MOTOMAN®

XRC Robot Controller

Technical data

Controller

Configuration	Free-standing, Enclosed type
Dimensions	800(W)x900(H)x650(D) mm
Weight	Approx. 170 kg
Cooling system	Indirect cooling
Ambient temperature	During operation 0° to +45° During transport -10° to +60°
Relative humidity	Max. 90% (non-condensing)
Power supply	3 x 400/415/440V AC, 50/60 Hz
Grounding	Less than 100 ohm
Digital I/O	Specialised signal (hardware) 12 inputs and 3 outputs General signals (standard) 40 inputs and 40 outputs 4 direct inputs
Positioning system	Absolute encoder / Serial interface
Drive units	Servopacks for AC servomotor
Accel / Decel	Software servo control
Programming capacity (standard)	5.000 steps and 3.000 instructions 1.500 ladder steps

Safety features

Personal safety	3-position "dead-man´s handle" Low speed in teaching mode
Teach Lock Mode	Prohibits operation from operator´s panel
Collision proof frames	Doughnut-sector frame, cubic frame
Machine lock	Test-run peripherial device without robot motion
Self-diagnosis	Alarm and error messages displayed together with explanation
User Alarm display	Possible to display alarm messages for peripheral devices

Operator´s panel

Buttons provided	Mode, Start, Hold, Emergency stop Servo power ON

Programming pendant

Material	Reinforced thermoplastic enclosure
Dimensions Weight	211(W)x382(H)x71(D) mm 1.2 kg
Display	5.7 inch, 40 characters x 12 lines
Safety feature	3-position "dead-man´s handle"
Interface	RS-232C

Programming functions

Coordinate system	Joint, rectangular/cylindrical, tool, user coordinates
Robot Motion Control	Joint coordinates, linear/circular, interpolation, tool coordinates
Speed setting	Percentage for joint coordinates, 0.1 mm/s units for interpolations, angular velocity for T.C.P. fixed motion
Program Control Instructions	Jump, call, timer, robot stop, execution of some instructions during robot motion
Modification of teaching point	Adding, deleting, correcting (robot axes and/or external axes)
Position control	Manually forwards and backwards in the job (even circular)
Speed adjustment	Fine adjustment possible
I/O-function	Discrete I/O control, pattern I/O processing
Programming	Interactive programming
Language	Robot language: INFORM II
Display text	English, Swedish, French, Spanish, Italian, Finnish, German
Tool Centre Point	Max. 24 and up to 24 external
TCP-calibration	TCP´s Automatically calibrates parameters for end effectors using master jig

Maintenance functions

Software time usage meters	Control power-ON time, servo power-ON time, playback time, work time and operation time displayed
Alarm display	Alarm messages and previous alarm records
I/O-diagnosis	Simulated enable/disabled output possible

Options

Digital I/O	I/O-boards, total max. 256/256 MIO02: 32 inputs and outputs MIO03: 16 inputs and outputs
Analog output	12 channel (MEW/XEW-board)
Memory expansion (up to...)	Max 60.000 points for 6 axes and 20.000 instructions 3.000 ladder steps
External axis	Total max. 27 axes
Enclosure classification	IP54, by add on kit

Software functions

Example of general functions

ARM control
Vibration control
Station coordinated motion control
P-start function
Coordinated motion 2 manipulators
Coordinated motion 3 manipulators
Coordinated motion 3 manipulators and ex-axis
Twin drive function
Welding condition slope up/down
Interrupt job function
Search function
Servo float function
Linear servo float function
T-axis endless rotation
External axis endless rotation
External reference point control function
PMT function
Start point search function
High speed start point search function
General purpose sensor function
Data tansmission function
Relative job function
Parallel shift function
PAM function
TCP function
Weaving function
Pause weaving function
Online tool modification function
Independant control function (6 tasks)
External storage function PC-Card
Analogue output function
Analogue output function related to speed

Examples of special functions

COMARC arc welding control
Multi-layer welding function
Conveyor synchonous function
Press synchronous function
Laser sensor function
Pitch control for spot welding
Ethernet communication
Fieldbus communication

Available optional boards

16/16 IO-board
32/32 IO-board
MEW-Welding interface board
XEW-Welding interface board
Ethernet communication board
Fieldbus communication board
Sensor board

Software applications

Arc welding application
Handling application
Spot welding application
General purpose application

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MOTOMAN XRC Robot Controller

MOTOMAN XRC will be the premier robot controller.
It is physically minimised but optimised for functions, simple operations and expandability.

Outlines of the XRC

Built-in transformer
Simple installation and setup by plug-connections.
Used for robot in UP-series and SK-X, SP-X and SV-X-series.
INFORM programming language
Expandable slots for optional boards
-Sensor function by MSL-board
-Welding interface MEW and XEW-board
-I/O-interface MIO-board
-Ethernet and Fieldbus board
XRC cabinets may be put on top of each other or docked side by side
Fulfils the EC-directive incl. EMC and LVD
Made in Sweden

Advanced control system

Powerful 32-bit micro processor for rapid data processing.
PLC-programs for different applications, for example: arc welding and handling.
Advanced PLC-unit in the control system with expanded program capacity and new logical functions e.g. for controlling pneumatic functions in fixtures.
Multi tasking makes it possible to run several jobs simultaneously.
Digital servopacks with software controlled speed and position feedback.

Shock detection function

This function stops the robot when it comes into contact with an object. Robot or peripherical devices can be protected in case of accidental collision.

Maintenance functions

Remote maintenance function monitors remotely robot status through ethernet network. Production processing monitoring and quality control can be managed from a central control room.
Maintains history of when and who changed robot job instructions.

Programming pendant

All programming functions are in one unit with clear and large 12-line screen. Optimal programming time is achieved while all functions are available during programming. The menu text can be switched between several different European languages by a simple key operation. The programming pendant is equipped with a 3-position "dead-man´s handle".

Communication

XRC is like the previous control system for MOTOMAN robots a data technical solution that is PC-compatible. Therefore common computer tools may be used for creating, reading and editing jobs in a PC.
The flexibility of the control system makes it possible to communicate with other systems such as PLC´s, host computers, vision system, etc. through serial links, Ethernet, digital I/O, fieldbus. Controller memory is also accessable through PC-card.

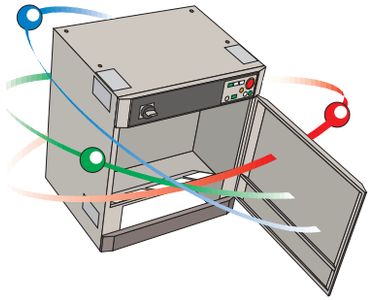
Path control

Robot working path is controlled to perform consistently precision and quality. Even at high speed, the robot will not vary from the target execution line.
XRC improves high speed welding, cutting and sealing more than ever.

ARM control

Advanced Robot Motion Control improves quality and productivity by improved servo response for the motion control. Optimised acceleration/deceleration and vibration control obtains correct path and cycle time. Speed is automatically optimised for circles and corners. Collision between robot, robot tool and other devices is immediately detected to stop robot and protect from damages.

Controller features



LCD-display
Large LCD-display with back-lighting. High contrast for day-light operation.

Cursor operation
Cross shape cursor button for instruction basic operations. Operates by icons and pull-down menues.

Lightweight
Lightweight thermoplastic p-pendant reduces fatigue.

Key operation
Key allocation is based on human engineering research. The number of keys are minimised for required functions only.

3 Robots
CPU can control up to 3 robots simultaneously.

27 Axes
CPU can control up to 27 axes simultaneously.

6 Tasks
Multi-task CPU can handle up to 6 tasks simultaneously.

Easy placing
Cables and air vent only at back. Optional cables, IO's, etc. are accessed behinde the front door.

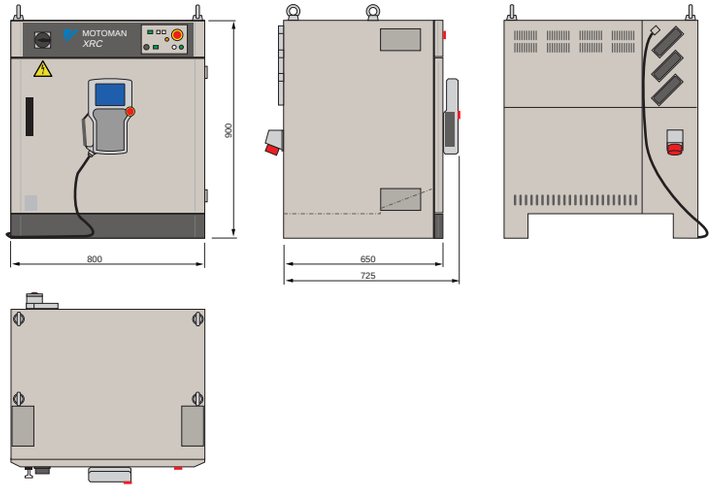
Easy installation
Cables for power, robots and IO´s are connected by plugs.

Expansion units
Optional units such as external axis servopacks may be placed in optional cabinets. These cabinets are docked to the controller cabinet by means of ports on top and on the sides. Which means tidy cable installation.

PC-Card
PC-Card (PCMCIA) is used for expansion interface. It simplifies expanding functions and speeds up backing up data.

Network
Standard field networks are applicable: Ethernet, Profibus, Interbus-S, Device-NET, etc. Your manufacturing line can be integrally controlled through your existing network.

Controller layout



External axis cabinet layout