

Single-axis
robot controller

SR1-P/SR1-X

Compact design with high performance.
Although with one axis, functions of upper class controllers.

Features

1 High performance type single-axis controller

Although with one axis, functions of upper class controllers, such as simple robot language, multi-task, communication, use of the field bus etc. can be handled. Furthermore, as the current position information and various information at occurrence of an alarm are retained, various checks can be made using the programming unit or the like as necessary. Also, it is possible to make fine controls of the torque and pressing force.

2 Compact design

The unit is designed as compactly as W74mm, H210mm and D146mm. It is about 26% less in volume than the conventional model SRCX controller. Also, its height is made the same as the new type 2-axis controller RCX221/222 so that they can be used conveniently when they are installed in parallel.

3 Lead free mounting PCB is used

As lead free mounting PCB is used taking influence to the environment and safety considered.

4 Applicable to various peripheral equipments

It is possible to operate and teach the robot by using the programming unit easily, to select the I/O board for various serial communication and perform the high level application work. In addition, a special PC software POPCOM to support the robot programming as a whole is available. Use of GUI makes the monitor display easy to see and understand for easy operation of the unit.

5 The back-up period has been increased greatly

The absolute position data retention period while no electricity is supplied is made much longer. It is as long as 1 years while it was 2 weeks at maximum with the conventional type unit. The current position information is monitored even during a long vacation, while the unit is kept unused and while it is transported so that the return to the origin process is not required when the unit is activated again, assuring quick start of production.

6 Capable of using additional function of "YC-Link option" for additional axis

By installing the YC-Link option, it is possible to link the SR1 controller with the RCX type multi-axis controller easily. Thus, by connecting a multiple number of SR1's as necessary, it is possible to control up to 8 axes (up to 6 axes when using the simultaneous control function).

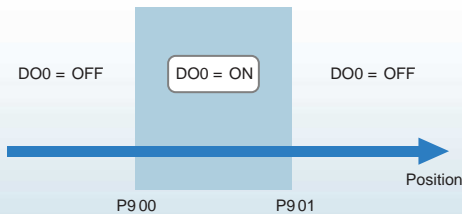


Functions

1 Position data output function

Zone output

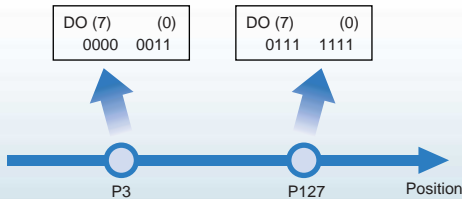
Outputs whether the robot position is within the specified range or not.



It is possible to reverse the output logic.

Point zone output

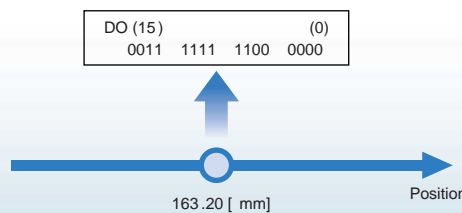
Outputs the number of the point near the robot position in the binary output.



It is also possible to limit to the moving point only.

Binary output

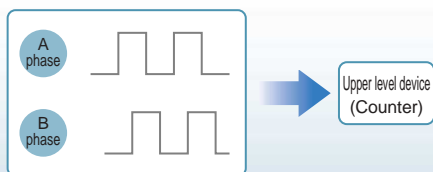
Outputs Current robot position by 16bits binary.



It is possible to adjust the unit of the output position data by using parameters.

Feedback pulse output

Outputs the current position counter value of the robot through the A/B phase line driver.

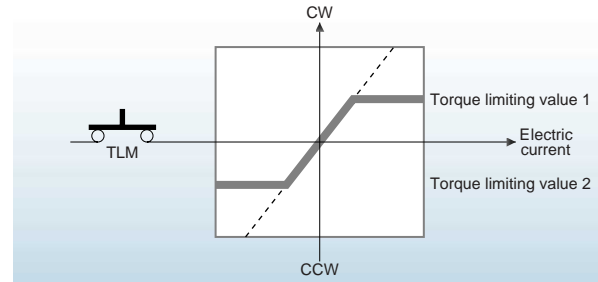


It is possible to monitor at real time by using the upper level device. A division function is installed.

2 Torque limiting drive

It is possible to perform such actions as pressing and gripping the work by restricting the torque during operation.

General idea



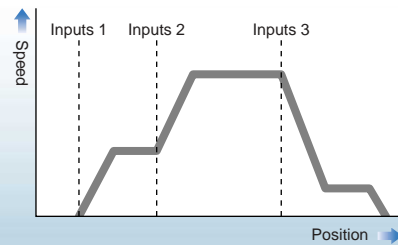
Features

- Control over limit timing at the upper level by TLM input
- Grasp of limit condition by torque limit condition output (TLON)
- Selection of torque limit value by input (up to 4 patterns)
- Limit of the torque by analog input (0 to +10V/12bit)

3 Changing movement data function

Possible to change the moving speed and programmed position while moving.

General idea



Features

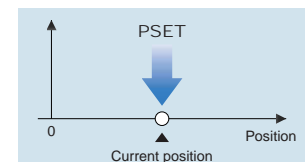
- Control over movement change timing at the upper level by movement command input
- The movement command is either ABS-PT (absolute movement command) or ABS-BN (Binary specification movement command)
- Selection of speed specification is 1 to 100% (up to 4 patterns)
- Change in the deceleration range is invalid.

4 Point instruction

It is possible to execute jog movement of the robot and point teaching from the upper level device.

General idea

- Robot is moved to the position where teaching is to be done by the JOG-/JOG+ command.
- The current position is registered to the number of the point specified by PSET input.



SR1-P ordering method

MR16- RH - S^{Note 4} - 1550 - 3L - SR1-P - 05 - R - CC

Model	Cable carrier take out direction	Optional cable carrier for users	Stroke	Cable length	Applicable controller	Driver	Regenerative unit	Input / Output Selection
	<ul style="list-style-type: none"> - RH : Horiz ontal, right - LH : Horiz ontal, left - RW : Wall hanging, right - LW : Wall hanging, left 	<ul style="list-style-type: none"> - No entry : None - S : Small size - M : Large size 	<ul style="list-style-type: none"> - 50 to 1550 (100mm pitch) 	<ul style="list-style-type: none"> - 3L : 3.5 m (Standard) - 5L : 5 m - 10L : 10m 		<ul style="list-style-type: none"> - 05 : 100W or less - 10 : 200W - 20 : 400 to 600W 	<ul style="list-style-type: none"> - No entry: None - R : RG1^{Note 2} 	<ul style="list-style-type: none"> - N : NPN - P : PNP - CC : CC-Link - DN : DeviceNet - PB : Profibus - YC : YC-Link^{Note 3}

Note 1 : For details of the mechanical section, refer to Yamaha PHASER catalog.
 Note 2 : The regenerative unit RG1 (option) is required when operating a model designated by Yamaha or a load with a large inertia.
 Note 3 : Available only for the slave.
 Note 4 : It will be a customer's choice.

SR1-X ordering method

F17 - 20 - BK - 1250 - 3L - SR1-X - 05 - E^{Note 4} - R - CC - B^{Note 4}

Model	Lead designation	Brake	Stroke	Cable length	Applicable controller	Driver	Usable for CE	Regenerative unit	Input / Output Selection	Battery
						<ul style="list-style-type: none"> - 05 : 100W or less - 10 : 200W - 20 : 400 to 600W 	<ul style="list-style-type: none"> - No entry: Standard - E : CE specification 	<ul style="list-style-type: none"> - No entry: None - R : RG1^{Note 2} 	<ul style="list-style-type: none"> - N : NPN - P : PNP - CC : CC-Link - DN : DeviceNet - PB : Profibus - YC : YC-Link^{Note 3} 	<ul style="list-style-type: none"> - No entry: None (Incremental specification) - B : Battery (Absolute specification)

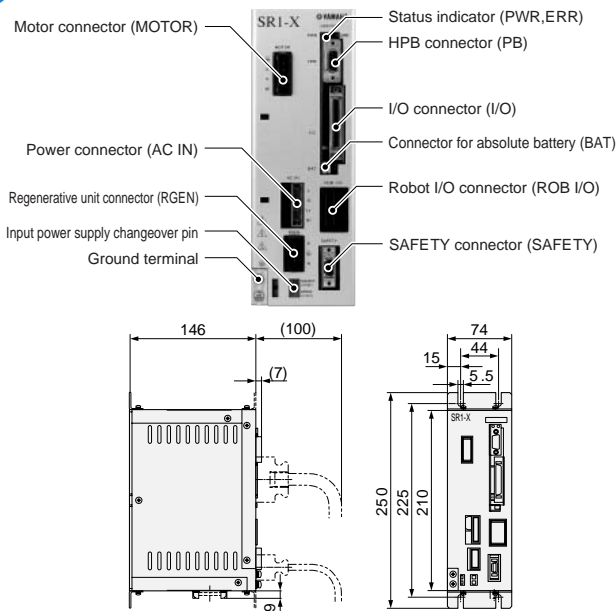
Note 1 : For details of the mechanical section, refer to Yamaha FLIP-X or XY-X catalog.
 Note 2 : The regenerative unit RG1 (option) is required when operating a model designated by Yamaha or a load with a large inertia.
 Note 3 : Available only for the slave.
 Note 4 : It will be a customer's choice.

SR1-P / SR1-X driver basic specifications

Item	Model	SR1-P05・10・20	SR1-X05・10・20	
Basic specifications	Applicable robot	Linear motor single-axis robots PHASER series	Single-axis robots FLIP-X series	
	Connected motor capacity	05 : 200V 100W, 10 : 200V 200W, 20 : 200V 600W		
	Maximum power consumption	05 : 400VA, 10 : 600VA, 20 : 1400VA		
	Dimensions	05・10 : W74x H210 x D146mm, 20 : W99x H210 x D146mm		
	Weight	05・10 : 1.5 Kg, 20 : 2.0Kg		
Axis control	Power supply voltage	05・10 : Single phase AC100 to 115 / 200 to 230V +/-10% percent maximum(50/60Hz) 20 : Single phase 200 to 230V +/-10% percent maximum(50/60Hz)		
	Number of controllable axes	1 axis		
	Drive method	AC full-digital software servo		
	Operation mode	Program operation, Point trace operation, Operation by RS232C communication		
	Position detection method / Resolution	Magnetic type linear scale / 1µm	Resolver with multi-rotation absolute function / 16384 pulses for 1 rotation	
Programs	Speed setting	1 to 100 % (Setting by 1% unit)		
	Acceleration setting	Automatic acceleration setting based on robot model type and end mass parameter, Setting based on acceleration and deceleration parameter		
	Programs	3000 steps / total or less, 255 steps / 1 program, Max.100 Multitasks : 4 tasks maximum		
External input/output	Points	1000 Points maximum MDI, remote teaching, direct teaching		
	External memory backup	SD Memory card (FA 12/16 format) ^{Note 1}		
	SAFETY	Input	Emergency stop (EMG)・ service mode (SVCE)・ inter lock (LOCK)	
		Output	Main power input ready (MPRDY)	
	Brake output	—	Relay contact	
General specifications	Origin sensor input	B contact sensor for DC24V connected		
	External communications	RS232C : 1CH		
	Analog input/output	Input 1ch (0 to + 10V) Output 2ch (0 to + 10V)		
	Selection input/output board	Parallel I/O (NPN or PNP), CC-Link, DeviceNet, Profibus (Expected to be usable)		
	Operating temperature / Storage temperature	0°C to 40°C / 35% to 85% RH		
Options	Operating humidity	-10°C to 65°C		
	Noise resistance capacity	IEC61000-4-4 Level 3 / (UL1740)		
	Programming unit	HPB, HPB-D		
Regenerative unit / Software	RG1 / POPCOM			

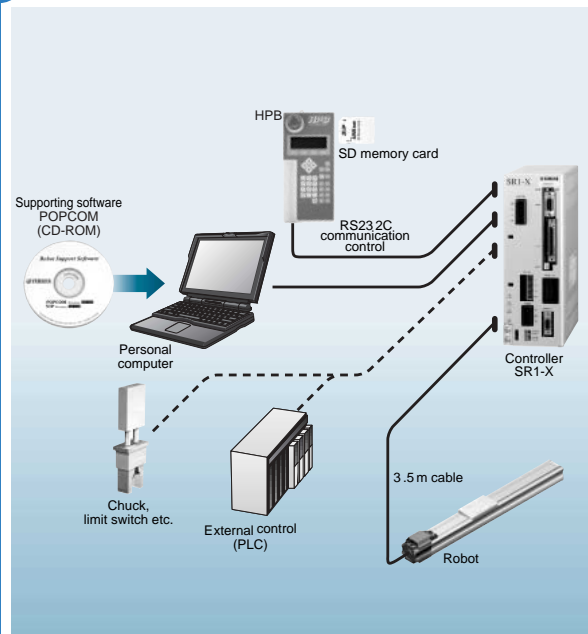
Note 1 : Available with HPB.
 Note : CC-Link is a registered trademark of CC-Link Association. / DeviceNet is a registered trademark of Open Device/Net Vendor Association, Inc. (ODVA) / Profibus is a registered trademark of SIEMENS Corp. Germany.

SR1-P / SR1-X part names / dimensions



Note : The photo, illustration shows SR1-X but the same applies to SR1-P as well.

SR1-X system diagram



SR1-P / SR1-X robot language quick-reference list

Command	Meaning	Format
MOVA	Move to a specified point (absolute position movement)	MOVA <point number> ,<maximum speed>
MOVI	Move to a specified point (relative position movement)	MOVI <point number> ,< maximum speed>
MOVF	Move until the specified DI number is entered	MOVF <point number> ,<DI number> ,<DI status>
J MP	J ump to a specified label of the program	J MP <label number> ,<program number>
J MPF	J ump to a specified label of the program when conditional j ump input matches the set value	J MPF <label number> ,<program number> ,<input condition>
J MPB	J ump to a specified label of the program when a DI number input matches the condition	J MPB <label number> ,<DI or MI number> ,<input status>
L	Defines the j ump destination for a J MP or J MPF statement, etc.	L <label number>
CALL	Call another program	CALL <program number> ,< number of times>
DO	Turns general-purpose output or memory output on or off	DO <DO or MO number> ,<output status>
WAIT	Waits until general-purpose input or memory input is in the specified state	WAIT <DI or MI number> ,<input status>
TIMR	Waits the specified amount of time before advancing to the next step	TIMR <time>
P	Defines point variable	P <point number>
P+	Adds 1 to point variable	P+
P-	Subtracts 1 from point variable	P-
SRVO	Turns servo on or off	SRVO <servo status>
STOP	Temporarily stops program execution	STOP
ORGN	Performs return-to-origin	ORGN
TON	Runs a specified task	TON <task number> ,<program number> ,< start type>
TOFF	Stops a specified task	TOFF <task number>
J MPP	J umps to a specified label when the axis position condition meets the specified conditions	J MPP <label number> ,<axis position condition>
MAT	Defines a matrix	MAT <number of rows> ,<number of columns> ,<pallet number>
MSEL	Specifies a matrix to move	MSEL <pallet number>
MOVm	Moves to a specified pallet work position on matrix	MOVm <pallet work position> ,< maximum speed>
J MPC	J umps to a specified label when the counter array variable C equals the specified value	J MPC <label number> ,< counter value>
J MPD	J umps to a specified label when the counter variable D equals the specified value	J MPD <label number> ,< counter value>
CSEL	Specifies an array element for counter array variable C	CSEL <array element number>
C	Defines counter array variable C	C < counter value>
C+	Adds a specified value to counter array variable C	C+ [< addition value>]
C-	Subtracts a specified value from counter array variable C	C- [< subtraction value>]
D	Defines counter variable D	D <counter value>
D+	Adds a specified value to counter variable D	D+ [< addition value>]
D-	Subtracts a specified value from counter variable D	D- [< subtraction value>]
SHFT	Shifts the coordinate position by amount of specified point data	SHFT <point number>
IN	Stores bit information on specified general-purpose input or memory input into counter variable D	IN <DI or MI number> ,< number of bits>
OUT	Outputs the value of counter variable D to specified general- purpose output or memory output	OUT <DO or MO numbers> ,< number of bits>
LET	Assigns the value of a specified variable to another variable	LET <variable 1> ,<variable 2>

SR1-P / SR1-X [NPN, PNP type] list

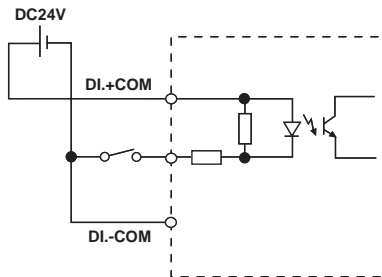
Terminal number	Signal name	Function	Terminal number	Signal name	Function
1	DI.+COM	Input supply+ common	26	DI.-COM	Input supply-common
2	SERVO	Return to servo on	27	AUTO-R	Auto run
3	INC-PT	Relative point transfer	28	RESET	Reset
4	ABS-PT	Absolute point transfer	29	ORG-S	Return to the origin
5	STEP-R	Step run	30	ALMRST	Alarm reset
6	DI 0	General input 0	31	DI 8	General input 8
7	DI 1	General input 1	32	DI 9	General input 9
8	DI 2	General input 2	33	DI 10	General input 10
9	DI 3	General input 3	34	DI 11	General input 11
10	DI 4	General input 4	35	DI 12	General input 12
11	DI 5	General input 5	36	DI 13	General input 13
12	DI 6	General input 6	37	DI 14	General input 14
13	DI 7	General input 7	38	DI 15	General input 15
14	DO.+COM	Output supply+ common	39	DO.-COM	Output supply-common
15	DO.+COM	Output supply+ common	40	DO.-COM	Output supply-common
16	END	Execution result (Execution complete)	41	READY	Available to operate (Ready for operation)
17	BUSY	Executing the command	42	UTL	Utility output
18	DO 0	General output 0	43	DO 8	General output 8
19	DO 1	General output 1	44	DO 9	General output 9
20	DO 2	General output 2	45	DO 10	General output 10
21	DO 3	General output 3	46	DO 11	General output 11
22	DO 4	General output 4	47	DO 12	General output 12
23	DO 5	General output 5	48	DO 13	General output 13
24	DO 6	General output 6	49	DO 14	General output 14
25	DO 7	General output 7	50	DO 15	General output 15

Note : Use SERVO, INC-PT, ABS-PT, STEP-R, AUTO-R, RESET, ORG-S, ALMRST as dedicated inputs, and END, BUSY, READY as dedicated outputs
 Note : Signals when selecting NPN and PNP.

Details of SR1-X NPN type input/output circuit

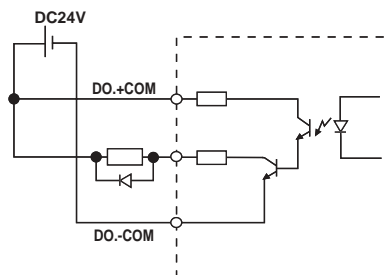
Input circuit

- Form : DC input (positive common type)
Photo coupler insulation type
- Input power supply : 5 mA/point
- Answering time : 30ms or less



Output circuit

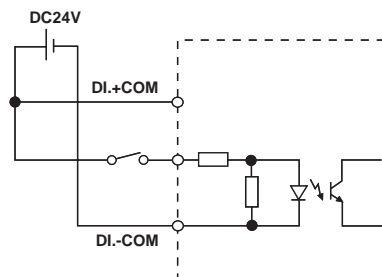
- Form : NPN open collector output (negative common type)
Photo coupler insulation type
- Load : 5 mA/point
- Answering time : 30ms or less



Details of SR1-X PNP type input/output circuit

Input circuit

- Form : DC input (negative common type)
Photo coupler insulation type
- Input power supply : 5 mA/point
- Answering time : 30ms or less



Output circuit

- Form : NPN open collector output (positive common type)
Photo coupler insulation type
- Load : 5 mA/point
- Answering time : 30ms or less

