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ROBO CYLINDER

24 VDC Pulse Motor Controller-Integrated Type

ERC2

with ERC2 controller

Catalogue Extract

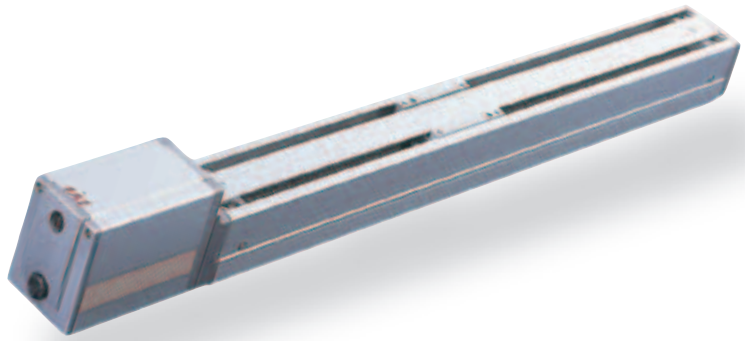
3rd revised Edition

ERC2-SA6C Controller-Integrated Slider Type 58mm Width Pulse Motor Straight Type

■ Configuration: **ERC2** — **SA6C** — **I** — **PM** — ☐ — ☐ — ☐ — ☐ — ☐ — ☐

Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
		I: Incremental	PM: Pulse motor	12:12mm 6: 6mm 3: 3mm	50: 50mm \ 600:600mm (50mm pitch increments)	NP: PIO (NPN) Type PSEL PN: PIO (PNP) Type SE :SIO Type	N : None P : 1m S : 3m M: 5m X☐☐ : Custom Length W☐☐: Cable with conectors on both ends R☐☐ : Robot cable RW☐☐ : Robot cable with conectors on both ends	B : Brake NM: Reversed-home

* See page Pre-35 for explanation of each code that makes up the configuration name.



Technical References P. A-5

POINT Notes on Selection

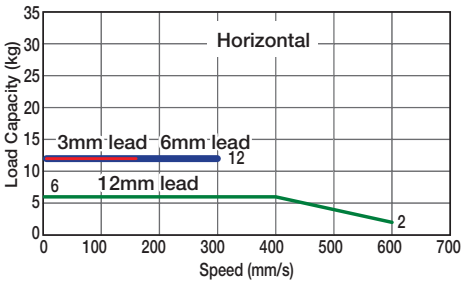
(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed.
Use the actuator specification table below to check the maximum speed at the stroke you desire.

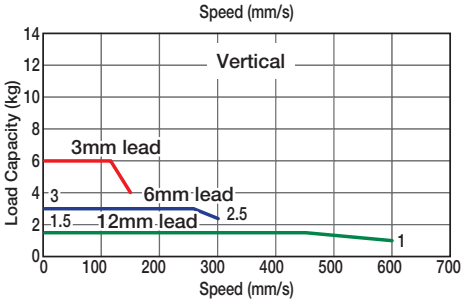
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported.

(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 3mm-lead model, or when using vertically).
These values are the upper limits for the acceleration.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Stroke (mm)
ERC2-SA6C-I-PM-12-①-②-③-④	12	～6	～1.5	50～600 (50mm increments)
ERC2-SA6C-I-PM-6-①-②-③-④	6	12	～3	
ERC2-SA6C-I-PM-3-①-②-③-④	3	12	～6	

Legend ① Stroke ② I/O type ③ Cable length ④ Options

■ Stroke and Maximum Speed

Lead \ Stroke	50～550 (50mm increments)	600 (mm)
12	600	515
6	300	255
3	150	125

(Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	**P** (1m)	
	S (3m)	
	M (5m)	
Special Lengths	**X06** (6m) ～ **X10** (10m)	
Connectors on Both Ends	**W01**(1m) ～ **W03**(3m)	
	W04(4m) ～ **W05**(5m)	
	W06(6m) ～ **W10**(10m)	
Robot Cable	**R01** (1m) ～ **R03** (3m)	
	R04 (4m) ～ **R05** (5m)	
	R06 (6m) ～ **R10** (10m)	
Connectors on Both Ends Robot Cable	**RW01** (1m) ～ **RW03** (3m)	
	RW04 (4m) ～ **RW05** (5m)	
	RW06 (6m) ～ **RW10** (10m)	

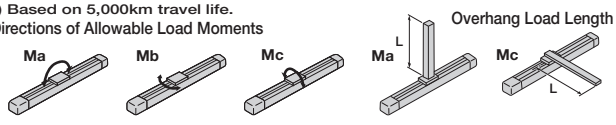
* See page A-39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw Ø10mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Allowable Static Moment	Ma: 38.3N·m Mb: 54.7N·m Mc: 81.0N·m
Allowable Dynamic Moment(*)	Ma: 8.9N·m Mb: 12.7N·m Mc: 18.6N·m
Overhang Load Length	150mm or less along Ma; 150mm or less along Mb/Mc
Ambient Operating Temp./Humidity	0～40°C, 85％RH or less (Non-condensing)

(*) Based on 5,000km travel life.

Directions of Allowable Load Moments



Overhang Load Length

Option List

Name	Option Code	See Page	
Brake	**B**	→ A-25	
Reversed-home	**NM**	→ A-33	

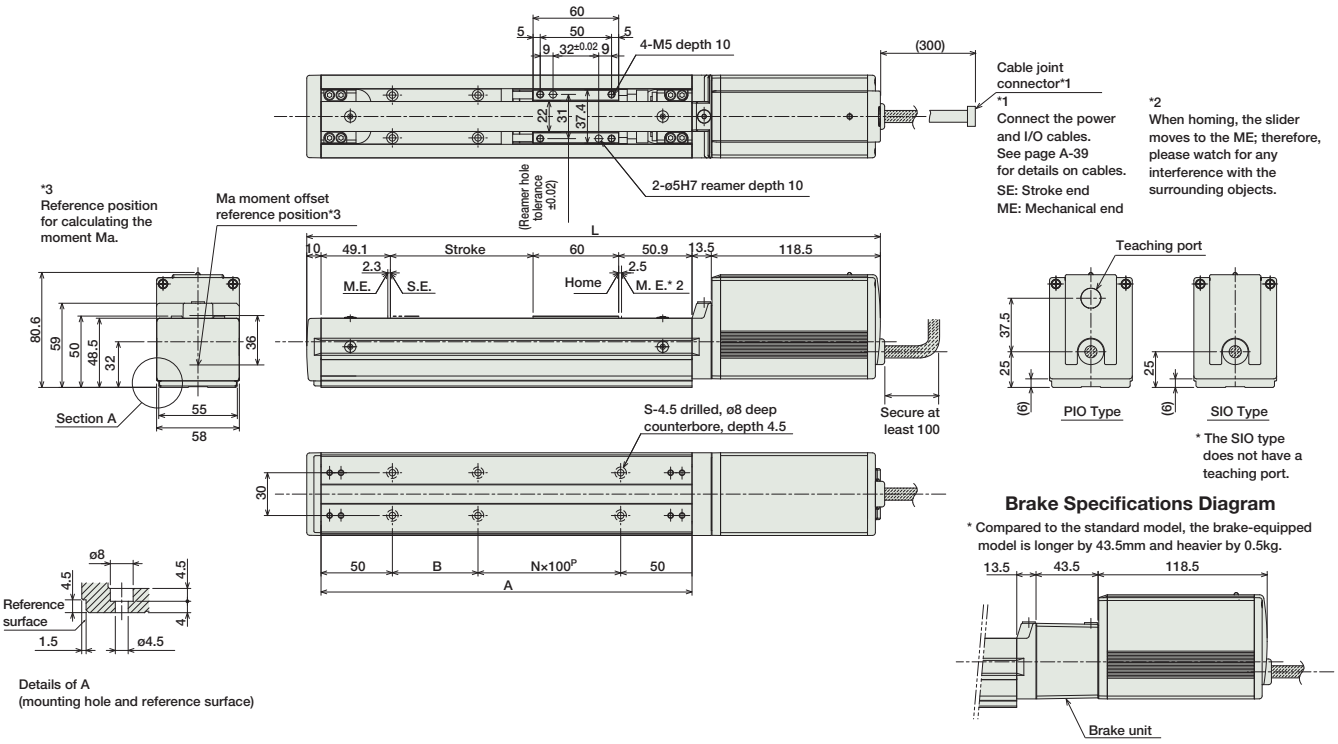
Dimensions

CAD drawings can be downloaded from IAI website. www.robocylinder.de

2/3D CAD

For Special Orders P. A-9

* For the reversed-home model, the dimensions (distance from the ME to home) on the motor-side and that on the opposite side are flipped.



Brake Specifications Diagram

* Compared to the standard model, the brake-equipped model is longer by 43.5mm and heavier by 0.5kg.

Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300	350	400	450	500	550	600
L	352	402	452	502	552	602	652	702	752	802	852	902
A	210	260	310	360	410	460	510	560	610	660	710	760
B	10	60	10	60	10	60	10	60	10	60	10	60
N	1	1	2	2	3	3	4	4	5	5	6	6
S	6	6	8	8	10	10	12	12	14	14	16	16
Weight (kg)	1.9	2.0	2.1	2.3	2.4	2.6	2.7	2.8	3.0	3.1	3.3	3.4

I/O Type (Controller built into the actuator)

I/O type

The integrated controller in the ERC2 Series can be selected from the following 3 types based on the type of external input and output (I/O). Select the type according to your application.

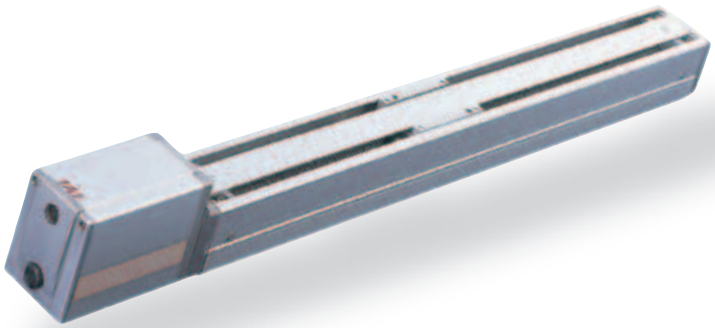
Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN Specification)		ERC2-SA6C-I-PM-□-□-NP-□-□	Simple control type with up to 16-point positioning	16	DC24V	2A Max.		→ P515
PIO Type (PNP Specification)		ERC2-SA6C-I-PM-□-□-PN-□-□	Supports the PNP I/O commonly used overseas.	16				
SIO Type		ERC2-SA6C-I-PM-□-□-SE-□-□	Field Network Connection Serial (Gateway unit used)	64				

ERC2-SA7C Controller-Integrated Slider Type 68mm Width Pulse Motor Straight Type

■ Configuration: **ERC2** — **SA7C** — **I** — **PM** — □ — □ — □ — □ — □ — □ — □

Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
		I: Incremental	PM: Pulse motor	16:16mm 8: 8mm 4: 4mm	50: 50mm \ 600:600mm (50mm pitch increments)	NP: PIO (NPN) Type PSEL PN: PIO (PNP) Type SE :SIO Type	N : None P : 1m S : 3m M: 5m X□□ : Custom Length W□□: Cable with conectors on both ends R□□: Robot cable RW□□: Robot cable with conectors on both ends	B : Brake NM : Reversed-home

* See page Pre-35 for explanation of each code that makes up the configuration name.



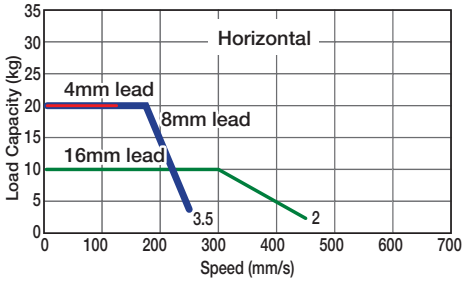
Technical References P. A-5

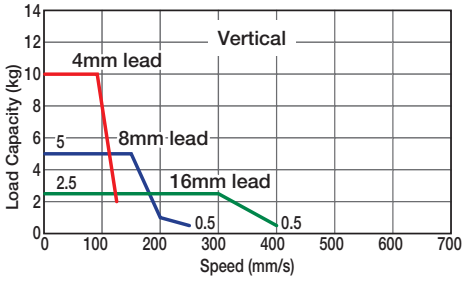
POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed.
Use the actuator specification table below to check the maximum speed at the stroke you desire.
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported.
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 3mm-lead model, or when using vertically).
These values are the upper limits for the acceleration.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Stroke (mm)
ERC2-SA7C-I-PM-16-①-②-③-④	16	～10	～2.5	50～600 (50mm increments)
ERC2-SA7C-I-PM-8-①-②-③-④	8	～20	～5	
ERC2-SA7C-I-PM-4-①-②-③-④	4	20	～10	

Legend ① Stroke ② I/O type ③ Cable length ④ Options

■ Stroke and Maximum Speed

Lead \ Stroke	50～600 (50mm increments)
16	450〈400〉
8	250
4	125

※ < > apply to vertical setting. (Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	P (1m)	
	S (3m)	
	M (5m)	
Special Lengths	X06 (6m) ～ X10 (10m)	
Connectors on Both Ends	W01(1m) ～ W03(3m)	
	W04(4m) ～ W05(5m)	
	W06(6m) ～ W10(10m)	
Robot Cable	R01 (1m) ～ R03 (3m)	
	R04 (4m) ～ R05 (5m)	
	R06 (6m) ～ R10 (10m)	
Connectors on Both Ends Robot Cable	RW01 (1m) ～ RW03 (3m)	
	RW04 (4m) ～ RW05 (5m)	
	RW06 (6m) ～ RW10 (10m)	

* See page A-39 for cables for maintenance.

Option List

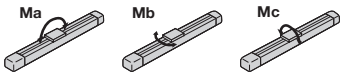
Name	Option Code	See Page	
Brake	B	→ A-25	
Reversed-home	NM	→ A-33	

Actuator Specifications

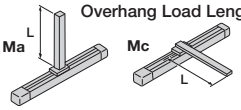
Item	Description
Drive System	Ball screw ø12mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Allowable Static Moment	Ma: 63.0N·m Mb: 90.0N·m Mc: 132.5N·m
Allowable Dynamic Moment(*)	Ma: 13.8N·m Mb: 19.7N·m Mc: 29.0N·m
Overhang Load Length	150mm or less along Ma; 150mm or less along Mb/Mc
Ambient Operating Temp./Humidity	0～40°C, 85%RH or less (Non-condensing)

(*) Based on 5,000km travel life.

Directions of Allowable Load Moments



Overhang Load Length



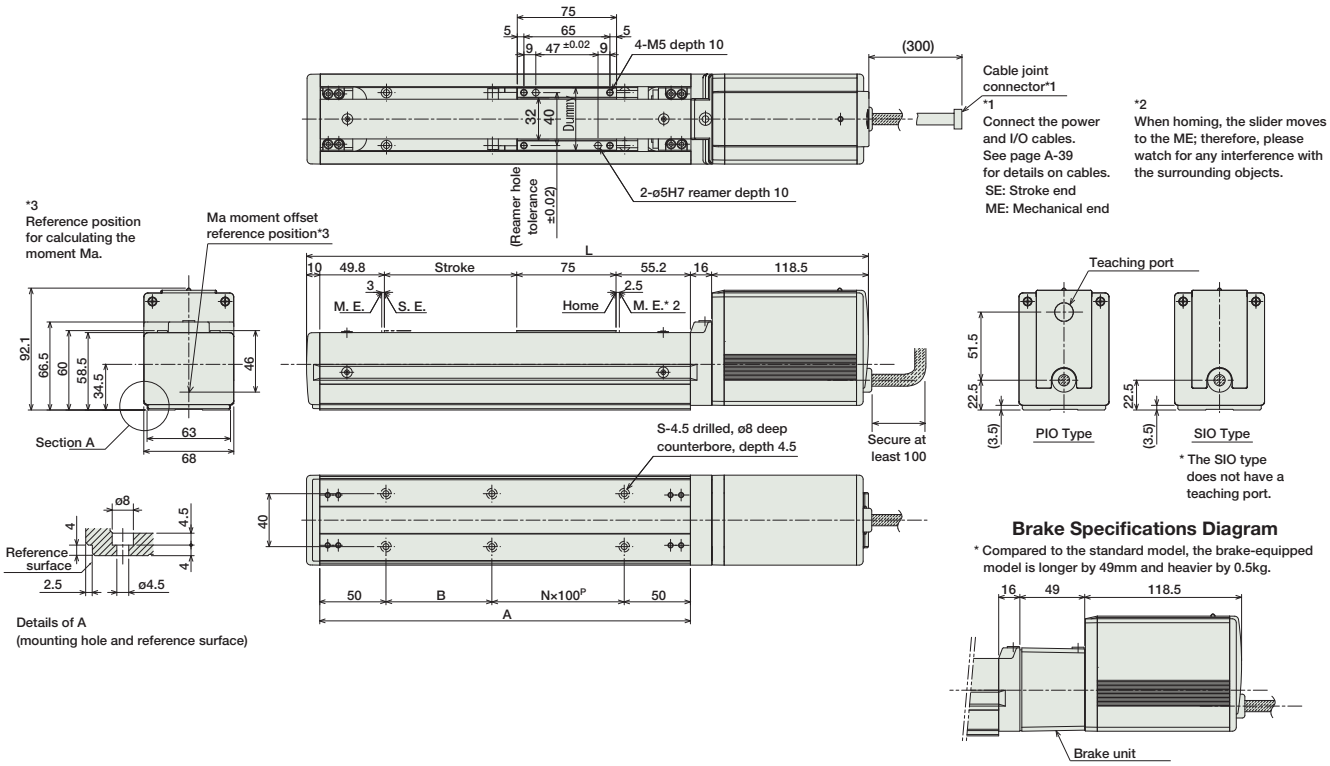
Dimensions

CAD drawings can be downloaded from IAI website. www.robocylinder.de

2/3D CAD

※ For the reversed-home model, the dimensions (distance from the ME to home) on the motor-side and that on the opposite side are flipped.

For Special Orders P. A-9



Brake Specifications Diagram

* Compared to the standard model, the brake-equipped model is longer by 49mm and heavier by 0.5kg.

■ Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300	350	400	450	500	550	600
L	374.5	424.5	474.5	524.5	574.5	624.5	674.5	724.5	774.5	824.5	874.5	924.5
A	230	280	330	380	430	480	530	580	630	680	730	780
B	30	80	30	80	30	80	30	80	30	80	30	80
N	1	1	2	2	3	3	4	4	5	5	6	6
S	6	6	8	8	10	10	12	12	14	14	16	16
Weight (kg)	3.1	3.2	3.4	3.6	3.7	3.9	4.0	4.2	4.3	4.5	4.6	4.8

I/O Type (Controller built into the actuator)

I/O type

The integrated controller in the ERC2 Series can be selected from the following 3 types based on the type of external input and output (I/O). Select the type according to your application.

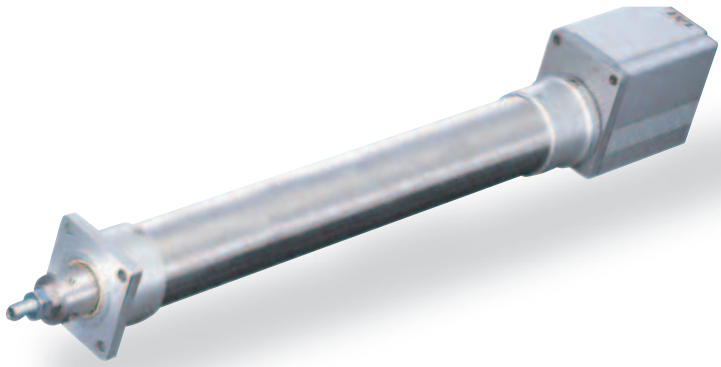
Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN Specification)		ERC2-SA7C-I-PM-□-□-NP-□-□	Simple control type with up to 16-point positioning	16	DC24V	2A Max.		→ P515
PIO Type (PNP Specification)		ERC2-SA7C-I-PM-□-□-PN-□-□	Supports the PNP I/O commonly used overseas.	16				
SIO Type		ERC2-SA7C-I-PM-□-□-SE-□-□	Field Network Connection Serial (Gateway unit used)	64				

ERC2-RA6C Controller-Integrated Rod Type 58mm Width Pulse Motor Straight Type

■ Configuration: ERC2 — RA6C — I — PM — □ — □ — □ — □ — □ — □

ERC2	RA6C	I	PM	□	□	□	□	□
Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
		I: Incremental	PM: Pulse motor	12 : 12mm 6 : 6mm 3 : 3mm	50: 50mm 〜 300: 300mm (50mm pitch increments)	NP : PIO (NPN) type PN : PIO (PNP) type SE : SIO type	N : None P : 1m S : 3m M : 5m X□□ : Custom W□□ : Double-ended cable R□□ : Robot cable RW□□ : Double-ended Robot cable	B : Brake FT : Foot bracket NM : Reversed-home

* See page Pre-35 for an explanation of the naming convention.



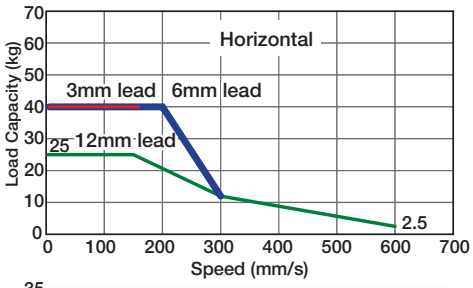
Technical References P. A-5

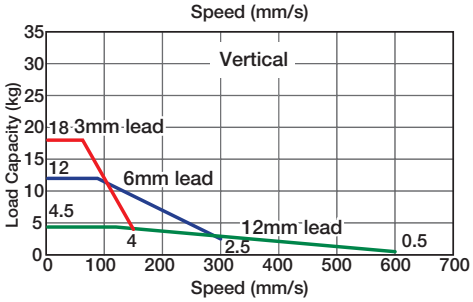
POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed.
Use the actuator specification table below to check the maximum speed at the stroke you desire.
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported.
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 3mm-lead model, or when used vertically). This is the upper limit of the acceleration.
(4) The value for the horizontal load capacity is with an external guide.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Maximum Push Force (N)(Note 2)	Stroke (mm)
ERC2-RA6C-I-PM-12-①-②-③-④	12	〜25	〜4.5	78	50〜300 (50mm increments)
ERC2-RA6C-I-PM-6-①-②-③-④	6	〜40	〜12	157	
ERC2-RA6C-I-PM-3-①-②-③-④	3	40	〜18	304	

Legend ① Stroke ② I/O Type ③ Cable length ④ Options

(Note 2) See page A-64 for the pushing force graphs.

■ Stroke and Maximum Speed

Lead \ Stroke	50 〜 250 (50mm increments)	300 (mm)
12	600	500
6	300	250
3	150	125

(Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	**P** (1m)	
	S (3m)	
	M (5m)	
Special Lengths	**X06** (6m) 〜 **X10** (10m)	
Double-Ended	**W01** (1m) 〜 **W03** (3m)	
	W04 (4m) 〜 **W05** (5m)	
	W06 (6m) 〜 **W10** (10m)	
Robot Cable	**R01** (1m) 〜 **R03** (3m)	
	R04 (4m) 〜 **R05** (5m)	
	R06 (6m) 〜 **R10** (10m)	
Double-Ended Robot Cable	**RW01** (1m)〜 **RW03** (3m)	
	RW04 (4m)〜 **RW05** (5m)	
	RW06 (6m)〜 **RW10** (10m)	

* See page A39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw ø10mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Rod Diameter	ø22mm special SUS type
Non-rotating accuracy of rod	±1.5 deg
Ambient Operating Temp./Humidity	0 〜 40°C, 85% RH or less (non-condensing)

Option List

Name	Option Code	See Page	
Brake	**B**	→ A-25	
Foot bracket	**FT**	→ A-29	
Reversed-home	**NM**	→ A-33	

Dimensions

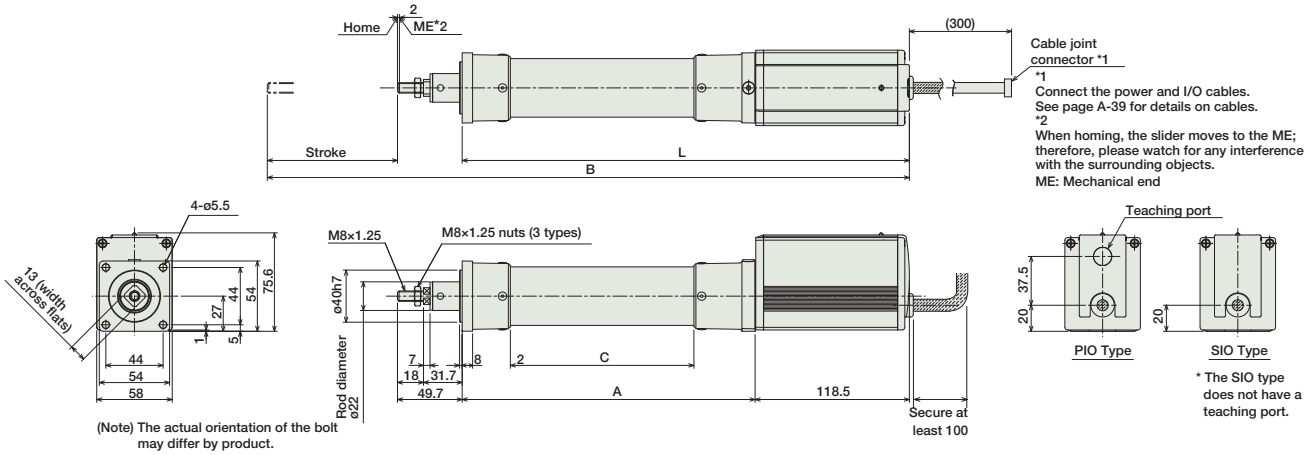
CAD drawings can be downloaded from IAI website. www.robocylinder.de

For Special Orders P. A-9

2/3D CAD

Note:

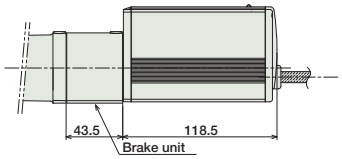
Do not apply any external force on the rod from any direction other than the direction of the rod's motion. If a force is exerted on the rod in a perpendicular or rotational direction, the detent may become damaged.



(Note) The actual orientation of the bolt may differ by product.

Brake Specifications Diagram

* Compared to the standard model, the brake-equipped model is longer by 43.5mm and heavier by 0.5kg.



Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300
L	293.5	343.5	393.5	443.5	493.5	543.5
A	175	225	275	325	375	425
B	393.2	493.2	593.2	693.2	793.2	893.2
C	91	141	191	241	291	341
Weight (kg)	1.6	1.7	1.8	2.0	2.1	2.2

I/O Type (Built-In Controller)

I/O Type

The integrated controller in the ERC2 series can be selected from the following 3 types based on the type of external input and output (I/O). Select the controller according to your applications.

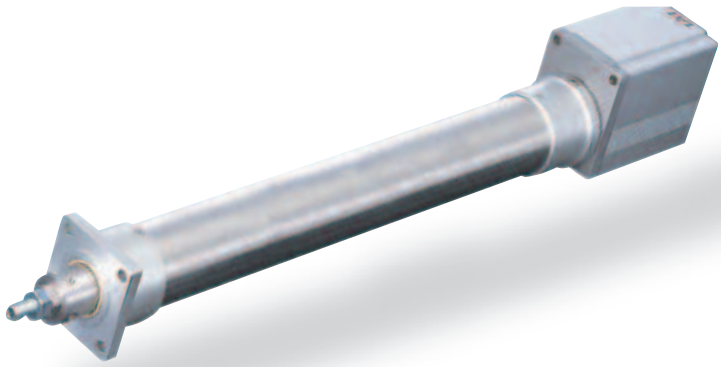
Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN)		ERC2-RA6C-I-PM-□-□-NP-□-□	Easy to control, capable of positioning up to 16 points	16	DC24V	2A max.		→ P515
PIO Type (PNP)		ERC2-RA6C-I-PM-□-□-PN-□-□	Supports the PNP I/O, commonly used overseas.	16				
SIO Type		ERC2-RA6C-I-PM-□-□-SE-□-□	For connecting to a field network (gateway unit used)	64				

ERC2-RA7C Controller-Integrated Rod Type 68mm Width Pulse Motor Straight Type

■ Configuration: **ERC2** — **RA7C** — **I** — **PM** — □ — □ — □ — □ — □

ERC2	RA7C	I	PM	Lead	Stroke	I/O Type	Cable Length	Option
Series	Type	Encoder	Motor					
		I: Incremental	PM: Pulse motor	16 : 16mm 8 : 8mm 4 : 4mm	50: 50mm 〜 300: 300mm (50mm pitch increments)	NP : PIO (NPN) type PN : PIO (PNP) type SE : SIO type	N : None P : 1m S : 3m M : 5m X□□ : Custom W□□ : Double-ended cable R□□ : Robot cable RW□□ : Double-ended Robot cable	B : Brake FT : Foot bracket NM: Reversed-home

* See page Pre-35 for an explanation of the naming convention.



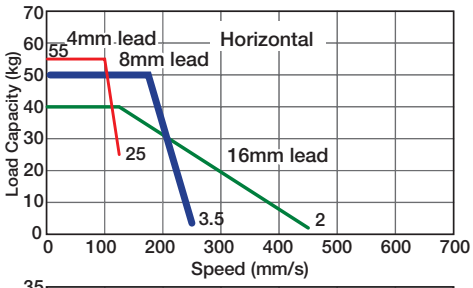
Technical References P. A-5

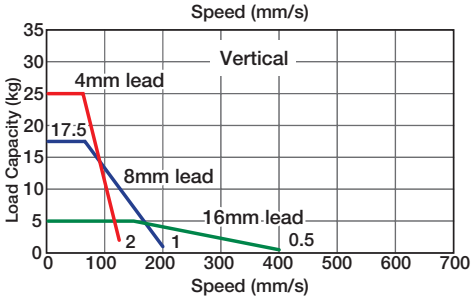
POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed. Use the actuator specification table below to check the maximum speed at the stroke you desire.
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported.
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 4mm-lead model, or when used vertically). This is the upper limit of the acceleration.
(4) The value for the horizontal load capacity is with an external guide.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Maximum Push Force (N)(Note 2)	Stroke (mm)
ERC2-RA7C-I-PM-16-①-②-③-④	16	〜40	〜5	220	50〜300 (50mm increments)
ERC2-RA7C-I-PM-8-①-②-③-④	8	〜50	〜17.5	441	
ERC2-RA7C-I-PM-4-①-②-③-④	4	〜55	〜25	873	

Legend ① Stroke ② I/O Type ③ Cable length ④ Options

(Note 2) See page A-64 for the pushing force graphs.

■ Stroke and Maximum Speed

Lead \ Stroke	50〜300 (50mm increments)
16	450 <400>
8	250 <200>
4	125

* The values enclosed in < > apply for vertical usage. (Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	**P** (1m)	
	S (3m)	
	M (5m)	
Special Lengths	**X06** (6m) 〜 **X10** (10m)	
Double-Ended	**W01** (1m) 〜 **W03** (3m)	
	W04 (4m) 〜 **W05** (5m)	
	W06 (6m) 〜 **W10** (10m)	
Robot Cable	**R01** (1m) 〜 **R03** (3m)	
	R04 (4m) 〜 **R05** (5m)	
	R06 (6m) 〜 **R10** (10m)	
Double-Ended Robot Cable	**RW01** (1m)〜 **RW03** (3m)	
	RW04 (4m)〜 **RW05** (5m)	
	RW06 (6m)〜 **RW10** (10m)	

* See page A-39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw ø12mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Rod Diameter	ø30mm special SUS type
Non-rotating accuracy of rod	±1.5 deg
Ambient Operating Temp./Humidity	0 〜 40°C, 85% RH or less (non-condensing)

Option List

Name	Option Code	See Page	
Brake	**B**	→ A-25	
Foot bracket	**FT**	→ A-29	
Reversed-home	**NM**	→ A-33	

Dimensions

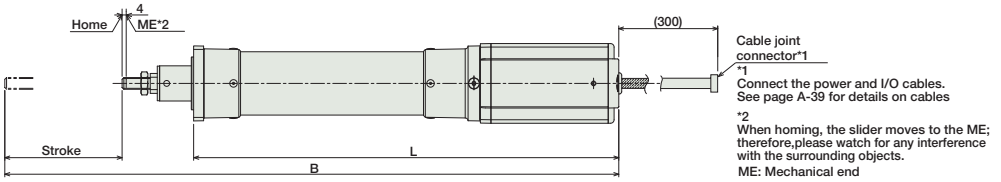
CAD drawings can be downloaded from IAI website. www.robocylinder.de

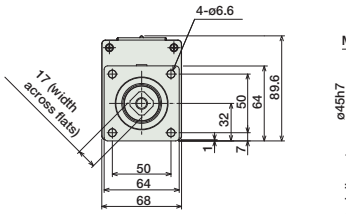
For Special Orders P. A-9

2/3D CAD

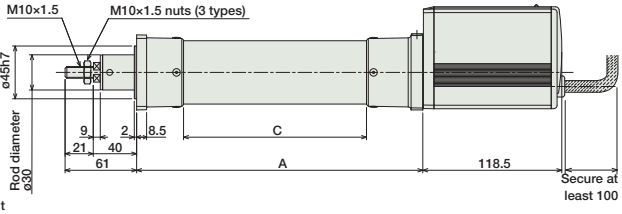
Note:

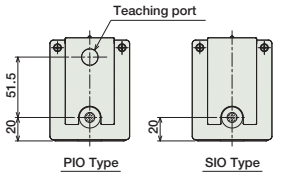
Do not apply any external force on the rod from any direction other than the direction of the rod's motion. If a force is exerted on the rod in a perpendicular or rotational direction, the detent may become damaged.





(Note) The actual orientation of the bolt may differ by product.

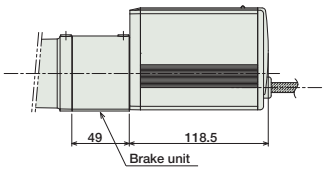




* The SIO type does not have a teaching port.

Brake Specifications Diagram

* Compared to the standard model, the brake-equipped model is longer by 49mm and heavier by 0.5kg.



Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300
L	312.5	362.5	412.5	462.5	512.5	562.5
A	194	244	294	344	394	444
B	423.5	523.5	623.5	723.5	823.5	923.5
C	106	156	206	256	306	356
Weight (kg)	2.7	2.9	3.0	3.2	3.3	3.5

I/O Type (Built-In Controller)

I/O Type

The integrated controller in the ERC2 series can be selected from the following 3 types based on the type of external input and output (I/O). Select the controller according to your applications.

Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN)		ERC2-RA7C-I-PM-□-□-NP-□-□	Easy to control, capable of positioning up to 16 points	16	DC24V	2A max.		→ P515
PIO Type (PNP)		ERC2-RA7C-I-PM-□-□-PN-□-□	Supports the PNP I/O, commonly used overseas.	16				
SIO Type		ERC2-RA7C-I-PM-□-□-SE-□-□	For connecting to a field network (gateway unit used)	64				

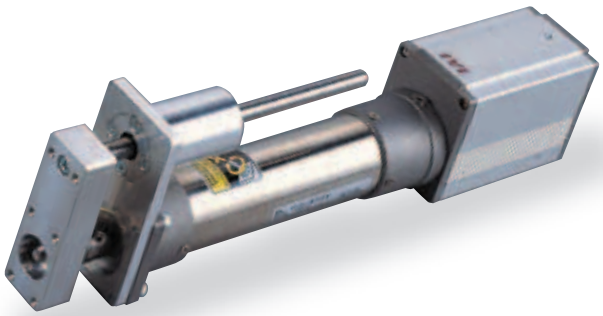
ERC2-RGS6C

Controller-Integrated Rod Type with Single Guide 58mm Width Pulse Motor
Straight Type

■ Configuration: ERC2 — RGS6C — I — PM — □ — □ — □ — □ — □ — □

Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
ERC2	RGS6C	I: Incremental	PM: Pulse motor	12 : 12mm 6 : 6mm 3 : 3mm	50: 50mm 〜 300: 300mm (50mm pitch increments)	NP : PIO (NPN) type PN : PIO (PNP) type SE : SIO type	N : None P : 1m S : 3m M : 5m X□□ : Custom W□□ : Double-ended cable R□□ : Robot cable RW□□ : Double-ended Robot cable	B : Brake FT : Foot bracket NM : Reversed-home

* See page Pre-35 for an explanation of the naming convention.



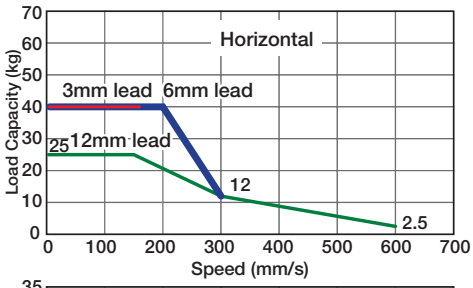
Technical References P. A-5

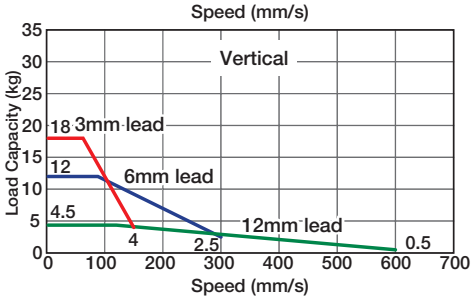
POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed. Use the actuator specification table below to check the maximum speed at the stroke you desire.
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported. In doing so, use the load capacity values without the weight of the guide (see right of page).
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 3mm-lead model, or when used vertically). This is the upper limit of the acceleration.
(4) The value for the horizontal load capacity is with an external guide.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Maximum Push Force (N)(Note 2)	Stroke (mm)
ERC2-RGS6C-I-PM-12-①-②-③-④	12	〜25	〜4.5	78	50〜300 (50mm increments)
ERC2-RGS6C-I-PM-6-①-②-③-④	6	〜40	〜12	157	
ERC2-RGS6C-I-PM-3-①-②-③-④	3	40	〜18	304	

Legend ① Stroke ② I/O Type ③ Cable length ④ Options

(Note 2) See page A-64 for the pushing force graphs.

■ Stroke and Maximum Speed

Lead \ Stroke	50〜250 (50mm increments)	300 (mm)
12	600	500
6	300	250
3	150	125

(Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	P (1m)	
	S (3m)	
	M (5m)	
Special Lengths	X06 (6m) 〜 X10 (10m)	
Double-Ended	W01 (1m) 〜 W03 (3m)	
	W04 (4m) 〜 W05 (5m)	
	W06 (6m) 〜 W10 (10m)	
Robot Cable	R01 (1m) 〜 R03 (3m)	
	R04 (4m) 〜 R05 (5m)	
	R06 (6m) 〜 R10 (10m)	
Double-Ended Robot Cable	RW01 (1m)〜 RW03 (3m)	
	RW04 (4m)〜 RW05 (5m)	
	RW06 (6m)〜 RW10 (10m)	

* See page A-39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw ø10mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Rod Diameter	ø22mm special SUS type
Non-rotating accuracy of rod	±0.05 deg
Ambient Operating Temp./Humidity	0 〜 40°C, 85% RH or less (non-condensing)

Option List

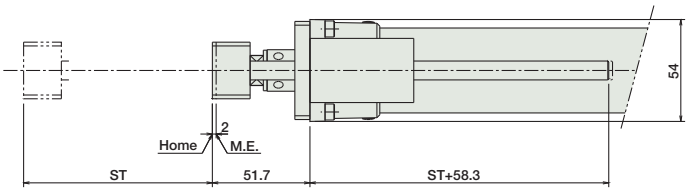
Name	Option Code	See Page	
Brake	B	→ A-25	
Foot bracket	FT	→ A-29	
Reversed-home	NM	→ A-33	

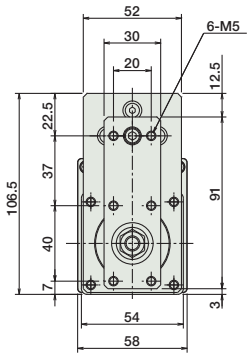
Dimensions

CAD drawings can be downloaded from IAI website. www.robocylinder.de

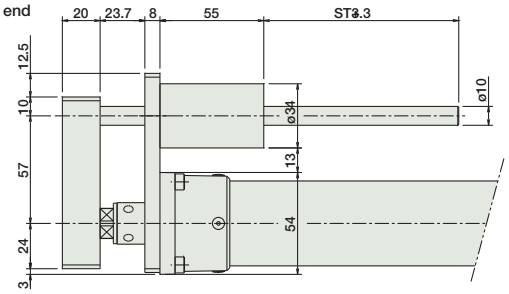
2/3D CAD

For Special Orders P. A-9





M.E. : Mechanical end



* See page 166 for the dimensions of the actuator.

Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300
Guide weight (kg)	0.2	0.2	0.3	0.3	0.3	0.4
Guide-actuator weight (kg)	1.8	1.9	2.1	2.3	2.4	2.6

I/O Type (Built-In Controller)

I/O Type

The integrated controller in the ERC2 series can be selected from the following 3 types based on the type of external input and output (I/O). Select the controller according to your applications.

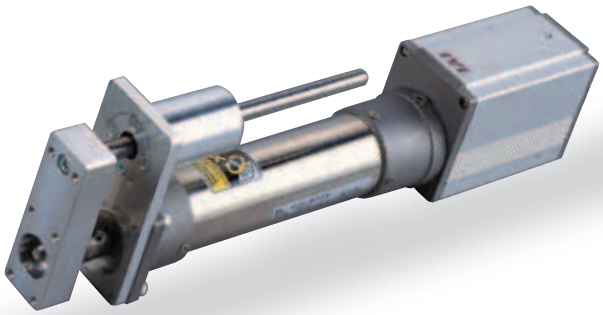
Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN)		ERC2-RGS6C-I-PM-□-□-NP-□-□	Easy to control, capable of positioning up to 16 points	16	DC24V	2A max.		→ P515
PIO Type (PNP)		ERC2-RGS6C-I-PM-□-□-PN-□-□	Supports the PNP I/O, commonly used overseas.	16				
SIO Type		ERC2-RGS6C-I-PM-□-□-SE-□-□	For connecting to a field network (gateway unit used)	64				

ERC2-RGS7C Controller-Integrated Rod Type 68mm Width Pulse Motor Straight Type

■ Configuration: **ERC2** — **RGS7C** — **I** — **PM** — □ — □ — □ — □ — □ — □

Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
ERC2	RGS7C	I: Incremental	PM: Pulse motor	16 : 16mm 8 : 8mm 4 : 4mm	50: 50mm 〜 300: 300mm (50mm pitch increments)	NP : PIO (NPN) type PN : PIO (PNP) type SE : SIO type	N : None P : 1m S : 3m M : 5m X□□ : Custom W□□ : Double-ended cable R□□ : Robot cable RW□□ : Double-ended Robot cable	B : Brake FT : Foot bracket NM : Reversed-home

* See page Pre-35 for an explanation of the naming convention.



Technical References P. A-5

POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed. Use the actuator specification table below to check the maximum speed at the stroke you desire.

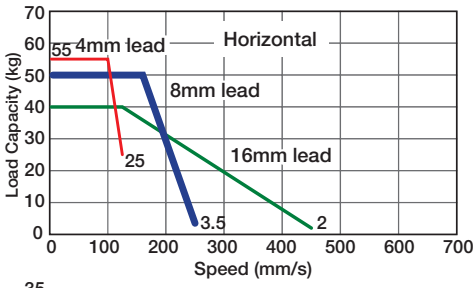
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported. In doing so, use the load capacity values without the weight of the guide (see right of page).

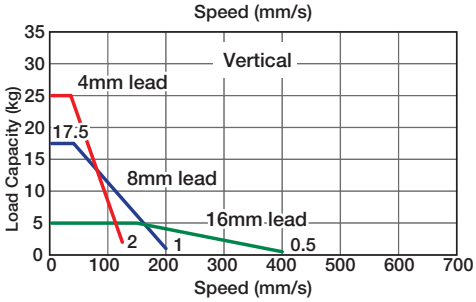
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 4mm-lead model, or when used vertically). This is the upper limit of the acceleration.

(4) The value for the horizontal load capacity is with an external guide.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Maximum Push Force (N) (Note 2)	Stroke (mm)
ERC2-RGS7C-I-PM-16-①-②-③-④	16	〜40	〜5	220	50〜300 (50mm increments)
ERC2-RGS7C-I-PM-8-①-②-③-④	8	〜50	〜17.5	441	
ERC2-RGS7C-I-PM-4-①-②-③-④	4	〜55	〜25	873	

Legend ① Stroke ② I/O Type ③ Cable length ④ Options

(Note 2) See page A-64 for the pushing force graphs.

■ Stroke and Maximum Speed

Lead \ Stroke	50〜300 (50mm increments)
16	450 <400>
8	250 <200>
4	125

* The values enclosed in < > apply for vertical usage. (Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	**P** (1m)	
	S (3m)	
	M (5m)	
Special Lengths	**X06** (6m) 〜 **X10** (10m)	
Double-Ended	**W01** (1m) 〜 **W03** (3m)	
	W04 (4m) 〜 **W05** (5m)	
	W06 (6m) 〜 **W10** (10m)	
Robot Cable	**R01** (1m) 〜 **R03** (3m)	
	R04 (4m) 〜 **R05** (5m)	
	R06 (6m) 〜 **R10** (10m)	
Double-Ended Robot Cable	**RW01** (1m)〜 **RW03** (3m)	
	RW04 (4m)〜 **RW05** (5m)	
	RW06 (6m)〜 **RW10** (10m)	

* See page A-39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw ø12mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Rod Diameter	ø30mm special SUS type
Non-rotating accuracy of rod	±0.05 deg
Ambient Operating Temp./Humidity	0 〜 40°C, 85% RH or less (non-condensing)

Option List

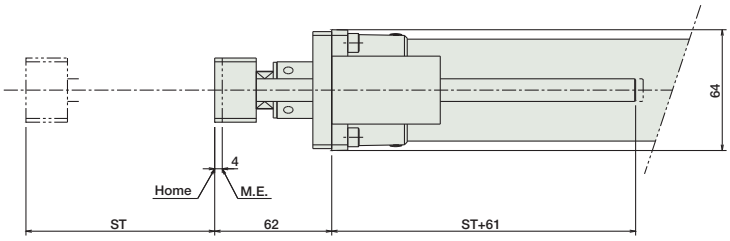
Name	Option Code	See Page	
Brake	**B**	→ A-25	
Foot bracket	**FT**	→ A-29	
Reversed-home	**NM**	→ A-33	

Dimensions

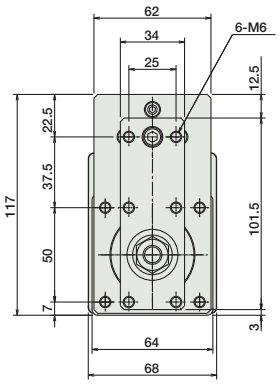
CAD drawings can be downloaded from IAI website. www.robocylinder.de

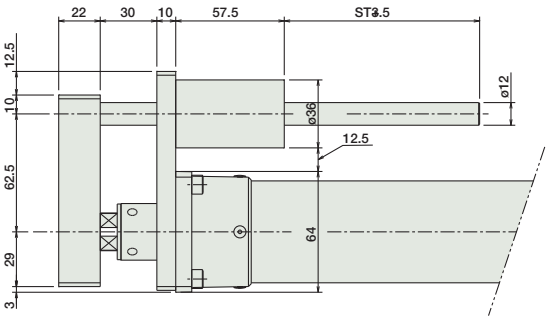
2/3D CAD

For Special Orders P. A-9



M.E. : Mechanical end





* See page 168 for the dimensions of the actuator.

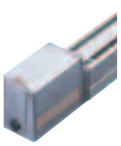
Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300
Guide weight (kg)	0.3	0.3	0.4	0.4	0.5	0.5
Guide+actuator weight (kg)	3.0	3.2	3.4	3.6	3.8	4.0

I/O Type (Built-In Controller)

I/O Type

The integrated controller in the ERC2 series can be selected from the following 3 types based on the type of external input and output (I/O). Select the controller according to your applications.

Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN)		ERC2-RGS7C-I-PM-□-□-NP-□-□	Easy to control, capable of positioning up to 16 points	16	DC24V	2A max.		→ P515
PIO Type (PNP)		ERC2-RGS7C-I-PM-□-□-PN-□-□	Supports the PNP I/O, commonly used overseas.	16				
SIO Type		ERC2-RGS7C-I-PM-□-□-SE-□-□	For connecting to a field network (gateway unit used)	64				

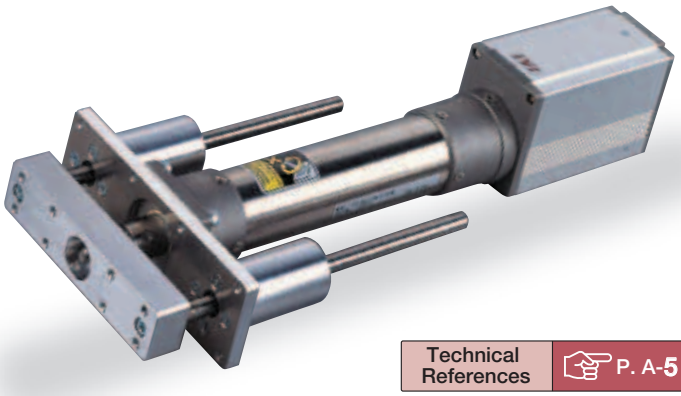
ERC2-RGD6C

Controller-Integrated Rod Type with Double Guide 58mm Width
Pulse Motor Straight Type

■ Configuration: ERC2 — RGD6C — I — PM — □ — □ — □ — □ — □ — □

Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
ERC2	RGD6C	I: Incremental	PM: Pulse motor	12 : 12mm 6 : 6mm 3 : 3mm	50: 50mm 〜 300: 300mm (50mm pitch increments)	NP : PIO (NPN) type PN : PIO (PNP) type SE : SIO type	N : None P : 1m S : 3m M : 5m X□□ : Custom W□□ : Double-ended cable R□□ : Robot cable RW□□ : Double-ended Robot cable	B : Brake FT : Foot bracket NM: Reversed-home

* See page Pre-35 for an explanation of the naming convention.



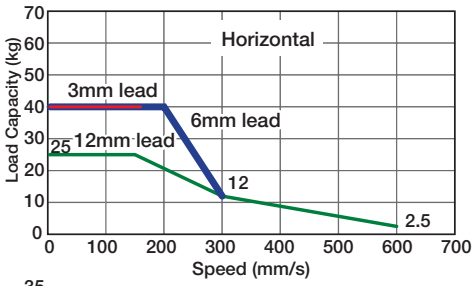
Technical References P. A-5

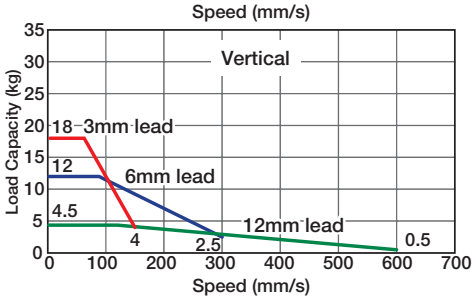
POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed. Use the actuator specification table below to check the maximum speed at the stroke you desire.
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported. In doing so, use the load capacity values without the weight of the guide (see right of page).
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 3mm-lead model, or when used vertically). This is the upper limit of the acceleration.
(4) The value for the horizontal load capacity is with an external guide.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Maximum Push Force (N)(Note 2)	Stroke (mm)
ERC2-RGD6C-I-PM-12-①-②-③-④	12	〜25	〜4.5	78	50〜300 (50mm increments)
ERC2-RGD6C-I-PM-6-①-②-③-④	6	〜40	〜12	157	
ERC2-RGD6C-I-PM-3-①-②-③-④	3	40	〜18	304	

Legend ① Stroke ② I/O Type ③ Cable length ④ Options

(Note 2) See page A-64 for the pushing force graphs.

■ Stroke and Maximum Speed

Lead \ Stroke	50〜250 (50mm increments)	300 (mm)
12	600	500
6	300	250
3	150	125

(Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	P (1m)	
	S (3m)	
	M (5m)	
Special Lengths	X06 (6m) 〜 X10 (10m)	
Double-Ended	W01 (1m) 〜 W03 (3m)	
	W04 (4m) 〜 W05 (5m)	
	W06 (6m) 〜 W10 (10m)	
Robot Cable	R01 (1m) 〜 R03 (3m)	
	R04 (4m) 〜 R05 (5m)	
	R06 (6m) 〜 R10 (10m)	
Double-Ended Robot Cable	RW01 (1m)〜 RW03 (3m)	
	RW04 (4m)〜 RW05 (5m)	
	RW06 (6m)〜 RW10 (10m)	

* See page A-39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw ø10mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Rod Diameter	ø22mm special SUS type
Non-rotating accuracy of rod	±0.05 deg
Ambient Operating Temp./Humidity	0 〜 40°C, 85% RH or less (non-condensing)

Option List

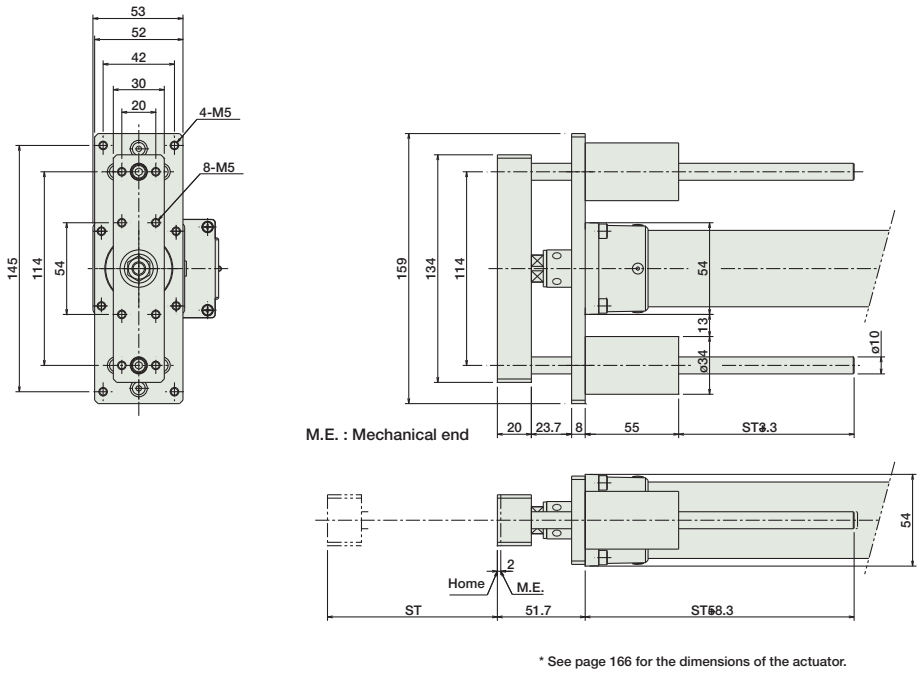
Name	Option Code	See Page	
Brake	B	→ A-25	
Foot bracket	FT	→ A-29	
Reversed-home	NM	→ A-33	

Dimensions

CAD drawings can be downloaded from IAI website. www.robocylinder.de

For Special Orders P. A-9

2/3D CAD



* See page 166 for the dimensions of the actuator.

Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300
Guide weight (kg)	0.4	0.4	0.5	0.6	0.6	0.7
Guide-actuator weight (kg)	2.0	2.1	2.3	2.6	2.7	2.9

I/O Type (Built-In Controller)

I/O Type

The integrated controller in the ERC2 series can be selected from the following 3 types based on the type of external input and output (I/O). Select the controller according to your applications.

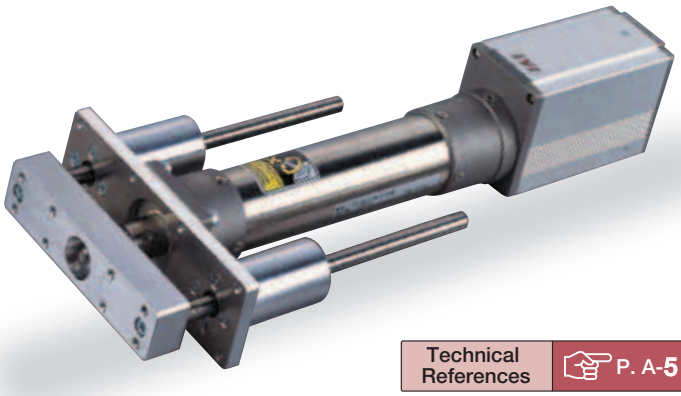
Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN)		ERC2-RGD6C-I-PM-□-□-NP-□-□	Easy to control, capable of positioning up to 16 points	16	DC24V	2A max.		→ P515
PIO Type (PNP)		ERC2-RGD6C-I-PM-□-□-PN-□-□	Supports the PNP I/O, commonly used overseas.	16				
SIO Type		ERC2-RGD6C-I-PM-□-□-SE-□-□	For connecting to a field network (gateway unit used)	64				

ERC2-RGD7C Controller-Integrated Rod Type 68mm Width Pulse Motor Straight Type

■ Configuration: ERC2 — RGD7C — I — PM — □ — □ — □ — □ — □ — □

Series	Type	Encoder	Motor	Lead	Stroke	I/O Type	Cable Length	Option
ERC2	RGD7C	I: Incremental	PM: Pulse motor	16 : 16mm 8 : 8mm 4 : 4mm	50: 50mm 〜 300: 300mm (50mm pitch increments)	NP : PIO (NPN) type PN : PIO (PNP) type SE : SIO type	N : None P : 1m S : 3m M : 5m X□□ : Custom W□□ : Double-ended cable R□□ : Robot cable RW□□ : Double-ended Robot cable	B : Brake FT : Foot bracket NM : Reversed-home

* See page Pre-35 for an explanation of the naming convention.



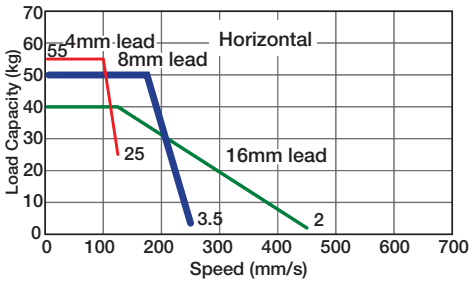
Technical References P. A-5

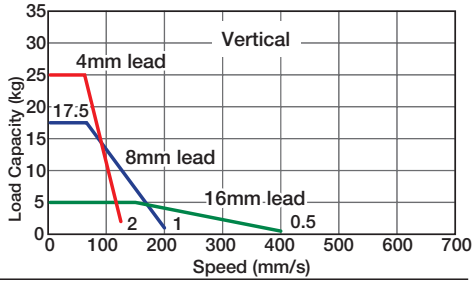
POINT Notes on Selection

(1) When the stroke increases, the maximum speed will drop to prevent the ball screw from reaching the critical rotational speed. Use the actuator specification table below to check the maximum speed at the stroke you desire.
(2) Since the ERC2 series use a pulse motor, the load capacity decreases at high speeds. Check in the Speed vs. Load Capacity graph to see if your desired speed and load capacity are supported. In doing so, use the load capacity values without the weight of the guide (see right of page).
(3) The load capacity is based on operation at an acceleration of 0.3G (0.2G for the 4mm-lead model, or when used vertically). This is the upper limit of the acceleration.
(4) The value for the horizontal load capacity is with an external guide.

■ Speed vs. Load Capacity

Due to the characteristics of the pulse motor, the ERC2 series' load capacity decreases at high speeds. In the table below, check if your desired speed and load capacity are supported.





Actuator Specifications

■ Lead and Load Capacity

(Note 1) Please note that the maximum load capacity decreases as the speed increases.

Model	Lead (mm)	Max. Load Capacity (Note 1) Horizontal (kg)	Max. Load Capacity (Note 1) Vertical (kg)	Maximum Push Force (N)(Note 2)	Stroke (mm)
ERC2-RGD7C-I-PM-16-①-②-③-④	16	〜40	〜5	220	50〜300 (50mm increments)
ERC2-RGD7C-I-PM-8-①-②-③-④	8	〜50	〜17.5	441	
ERC2-RGD7C-I-PM-4-①-②-③-④	4	〜55	〜25	873	

Legend ① Stroke ② I/O Type ③ Cable length ④ Options

(Note 2) See page A-64 for the pushing force graphs.

■ Stroke and Maximum Speed

Lead \ Stroke	50〜300 (50mm increments)
16	450 <400>
8	250 <200>
4	125

* The values enclosed in < > apply for vertical usage. (Unit: mm/s)

Cable List

Type	Cable Symbol	
Standard	P (1m)	
	S (3m)	
	M (5m)	
Special Lengths	X06 (6m) 〜 X10 (10m)	
Double-Ended	W01 (1m) 〜 W03 (3m)	
	W04 (4m) 〜 W05 (5m)	
	W06 (6m) 〜 W10 (10m)	
Robot Cable	R01 (1m) 〜 R03 (3m)	
	R04 (4m) 〜 R05 (5m)	
	R06 (6m) 〜 R10 (10m)	
Double-Ended Robot Cable	RW01 (1m)〜 RW03 (3m)	
	RW04 (4m)〜 RW05 (5m)	
	RW06 (6m)〜 RW10 (10m)	

* See page A-39 for cables for maintenance.

Actuator Specifications

Item	Description
Drive System	Ball screw ø12mm C10 grade
Positioning Repeatability	±0.02mm
Lost Motion	0.1mm or less
Rod Diameter	ø30mm special SUS type
Non-rotating accuracy of rod	±0.05 deg
Ambient Operating Temp./Humidity	0 〜 40°C, 85% RH or less (non-condensing)

Option List

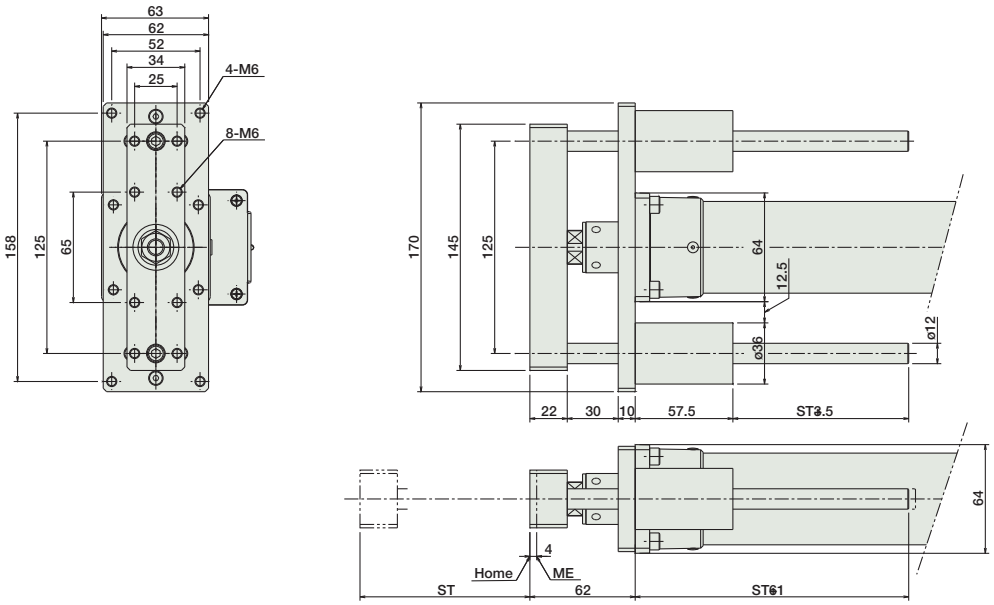
Name	Option Code	See Page	
Brake	B	→ A-25	
Foot bracket	FT	→ A-29	
Reversed-home	NM	→ A-33	

Dimensions

CAD drawings can be downloaded from IAI website. www.robocylinder.de

2/3D CAD

For Special Orders P. A-9



ME: Mechanical end

* See page 168 for the dimensions of the actuator.

Dimensions/Weight by Stroke

Stroke	50	100	150	200	250	300
Guide weight (kg)	0.5	0.6	0.7	0.8	0.9	1.0
Guide actuator weight (kg)	3.2	3.5	3.7	4.0	4.2	4.5

I/O Type (Built-In Controller)

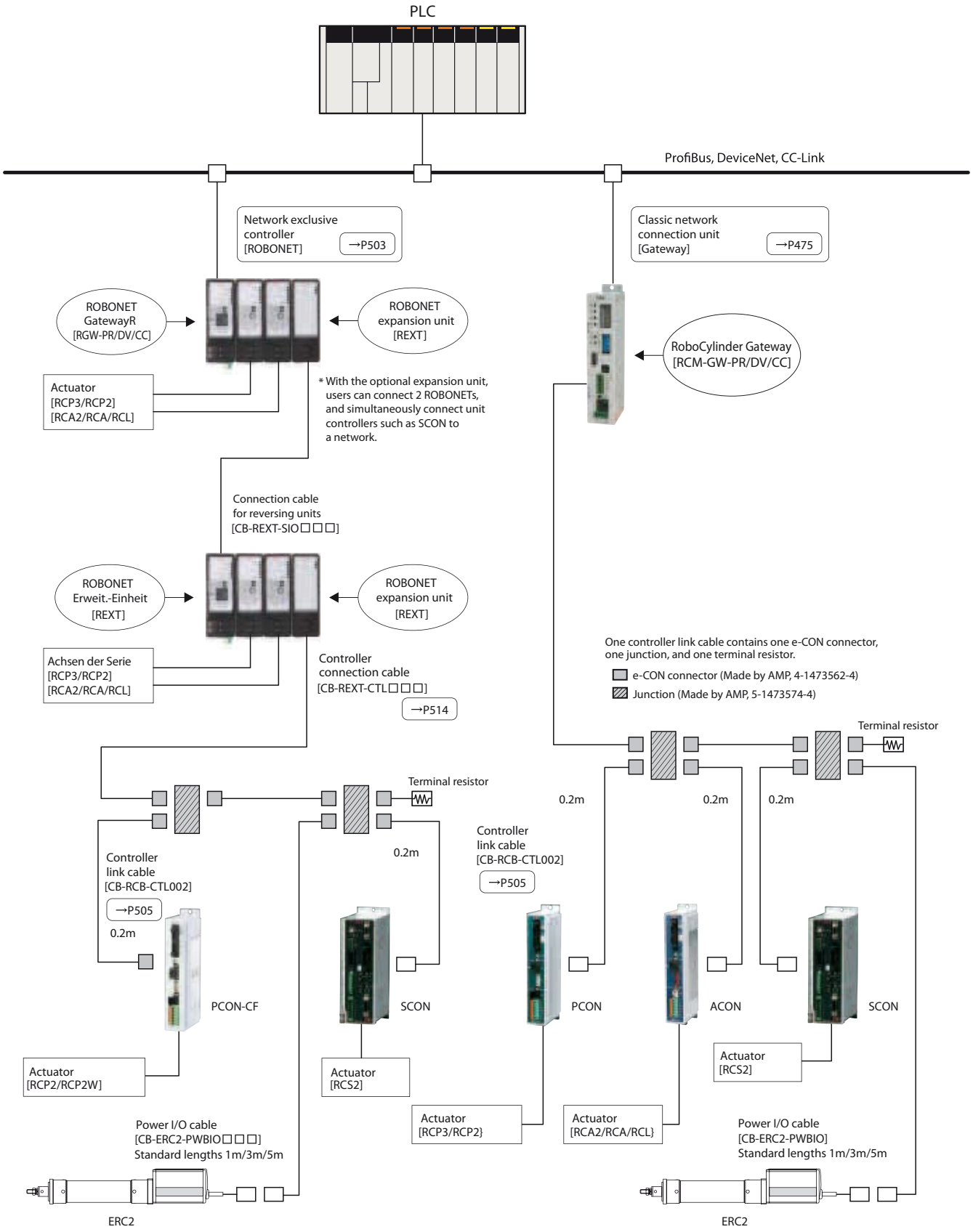
I/O Type

The integrated controller in the ERC2 series can be selected from the following 3 types based on the type of external input and output (I/O). Select the controller according to your applications.

Name	External View	Model	Description	Max. Positioning Points	Input Voltage	Power Supply Capacity		See Page
PIO Type (NPN)		ERC2-RGD7C-I-PM-□-□-NP-□-□	Easy to control, capable of positioning up to 16 points	16	DC24V	2A max.		→ P515
PIO Type (PNP)		ERC2-RGD7C-I-PM-□-□-PN-□-□	Supports the PNP I/O, commonly used overseas.	16				
SIO Type		ERC2-RGD7C-I-PM-□-□-SE-□-□	For connecting to a field network (gateway unit used)	64				

Fieldbus Network System

When operating RoboCylinders over a fieldbus network, a network-dedicated controller ROBONET can be used or a stand-alone controller (PCON/ACON/SCON) can be used connected to a gateway unit or directly via optional fieldbus interface.

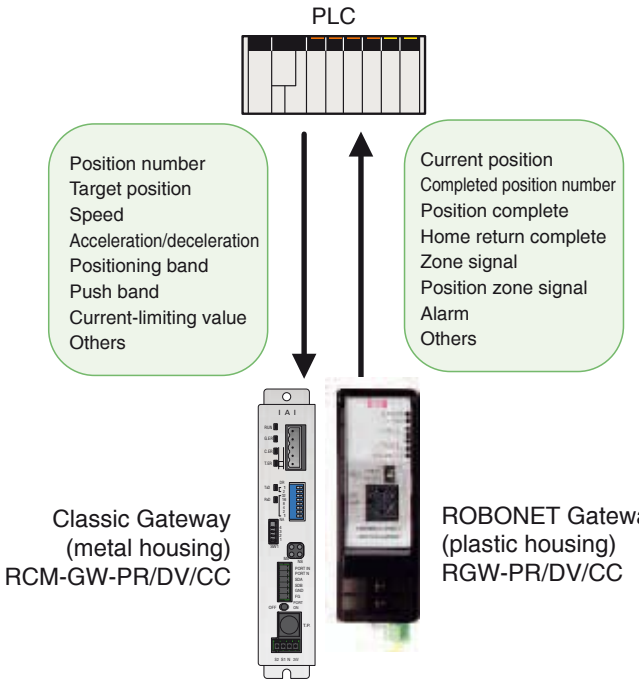


Gateway Unit

The gateway unit is a conversion unit for connecting a RoboCylinder controller to a fieldbus network such as Profibus or DeviceNet. Connect a gateway unit to your field network, and link the gateway unit and each controller via serial communication (RS485). Numerical data such as coordinates, speeds, accelerations and current values can be sent and received between the network master (PLC) and controller by means of I/O-level communication.

Features

1. Move the actuator by specifying positions from a PLC via fieldbus network.
2. Perform push-motion operation via fieldbus network.
3. Operate the actuator by directly sending the target position, speed, acceleration/deceleration and positioning band as numerical values from a PLC.
4. Read the current actuator position and various signals using a PLC.
5. Connectable to a maximum of 16 axes.



Functions

One of the following three operation modes can be selected.

(1) Position-number specification mode

Input target positions, speeds, accelerations/decelerations, positioning bands and other settings to the controller in advance as position data, and specify a desired position number via network, just like you do with PIO signals, to move the actuator. A maximum of 64 positioning points (ROBONET GatewayR: 768) can be set. Various status signals can be read using a PLC.

(2) Positioning-data specification mode

Specify a desired target position, speed, acceleration/deceleration, positioning band, push band, current-limiting value, etc., directly as numerical values to move the actuator or cause it to perform push-motion operation. Various status signals can be input/output and current position data read using a PLC.

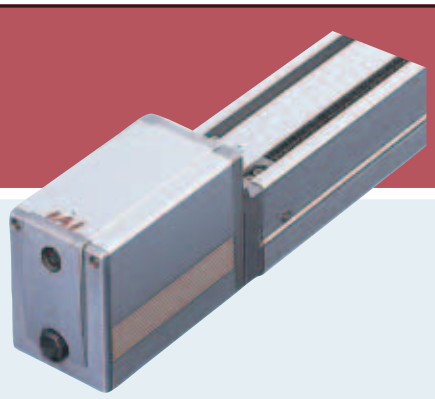
(3) Simple direct/position-number specification mode

Call desired position data except for a target position (by specifying an applicable position number), and specify only a target position as a numerical value, to move the actuator. A maximum of 512 positioning points (ROBONET GatewayR: 768) can be set.

ERC2

■ Model: NP / PN / SE

Controller module of controller-integrated actuator



List of Models

I/O type	NP	PN	SE
Name	PIO type (NPN Specification)	PIO type (PNP Specification)	Serial Communication Type
External View			
Description	Controller that moves by designating position numbers with NPN PIO via PLC.	Controller that moves by designating position numbers with PNP PIO via PLC.	Controller that is used by connecting to the field network via the gateway unit.
Position points	16 points	16 points	64 points

Model

ERC2 – □ – I – PM – □ – □ – □ – □ – □

Series – Type – Encoder – Motor – Lead – Stroke – I/O Type – Cable Length – Option

Type	
SA6C	Slider type (52mm width)
SA7C	Slider type (58mm width)
RA6C	Rod type (52mm width)
RA7C	Rod type (58mm width)
RGS6C	Rod type with single guide (52mm width)
RGS7C	Rod type with single guide (58mm width)
RGD6C	Rod type with double guide (52mm width)
RGD7C	Rod type with double guide (58mm width)

Encoder	
I	Incremental

Motor	
PM	Pulse Motor

Lead	
16	16mm
12	12mm
8	8mm
6	6mm
4	4mm
3	3mm

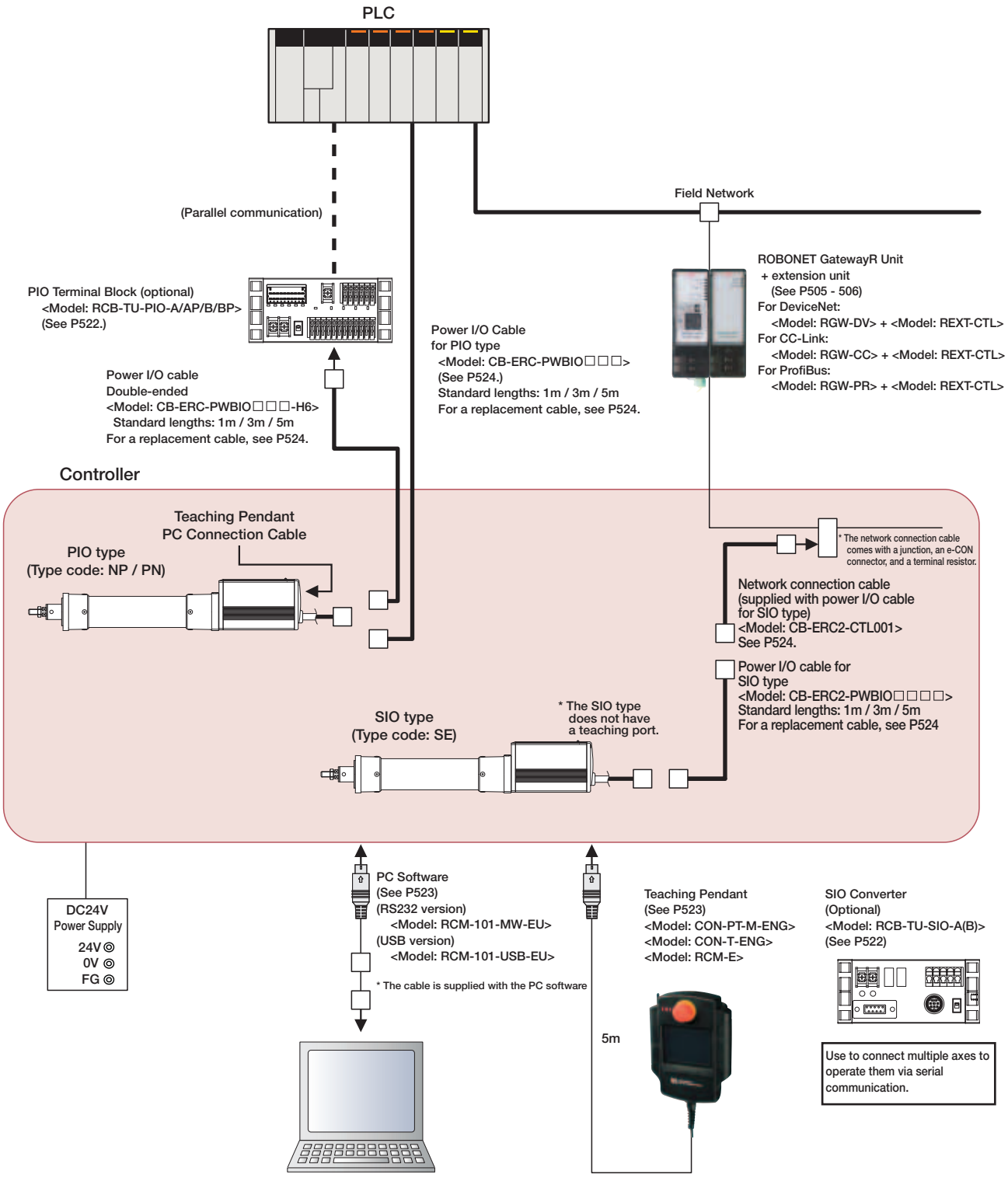
Stroke	
50 ~ 600	50mm ~ 600mm (50mm increments)

I/O Type	
NP	PIO Type (NPN)
PN	PIO Type (PNP)
SE	SIO Type

Cable Length	
N	No cable
P	1m
S	3m
M	5m
X□□	Custom length
R□□	Robot Cable
W□□	Cable with connectors at both ends
RW□□	Robot cable with connectors at both ends

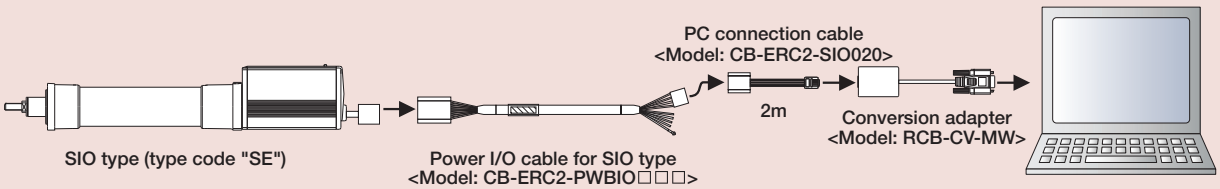
Option	
B	Brake
NM	Reversed-home
FT	Foot bracket

System configuration



Wiring Diagram to Connect to a PC

When connecting the SIO type to the PC directly, use the following cable.



I/O specification (PIO type)

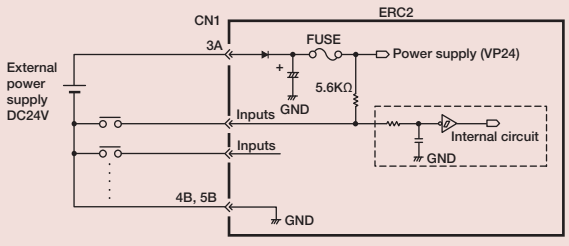
Input section External input specifications

Item	Specifications
Input points	6 points
Input voltage	DC24V +/-10%
Input current	4mA/circuit
Leak current	Max. 1mA/point
Operating voltage	ON voltage: Min. 18V (3.5mA) OFF voltage: Max. 6V (1mA)

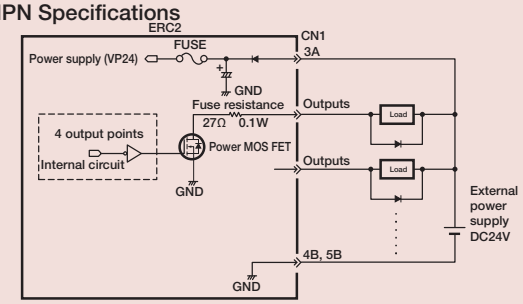
Output section External output specifications

Item	Specifications
Input points	4 points
Nominal load voltage	DC24V
Max. current	60mA/point
Remaining voltage	2V or less
Short-circuit, reverse voltage, protection	Fuse resistance (27Ω0.1W)

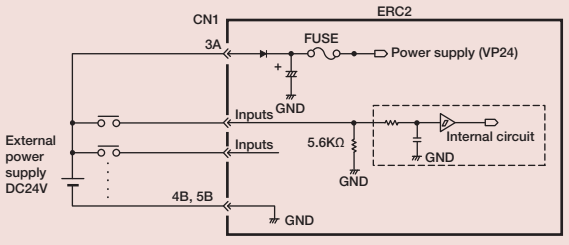
NPN Specifications



NPN Specifications



PNP Specifications



PNP Specifications

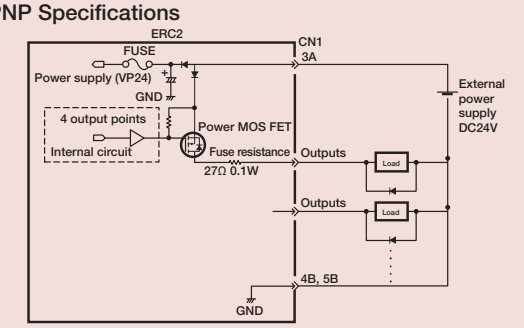


Table of I/O signals (PIO type)

Parameter (PIO pattern select)	PIO pattern	Pin No.
0	8-point type	A standard specification providing eight positioning points, plus a home return signal, zone signal,etc. (The parameter has been set to this pattern prior to the shipment.)
1	3-point type (Solenoid valve type)	Simply turn ON three signals of ST0 to ST2 to move the actuator to the corresponding positions (0 to 2), just like you do with solenoid valves (This allows for easy conversion from air cylinders).
2	16-point type (Zone signal type)	Can be positioned for up to 16 points. (Same as the 8-point type, except that this pattern provides no home return signal.)
3	16-point type (Position zone signal type)	A 16-point pattern with a position zone signal instead of a zone signal.

Pin No.	Classification	Wire color	Parameters (select PIO pattern)			
			0	1	2	3
			Conventional type	3-point type (Solenoid valve type)	16-point type (Zone signal type)	16-point type (Position zone signal type)
1A	SIO	Orange (Red 1)	SGA			
1B		Orange (Black 1)	SGB			
2A	Signal	Light Blue (Red 1)	EMS1			
2B	Signal	Light Blue (Black 1)	EMS2			
3A	24V	White (Red 1)	24V			
3B	0V	White (Black 1)	BLK			
4A	24V	Yellow (Red 1)	MPI			
4B	0V	Yellow (Black 1)	GND			
5A	24V	Pink (Red 1)	MPI			
5B	0V	Pink (Black 1)	GND			
6A	Input	Orange (Red 2)	PC1	ST0	PC1	PC1
6B		Orange (Black 2)	PC2	ST1	PC2	PC2
7A		Light Blue (Red 2)	PC4	ST2	PC4	PC4
7B		Light Blue (Black 2)	HOME	–	PC8	PC8
8A		White (Red 2)	CSTR	RES	CSTR	CSTR
8B		White (Black 2)	* STP	* STP	* STP	* STP
9A	Output	Yellow (Red 2)	PEND	PE0	PEND	PEND
9B		Yellow (Black 2)	HEND	PE1	HEND	HEND
10A		Pink (Red 2)	ZONE	PE2	ZONE	PZONE
10B		Pink (Black 2)	* ALM			

Signals marked with an asterisk (*) (ALM/STP) are negative logic signals so they are normally on.

Signal names

Classification	Signal Name	Signal abbreviations	Function overview
SIO	Serial Communication	SGA SGB	Used for serial communication.
24V 0V	Emergency stop	EMS1 EMS2	These signals are wired to enable the emergency stop switch on the teaching pendant (see P521).
	Brake release	BKR	By connecting to 0V (150mA needed) the brake is forcibly released.
Input	Command position No.	PC1 PC2 PC4 PC8	Designates the position number using 4-bit binary signals (or 3-bit binary signals if the 8-point PIO pattern is selected). (Example) Position 3 → Input PC1 and PC2 Position 7 → Input PC1 and PC2 and PC4
	Position movement	ST0 ST1 ST2	Turn the ST0 signal on to move the actuator to position 0. Same for ST1 and ST2 (Operation can be started with these signals alone. No need to input a start signal).
	Home return	HOME	Home-return operation starts at the leading edge of this signal.
	Start	CSTR	Input a command position number signal and turn this signal ON, and the actuator will start moving to the specified position.
	Reset	RES	Turning this signal ON resets the alarms that are present. When it is paused (*STP is off), it is possible to cancel the residual movement.
	Pause	＊STP	Normal operation is allowed while this signal is ON (negative logic) The actuator starts to decelerate to a stop at the ON → OFF leading edge of this signal.
Output	Positioning complete	PEND	This signal turns ON once the actuator has moved to the target position and completed the positioning by entering the specified positioning band. Used to determine if positioning has completed.
	Complete position No.	PE0 PE1 PE2	PE0 is output upon completion of movement to position 0. Same for PE1 and PE2. (These signals are valid only when the 3-point PIO pattern is selected.)
	Home return complete	HEND	This signal turns ON upon completion of home return.
	Zone	ZONE	This signal turns ON upon entry into the zone signal range set by parameters.
	Position zone	PZONE	This signal turns ON upon entry into the zone signal range set in the position table.
	Alarm	＊ALM	The signal remains ON in normal conditions and turns OFF upon generation of the alarm (negative logic). Synchronized with the LED at the top of the motor cover (green: normal state, red: alarm on).

Signals marked with an asterisk (*) (ALM/STP) are negative logic signals, so they are normally on.

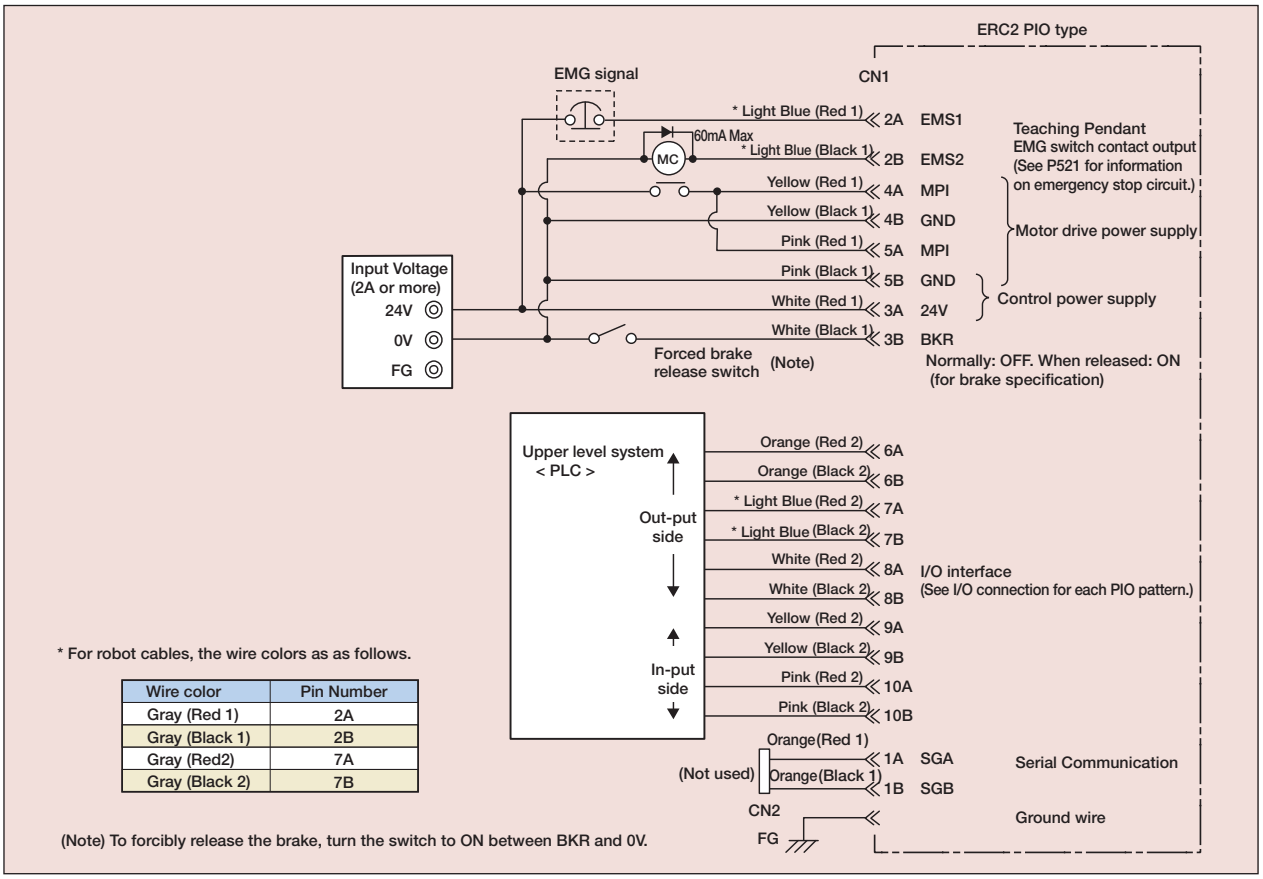
Specification Table

Specification		Details	
Type		PIO specification (NP / PN)	SIO specification (SE)
Control method		Low field vector control (patent pending)	
Positioning command		Position No. designation	Position No. designation / Direct value designation
Position No.		Max. 16 points	Max. 64 points
Backup memory		Position number data and parameters are stored in nonvolatile memory. Serial EEPROM with a rewrite life of 100,000 times	
PIO		6 dedicated input points/4 dedicated output points	None
Electromagnetic brake		Built-in circuit DC24V±10% 0.15A max.	
2-color LED display		Servo ON (green), Alarm/motor drive power supply shut-down (red)	
I/O power (Note 1)		Common to control power (non-isolated)	
Serial Communication		RS485 1ch (External termination)	
Absolute function		None	
Forced release of electromagnetic brake		Forced release when connected to 0V (NP), or 24V (PN)	Forced release when connected to 24V
Cable Length		I/O cable: 10m max.	
		SIO connector communication cable: 5m or shorter	
Dielectric strength voltage		DC500V 10MΩ	
EMC		EN55011 Class A Group1 (3m)	
Power supply voltage		DC24V ± 10%	
Power supply current		2A max.	
Environment	Ambient operating temperature	0 ～ 40°C	
	Ambient operating humidity	85% RH or lower (non-condensing)	
	Ambient operating atmosphere	Free from corrosive gases	
Protection class		IP20	

Use the isolated PIO terminal block (option P522) to isolate the I/O power supply.

I/O wiring drawing

PIO Type NP (NPN Specification)

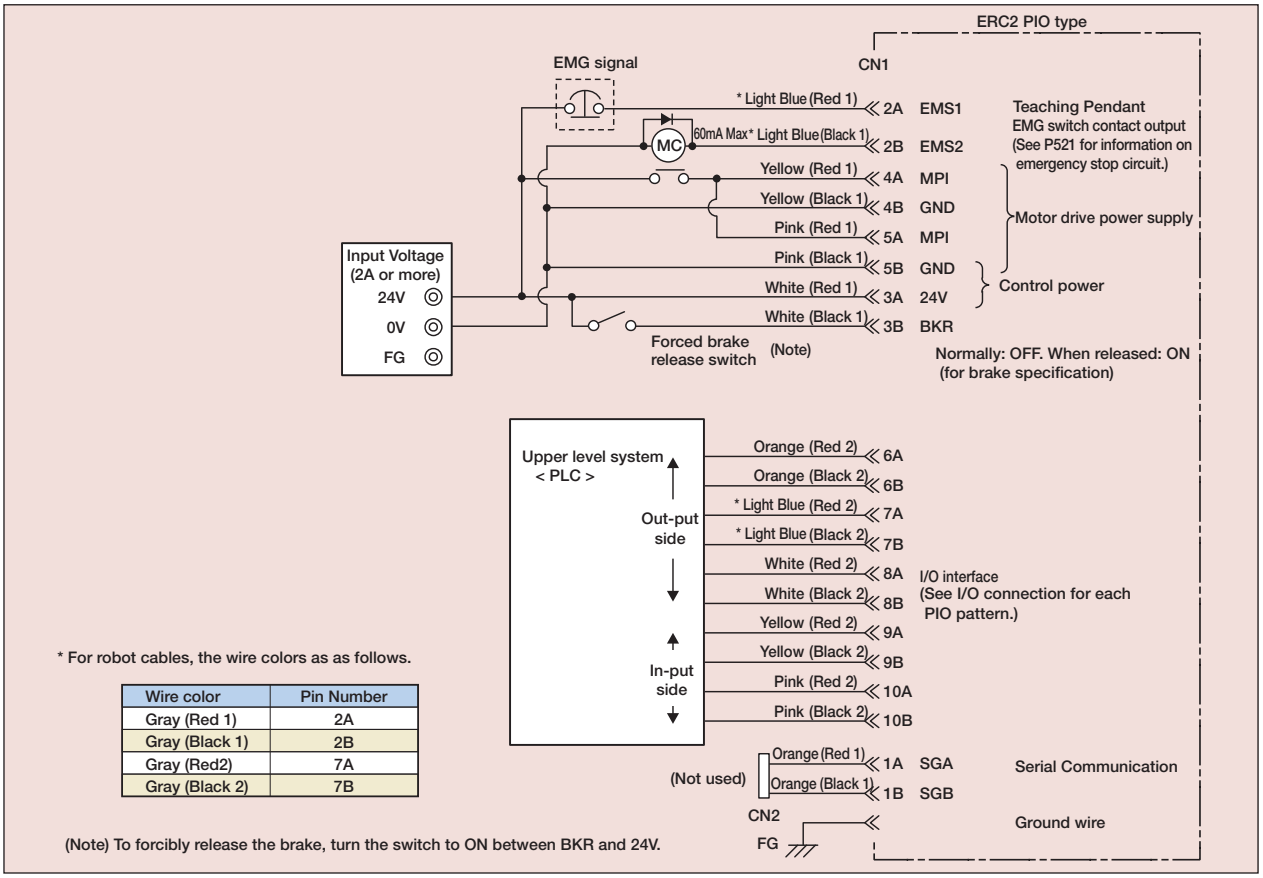


* For robot cables, the wire colors as as follows.

Wire color	Pin Number
Gray (Red 1)	2A
Gray (Black 1)	2B
Gray (Red2)	7A
Gray (Black 2)	7B

(Note) To forcibly release the brake, turn the switch to ON between BKR and 0V.

PIO Type PN (PNP Specification)

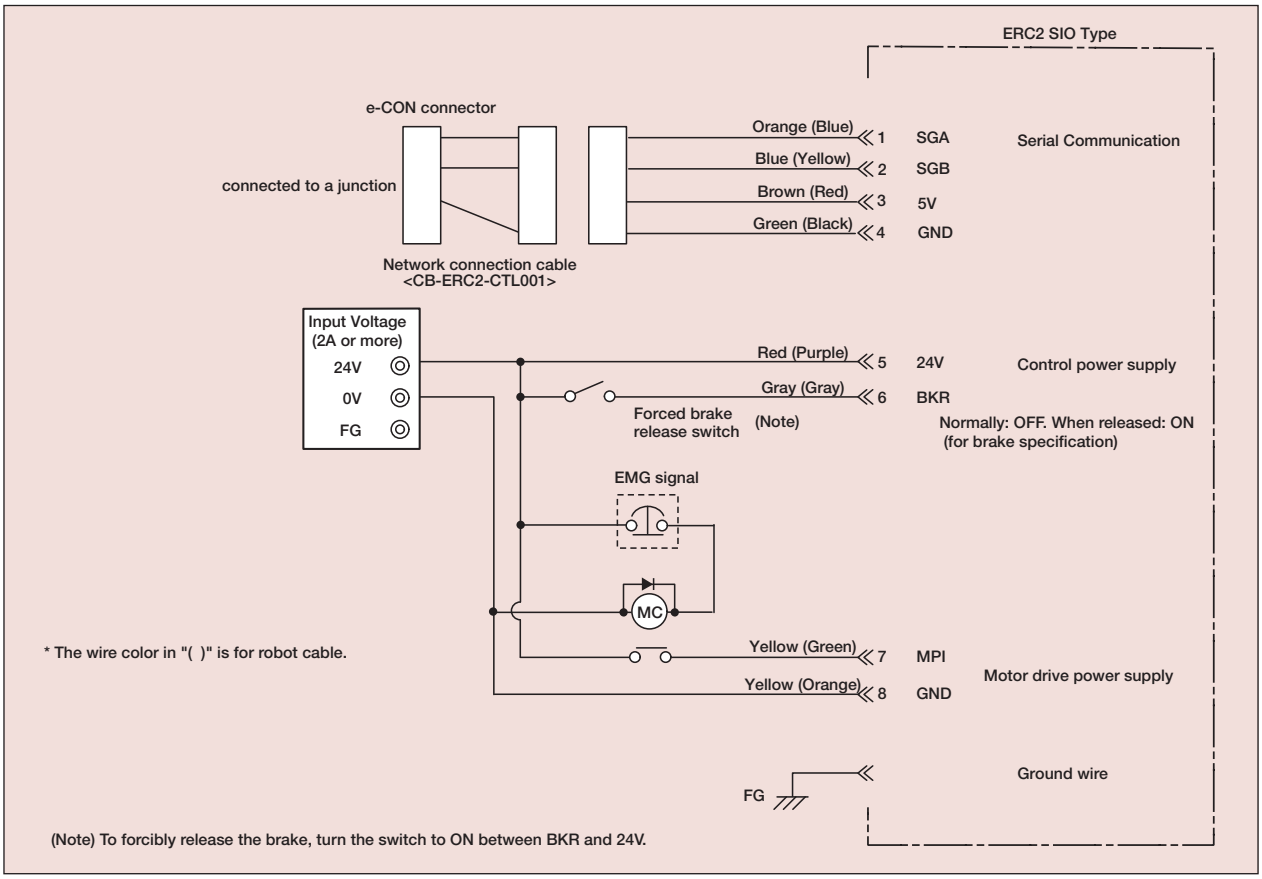


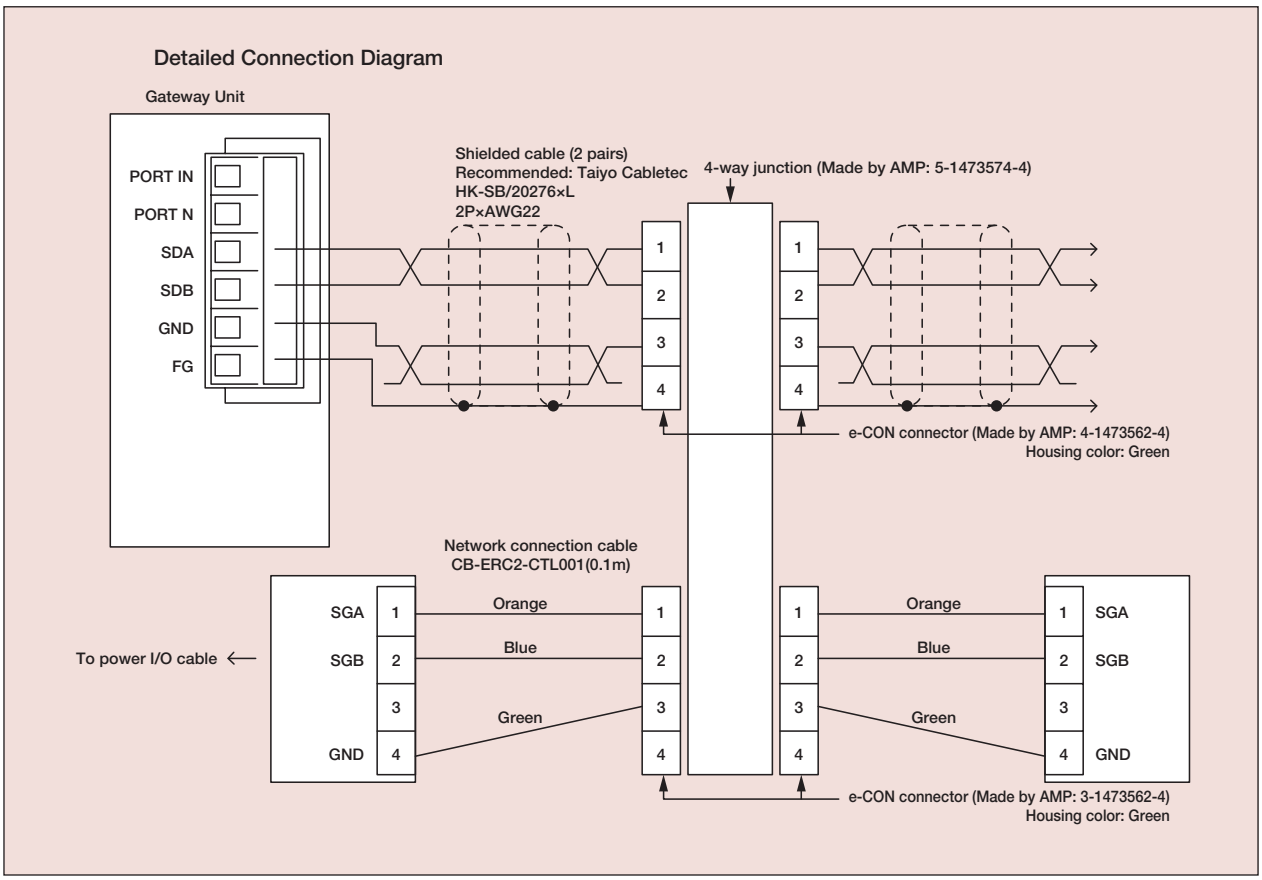
* For robot cables, the wire colors as as follows.

Wire color	Pin Number
Gray (Red 1)	2A
Gray (Black 1)	2B
Gray (Red2)	7A
Gray (Black 2)	7B

(Note) To forcibly release the brake, turn the switch to ON between BKR and 24V.

SIO Type SE

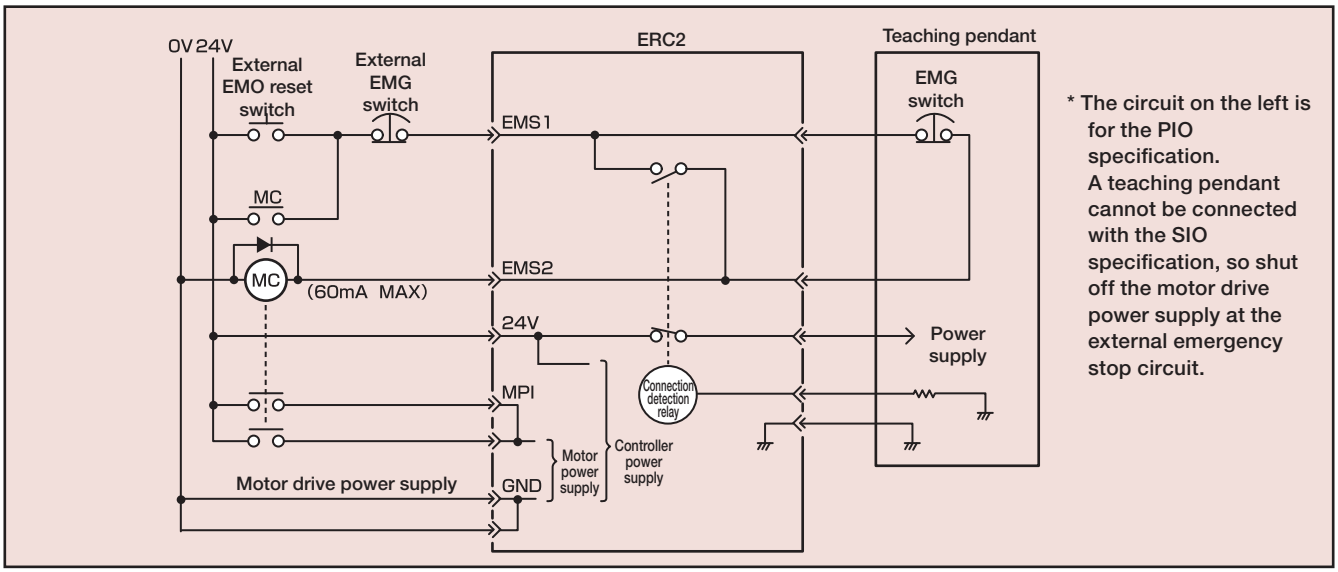

ERC2 SIO Type
e-CON connector
connected to a junction
Orange (Blue) 1 SGA
Blue (Yellow) 2 SGB
Brown (Red) 3 5V
Green (Black) 4 GND
Serial Communication
Network connection cable
<CB-ERC2-CTL001>
Input Voltage
(2A or more)
24V
0V
FG
Red (Purple) 5 24V
Gray (Gray) 6 BKR
Control power supply
Forced brake
release switch
(Note)
Normally: OFF. When released: ON
(for brake specification)
EMG signal
MC
* The wire color in "( )" is for robot cable.
Yellow (Green) 7 MPI
Yellow (Orange) 8 GND
Motor drive power supply
FG
Ground wire
(Note) To forcibly release the brake, turn the switch to ON between BKR and 24V.


Detailed Connection Diagram
Gateway Unit
PORT IN
PORT N
SDA
SDB
GND
FG
Shielded cable (2 pairs)
Recommended: Taiyo Cabletec
HK-SB/20276×L
2P×AWG22
4-way junction (Made by AMP: 5-1473574-4)
e-CON connector (Made by AMP: 4-1473562-4)
Housing color: Green
Network connection cable
CB-ERC2-CTL001(0.1m)
To power I/O cable
SGA
SGB
GND
Orange
Blue
Green
e-CON connector (Made by AMP: 3-1473562-4)
Housing color: Green

Emergency Stop Circuit

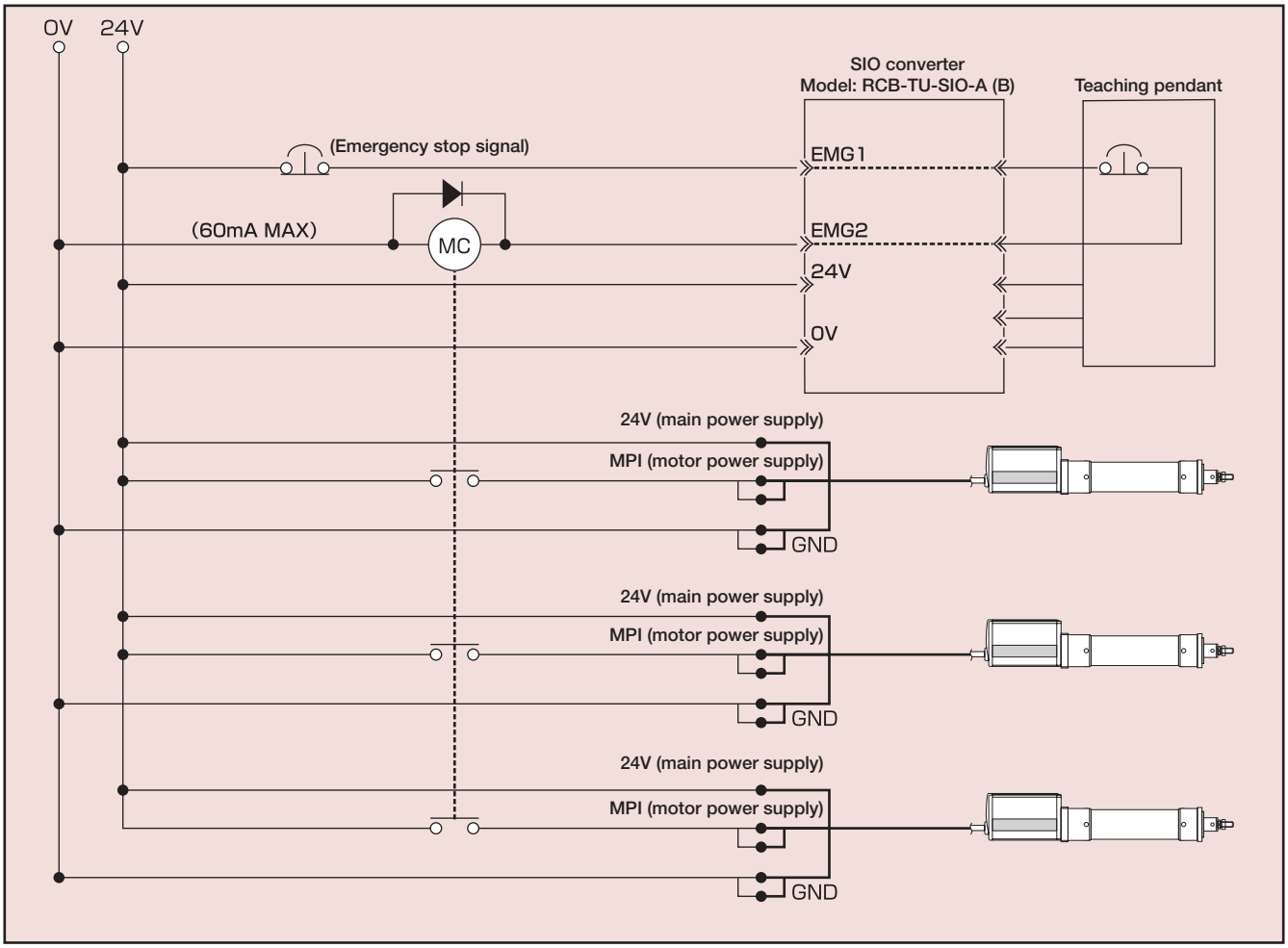
The ERC2 series has no built-in emergency stop circuit, so the customer must provide an emergency stop circuit based on the logic explained below.
(The circuit below is simplified for explanation purposes. Provide a ready circuit, etc., according to your specification.)

Single Axis: To provide an emergency stop circuit for a single-axis configuration, operate a relay using the EMS1 and EMS2 contacts of the power & I/O cable to cut off MPI (motor power).



* The circuit on the left is for the PIO specification.
A teaching pendant cannot be connected with the SIO specification, so shut off the motor drive power supply at the external emergency stop circuit.

Multiple Axis: To provide an emergency stop circuit for a multiple-axes configuration, operate a relay using the EMG1 and EMG2 contacts of the SIO converter to cut off MPI (motor power) for each axis.



Option

Isolated PIO Terminal Block

This terminal block is used to isolate the I/O power or simplify the wiring with a PLC.
*When a terminal block is used, the optional power & I/O cable with connectors on both ends must be used.

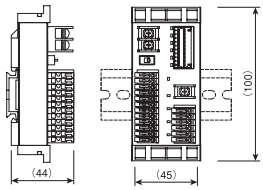
Features - The input and output ports are non-polar, so both NPN and PNP are compatible with the I/O specifications on the PLC side.
- An input/output-signal monitor LED is equipped to check the ON/OFF status of signals.

Specifications

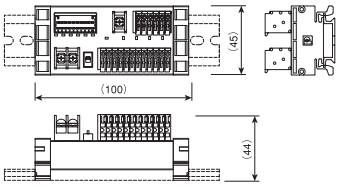
Item		Specifications
Power supply voltage		DC24V±10%
Ambient Operating Temp./Humidity		0 to 55°C, 85% RH or below (non-condensing)
Input area	Input points	6 points
	Input voltage	DC24V±10%
	Input current	7mA/circuit (bipolar)
	Allowable leaked current	1mA/point (at room temperature, about 2mA)
	Operating voltage (with respect to ground)	Input ON: Min. 16V (4.5mA) OFF : Max. 5V (1.3 mA)
Output area	Output points	4 points
	Rated load voltage	DC24V
	Max. current	60mA/point
	Residual voltage	2V or less/60mA
	Short circuit Overcurrent protection	Fuse resistance (27Ω0.1W)

Note:
If you are using the ERC2-PN (PNP specification), use RCB-TU-PIO-AP/BP (compatible with PNP specification).

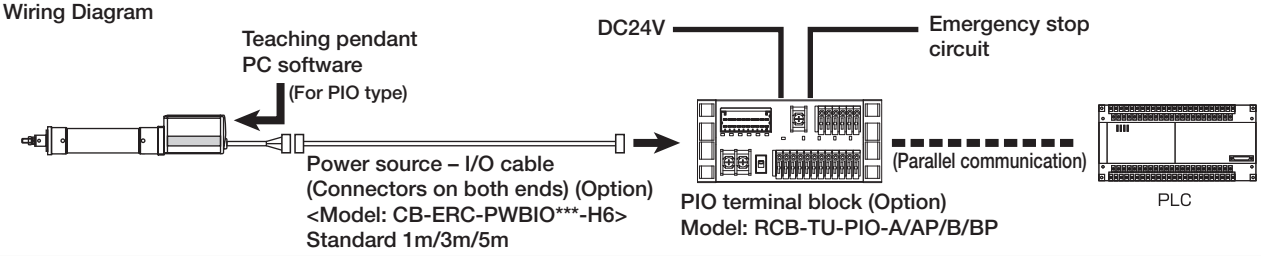
■Vertical Model: RCB-TU-PIO-A/AP



■Horizontal Model: RCB-TU-PIO-B/BP



Wiring Diagram



SIO Converter

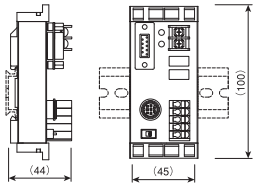
This converter can be used for RS232 communication by connecting a serial communication wire (SGA, SGB) for the power-I/O cable, and using a D-sub 9-pin cross cable to connect a computer.

Features - The connection port for teaching-pendant or a PC cable can be installed at any position away from the actuator.
- Multiple axes can be connected and operated from a PC via serial communication.

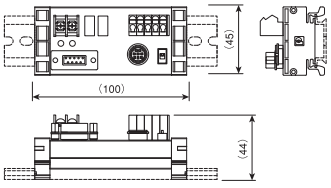
Specifications

Item	Specifications
Power supply voltage	DC24V ±10%
Ambient Operating Temp./ Humidity	0 to 55°C, 85% RH or below (non-condensing)
Terminal resistor	120Ω (built-in)

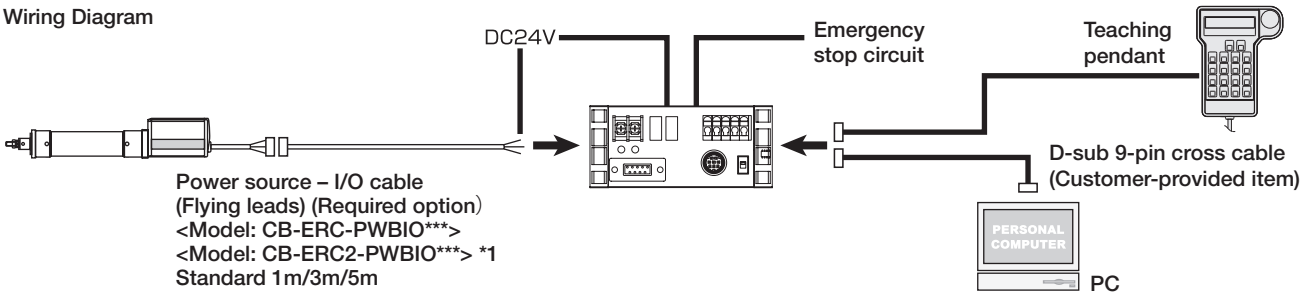
■Vertical specification
Model: RCB-TU-SIO-A



■Horizontal specification
Model: RCB-TU-SIO-B



Wiring Diagram



*1 For the SIO model, connect to the SIO converter using the network connection cable.

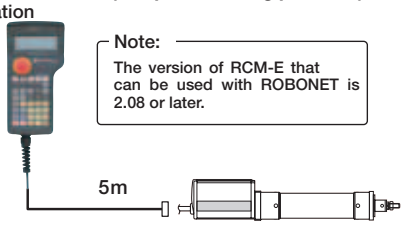
Option

Teaching Pendant

Features This is a teaching device that provides information on functions such as position input, test runs, and monitoring.

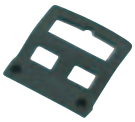
Model **CON-PT-M-ENG** (Touch panel teaching pendant)
CON-T-ENG (Standard type)
RCM-E (Simple teaching pendant)

Configuration

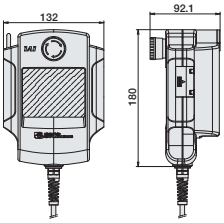


Note:
The version of RCM-E that can be used with ROBONET is 2.08 or later.

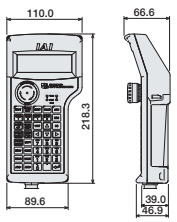
CON-T-ENG Options
- Wall-mounting hook Model HK-1
- Strap Model STR-1



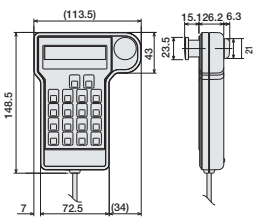
CON-PT-M-ENG



CON-T-ENG



RCM-E



Specifications

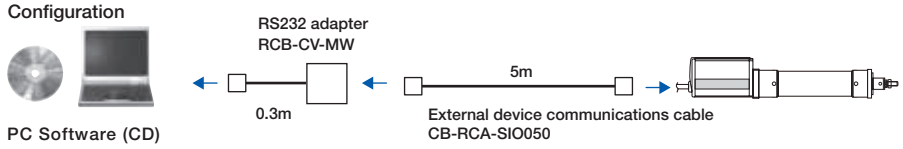
Item	CON-PT-M-ENG	CON-T-ENG	RCM-E
Data Input	O	O	O
Actuator motion	O	O	O
Ambient Operating Temp./Humidity	Temp: 0~40ºC; Humidity: 85% RH or below		
Ambient Operating Atmosphere	No corrosive gases. Especially no dust.		
Protection class	IP40	IP54	–
Weight	Approx. 750g	Approx. 400g	Approx. 400g
Cable Length	5m		
Display	3-color LED touch panel with backlight	20 char. × 4 lines LCD display	16 char. × 2 lines LCD display

PC Software (Windows Only)

Features A startup support software for teaching positions, performing test runs, and monitoring.
With enhancements for adjustment functions, the startup time is shortened.

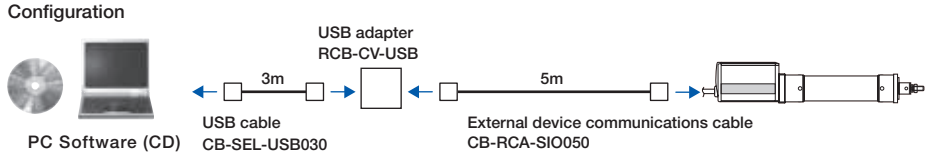
Model **RCM-101-MW-EU** (External device communications cable + RS232 conversion unit)

Configuration



Model **RCM-101-USB-EU** (External device communications cable + USB adapter + USB cable)

Configuration

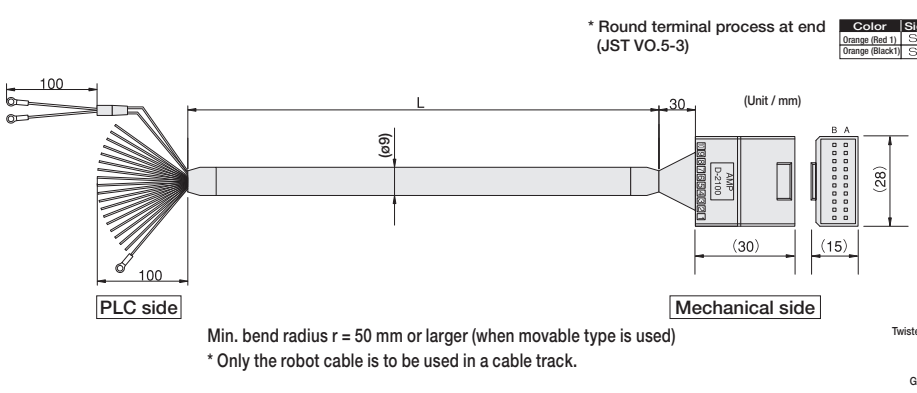


Cables & Spare Parts

Power & I/O Cable, Power & I/O Robot Cable For PIO

Model **CB-ERC-PWBIO□□□/CB-ERC-PWBIO□□□-RB**

* Enter the cable length (L) into □□□. Compatible to a maximum of 10 meters.
Ex.: 080 = 8 m



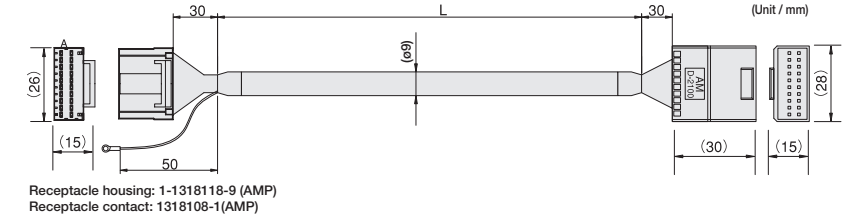
Color	Signal	No.
Orange (Red 1)	SGA	1
Orange (Black1)	SGB	2

No.	Signal	Wire color Standard Cable	Robot Cable
1A	SGA	Orange (Red 1)	←
1B	SGB	Orange (Black1)	←
2A	EMS1	Light Blue (Red 1)	Gray (Red 1)
2B	EMS2	Light Blue (Black 1)	Gray (Black 1)
3A	24V	White (Red 1)	←
3B	BKR	White (Black 1)	←
4A	MPI	Yellow (Red 1)	←
4B	GND	Yellow (Black 1)	←
5A	MPI	Pink (Red 1)	←
5B	GND	Pink (Black 1)	←
6A	IN1	Orange (Red 2)	←
6B	IN2	Orange (Black2)	←
7A	IN3	Light Blue (Red 2)	Gray (Red 2)
7B	IN4	Light Blue (Black 2)	Gray (Black 2)
8A	IN5	White (Red 2)	←
8B	IN6	White (Black 2)	←
9A	OUT1	Yellow (Red 2)	←
9B	OUT2	Yellow (Black 2)	←
10A	OUT3	Pink (Red 2)	←
10B	OUT4	Pink (Black 2)	←

Power & I/O Cable, Power-I/O Robot Cable (Connectors on Both Ends)

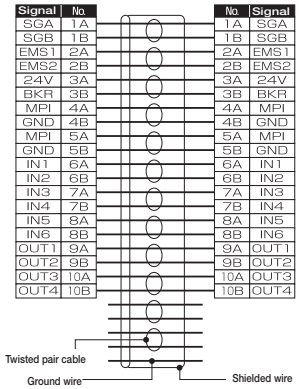
Model **CB-ERC-PWBIO□□□-H6/CB-ERC-PWBIO□□□-RB-H6**

* Enter the cable length (L) into □□□. Compatible to a maximum of 10 meters.
Ex.: 080 = 8 m



Signal	No.
SGA	1A
SGB	1B
EMS1	2A
EMS2	2B
24V	3A
BKR	3B
MPI	4A
GND	4B
MPI	5A
GND	5B
IN1	6A
IN2	6B
IN3	7A
IN4	7B
IN5	8A
IN6	8B
OUT1	9A
OUT2	9B
OUT3	10A
OUT4	10B

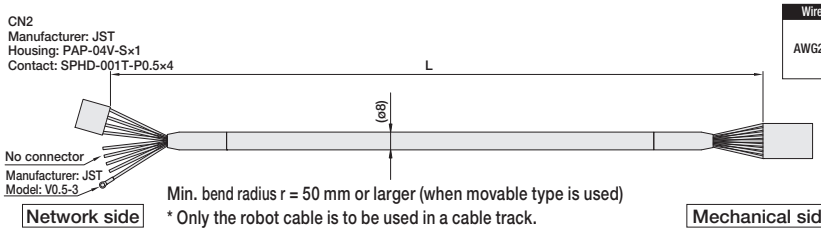
No.	Signal
1A	SGA
1B	SGB
2A	EMS1
2B	EMS2
3A	24V
3B	BKR
4A	MPI
4B	GND
5A	MPI
5B	GND
6A	IN1
6B	IN2
7A	IN3
7B	IN4
8A	IN5
8B	IN6
9A	OUT1
9B	OUT2
10A	OUT3
10B	OUT4



Power & I/O Cable, Power & I/O Robot Cable For SIO Type

Model **CB-ERC2-PWBIO□□□/CB-ERC2-PWBIO□□□-RB**

* Enter the cable length (L) into □□□. Compatible to a maximum of 10 meters.
Ex.: 080 = 8 m

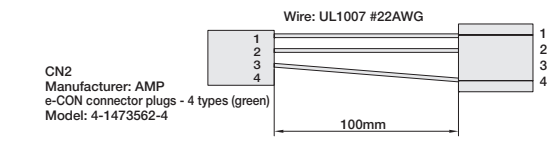


Wire	Color	Signal	No.
AWG26	Orange	SGA	1
	Blue	SGB	2
	Brown	5V	3
	Green	GND	4

No.	Signal Name	Wire color Standard Cable	Wire color Robot Cable
1	SGA	Orange	Blue
2	SGB	Blue	Yellow
3	5V	Brown	Red
4	GND	Green	Black
5	Control power	Red	Purple
6	Brake	Gray	Gray
7	MPI	Yellow	Green
8	GND	Black	Orange
9	Shield	Shield	Shield

Network Connection Cable

Model **CB-ERC2-CTL001**



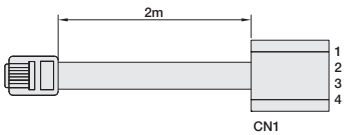
Wire	Color	Signal	No.
CN2 AWG22	Orange	SGA	1
	Blue	SGB	2
	Green	GND	3
		NC	4

No.	Signal	Color	Wire
1	SGA	Orange	CN1 AWG22
2	SGB	Blue	
3	5V	—	
4	GND	Green	

CN1
JST
Housing: PALR-04VF×1
Contact: SPAL-001T-P0.5×4

Communication Cable to Connect to PC

Model **CB-ERC2-SIO020**



CN2
Japan Chain Terminal (JCT)
Modular plug: NTC-66R

CN1
JST
Housing: PALR-04VF×1
Contact: SPAL-001T-P0.5×4

Wire	Signal	No.
AWG26	5V	1
	SGA	2
	GND	3
	SGB	4
	GND	5
	5V	6

No.	Signal	Wire
1	SGA	AWG26
2	SGB	
3	5V	
4	GND	

ERC2 Series
Extract Cat. No. 0611-E

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

ISO 9001

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