

RDP/RDX

Robot driver exclusively for pulse train control.
As the size is small and weight is light,
it is easy to include in the automated unit.

Features

1 Special pulse string control driver

This driver is specially designed for YAMAHA single axis robot FLIP-X series and PHASER series. Different from the robot controller, this driver does not have the operation function by the robot language. Focusing on the pulse string control function only resulted in a robot mechanism control unit which is compact in size and available at a low price level. It is also easy to include in the automated unit.

2 Cost reduction to a large extent is possible in designing the system

As compared with building the equipment by combining ball screws, motor, etc. one by one, it is possible to reduce a large amount of labor required for designing, selecting parts, settings and so on, meaning a drastic cost reduction.

3 Compact

Compact design of H160 x W57 x D130mm. The size reduction to 65% of the YAMAHA's conventional product in volume has as been achieved. It saves space in the control panel.

4 Easy tuning

As parameters suitable for each robot model are available, it is not necessary to do such complicated tuning as when constructing the system using commercially available motors.

5 Low price

By rationalizing functions and using the structure with reduction of parts and ease of assembly taken into consideration, the cost is reduced by 35% as compared with YAMAHA's conventional product

6 Easy operation environment

Use of the special PC software "TOP" enables pleasant and easy operation by means of GUI.

7 Origin return function

As a special origin return input function is provided, returning to the origin is executed automatically without making a complicated sequence.



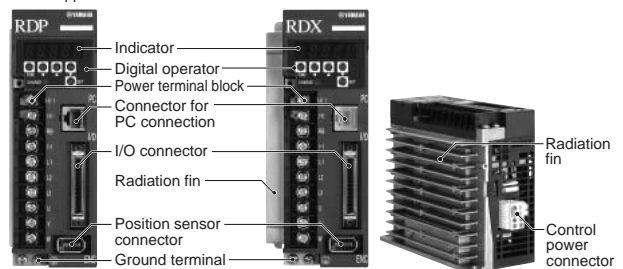
RDP / RDX part names / dimensions

RDP-05 / 10
RDX-05 / 10

Note : The photo shows the front of RDP-05 / 10. The same applies to RDX-05 / 10.

RDP-20
RDX-20

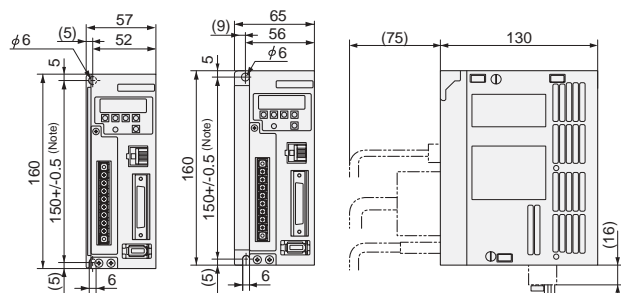
Note : The photos show the front (left) and the underside (right) of RDX-20. The same applies to RDP-20.



RDP-05 / 10
RDX-05 / 10

RDP-20
RDX-20

RDP-05 / 10 / 20, RDX-05 / 10 / 20
Side drawing



RDP ordering method

MR25 - RH - 1900 - 3L - RDP - 10 - RBR1

Model	Cable carrier take out direction	Stroke	Cable length	Applicable driver	Driver	Braking resistor	Note 2
					05 : 100W or less 10 : 200W or less 20 : 400W or less	No entry : None RBR1 RBR2	

Note 1 : For details of the mechanical section, refer to Yamaha PHASER catalog.
Note 2 : It is necessary when operating YAMAHA-designated models or a load with a large inertia.

RDX ordering method

F14H - 20 - 1050 - 3L - RDX - 10 - RBR1

Model	Lead designation	Stroke	Cable length	Applicable driver	Driver	Braking resistor	Note 2
					05 : 100W or less 10 : 200W or less 20 : 400W or less	No entry : None RBR1 RBR2	

Note 1 : For details of the mechanical section, refer to Yamaha FLIP-X catalog.
Note 2 : It is necessary when operating YAMAHA-designated models or a load with a large inertia.

RDP / RDX driver basic specifications

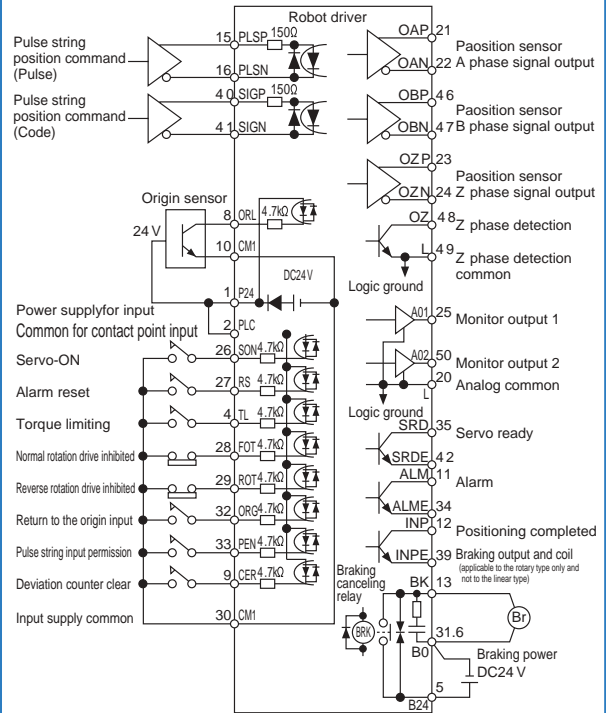
Item	Model	RDP (PHASER series)			RDX (FLIP-X series)			
		RDP-05	RDP-10	RDP-20	RDX-05	RDX-10	RDX-20	
Basic specifications	Applicable robot	MR12 / MR16	MR16H / MR25	MR20 / MF50	T6 / T7 / T9 / F10 / F14 / C6 C14 / B10 / B14 / R5 / R10	T9H / F14H / C14H B14H / R20	F17 / F17L / F20 / F20N C17L / C17 / C20	
	Applicable motor output	200V 100W or less	200V 200W or less	200V 400W or less	200V 100W or less	200V 200W or less	200V 400W or less	
	Power facility capacity	0.3kVA	0.5kVA	0.9kVA	0.3kVA	0.5kVA	0.9kVA	
	Input power (Main circuit)	3-phase 200 to 230V +10%,-15%,50/60Hz+/-5%						
	Input power (Control circuit)	Single phase 200 to 230V +10%,-15%,50/60Hz+/-5%						
	Maximum speed	3.0m/s ^{Note 6}			5000min-1			
	Protection structure ^{Note 3}	Open type (IPOO)						
	Control system	Line sine wave modulation PWM type						
	Control mode	Position control						
	Position detection method	Magnetic type linear scale			Resolver			
Input/output related function	Position command input	Line driver signal (2M pulse/s or less) 1) Normal rotation pulse + Reverse rotation pulse 2) Code input + command pulse 3) 2-phase pulse command with 90° phase difference (Maximum frequency: 500k pulse/s) Select one from (1), (2) and (3)						
	Input signal	DC12/24 v contact point signal input (usable for sink/source) (DC24 V power included) 1) Servo-ON 2) Alarm reset 3) Torque limiting 4) Normal rotation drive inhibited 5) Reverse rotation drive inhibited 6) Origin sensor ^{Note 5} 7) Return to the origin input 8) Pulse string input permitted 9) Deviation counter clear						
	Output signal	Open collector signal output (usable for sink/source) 1) Servo ready 2) Alarm 3) Positioning completed						
	Relay output signal	—			Braking cancel signal (24 V 375mA)			
	Position output	A, B phase signal output : Line driver signal output Z phase signal output: Line driver/open collector signal output N/8 192 (N= 1 to 8 191), 1/N (N= 1 to 64) or 2/N (N=3 to 64)						
	Monitor output	Selectable items: 2ch, 0 to +/-3V voltage output, speed detection value, torque command, etc.						
	Built-in operator	5-digit number indicator, key input x 5						
	External operator	PC software "TOP" monitoring function, parameter setting function, operation tracing function, trial operation function, etc. RS232C port in use, PC with Windows 95/98/Me, Windows NT/2000/XP can be connected						
	Internal function	Regenerative braking circuit	Included (but without braking resistor)		Included	Included (but without braking resistor)		Included
		Dynamic brake ^{Note 4}	Included (Operation conditions can be set.) (No DB resistor, connection: 2-phase short circuit)					
Protective function		Over-current check, Over-load check, Braking resistor overloaded, main circuit over-voltage, memory error, main circuit under-voltage, CT error, CPU error 1, grounding detected when servo ON, control circuit under-voltage, robot driver abnormal temperature, CPU error 2, drive inhibition error, PM error, resolver error, unmatched error, position deviation error, speed deviation error, overspeed error, drive range error, position monitoring time error, pole position estimation error, pole position estimation unexecuted			Over-current check, Over-load check, Braking resistor overloaded, main circuit over-voltage, memory error, main circuit under-voltage, CT error, CPU error 1, grounding detected when servo ON, control circuit under-voltage, robot driver abnormal temperature, CPU error 2, drive inhibition error, PM error, resolver error, unmatched error, position deviation error, speed deviation error, overspeed error, drive range error, position monitoring time error, origin sensor malfunction			
Use environment	Operating temperature / Storage temperature	0°C to 40°C / -10°C to 70°C						
	Operating humidity ^{Note 1}	20% to 90%RH (non-condensing)						
	Anti-vibration ^{Note 2}	5.9m/s ² (0.6G) 10 to 55Hz						
	Use position	1,000m or less above sea level, indoors (without corrosive gas or dust)						
Approximate weight	0.8 kg	0.8 kg	1.0kg	0.8 kg	0.8 kg	1.0kg		

Note 1 : Storage temperature applies to the temperature during transportation. Note 2 : The JIS C0040 test method is used as the base. Note 3 : JEM1030 is used as the base for the protection method.
Note 4 : Use the dynamic brake for emergency stop. Note that the braking may be less effective depending on the robot model.
Note 5 : GXL-8FB (made by SUNX) or FL7M-1P586-Z (made by YAMATAKE) is used for the origin sensor. The power consumption of the origin sensor is 15mA or less (at open output) and only 1 unit of the origin sensor is connected to each robot driver. (future specification)
Note 6 : These data are parameters and calculation range in controlling the robot driver and do not indicate the capacity of the robot at the maximum speed.

List of RDP / RDX terminal functions

Type	Terminal number	Terminal name	Outline of function	
Contact point input signal	P24	Power supply for input	DC24V power is supplied for contact point input. By connecting this signal to the PLC terminal, the internal power can be used. This terminal can be used only for contact point input. It cannot be used for an equipment outside of the robot such as the brake.	
	CM1	Input supply common	This is a ground signal for the P24 power supply. When using the internal power supply, input the contact point signal between the contact point input signal and this signal.	
	PLC	Common for contact point input	Connect the power supply common of the contact point input signal. Connect the external power supply or internal power supply (P24).	
	SON	Servo-ON	Turning on this signal will set the servo ON state (with the power supplied to the motor and control functioning).	
	RS	Alarm reset	When tripping has occurred, the tripping state is cancelled by inputting this signal. Before inputting this signal, be sure to turn off the SON terminal before resetting and remove the error causal factor before inputting the signal. Also, when the FA-9=OFF setting is used, turning on the SON terminal with this signal turned on will cause the pole position estimation function to work.	
	TL	Torque limiting	When this signal is ON, the torque restriction is effective.	
	FOT	Normal rotation drive inhibited	When this signal is OFF, operation in the normal rotation direction is not available. (Normal rotation direction limit signal)	
	ROT	Reverse rotation drive inhibited	When this signal is OFF, operation in the reverse rotation direction is not available. (Reverse rotation direction limit signal)	
	ORL	Origin sensor	Input the signal of the origin limit switch to indicate the origin range. This function is used when returning to the origin in the position control.	
	ORG	Return to the origin input	Inputting this signal causes the origin return operation to start. This function is used for returning to the origin in position control.	
	PEN	Pulse string input permission	While this signal ON, the pulse string position command input is effective.	
	CER	Deviation counter clear	The position deviation counter is cleared. (the current position is used as the position command value.)	
	Analog common	L	Analog common	Ground for the analog signal
	Contact point output signal	SRD	Servo ready	This output is used in the servo ON possible state (The main power supply is secured and not in the tripping state.)
SRDE				
ALM		Alarm	An alarm signal is output when tripping occurs. (ON when in the normal state, OFF when tripping)	
ALME				
Relay output	INP	Positioning completed	This signal is output when deviation between the command position and current position is within the specified positioning width.	
	INPE			
Monitor output	BK	Canceling braking Relay output	When in the servo ON state, a signal to permit braking cancellation is output. (applicable to the rotary type only)	
	AO1	Monitor output 1	The speed detected value, torque command value, etc. are output in the voltage form as the analog signal for monitoring. The signal to be output can be set using parameters. As this signal is intended for monitoring, do not use it for the control purpose.	
	AO2	Monitor output 2		
Position command	L	Monitor output common	This is the ground for the monitoring signal.	
	PLSP	Position command pulse (Pulse signal)	Using the pulse string position command input, the signal format can be selected from the following formats. 1) Command pulse + direction signal	
	PLSN			
	SIGP	Position command pulse (code signal)	2) Normal rotation direction pulse string+reverse rotation direction pulse string 3) Phase difference 2-phase pulse	
Position sensor monitor	SIGN			
	OAP	Position sensor A phase signal output	The A phase signal of the position sensor is divided and output as the monitor signal.	
	OAN			
	OAP	Position sensor B phase signal output	The B phase signal of the position sensor is divided and output as the monitor signal.	
	OBN			
	OZP	Position sensor Z phase signal output	The monitor signal of the Z phase signal of the position sensor is output.	
Braking power input	OZN	Z phase signal output		
	OZ	Z phase detection	The monitor signal of the Z phase signal of the position sensor is output.	
	L	Z phase detection common		
Braking power input	B24	Braking power input	Braking power DC24V is inputted.	
	B0	Braking power common	This is used for the common terminal input of the braking power.	

RDP / RDX input / output signal connection diagram



SOFTWARE

RDP/RDX

TOP Windows Software for setup

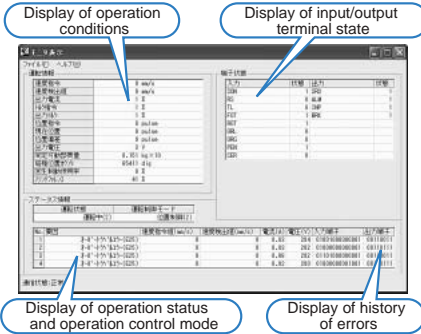
Tool for Optimizing Parameters

This software is intended exclusively for RDP/RDX. Using the Windows operating computer, it is possible to set parameters, to monitor the position, speed and torque and to have graphics displayed, assuring pleasant and easy operation in the Windows 95/98/ME, Windows NT, Windows 2000 or Windows XP environment.

Features

1 Monitoring function

It is possible to monitor the operation condition and output state in real time.



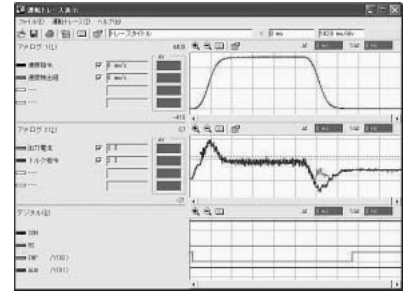
2 Setting parameters

It is possible to set, change, print and store the parameters.



3 Operation tracing function

It is possible to have the servo motor speed and electric current displayed in the form of graphics.



TOP ordering method

TOP - SSC
TOP - Cable

TOP environment

Model	KBH-M4 966-00
PC	DOS/V PC
OS	Windows 95/98/Me Windows NT Windows 2000 Windows XP
Communication method	RS-232C

Note : Windows 95/98/Me, Windows NT, Windows 2000 and Windows XP are trademarks of Microsoft Corporation registered in U.S.A. and other countries.

Communication cable for PC supporting software TOP

Communication cable to connect PC and a controller.



Model KBH-M538 F-00

OPTION

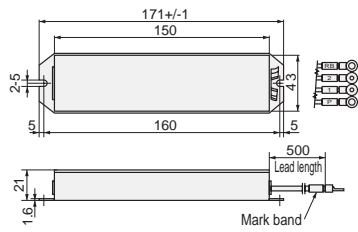
RDP/RDX

Braking resistor RBR1 / RBR2

Braking resistor RBR1

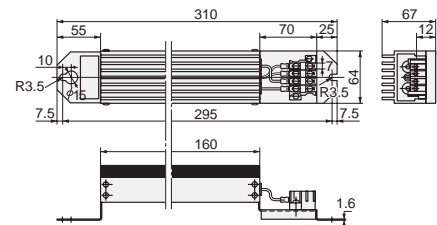


Braking resistor RBR1 dimensions



Braking resistor RBR2

Braking resistor RBR2 dimensions



Braking resistor RBR1 / RBR2

Required when operating the model specified by YAMAHA with a large inertia load.

Braking resistor RBR1 / RBR2 Basic specification

Item	RBR1	RBR2
Model	KBH-M58 50-00	KBH-M58 50-10
Capacity type	120W	200W
Resistance value	100Ω	100Ω
Permissible braking frequency	2.5%	7.5%
Permissible continuous braking time	12 sec.	30 sec.
Weight	0.27Kg	0.97Kg

Note : The internal thermal contact point capacity is AC250V, 2A max. ON (b contact point) in the normal state.

Note : The built-in thermal fuse prevents abnormal heat generation which occurs by an erroneous use. (not resettable)

Note : When the thermal relay has worked, reduce the regeneration energy by either stopping the servo amplifier or making the deceleration time longer.

Note : With the braking resistor, specifications and whether or not required may vary depending on each robot and its operation conditions.