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# Network Controller ROBO NET



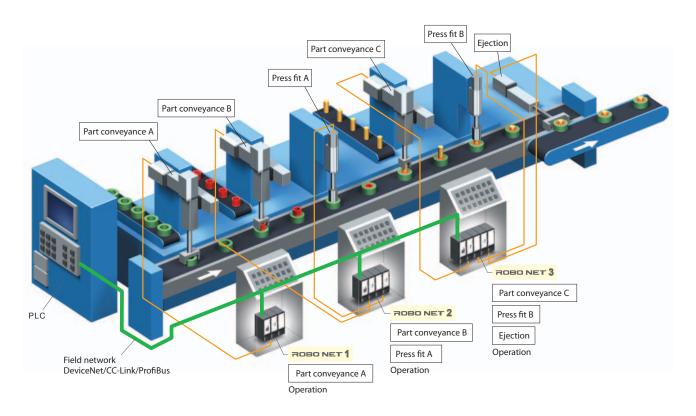
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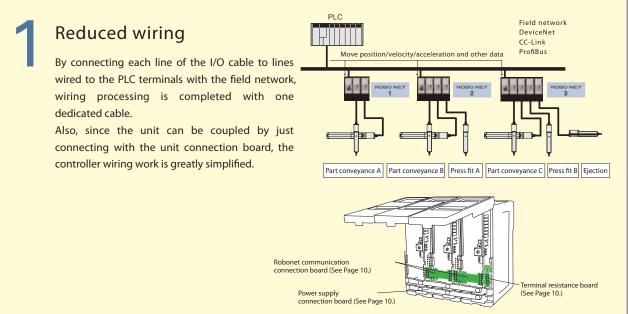
# Greatly reduces time and effort of wiring and installation

RoboNet is a new type of controller unit that can freely operate robot cylinders via a field network. This makes it possible to greatly

reduce the time and effort of wiring installation compared to conventional

controllers by reducing wiring, making the controller smaller, and using DIN rail installation.





(Coupling section within RoboNet unit)

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# Newly Developed Network Controller **ROBO NET**Arrives!

# The robot can be moved by directly specifying numeric values for the move position/velocity/ acceleration and other data.

Besides the conventional method of moving the robot to pre-taught positions it is also possible to operate the robot by sending information as a string of numeric data that contains position, velocity, acceleration, etc. values. This is effective for cases such as when the move position changes with each piece or when one wants to move the robot to an arbitrary position.

	ROBONET controller	Standard controller (ACON/PCON)
Position specification movement	0	0
Direct numeric value specification movement	0	Λ
Velocity/acceleration specification	0	(Not possible with PIO)
Current value output	0	(Possible with serial communications)

\* RoboNet operates via the field network; the standard controller operates with PIO.



#### Ultra-compact

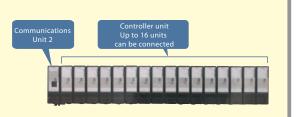
Each unit is an ultra-compact size of 34mm wide by 100mm high x 73 mm deep. Also, since there is no base unit and the main unit is coupled with connectors, the controller takes up little space for installation even if there are many units.



## Can operate up to 16 axes

Up to 16 controller units can be connected to one communications unit (GatewayR unit). One can also freely mix and connect RACON units (RCA

One can also freely mix and connect RACON units (RCA controllers) and RPCON units (RCP2 controllers).



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# Simple absolute specifications that do not require a return to home position

The simple absolute R unit makes it possible to operate incremental specification axes without returning to the home position. By mounting a simple absolute R unit on a RACON unit (RCA controller)/RPCON unit (RCP2 controller), the actuator encoder data is backed up even if the power is cut off.

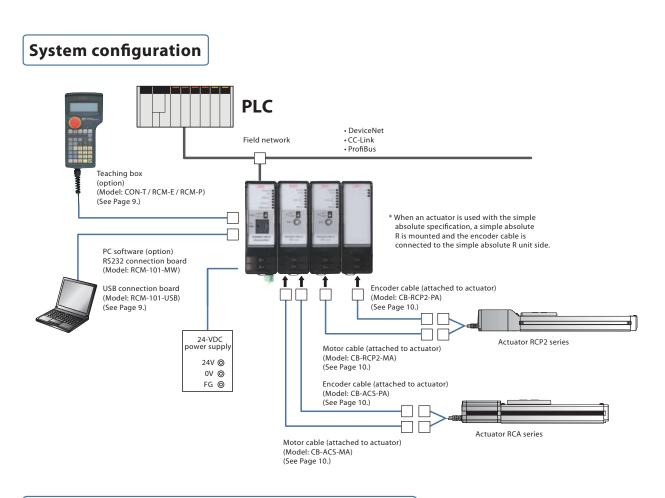


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# DIN rail installation

The controller is installed with DIN rails, so it can be fastened and removed with one touch.

System configuration/component units



# Component unit/ordering method explanation

For RoboNet, you order the required units individually and use them together freely. Even if you want to add actuators later, you can do so simply by ordering additional RACON/RPCON units.



Unit name	Contents	See Page _
Gateway R unit		
RACON unit	This is the controller unit for operating an RCA actuator. (Each actuator axis requires one unit.) The standard specifications are the incremental specifications, but this unit can be used with the simple absolute specifications by just combining with a simple absolute R unit.	P7
RPCON unit	This is the controller unit for operating an RCP2 actuator. (Each actuator axis requires one unit.) The standard specifications are the incremental specifications, but this unit can be used with the simple absolute specifications by just combining with a simple absolute R unit.	P7
Simple absolute R unit	This is the backup battery unit for holding the actuator encoder data when the power is switched Off.	P8
Extension unit	This is an extension unit for placing many ROBONET units in two lines. Also for operating single controllers such as SCON or PCON-CF on network.	P8

Order method RoboNet is used by ordering the necessary units one by one and using them together.
 This means you can add or change units afterwards.

(Order example) Operating the two actuator axes below via ProfiBus. The models for operating with absolute specifications are as follows.



**Operating mode explanation** 

# Operating mode explanation

RoboNet operates under instructions received from the PLC via the field network. It can be used switching among the following three operating modes.

Use the operating mode that best suits the device operation details and control method.

	Name	Contents
1	Positioner mode	This mode operates by specifying the position number. The position data, velocity, acceleration, etc. are input for each position ahead of time. Up to 768 positions can be registered.
2 Simple direct value mode This mode operates by directly specifying only the position data and specifying of - velocity, acceleration, position width, electrical current limit for pressing – with the posit Up to 768 positions can be registered.		
3	Direct numeric value specification	This mode operates by directly specifying the numeric values for the position data, velocity, acceleration, position width, and electrical current limit for pressing. There is no limit on the number of position points that can be specified numerically.

# List of Functions by Operating Mode

	Positioner mode	Simple direct value mode	Direct numeric value specification
Number of positions registered	768 points	768 points	_
Movement by specifying position number	0	0	_
Direct specification of position data	_	0	0
Direct specification of velocity and acceleration	— (Specified with position table)	— (Specified with position table)	0
Direct specification of positioning width	— (Specified with position table)	— (Specified with position table)	0
Pressing operation	(Specified with position table)	(Specified with position table)	0
Completion position number monitor	0	0	_
Zone output monitor	0	O	0
Position zone output monitor	$\bigcirc$	O	_
Teaching functions	0	—	_
Jog operations	0	0	0
Incremental moves	0	0	0
Status signal monitor (*)	$\bigcirc$	$\bigcirc$	$\bigcirc$
Current position monitor (*)	$\bigcirc$	0	$\bigcirc$
Alarm code monitor (*)	0	0	0
Velocity and electric current monitor (*)	-	—	0
Maximum value for specification of position data	9999.99mm	9999.99mm	9999.99mm
Number of axes that can be connected	16	16	8

\* The status signal monitor, current position monitor, alarm code monitor, and velocity and electric current monitor can monitor by accessing each address of the GatewayR unit from the PLC.

#### **Component unit explanation**

# GatewayR unit (DeviceNet specifications)

Model RGW-DV Specifications

This is the communications unit for operating RoboNet via DeviceNet.

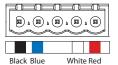
	Item Specifications		Item		Specifications				
Pow	wer supply DC24V ±10%				Communications speed	Maximum network length	Maximum branch line length	Total branch line length	
Curr	ent consumption	600 mA max.		tions	Communications	500kbps	100m		39m
		Uses DeviceNet 2.0 certified interface module		specifications	Cable length (*1)	250kbps	250m	6m	78m
ations	Communications standard	Group 2 only server	Group 2 only server		( 1)	125kbps	500m		156m
Device Net specifications		Insulated node operating with network power supply		DeviceNet		Note: When t	hick DeviceNet cable is used		
Net sp			Bit strobe		Number of nodes occupied	1 node			
Jevice	Communications specifications	Connection Polling 2		ntal ns	Usage ambient temperature	0~40°C			
				Cyclic E	Usage ambient humidity Usage	95% RH max.	(no condensation	allowed)	
	Communications speed	500k/250k/125kbps (switched with dedicated software)		Envii Co	Usage atmosphere	There must be no corrosive gas, combustible gas, oil mis			oil mist, or dust.
	1 For T branch communications, refer to the user's manuals for the master unit		Protection rank		IP20				
an	and for the PLC used.		We	ight	140g				
			Acc	accoriac	Terminal resis	tance board (Mod	lel TN-1)		

Accessories

#### **Network connector**

Gateway side connector MSTBA2.5/5-G-5.08 ABGY AU (Made by Phoenix Contact)

Cable side connector MSTB2.5/5-ST-5.08 ABGY AU (Made by Phoenix Contact) = Standard accessory



Pin colors	Explanation				
Black	Power cable - side				
Blue	Communications data	Low side			
-	Shield				
White	Communications data	High side			
Red	Power cable + side				

#### Compatible wire for cable side connector

Network connector/emergency stop connector

ltem	Contents
Compatible wire diameter	Braided wire AWG24-12 (0.2~2.5 mm²)
Peeled wire length	7mm

# **GatewayR unit CC-Link specifications**



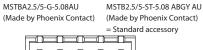
This is the communications unit for operating RoboNet via CC-Link. Model **RGW-CC** 

#### Specifications

	ltem	Specifications		ltem	Specifications					
Powe	er supply	DC24V ±10%	su	Error control technique	CRC (X <sup>16</sup> +X <sup>12</sup> +X <sup>5</sup> +1)					
Curre	ent consumption	600 mA max.	Sections occupied		Remote device stat	ions 1x 4	stations,	4x 2 statio	ons, 8x 2 s	stations
	Communications standard	CC-Link Ver2.0 (* 1)	specif	Communications	Communications	10M	5M	2.5 M	625k	156k
ns	Communications speed	10M/5M/2.5M/625k/156kbps (switched with dedicated software)	CC-Link	cable length (*2)	Total cable length (m)	100	160	400	900	1200
ficatio	Communications technique	Broadcast polling technique	0	Communication cable	Special CC-Link cable					
specit	Synchronization technique	Frame synchronization technique	ntal ns	Usage ambient temperature	0~40°C					
CC-Link specifications	Encoding technique	NRZI	Environmental conditions	Usage ambient humidity	95% RH max. (no condensation allowed)					
0	Transmission path format	Bus format (complies with EIA RS485)	Envii Co	Usage atmosphere	re There must be no corrosive gas, combu		ustible gas, oil mist, or dust.			
	Transmission format Complies with HDLC		Pro	Protection rank IP20						
°1 Ce	1 Certification acquired		Weight		140g					
	2 For T branch communications, refer to the user's manuals for the master unit and for the PLC used.		Accessories		Terminal resistan Network connect Terminal resistan	or/emerg	, jency stoj	, connecto	or	

**Network connector** 

Gateway side connector MSTBA2.5/5-G-5.08AU



Cable side connector



Signal name	Explanation				
DA	Communications line A				
DB	Communications line B				
DG	Ground				
SLD	Connect the shield and cable shield to the frame ground and chassis.				
FG	Connect the frame ground to the shield and the chassis				

#### Compatible wire for cable side connector

ltem	Contents
Compatible	Braided wire
wire diameter	AWG24-12 (0.2~2.5 mm <sup>2</sup> )
Peeled wire length	7mm

# GatewayR unit (ProfiBus specifications)



This is the communications unit for operating RoboNet via ProfiBus.

Model **RGW-PR** Specifications

Item		Specifications			Item	Specifications	
Power supply DC24		DC24V ±10%		ntal 1s	Usage ambient temperature	0~40°C	
Curre	ent consumption	600 mA max.		Environmental conditions	Usage ambient humidity	95% RH max. (no condensation allowed)	
	Communications standard DP satellite			Envir	Usage atmosphere	There must be no corrosive gas, combustible gas, oil mist, or dust	
ions	Communications speed	s 9.6kbps~12Mbps				IP20	
specifications		9.6kbps	1500m	We	eight	140g	
ads sn	Communications cable length	500kbps	400m	Ac	cessories	Terminal resistance board (Model TN-1) Emergency stop connector	
ProfiBus		1.5Mbps	200m				
		3Mbps	200m				
		12Mbps	100m				

#### Network connector

Gateway side connector: 5 D-Sub 9-pin connector Socket side



1

Pin No.	Signal name	Explanation	Pin No.	Signal name	Explanation
	B-Line	Communications line B (RS485)	6	+5V	+5V output (insulated)
4	RTS	Request to send	8	A-Line	Communications line A (RS485)
5	GND	Signal ground (insulated)	Housing	Shield	The cable shield is connected with the chassis.

\* Pins 1, 2, 7, and 9 are not connected.

\* The partner side connector (D-sub 9-pin connector) does not come as an accessory.

# GatewayR unit SIO specifications

This is the communications unit for operating RoboNet with serial communications from an XSEL controller (\*1) or Modbus communications unit.

\*1 A unit with XSEL Gateway functions is scheduled for release soon.

# Model **RGW-SIO**

Specifica	Specifications							
ſ	Item		Specifications		ltem	Specifications		
[	ions	Power supply	DC24V ±10%	nental tions	Usage ambient temperature	0~40°C		
		Current consumption			Usage ambient humidity Usage atmosphere	95% RH max. (no condensation allowed)		
		Communications format	RS485 compliant (Modbus protocol) 1:1 communication connection	Wiron	Usage atmosphere	There must be no corrosive gas, combustible gas, oil mist, or dust.		
	pecific	g technique	Stop-start system Half duplex	5	Protection rank	IP20		
	2		230.4 kbps max.	We	eight	140g		
		Cable length	5 100 III IIIdx.		cessories	Terminal resistance board (Model TN-1) Network connector/emergency stop connector		
		Recommended cable				network connector/energency stop connector		

#### **Network connector**

= Standard accessory

Gateway side connector MC1.5/4-G-3.5 (Made by Phoenix Contact)	J, ₪			F @
Cable side connector: MC1.5/4-ST-3.5	FG	SG	SB	SA
(Made by Phoenix Contact)				

 
 Signal name
 Explanation

 SA
 Communications line A (+ side)
 RS485 compliant Terminal resistance board (220 Ω) built in

 SB
 Communications line B (- side)
 board (220 Ω) built in

 SG
 Signal ground
 FG

# Compatible wire for cable side connector

Item	Contents
Compatible	Braided wire
wire diameter	AWG28-16 (0.14 ~ 1.5 mm <sup>2</sup> )
Peeled wire length	7mm

 $\cap$ 

# Component unit explanation

# **RACON unit RCA series controller**



This is the controller unit for operating an RCA actuator with RoboNet.

## Model RACON-①-②

Explanation model items: ① Motor output (W) ② Optional integrated absolute unit (ABU)

Controller model	Supported actuators				
RACON-20-@	RCA-SA4□ / SS4□ / SA5□ / SS5□ / RA4□-20 / RG□4□-20 / A4R / A5R RCACR-SA4C / SA5□ RCAW-RA4□-20				
RACON-20S-@	RCA-RA3 / RG 3 RCAW-RA3				
RACON-30-@	RCA-SA6□ / SS6□ / RA4□-30 / RG□4□-30 / A6R RCACR-SA6□ RCAW-RA4□-30				

#### Specifications

	ltem	Specifications		ltem	Specifications	
	Power supply	DC24V ±10%	onmental	Usage ambient temperature	0~50°C	
	Power supply capacity	5.1 A max. (depends on actuator)		ment	Usage ambient humidity	95% RH max. (no condensation allowed)
tions	Operating actuator	RCA series		Usage atmosphere	There must be no corrosive gas, combustible gas, oil mist, or dust.	
specification	Number of positioning points	768 points		Protection rank	IP20	
	Backup memory	EEPROM		ight	200g	
General	Position detection technique				RoboNet communication connection board (JB-1 model)	
g	Electromagnetic brake forced release	Brake release switch	Acc	essories	Power supply connection board (PP-1 mode	
	Motor cable	Model CB-ACS-MA				
	Encoder cable	Model CB-ACS-PA				

# **RPCON unit RCP2 series controller**



This is the controller unit for operating an RCP2 actuator (\*1) with RoboNet. Model **RPCON-**①-②

# Model **KPCON-**U-@

Explanation model items:	① Motor output (W) ② Optional integrated absolute unit (ABU)				
Controller model	Supported actuators				
RPCON-20P	RCP2-RA2C (*2) / GRS (*2)				
RPCON-28P-2	RCP2-GRM / GR3LS / GR3SS / RTB (*2) / RTC (*2)				
RPCON-28SP-@	RCP2-RA3C / RGD3C				
RPCON-42P-2	RCP2-SA5□ / SA6□ / SS7□ / BA6□ / BA7□ / RA4C / RG□4C / GR3LM / GR3SM RCP2CR-SA5C / SA6C / SS7C RCP2W-RA4C				
RPCON-56P	RCP2-SA7□ / SS8□ / RA6C / RG6□C RCP2CR-SA7C / SS8C RCP2W-RA6C				
	RUPZUR-SA/U / SS80 RUPZW-RABU				

\*1 This controller can also operate an old-type RCP2 actuator. (Please inquire for details.)

\*2 Controller models with integrated absolute unit (item ②) are not available for RCP2-RA2C / GRS / RTB / RTC.

#### Specifications

iiCa	uo	115				
	Item		Specifications		Item	Specifications
		Power supply	DC24V ±10%	al	Usage ambient temperature	0~50°C
		Power supply capacity	2 A max.	invironme	Usage ambient humidity	95% RH max. (no condensation allowed)
	tions	Operating actuator	RCP2 series		Usage atmosphere	There must be no corrosive gas, combustible gas, oil mist, or dust.
	cificat	Number of positioning points	768 points		Protection rank	IP20
	spe	Backup memory	EEPROM	We	ight	200g
	eneral	Position detection technique	Incremental encoder			RoboNet communication connection board (JB-1 model)
	Gei	Electromagnetic brake forced release	Brake release switch	Acc	essories	Power supply connection board (PP-1 model)
		Motor cable	Motor cable Model CB-RCP2-MA			
		Encoder cable	Model CB-RCP2-PA□□□			

# Simple absolute R unit



This is a data backup battery unit that is connected to a RACON/RCPON unit (\*1) to allow incremental specifications actuators to be used as absolute specifications actuators. \*1 One simple absolute R unit is required for each RACON/RPCON unit.

### Model RABU (Common to RACON/RPCON)

Specifications

	ltem	Specifications				ltem		Specifications
	Power supply	DC24V ±10%				ntal	Usage ambient temperature	0~40°C
su	Current consumption	300 mA max.					Usage ambient humidity	95% RH max. (no condensation allowed)
catior	Battery used	Nickel metal hydride battery (Ni-MH)					humidity Usage atmosphere	There must be no corrosive gas, combustible gas, oil mist, or dust.
ecific	Charge time	About 78 hours					Protection rank	IP20
ral sp.	Battery life	3 years					ight	330g
Gener	Can store absolute data Maximum rotation rate (rpm)	800	400	200	100	Aco	essories	RoboNet communication connection board (JB-1 model) Simple absolute specifications connection
	Absolute data storage time (h)							board (JB-1 model) Power supply connection board (PP-1 model

# **Extension unit**



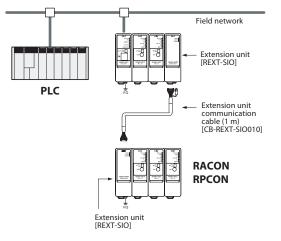
This is an extension unit for connecting many RoboNet units in two lines by a communication cable when there is space limit. Also it enables to operate single controller such as SCON or PCON-CF on network by connecting a link cable between the last extension unit and a wire from controller.

#### Model **REXT** (Common to RACON/RPCON)

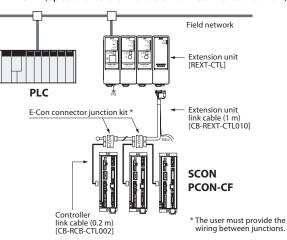
Specifications

ltem		Specifications
Pow	er supply	DC24V ±10%
Curr	ent sumption	100 mA max.
tal	Usage ambient temperature	0~40°C
Environmental conditions	Usage ambient humidity	95% RH max. (no condensation allowed)
nditi	Usage atmosphere	There must be no corrosive gas, combustible gas, oil mist, or dust.
<u></u> 9	Protection rank	IP20
Wei	ght	140g
Accessories		RoboNet communication connection board (JB-1 model) Power supply connection board (PP-1 model)

#### REXT-SIO (Standard extension for more RoboNet units)



#### **REXT-CTL** (Special extension for SCON or PCON-CF controllers)

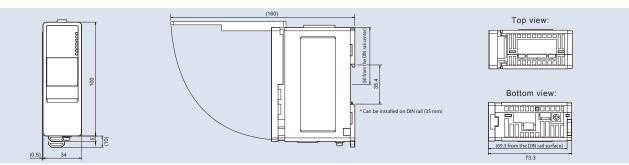


В

**External dimensions / Options** 

# **External dimensions diagram**

GatewayR unit/RACON unit/RPCON unit/simple absolute R unit all share the same external dimensions.

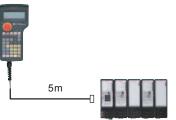




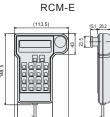
#### **Teaching box**

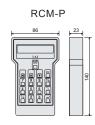
- Features This is a teaching device equipped with position input, test run, monitor, and other functions.
- Model CON-T-ENG (standard type, with CE/ANSI mark) RCM-E (simple teaching box, no CE mark) RCM-P (data setting unit, no CE mark)

Configuration



CON-T-E	ENG	
		19: 19 19: 19 7

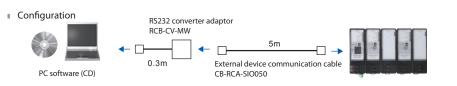




Specifications		* no CE mark			
ltem	CON-T-ENG	RCM-E (*)	RCM-P (*)		
Data input	0	0	0		
Actuator operation	0	0	-		
Usage ambient temperature and humidity	Temperature 0 to 40°C Relative humidity 85% max.				
Usage atmosphere	No corrosive gas allowed. Dust must not be particularly bad.				
Protection rank	IP54	-	-		
Weight	About 400g	About 400g	About 360g		
Cable length		5m			
Display	20-character by 4-line LCD display	16-character by 2-line LCD display	16-character by 2-line LCD display		

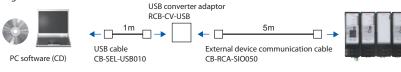
### PC software (for Windows only)

- Features This is startup support software equipped with program/position input, test run, monitor, and other functions. It increases functions required for debugging operations and contributes to shortening the start-up time.
- Model RCM-101-MW-EU (with external device communications cable + RS232 converter unit)





- Model RCM-101-USB-EU (with external device communications cable + USB cable)
- Configuration

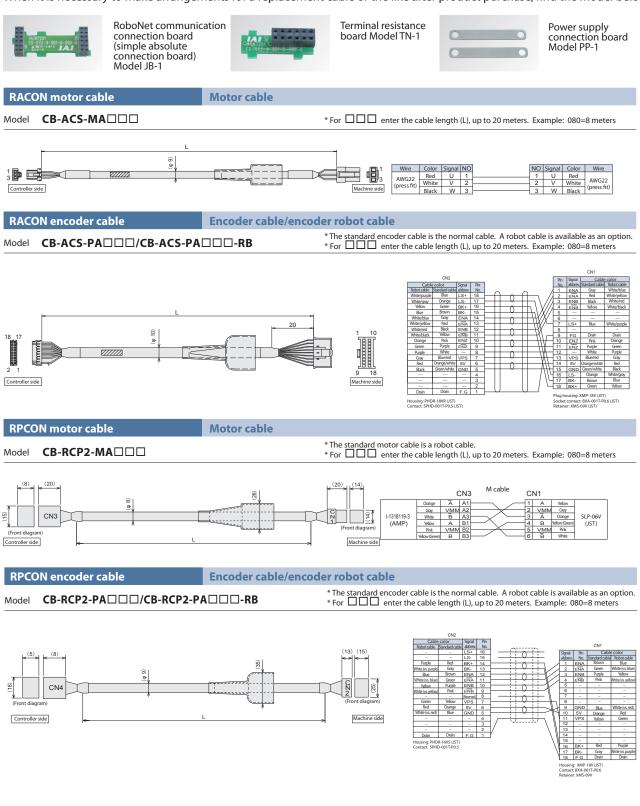




**Maintenance parts** 

# **Maintenance parts**

When it is necessary to make arrangements for a replacement cable or the like after product purchase, find the model below.



Please ask IAI for special cables of new RoboCylinder series RCP3 (CB-PCS-MPADD) and RCA2 (CB-ACS-MPADD) or of extension unit REXT-SIO (CB-REXT-SIO010) and REXT-CTL (CB-REXT-CTL-010).

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RoboNet Series Catalogue No. 1107-E

The information contained in this catalog is subject to change without notice for the pupose of product inprovement





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