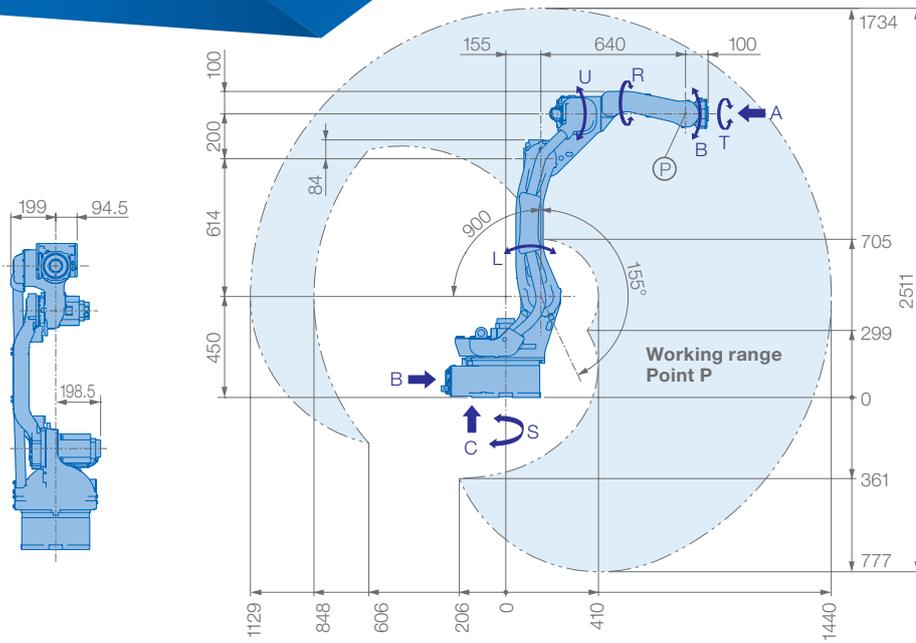
The hollow shaft structure is adopted to the upper-arm. By storing the cables in the arm, operation restriction due to the cable interference is reduced. Therefore, maintainability such as simplifying of the robot teaching operation or eliminating of the cable disconnection problems, etc. is improved.

Stream-lined structure adopted to the new type arc welding purpose robot is also applied to this multipurpose-applicable robot. And this adoption contributes to reduce the interference area between the jigs and work pieces. Superior performance can be delivered in handling operations which requires for example the rotation of large-sized work pieces.

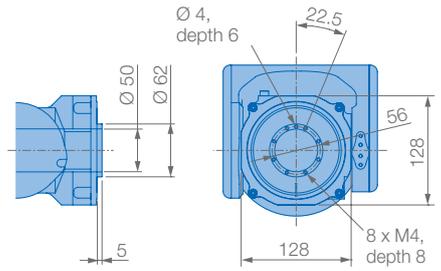
The Servo-Float function enables, for example in plastic injection moulding machines, safely handling of work pieces which are pushed back by the ram, including the arm of the robot.

KEY BENEFITS

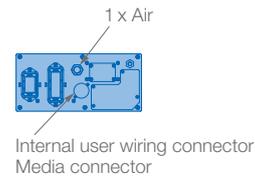
- Expanded diameter of hollow wrist (50 mm)
- Fast and powerful (max. payload 12 kg)
- Reduced interference due to internal cable wiring
- Servo float possible
- Stream-lined structure
- Easy maintenance



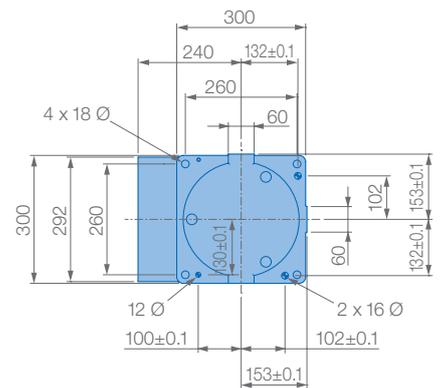
View A



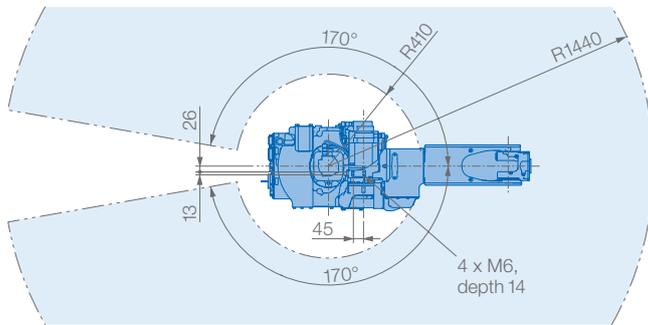
View B



View C



Mounting options: Floor, wall, ceiling
Protection class: IP54/67

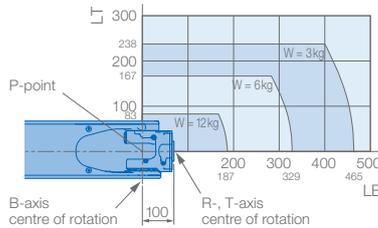


Please note wall mounting option:
±30° S-axis limit

Please note ceiling mounting option:
Please notice working range of B-axis

Please note tilted robot (MH12):
0°–90° limitation of S-axis, details on request

Allowable wrist load



Specifications MH12, MH12F						
Axes	Maximum motion range [°]	Maximum speed [°/sec.]	Allowable moment [Nm]	Allowable moment of inertia [kg · m ²]	Controlled axes	
					Max. payload [kg]	
S	±170	220	–	–	6	
L	+155/–90	200	–	–	12	
U	+240/–175	220	–	–		Repeatability [mm]
R	±180	410	22.0	0.67		±0.08
B	±135	410	22.0	0.67		Max. working range R [mm]
T	±360	610	9.8	0.17		1440
						Temperature [°C]
						0 to +45
						Humidity [%]
						20 – 80
						Weight [kg]
						130
						Power supply, average [KVA]
						1.5

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