



Articulated robots <b>YA</b>
Linear conveyor modules <b>LCM100</b>
Motor-less single axis actuator <b>Robonity</b>
Compact single-axis robots <b>TRANSERVO</b>
Single-axis robots <b>FLIP-X</b>
Linear motor single-axis robots <b>PHASER</b>
Cartesian robots <b>XY-X</b>
SCARA robots <b>YK-X</b>
Pick & place robots <b>YP-X</b>
<b>CLEAN</b>
<b>CONTROLLER</b>
<b>INFORMATION</b>
<b>CABLE</b>
<b>TECHNICAL INFORMATION</b>
<b>DISCONTINUED</b>

# ALL TYPES OF INFORMATION

# INFORMATION

## CONTENTS

CABLE	INFORMATION	DISCONTINUED
Robot cable table .....614	Cautions regarding CE specifications ... 648	Discontinued sales models and repair coverage limits ..... 654
Single-axis robot cable .....614	CE marking ..... 648	MR12/MR12D ..... 654
Multi-robot cable.....618	Cautions regarding compliance with EC Directives ..... 648	YK400XR .....657
Cartesian robot cable .....620	Applicable directives and their related standards ..... 648	RCX240/RCX240S ..... 658
SCARA robot cable .....621	Installation of external safety circuits ..... 648	iVY System ..... 668
Gripper cable .....621	Compliance with EMC Directives..... 648	
Cable terminal table ..... 622	Cautions regarding official language of EU countries ..... 648	
PHASER relay cable ..... 622	Cautions on KCs (Korean Certificate Safety) specifications ..... 649	
Connector converter cable.....623	About KCs..... 649	
Programming box converter cable ....623	About measures for KCs ..... 649	
I/O control converter cable .....623	List of robots subject to KCs..... 649	
Robonity Acceleration/Deceleration and Inertia Moment..... 624	Cautions on Korean EMC specifications .....651	
TRANSERVO RF type model selection.....641	About Korean KC .....651	
Selecting a model .....641	About Korean KC compliance .....651	
List of moment of inertia calculation formulas (Calculation of moment of inertia I) ..... 642	List of KC compliant robots.....651	
Kinds of loads ..... 642	About non-compliant models .....651	
R-axis tolerable moment of inertia and acceleration coefficient..... 643	Warranty..... 652	
How to find the inertia moment ..... 643	This warranty does not cover any failure caused by: .....652	
Example of moment of inertia calculation ..... 644	The following cases are not covered under the warranty: .....652	
External safety circuit examples ..... 645	Repeatability positioning accuracy .... 653	
Circuit configuration examples (TS-X/TS-P) ..... 645	Factors involving absolute accuracy 653	
Circuit configuration examples (SR1).....646	Operating pattern factors ..... 653	
Circuit configuration examples (RCX240) .....647	Temperature factors ..... 653	
	Fluctuating load factors ..... 653	

# Robot cable table

The robot cable is a cable joining the robot to the controller.

## Single-axis robot cable

### TS-S/TS-S2/TS-SD cable

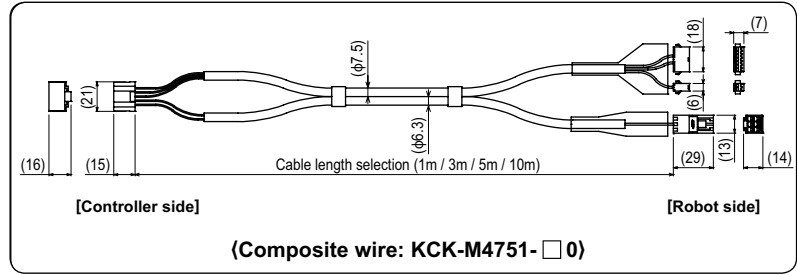
#### [Flexible cable]

Connected robot ▷ **TRANSERVO**

Set	Single item	
-	Composite wire	KCK-M4751- □ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
1	1m
3	3m
5	5m
A	10m



### TS-S2S cable

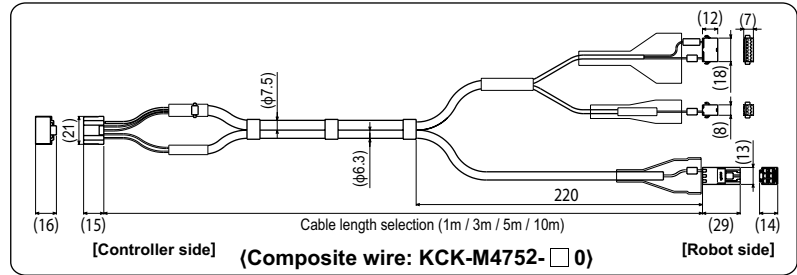
#### [Flexible cable]

Connected robot ▷ **TRANSERVO**  
(RF Type Sensor specification)

Set	Single item	
-	Composite wire	KCK-M4752- □ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
1	1m
3	3m
5	5m
A	10m



### TS-X cable

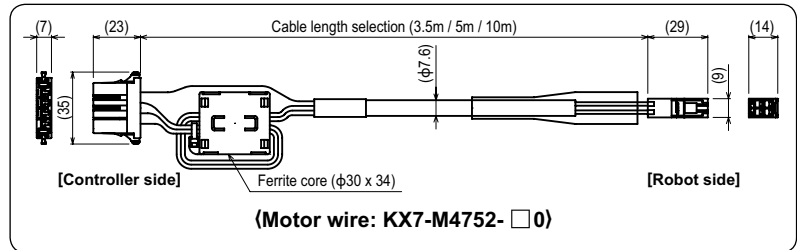
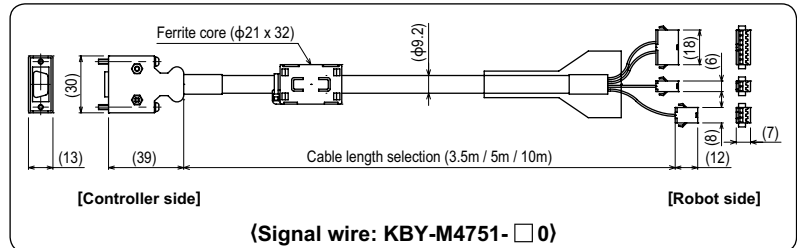
#### [Standard cable]

Connected robot ▷ **FLIP-X**

Set	Single item	
KBY-M4710- □ 0	Signal wire	KBY-M4751- □ 0
	Motor wire	KX7-M4752- □ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



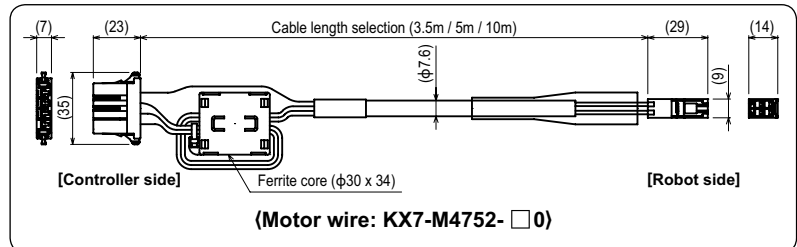
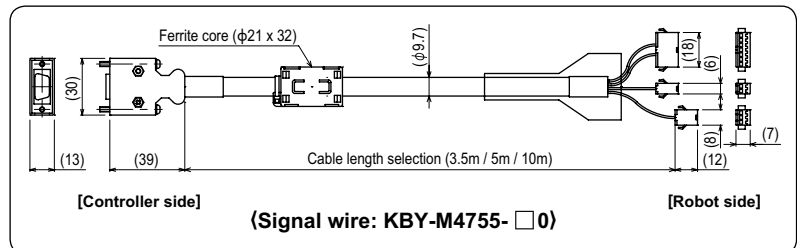
#### [Flexible cable]

Connected robot ▷ **FLIP-X**

Set	Single item	
KBY-M4720- □ 0	Signal wire	KBY-M4755- □ 0
	Motor wire	KX7-M4752- □ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



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CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

**TS-P cable**

**[Standard cable]**

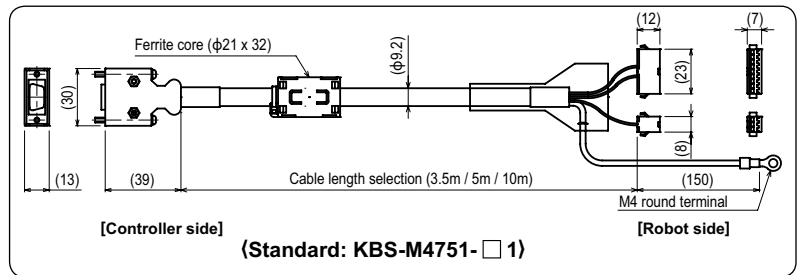
Connected robot ▷ PHASER

Set	Single item
KBS-M4710-□ 0	Signal wire KBS-M4751-□ 1
	Motor wire KAU-M4752-□ 1

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m

**[Signal wire]**



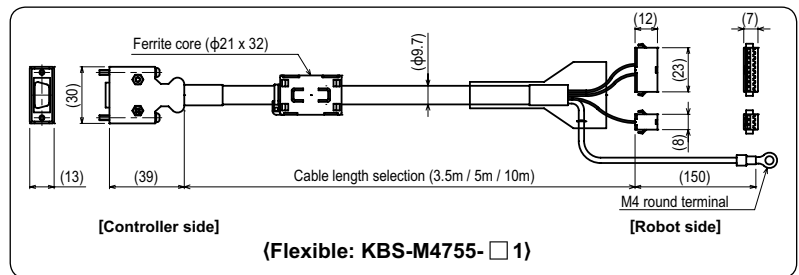
**[Flexible cable]**

Connected robot ▷ PHASER

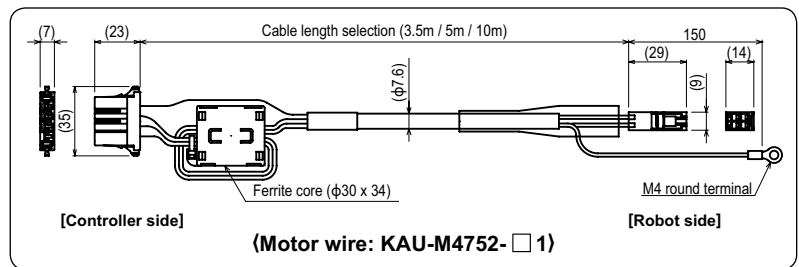
Set	Single item
KBS-M4720-□ 0	Signal wire KBS-M4755-□ 1
	Motor wire KAU-M4752-□ 1

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



**[Motor wire]**



**RDV-X cable (No-brake specifications)**

**[Standard cable]**

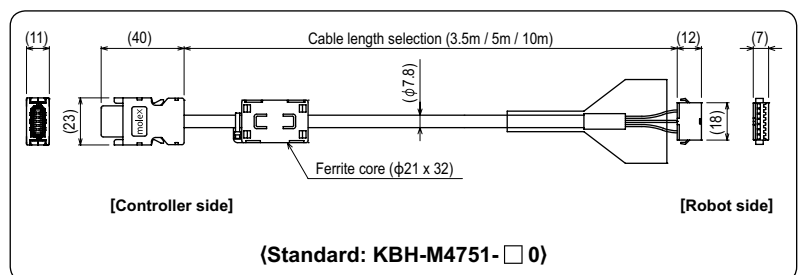
Connected robot ▷ FLIP-X

Set	Single item
KEF-M4710-□ 0	Signal wire KBH-M4751-□ 0
	Motor wire KEF-M4752-□ 0
	I/O connector KBH-M4420-00

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m

**[Signal wire]**



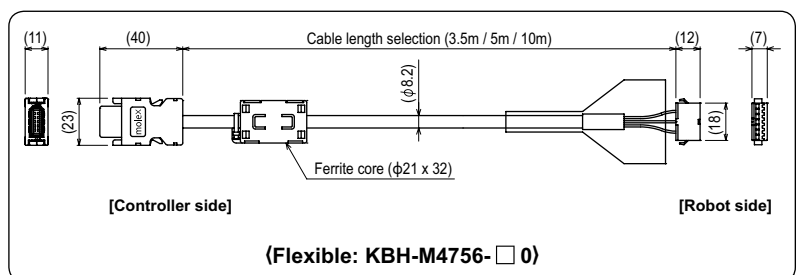
**[Flexible cable]**

Connected robot ▷ FLIP-X

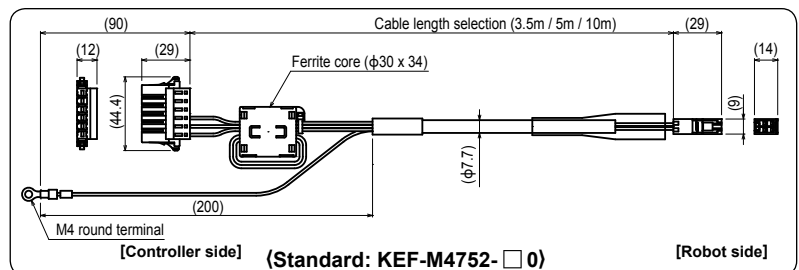
Set	Single item
KEF-M4730-□ 0	Signal wire KBH-M4756-□ 0
	Motor wire KEF-M4752-□ 0
	I/O connector KBH-M4420-00

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



**[Motor wire]**



# Robot cable table

## RDV-X cable (models with brake and sensor)

### [Standard cable]

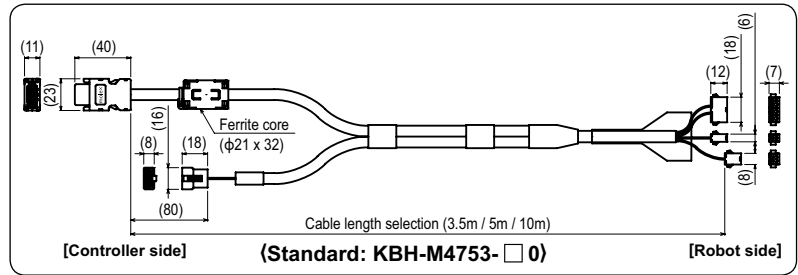
Connected robot ▷ **FLIP-X**

Set	Single item
KEF-M4720-□ 0	Signal wire KBH-M4753-□ 0
	Motor wire KEF-M4752-□ 0
	ORG, BK wires KBH-M4421-00

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m

### [Signal wire]



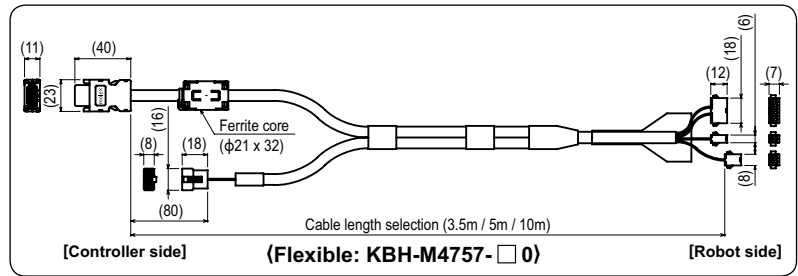
### [Flexible cable]

Connected robot ▷ **FLIP-X**

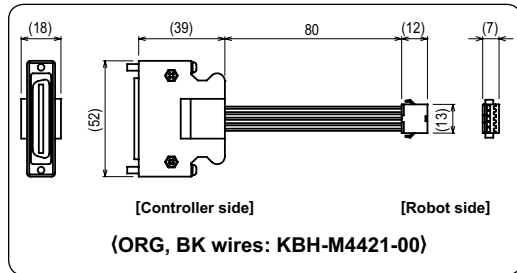
Set	Single item
KEF-M4740-□ 0	Signal wire KBH-M4757-□ 0
	Motor wire KEF-M4752-□ 0
	ORG, BK wires KBH-M4421-00

Note. Notation within slot in model types is as shown at right.

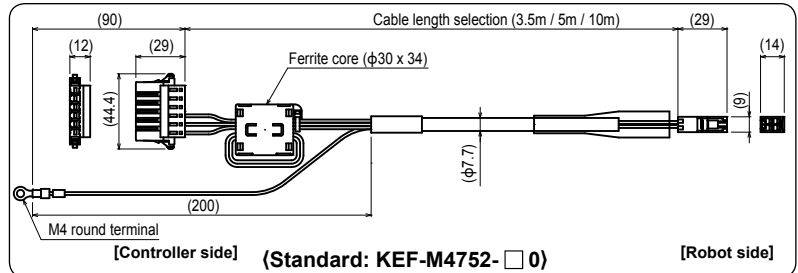
Within □	Cable length
3	3.5m
5	5m
A	10m



### [ORG, BK wires]



### [Motor wire]



## RDV-P cable

### [Standard cable]

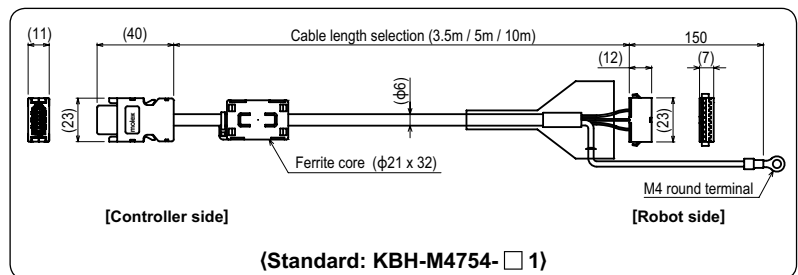
Connected robot ▷ **PHASER**

Set	Single item
KEF-M4711-□ 0	Signal wire KBH-M4754-□ 1
	Motor wire KEF-M4755-□ 0
	I/O connector KBH-M4420-00

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m

### [Signal wire]



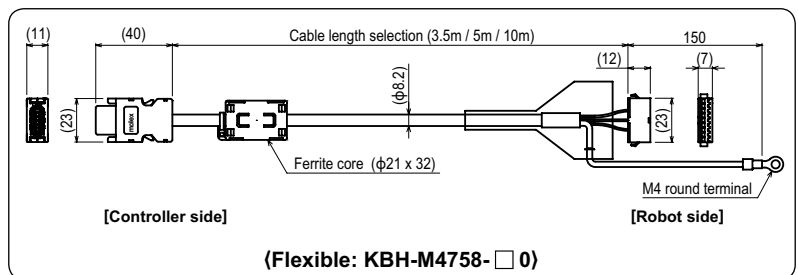
### [Flexible cable]

Connected robot ▷ **PHASER**

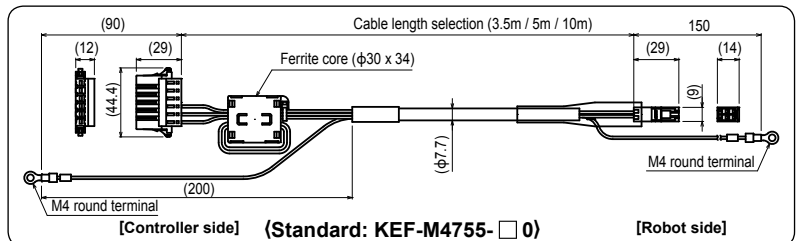
Set	Single item
KEF-M4712-□ 0	Signal wire KBH-M4758-□ 0
	Motor wire KEF-M4755-□ 0
	I/O connector KBH-M4420-00

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



### [Motor wire]



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CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

**SR1-X cable**

**[Standard cable]**

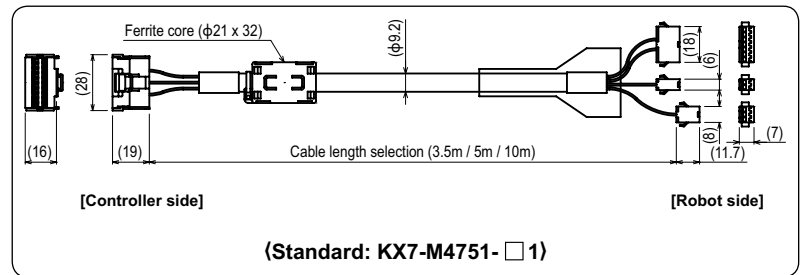
Connected robot ▷ **FLIP-X**

Set	Single item	
KX7-M4710-□ 0	Signal wire	KX7-M4751-□ 1
	Motor wire	KX7-M4752-□ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m

**[Signal wire]**



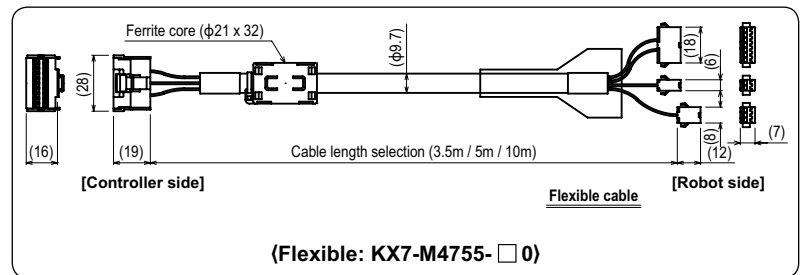
**[Flexible cable]**

Connected robot ▷ **FLIP-X**

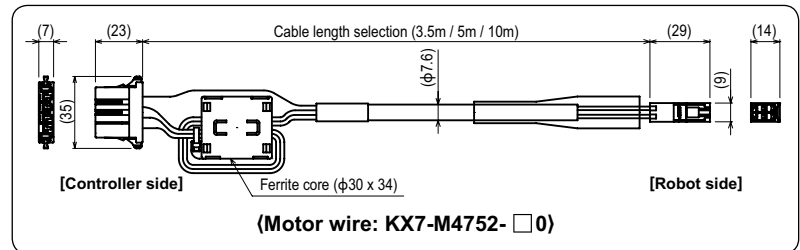
Set	Single item	
KX7-M4720-□ 0	Signal wire	KX7-M4755-□ 0
	Motor wire	KX7-M4752-□ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



**[Motor wire]**



**SR1-P cable**

**[Standard cable]**

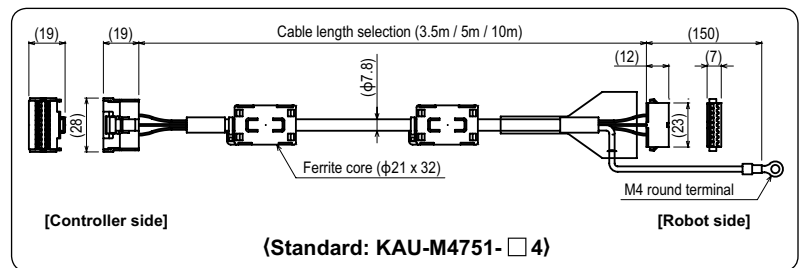
Connected robot ▷ **PHASER**

Set	Single item	
KAU-M4710-□ 0	Signal wire	KAU-M4751-□ 4
	Motor wire	KAU-M4752-□ 1

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m

**[Signal wire]**



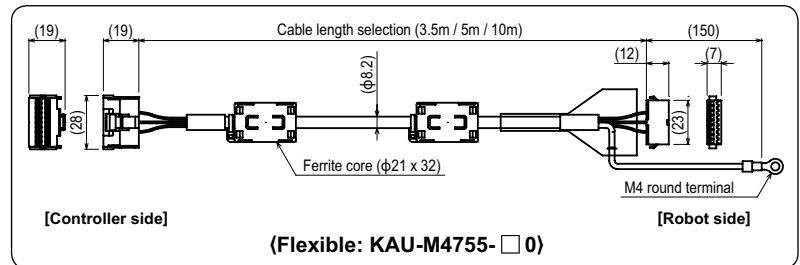
**[Flexible cable]**

Connected robot ▷ **PHASER**

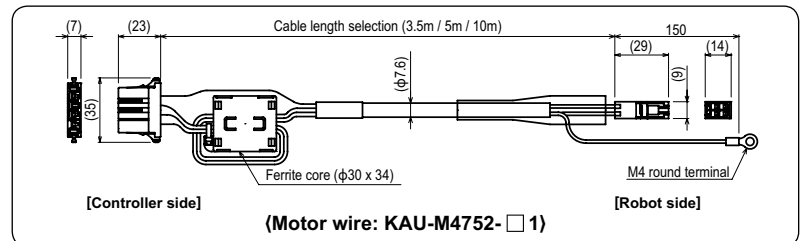
Set	Single item	
KAU-M4720-□ 0	Signal wire	KAU-M4755-□ 0
	Motor wire	KAU-M4752-□ 1

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



**[Motor wire]**



# Robot cable table

## ERCD / ERCX cable

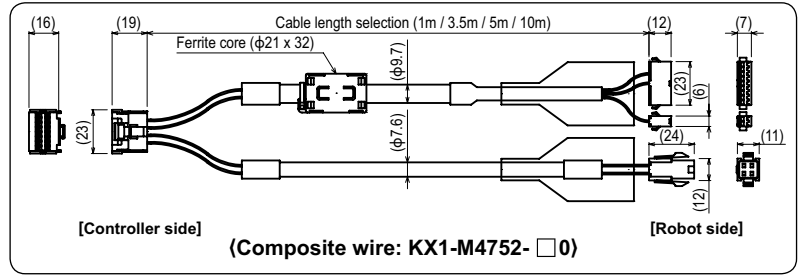
### [Flexible cable]

Connected robot ▷ **FLIP-X**

Set	Single item
-	Composite wire KX1-M4752- □ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
1	1m
3	3.5m
5	5m
A	10m



## Multi-robot cable

### Single axis multi-robot cable

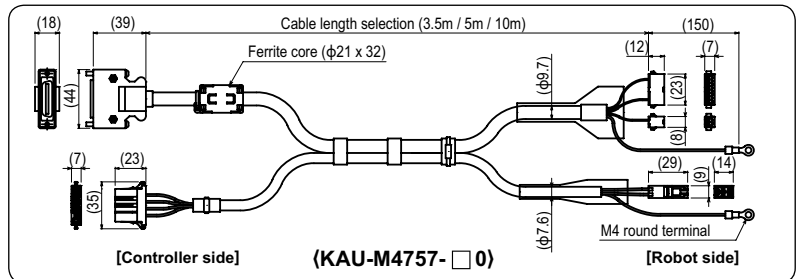
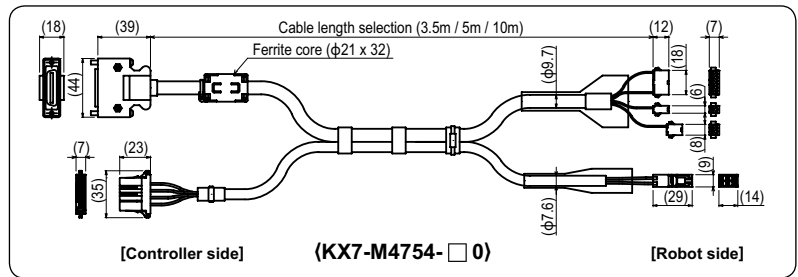
### [Flexible cable]

Connected controller ▷ **RCX240**

Robot	Cable type
FLIP-X	KX7-M4754- □ 0
PHASER	KAU-M4757- □ 0

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



2-axes multi-robot cable

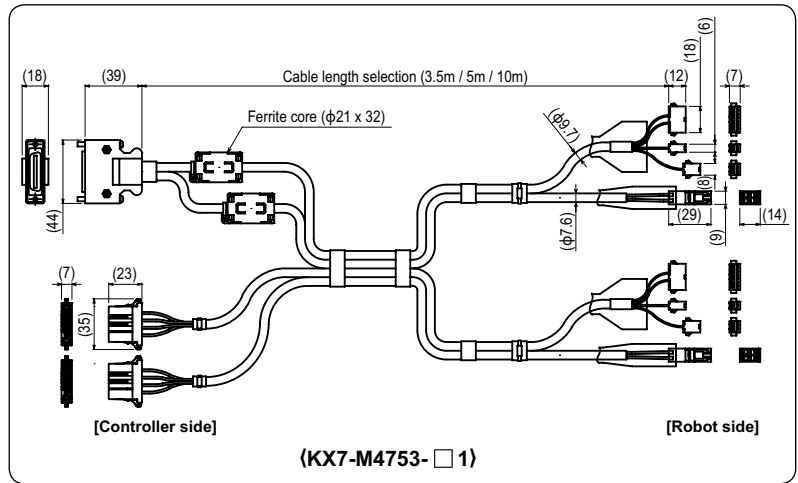
[Flexible cable]

Connected controller ▷ • RCX221 / RCX222  
• RCX240 / RCX320 / RCX340  
• DRCX

Robot combinations		Cable type
First axis	Second axis	
FLIP-X	FLIP-X	KX7-M4753- □ 1

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



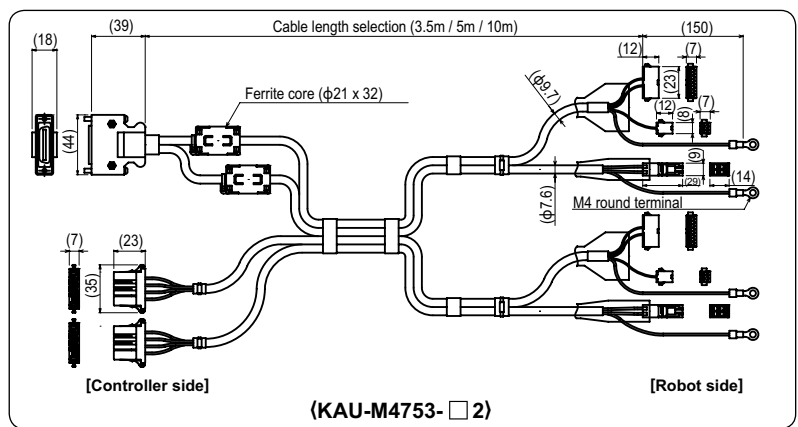
[Flexible cable]

Connected controller ▷ RCX221 / RCX240

Robot combinations		Cable type
First axis	Second axis	
PHASER	PHASER	KAU-M4753- □ 2

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



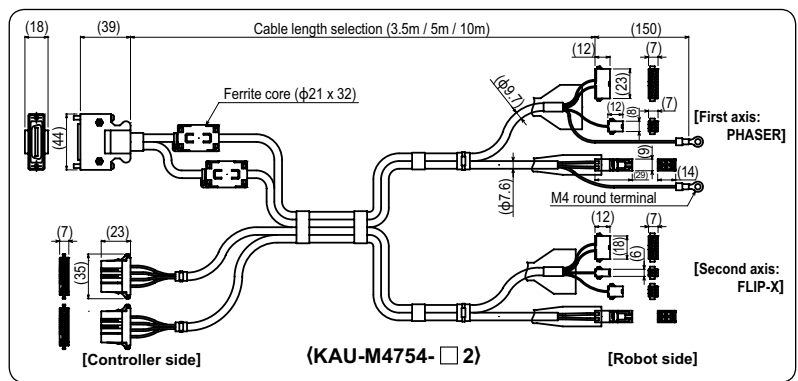
[Flexible cable]

Connected controller ▷ RCX221 / RCX240

Robot combinations		Cable type
First axis	Second axis	
PHASER	FLIP-X	KAU-M4754- □ 2

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



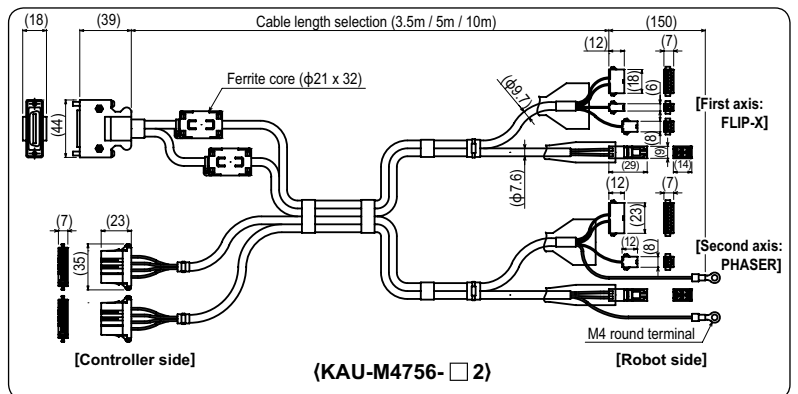
[Flexible cable]

Connected controller ▷ RCX221 / RCX240

Robot combinations		Cable type
First axis	Second axis	
FLIP-X	PHASER	KAU-M4756- □ 2

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



## Cartesian robot cable

### Cartesian 2-axes cable

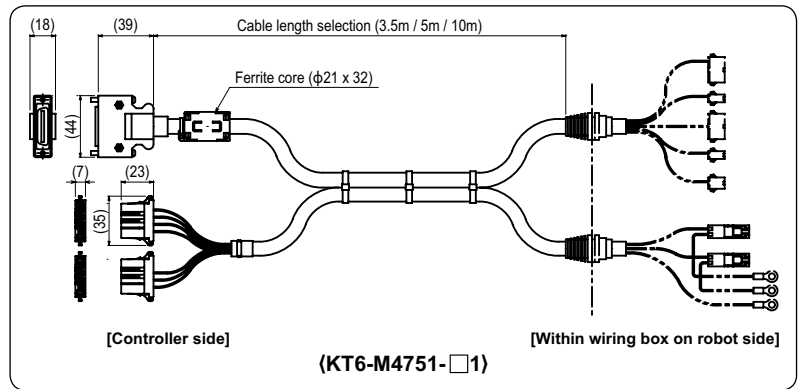
**[Standard cable]**

Connected controller ▷ **DRCX / RCX222 / RCX320 / RCX340**

<b>Type</b>	KT6-M4751-□ 1
-------------	---------------

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



### Cartesian 3-axes cable

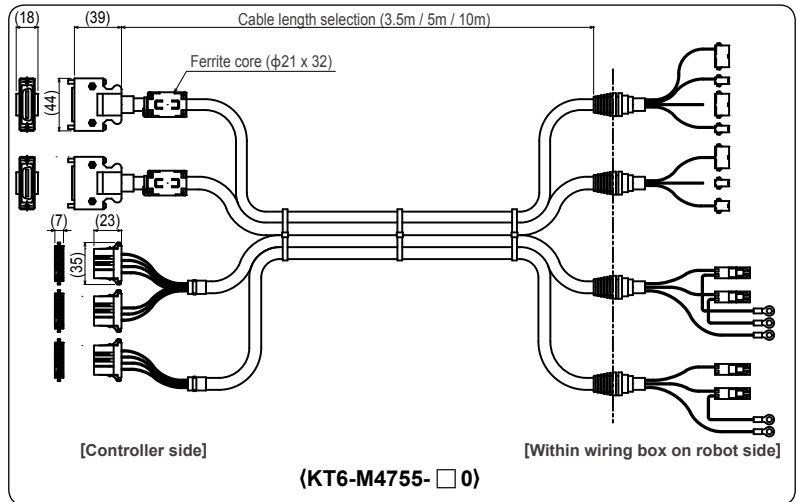
**[Standard cable]**

Connected controller ▷ **RCX142 / RCX240 / RCX340**

<b>Type</b>	KT6-M4755-□ 0
-------------	---------------

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m



### Cartesian 4-axes cable

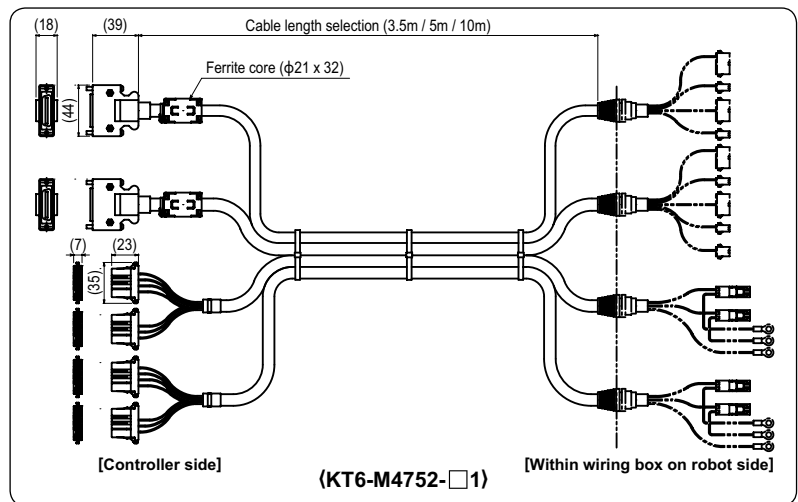
**[Standard cable]**

Connected controller ▷ **RCX142 / RCX240 / RCX340**

<b>Type</b>	KT6-M4752-□ 1
-------------	---------------

Note. Notation within slot in model types is as shown at right.

Within □	Cable length
3	3.5m
5	5m
A	10m





# SCARA robot cable

Note. SCARA robot cables all use the same size connectors but different models use different cables.

## [Standard cable]

Connected robot ▷ • **YK-XG (No including YK120XG / YK150XG / YK180XG)**

- YK-XGS
- YK-TW
- YK400XR / YK-XE

Cable length	Type
3.5m	KBF-M6211-00
5m	KBF-M6211-10
10m	KBF-M6211-20

Connected robot ▷ • **YK120XG**  
• **YK150XG**  
• **YK180XG**

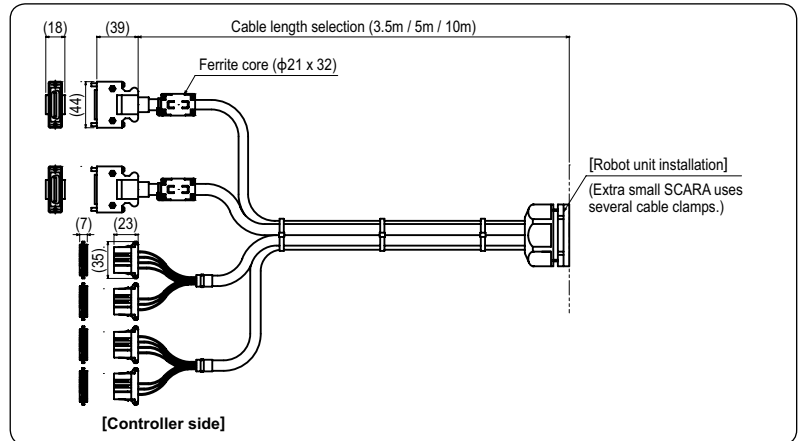
Cable length	Type
2m	KCB-M6211-31
3.5m	KCB-M6211-01
5m	KCB-M6211-11
10m	KCB-M6211-21

Connected robot ▷ • **YK-XGP**  
• **YK-XGC**

Cable length	Type
3.5m	KDP-M6211-00
5m	KDP-M6211-10
10m	KDP-M6211-20

Connected robot ▷ • **YK-XC (Large type)**  
• **YK-XS**  
• **YK-XP**

Cable length	Type
3.5m	KN3-M6211-00
5m	KN3-M6211-10
10m	KN3-M6211-20



Connected robot ▷ • **YK180X**  
• **YK220X**  
• **YK180XC**  
• **YK220XC**

Connected robot ▷ • **YK1200X**

Cable length	Type
3.5m	KN6-M6211-00
5m	KN6-M6211-10
10m	KN6-M6211-20

Cable length	Type
3.5m	KBE-M6211-00
5m	KBE-M6211-10
10m	KBE-M6211-20

# Gripper cable

Note. Be sure to adjust the total length of the robot (for gripper) cable and relay cable to 14m or less.

## ● Robot cable

[Flexible cable]

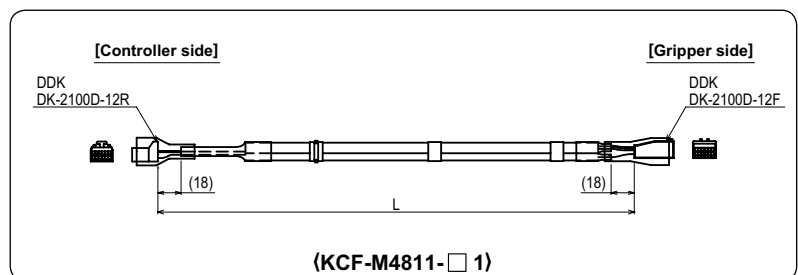
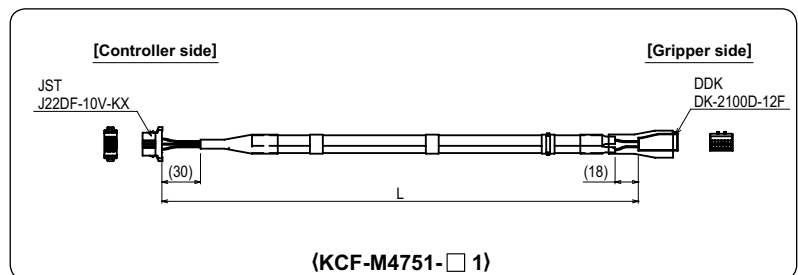
Cable length	Type
3.5m	KCF-M4751-31
5m	KCF-M4751-51
10m	KCF-M4751-A1

## ● Relay cable

[Flexible cable]

Type	KCF-M4811-□ 1
------	---------------

Within □	1	2	3	4	5	6	7	8
Length (mm)	0.5	1	1.5	2	2.5	3	3.5	4



Articulated robots  
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Linear conveyor modules  
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Robonity

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TRANSEVO

Single-axis robots  
FLIP-X

Linear motor single-axis robots  
PHASER

Cartesian robots  
XX-X

SCARA robots  
YK-X

Pick & place robots  
YP-X

CLEAN

CONTROLLER INFORMATION

CABLE

TECHNICAL INFORMATION

DISCONTINUED

# Cable terminal table

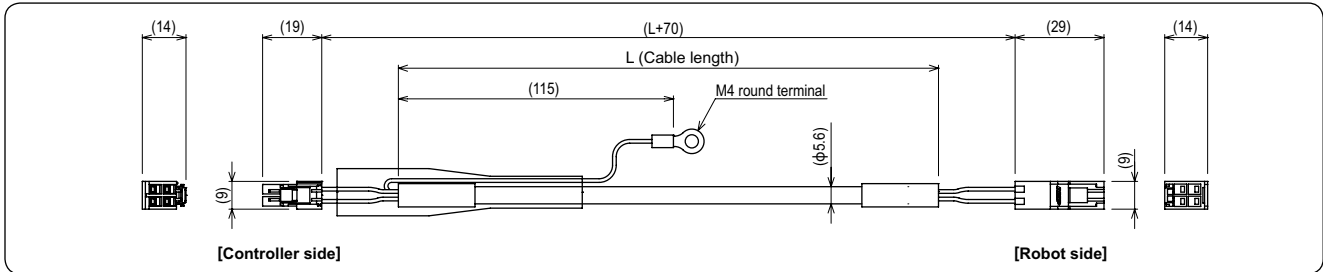
This is a relay cable used between the robot body and the robot cable such as cable carrier wiring, etc.

## PHASER relay cable

Motor wire (350mm to 1450mm) Note. Common to MR types and MF types

Type	KAU-M4813-□ 0
------	---------------

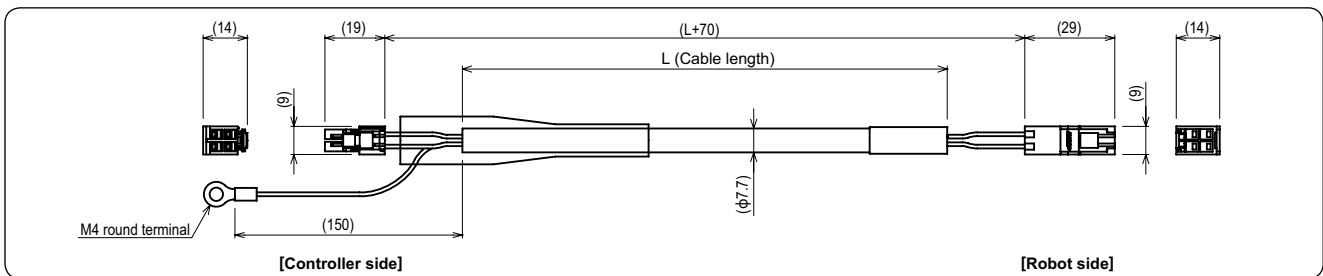
Within □	1	2	3	4	5	6	7	8	9	A	B	C
Length (mm)	350	450	550	650	750	850	950	1050	1150	1250	1350	1450



Motor wire (1500mm to 2600mm) Note. Not usable on MR type

Type	KBD-M4813-□ 0
------	---------------

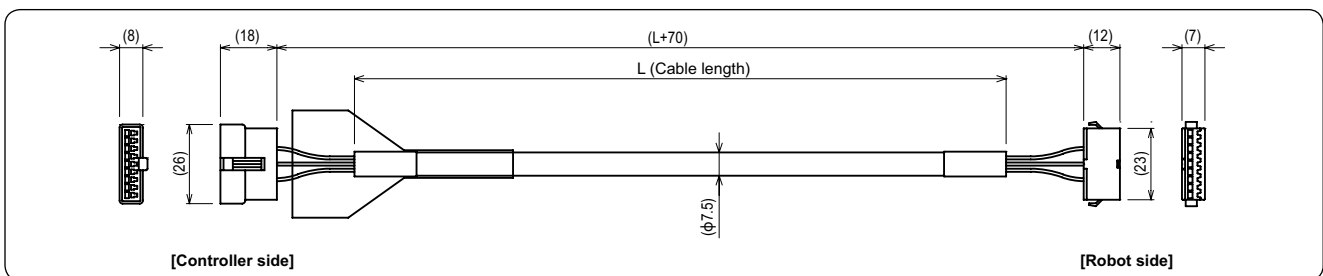
Within □	6	7	8	9	A	B	C	D	E	F	G	M
Length (mm)	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600



Signal cable (350mm to 1450mm) Note. Common to MR types and MF types

Type	KAU-M4812-□ 1
------	---------------

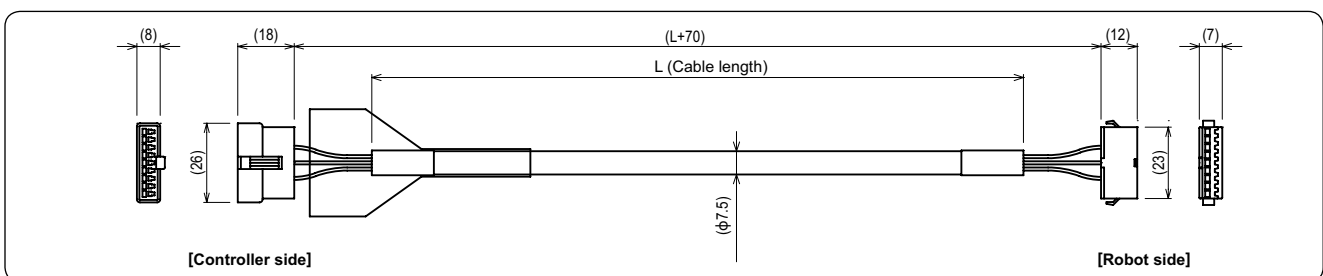
Within □	1	2	3	4	5	6	7	8	9	A	B	C
Length (mm)	350	450	550	650	750	850	950	1050	1150	1250	1350	1450



Signal cable (1500mm to 2600mm) Note. Common to MR types and MF types

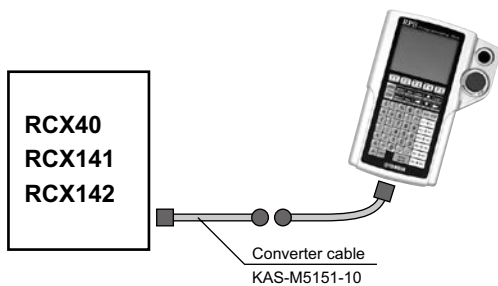
Type	KBD-M4812-□ 1
------	---------------

Within □	6	7	8	9	A	B	C	D	E	F	G	J
Length (mm)	1500	1600	1700	1800	1900	2000	2100	2200	2300	2400	2500	2600



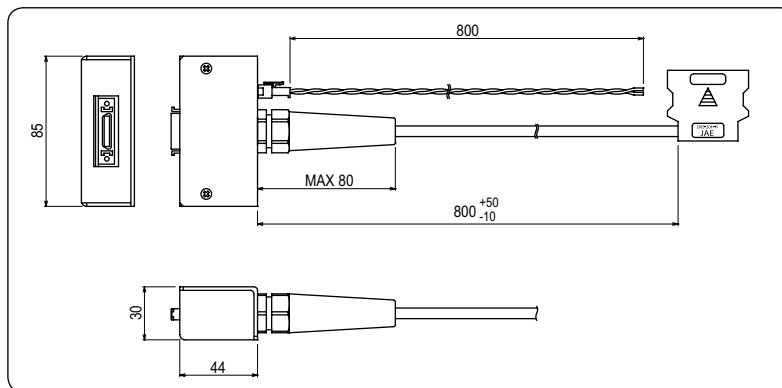
# Connector converter cable

## Programming box converter cable

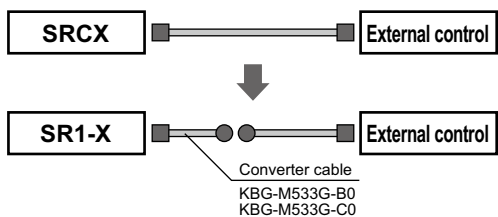


Converter cable for operating the RCX40, RCX141, RCX142 by RPB.

Type KAS-M5151-10

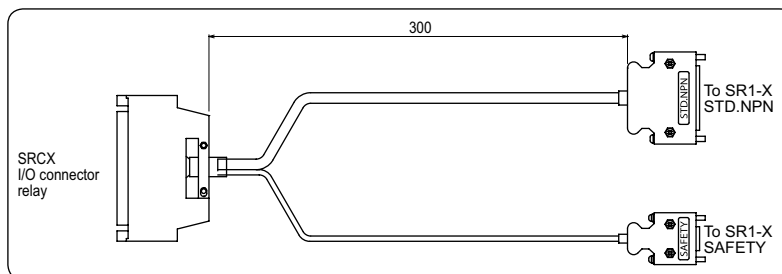


## I/O control converter cable



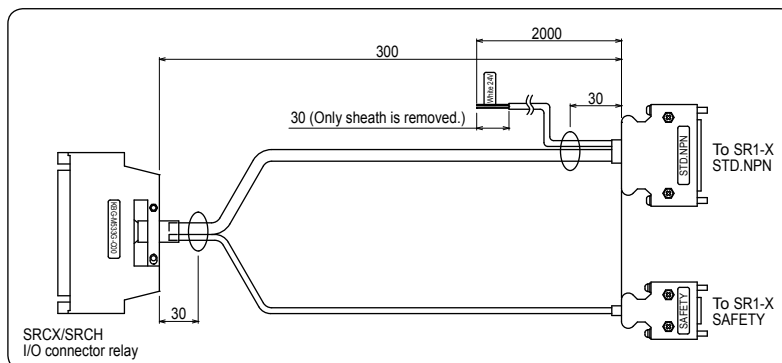
Converter cable allows connecting to the SRCX connector when system using the SRCX was changed to the SR1-X.

External power supply is used for the I/O power supply.



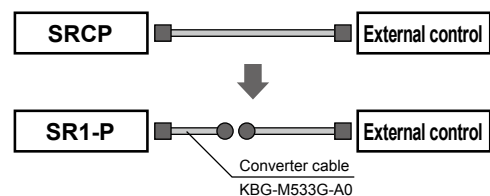
Type KBG-M533G-B0

Internal power supply of the SRCX is used for the I/O power supply.

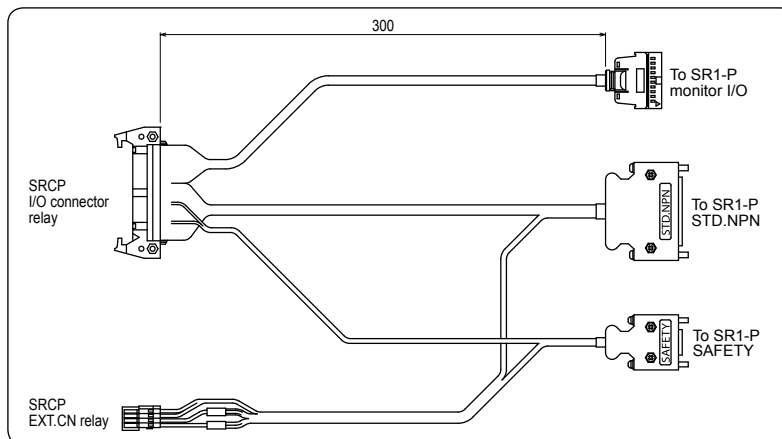


Note. It is necessary to input the 24V-power supply from the outside.

Type KBG-M533G-C0



Converter cable allows connecting to the SRCP connector when system using the SRCP was changed to the SR1-P.



Type KBG-M533G-A0

Articulated robots  
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SCARA robots  
YK-X

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YP-X

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CABLE

TECHNICAL

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# Robonity Acceleration/Deceleration and Inertia Moment

## Acceleration/Deceleration

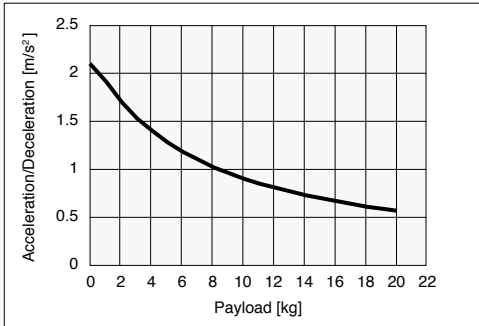
### LBAS04

Model	LBAS04 -6	LBAS04 -6	LBAS04 -12	LBAS04 -12
	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical
0	2.1	2.1	4.2	3.6
1	1.91	2.1	3.84	2.4
2	1.7	1.64	2.99	1.8
3	1.53	1.34	2.45	
4	1.4	1.14	2.07	
5	1.28	0.99	1.8	
6	1.18		1.58	
7	1.1		1.42	
8	1.02		1.28	
9	0.96		1.17	
10	0.9		1.08	
11	0.85		1	
12	0.81		0.93	
13	0.77			
14	0.73			
15	0.7			
16	0.67			
17	0.64			
18	0.61			
19	0.59			
20	0.57			

## Payload – Acceleration/Deceleration Graph (Estimate)

### LBAS04-6

Horizontal/  
Wall hanging

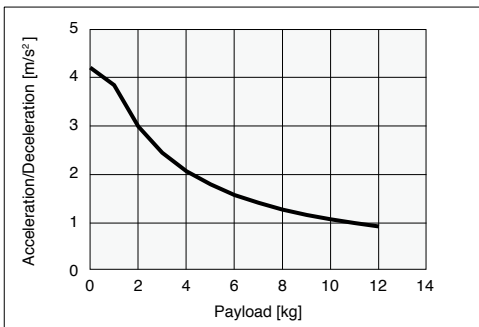


Vertical

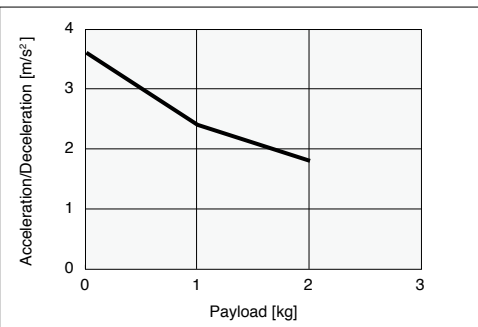


### LBAS04-12

Horizontal/  
Wall hanging



Vertical



## Inertia Moment

### LBAS04

Model	Effective stroke [mm]															
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
LBAS04-6	0.060	0.063	0.067	0.071	0.075	0.079	0.083	0.087	0.090	0.094	0.098	0.102	0.106	0.110	0.114	0.117
LBAS04-12	0.069	0.072	0.076	0.080	0.084	0.088	0.092	0.096	0.099	0.103	0.107	0.111	0.115	0.119	0.123	0.126

# Robonity Acceleration/Deceleration and Inertia Moment (Basic model)

## Acceleration/Deceleration

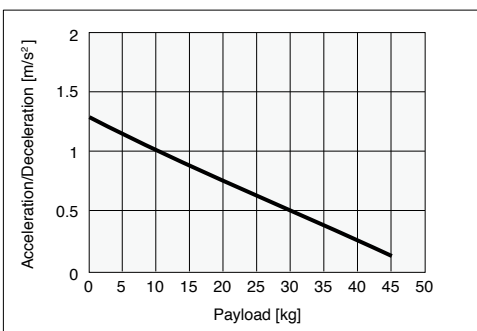
### LBAS05

Model	LBAS05-2	LBAS05-2	LBAS05-5	LBAS05-5	LBAS05-10	LBAS05-10	LBAS05-20	LBAS05-20
	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
0	1.3	1	3.04	3.34	4.64	4.86	7.44	7.44
1	1.27	0.95	2.97	3.18	4.44	4.56	7.44	6.99
2	1.24	0.91	2.91	3.03	4.25	4.3	7.44	5.65
3	1.22	0.86	2.85	2.88	4.07	4.06	7.44	3.42
4	1.19	0.82	2.79	2.73	3.9	3.85	7.44	
5	1.17	0.77	2.73	2.58	3.73	3.66	7.44	
6	1.14	0.73	2.67	2.43	3.57	3.49	6.64	
7	1.11	0.68	2.61	2.28	3.41		6	
8	1.09	0.64	2.55	2.13	3.27		5.47	
9	1.06	0.59	2.49	1.98	3.12		5.02	
10	1.04	0.55	2.43	1.83	2.99		4.65	
11	1.01	0.5	2.37	1.68	2.86		4.32	
12	0.98	0.46	2.31	1.53	2.74		4.04	
13	0.96	0.41	2.24		2.62			
14	0.93	0.37	2.18		2.51			
15	0.91	0.32	2.12		2.41			
16	0.88		2.06		2.31			
17	0.85		2		2.22			
18	0.83		1.94		2.14			
19	0.8		1.88		2.06			
20	0.78		1.82		1.99			
21	0.75		1.76		1.93			
22	0.72		1.7		1.87			
23	0.7		1.64		1.82			
24	0.67		1.58		1.77			
25	0.65		1.52					
26	0.62		1.45					
27	0.59		1.39					
28	0.57		1.33					
29	0.54		1.27					
30	0.52		1.21					
31	0.49		1.15					
32	0.46		1.09					
33	0.44		1.03					
34	0.41		0.97					
35	0.39		0.91					
36	0.36		0.85					
37	0.33		0.79					
38	0.31		0.72					
39	0.28		0.66					
40	0.26		0.6					
41	0.23							
42	0.2							
43	0.18							
44	0.15							
45	0.13							

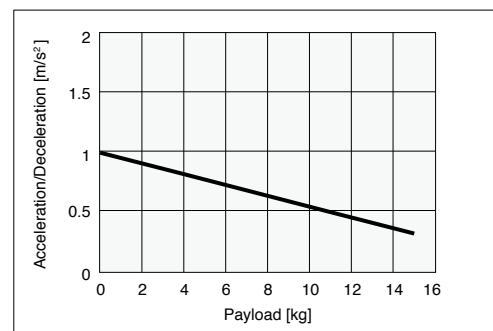
## Payload – Acceleration/Deceleration Graph (Estimate)

### LBAS05-2

Horizontal/Wall hanging

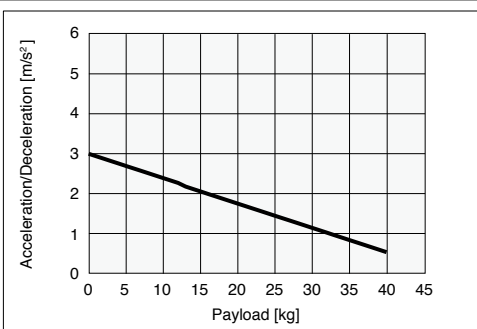


Vertical

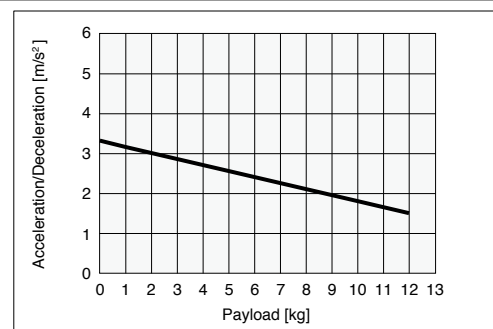


### LBAS05-5

Horizontal/Wall hanging



Vertical



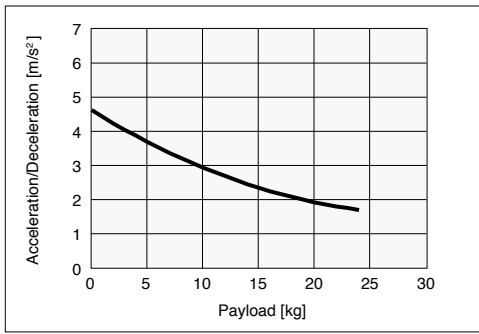
Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
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Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
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# Robonity Acceleration/Deceleration and Inertia Moment (Basic model)

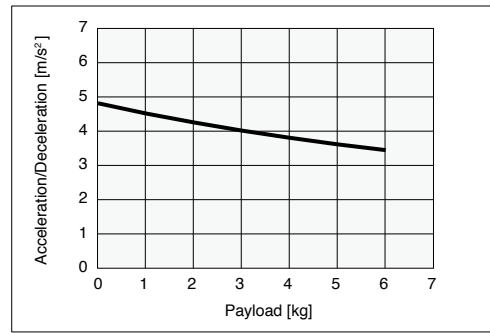
## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LBAS05-10

Horizontal/  
Wall hanging



Vertical

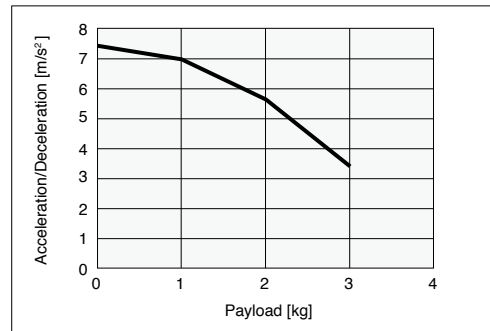


### LBAS05-20

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

### LBAS05

[kg·m <sup>2</sup> ·10 <sup>-4</sup> ]	Effective stroke [mm]															
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
LBAS05-2	0.082	0.090	0.098	0.106	0.114	0.122	0.130	0.138	0.146	0.154	0.162	0.170	0.178	0.186	0.194	0.202
LBAS05-5	0.085	0.093	0.101	0.109	0.117	0.125	0.133	0.141	0.149	0.157	0.165	0.173	0.181	0.189	0.197	0.205
LBAS05-10	0.097	0.105	0.113	0.121	0.129	0.137	0.145	0.153	0.161	0.169	0.177	0.185	0.193	0.201	0.209	0.217
LBAS05-20	0.145	0.153	0.161	0.169	0.177	0.185	0.193	0.201	0.209	0.217	0.224	0.232	0.240	0.248	0.256	0.264

# Robonity Acceleration/Deceleration and Inertia Moment (Basic model)

## Acceleration/Deceleration

### LBAS08

Model	LBAS08 -5 Horizontal/ Wall hanging	LBAS08 -5 Vertical	LBAS08 -10 Horizontal/ Wall hanging	LBAS08 -10 Vertical	LBAS08 -20 Horizontal/ Wall hanging	LBAS08 -20 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
0	1.65	1.65	6.09	4.79	8.51	8.5
1	1.63	1.62	5.97	4.54	8.2	7.39
2	1.62	1.59	5.86	4.31	7.9	6.42
3	1.6	1.57	5.74	4.09	7.61	5.59
4	1.59	1.54	5.63	3.88	7.33	4.89
5	1.58	1.51	5.52	3.68	7.05	4.33
6	1.56	1.49	5.42	3.5	6.77	3.91
7	1.55	1.46	5.31	3.32	6.51	3.62
8	1.54	1.44	5.21	3.16	6.24	3.46
9	1.52	1.41	5.1	3.01	5.99	
10	1.51	1.38	5	2.87	5.74	
11	1.5	1.36	4.9	2.74	5.5	
12	1.49	1.33	4.8	2.62	5.26	
13	1.47	1.3	4.7	2.52	5.03	
14	1.46	1.28	4.61	2.42	4.8	
15	1.45	1.25	4.51	2.34	4.58	
16	1.43	1.23	4.42	2.27	4.37	
17	1.42	1.2	4.33	2.21	4.16	
18	1.41	1.17	4.24	2.16	3.96	
19	1.4	1.15	4.15	2.13	3.76	
20	1.38	1.12	4.06	2.1	3.57	
21	1.37	1.09	3.98		3.38	
22	1.36	1.07	3.89		3.21	
23	1.35	1.04	3.81		3.03	
24	1.34	1.02	3.73		2.87	
25	1.32	0.99	3.65		2.71	
26	1.31	0.96	3.57		2.55	
27	1.3	0.94	3.49		2.4	
28	1.29	0.91	3.42		2.26	
29	1.28	0.88	3.34		2.13	
30	1.26	0.86	3.27		1.99	
31	1.25		3.2		1.87	
32	1.24		3.13		1.75	
33	1.23		3.06		1.64	
34	1.22		2.99		1.53	
35	1.21		2.93		1.43	
36	1.19		2.86		1.34	
37	1.18		2.8		1.25	
38	1.17		2.74		1.16	
39	1.16		2.68		1.09	
40	1.15		2.62		1.02	
41	1.14		2.57			
42	1.13		2.51			
43	1.12		2.46			
44	1.11		2.41			
45	1.09		2.36			
46	1.08		2.31			
47	1.07		2.26			
48	1.06		2.21			
49	1.05		2.17			
50	1.04		2.12			
51	1.03		2.08			
52	1.02		2.04			
53	1.01		2			
54	1		1.96			
55	0.99		1.93			
56	0.98		1.89			
57	0.97		1.86			
58	0.96		1.83			
59	0.95		1.8			
60	0.94		1.77			
61	0.93		1.74			
62	0.92		1.72			
63	0.91		1.69			
64	0.9		1.67			
65	0.89		1.65			
66	0.88		1.63			
67	0.87		1.61			
68	0.86		1.59			
69	0.85		1.57			
70	0.84		1.56			
71	0.84		1.55			
72	0.83		1.54			
73	0.82		1.53			
74	0.81		1.52			
75	0.8		1.51			
76	0.79		1.51			
77	0.78		1.5			
78	0.77		1.5			
79	0.76		1.5			
80	0.76		1.5			
81	0.75					
82	0.74					
83	0.73					
84	0.72					
85	0.71					
86	0.71					
87	0.7					
88	0.69					
89	0.68					

Model	LBAS08 -5 Horizontal/ Wall hanging	LBAS08 -5 Vertical	LBAS08 -10 Horizontal/ Wall hanging	LBAS08 -10 Vertical	LBAS08 -20 Horizontal/ Wall hanging	LBAS08 -20 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
90	0.67					
91	0.67					
92	0.66					
93	0.65					
94	0.64					
95	0.63					
96	0.63					
97	0.62					
98	0.61					
99	0.6					
100	0.6					

Articulated robots  
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YK-X

Pick & place robots  
YP-X

CLEAN

CONTROLLER INFORMATION

CABLE

TECHNICAL INFORMATION

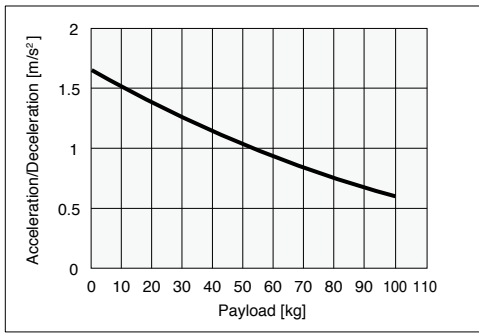
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# Robonity Acceleration/Deceleration and Inertia Moment (Basic model)

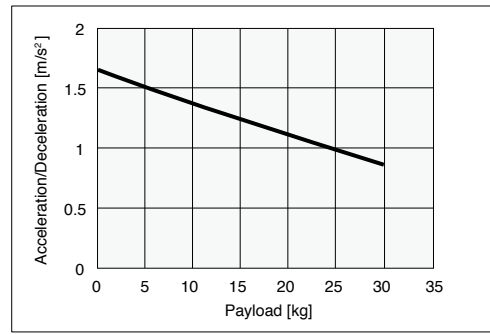
## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LBAS08-5

Horizontal/  
Wall hanging

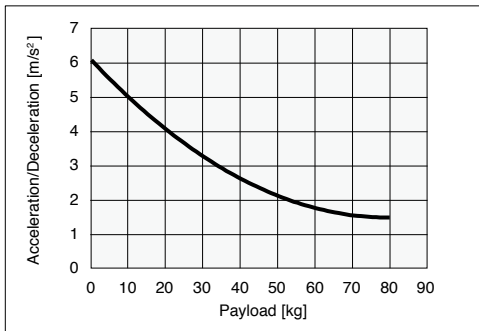


Vertical

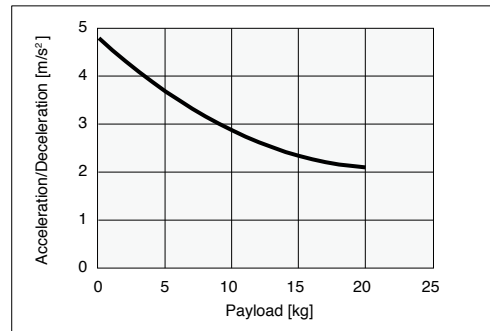


### LBAS08-10

Horizontal/  
Wall hanging

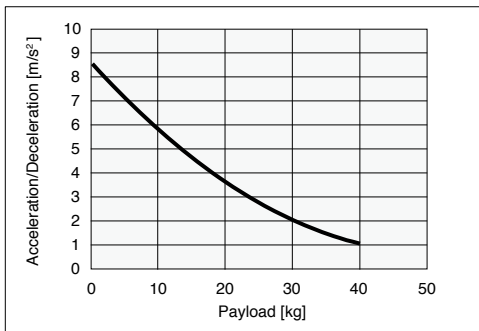


Vertical

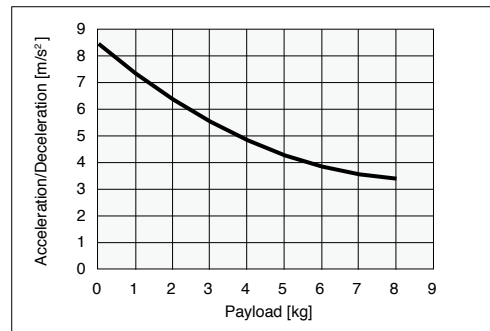


### LBAS08-20

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

### LBAS08

[kg·m <sup>2</sup> ·10 <sup>-4</sup> ]	Effective stroke [mm]																					
Model	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
LBAS08-5	0.160	0.168	0.176	0.184	0.192	0.200	0.208	0.216	0.224	0.232	0.240	0.248	0.256	0.263	0.271	0.279	0.287	0.295	0.303	0.311	0.319	0.327
LBAS08-10	0.190	0.198	0.206	0.214	0.222	0.230	0.238	0.246	0.254	0.261	0.269	0.277	0.285	0.293	0.301	0.309	0.317	0.325	0.333	0.341	0.349	0.357
LBAS08-20	0.309	0.317	0.325	0.333	0.341	0.349	0.357	0.365	0.373	0.381	0.389	0.397	0.405	0.413	0.421	0.429	0.437	0.445	0.453	0.461	0.469	0.477



## Acceleration/Deceleration

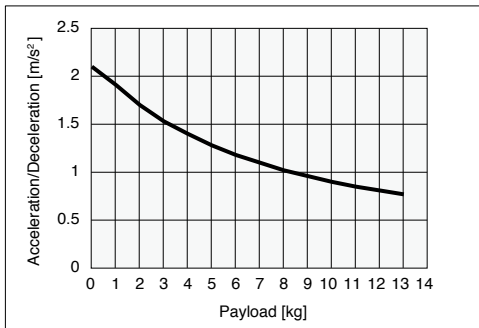
### LGXS05

Model	LGXS05 -5 Horizontal/ Wall hanging	LGXS05 -5 Vertical	LGXS05 -10 Horizontal/ Wall hanging	LGXS05 -10 Vertical	LGXS05 -20 Horizontal/ Wall hanging	LGXS05 -20 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
0	2.1	2.1	4.2	3.6	5.3	5.3
1	1.91	2.1	3.84	2.4	5.3	5.3
2	1.7	1.64	2.99	1.8	3.98	3.98
3	1.53	1.34	2.45	1.44	3.19	
4	1.4	1.14	2.07	1.2	2.66	
5	1.28	0.99	1.8		2.28	
6	1.18	0.87	1.58			
7	1.1	0.78	1.42			
8	1.02	0.7	1.28			
9	0.96					
10	0.9					
11	0.85					
12	0.81					
13	0.77					

## Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS05-5

Horizontal/  
Wall hanging



Vertical

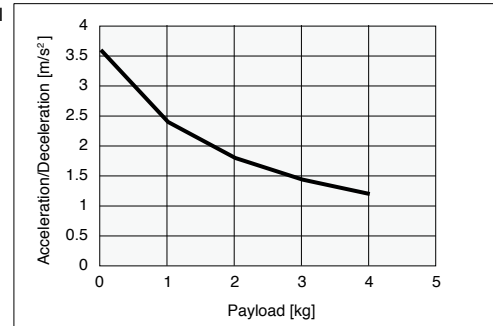


### LGXS05-10

Horizontal/  
Wall hanging

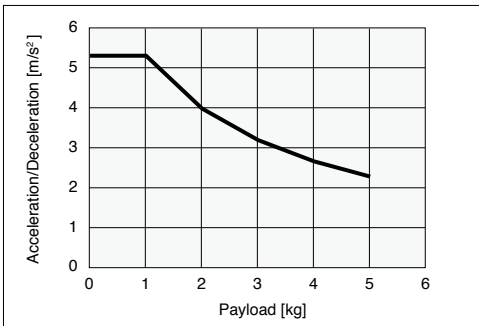


Vertical

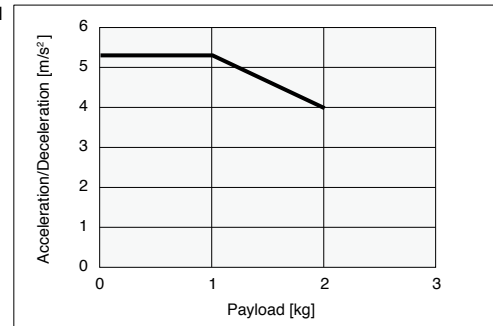


### LGXS05-20

Horizontal/  
Wall hanging



Vertical



## Inertia Moment

### LGXS05

[kg·m <sup>2</sup> ·10 <sup>-4</sup> ]	Effective stroke [mm]																
	Model	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800
LGXS05-5	0.139	0.147	0.155	0.163	0.171	0.179	0.187	0.195	0.203	0.211	0.219	0.227	0.235	0.243	0.251	0.259	
LGXS05-10	0.146	0.154	0.162	0.170	0.178	0.186	0.194	0.202	0.210	0.218	0.226	0.234	0.242	0.250	0.258	0.266	
LGXS05-20	0.177	0.185	0.193	0.201	0.209	0.217	0.225	0.233	0.241	0.249	0.257	0.265	0.273	0.281	0.289	0.297	

Articulated robots  
YA  
Linear conveyor  
modules  
LCM100  
Motor-less single  
axis actuator  
Robonity  
Compact  
single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor  
single-axis robots  
PHASER  
Cartesian  
robots  
XY-X  
SCARA  
robots  
YK-X  
Pick & place  
robots  
YP-X  
Linear motor  
CLEAN  
CONTROLLER  
INFORMATION  
CABLE  
TECHNICAL  
INFORMATION  
DISCONTINUED

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## Acceleration/Deceleration

### LGXS05L

Model	LGXS05L -5		LGXS05L -10		LGXS05L -20	
	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
0	3.04	3.34	4.26	4.86	5.07	5.07
1	2.97	3.18	4.08	4.56	4.86	4.86
2	2.91	3.03	3.9	4.3	4.66	4.66
3	2.85	2.88	3.74	4.06	4.46	4.46
4	2.79	2.73	3.58	3.85	4.25	
5	2.73	2.58	3.42	3.66	4.05	
6	2.67	2.43	3.28	3.49	3.85	
7	2.61	2.28	3.13		3.65	
8	2.55	2.13	3		3.44	
9	2.49	1.98	2.87		3.24	
10	2.43	1.83	2.74		3.04	
11	2.37	1.68	2.62		2.83	
12	2.31	1.53	2.51		2.63	
13	2.24		2.41			
14	2.18		2.3			
15	2.12		2.21			
16	2.06		2.12			
17	2		2.04			

Model	LGXS05L -5		LGXS05L -10		LGXS05L -20	
	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical	Horizontal/Wall hanging	Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
18	1.94		1.96			
19	1.88		1.89			
20	1.82		1.83			
21	1.76		1.77			
22	1.7		1.72			
23	1.64		1.67			
24	1.58		1.63			
25	1.52					
26	1.45					
27	1.39					
28	1.33					
29	1.27					
30	1.21					
31	1.15					
32	1.09					

## Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS05L-5

Horizontal/Wall hanging



Vertical



## Acceleration/Deceleration

### LGXS07

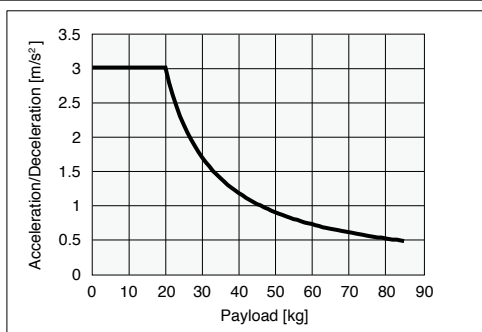
Model	LGXS07-5 Horizontal/ Wall hanging	LGXS07-5 Vertical	LGXS07-10 Horizontal/ Wall hanging	LGXS07-10 Vertical	LGXS07-20 Horizontal/ Wall hanging	LGXS07-20 Vertical	LGXS07-30 Horizontal/ Wall hanging	LGXS07-30 Vertical
Payload [kg]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]
0	3.04	2.53	6.08	5.57	7.09	6.08	6.99	6.99
1	3.04	2.47	5.68	5.29	6.74	5.57	6.64	6.64
2	3.04	2.42	5.33	5.02	6.4	5.15	6.31	6.31
3	3.04	2.37	5.02	4.75	6.07	4.78	5.98	
4	3.04	2.32	4.75	4.5	5.75	4.47	5.67	
5	3.04	2.27	4.5	4.24	5.44		5.36	
6	3.04	2.22	4.28	3.99	5.14		5.06	
7	3.04	2.17	4.08	3.75	4.85		4.78	
8	3.04	2.12	3.89	3.52	4.57		4.5	
9	3.04	2.07	3.73		4.3		4.24	
10	3.04	2.02	3.57		4.04		3.98	
11	3.04	1.97	3.43		3.79			
12	3.04	1.92	3.3		3.55			
13	3.04	1.87	3.18		3.32			
14	3.04	1.82	3.07		3.09			
15	3.04	1.77	2.96		2.88			
16	3.04	1.72	2.86		2.68			
17	3.04		2.77		2.49			
18	3.04		2.69		2.31			
19	3.04		2.6		2.14			
20	3.04		2.53		1.98			
21	2.82		2.46		1.83			
22	2.64		2.39		1.69			
23	2.48		2.32		1.56			
24	2.33		2.26		1.44			
25	2.21		2.21		1.32			
26	2.09		2.15					
27	1.99		2.1					
28	1.9		2.05					
29	1.81		2					
30	1.73		1.96					
31	1.66		1.91					
32	1.6		1.87					
33	1.53		1.83					
34	1.48		1.79					
35	1.43		1.76					
36	1.38		1.72					
37	1.33		1.69					
38	1.29		1.66					
39	1.25		1.63					
40	1.21		1.6					
41	1.18		1.57					
42	1.14		1.54					
43	1.11		1.51					
44	1.08		1.49					
45	1.05		1.46					

Model	LGXS07-5 Horizontal/ Wall hanging	LGXS07-5 Vertical	LGXS07-10 Horizontal/ Wall hanging	LGXS07-10 Vertical	LGXS07-20 Horizontal/ Wall hanging	LGXS07-20 Vertical	LGXS07-30 Horizontal/ Wall hanging	LGXS07-30 Vertical
Payload [kg]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]
46	1.03							
47	1							
48	0.98							
49	0.95							
50	0.93							
51	0.91							
52	0.89							
53	0.87							
54	0.85							
55	0.83							
56	0.82							
57	0.8							
58	0.78							
59	0.77							
60	0.76							
61	0.74							
62	0.73							
63	0.71							
64	0.7							
65	0.69							
66	0.68							
67	0.67							
68	0.66							
69	0.65							
70	0.64							
71	0.63							
72	0.62							
73	0.61							
74	0.6							
75	0.59							
76	0.58							
77	0.57							
78	0.56							
79	0.56							
80	0.55							
81	0.54							
82	0.53							
83	0.53							
84	0.52							
85	0.51							

## Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS07-5

Horizontal/  
Wall hanging

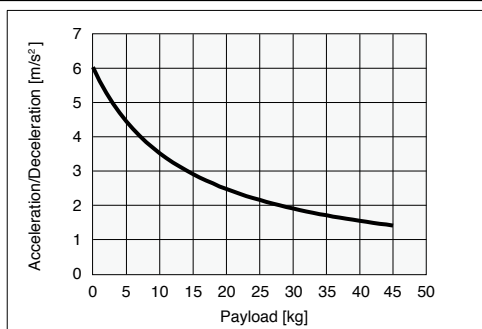


Vertical



### LGXS07-10

Horizontal/  
Wall hanging



Vertical



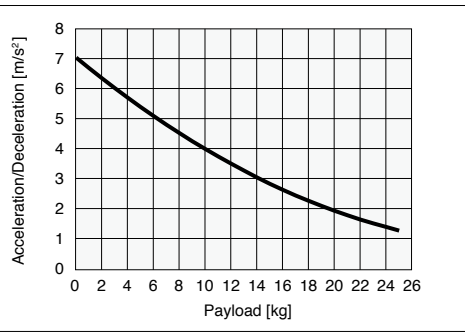
Articulated robots  
YA  
Linear conveyor  
modules  
LCM100  
Motor-less single  
axis actuator  
Robonity  
Compact  
single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor  
single-axis robots  
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robots  
XY-X  
SCARA  
robots  
YK-X  
Pick & place  
robots  
YP-X  
CLEAN  
CONTROLLER  
INFORMATION  
CABLE  
TECHNICAL  
INFORMATION  
DISCONTINUED

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS07-20

Horizontal/  
Wall hanging



Vertical

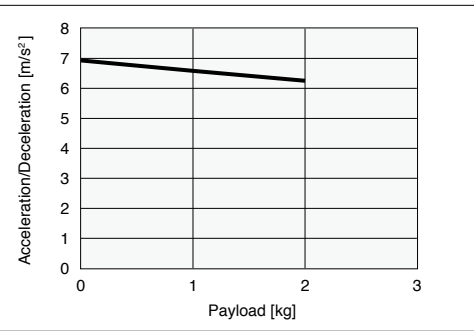


### LGXS07-30

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

### LGXS07

[kg·m <sup>2</sup> ×10 <sup>-4</sup> ]	Effective stroke [mm]																						
	Model	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100
LGXS07-5	0.623	0.643	0.662	0.682	0.701	0.721	0.740	0.760	0.779	0.799	0.818	0.838	0.857	0.877	0.896	0.916	0.935	0.955	0.974	0.994	1.013	1.033	1.053
LGXS07-10	0.644	0.663	0.683	0.702	0.722	0.741	0.761	0.780	0.800	0.819	0.839	0.858	0.878	0.897	0.917	0.936	0.956	0.975	0.995	1.014	1.034	1.053	1.073
LGXS07-20	0.728	0.747	0.767	0.787	0.806	0.826	0.845	0.865	0.884	0.904	0.923	0.943	0.962	0.982	1.001	1.021	1.040	1.060	1.079	1.099	1.118	1.138	1.158
LGXS07-30	0.885	0.905	0.924	0.944	0.963	0.983	1.002	1.022	1.041	1.061	1.080	1.100	1.119	1.139	1.158	1.178	1.197	1.217	1.236	1.256	1.275	1.295	1.315

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## Acceleration/Deceleration

### LGXS10

Model	LGXS10 -5 Horizontal/ Wall hanging	LGXS10 -5 Vertical	LGXS10 -10 Horizontal/ Wall hanging	LGXS10 -10 Vertical	LGXS10 -20 Horizontal/ Wall hanging	LGXS10 -20 Vertical	LGXS10 -30 Horizontal/ Wall hanging	LGXS10 -30 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
0	2.27	1.9	6.89	3.29	6.59	8.11	9.75	9.75
1	2.25	1.87	6.78	3.27	6.54	7.86	9.75	9.75
2	2.23	1.85	6.67	3.24	6.49	7.6	9.75	9.75
3	2.21	1.82	6.56	3.22	6.44	7.35	9.75	9.75
4	2.19	1.8	6.46	3.2	6.39	7.09	9.75	9.75
5	2.17	1.77	6.35	3.17	6.34	6.84	9.75	
6	2.15	1.75	6.25	3.15	6.29	6.59	9.75	
7	2.13	1.72	6.14	3.13	6.24	6.33	9.75	
8	2.11	1.7	6.04	3.1	6.18	6.08	9.75	
9	2.09	1.67	5.94	3.08	6.13		9.01	
10	2.07	1.65	5.84	3.05	6.08		8.38	
11	2.05	1.62	5.74	3.03	6.03		7.83	
12	2.03	1.6	5.64	3	5.98		7.34	
13	2.01	1.57	5.54	2.97	5.93		6.91	
14	1.99	1.55	5.44	2.95	5.88		6.53	
15	1.97	1.52	5.34	2.92	5.83		6.19	
16	1.95	1.5	5.25	2.89	5.78		5.89	
17	1.93	1.47	5.16	2.87	5.73		5.61	
18	1.91	1.45	5.06	2.84	5.68		5.36	
19	1.9	1.42	4.97	2.81	5.63		5.13	
20	1.88	1.39	4.88	2.78	5.58		4.91	
21	1.86	1.37	4.79		5.53		4.72	
22	1.84	1.34	4.7		5.48		4.54	
23	1.82	1.32	4.61		5.42		4.37	
24	1.8	1.29	4.52		5.37		4.22	
25	1.79	1.27	4.44		5.32		4.07	
26	1.77	1.24	4.35		5.27			
27	1.75	1.22	4.27		5.22			
28	1.74	1.19	4.18		5.17			
29	1.72	1.17	4.1		5.12			
30	1.7	1.14	4.02		5.07			
31	1.68		3.94		5.02			
32	1.67		3.86		4.97			
33	1.65		3.78		4.92			
34	1.63		3.7		4.87			
35	1.62		3.62		4.82			
36	1.6		3.55		4.77			
37	1.59		3.47		4.71			
38	1.57		3.4		4.66			
39	1.55		3.32		4.61			
40	1.54		3.25		4.56			
41	1.52		3.18					
42	1.51		3.11					
43	1.49		3.04					
44	1.48		2.97					
45	1.46		2.91					
46	1.45		2.84					
47	1.43		2.77					
48	1.42		2.71					
49	1.41		2.65					
50	1.39		2.58					
51	1.38		2.52					
52	1.36		2.46					
53	1.35		2.4					
54	1.34		2.34					
55	1.32		2.29					
56	1.31		2.23					
57	1.3		2.17					
58	1.28		2.12					
59	1.27		2.06					
60	1.26		2.01					
61	1.25		1.96					
62	1.23		1.91					
63	1.22		1.86					
64	1.21		1.81					
65	1.2		1.76					
66	1.18		1.72					
67	1.17		1.67					
68	1.16		1.62					
69	1.15		1.58					
70	1.14		1.54					
71	1.13		1.49					
72	1.12		1.45					
73	1.11		1.41					
74	1.09		1.37					
75	1.08		1.33					
76	1.07		1.3					
77	1.06		1.26					
78	1.05		1.23					
79	1.04		1.19					
80	1.03		1.16					
81	1.02							
82	1.01							
83	1							
84	0.99							
85	0.99							
86	0.98							
87	0.97							
88	0.96							
89	0.95							

Model	LGXS10 -5 Horizontal/ Wall hanging	LGXS10 -5 Vertical	LGXS10 -10 Horizontal/ Wall hanging	LGXS10 -10 Vertical	LGXS10 -20 Horizontal/ Wall hanging	LGXS10 -20 Vertical	LGXS10 -30 Horizontal/ Wall hanging	LGXS10 -30 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
90	0.94							
91	0.93							
92	0.92							
93	0.92							
94	0.91							
95	0.9							
96	0.89							
97	0.89							
98	0.88							
99	0.87							
100	0.86							

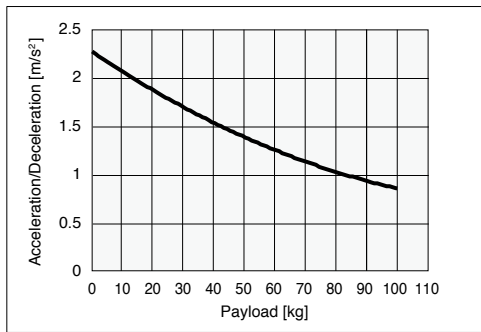
Articulated robots  
YA  
Linear conveyor  
modules  
LCM100  
Motor-less single  
axis actuator  
Robonity  
Compact  
single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor  
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robots  
XY-X  
SCARA  
robots  
YK-X  
Pick & place  
robots  
YP-X  
CLEAN  
CONTROLLER  
INFORMATION  
CABLE  
TECHNICAL  
INFORMATION  
DISCONTINUED

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

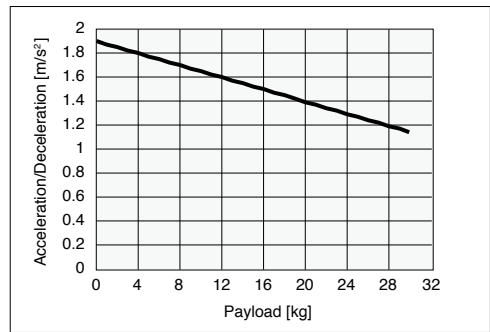
## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS10-5

Horizontal/  
Wall hanging

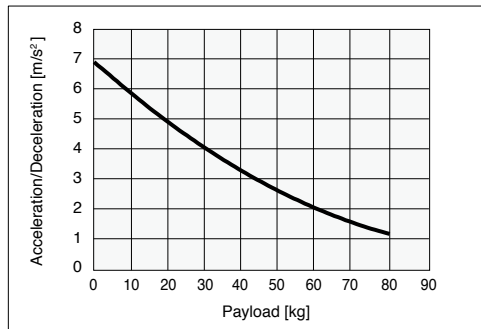


Vertical

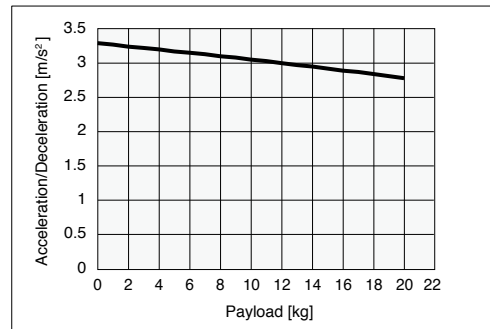


### LGXS10-10

Horizontal/  
Wall hanging

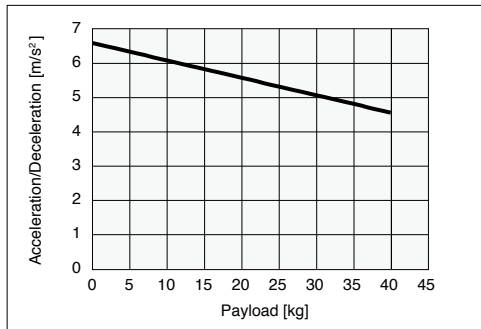


Vertical

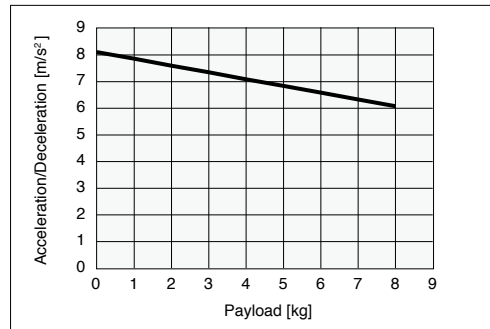


### LGXS10-20

Horizontal/  
Wall hanging

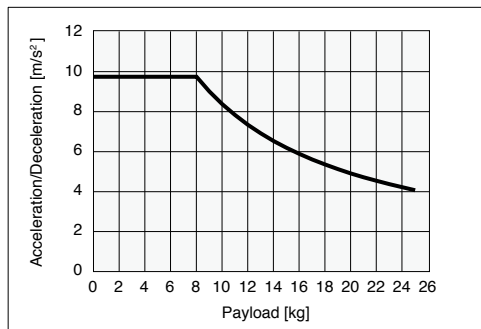


Vertical

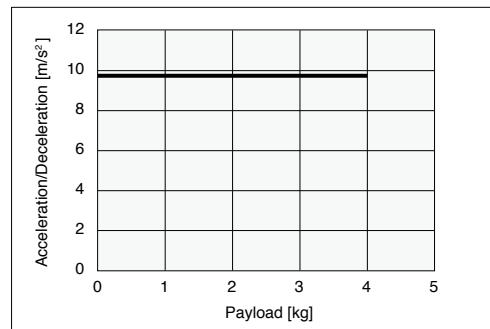


### LGXS10-30

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

### LGXS10

[kg·m <sup>2</sup> ·10 <sup>-4</sup> ]	Effective stroke [mm]																								
	Model	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
LGXS10-5	-	0.686	0.706	0.726	0.745	0.765	0.784	0.804	0.823	0.843	0.862	0.882	0.901	0.921	0.940	0.960	0.979	0.999	1.018	1.038	1.057	1.077	1.096	1.116	1.135
LGXS10-10	-	0.707	0.726	0.746	0.765	0.785	0.804	0.824	0.843	0.863	0.882	0.902	0.921	0.941	0.960	0.980	0.999	1.019	1.038	1.058	1.077	1.097	1.116	1.136	1.155
LGXS10-20	-	0.789	0.809	0.828	0.848	0.867	0.887	0.906	0.926	0.945	0.965	0.984	1.004	1.023	1.043	1.062	1.082	1.101	1.121	1.140	1.160	1.179	1.199	1.218	1.238
LGXS10-30	-	0.944	0.963	0.983	1.002	1.022	1.041	1.061	1.080	1.100	1.119	1.139	1.158	1.178	1.197	1.217	1.236	1.256	1.275	1.295	1.314	1.334	1.353	1.373	1.392

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## Acceleration/Deceleration

### LGXS12

Model	LGXS12 -5 Horizontal/ Wall hanging	LGXS12 -5 Vertical	LGXS12 -10 Horizontal/ Wall hanging	LGXS12 -10 Vertical	LGXS12 -20 Horizontal/ Wall hanging	LGXS12 -20 Vertical	LGXS12 -30 Horizontal/ Wall hanging	LGXS12 -30 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
0	2.27	1.9	8.61	3.29	9.73	8.11	9.75	9.75
1	2.24	1.87	8.47	3.26	9.53	7.85	9.75	9.75
2	2.22	1.84	8.33	3.24	9.35	7.6	9.75	9.75
3	2.2	1.82	8.2	3.22	9.16	7.34	9.75	9.75
4	2.18	1.79	8.06	3.19	8.98	7.09	9.75	9.75
5	2.16	1.77	7.93	3.17	8.8	6.84	9.75	9.75
6	2.14	1.74	7.8	3.15	8.62	6.58	9.75	9.75
7	2.12	1.72	7.67	3.12	8.45	6.33	9.75	9.75
8	2.1	1.69	7.54	3.1	8.28	6.07	9.75	9.75
9	2.08	1.67	7.41	3.07	8.11	5.82	9.01	
10	2.06	1.64	7.29	3.05	7.95	5.57	8.37	
11	2.04	1.62	7.16	3.02	7.79	5.31	7.82	
12	2.02	1.59	7.04	3	7.63	5.06	7.34	
13	2	1.57	6.92	2.97	7.48	4.81	6.91	
14	1.98	1.54	6.79	2.94	7.33	4.55	6.53	
15	1.96	1.52	6.67	2.92	7.18	4.3	6.19	
16	1.95	1.49	6.56	2.89	7.03		5.88	
17	1.93	1.47	6.44	2.86	6.89		5.6	
18	1.91	1.44	6.32	2.83	6.75		5.35	
19	1.89	1.41	6.21	2.81	6.61		5.12	
20	1.87	1.39	6.09	2.78	6.48		4.91	
21	1.85	1.36	5.98	2.75	6.35		4.71	
22	1.84	1.34	5.87	2.72	6.22		4.53	
23	1.82	1.31	5.76	2.69	6.1		4.37	
24	1.8	1.29	5.65	2.66	5.98		4.21	
25	1.78	1.26	5.54	2.63	5.86		4.07	
26	1.76	1.24	5.43		5.74		3.93	
27	1.75	1.21	5.32		5.63		3.81	
28	1.73	1.19	5.22		5.52		3.69	
29	1.71	1.16	5.12		5.41		3.58	
30	1.7	1.14	5.01		5.31		3.47	
31	1.68	1.11	4.91		5.21		3.37	
32	1.66	1.09	4.81		5.11		3.28	
33	1.65	1.06	4.72		5.02		3.19	
34	1.63	1.04	4.62		4.93		3.11	
35	1.61	1.01	4.52		4.84		3.03	
36	1.6	0.99	4.43		4.76			
37	1.58	0.96	4.33		4.67			
38	1.57	0.93	4.24		4.6			
39	1.55	0.91	4.15		4.52			
40	1.53	0.88	4.06		4.45			
41	1.52	0.86	3.97		4.38			
42	1.5	0.83	3.88		4.31			
43	1.49	0.81	3.8		4.25			
44	1.47	0.78	3.71		4.19			
45	1.46	0.76	3.63		4.13			
46	1.44		3.54		4.07			
47	1.43		3.46		4.02			
48	1.42		3.38		3.97			
49	1.4		3.3		3.93			
50	1.39		3.22		3.89			
51	1.37		3.15					
52	1.36		3.07					
53	1.35		3					
54	1.33		2.92					
55	1.32		2.85					
56	1.3		2.78					
57	1.29		2.71					
58	1.28		2.64					
59	1.27		2.58					
60	1.25		2.51					
61	1.24		2.44					
62	1.23		2.38					
63	1.22		2.32					
64	1.2		2.26					
65	1.19		2.2					
66	1.18		2.14					
67	1.17		2.08					
68	1.16		2.02					
69	1.14		1.97					
70	1.13		1.92					
71	1.12		1.86					
72	1.11		1.81					
73	1.1		1.76					
74	1.09		1.71					
75	1.08		1.66					
76	1.07		1.62					
77	1.06		1.57					
78	1.05		1.53					
79	1.04		1.48					
80	1.03		1.44					
81	1.02		1.4					
82	1.01		1.36					
83	1		1.32					
84	0.99		1.29					
85	0.98		1.25					
86	0.97		1.22					
87	0.96		1.18					
88	0.95		1.15					
89	0.94		1.12					

Model	LGXS12 -5 Horizontal/ Wall hanging	LGXS12 -5 Vertical	LGXS12 -10 Horizontal/ Wall hanging	LGXS12 -10 Vertical	LGXS12 -20 Horizontal/ Wall hanging	LGXS12 -20 Vertical	LGXS12 -30 Horizontal/ Wall hanging	LGXS12 -30 Vertical
Payload [kg]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]	Acceleration/Deceleration [m/s <sup>2</sup> ]
90	0.94		1.09					
91	0.93		1.06					
92	0.92		1.03					
93	0.91		1.01					
94	0.9		0.98					
95	0.9		0.96					
96	0.89							
97	0.88							
98	0.87							
99	0.87							
100	0.86							
101	0.85							
102	0.84							
103	0.84							
104	0.83							
105	0.82							
106	0.82							
107	0.81							
108	0.81							
109	0.8							
110	0.79							
111	0.79							
112	0.78							
113	0.78							
114	0.77							
115	0.77							

Articulated robots  
YA

Linear conveyor  
modules  
LCM100

Motor-less single  
axis actuator  
Robonity

Compact  
single-axis robots  
TRANSEVO

Single-axis robots  
FLIP-X

Linear motor  
single-axis robots  
PHASER

Cartesian  
robots  
XY-X

SCARA  
robots  
YK-X

Pick & place  
robots  
YP-X

CLEAN

CONTROLLER  
INFORMATION

CABLE

TECHNICAL  
INFORMATION  
DISCONTINUED

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

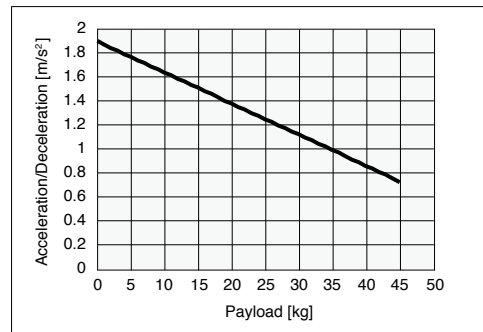
## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS12-5

Horizontal/  
Wall hanging

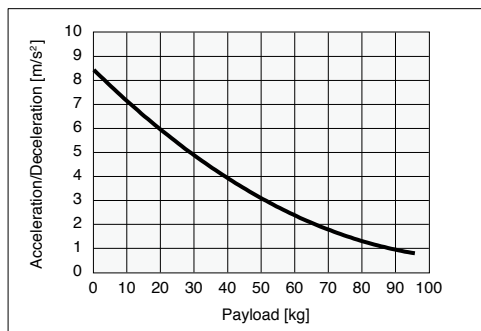


Vertical

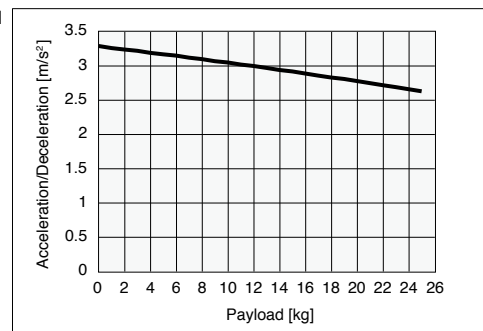


### LGXS12-10

Horizontal/  
Wall hanging



Vertical

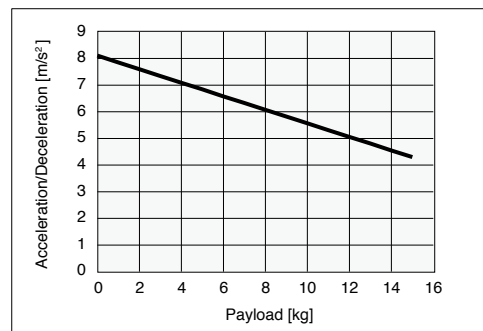


### LGXS12-20

Horizontal/  
Wall hanging

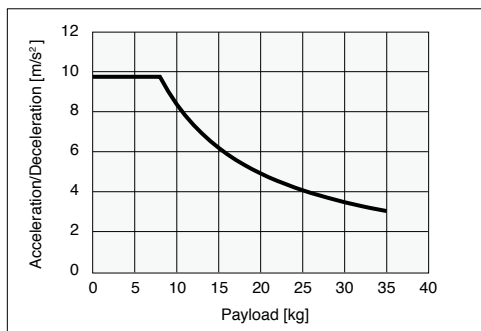


Vertical

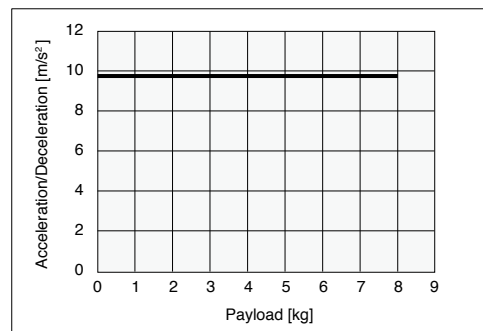


### LGXS12-30

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

### LGXS12

[kg·m <sup>2</sup> ×10 <sup>-4</sup> ]	Effective stroke [mm]																								
	Model	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
LGXS12-5	-	0.702	0.721	0.741	0.761	0.780	0.800	0.819	0.839	0.858	0.878	0.897	0.917	0.936	0.956	0.975	0.995	1.014	1.034	1.053	1.073	1.092	1.112	1.131	1.151
LGXS12-10	-	0.733	0.753	0.772	0.792	0.811	0.831	0.850	0.870	0.889	0.909	0.928	0.948	0.967	0.987	1.006	1.026	1.045	1.065	1.085	1.104	1.124	1.143	1.163	1.182
LGXS12-20	-	0.862	0.881	0.901	0.920	0.940	0.959	0.979	0.998	1.018	1.037	1.057	1.076	1.096	1.115	1.135	1.154	1.174	1.193	1.213	1.232	1.252	1.271	1.291	1.310
LGXS12-30	-	1.092	1.111	1.131	1.150	1.170	1.189	1.209	1.228	1.248	1.267	1.287	1.306	1.326	1.345	1.365	1.384	1.404	1.423	1.443	1.462	1.482	1.501	1.521	1.540



# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## Acceleration/Deceleration

### LGXS16

Model	LGXS16 -10	LGXS16 -10	LGXS16 -20	LGXS16 -20	LGXS16 -40	LGXS16 -40
	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical
Payload [kg]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]
0	5.07	3.8	7.6	7.99	9.6	9.6
1	5.04	3.74	7.48	7.73	9.6	9.02
2	5.01	3.69	7.36	7.47	9.6	8.45
3	4.99	3.64	7.25	7.22	9.6	7.87
4	4.96	3.59	7.14	6.97	9.6	7.3
5	4.94	3.54	7.03	6.72	9.6	6.74
6	4.91	3.49	6.93	6.47	9.6	6.17
7	4.89	3.44	6.83	6.22	9.6	5.61
8	4.86	3.39	6.73	5.97	9.6	5.04
9	4.84	3.34	6.64	5.73	9.6	4.48
10	4.81	3.29	6.55	5.48	9.6	3.92
11	4.79	3.24	6.46	5.24	9.18	3.36
12	4.76	3.19	6.37	5	8.8	2.81
13	4.74	3.14	6.29	4.76	8.45	
14	4.71	3.09	6.2	4.53	8.13	
15	4.68	3.04	6.12	4.29	7.83	
16	4.66	2.99	6.05	4.05	7.55	
17	4.63	2.94	5.97	3.82	7.3	
18	4.61	2.89	5.9	3.59	7.05	
19	4.58	2.83	5.82	3.36	6.83	
20	4.56	2.78	5.75	3.13	6.62	
21	4.53	2.73	5.68	2.9	6.42	
22	4.51	2.68	5.62	2.68	6.23	
23	4.48	2.63	5.55	2.45	6.05	
24	4.46	2.58	5.49	2.23	5.88	
25	4.43	2.53	5.42	2.01	5.73	
26	4.41	2.48	5.36	1.79	5.58	
27	4.38	2.43	5.3	1.57	5.43	
28	4.36	2.38	5.24	1.35	5.3	
29	4.33	2.33	5.19		5.17	
30	4.3	2.28	5.13		5.05	
31	4.28	2.23	5.08		4.93	
32	4.25	2.18	5.02		4.82	
33	4.23	2.13	4.97		4.71	
34	4.2	2.08	4.92		4.61	
35	4.18	2.03	4.87		4.51	
36	4.15	1.98	4.82		4.42	
37	4.13	1.93	4.77		4.33	
38	4.1	1.87	4.72		4.24	
39	4.08	1.82	4.67		4.16	
40	4.05	1.77	4.63		4.08	
41	4.03	1.72	4.58		4	
42	4	1.67	4.54		3.93	
43	3.97	1.62	4.5		3.86	
44	3.95	1.57	4.46		3.79	
45	3.92	1.52	4.41		3.72	
46	3.9	1.47	4.37			
47	3.87	1.42	4.33			
48	3.85	1.37	4.29			
49	3.82	1.32	4.26			
50	3.8	1.27	4.22			
51	3.77	1.22	4.18			
52	3.75	1.17	4.14			
53	3.72	1.12	4.11			
54	3.7	1.07	4.07			
55	3.67	1.02	4.04			
56	3.65		4			
57	3.62		3.97			
58	3.59		3.94			
59	3.57		3.9			
60	3.54		3.87			
61	3.52		3.84			
62	3.49		3.81			
63	3.47		3.78			
64	3.44		3.75			
65	3.42		3.72			
66	3.39		3.69			
67	3.37		3.66			
68	3.34		3.63			
69	3.32		3.61			
70	3.29		3.58			
71	3.27		3.55			
72	3.24		3.53			
73	3.21		3.5			
74	3.19		3.47			
75	3.16		3.45			
76	3.14		3.42			
77	3.11		3.4			
78	3.09		3.38			
79	3.06		3.35			
80	3.04		3.33			
81	3.01		3.31			
82	2.99		3.28			
83	2.96		3.26			
84	2.94		3.24			
85	2.91		3.22			
86	2.88		3.19			
87	2.86		3.17			
88	2.83		3.15			
89	2.81		3.13			

Model	LGXS16 -10	LGXS16 -10	LGXS16 -20	LGXS16 -20	LGXS16 -40	LGXS16 -40
	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical
Payload [kg]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]
90	2.78				3.11	
91	2.76				3.09	
92	2.73				3.07	
93	2.71				3.05	
94	2.68				3.03	
95	2.66				3.01	
96	2.63					
97	2.61					
98	2.58					
99	2.56					
100	2.53					
101	2.5					
102	2.48					
103	2.45					
104	2.43					
105	2.4					
106	2.38					
107	2.35					
108	2.33					
109	2.3					
110	2.28					
111	2.25					
112	2.23					
113	2.2					
114	2.18					
115	2.15					
116	2.12					
117	2.1					
118	2.07					
119	2.05					
120	2.02					
121	2					
122	1.97					
123	1.95					
124	1.92					
125	1.9					
126	1.87					
127	1.85					
128	1.82					
129	1.79					
130	1.77					

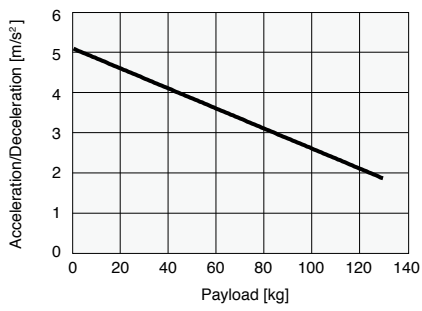
Articulated robots  
YA  
Linear conveyor  
modules  
LCM100  
Motor-less single  
axis actuator  
Robonity  
Compact  
single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor  
single-axis robots  
PHASER  
Cartesian  
robots  
XY-X  
SCARA  
robots  
YK-X  
Pick & place  
robots  
YP-X  
CLEAN  
CONTROLLER  
INFORMATION  
CABLE  
TECHNICAL  
INFORMATION  
DISCONTINUED

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

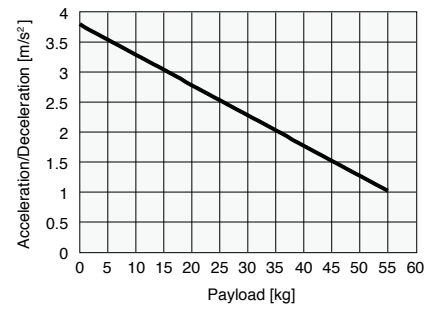
## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS16-10

Horizontal/  
Wall hanging

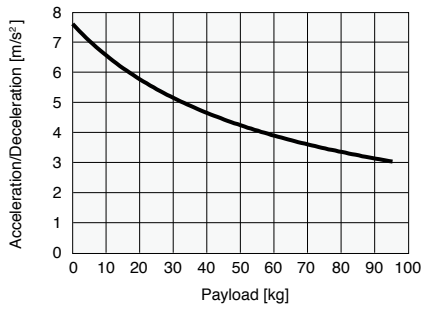


Vertical

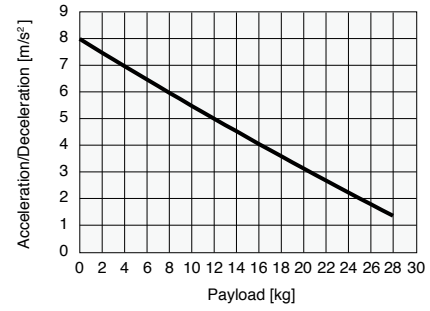


### LGXS16-20

Horizontal/  
Wall hanging

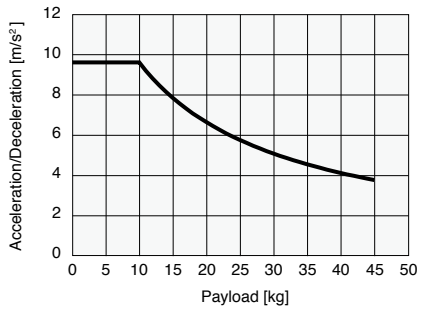


Vertical



### LGXS16-40

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

### LGXS16

Model	Effective stroke [mm]																												
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450
LGXS16-10	-	2.433	2.495	2.557	2.618	2.680	2.742	2.803	2.865	2.927	2.988	3.050	3.112	3.173	3.235	3.297	3.358	3.420	3.482	3.543	3.605	3.667	3.728	3.790	3.851	3.913	3.975	4.036	4.098
LGXS16-20	-	2.653	2.715	2.777	2.838	2.900	2.961	3.023	3.085	3.146	3.208	3.270	3.331	3.393	3.455	3.516	3.578	3.640	3.701	3.763	3.825	3.886	3.948	4.010	4.071	4.133	4.195	4.256	4.318
LGXS16-40	-	3.624	3.685	3.747	3.809	3.870	3.932	3.994	4.055	4.117	4.179	4.240	4.302	4.364	4.425	4.487	4.548	4.610	4.672	4.733	4.795	4.857	4.918	4.980	5.042	5.103	5.165	5.227	5.288

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## Acceleration/Deceleration

### LGXS20

Model	LGXS20 -10	LGXS20 -10	LGXS20 -20	LGXS20 -20	LGXS20 -40	LGXS20 -40
	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical
Payload [kg]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]
0	2.5	3.8	7.8	9.95	9.61	9.61
1	2.5	3.74	7.7	9.67	9.61	9.12
2	2.5	3.69	7.61	9.4	9.61	8.64
3	2.5	3.64	7.52	9.13	9.61	8.16
4	2.5	3.59	7.43	8.86	9.61	7.68
5	2.5	3.54	7.34	8.59	9.61	7.2
6	2.5	3.49	7.25	8.32	9.61	6.72
7	2.5	3.44	7.16	8.05	9.61	6.24
8	2.5	3.39	7.07	7.78	9.61	5.76
9	2.5	3.34	6.98	7.51	9.61	5.28
10	2.5	3.29	6.89	7.24	9.2	4.8
11	2.5	3.24	6.81	6.97	8.83	4.32
12	2.5	3.19	6.72	6.7	8.48	3.84
13	2.5	3.14	6.64	6.43	8.17	3.36
14	2.5	3.09	6.55	6.16	7.87	2.88
15	2.5	3.04	6.47	5.89	7.6	2.4
16	2.5	2.99	6.39	5.62	7.34	
17	2.5	2.94	6.31	5.35	7.1	
18	2.5	2.89	6.23	5.08	6.88	
19	2.5	2.83	6.15	4.81	6.67	
20	2.5	2.78	6.07	4.54	6.47	
21	2.5	2.73	5.99	4.27	6.28	
22	2.5	2.68	5.91	4	6.11	
23	2.5	2.63	5.83	3.73	5.94	
24	2.5	2.58	5.76	3.46	5.78	
25	2.5	2.53	5.68	3.19	5.63	
26	2.5	2.48	5.6	2.92	5.49	
27	2.5	2.43	5.53	2.65	5.36	
28	2.5	2.38	5.46	2.38	5.23	
29	2.5	2.33	5.38	2.11	5.11	
30	2.5	2.28	5.31	1.84	4.99	
31	2.5	2.23	5.24	1.57	4.88	
32	2.5	2.18	5.17	1.3	4.77	
33	2.5	2.13	5.1	1.03	4.67	
34	2.5	2.08	5.03	0.76	4.57	
35	2.5	2.03	4.96	0.5	4.48	
36	2.44	1.98	4.89		4.39	
37	2.38	1.93	4.82		4.3	
38	2.33	1.87	4.76		4.22	
39	2.28	1.82	4.69		4.14	
40	2.23	1.77	4.63		4.06	
41	2.18	1.72	4.56		3.99	
42	2.14	1.67	4.5		3.91	
43	2.09	1.62	4.43		3.85	
44	2.05	1.57	4.37		3.78	
45	2.01	1.52	4.31		3.71	
46	1.97	1.47	4.25		3.65	
47	1.94	1.42	4.19		3.59	
48	1.9	1.37	4.13		3.53	
49	1.87	1.32	4.07		3.48	
50	1.83	1.27	4.01		3.42	
51	1.8	1.22	3.95		3.37	
52	1.77	1.17	3.9		3.32	
53	1.74	1.12	3.84		3.27	
54	1.71	1.07	3.79		3.22	
55	1.68	1.02	3.73		3.17	
56	1.66	0.96	3.68		3.13	
57	1.63	0.91	3.63		3.08	
58	1.61	0.86	3.57		3.04	
59	1.58	0.81	3.52		3	
60	1.56	0.76	3.47		2.96	
61	1.53	0.71	3.42		2.92	
62	1.51	0.66	3.37		2.88	
63	1.49	0.61	3.32		2.84	
64	1.47	0.56	3.27		2.8	
65	1.45	0.51	3.23		2.77	
66	1.43		3.18			
67	1.41		3.13			
68	1.39		3.09			
69	1.37		3.04			
70	1.35		3			
71	1.34		2.96			
72	1.32		2.92			
73	1.3		2.87			
74	1.29		2.83			
75	1.27		2.79			
76	1.26		2.75			
77	1.24		2.72			
78	1.23		2.68			
79	1.21		2.64			
80	1.2		2.6			
81	1.18		2.57			
82	1.17		2.53			
83	1.16		2.5			
84	1.14		2.46			
85	1.13		2.43			
86	1.12		2.4			
87	1.11		2.37			
88	1.1		2.34			
89	1.08		2.31			

Model	LGXS20 -10	LGXS20 -10	LGXS20 -20	LGXS20 -20	LGXS20 -40	LGXS20 -40
	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical	Horizontal/ Wall hanging	Vertical
Payload [kg]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]	Acceleration/ Deceleration [m/s <sup>2</sup> ]
90	1.07		2.28			
91	1.06		2.25			
92	1.05		2.22			
93	1.04		2.19			
94	1.03		2.17			
95	1.02		2.14			
96	1.01		2.12			
97	1		2.09			
98	0.99		2.07			
99	0.98		2.05			
100	0.97		2.02			
101	0.96		2			
102	0.95		1.98			
103	0.94		1.96			
104	0.94		1.94			
105	0.93		1.92			
106	0.92		1.9			
107	0.91		1.89			
108	0.9		1.87			
109	0.9		1.86			
110	0.89		1.84			
111	0.88		1.83			
112	0.87		1.81			
113	0.87		1.8			
114	0.86		1.79			
115	0.85		1.78			
116	0.84		1.77			
117	0.84		1.76			
118	0.83		1.75			
119	0.82		1.74			
120	0.82		1.73			
121	0.81		1.72			
122	0.8		1.72			
123	0.8		1.71			
124	0.79		1.71			
125	0.79		1.7			
126	0.78		1.7			
127	0.77		1.69			
128	0.77		1.69			
129	0.76		1.69			
130	0.76		1.69			
131	0.75					
132	0.75					
133	0.74					
134	0.74					
135	0.73					
136	0.73					
137	0.72					
138	0.72					
139	0.71					
140	0.71					
141	0.7					
142	0.7					
143	0.69					
144	0.69					
145	0.68					
146	0.68					
147	0.67					
148	0.67					
149	0.66					
150	0.66					
151	0.66					
152	0.65					
153	0.65					
154	0.64					
155	0.64					
156	0.64					
157	0.63					
158	0.63					
159	0.62					
160	0.62					

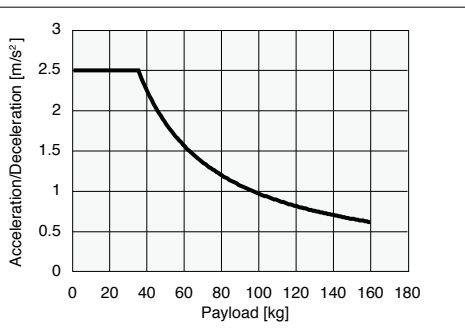
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YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER  
INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

# Robonity Acceleration/Deceleration and Inertia Moment (Advanced model)

## ■ Payload – Acceleration/Deceleration Graph (Estimate)

### LGXS20-10

Horizontal/  
Wall hanging

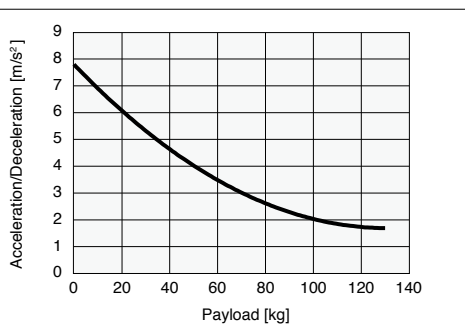


Vertical

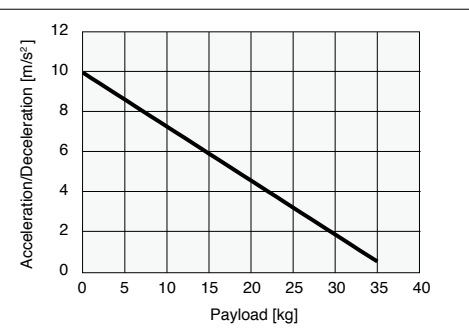


### LGXS20-20

Horizontal/  
Wall hanging

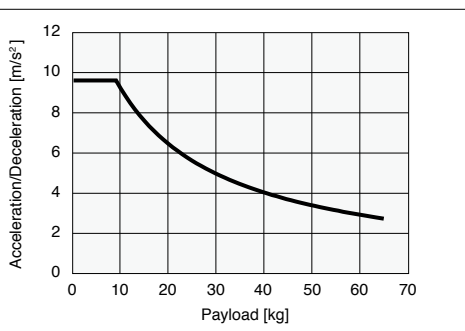


Vertical

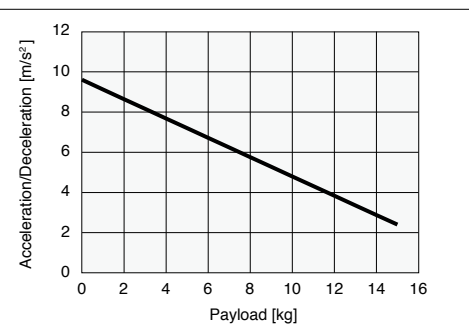


### LGXS20-40

Horizontal/  
Wall hanging



Vertical



## ■ Inertia Moment

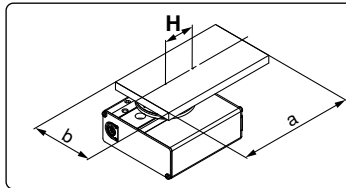
### LGXS20

Model	Effective stroke [mm]																												
	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450
LGXS20-10	-	2.524	2.585	2.647	2.709	2.770	2.832	2.894	2.955	3.017	3.079	3.140	3.202	3.264	3.325	3.387	3.448	3.510	3.572	3.633	3.695	3.757	3.818	3.880	3.942	4.003	4.065	4.127	4.188
LGXS20-20	-	2.863	2.924	2.986	3.048	3.109	3.171	3.232	3.294	3.356	3.417	3.479	3.541	3.602	3.664	3.726	3.787	3.849	3.911	3.972	4.034	4.096	4.157	4.219	4.281	4.342	4.404	4.466	4.527
LGXS20-40	-	4.309	4.371	4.433	4.494	4.556	4.618	4.679	4.741	4.803	4.864	4.926	4.988	5.049	5.111	5.173	5.234	5.296	5.357	5.419	5.481	5.542	5.604	5.666	5.727	5.789	5.851	5.912	5.974

# TRANSERVO RF type model selection

## Selecting a model

### Operating conditions



Rotary type: RF03  
 Installation posture: Horizontal  
 Kind of load: Inertial load  $T_a$   
 Shape of load: 150 mm x 80 mm  
 (rectangular plate)  
 Oscillating angle  $\theta$ : 180°

Acceleration/deceleration  $\dot{\omega}$ : 1,000 °/sec<sup>2</sup>  
 Speed  $\omega$ : 420 °/sec  
 Load mass  $m$ : 2.0 kg  
 Distance between shaft and center of gravity  $H$ : 40 mm

### Step 1 Moment of inertia Acceleration/deceleration

- Calculating the moment of inertia.
- Checking the moment of inertia vs. acceleration/deceleration. Select an appropriate model from the moment of inertia vs. acceleration/deceleration while referring to the moment of inertia vs. acceleration/deceleration graph.

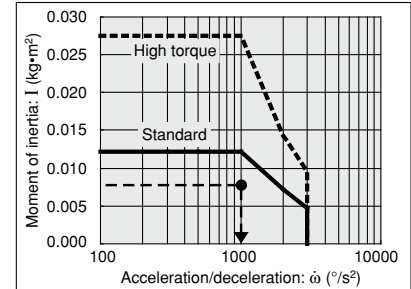
#### Calculation formula

$$I = m \times (a^2 + b^2) / 12 + m \times H^2$$

#### Selection example

$$I = 2.0 \times (0.15^2 + 0.08^2) / 12 + 2.0 \times 0.04^2 = 0.00802 \text{ kg} \cdot \text{m}^2$$

RF03



### Step 2 Selecting a torque

- Kinds of loads
  - Static load:  $T_s$
  - Resistance load:  $T_f$
  - Inertial load:  $T_a$
- Checking the effective torque  
 Check that the speed can be controlled by the effective torque by the speed while referring to the effective torque vs. speed graph.

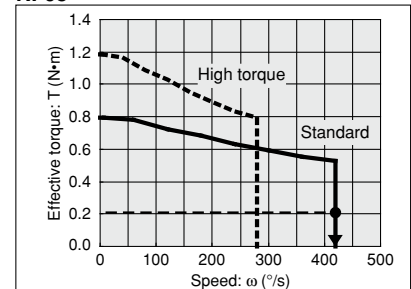
#### Calculation formula

$$\begin{aligned} \text{Effective torque} &\geq T_s \\ \text{Effective torque} &\geq T_f \times 1.5 \\ \text{Effective torque} &\geq T_a \times 1.5 \end{aligned}$$

#### Selection example

$$\begin{aligned} \text{Inertial load: } T_a \\ T_a \times 1.5 &= I \times \dot{\omega} \times 2\pi / 360 \times 1.5 \\ &= 0.00802 \times 1,000 \times 0.0175 \times 1.5 \\ &= 0.21 \text{ N} \cdot \text{m} \end{aligned}$$

RF03



### Step 3 Allowable load

- Checking the allowable load
  - Radial load
  - Thrust load
  - Moment

#### Calculation formula

$$\begin{aligned} \text{Allowable thrust load} &\geq m \times 9.8 \\ \text{Allowable moment} &\geq m \times 9.8 \times H \end{aligned}$$

#### Selection example

$$\begin{aligned} \text{Thrust load} \\ 2.0 \times 9.8 &= 19.6 \text{ N} < \text{Allowable load OK} \\ \text{Allowable moment} \\ 2.0 \times 9.8 \times 0.04 &= 0.784 \text{ N} \cdot \text{m} < \text{Allowable moment OK} \end{aligned}$$

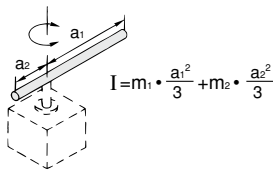
Articulated robots  
 YA  
 Linear conveyor modules  
 LCM100  
 Motor-less single axis actuator  
 Robonity  
 Compact single-axis robots  
 TRANSERVO  
 Single-axis robots  
 FLIP-X  
 Linear motor single-axis robots  
 PHASER  
 Cartesian robots  
 XX-X  
 SCARA robots  
 YK-X  
 Pick & place robots  
 YP-X  
 CLEAN  
 CONTROLLER  
 INFORMATION  
 CABLE  
 TECHNICAL INFORMATION  
 DISCONTINUED

# List of moment of inertia calculation formulas (Calculation of moment of inertia I)

I: Moment of inertia m: Load mass

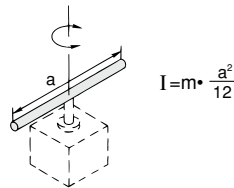
## 1 Thin rod

Position of rotation axis:  
Passes through one end perpendicularly to the rod.



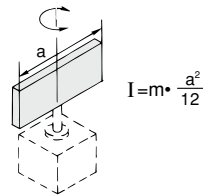
## 2 Thin rod

Position of rotation axis:  
Passes through the center of gravity of the rod.



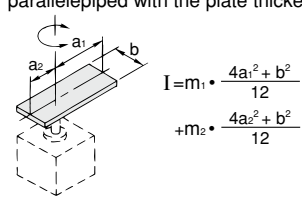
## 3 Thin rectangular plate (rectangular parallelepiped)

Position of rotation axis:  
Passes through the center of gravity of the rod.



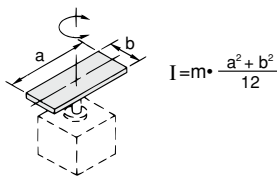
## 4 Thin rectangular plate (rectangular parallelepiped)

Position of rotation axis:  
Passes through one end perpendicularly to the plate.  
(Same position for the rectangular parallelepiped with the plate thickened.)



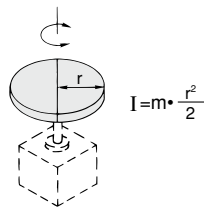
## 5 Thin rectangular plate (rectangular parallelepiped)

Position of rotation axis:  
Passes through one end perpendicularly to the plate.  
(Same position for the rectangular parallelepiped with the plate thickened.)



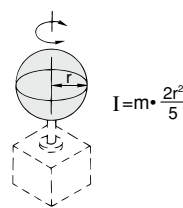
## 6 Cylinder (including thin disc)

Position of rotation axis:  
Central axis



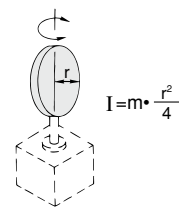
## 7 Solid ball

Position of rotation axis:  
Diameter

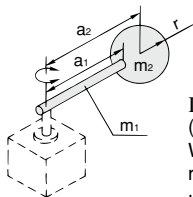


## 8 Thin disc

Position of rotation axis:  
Diameter

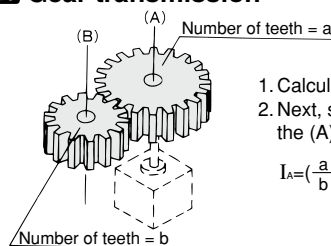


## 9 Load at lever tip



$I = m_1 \cdot \frac{a_1^2}{3} + m_2 \cdot a_2^2 + K$   
(Example)  
When the shape of  $m_2$  is a ball, refer to [7] to obtain the following.  
 $K = m_2 \cdot \frac{2r^2}{5}$

## 10 Gear transmission



1. Calculate the moment of inertia  $I_B$  around the (B) axis.
2. Next, substitute  $I_B$  for the moment of inertia around the (A) axis to calculate  $I_A$  as follows.

$$I_A = \left(\frac{a}{b}\right)^2 \cdot I_B$$

# Kinds of loads

Kinds of loads		
Static load: Ts	Resistance load: Tf	Inertial load: Ta
Only push force is needed (clamp, etc.).	Gravity or friction force applies in the rotation direction.	Load with inertia needs to be rotated.
	<Gravity applies.> <Friction force applies.>	<Rotation center matches to the gravity of the load.> <Rotation axis is in the vertical direction.>
$T_s = F \cdot L$ Ts : Static load (N·m) F : Clamp force (N) L : Distance from oscillating center to clamp position (m)	Gravity applies in the rotation direction. $T_f = m \cdot g \cdot L$ Friction force applies in the rotation direction. $T_f = \mu \cdot m \cdot g \cdot L$ Tf : Resistance load (N·m) m : Mass of load (kg) g : Gravity acceleration 9.8 (m/s <sup>2</sup> ) L : Distance from oscillating center to gravity or friction force action point (m) μ : Friction coefficient	$T_a = I \cdot \dot{\omega} \cdot 2\pi / 360$ $(T_a = I \cdot \dot{\omega} \cdot 0.0175)$ Ta: Inertial load (N·m) I : Moment of inertia (kg·m <sup>2</sup> ) ω̇ : Acceleration/deceleration (°/sec <sup>2</sup> ) ω : Speed (°/sec)
Required torque T = Ts	Required torque T = Tf × 1.5 (Note 1)	Required torque T = Ta × 1.5 (Note 1)
<ul style="list-style-type: none"> <li>• Load becomes the resistance load. Gravity or friction force applies in the rotation direction.                              Example 1) The rotation center of the rotation axis does not match to the center of gravity of the load in the horizontal direction.                              Example 2) The load slips on the floor to move it. The required torque is the total of the resistance load and inertial load.  <math>T = (T_f + T_a) \times 1.5</math> </li> <li>• Load does not become the resistance load. Gravity or friction force does not apply in the rotation direction.                              Example 1) The rotation axis is vertical.                              Example 2) The rotation center of the rotation axis does not match to the center of gravity of the load in the horizontal direction.                              The required torque is only the inertial load.  <math>T = T_a \times 1.5</math>                              Note 1) An allowance is required for Tf and Ta to make the speed adjustment.                         </li> </ul>		

# R-axis tolerable moment of inertia and acceleration coefficient

## How to find the inertia moment

The tool and work are not usually a simple shape so calculating the inertia moment is not easy.

As a method, the load is replaced with several factors that resemble a simple form for which the moment of inertia can be calculated. The total of the moment of inertia for these factors is then obtained. The objects and equations often used for the calculation of the moment of inertia are shown below. Incidentally, there is the following relation:  $J \text{ (kgfcmsec}^2\text{)} = I \text{ (kgm}^2\text{)} \times 10.2$

### [1] Moment of inertia for material particle

The equation for the moment of inertia for a material particle that has a rotation center such as shown in Fig. ①

① is as follows: This is used as an approximate equation when  $x$  is larger than the object size.

$$I = mx^2 \text{ (kgm}^2\text{)}$$

$$J = \frac{Wx^2}{g} \text{ (kgfcmsec}^2\text{)} \quad \dots (3.1)$$

$g$  : Gravitational acceleration (cm/sec<sup>2</sup>)  
 $m$  : Mass of material particle (kg)  
 $W$  : Weight of material particle (kgf)

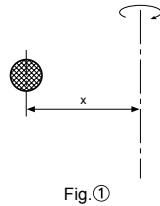


Fig.①

### [2] Moment of inertia for cylinder (part 1)

The equation for the moment of inertia for a cylinder that has a rotation center such as shown in Fig. ② is given below.

$$I = \frac{\rho \pi D^4 h}{32} = \frac{mD^2}{8} \text{ (kgm}^2\text{)}$$

$$J = \frac{\rho \pi D^4 h}{32g} = \frac{WD^2}{8g} \text{ (kgfcmsec}^2\text{)} \quad \dots (3.2)$$

$\rho$  : Density (kg/m<sup>3</sup>, kg/cm<sup>3</sup>)  
 $g$  : Gravitational acceleration (cm/sec<sup>2</sup>)  
 $m$  : Mass of cylinder (kg)  
 $W$  : Weight of cylinder (kgf)

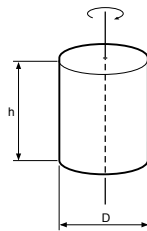


Fig.②

### [3] Moment of inertia for cylinder (part 2)

The equation for the moment of inertia for a cylinder that has a rotation center such as shown in Fig. ③ is given below.

$$I = \frac{\rho \pi D^3 h}{16} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) = \frac{m}{4} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) \text{ (kgm}^2\text{)}$$

$$J = \frac{\rho \pi D^3 h}{16g} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) = \frac{W}{4g} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) \text{ (kgfcmsec}^2\text{)} \quad \dots (3.3)$$

$\rho$  : Density (kg/m<sup>3</sup>, kg/cm<sup>3</sup>)  
 $g$  : Gravitational acceleration (cm/sec<sup>2</sup>)  
 $m$  : Mass of cylinder (kg)  
 $W$  : Weight of cylinder (kgf)

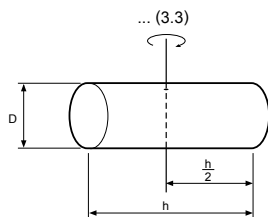


Fig.③

### [4] Moment of inertia for prism

The equation for the moment of inertia for a prism that has a rotation center as shown in Fig. ④ is given as follows.

$$I = \frac{\rho abc (a^2 + b^2)}{12} = \frac{m (a^2 + b^2)}{12} \text{ (kgm}^2\text{)}$$

$$J = \frac{\rho abc (a^2 + b^2)}{12g} = \frac{W (a^2 + b^2)}{12g} \text{ (kgfcmsec}^2\text{)} \quad \dots (3.4)$$

$\rho$  : Density (kg/m<sup>3</sup>, kg/cm<sup>3</sup>)  
 $g$  : Gravitational acceleration (cm/sec<sup>2</sup>)  
 $m$  : Mass of prism (kg)  
 $W$  : Weight of prism (kgf)

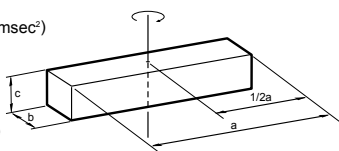


Fig.④

### [5] When the object's center line is offset from the rotation center

The equation for the moment of inertia, when the center of the cylinder is offset by the distance "x" from the rotation center as shown in Fig. ⑤, is given as follows.

$$I = \frac{\rho \pi D^4 h}{32} + \frac{\rho \pi D^2 hx^2}{4} = \frac{mD^2}{8} + mx^2 \text{ (kgm}^2\text{)}$$

$$J = \frac{\rho \pi D^4 h}{32g} + \frac{\rho \pi D^2 hx^2}{4g}$$

$$= \frac{WD^2}{8g} + \frac{Wx^2}{g} \text{ (kgfcmsec}^2\text{)} \quad \dots (3.5)$$

$\rho$  : Density (kg/m<sup>3</sup>, kg/cm<sup>3</sup>)  
 $g$  : Gravitational acceleration (cm/sec<sup>2</sup>)  
 $m$  : Mass of cylinder (kg)  
 $W$  : Weight of cylinder (kgf)

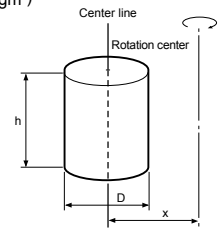


Fig.⑤

In the same manner, the moment of inertia of a cylinder as shown in Fig. ⑥ is given by

$$I = \frac{\rho \pi D^3 h}{16} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) + \frac{\rho \pi D^2 hx^2}{4} = \frac{m}{4} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) + mx^2 \text{ (kgm}^2\text{)}$$

$$J = \frac{\rho \pi D^3 h}{16g} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) + \frac{\rho \pi D^2 hx^2}{4g}$$

$$= \frac{W}{4g} \left( \frac{D^2}{4} + \frac{h^2}{3} \right) + \frac{Wx^2}{g} \text{ (kgfcmsec}^2\text{)} \quad \dots (3.6)$$

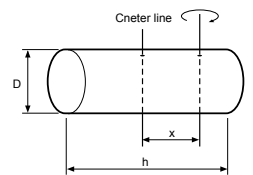


Fig.⑥

In the same manner, the moment of inertia of a prism as shown in Fig. ⑦ is given by

$$I = \frac{\rho abc (a^2 + b^2)}{12} + \rho abc x^2 = \frac{m (a^2 + b^2)}{12} + mx^2 \text{ (kgm}^2\text{)}$$

$$J = \frac{\rho abc (a^2 + b^2)}{12g} + \frac{\rho abc x^2}{g}$$

$$= \frac{W (a^2 + b^2)}{12g} + \frac{Wx^2}{g} \text{ (kgfcmsec}^2\text{)} \quad \dots (3.7)$$

$m$  : Mass of prism (kg)  
 $W$  : Weight of prism (kgf)

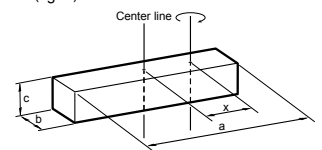


Fig.⑦

Articulated robots  
 YA  
 Linear conveyor modules  
 LCM100  
 Motor-less single axis actuator  
 Robonity  
 Compact single-axis robots  
 TRANSEMO  
 Single-axis robots  
 FLIP-X  
 Linear motor single-axis robots  
 PHASER  
 Cartesian robots  
 XX-X  
 SCARA robots  
 YK-X  
 Pick & place robots  
 YP-X  
 CLEAN  
 CONTROLLER INFORMATION  
 CABLE  
 TECHNICAL INFORMATION  
 DISCONTINUED

## Example of moment of inertia calculation

Let's discuss an example in which the chuck and workpiece are at a position offset by 10cm from the R-axis by a stay, as shown in Fig. ⑧. The moment of inertia is calculated with the following three factors, assuming that the load material is steel and its density  $\rho$  is  $0.0078\text{kg/cm}^3$ .

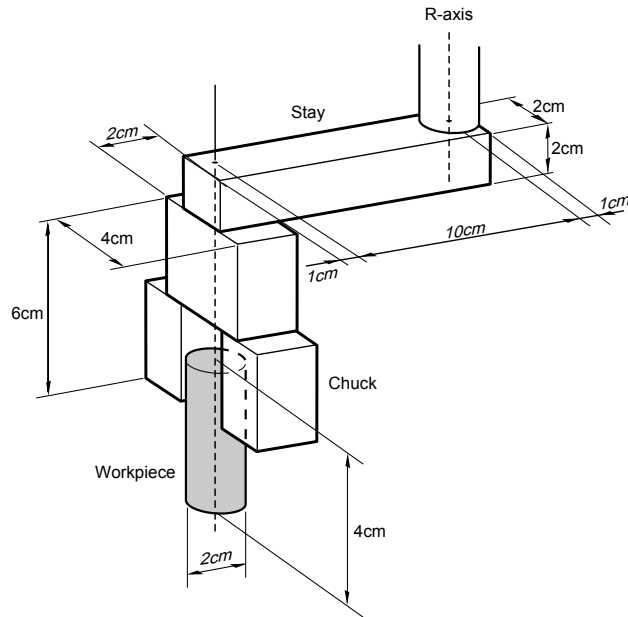


Fig. ⑧

### [1] Moment of inertia of the stay

From Fig. ⑨, the weight of the stay ( $W_s$ ) is given as follows :

$$W_s = \rho abc = 0.0078 \times 12 \times 2 \times 2 = 0.37 \text{ (kgf)}$$

The moment of inertia of the stay ( $J_s$ ) is then calculated from Eq. 3-7.

$$J_s = \frac{0.37 \times (12^2 + 2^2)}{12 \times 980} + \frac{0.37 \times 5^2}{980} = 0.014 \text{ (kgfcmsec}^2\text{)}$$

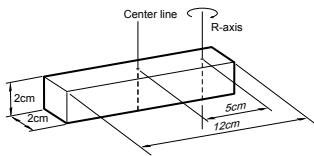


Fig. ⑨

### [4] Total weight

$$W = W_s + W_c + W_w = 0.84 \text{ (kgf)}$$

### [5] Total moment of inertia

$$J = J_s + J_c + J_w = 0.062 \text{ (kgfcmsec}^2\text{)}$$

### [2] Moment of inertia of the chuck

When the chuck form resembles that shown in Fig. ⑩, the weight of the chuck ( $W_c$ ) is

$$W_c = 0.0078 \times 2 \times 4 \times 6 = 0.37 \text{ (kgf)}$$

The moment of inertia of the chuck ( $J_c$ ) is then calculated from Eq. 3-7.

$$J_c = \frac{0.37 \times (2^2 + 4^2)}{12 \times 980} + \frac{0.37 \times 10^2}{980} = 0.038 \text{ (kgfcmsec}^2\text{)}$$

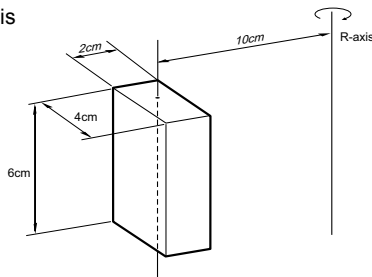


Fig. ⑩

### [3] Moment of inertia of workpiece

When the workpiece form resembles that shown in Fig. ⑪, the weight of the workpiece ( $W_w$ ) is

$$W_w = \frac{\rho \pi D^2 h}{4} = \frac{0.0078 \pi \times 2^2 \times 4}{4} = 0.098 \text{ (kgf)}$$

The moment of inertia of the workpiece ( $J_w$ ) is then calculated from Eq. 3-5.

$$J_w = \frac{0.097 \times 2^2}{8 \times 980} + \frac{0.097 \times 10^2}{980} = 0.010 \text{ (kgfcmsec}^2\text{)}$$

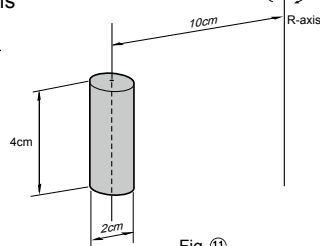


Fig. ⑪



# External safety circuit examples

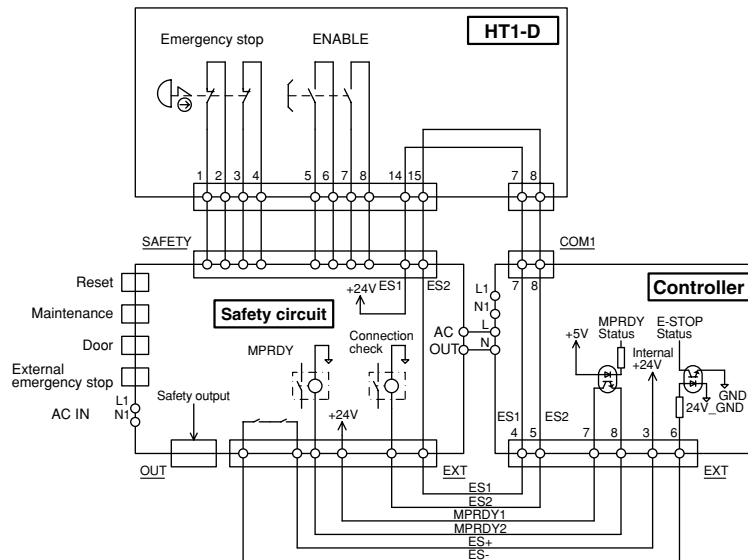
To ensure safe use of the robot, we request the customers make a risk assessment of their end equipment to decide what performance level is needed from safety circuits at the point. Customer should then install a safety circuit at the required performance level.

Here we show examples of category 4 circuits for the TS-X/TS-P, SR1 and RCX240 controllers using a programming box with an enable switch.

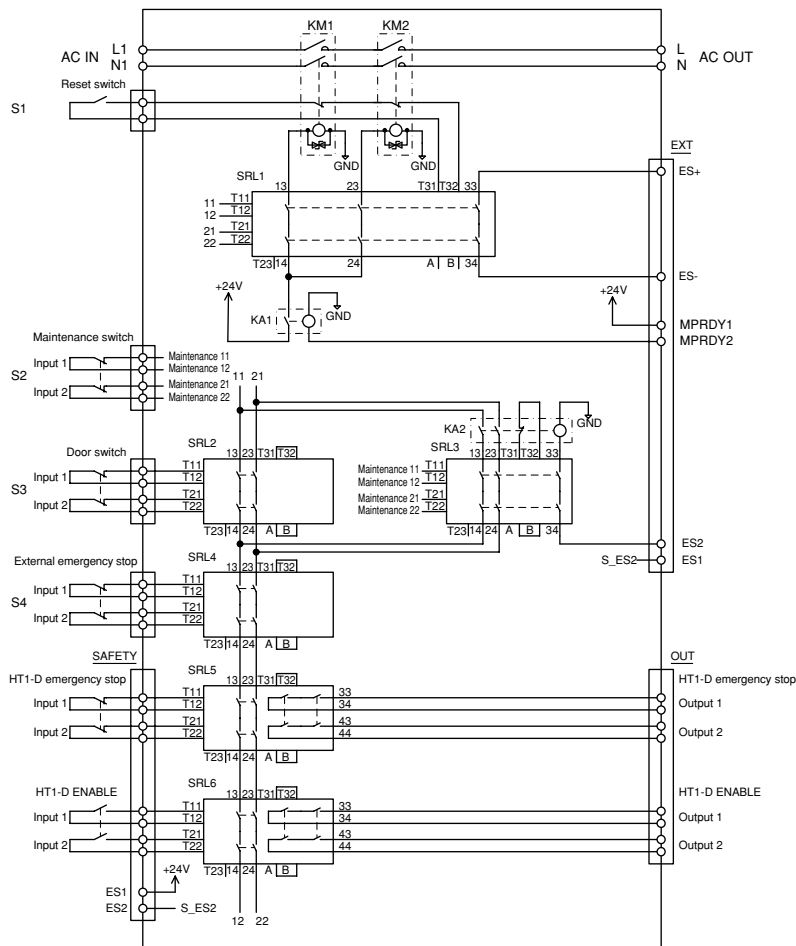
Safety circuits for other categories are described in the user's manuals, so download them from our website if needed.

## Circuit configuration examples (TS-X/TS-P)

### General connection diagram



### Category 4



Articulated robots  
YA

Linear conveyor modules  
LCM100

Motor-less single axis actuator  
Robonity

Compact single-axis robots  
TRANSEVO

Single-axis robots  
FLIP-X

Linear motor single-axis robots  
PHASER

Cartesian robots  
XX-X

SCARA robots  
YK-X

Pick & place robots  
YP-X

Linear motor  
CLEAN

CONTROLLER INFORMATION

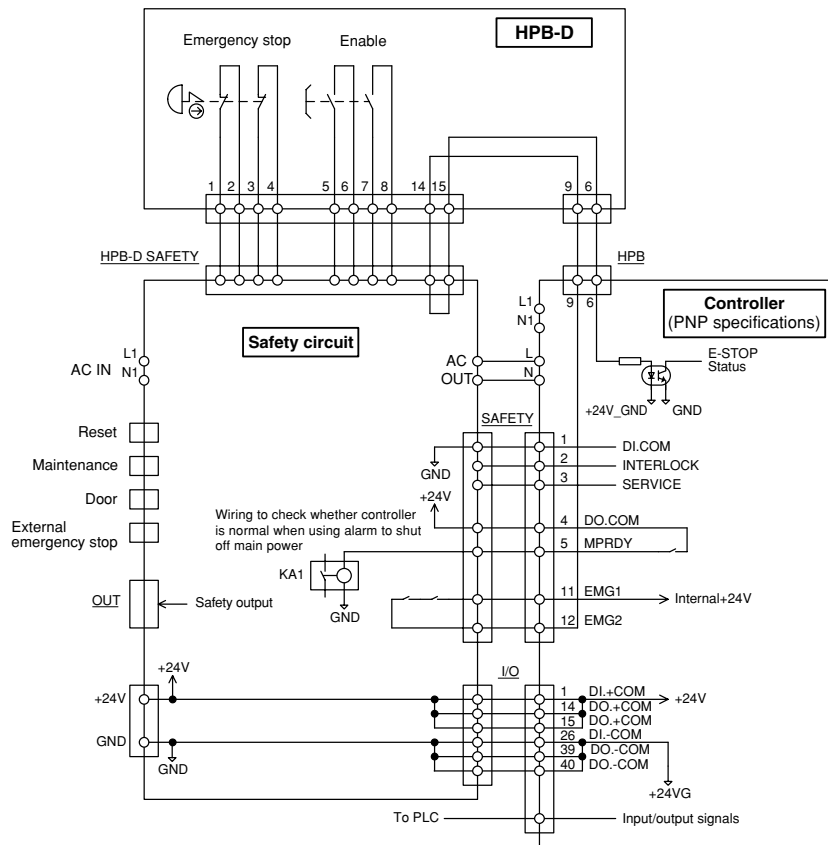
CABLE

TECHNICAL INFORMATION

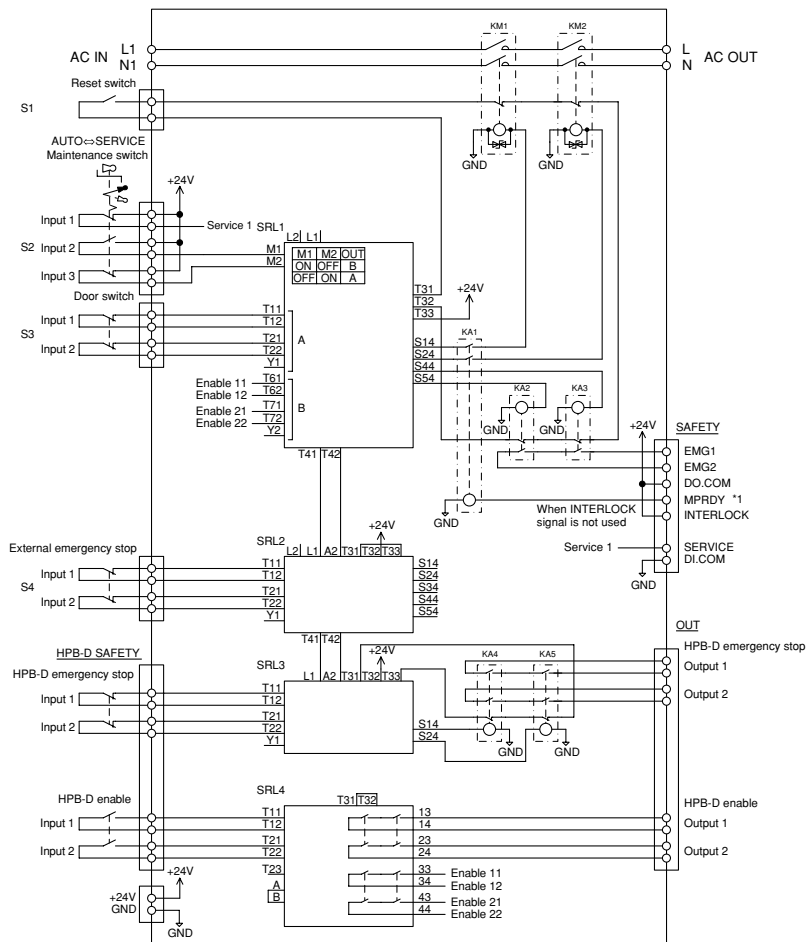
DISCONTINUED

# Circuit configuration examples (SR1)

## General connection diagram



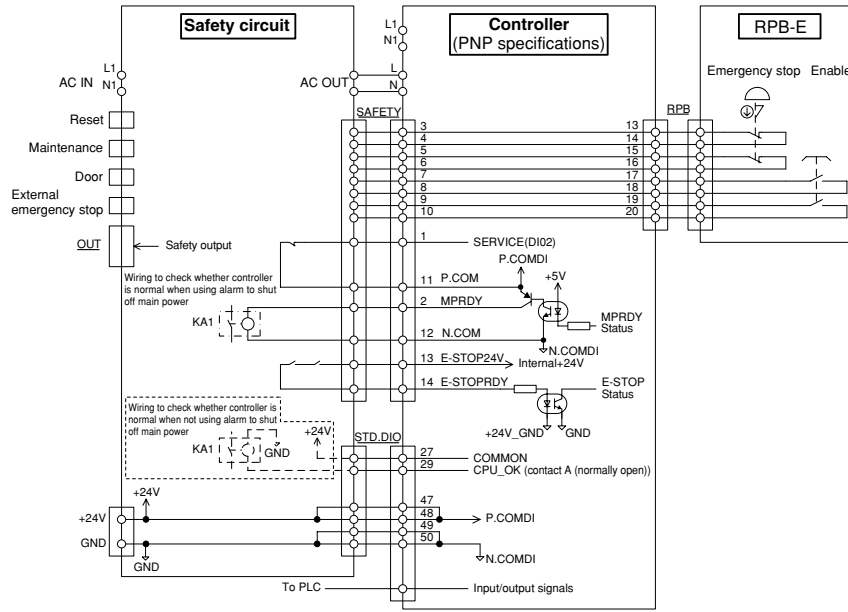
## Category 4



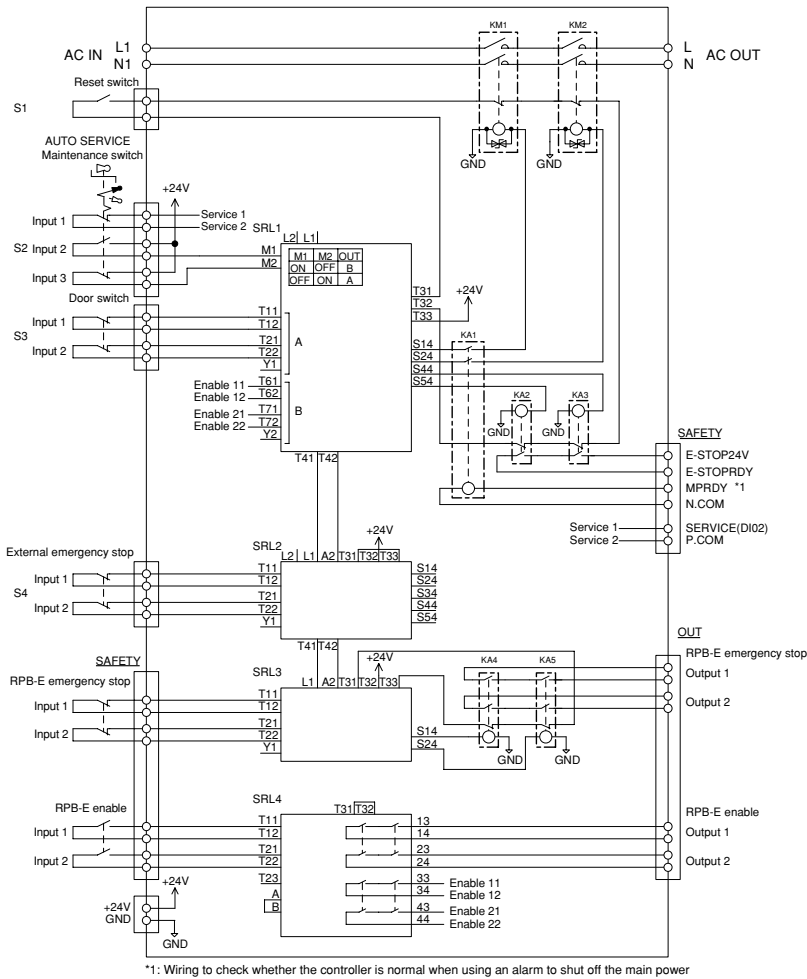
\*1: Wiring to check whether the controller is normal when using an alarm to shut off the main power

# Circuit configuration examples (RCX240)

## General connection diagram



## Category 4



### Parts Table

Circuit No.	Part Name	Circuit No.	Part Name
S1	Reset switch	KM1, 2	Contactor (mirror contact)
S2	Key-selector switch	KA1 to 5 <sup>*1</sup>	Safety relay
S3	Safety door switch	SRL1 to 4	Safety relay unit
S4	Emergency stop switch	SRL5, 6 <sup>*2</sup>	Safety relay unit

\*1. TS-X and TS-P are KA1 to 2.  
\*2. Only TS-X and TS-P.

Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XX-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

# Cautions regarding CE specifications

## ■ CE marking

The YAMAHA robot (robot and controller) is one component that is incorporated into the customer's system (built-in equipment), and we declare that the YAMAHA robots conform to the EC Directives only within the scope of built-in equipment (semi-finished product). So, no CE marks are affixed to the YAMAHA robot products.

## ■ Cautions regarding compliance with EC Directives

The YAMAHA robot (robot and controller) is not, in itself, a robot system. The YAMAHA robot-series product is one component that is incorporated into the customer's system (built-in equipment), and we declare that the YAMAHA robots conform to the EC Directives only within the scope of built-in equipment. Just incorporating the YAMAHA robot does not guarantee that the customer's system conforms to the EC Directives. However, combining the YAMAHA robot that is a semi-finished product with other device or circuit that is designed and manufactured appropriately makes it possible to conform the finished system to the EC Directives. The customer who incorporates YAMAHA robot products into the customer's final system, which will be shipped to or used in European region, should verify that the overall system conforms to the EC Directives.

## ■ Installation of external safety circuits

To comply with EC directives, customers using YAMAHA robots must always build and install their own external safety circuits after selecting product components (safety relays, etc.) according to performance levels and safety categories required by the customer equipment.

For details about examples of external safety circuits, the user's manual should be referred to.

## ■ Compliance with EMC Directives

In order to conform to the EMC Directives, the customer should evaluate the final system (overall system) and take necessary countermeasures. As examples of EMC countermeasures for single YAMAHA robot product are described in the user's manual, these descriptions should be referred to.

## ■ Cautions regarding official language of EU countries

Only English which is the official language of the EU is utilized in the manuals, warning labels, operating screens, and the Declaration of Incorporation for this product.

If warning text appears on the warning label, then Japanese may also sometimes be listed along with the English.

Articulated robots  
YA

Linear conveyor  
modules  
LCM100

Motor-less single  
axis actuator  
Robonity

Compact  
single-axis robots  
TRANSEVO

Single-axis robots  
FLIP-X

Linear motor  
single-axis robots  
PHASER

Cartesian  
robots  
XY-X

SCARA  
robots  
YK-X

Pick & place  
robots  
YP-X

CLEAN

CONTROLLER

INFORMATION

CABLE

TECHNICAL

INFORMATION

DISCONTINUED

# Cautions on KCs (Korean Certificate Safety) specifications

## About KCs

KCs is a system that conforms to Korean Industrial Safety and Health Act and self-regulatory safety confirmation declaration of hazardous machines and devices. For machines specified in this system, the KCs mark needs to be indicated after conducting the forced certification or self-regulatory safety confirmation declaration. Industrial robots that have manipulators with 3 or more axes are specified as machines needing the self-regulatory safety confirmation declaration in South Korea's Ministry of Employment and Labor Notification No. 1201-46. Its safety standards are defined in separate table 2 of this notification.

## About measures for KCs

For some YAMAHA robot models, this self-regulatory safety confirmation declaration is conducted to register these models. Additionally, the KCs mark is indicated on the robots that have been declared. When you investigate to purchase a robot to be used in South Korea, check whether or not this robot conforms to KCs and order it with the KCs specifications specified.

The YAMAHA robot is a unit that is incorporated into the customer's system. Therefore, when the customer incorporates the robot into the customer's system, additional safety measures need to be taken. For details, see "Safety standards application guide reference manual".

## List of robots subject to KCs

Robot products may not be applicable to KCs depending on the customer's applications, operating conditions, or environments. Consult YAMAHA before purchasing a product.

Since a self-regulatory safety declaration has not been made for inapplicable models, these models cannot be used in Korea. Special-order robots are also unavailable. For details, please contact YAMAHA.

As of October, 2019  
 ○ : subject to KCs  
 - : not subject to KCs

Product	Type	Model name	KCs registration	
			RCX240 (S)	RCX340
Cartesian robot	FXYx	3 axes	○	○
		SXYx	3 axes	○
	4 axes			
	SXYBx	3 axes	○	○
		4 axes		
	MXYx	3 axes	○	○
		4 axes		
	HXYx	3 axes	○	○
		4 axes		
	NXY	3 axes	-	-
		4 axes		
		6 axes		
SXYxC	3 axes	-	-	
	4 axes			
Pick & place robot	YP Series	3 axes	-	-
		4 axes		
SCARA robot	YK180X			
	YK220X			
	YK120XG		-	-
	YK150XG			
	YK180XG			
	YK250XG			
	YK350XG		○	○
	YK400XG			
	YK400XR		-	○
	YK400XE		-	-
	YK500XGL		○	○
	YK600XGL		-	○
	YK700XGL			
	YK500XG			
	YK600XG			
	YK600XGH			
	YK700XG		○	○
	YK800XG			
	YK900XG			
	YK1000XG			
YK1200X		-	-	
YK180XC		-	-	
YK220XC				

▶ Continues to the next page.

Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XX-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

# Cautions on KCs (Korean Certificate Safety) specifications

Product	Type	Model name	KCs registration	
			RCX240 (S)	RCX340
SCARA robot		YK250XGC		
		YK350XGC		
		YK400XGC	○	-
		YK500XGLC		
		YK600XGLC		
		YK300XGS	-	○
		YK400XGS		
		YK500XGS		
		YK600XGS		
		YK700XGS		
		YK800XGS	○	○
		YK900XGS		
		YK1000XGS		
		YK250XGP		
		YK350XGP		
		YK400XGP		
		YK500XGLP		
		YK600XGLP		
		YK500XGP	○	-
		YK600XGP		
		YK600XGHP		
		YK700XGP		
		YK800XGP		
		YK900XGP		
	YK1000XGP			
	YK350TW	-	○	
	YK500TW	○	○	

- Articulated robots  
YA
- Linear conveyor  
models  
LCM100
- Motor-less single  
axis actuator  
Robonity
- Compact  
single-axis robots  
TRANSEVO
- Single-axis robots  
FLIP-X
- Linear motor  
single-axis robots  
PHASER
- Cartesian  
robots  
XY-X
- SCARA  
robots  
YK-X
- Pick & place  
robots  
YP-X
- CLEAN
- CONTROLLER
- INFORMATION
- CABLE
- TECHNICAL
- INFORMATION
- DISCONTINUED

# Cautions on Korean EMC specifications

## About Korean KC

KC is a system based on the radio regulations of Korea. Devices specified by this system must certify compliance or register compliance, and indicate compliance. Applicable devices are defined by public announcement from the Korean National Radio Research Agency (NRRRA).

## About Korean KC compliance

Some models of YAMAHA robot (robots and controllers) are registered with the Korean National Radio Research Agency (NRRRA) by self-test compliance registration. YAMAHA robots that have already been registered display the KC mark.

If you are considering the purchase of robots to be used in Korea, please check the table below for compliance before ordering the applicable product.

YAMAHA robots are devices for inclusion in a system; therefore, if you, the customer, build a complete system that includes robots, and ship that system as a final product to Korea or use it within Korea, you yourself must verify EMC compliance.

For TS series and TS-SD units, check "Examples of EMC countermeasures" within the user's manual; for other controllers, check this section within the "Safety standards application guide reference manual".

## List of KC compliant robots

- \* Please consult with YAMAHA before purchase, since compliance might not be possible depending on your application, conditions of use, and environment.
- \* In the case of 3-axis or greater Cartesian robots and SCARA robots, the robot must be compliant with both KC and KCs. In conjunction with this table, refer also to the list of KCs compliant robots.

As of October 2019

Product	Model name	Registration number
Controller	ERCD	MSIP-REM-Y3M-ERCD
	TS-S2	MSIP-REM-Y3M-TSS
	TS-SD	MSIP-REM-Y3M-TSSD
	TS-SH	MSIP-REM-Y3M-TSSH
	TS-X	MSIP-REM-Y3M-TSX
	TS-P	MSIP-REM-Y3M-TSP
	RDV-X	MSIP-REM-Y3M-RDVX
	RDV-P	MSIP-REM-Y3M-RDVP
	SR1-X	MSIP-REM-Y3M-SR1X
	SR1-P	MSIP-REM-Y3M-SR1P
	RCX221	MSIP-REM-Y3M-X221
	RCX222	MSIP-REM-Y3M-X222
	RCX320	R-R-GYM-RCX320
	RCX240(S)	MSIP-REM-Y3M-X240
	RCX340	MSIP-REM-Y3M-X340
LCC140	MSIP-REM-Y3M-C140	
Robot	TRANSERVO series	MSIP-REM-Y3M-TR
	FLIP-X series	MSIP-REM-Y3M-FXL
		MSIP-REM-Y3M-FX
	PHASER series	MSIP-REM-Y3M-PH
	XY-X series	MSIP-REM-Y3M-XY
YK series	MSIP-REM-Y3M-YK	
Linear conveyor	LCC100	MSIP-REM-Y3M-M100

## About non-compliant models

The following robots are subject to the KC system; however, since self-test compliance registration has not been done at the present time, they cannot be used in Korea. Additionally, special-order robots are also not compliant with the KC system.

Even for the various series listed in the table, some new models might not have been registered.

(Contact YAMAHA for details.)

Pick and place robots: YP-X series

Articulated robots  
YA  
Linear conveyor models  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSERVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER  
INFORMATION  
CABLE  
TECHNICAL  
INFORMATION  
DISCONTINUED

# Warranty

For information on the warranty period and terms, please contact our distributor where you purchased the product.

## ■ This warranty does not cover any failure caused by:

1. Installation, wiring, connection to other control devices, operating methods, inspection or maintenance that does not comply with industry standards or instructions specified in the YAMAHA manual;
2. Usage that exceeded the specifications or standard performance shown in the YAMAHA manual;
3. Product usage other than intended by YAMAHA;
4. Storage, operating conditions and utilities that are outside the range specified in the manual;
5. Damage due to improper shipping or shipping methods;
6. Accident or collision damage;
7. Installation of other than genuine YAMAHA parts and/or accessories;
8. Modification to original parts or modifications not conforming to standard specifications designated by YAMAHA, including customizing performed by YAMAHA in compliance with distributor or customer requests;
9. Pollution, salt damage, condensation;
10. Fires or natural disasters such as earthquakes, tsunamis, lightning strikes, wind and flood damage, etc;
11. Breakdown due to causes other than the above that are not the fault or responsibility of YAMAHA;

## ■ The following cases are not covered under the warranty:

1. Products whose serial number or production date (month & year) cannot be verified.
2. Changes in software or internal data such as programs or points that were created or changed by the customer.
3. Products whose trouble cannot be reproduced or identified by YAMAHA.
4. Products utilized, for example, in radiological equipment, biological test equipment applications or for other purposes whose warranty repairs are judged as hazardous by YAMAHA.

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# Repeatability positioning accuracy

The “repeatability positioning accuracy” cannot be guaranteed for the accuracy conditions listed below.

## (1) Factors involving absolute accuracy

- Under conditions requiring accuracy between the robot controller internal coordinate position (command position) and real space position (movement position).

## (2) Operating pattern factors

- Under conditions including a motion approaching close to a teaching point (position) from different directions during repeating operation.
- Under conditions where power was turned off or operation was stopped, even when approaching a teaching position from same direction.
- Under conditions where movement to a teaching position uses a hand system (left-handed or right-handed system) different from that during teaching. (SCARA robots)

## (3) Temperature factors

- Under conditions subject to drastic changes in ambient temperature.
- Under conditions where temperature of robot unit fluctuates.

## (4) Fluctuating load factors

- Under conditions where load conditions fluctuate during operation (load fluctuates due to workpiece or no workpiece).

# Discontinued sales models and repair coverage limits

## MR12/MR12D

● Can be used for wall-mount

Sales end date	End of December 2019
Repair coverage	End of December 2026

### Ordering method

#### Single carriage model

**MR12**

Model	Cable carrier entry location	Optional cable carrier for users	Origin position change	Grease type	Stroke	Cable length	TSP	Positioner	Driver: Power supply voltage / Power capacity	LCD monitor	I/O selection
MR12: Incremental MR12A: Semi-absolute <sup>Note 1</sup>	RH: Horizontal, right LH: Horizontal, left RW: Wall mounted, right LW: Wall mounted, left	No entry: None S: S type M: M type	No entry: L side (Standard) Z: R side No entry: R side (Standard) Z: L side	No entry: Standard GC: Clean	50 to 1050 (100mm pitch)	3L: 3.5m 5L: 5m 10L: 10m 3K/5K/10K (Flexible cable) <sup>Note 3</sup>	TS-P	Note 4 TS-P	105: 100V/100W or less 205: 200V/100W or less	No entry: None L: With LCD	NP: NPN PN: PNP CC: CC-Link DN: DeviceNet™ EP: EtherNet/IP™ GW: No I/O board <sup>Note 5</sup>

Note 1. For the details of the semi-absolute model, please refer to P.39. RDV-P has an incremental model only.  
 Note 2. The robot cable is standard cable (3L/5L/10L), but can be changed to flexible cable. See P.614 for details on robot cable.  
 Note 3. If a flexible cable is needed for the SR1-P, TS-P, or RDV-P, then select 3K/5K/10K. On the RCX221, the standard cable is a flexible cable, so enter 3L/5L/10L when ordering.  
 Note 4. These controllers can be mounted on DIN rails. See P.522 for details.  
 Note 5. Select this selection when using the gateway function. For details, see P.66.  
 Note. It is possible to provide the model without a cable carrier. To find information on wiring (cable terminals) within the cable carrier see P.622.

SR1-P	05	RDV-P	2	05
Controller	Driver: Power capacity 05: 100W or less	Driver	Power-supply voltage 2: AC200V	Driver: Power capacity 05: 100W or less
	Usable for CE No entry: Standard E: CE marking			
	I/O selection N: NPN P: PNP CC: CC-Link DN: DeviceNet™ PB: PROFIBUS			

#### Double carriage model

**MR12D**

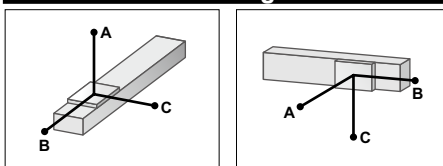
Model	Installing direction	Optional cable carrier for users	Grease type	Stroke	Cable length	RCX221	Usable for CE	I/O selection 1	I/O selection 2
MR12D: Incremental MR12AD: Semi-absolute <sup>Note 1</sup>	H: Horizontal installation W: Wall mounted installation	No entry: None S: S type M: M type	No entry: Standard GC: Clean	50 to 1050 (100mm pitch)	3L: 3.5m 5L: 5m 10L: 10m 3K/5K/10K (Flexible cable) <sup>Note 3</sup>	RCX221 SR1-P (2 units) TS-P (2 units) RDV-P (2 units)	No entry: Standard E: CE marking	N: NPN P: PNP CC: CC-Link DN: DeviceNet™ PB: PROFIBUS EN: Ethernet	No entry: None Nt: OPDIO24/16 (NPN) Pt: OPDIO24/17 (PNP) EN: Ethernet

### Specifications

Model	MR12	MR12D
Driving method / Shaft diameter	Shaft motor / $\phi 12$	
Repeatability ( $\mu\text{m}$ )	+/-5 or less	
Scale ( $\mu\text{m}$ )	Magnetic type: resolution of 1	
Maximum speed <sup>Note 1</sup> (mm/sec)	2500	
Rated thrust (N)	18	
Maximum payload <sup>Note 2</sup> (kg)	5	
Stroke (mm)	50 to 1050 (50mm pitch)	
Linear guide	4 rows of circular arc grooves $\times$ 2 rail	
Maximum cross-section outside dimensions (mm)	W60 $\times$ H90 (except the cable carrier section)	
Total length (mm)	Stroke+288	Stroke+488
Cable length (m)	Standard: 3.5 / Option: 5.10	

Note. A vertical model (with brake) is not available with the PHASER series.  
 Note. The basic specifications of semi-absolute model are the same as those of the incremental model.  
 Note 1. Maximum speed may not be obtained depending on operating conditions.  
 Note 2. Maximum payload per carriage.

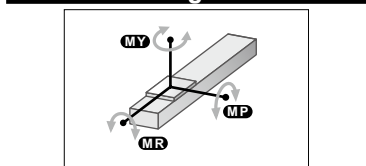
### Allowable overhang



	Horizontal installation (Unit: mm)			Wall installation (Unit: mm)		
	A	B	C	A	B	C
1kg	600	600	600	1kg	600	600
2kg	1200	1200	598	2kg	529	1200
3kg	1800	1800	406	3kg	323	1800
5kg	3000	1561	241	5kg	162	589

Note. Distance from center of slider top to center of gravity of object being carried at a guide service life of 10,000 km.

### Static loading moment



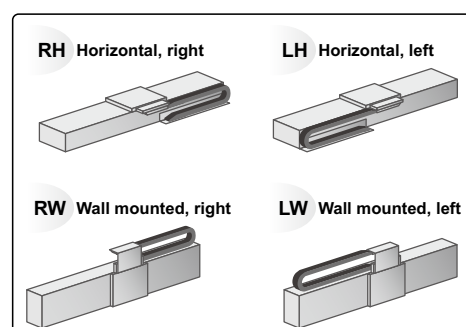
MY	MP	MR
107	107	89

(Unit: N·m)

### Controller

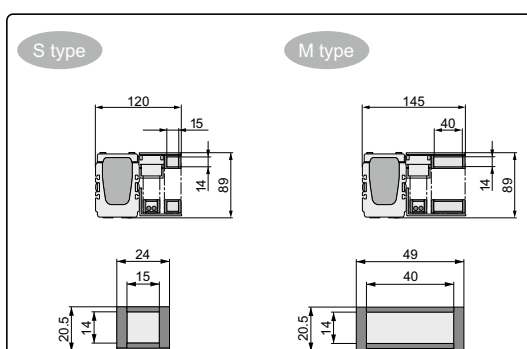
Controller	Operating method
SR1-P05	Programming / I/O point trace / Remote command / Operation using RS-232C communication
RCX221 RCX240/340	Operation using RS-232C communication
TS-P105	I/O point trace / Remote command
TS-P205	Remote command
RDV-P205	Pulse train control

### Cable carrier entry location



Note. Be sure to install in the direction as specified (in cable carrier take-out direction drawing and various specification drawings) individually. Installation in any other way will cause a failure. For requirement of installation in any way other than the above standard installation, please consult YAMAHA as special arrangement will be available.

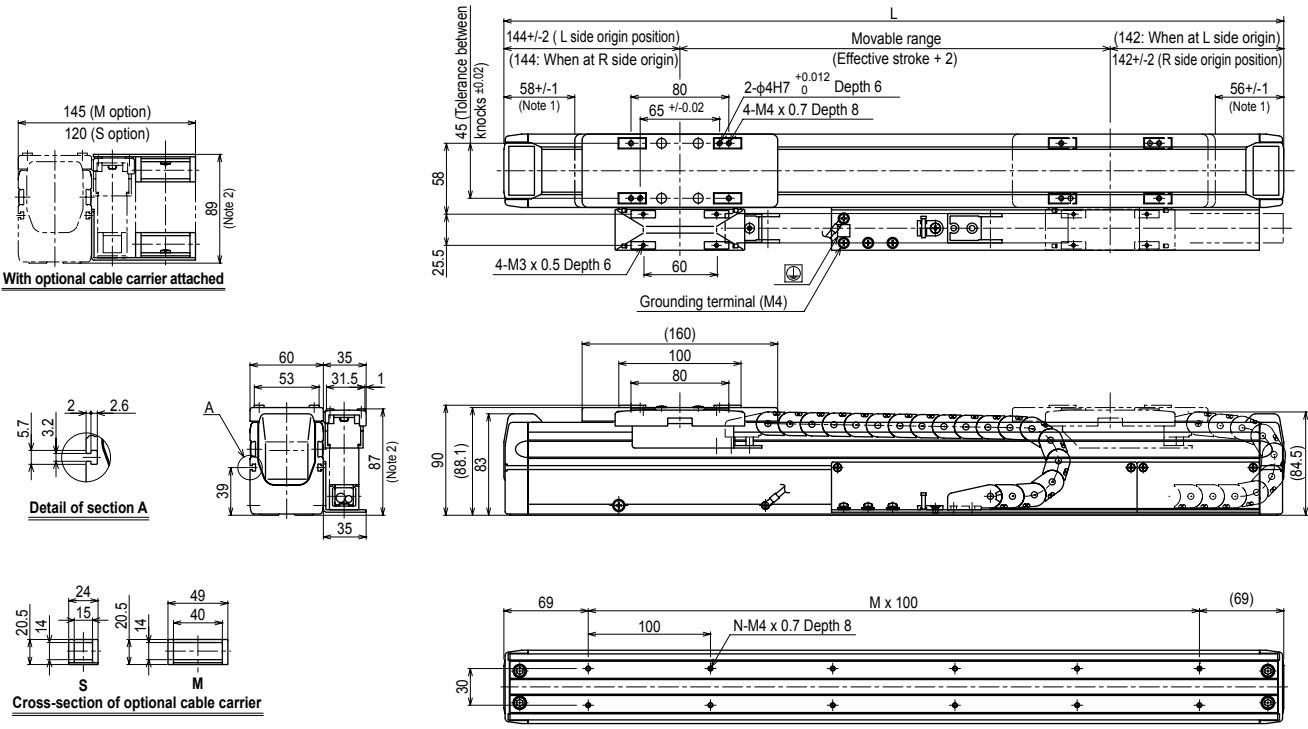
### Optional cable carrier for users



Space for optional cable for users

Note. The cable and air hoses should take up less than 30% of the space when storing them inside the cable carrier. Lay out the cables and air hoses in rows inside the cable carrier so they do not cross each other.

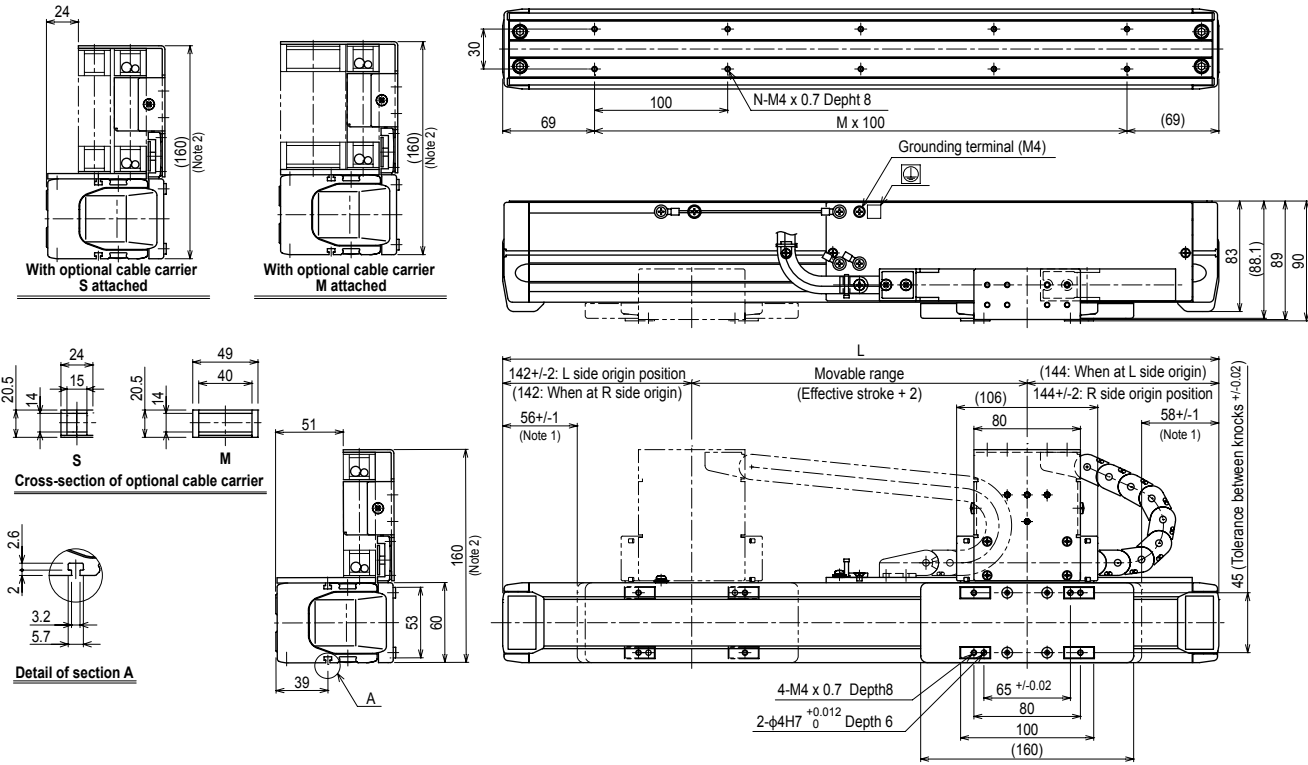
## MR12 single carriage horizontal mount model **RH**



Effective stroke	50	150	250	350	450	550	650	750	850	950	1050
<b>L</b>	338	438	538	638	738	838	938	1038	1138	1238	1338
<b>M</b>	2	3	4	5	6	7	8	9	10	11	12
<b>N</b>	6	8	10	12	14	16	18	20	22	24	26
<b>Weight (kg)</b>	3.9	4.4	5.0	5.6	6.1	6.7	7.3	7.9	8.4	9.0	9.5

Note 1. Stop positions are determined by the mechanical stoppers at both ends.  
 Note 2. Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.  
 Note. The origin is set on the L side at the time of shipment. It can be changed to the R side by parameter setting.

## MR12 single carriage wall mount model **RW**

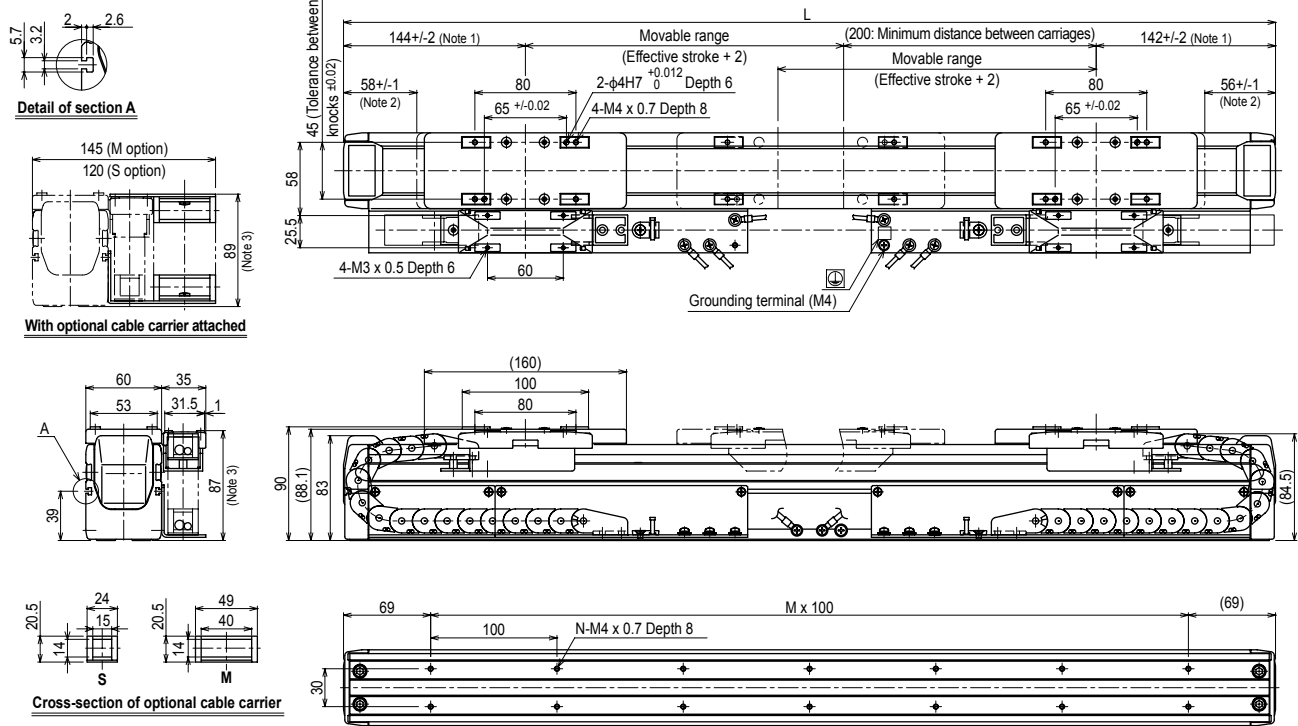


Effective stroke	50	150	250	350	450	550	650	750	850	950	1050
<b>L</b>	338	438	538	638	738	838	938	1038	1138	1238	1338
<b>M</b>	2	3	4	5	6	7	8	9	10	11	12
<b>N</b>	6	8	10	12	14	16	18	20	22	24	26
<b>Weight (kg)</b>	3.9	4.4	5.0	5.6	6.1	6.7	7.3	7.9	8.4	9.0	9.5

Note 1. Stop positions are determined by the mechanical stoppers at both ends.  
 Note 2. Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.  
 Note. The origin is set on the R side at the time of shipment. It can be changed to the L side by parameter setting.

# MR12/MR12D

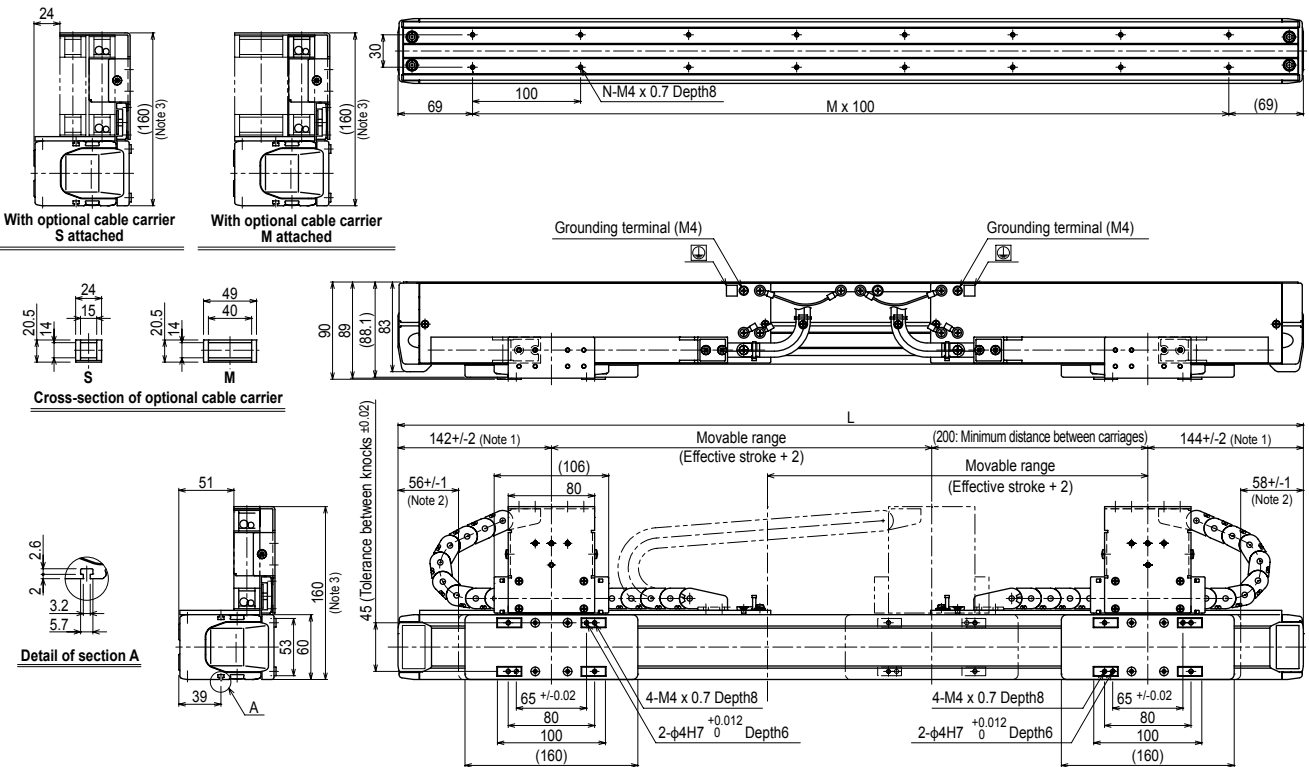
## MR12D double carriage horizontal mount model **(H)**



Effective stroke	50	150	250	350	450	550	650	750	850	950	1050
<b>L</b>	538	638	738	838	938	1038	1138	1238	1338	1438	1538
<b>M</b>	4	5	6	7	8	9	10	11	12	13	14
<b>N</b>	10	12	14	16	18	20	22	24	26	28	30
<b>Weight (kg)</b>	5.7	6.3	6.8	7.3	8.0	8.6	9.1	9.7	10.2	10.8	11.3

Note 1. Position of the table slider when returned to the origin.  
 Note 2. Stop positions are determined by the mechanical stoppers at both ends.  
 Note 3. Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.

## MR12D double carriage wall mount model **(W)**



Effective stroke	50	150	250	350	450	550	650	750	850	950	1050
<b>L</b>	538	638	738	838	938	1038	1138	1238	1338	1438	1538
<b>M</b>	4	5	6	7	8	9	10	11	12	13	14
<b>N</b>	10	12	14	16	18	20	22	24	26	28	30
<b>Weight (kg)</b>	5.7	6.3	6.8	7.3	8.0	8.6	9.1	9.7	10.2	10.8	11.3

Note 1. Position of the table slider when returned to the origin.  
 Note 2. Stop positions are determined by the mechanical stoppers at both ends.  
 Note 3. Depending on the stroke and the operating conditions, the cable carrier bending radius might be larger, making it higher than the dimensions shown in the diagram.

# YK400XR

Standard type: Small type

Sales end date	End of June 2020
Repair coverage	End of June 2027

LOW COST HIGH PERFORMANCE MODEL

- Arm length 400mm
- Maximum payload 3kg



## Ordering method

**YK400XR** - **150** - **RCX340-4**

Model	Return-to-origin method S: Sensor T: Stroke end	Z axis stroke	Hollow shaft No entry: None S: With hollow shaft	Cable 3L: 3.5m 5L: 5m 10L: 10m	Controller / Number of controllable axes	Safety standard	Option A (OPA)	Option B (OPB)	Option C (OPC)	Option D (OPD)	Option E (OPE)	Absolute battery
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Specify various controller setting items. RCX340 ▶ **P.566**

## Specifications

		X-axis	Y-axis	Z-axis	R-axis
Axis specifications	Arm length	225 mm	175 mm	150 mm	-
	Rotation angle	+/-132°	+/-150°	-	+/-360°
AC servo motor output		200 W	100 W	100 W	100 W
Deceleration mechanism	Transmission method	Direct-coupled		Timing belt	
	Motor to speed reducer Speed reducer to output	Direct-coupled		Timing belt	
Repeatability <sup>Note 1</sup>		+/-0.01 mm	+/-0.01 mm	+/-0.01°	
Maximum speed		6 m/sec	1.1 m/sec	2600°/sec	
Maximum payload		3 kg (Standard specification), 2 kg (Option specifications <sup>Note 4</sup> )			
Standard cycle time: with 2kg payload <sup>Note 2</sup>		0.45 sec			
R-axis tolerable moment of inertia <sup>Note 3</sup>		0.05 kgm <sup>2</sup> (0.5 kgfcm <sup>2</sup> )			
User wiring		0.2 sq × 10 wires			
User tubing (Outer diameter)		φ 4 × 3			
Travel limit		1. Soft limit 2. Mechanical stopper (X,Y,Z axis)			
Robot cable length		Standard: 3.5 m Option: 5 m, 10 m			
Weight		17 kg			

Note 1. This is the value at a constant ambient temperature. (X,Y axes)  
 Note 2. When reciprocating 300mm in horizontal and 25mm in vertical directions and performing the coarse positioning arch operation.  
 Note 3. It is necessary to input the moment of inertia in the actual operating environment.  
 Note 4. Maximum payload of option specifications (with user wiring/tubing through spline type) is 2kg.

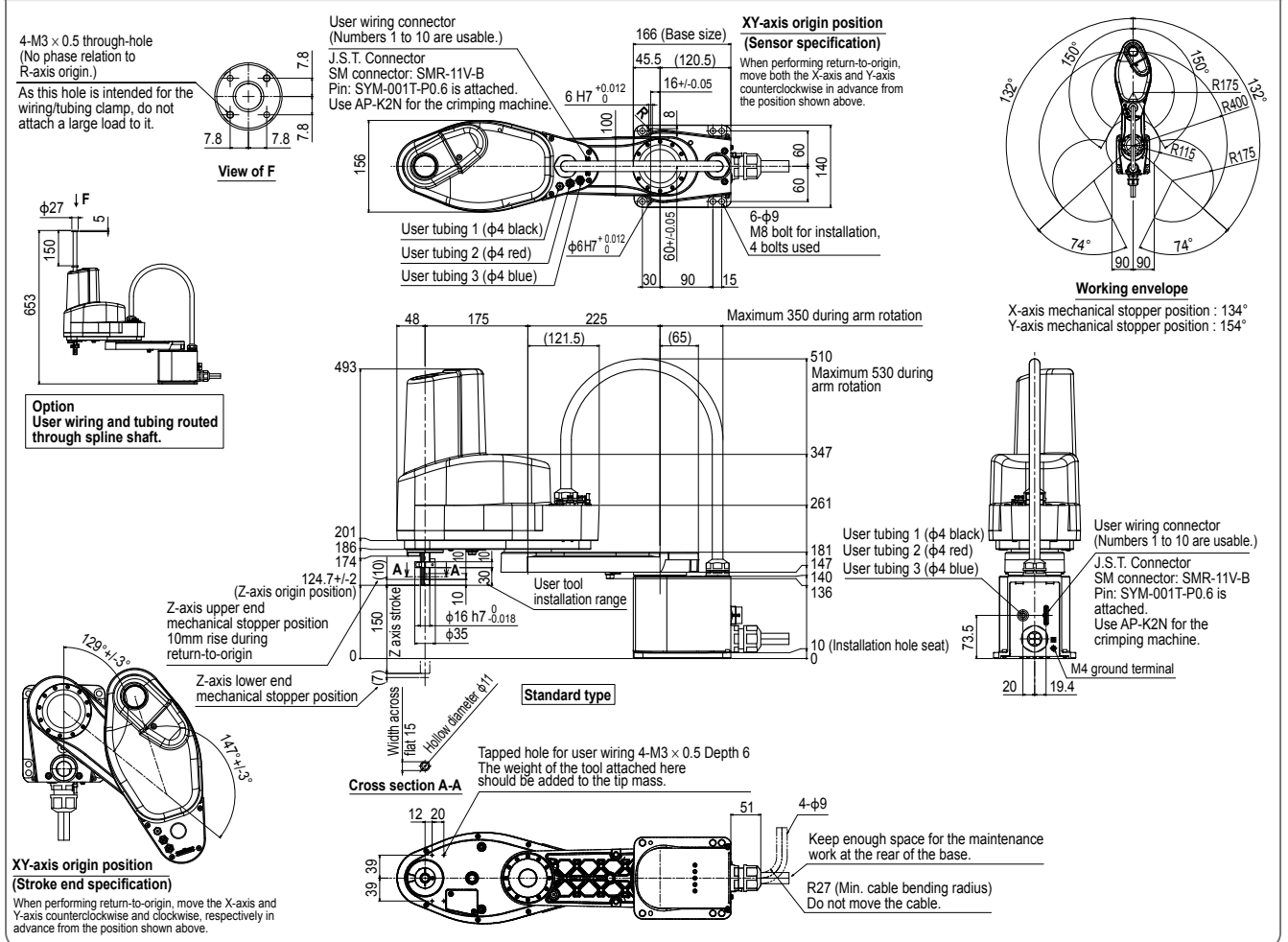
## Controller

Controller	Power capacity (VA)	Operation method
RCX340	1000	Programming / Remote command / Operation using RS-232C communication

Note. The movement range can be restricted by adding the X- and Y-axis mechanical stoppers. (The maximum movement range was set at shipment.)  
 See our robot manuals (installation manuals) for detailed information.  
 Note. To set the standard coordinates with high accuracy, use a standard coordinate setting jig (option). Refer to the user's manual (installation manual) for more details.

Our robot manuals (installation manuals) can be downloaded from our website at the address below:  
<https://global.yamaha-motor.com/business/robot/>

## YK400XR



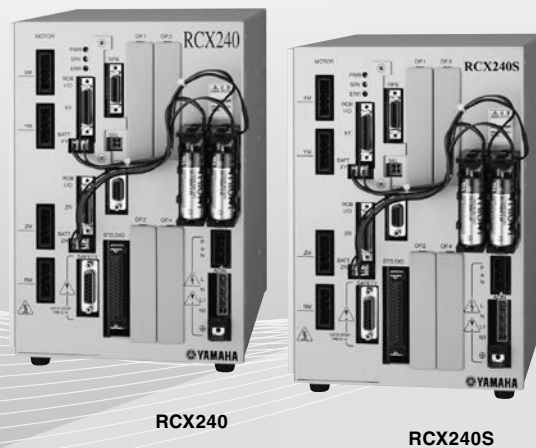
Articulated robots  
 YA  
 Linear conveyor modules  
 LCM100  
 Motor-less single axis actuator  
 Robonity  
 Compact single-axis robots  
 TRANSEVO  
 Single-axis robots  
 FLIP-X  
 Linear motor single-axis robots  
 PHASER  
 Cartesian robots  
 XX-X  
 SCARA robots  
 YK-X  
 Pick & place robots  
 YP-X  
 CLEAN  
 CONTROLLER INFORMATION  
 CABLE  
 TECHNICAL INFORMATION  
 DISCONTINUED

# RCX240/RCX240S

Sales end date	End of December 2019
Repair coverage	End of December 2026

## ● Robot controller with advanced functions

An advanced multi-axial controller newly developed based on long years of actual results! Along with a full range of functions, great engineering also makes it extremely easy to use.



Programming box  
▶ RPB/RPB-E  
P.586



Support software for PC  
▶ VIP+  
P.580

## ■ Basic specifications

Item	Model	RCX240 / RCX240S
Basic specifications	Number of controllable axes	4 axes maximum (Control simultaneously: 4 axes)
	Controllable robots	Single-axis robot FLIP-X, Linear motor single-axis robot PHASER, Cartesian robot XY-X, SCARA robot YK-XG, Pick & place robot YP-X
	Maximum power consumption	2500VA (RCX240) / 1500VA (RCX240S)
	Capacity of the connected motor	1600W (RCX240) / 800W (RCX240S)
	Dimensions	W180 × H250 × D235mm
Weight		6.5kg
	Input power supply	Control power supply: Single phase AC200 to 230V +/-10% maximum (50/60Hz) Motor power supply: Single phase AC200 to 230V +/-10% maximum (50/60Hz)
Axis control	Drive method	AC full-digital software servo
	Position detection method	Multi-turn resolver with data backup function, Magnetic linear scale
	Operating method	PTP (Point to Point), Linear interpolation, Circular interpolation, ARCH
	Coordinate system	Joint coordinates, Cartesian coordinates
	Position indication units	Pulses, mm (millimeters), deg (degrees)
	Speed setting	1% to 100% (In units of 1%. However speed is in units of 0.01% during single-axis operation by DRIVE statement.)
	Acceleration setting	1. Automatic acceleration setting based on robot model type and end mass parameter 2. Setting based on acceleration and deceleration parameter (Setting by 1% unit)
Program	Origin search method	Incremental, Absolute, Semi-absolute
	Program language	YAMAHA BASIC (Conforming to JIS B8439 SLIM Language)
	Multitasks	8 tasks maximum
	Sequence program	1 program
Memory	Point-data input method	Manual data input (coordinate value input), Direct teaching, Teaching playback
	Memory capacity	364KB (total capacity of program and points) (available program capacity during use of maximum number of points is 84KB)
	Programs	100 program (Max.) 9,999: maximum lines per program 98KB: maximum capacity per program
	Points	10,000 points: maximum numbers of points
	Memory Backup battery	Lithium metallic battery (service life 4 years at 0°C to 40°C)
	Internal flash memory	512KB (ALL data only)

Controllable robot	<b>XY-X P261</b>	<b>YK-X P389</b>	<b>FLIP-X P193</b>	<b>PHASER P239</b>	<b>YP-X P451</b>
CE marking		Field networks			

## Model Overview

Name	RCX240/RCX240S
Controllable robot <sup>Note1</sup>	Cartesian robot XY-X / SCARA robot YK-X / Single-axis robot FLIP-X / Linear motor single-axis robot PHASER / Pick & place robot YP-X
Input power	Single phase : AC200V to 230V +/-10% maximum (50/60Hz)
Operating method	Programming / Remote command / Operation using RS-232C communication
Maximum number of controllable axes	4 axes maximum
Origin search method	Incremental/Absolute

Note. For details, please refer to the controller model selection table on the next page.

## Ordering method

<b>RCX240</b> <b>RCX240S</b>								
<b>Controller</b> <sup>Note1</sup>	<b>Usable for CE</b>	<b>Regenerative unit</b> <sup>Note2</sup>	<b>Option I/O</b>	<b>Network Option</b>	<b>iVY System Option board</b>	<b>Light/Tracking</b>	<b>Gripper</b>	<b>Battery</b>
RCX240: Standard model RCX240S: Low capacity model	No entry: Standard E: CE marking K: KCs	No entry: None R: RGU-2 R3: RGU-3 <sup>Note3</sup>	N, P: Standard I/O 16/8 N1, P1: 40/24 points N2, P2: 64/40 points N3, P3: 88/56 points N4, P4: 112/72 points	No entry: None CC: CC-Link DN: DeviceNet™ PB: PROFIBUS EN: Ethernet EP: EtherNet/IP™ YC: YC-Link <sup>Note5</sup>	No entry: None VY: iVY (VISION)	No entry: None TR: Light+Tracking LC: Light	No entry: None GR: Gripper	No entry: None <sup>Note6</sup> B: 2pcs <sup>Note7</sup> BB: 4pcs <sup>Note8</sup>

Note 1. The RCX240S controller is limited to use with robots that handles 200W or lower on each axis. Check the following controller selection table to find the matching model.

Note 2. The regenerative unit (option) is required when operating a model designated by YAMAHA or a load with a large inertia. Please refer to the following regenerative unit selection table.

Note 3. YK500XG to YK1000XG are for RGU-3.

Note 4. Use N to N4 when NPN is selected on the I/O board, and P to P4 when PNP is selected.

Note 5. Available only for the master. (The YC-Link system controls an SR1 series single-axis controller in accordance with communications received from an RCX series multi-axis controller. Using the YC-Link system allows control of up to 8 axes (or up to 6 axes with synchronous control)).

Note 6. Use battery-less model if connecting to all-axis linear motor, or to incremental models.

Note 7. If any or Single-axis among the XY axes are absolute specifications then 2 batteries are required.

Note 8. If any or Single-axis among the ZR axes are absolute specifications then 2 batteries are required.

☆ Please note that:

The current sensor on the RCX240S cannot be set to 20A.

As a controller stocked for maintenance, please order an RCX240 that can be set to any of 05A, 10A and 20A.

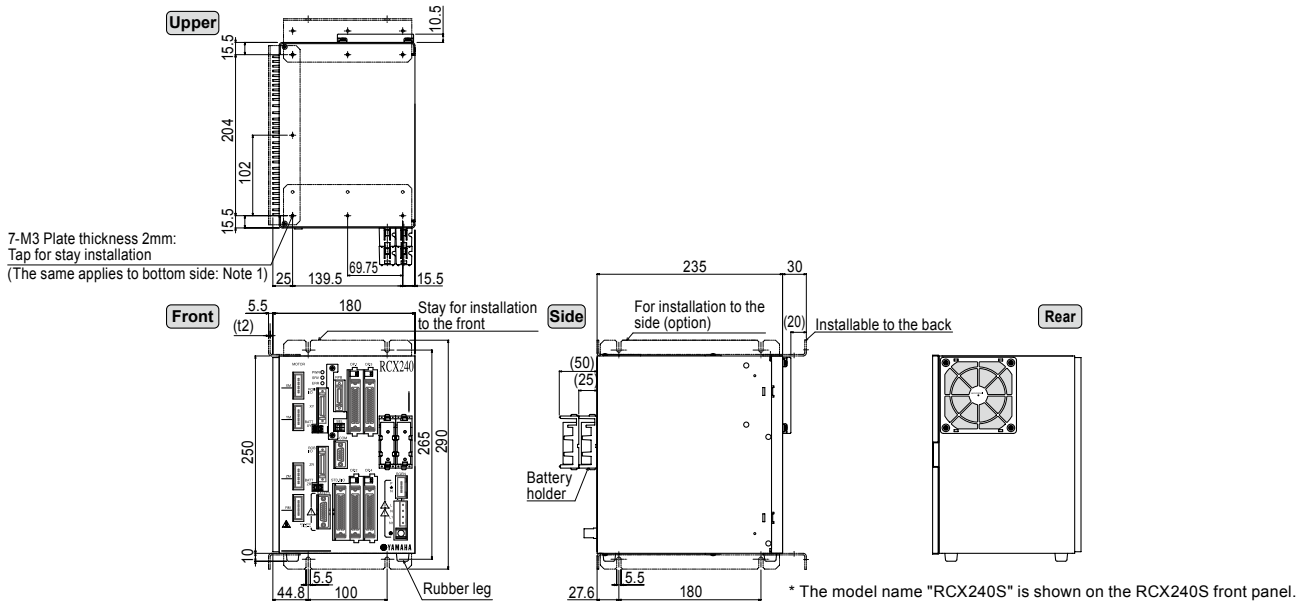
Item	Model	RCX240 / RCX240S		
External input/output	STD.DIO	I/O input	Dedicated input 10 points, General input 16 points (NPN / PNP specifications selectable)	
		I/O output	Dedicated output 11 points, General output 8 points	
	SAFETY		Emergency stop input (Relay contact), Service mode input (NPN/PNP specification is set according to STD. DIO setting), Enabling switch input (Enabled only when the RPB-E is used.)	
	Brake output		Relay contact	
	Origin sensor input		Connectable to DC 24V normally-closed contact sensor	
	External communications		RS-232C: 1CH D-SUB9 (female) RS-422: 1CH (Dedicated RPB)	
	Regenerative unit connection		RGEN connector	
	Options	Slots	Type	4
			Optional input/output (NPN/PNP)	General input 24 points, General output 16 points
			CC-Link	Dedicated input 16 points, Dedicated Output 16 points, General input 96 points, General output 96 points (4 nodes occupied)
			DeviceNet™	Dedicated input 16 points, Dedicated Output 16 points, General input 96 points, General output 96 points
			PROFIBUS	Dedicated input 16 points, Dedicated Output 16 points, General input 96 points, General output 96 points
			Ethernet	IEEE802.3 10Mbps (10BASE-T)
			EtherNet/IP™	Dedicated input 16 points, dedicated output 16 points, General-purpose input 96 points, general-purpose output 96 points Conforms to Ethernet (IEEE 802.3) 10Mbps/100Mbps.
iVY			Camera input (2ch), camera trigger input, PC connection input	
Tracking			AB phase input, lighting trigger input, lighting power supply input/output	
Lighting control			Lighting trigger input, lighting power supply input/output	
Gripper control	No. of axes: 1 axis, Position detection method: Optical rotary encoder, Min. setting distance: 0.01mm			
Options	Programming box		RPB, RPB-E (with enable switch)	
	Support software for PC		VIP+	
	Regenerative unit		RGU-2, RGU-3	
General specifications	Operating temperature		0°C to 40°C	
	Storage temperature		-10°C to 65°C	
	Operating humidity		35% to 85%RH (non-condensing)	
	Absolute backup battery		Lithium metallic battery 3.6V 5400mAH (2700mAH × 2)	
	Absolute data backup period		1 year (in state with no power applied)	
	Noise immunity		IEC61000-4-4 Level 3	
Protective structure		IP10		

Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED





## ■ Dimensions



## ■ Power supply capacity and heat emission

The required power supply capacity and heat emission will vary depending on the robot type and number of axes.

Using the following table as a general guide consider the required power supply preparation and control panel size, controller installation, and cooling method.

### (1) When connected to SCARA robot

Standard type	Robot type			Power capacity (VA)	Generated heat amount (W)	
	Clean type	Dust-proof & drip-proof type	Wall-mount / Ceiling-mount / inverse type			
YK180X, 220X	—	—	—	500	63	
YK250XG, 350XG, 400XG, 500XGL, 600XGL	YK250XGC, 350XGC, 400XGC, 500XGLC, 600XGLC	YK250XGP, 350XGP, 400XGP, 500XGLP, 600XGLP	YK300XGS, 400XGS	1000	75	
—	YK500XC, 600XC	—	—	1500	88	
YK550X, 500XG, 600XG	—	YK500XGP, 600XGP	YK500XGS, 600XGS	1700	93	
—	YK700XC, 800XC, 1000XC	—	—	2000	100	
YK600XGH, 700XG, 800XG, 900XG, 1000XG, 1200X	—	YK600XGHP, 700XGP, 800XGP, 900XGP, 1000XGP	YK700XGS, 800XGS, 900XGS, 1000XGS	YK350TW, YK500TW	2500	113

### (2) When connected to 2 axis (Cartesian robot and/or multi-axis robot)

Axial current sensor value <sup>Note</sup>		Power capacity (VA)	Generated heat amount (W)
X axis	Y axis		
05	05	600	65
10	05	800	70
10	10	1000	75
20	05	1100	78
20	10	1300	83
20	20	1700	93

### (3) When connected to 3 axis (Cartesian robot and/or multi-axis robot)

Axial current sensor value <sup>Note</sup>			Power capacity (VA)	Generated heat amount (W)
X axis	Y axis	Z axis		
05	05	05	700	68
10	05	05	900	73
10	10	05	1000	75
10	10	10	1200	80
20	05	05	1200	80
20	10	05	1300	83
20	10	10	1500	88
20	20	05	1600	90
20	20	10	1800	95
20	20	20	2000	95

### (4) When connected to 4 axis (Cartesian robot and/or multi-axis robot)

Axial current sensor value <sup>Note</sup>				Power capacity (VA)	Generated heat amount (W)
X axis	Y axis	Z axis	R axis		
05	05	05	05	800	70
10	05	05	05	1000	75
10	10	05	05	1100	78
10	10	10	05	1300	83
10	10	10	10	1400	85
20	05	05	05	1200	80
20	10	05	05	1400	85
20	10	10	05	1500	88
20	10	10	10	1700	93
20	20	05	05	1600	90
20	20	10	05	1800	95
20	20	10	10	2000	100
20	20	20	05	2100	103
20	20	20	10	2200	105
20	20	20	20	2500	113

Note. Even if axial current sensor values for each axis are interchanged no problem will occur.

Note. Motor capacity vs. current sensor table

Connected motor capacity	Current sensor
100W or less	05
200W	10
400W or more	20

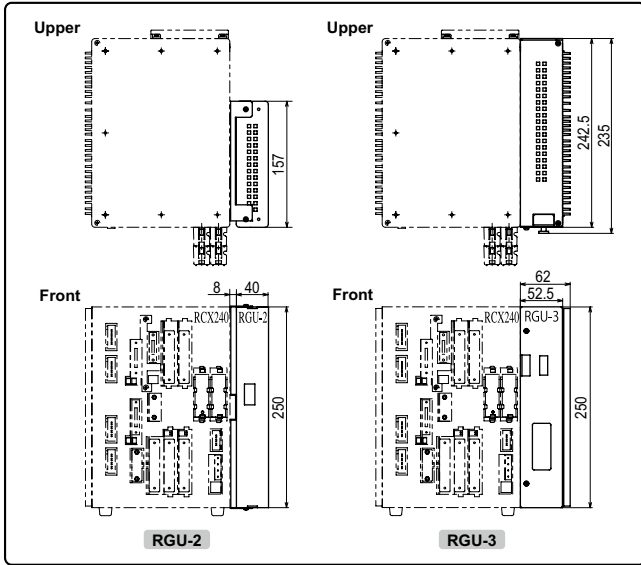
Note. Motor output of the B14H is 200W but the current sensor is 05.

Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

# RCX240/RCX240S

Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

## Regenerative unit



## RGU-2 basic specifications



Item	RGU-2
Model	KX0-M4107-20 (including cable supplied with unit)
Dimensions	W40 × H250 × D157mm
Weight	0.9kg
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Always leave an empty space (gap of about 20mm) between this unit and the adjacent controller. Also, always use the dedicated cable when connecting the controller.

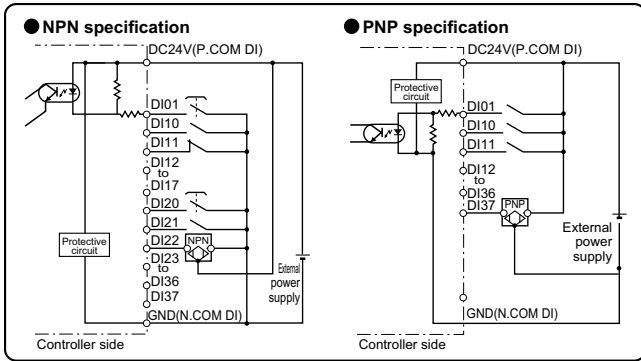
## RGU-3 basic specifications



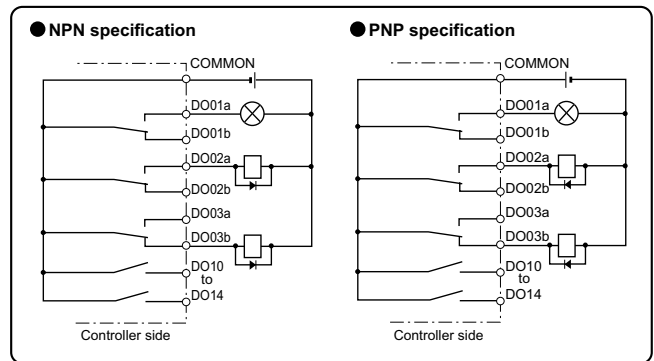
Item	RGU-3
Model	KX0-M4107-30 (including cable supplied with unit)
Dimensions	W62 × H250 × D242.5mm
Weight	3.7kg
Regenerative voltage	Approx. 380V or more
Regenerative stop voltage	Approx. 360V or less
Accessory	Cable for connection with controller (300mm)

Note. Cannot be installed as a separate unit.

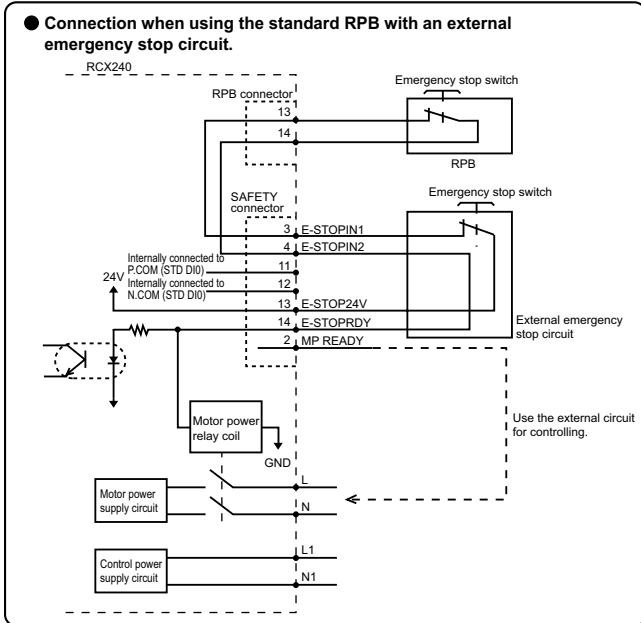
## Example of input signal connection



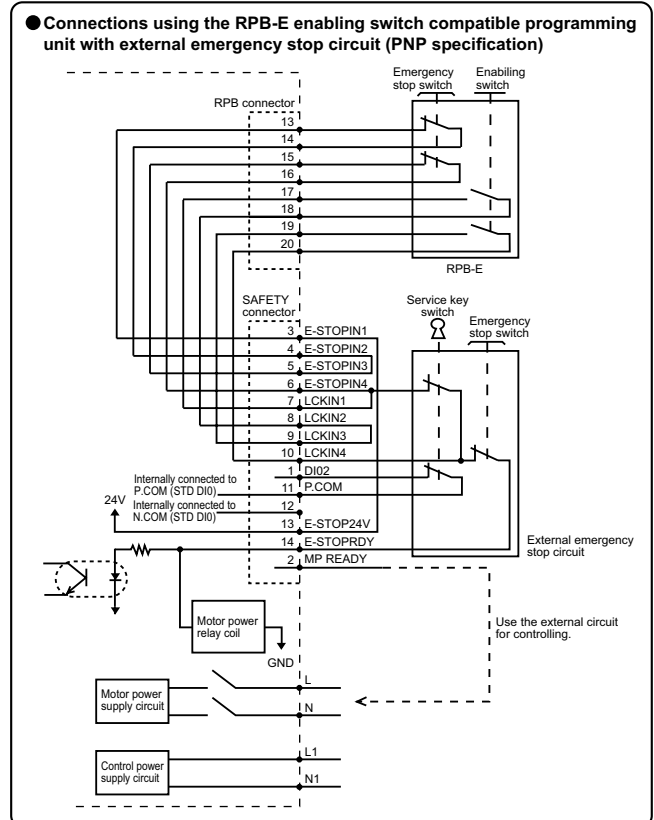
## Example of output signal connection



## Emergency input signal connections



Installing an external safety circuit will satisfy safety category class 4 standards. See P.647 for more information.



## Connector input / output signals

PIN	I/O No.	Name	Note	PIN	I/O No.	Name	Note
1	DI05	I/O command execution trigger input		27	COMMON	Relay common	
2	DI01	Servo ON input		28	DO01b	CPU_OK (B contact)	
3	DI10	Sequence control		29	DO01a	CPU_OK (A contact)	
4	DI11	Interlock		30	DO02b	Servo ON output (B contact)	(Relay output)
5	DI12	Program start		31	DO02a	Servo ON output (A contact)	Maximum capacity of each terminal (resistance load)
6	DI13	AUTO mode input		32	DO03b	Alarm (B contact)	: DC 24V 0.5A
7	DI14	Return-to-origin		33	DO03a	Alarm (A contact)	Common terminal
8	DI15	Program reset		34	DO10	AUTO mode output	: COMMON
9	DI16	MANUAL mode input		35	DO11	Return-to-origin complete	
10	DI17	Absolute reset / Return-to-origin	Common terminal	36	DO12	Sequence program in-progress	
11	DI20	General input 20	: P.COMDI	37	DO13	Robot program in-progress	
12	DI21	General input 21	: N.COMDI	38	DO14	Program reset	
13	DI22	General input 22		39	DO20	General output 20	
14	DI23	General input 23	(Photo-coupler input) NPN specification	40	DO21	General output 21	(Transistor output)
15	DI24	General input 24	: Source type	41	DO22	General output 22	NPN specification or PNP specification
16	DI25	General input 25	PNP specification	42	DO23	General output 23	Maximum capacity of each terminal (resistance load): 0.1A
17	DI26	General input 26	: Sink type	43	DO24	General output 24	+Common terminal: DC+24V
18	DI27	General input 27		44	DO25	General output 25	- Common terminal: GND
19	DI30	General input 30		45	DO26	General output 26	
20	DI31	General input 31		46	DO27	General output 27	
21	DI32	General input 32		47	DC24V	DC+24V (P.COMDI)	External power supply input
22	DI33	General input 33		48			
23	DI34	General input 34		49	GND	GND (N.COMDI)	
24	DI35	General input 35		50			
25	DI36	General input 36					
26	DI37	General input 37					

Note. When using the CC-Link, DeviceNetTM, EtherNet/IP™, or PROFIBUS, the dedicated inputs other than the interlock signal (DI11) of the STD.DIO that are provided on the RCX240 controller are disabled.  
 Additionally, when the external 24V monitor control of the system parameters is set disabled, the interlock signal (DI11) becomes disabled.

## SAFETY connector signals

Terminal number	RPB connected		RPB-E connected	
	I/O No.	Name	I/O No.	Name
1	DI02	SERVICE mode	DI02	SERVICE mode
2	MP READY	Motor power ready signal	MP READY	Motor power ready signal
3	E-STOPIN 1	Emergency stop input 1	E-STOPIN 1	Emergency stop input 1
4	E-STOPIN 2	Emergency stop input 2	E-STOPIN 2	Emergency stop input 2
5	NC	NC	E-STOPIN 3	Emergency stop input 3
6	NC	NC	E-STOPIN 4	Emergency stop input 4
7	NC	NC	LCKIN 1	Enabling switch input 1
8	NC	NC	LCKIN 2	Enabling switch input 2
9	NC	NC	LCKIN 3	Enabling switch input 3
10	NC	NC	LCKIN 4	Enabling switch input 4
11	P.COM	DC+24V (P.COM DI)	P.COM	DC+24V (P.COM DI)
12	N.COM	GND (N.COM DI)	N.COM	GND (N.COM DI)
13	E-STOP 24V	Emergency stop input supply	E-STOP 24V	Emergency stop input supply
14	E-STOPRDY	Emergency stop READY signal	E-STOPRDY	Emergency stop READY signal
15	NC	NC	NC	NC

## Standard functions of the controller

Function	Description
Operation mode	Automatic mode (main task: execution of program, execution of step), Program mode (main task: creation of program), Manual mode (main task: jog movement, point teaching), System mode (main task: parameter editing, data initialization), Utility mode (main task: operation of motor power source)
Command	Array declarator command (DIM statement), Assignment command (numeric value assignment statement, character string assignment statement, point definition statement), Movement related command (MOVE statement, DRIVE statement, PMOVE statement), Condition branching command (IF statement, FOR statement, WHILE statement), External output command (DO statement, MO statement, LO statement, TO statement, SO statement), Parameter command (ACCEL statement, OUTPOS statement, TOLE statement), Task related command (START statement, SUSPEND statement, CUT statement), Condition wait command (WAIT statement), etc.
Function	Arithmetic function (SIN function, COS function, TAN function), Character string function (STR\$ function, LEFT\$ function, MID\$ function, RIGHT\$ function), Point function (WHERE function, JTOXY function, XYTOJ function), Parameter function (ACCEL statement, OUTPOS statement, TOLE statement), etc.
Variable	Simple variable (integer type variable, real number type variable, character string type variable), Array variable (integer type variable, real number type variable, character string type variable), Point variable, Shift variable, Element variable (point element variable, shift element variable), Input/output variable, etc.
Operator	Arithmetic operator (+, -, *, /, MOD), Logical operator (AND, OR, XOR), Comparison operator (=, <, >, <>, <=, >=)
Monitor	Monitor of input/output (200ms interval)
On-line command	Key operation command (AUTO, RUN, RESET, STEP), Data handling command (READ, WRITE, ?VER, ?CONFIG), Utility command (COPY, ERA, INIT), Robot language command (independently executable command)
Data file	Program, Point, Parameter, Shift, Hand, All, Error history, etc.
Internal timer	10ms interval
Program break point	4 points at maximum

Articulated robots  
 YA  
 Linear conveyor modules  
 LCM100  
 Motor-less single axis actuator  
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 Compact single-axis robots  
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 Linear motor single-axis robots  
 PHASER  
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 XX-X  
 SCARA robots  
 YK-X  
 Pick & place robots  
 YP-X  
 CLEAN  
 CONTROLLER  
 INFORMATION  
 CABLE  
 TECHNICAL INFORMATION  
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## Robot Language Table

### General commands

Language	Function
DECLARE	Declares that a label or sub-procedure is in an external program.
DEF FN	Defines a function that is available to the user.
DIM	Declares the name of an array variable and the number of elements.
EXIT FOR	Terminates a FOR statement to NEXT statement loop.
FOR to NEXT	Controls repetitive operations
GOSUB to RETURN	Jumps to a subroutine with the label specified by a GOSUB statement and executes the subroutine.
GOTO	Unconditionally jumps to the line specified by a label.
HALT	Stops a program and resets it.
HOLD	Pauses a program.
IF	Allows control flow to branch according to conditions.
LET	Executes a specified assignment statement.
ON to GOSU	Jumps to a subroutine with each label specified by a GOSUB statement according to conditions and executes the subroutine.
ON to GOTO	Jumps to each line specified by a label according to conditions.
REM	All characters that follow REM or an apostrophe (') are viewed as comments.
SELECT CASE to END SELECT	Allows control flow to branch according to conditions.
SWI	Switches the currently executed program to a specified program, and executes from the first line after compiling.
WHILE to WEND	Controls repetitive operations.
Label statement	Defines "labels" in program lines.

### Robot operation

Language	Function
ABSRST	Performs return-to-origin along robot absolute motor axes.
DRIVE	Performs an absolute movement of each axis in the main group.
DRIVEI	Performs a relative movement of each axis in the main group.
MOVE	Performs an absolute movement of the main robot axes.
MOVEI	Performs a relative movement of the main robot axes.
ORIGIN	Performs return-to-origin on an incremental mode axis or absolute search on a semi-absolute mode axis.
PMOVE	Performs a pallet movement of the main robot axes.
SERVO	Controls the servo ON/OFF of the specified axes in the main group or all axes (in main group and sub group).

### I/O control

Language	Function
DELAY	Waits for the specified length of time (ms).
DO	Outputs the specified value to the DO ports.
LO	Outputs the specified value to the LO port to prohibit axis movement or permit axis movement.
MO	Outputs the specified value to the MO ports.
OUT	Turns ON the bits of the specified output ports and the command statement ends.
RESET	Turns OFF the bits of the specified output ports.
SET	Turns ON the bits of the specified output ports
SO	Outputs the specified value to the SO port.
TO	Outputs the specified value to the TO port.
WAIT	1. Waits until the condition in DI/DO conditional expression are met. 2. Waits until positioning on the robot axes is complete (within the tolerance range).

### Coordinate control

Language	Function
CHANGE	Switches the hand of the main robot.
HAND	Defines the hand of the main robot.
RIGHTY / LEFTY	Selects whether the main robot will be "right-handed" or "left-handed" when moving to a point specified on a Cartesian coordinate system.
SHIFT	Sets the shift coordinates for the main robot by using the shift data specified by a shift variable.

### Condition change

Language	Function
ACCEL	Changes the acceleration coefficient parameter of the main group.
ARCH	Changes the arch position parameter of the main group.
ASPEED	Changes the automatic movement speed of the main group.
AXWGHT	Changes the axis tip weight parameter of the main group.
DECCEL	Changes the deceleration rate parameter of the main group.
ORGORD	Sets the axis sequence parameter to perform return-to-origin and absolute search in the main group.
OUTPOS	Changes the OUT position parameter of the main group.
PDEF	Defines the pallet used to execute a pallet movement command.
SPEED	Changes the program speed for the main group.
TOLE	Changes the tolerance parameter of the main group.
WEIGHT	Changes the tip weight parameter of the main robot.

### Communication control

Language	Function
ONLINE / OFFLINE	Changes communication mode and initialize the communication port.
SEND	Sends the read file data into a write file.

### Screen control

Language	Function
PRINT	Displays the value of specified variable on the MPB/RPB screen.

### Key control

Language	Function
INPUT	Assigns a value to the variable specified from the MPB/RPB.

### Procedure

Language	Function
CALL	Calls up sub-procedures defined by the SUB and END SUB statements.
EXIT SUB	Terminates the sub-procedure defined by the SUB and END SUB statements.
SHARED	Does not permit variables declared with a program written outside a subprocedure (SUB to END SUB) to be passed on as dummy arguments, but allows them to be referred to with a sub-procedure.
SUB to END SUB	Defines a sub-procedure.

### Task control

Language	Function
CHGPRI	Changes the priority of the specified task.
CUT	Terminates a task currently being executed or temporarily stopped.
EXIT TASK	Terminates its own task currently being executed.
RESTART	Restarts a task that is temporarily stopped.
START	Sets the task number and priority of the specified task and starts that task.
SUSPEND	Temporarily stops another task being executed.

### Error control

Language	Function
ON ERROR GOTO	If an error occurs during program execution, this command allows the program to jump to the error processing routine specified by the label without stopping the program, or stops the program and displays the error message.
RESUME	Resumes the program execution after recovery from an error. This command is used in the error processing routine.
ERL	Gives the line number where an error occurred.
ERR	Gives the error code number when an error occurred.

### PATH control

Language	Function
PATH	Sets the PATH motion on the main robot axis.
PATH END	Terminates the path setting for PATH motion.
PATH SET	Starts the path setting for PATH motion.
PATH START	Starts the PATH motion.

### Torque control

Language	Function
DRIVE (with torque limit option)	Executes an absolute movement command on each axis in the main group.
TORQUE	Changes the maximum torque instruction for the specified main group axis.
TRQTIME	Sets the current limit time-out period on the specified main group axis when using a torque limit setting option in the DRIVE statement.
TRQTIME	Sets the current limit time-out period on the specified main group axis when using a torque limit setting option in the DRIVE statement.



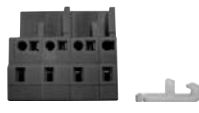
## Accessories and part options

### RCX240/RCX240S

#### Standard accessories

- LCC140
- TS-X
- TS-P
- SR1-X
- SR1-P
- RCX221
- RCX222
- RCX240/S
- RCX340

#### ● Power connector + wiring connection lever



Model KAS-M5382-00

#### ● Safety connector



Model KX0-M5163-00

RCX240/S

#### ● RPB terminator (dummy connector)

Attach this to the RPB connector during operation with the programming box RPB removed.



Model KAS-M5163-30

- RCX221
- RCX222
- RCX240/S

#### ● Standard I/O (STD.DIO) connector



Model KX0-M533G-00

RCX240/S

#### ● L type stay (for installing front side, rear side.)

Use to install the controller.



Model KX0-M410H-00

RCX240/S

Note. Model No. is for a single bracket (L type stay).  
 (Two are required to install one controller.)

#### ● Absolute battery

Battery for absolute data back-up.

##### ● Basic specifications

Item	Absolute battery
Battery type	Lithium metallic battery
Battery capacity	3.6V/2,750mAh
Data holding time	About 1 year <sup>Note1</sup> (in state with no power applied)
Dimensions	φ17 × L53mm
Weight <sup>Note2</sup>	22g



Model KAS-M53G0-11

Note 1. When using two batteries for each two axes.  
 Note 2. Weight of battery itself.  
 Note. The absolute battery is subject to wear and requires replacement.  
 If trouble occurs with the memory then remaining battery life is low so replace the absolute battery.  
 The battery replacement period depends on usage conditions. But generally you should replace the battery after about 1 year counting the total time after connecting to the controller and left without turning on the power.

- SR1-X
- RCX222
- RCX240/S

#### Important

#### Absolute battery installation conditions

1 to 2 batteries are required for each 2 axes.  
 ● 1 battery.....Data storage time of approximately 6 months (with no power applied)  
 ● 2 batteries...Data storage time of approximately 1 year (with no power applied)  
 Note. Absolute battery is not required for either of the 2 axes if using incremental or semi-absolute specifications.

#### ● Battery case

This is the absolute battery holder.



Model KBG-M5395-00

- SR1-X
- RCX222
- RCX240/S

See next page for optional parts

# RCX240/RCX240S

## Options

### L type stay (for side surface installation)

Use to install the controller.



Model	KX0-M410H-10	RCX240/S
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Note. Model No. is for a single bracket (L type stay).

### Programming box RPB/RPB-E

P.586

This device can perform all operations such as manual robot operation, program entry and edit, teaching and parameter settings.



	RPB	RPB-E	
Model	KBK-M5110-10	KBK-M5110-00	RCX221
Enable switch	-	3-position	RCX222
CE marking	Not supported	Applicable	RCX240/S

### Support software for PC VIP+

P.580

VIP+ is a simple to use application software that makes tasks such as robot operation, writing-editing programs, and point teaching easy to visually understand.



VIP+ software model	KX0-M4966-00	RCX221
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RCX222  
RCX240/S

### Environment

OS	Windows 2000, XP (32bit), Vista, 7, 10 (Supported version: V.2.8.4 or later)
CPU	Processor that meets or exceeds the suggested requirements for the OS being used.
Memory	Suggested amount of memory or more for the OS being used.
Hard disk	40MB of available space required on installation drive.
Communication method	RS-232C, Ethernet Note. For Ethernet communication, Ethernet unit for RCX series controller is required.
Applicable robot controllers	RCX14x / 22x / 240

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.  
Note. ADOBE and ADOBE READER are registered trademarks of Adobe Systems Incorporated.  
Note. Ethernet is a registered trademark of Xerox Corporation.

### Data cables

Communication cable for VIP+.  
Select from USB cable or D-sub cable.



Model	USB type (5m)	KBG-M538F-00	LCC140
	D-Sub type 9pin-9pin (5m)	KAS-M538F-10	ERCD

Note. This USB cable supports Windows 2000/XP or later.  
Note. Data cable jointly used for POPCOM+, VIP+, RCX-Studio Pro.

Note. USB driver for communication cable can also be downloaded from our website.

SR1-X  
SR1-P  
RCX221  
RCX222  
RCX240/S  
RCX340

### YC-Link board

Model	KX0-M4400-A1	RCX240/S
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Articulated robots  
YA  
Linear conveyor modules  
LCM100  
Motor-less single axis actuator  
Robonity  
Compact single-axis robots  
TRANSEVO  
Single-axis robots  
FLIP-X  
Linear motor single-axis robots  
PHASER  
Cartesian robots  
XY-X  
SCARA robots  
YK-X  
Pick & place robots  
YP-X  
CLEAN  
CONTROLLER INFORMATION  
CABLE  
TECHNICAL INFORMATION  
DISCONTINUED

Articulated robots  
**YA**

Linear conveyor  
modules  
**LCMT100**

Motor-less single  
axis actuator  
**Robonity**

Compact  
single-axis robots  
**TRANSERVO**

Single-axis robots  
**FLIP-X**

Linear motor  
single-axis robots  
**PHASER**

Cartesian  
robots  
**XY-X**

SCARA  
robots  
**YK-X**

Pick & place  
robots  
**YP-X**

**CLEAN**

**CONTROLLER**

**INFORMATION**

**CABLE**

**TECHNICAL**

**INFORMATION**

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# iVY System

Sales end date **End of December 2019**  
 Repair coverage **End of December 2026**

Applicable controllers ▶ **RCX240/RCX240S**

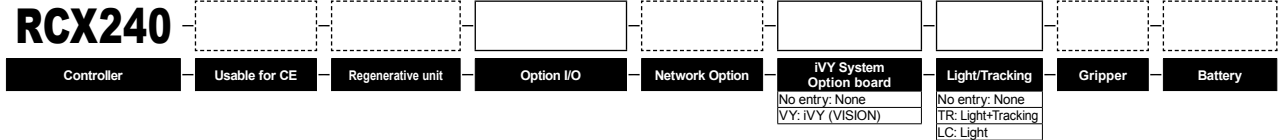
● **Robot with image processing functions**

“SEARCH and TAKE” “CHECK POSITION and ASSEMBLE”  
**YAMAHA offers a whole new production line concept that eliminates time-consuming teaching and positioning tasks with “iVY-system”.**



■ **Ordering method**

## RCX240



Note. For details on the various selection items, refer to P.659

■ **Basic specifications**

● **iVY board**

Item	iVY board	
Basic specifications	Applicable controllers	RCX240 / RCX240S
	Pixels	640 (H) × 480 (V) (300,000 pixels, VGA)
	Settable part types	40 part types
	Connectable cameras	Maximum 2 units Note. Note. If connecting 2 units, then must be the same model
	Camera types	Double speed compatible analog camera
	Memory	128MB SDRAM, 256MB miniSD card
	External I/F	Ethernet (100BASE-TX)
Search method	Edge search (Correlative edge filter, Sobel filter)	
Image input	Trigger	S/W trigger, H/W trigger, Camera internal synch
	External trigger input	2 points
Functions	Search function	Position offset, Auto registry of point data
	ID recognition (usage planned)	QR-Code [Model2], DataMatrix
Setup support functions	Calibration, image save function, model registration <sup>Note</sup> , fiducial mark registration <sup>Note</sup> , monitor function <sup>Note</sup>	

Note. Requires Windows PC.

● **Lighting control board (option)**

Item	Lighting control board (option)	
Basic specifications	Applicable controllers	RCX240 / RCX240S
	Number of lighting connected units	Up to 2 units
	Light adjusting system	PWM control (0 to 100%) (Cycle 60kHz) Stroboscopic light (10 to 33000us)
	Trigger	S/W trigger, H/W trigger
	External trigger input	2 points
	Lighting power input	12VDC or 24VDC (Supplied from outside commonly to 2 channels)
	Lighting output	When DC12V is supplied: Less than 30W with 2 channels totaled When DC24V is supplied: Less than 60W with 2 channels totaled

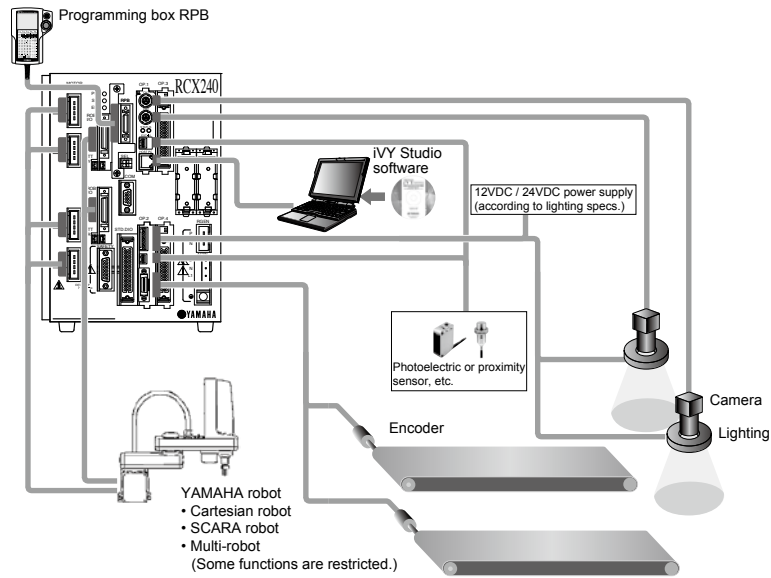
● **Tracking board (Options)**

Item	Tracking board (option)		
Basic specifications	Applicable controllers	RCX240 / RCX240S	
	Lighting control section	Light adjusting system	Up to 2 units
		Light adjusting system	PWM control (0 to 100%) (Cycle 60kHz) Stroboscopic light (10 to 33000us)
		Trigger	S/W trigger, H/W trigger
		External trigger input	2 points
	Pulse input section	Lighting power input	12VDC or 24VDC (Supplied from outside commonly to 2 channels)
		Lighting output	When DC12V is supplied: Less than 30W with 2 channels totaled When DC24V is supplied: Less than 60W with 2 channels totaled
		Number of encoder connected units	Up to 2 units
		Encoder power source	DC5V (Less than 500mA with 2 channels totaled) (Supplied from controller)
		Applicable encoder	Line driver equivalent to 26LS31 / 26C31 (Conforming to RS-422)
Input phase		A, $\bar{A}$ , B, $\bar{B}$ , Z, $\bar{Z}$	
Maximum response frequency	2MHz		
Counter / Step-up multiplication	0 to 65535 / Double, quadruple		
Other	Provided with broken wire detect function		

Note. The tracking board is required when using the tracking function.



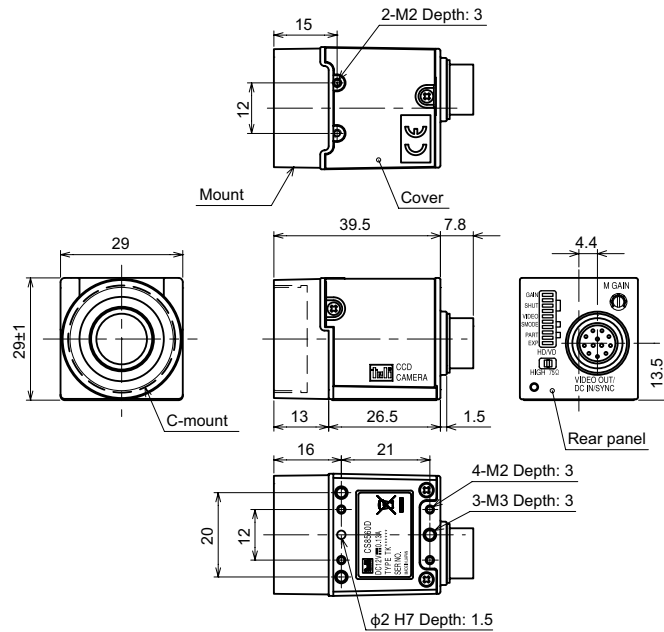
## System configuration illustration



\* The above configuration example shows a system where the ivY board and tracking board are used.  
 \* Connections to the STD.DIO, ACIN, and SAFETY connectors is not shown in the above illustration.

## Dimensional outlines CCD camera

### CCD camera dimensions (Model No. : KX0-M7913-00)

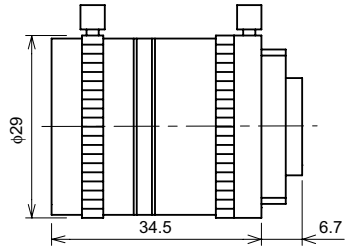


- Articulated robots  
YA
- Linear conveyor modules  
LCM100
- Motor-less single axis actuator  
Robonity
- Compact single-axis robots  
TRANSEVO
- Single-axis robots  
FLIP-X
- Linear motor single-axis robots  
PHASER
- Cartesian robots  
XX-X
- SCARA robots  
YK-X
- Pick & place robots  
YP-X
- CLEAN
- CONTROLLER INFORMATION
- CABLE
- TECHNICAL INFORMATION
- DISCONTINUED

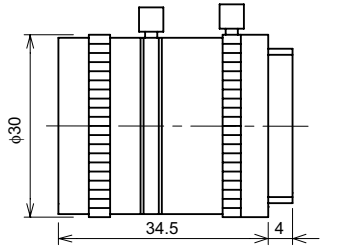
Articulated robots  
YA  
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Motor-less single axis actuator  
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## Lenses

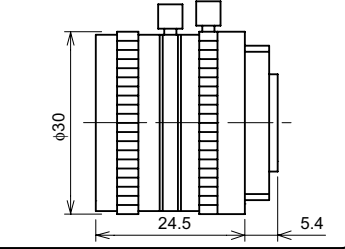
- **8mm lens [ML-0813]**  
(Model No. : KM7-M7214-60)



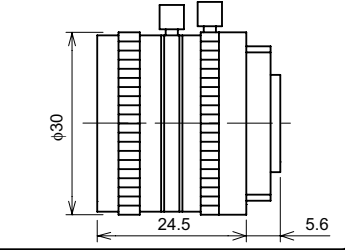
- **12mm lens [ML-1214]**  
(Model No. : KM7-M7214-40)



- **16mm lens [ML-1614]**  
(Model No. : KM7-M7214-30)



- **25mm lens [ML-2514]**  
(Model No. : KM7-M7214-20)



## Standard lens angle-of-view table

	Focal length (mm)	Aperture value (F No.)	Angle-of-view (degrees)		Closest approach distance (m)
			Vertical	Horizontal	
8mm lens [ML-0813]	8	F1.3-CLOSE	45.0	57.8	0.2
12mm lens [ML-1214]	12	F1.4-CLOSE	21.9	29.0	0.3
16mm lens [ML-1614]	16	F1.4-CLOSE	23.0	30.4	0.4
25mm lens [ML-2514]	25	F1.4-CLOSE	21.6	28.5	0.5

Note. Field-of-view table for our standard lenses. As the field-of-view widens, distortion on image edges may increase.

## Viewing angle, WD, and magnification when using close-up ring

Close-up ring (mm)	8mm lens [ML-0813]				12mm lens [ML-1214]			
	Viewing angle (mm×mm)		WD (mm)	Magnification	Viewing angle (mm×mm)		WD (mm)	Magnification
	Vertical	Horizontal			Vertical	Horizontal		
None	72	96	148	0.05	77	103	248	0.05
	32	43	59	0.11	41	55	125	0.09
0.5	57	77	115	0.06	89	119	289	0.04
	21	27	34	0.18	28	38	80	0.13
1	29	38	52	0.13	45	59	136	0.08
	26	34	22	0.24	21	29	57	0.17
1.5	19	26	31	0.19	30	40	85	0.12
	-	-	-	-	17	23	42	0.21
2	-	-	-	-	22	30	59	0.16
	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-

Close-up ring (mm)	16mm lens [ML-1614]				25mm lens [ML-2514]			
	Viewing angle (mm×mm)		WD (mm)	Magnification	Viewing angle (mm×mm)		WD (mm)	Magnification
	Vertical	Horizontal			Vertical	Horizontal		
None	82	109	358	0.04	65	87	458	0.06
	48	64	206	0.07	48	64	338	0.08
0.5	117	156	515	0.03	181	242	1270	0.02
	34	45	143	0.11	38	50	269	0.10
1	58	78	252	0.06	91	121	637	0.12
	26	35	108	0.14	31	42	223	0.12
1.5	39	52	164	0.09	60	81	425	0.06
	22	29	86	0.17	27	36	191	0.13
2	29	39	120	0.12	45	60	320	0.08
	10	14	35	0.35	14	19	103	0.25
5	12	16	42	0.31	18	24	130	0.20

### Notes

- This table shows viewing angles when using the standard lens and close-up ring. (If no close-up ring this is closest approach.)
- If not using a close-up ring, then a WD smaller than the value in this table cannot be used.
- If using a close-up ring, then only a WD close to this value can be used.
- The values in this table are at most only a reference and do not signify an absolute index.
- To find viewing angle and WD other than for our standard lens, visit our website at: <http://www.moritex.co.jp/products/>.

# Accessories and part options

## iVY System

### Standard accessories



Model	Without power supply harness	KX0-M4402-10
	With power supply harness	KX0-M4402-00

Note. If newly adding an iVY, choose the model with harness.

- **iVY board**

- **iVY board accessories**

Name	Single unit model	Set Model
Camera trigger input cable connector	KX0-M657L-00	KX0-M657K-00
Custom tool	KX0-M657M-00	

- **Support software for PC**  
**iVY Studio**

iVY Studio is support software for the iVY system that allows registering part types and reference marks as well as monitoring the work search status during automatic robot operation by connecting to the robot controller.



- **Environment**

Software model	KX0-M4988-00
OS	Windows 2000, XP (32bit), Vista, 7 Note. The 64 bit version is not subject to the operation warranty.
CPU	Exceeding the environment recommended by the OS being used
Memory	64MB or more (Recommend)
Hard disk	Vacant capacity of more than 40MB in the installation destination drive Note. Besides the above, also requires memory space for storing images and data.
Display	800 × 600 dots or more, 32768 colors (16bit High Color) or more (recommended)
Network	TCP/IP Ethernet port × 1

Note. Windows is the registered trademark of US Microsoft Corporation in U.S.A. and other countries.

## Options

### ● Lighting control board

Model	KX0-M4400-G0
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#### ● Required options for the lighting control board

Name	Single unit model	Set Model
Lighting power cable connector	KX0-M657L-10	KX0-M657K-10
Wiring lever	KX0-M657M-10	
Lighting input trigger cable connector	KX0-M657L-00	KX0-M657K-00
Custom tool	KX0-M657M-00	

### ● Tracking board

Model	KX0-M4400-E0
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#### ● Required options for the tracking board

Name	Single unit model	Set Model
Lighting power cable connector	KX0-M657L-10	KX0-M657K-10
Wiring lever	KX0-M657M-10	
Lighting input trigger cable connector	KX0-M657L-00	KX0-M657K-00
Custom tool	KX0-M657M-00	
AB phase input cable connector	KX0-M657L-20	KX0-M657K-20
AB phase input cable connector case	KX0-M657M-20	

### ● Camera cable

Cable for connecting the camera to the iVY board.



Model	3.5m	KX0-M66F3-00
	6m	KX0-M66F3-10
	9.5m (relay 3.5m+6m)	KX0-M66F0-20
	Relay cable 3.5m	KX0-M66F4-00
	7m (relay 1m+6m)	KX0-M66F0-30
	Relay cable 1m	KX0-M66F4-10

Note. When installing a camera cable in a moving section, use a relay cable so that it can be easily replaced if needed.

### ● CCD camera



Model	KX0-M7913-00
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### ● Lens



Model	8mm	KM7-M7214-60 (ML-0813)
	12mm	KM7-M7214-40 (ML-1214)
	16mm	KM7-M7214-30 (ML-1614)
	25mm	KM7-M7214-20 (ML-2514)

### ● Close-up ring



Model	0.5mm	KX0-M7215-00
	1.0mm	KX0-M7215-10
	2.0mm	KX0-M7215-20
	5.0mm	KX0-M7215-30

### ● LAN cable with shield cloth (5m)



Model	KX0-M55G0-00
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### ● Tracking encoder cable (10m)



Model	KX0-M66AF-00
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