



PIO Type

MSEP

First Step Guide First Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual (DVD) included with the product in addition to this First Step Guide to ensure correct use.
This Instruction Manual is original.

Warning : Operation of this equipment requires detailed installation and operation instructions which are provided on the DVD Manual included in the box this device was packaged in. It should be retained with this device at all times.
A hardcopy of the Manual can be requested by contacting your nearest IAI Sales Office listed at the back cover of the Instruction Manual or on the First Step Guide.

- Using or copying all or part of this Instruction Manual without permission is prohibited.
- The company names, names of products and trademarks of each company shown in the sentences are registered trademarks.

Product Check

This product is comprised of the following parts if it is of standard configuration.
If you find any fault in the contained model or any missing parts, contact us or our distributor.

1. Parts

No.	Part Name	Model	Remarks
1	Controller Main Body	Refer to "How to read the model plate", "How to read the model No."	
Accessories			
2	Power Connector	FKC2.5HC/4-ST-5.08 (Supplier : PHOENIX CONTACT)	<ul style="list-style-type: none">• Control Power Supply Recommended cable size 0.5 to 0.3mm² (AWG20 to 22)• Motor Driving Power Supply Recommended cable size 2.5 to 0.5mm² (AWG12 to 20)
3	External Brake Input Connector	FMCD1.5/5-ST-3.5 (Supplier : PHOENIX CONTACT)	Recommended cable size 0.5 to 0.2mm ² (AWG20 to 24)
4	Drive Cutoff/Emergency Stop Input Connector	FMCD1.5/8-ST-3.5 (Supplier : PHOENIX CONTACT)	<ul style="list-style-type: none">• Emergency Stop Recommended cable size 0.5 to 0.2mm² (AWG20 to 24)• Motor Power External Input Recommended cable size 1.25 to 0.5mm² (AWG16 to 20)
5	System I/O Connector	FMCD1.5/4-ST-3.5 (Supplier : PHOENIX CONTACT)	Recommended cable size 0.5 to 0.2mm ² (AWG20 to 24)
6	I/O Flat Cable (For PIO Type)	CB-MSEP-PIO***	***shows the cable length (Example) *** : 020 = 2 [m]
7	CC-Link Connector (For CC-Link Type)	MSTB2.5/5-ST-5.08 ABGY AU (Supplier : PHOENIX CONTACT)	Terminal Resistance (130Ω1/2W, 110Ω1/2W) enclosed one unit each
8	DeviceNet Connector (For DeviceNet Type)	MSTB2.5/5-ST-5.08 ABGY AU (Supplier : PHOENIX CONTACT)	Prepare a terminal resistor separately if this controller is to be allocated at the terminal.
9	Absolute Battery Box (Option)	MSEP-ABU (Battery AB-7)	For Simple Absolute Type
10	First Step Guide		
11	Instruction Manual (DVD)		
12	Safety Guide		

2. Teaching Tool (Please purchase separately)

A teaching tool such as PC software is necessary when performing the setup for position setting, parameter setting, etc. that can only be done on the teaching tool.
Please prepare either of the following teaching tools.

No.	Part Name	Model
1	PC Software (Includes RS232C Exchange Adapter + Peripheral Communication Cable)	RCM-101-MW
2	PC Software (Includes USB Exchange Adapter + USB Cable + Peripheral Communication Cable)	RCM-101-USB
3	Teaching Pendant (Touch Panel Teaching)	CON-PTA
4	Teaching Pendant (Touch Panel Teaching with deadman switch)	CON-PDA
5	Teaching Pendant (Touch Panel Teaching with deadman switch + TP Adapter (RCB-LB-TG))	CON-PGA

3. Instruction manuals related to this product, which are contained in the instruction manual (DVD).

No.	Name	Manual No.
1	MSEP Controller Instruction Manual	ME0299
2	PC Software RCM-101-MW/RCM-101-USB Instruction Manual	ME0155
3	Touch Panel Teaching CON-PTA/PDA/PGA Instruction Manual	ME0295
4	XSEL controller RC Gateway Function Instruction Manual	ME0188

4. How to read the model plate

Model →	MODEL	MSEP-C-5-20PI-N-42PI-PI-10I-20ILA-DV-2-0-ABU
Serial number →	SERIAL No.	SI-E18392
Manufactured date →	PRODUCT DATE	2012/02/01
Manual No. →	MANUAL No.	MJ0299
Input power supply →	CP INPUT	DC24V 2.0A
	MP INPUT	DC24V 7.6A
AXIS No. /OUTPUT		
	0	0-24Vac 3ph 0-333Hz 1.0A
	1	
	2	0-24Vac 3ph 0-333Hz 2.0A
	3	0-24Vac 3ph 0-333Hz 2.0A
	4	0-24Vac 3ph 0-333Hz 1.3A
	5	0-24Vac 3ph 0-333Hz 1.3A
	6	
	7	
⚠ CAUTION: Connect the wiring correctly and properly. use IAI Corporation specified cables.		
Made In Japan		

5. How to read controller model code

(Example) Consists of 5 axes: Axis No.0=pulse motor type, Axis No.2,3=servo motor type, Axis No.4=No connected axis and Axis No.1=Ineffective axis

MSEP-C-5-20PI-PI-10I-20I-N-DV-2-0-ABU-**-		
<Series>		<Identification for IAI use only> * There is no identification in some cases
<Type>	C : Standard Type	<Applicable for Simple Absolute Type> ABB : Simple Absolute Type (with absolute battery) ABBN : Simple Absolute Type (with no absolute battery) No indication : Incremental
<Connected Axes>	1 to 8: Number of driver axes	<Power Voltage> 0 : 24V DC
<Detail of Connected Axis>	[Pulse Motor Type] 20P : 20□ pulse motor 20SP : 20□ pulse motor 28P : 28□ pulse motor 28SP : 28□ pulse motor 42P : 42□ pulse motor 56P : 56□ pulse motor PI : Ineffective axis (Pulse motor) N : Not connected [Encoder Type] I : Incremental [Option] (if servo motor is selected) HA : High Acceleration/Deceleration Type LA : Low Power Consumption Type	[Servo Motor Type] 2 : 2W servo motor 5 : 5W servo motor 5S : 5W servo motor 10 : 10W servo motor 20 : 20W servo motor 20S : 20W servo motor 30 : 30W servo motor AI : Ineffective axis (Servo motor)
		<I/O Cable Length> 0 : No cable 2 : 2m (Standard) 3 : 3m 5 : 5m
		<I/O Type> NP : NPN Type (Sink type) (Standard) PN : PNP Type (Source type) DV : DeviceNet Type CC : CC-Link Type PR : PROFIBUS-DP Type

Basic Specifications

List of Specifications

Specification Item		Driver for Servo Motor				Driver for Pulse Motor		
Number of Controlled Axes		8 axes MAX.						
Control/Motor Power Supply Voltage		24V DC ±10%						
Control Power Current Consumption		2A						
Control Power In-Rush Current		MAX. 5A 30ms or less						
Motor Current Consumption		Motor Type	Rated	Low power	MAX. (Note 1)	Motor Flange Size	Rated	MAX. (Note 2)
		2W	0.8A		4.6A	20P	1.0A	2.0A
		5W	1.0A		6.4A	28P	1.0A	2.0A
		10W (RCL)	1.3A		6.4A	35P	2.0A	2.0A
		10W (RCA/RCA2)		2.5A	4.4A			
		20W		1.3A	2.5A	4.4A	42P	2.0A
		20W (20S Type)	1.7A	3.4A	5.1A			
		30W	1.3A	2.2A	4.4A	56P		
Motor Power In-Rush Current		Number of slots × MAX. 10A 5ms or less						
Control System		Vector control				Weak field-magnet vector control		
Encoder Resolution	RCA, RCP2, RCP3, RCP4	All Types				800Pulse/rev		
	RCA2	RCA2-□□□N				1048Pulse/rev		
		Except for RCA2-□□□N				800Pulse/rev		
	RCL	RA1L • SA1L • SA4L • SM4L				715Pulse/rev		
		RA2L • SA2L • SA5L • SM5L				855Pulse/rev		
RA3L • SA3L • SA6L • SM6L				1145Pulse/rev				
Actuator Cable Length		MAX. 20m (Note) 10m maximum for Simple Absolute type						
Serial Communication Interface (SIO Port: Only for teaching)		RS485 1CH (based on Modbus Protocol) Speed 9.6 to 230.4kbps						
External Interface	PIO Type	PIO Type:Signal I/O dedicated for 24V DC (to be selected when purchased NPN/PNP) Number of max. input: 4 points per axis, Number of max. output: 4 points per axis Cable length MAX. 10m						
	Field Network Type	DeviceNet, CC-Link, PROFIBUS-DP (Reference: to be released soon) An operation by RC Gateway Function is available.						
Data Setting and Input		PC Software, Touch Panel Teaching, Gateway Parameter Create Tool						
Data Retention Memory		Position data and parameters are saved in the nonvolatile memory. (There is no limitation in number of writing)						
Number of Positioning Points		PIO Type: 2 or 3 points						
		Field Network Type: 256 points (There is no limit for simple direct and direct indication modes) (The number of positioning points differs depending on the operation mode select by the parameter setting.)						

Specification Item	Driver for Servo Motor	Driver for Pulse Motor
LED Display (Mounted on Front Panel)	8 LED lamps for driver status display (for each driver board) Status LED 4 points (PIO Type), 7 points (Field Network Type)	
Electromagnetic Brake Compulsory Release	Brake release available for each axis by compulsory release signal input (24V DC input)	
Protective functions ^(Note3)	Overcurrent Protection (Equipped with a built-in cutoff circuit using a semiconductor for each slot)	
Protection Function against Electric Shock	Class I basic insulation	
Insulation Resistance	500V DC 10MΩ	
Weight	620g, For simple absolute type, 690g plus 1950g for absolute battery box (for 8-axis type)	
Cooling Method	Forced air-cooling	
External Dimensions	123W × 115H × 95D	
Environment	Ambient Air Temperature	0 to 40°C
	Ambient Humidity	85%RH or less (non-condensing)
	Ambient Environment	[Refer to Installation Environment]
	Ambient Storage Temperature	-20 to 70°C
	Ambient storage humidity	0 to 40°C for absolute battery
	Usable Altitude	1000m or lower above sea level
	Vibration Durability	Frequency 10 to 57Hz/ Swing width : 0.075mm Frequency 57 to 150Hz/ Acceleration : 9.8m/s ² XYZ Each direction Sweep time: 10 min. Number of sweep: 10 times
	Shock Resistance	150mm/s ² 11ms Semi-sine wave pulse XYZ Each direction 3 times
	Protection Class	IP20

- Note 1 The current becomes maximum when the excitation phase of the servo-motor is detected, which is performed during the initial servo-motor ON processing after the power is injected. (Normal: Approx. 1 to 2 sec, MAX.: 10 sec).
- Note 2 The current is maximized at the excitation phase detection conducted in the first servo-on process after the power is supplied (ordinary 100ms). However, approximately 6A current flows at the recovery (when the drive power is supplied) from an emergency stop (approx. 1 to 2ms).
- Note 3 For servo-motor, the protection is triggered with the current greater in 1.4 times than the maximum load current.
- Note 4 It is not applicable for the high output setting even if RCP4 is connected.

< Calculation of 24V DC Power Capacity >

For the calculation of 24V DC power capacity, figure out the numbers for (1) to (5) below, and then follow Step (6).

- (1) Control Power Current Consumption: 2A
- (2) Current Consumption of Motor Power Supply:
Total of motor current consumption of connected actuator
- (3) Current Consumption at Excitation Phase Detection:
Maximum current in the total of maximum motor current to turn the servo on at the same time
- (4) Control Power In-Rush Current: Number of slots × 5A
- (5) Motor Power In-Rush Current: Number of slots × 10A
- (6) Selection of Power Supply:

Usually, the rated current is to be approximately 1.3 times higher than 1) + 2) above considering approximately 30% of margin to the load current. However, considering the current of 3) to 5), even though it is a short time, select a power supply with "peak load corresponding" type or that with enough capacity. For the current of 3) to 5), it can be avoided from the current consumption occurred at the same time by the timing for the emergency stop release (motor power-on) and servo-on being changed. In the case that the capacity margin is not sufficient, voltage might be dropped in a moment. In particular, be careful of the power unit with the remote sensing function.

(Note) Make short-circuit on 0V side when separate power sources are used for the control power and motor power.

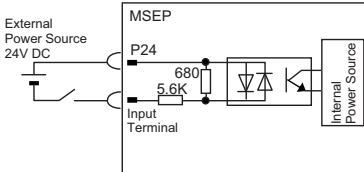
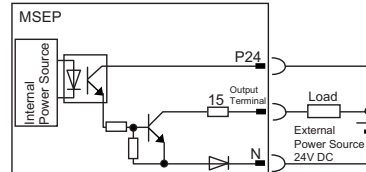
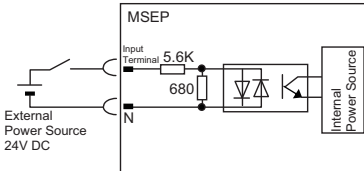
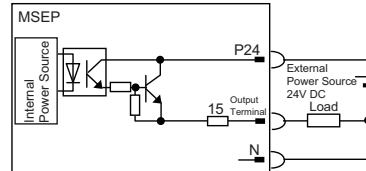
(Reference) Selection of Power Supply Protection Circuit Breaker

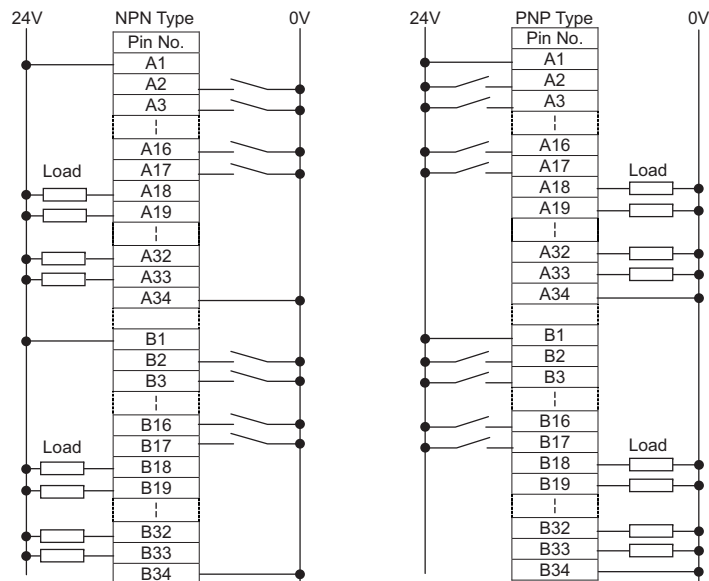
It is recommended that the power supply protection is conducted on the primary side (AC power side) of the 24V DC power supply unit.

Pay attention to the in-rush current of 24V DC power supply unit and rated cutoff current of the circuit breaker.

- Rated Breaking Current > Short-circuit Current = Primary Power Supply Capacity/Power Voltage
- (Reference) In-rush Current of IAI Power Supply Unit PS241 = 50 to 60A, 3ms

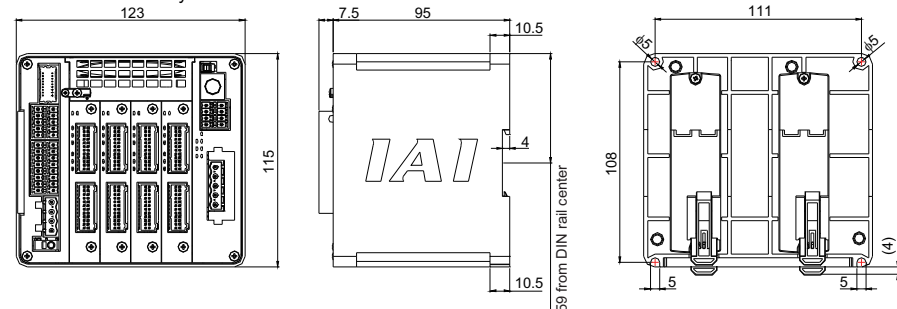
Specifications of PIO Interface

Specification	Input section		Output section	
	Input Voltage	24V DC $\pm 10\%$	Load Voltage	24V DC $\pm 10\%$
	Input Current	5mA 1 circuit	Peak Load Electric Current	50mA 1 circuit
	ON/OFF voltage	ON voltage MIN. 18V DC OFF voltage MAX. 6V DC	Leak Current	MAX. 2mA/1 point
External circuit insulation with photocoupler				
NPN				
PNP				

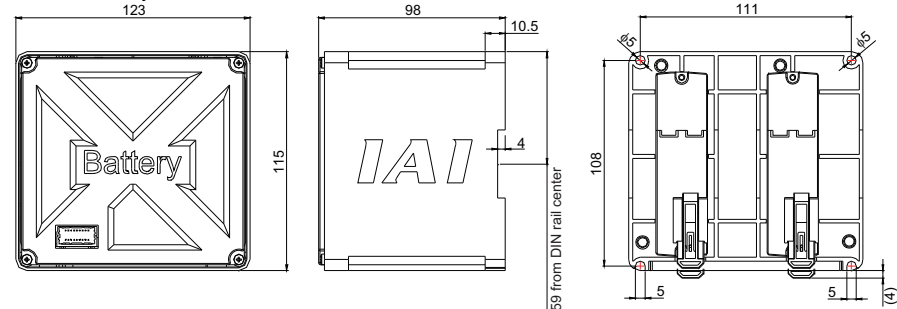


External Dimensions

Controller Main Body



Absolute Battery Box



Installation Environment

This product is capable for use in the environment of pollution degree 2¹ or equivalent.

*1 Pollution Degree 2 : Environment that may cause non-conductive pollution or transient conductive pollution by frost (IEC60664-1).

1. Installation Environment

Do not use this product in the following environment.

- Location where the surrounding air temperature exceeds the range of 0 to 40°C
- Location where condensation occurs due to abrupt temperature changes
- Location where relative humidity exceeds 85%RH
- Location exposed to corrosive gases or combustible gases
- Location exposed to significant amount of dust, salt or iron powder
- Location subject to direct vibration or impact
- Location exposed to direct sunlight
- Location where the product may come in contact with water, oil or chemical droplets
- Environment that blocks the air vent [Refer to 1.7 Noise Elimination and Mounting Method]

When using the product in any of the locations specified below, provide a sufficient shield.

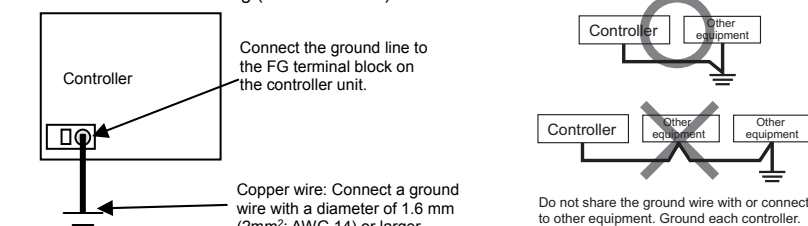
- Location subject to electrostatic noise
- Location where high electrical or magnetic field is present
- Location with the mains or power lines passing nearby

2. Storage and Preservation Environment

- Storage and preservation environment follows the installation environment. Especially in a long-term storage, consider to avoid condensation of surrounding air. Unless specially specified, moisture absorber protection is not included in the package when the machine is delivered. In the case that the machine is to be stored in an environment where dew condensation is anticipated, take the condensation preventive measures from outside of the entire package, or directly after opening the package.

Installation and Noise Elimination

1. Noise Elimination Grounding (Frame Ground)



Earth Terminal
Class D grounding (Formerly Class-III grounding :
Grounding resistance at 100Ω or less)

2. Precautions regarding wiring method

- Wire is to be twisted for the 24V DC power supply.
- Separate the signal and encoder lines from the power supply and power lines.

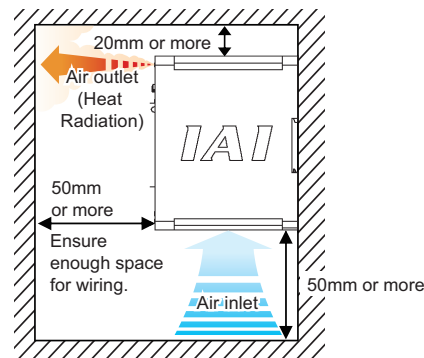
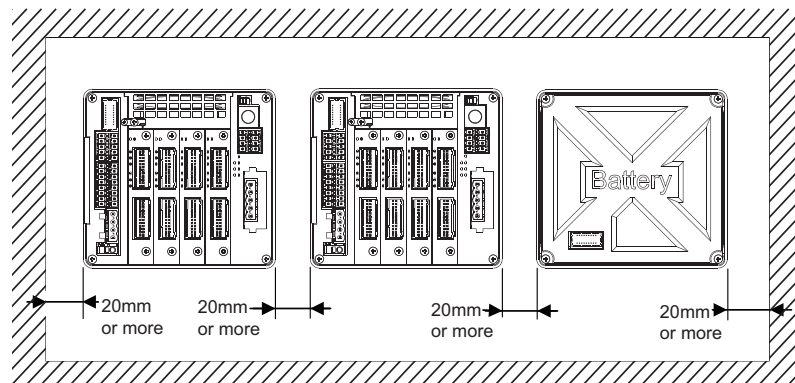
3. Noise Sources and Elimination

Carry out noise elimination measures for electrical devices on the same power path and in the same equipment.
The following are examples of measures to eliminate noise sources.

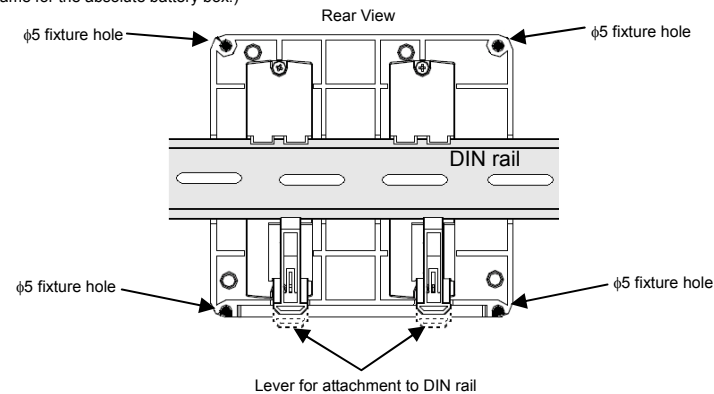
- AC solenoid valves, magnet switches and relays
[Measure] Install a Surge absorber parallel with the coil.
- DC solenoid valves, magnet switches and relays
[Measure] Mount the windings and diodes in parallel. Select a diode built-in type for the DC relay.

4. Cooling Factors and Installation

Design and Build the system considering the size of the controller box, location of the controller and cooling factors to keep the ambient temperature around the controller below 40°C.
Pay a special attention to the battery unit since the performance of it would drop both in the low and high temperatures. Keep it in an environment in the room temperature as much as possible. (Approximately 20°C is the recommended temperature.)



For the attachment of the unit, use the fixture holes on the four corners or attach on the DIN rail. (Attachment should be the same for the absolute battery box.)



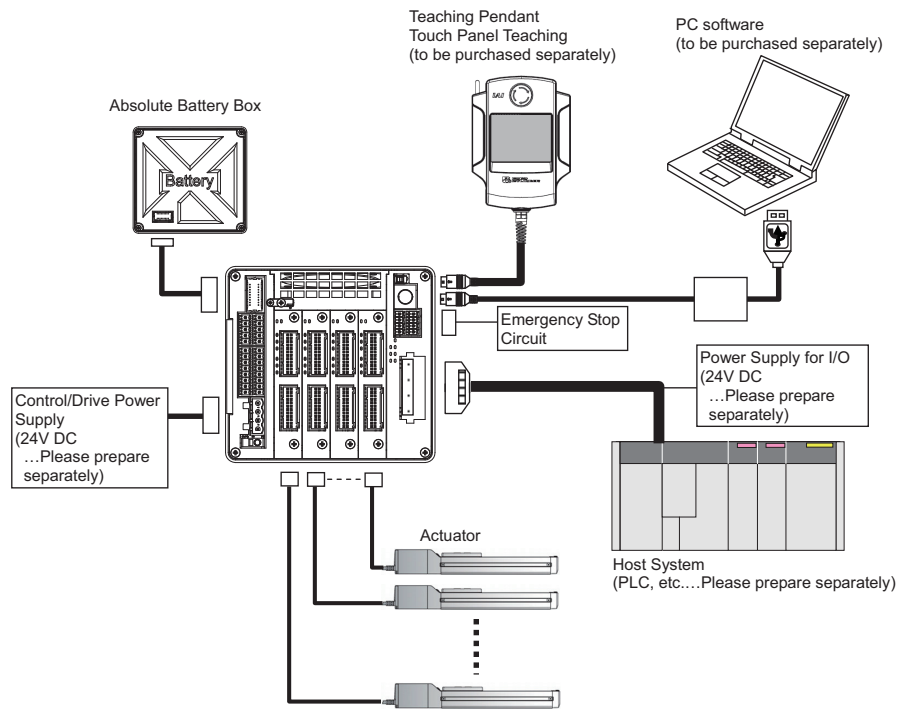
Operation Pattern Selected

This controller possesses 6 patterns of control methods for PIO type. Set the most suitable operation pattern for your use with Gateway Parameter Setting Tool.

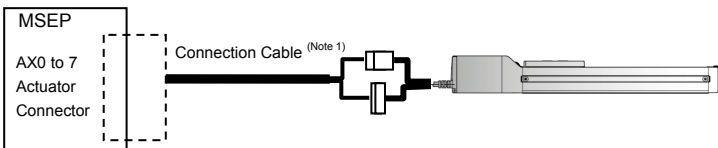
• Operation Patterns for PIO Type

Operation Pattern	Description	Example for Electric Cylinder Connection	Example for Air Cylinder Connection (Reference)
PIO Pattern 0 Single Solenoid System (Standard Point-to-Point Movement)	The actuator point-to-point movement is available using the same control function as for the air cylinder. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		
PIO Pattern 0 Double Solenoid System (Standard Point-to-Point Movement)	The actuator point-to-point movement is available using the same control function as for the air cylinder. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		
PIO Pattern 1 Single Solenoid System (Point-to-Point Movement, Movement Speed Setting)	The actuator point-to-point movement is available using the same control function as for the air cylinder. The movement speed can be changed while the actuator is moving if the movement speed change signal is input. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		
PIO Pattern 1 Double Solenoid System (Point-to-Point Movement, Movement Speed Setting)	The actuator point-to-point movement is available using the same control function as for the air cylinder. The movement speed can be changed while the actuator is moving if the movement speed change signal is input. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		
PIO Pattern 2 Single Solenoid System (Point-to-Point Movement, Target Position Setting (Position Data) Change)	The actuator point-to-point movement is available using the same control function as for the air cylinder. The target position and operation condition can be changed while the actuator is moving if the target position change signal is input. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		
PIO Pattern 2 Double Solenoid System (Point-to-Point Movement, Target Position Setting (Position Data) Change)	The actuator point-to-point movement is available using the same control function as for the air cylinder. The target position and operation condition can be changed while the actuator is moving if the target position change signal is input. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		
PIO Pattern 3 (2-Input, 3-Point Movement)	The actuator 3-Point Movement is available using the same control function as for the air cylinder. The target position setting (forward position, backward position and intermediate position) is available. Speed and acceleration settings in the actuator movement are available. Pressing operation is available at the points except for the intermediate point.		
PIO Pattern 4 (3-Input, 3-Point Movement)	The actuator 3-Point Movement is available using the same control function as for the air cylinder. The target position setting (forward position, backward position and intermediate position) is available. Speed and acceleration settings in the actuator movement are available. Pressing operation is available at the points except for the intermediate point.		
PIO Pattern 5 (Continuous Reciprocating Operation)	The actuator's point-to-point reciprocating operation is performed between the forward position and backward position. The target position setting (forward position and backward position) is available. Speed and acceleration settings in the actuator movement are available. The pressing operation is available.		

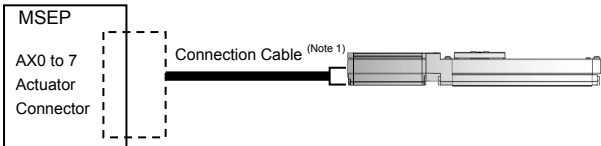
Wiring



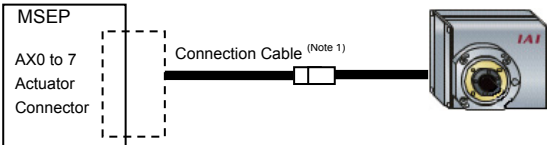
1) Connection to RCP2 Series



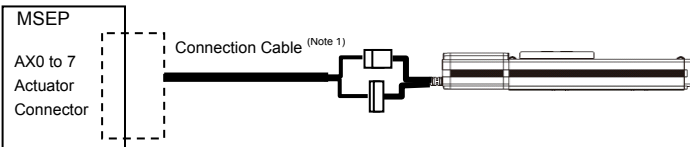
2) Connection to RCP3, RCP4, RCA2 and RCL Series



3) Connection to RCP2 Small Rotary Series



4) Connection to RCA Series



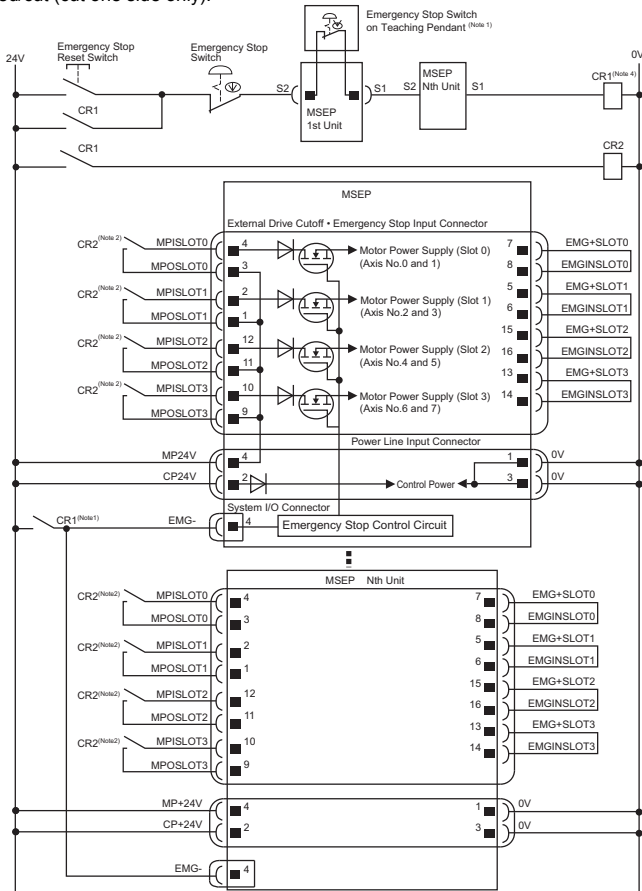
Note 1 Connection Cable Model Codes □□□: Cable length Example) 030 = 3m

Model	Cable	Remarks
RCP2	CB-PSEP-MPA□□□	Robot cable from 0.5 to 20m
RCA	CB-ASEP-MPA□□□	Robot cable from 0.5 to 20m
RCP3, RCA2, RCL	CB-APSEP-MPA□□□	Robot cable from 0.5 to 20m
RCP3, RCA2, RCL	CB-APSEP-MPA□□□-LC	Standard cable from 0.5 to 20m
RCP4	CB-CA-MPA□□□-RB	Robot cable from 0.5 to 20m
RCP4	CB-CA-MPA□□□	Standard cable from 0.5 to 20m

⚠ Caution: Follow the content described in the model code record card inserted to the controller when connecting actuators.
Wrong connection will issue an error such as the encoder wire breakage.

Power Supply and Emergency Stop Circuit

The following diagram shows an example of how the emergency stop switch for the teaching pendant may be included in the emergency stop circuit you may construct.
If supplying power with using a 24V DC, having it turned ON/OFF, keep the 0V connected and have the +24V supplied/cut (cut one side only).



Note 1 When the teaching pendant is not connected, S1 and S2 become short-circuited inside the controller.

Note 2 When the motor driving source is cut off externally for a compliance with the safety category, connect a contact such as a contactor to the wires between MPISLOT* and MPOSLOT*.

Note 3 The rating for the emergency stop signal (EMG-) to turn ON/OFF at contact CR1 is 24V DC and 10mA.

Note 4 For CR1, select the one with coil current 0.1A or less.

PIO Type

Function description for I/O Signals

Category	Signal Abbreviation	Signal Name	Function Description
Input	ST0	• Moving Signal (Single Solenoid System) • Backward End Movement Signal (Double Solenoid System) • Move Signal 1 (PIO Pattern 3)	The positioning to the corresponding target position is performed, when the signal leading edge created in the mode change from OFF to ON, or ON level is detected.
	ST1	• Forward End Movement Signal • Move Signal 2 (PIO Pattern 3)	
	ST2	Intermediate Point Movement Signal	
	*STP	Pause	When this signal is turned OFF while in move, the actuator decelerates and then stops. The remaining movement is in a hold while the actuator is stopped and will resume when the signal turns back ON.
	RES	Reset	An alarm will be reset when this signal is turned ON.
	SON	Servo ON	The servo remains ON while this signal is ON, or OFF while this signal is OFF.
	SPDC	Movement Speed Change	To change the speed during a movement operation, input the movement signal while this signal is ON. (Note) This signal is available only in the operation pattern 1.
	CN1	Target Position Change	Turn this signal ON when an operation is made with a change to the operation condition. When this signal is turned ON or OFF during the operation, the position data is changed. (Note) This signal is available only in the operation pattern 2.
	ASTR	Continuous Reciprocating Operation	A back and forth movement is performed repeatedly between the forward end and the backward end while this signal is ON. When this signal is turned OFF during the movement operation, after the actuator is positioned to the current target, it is stopped. (Note) This signal is available only in the operation pattern 5.
	LS0	Backward End Position Detection	The same operation as of the limit switch of the air cylinder is performed. It is turned ON when the current position is within the positioning width for each position detection output.
Output	LS1	Forward End Position Detection	
	LS2	Intermediate Point Detection	
	PE0	Backward End Point Positioning Completion	This signal is turned ON when the current position goes within the positioning width, and the positioning to the target position is complete. It is turned OFF in the Servo-Motor OFF mode or the Emergency Stop Mode.
	PE1	Forward End Point Positioning Completion	
	PE2	Intermediate Point Positioning Completion	
	HEND	Home Return Completion	This signal will turn ON when home return has been completed. It will be kept ON unless the home position is lost.
	SV	Servo ON	This signal will remain ON while the servo is ON.
	*ALM	Alarm Output	This signal remains ON in normal conditions of use and turns OFF when an alarm is generated.

Signal with "*" expresses the signal of active low. In the controller, the process is held when the input signal is turned OFF.

Signal Assignment for Each Mode

The signal assignment of I/O flat cable by the PIO pattern is as shown below. Follow the following table to connect the external equipment (such as PLC).

	Category	PIO Functions	Operation Pattern (PIO pattern)													
			0		1		2		3		4		5		6	
			Point-to-Point Movement		Movement speed setting		Target position change		2-Input, 3-Point Movement		3-Input, 3-Point Movement		Continuous reciprocating operation		Fieldbus connection	
Input		Number of positioning points	2 points		2 points		2 points		3 points		3 points		2 points			
		Home return signal	x (Home-return operation at the power-on or the first movement operation)													
		Servo ON signal	o (Automatic servo-on is also available at the power-on)													
		Movement speed setting	x		o		x		x		x		o			
		Target position change	x		x		o		x		x		x			
Output		Servo ON signal	o (Selection available in the initial setting whether to use)													
		Homing completion signal	o (Selection available in the initial setting whether to use)													
		Zone signal, Position zone signal	x		x		x		x		x		x			
	Pin No.	Solenoid system	Single	Double	Single	Double	Single	Double	-		Double		-			
A1	-	COM	24V													
A2		IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR			
A3	Input (Axis No.0)	IN1	*STP	ST1 (Note 1)	*STP	ST1	*STP	ST1	ST1 (Note 1)		ST1 (Note 1)		*STP			
A4		IN2	RES		SPDC(RES) (Note 3)		CN1(RES) (Note 3)		RES		ST2(RES) (Note 3)		RES			
A5		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON			
A6		IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR			
A7	Input (Axis No.1)	IN1	*STP	ST1 (Note 1)	*STP	ST1	*STP	ST1	ST1 (Note 1)		ST1 (Note 1)		*STP			
A8		IN2	RES		SPDC(RES) (Note 2)		CN1(RES) (Note 2)		RES		ST2(RES) (Note 2)		RES			
A9		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON			
A10		IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR			
A11	Input (Axis No.2)	IN1	*STP	ST1 (Note 1)	*STP	ST1	*STP	ST1	ST1 (Note 1)		ST1 (Note 1)		*STP			
A12		IN2	RES		SPDC(RES) (Note 3)		CN1(RES) (Note 3)		RES		ST2(RES) (Note 2)		RES			
A13		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON			
A14		IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR			
A15	Input (Axis No.3)	IN1	*STP	ST1 (Note 1)	*STP	ST1	*STP	ST1	ST1 (Note 1)		ST1 (Note 1)		*STP			
A16		IN2	RES		SPDC(RES) (Note 3)		CN1(RES) (Note 3)		RES		ST2(RES) (Note 3)		RES			
A17		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON			
A18	Output (Axis No.0)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0			
A19		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1			
A20		OUT2	HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2		HEND/SV			
A21		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV			
A22	Output (Axis No.1)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0			
A23		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1			
A24		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2			
A25		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV			
A26	Output (Axis No.2)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0			
A27		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1			
A28		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2			
A29		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV			
A30	Output (Axis No.3)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0			
A31		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1			
A32		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2			
A33		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV			
A34	-	COM	0V													

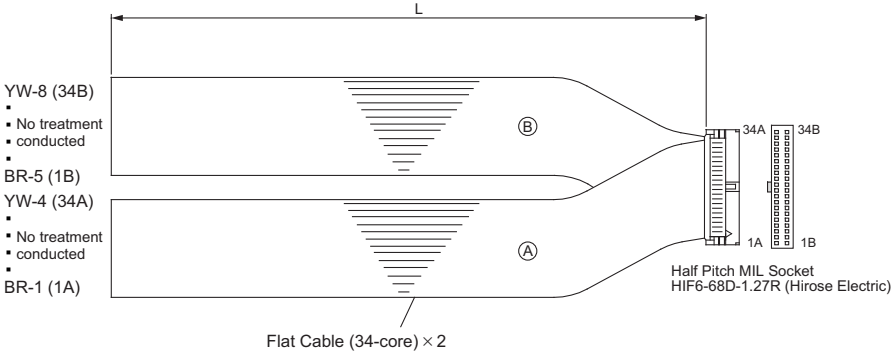
(Note) "*" in codes above shows the signal of the active low.

(Note1) It is invalid before home-return operation.

(Note2) The description in the brackets shows the condition before the home return operation.

Pin No.	Category	PIO Functions	Operation Pattern										Fieldbus connection				
			0		1		2		3		4			5		6	
			Point-to-Point Movement		Movement speed setting		Target position change		2-Input, 3-Point Movement		3-Input, 3-Point Movement			Continuous reciprocating operation		-	
		Solenoid system	Single	Double	Single	Double	Single	Double	-		Double		-				
B1	-	COM	24V														
B2	Input (Axis No.4)	IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR				
B3		IN1	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	ST1 (Note 1)	ST1 (Note 1)		*STP					
B4		IN2	RES		SPDC(RES) (Note 2)		CN1(RES) (Note 2)		RES		ST2(RES) (Note 2)		RES				
B5		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON				
B6	Input (Axis No.5)	IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR				
B7		IN1	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	ST1 (Note 1)	ST1 (Note 1)		*STP					
B8		IN2	RES		SPDC(RES) (Note 2)		CN1(RES) (Note 2)		RES		ST2(RES) (Note 2)		RES				
B9		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON				
B10	Input (Axis No.6)	IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR				
B11		IN1	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	ST1 (Note 1)	ST1 (Note 1)		*STP					
B12		IN2	RES		SPDC(RES) (Note 2)		CN1(RES) (Note 2)		RES		ST2(RES) (Note 2)		RES				
B13		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON				
B14	Input (Axis No.7)	IN0	ST0	ST0	ST0	ST0	ST0	ST0	ST0		ST0		ASTR				
B15		IN1	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	*STP	ST1 (Note 1)	ST1 (Note 1)	ST1 (Note 1)		*STP					
B16		IN2	RES		SPDC(RES) (Note 2)		CN1(RES) (Note 2)		RES		ST2(RES) (Note 2)		RES				
B17		IN3	-/SON		-/SON		-/SON		-/SON		-/SON		-/SON				
B18	Output (Axis No.4)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0				
B19		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1				
B20		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2				
B21		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV				
B22	Output (Axis No.5)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0				
B23		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1				
B24		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2				
B25		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV				
B26	Output (Axis No.6)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0				
B27		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1				
B28		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2				
B29		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV				
B30	Output (Axis No.7)	OUT0	LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0		LS0/PE0				
B31		OUT1	LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1		LS1/PE1				
B32		OUT2	HEND/SV		HEND/SV		HEND/SV		HEND/SV		LS2/PE2		LS2/PE2				
B33		OUT3	*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV		*ALM/SV				
B34	-	COM	0V														

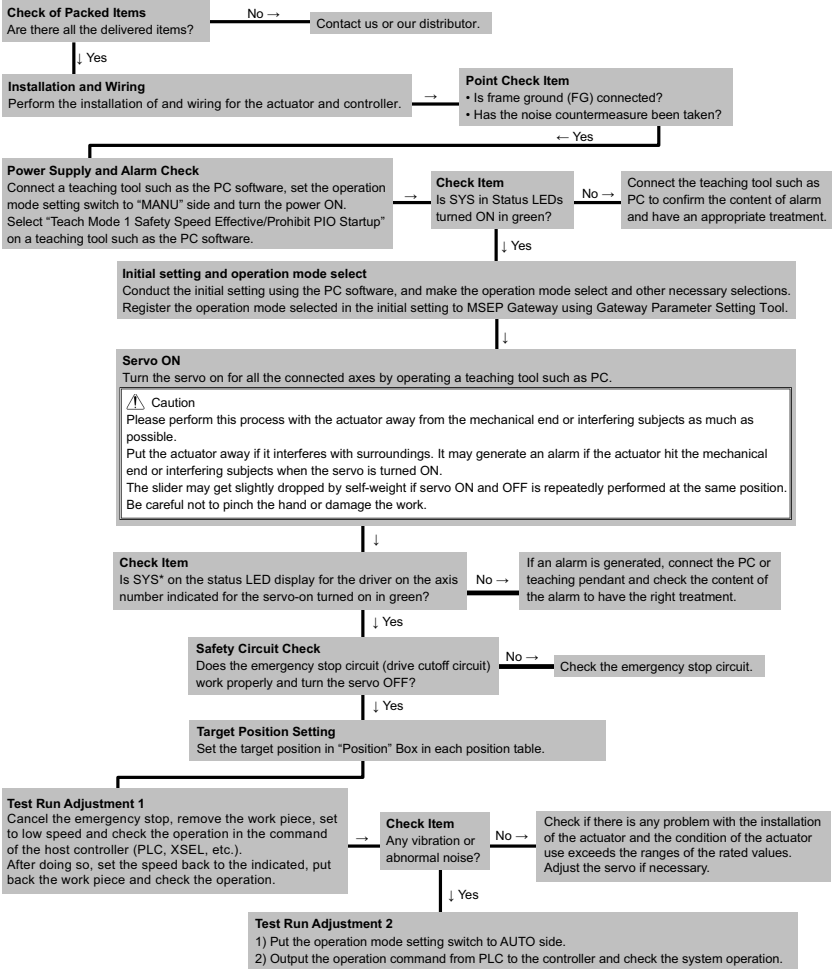
Use the attached cable for the I/O connection.
Model : CB-MSEP-PIO□□□ (□□□ indicates the cable length L. Example. 020 = 2m)



No.	Cable Color	Wiring	No.	Cable Color	Wiring
1A	BR-1	Flat Cable ㊤ (Press Welding) AWG28	1B	BR-5	Flat Cable ㊶ (Press Welding) AWG28
2A	RD-1		2B	RD-5	
3A	OR-1		3B	OR-5	
4A	YW-1		4B	YW-5	
5A	GN-1		5B	GN-5	
6A	BL-1		6B	BL-5	
7A	PL-1		7B	PL-5	
8A	GY-1		8B	GY-5	
9A	WT-1		9B	WT-5	
10A	BK-1		10B	BK-5	
11A	BR-2		11B	BR-6	
12A	RD-2		12B	RD-6	
13A	OR-2		13B	OR-6	
14A	YW-2		14B	YW-6	
15A	GN-2		15B	GN-6	
16A	BL-2		16B	BL-6	
17A	PL-2		17B	PL-6	
18A	GY-2		18B	GY-6	
19A	WT-2		19B	WT-6	
20A	BK-2		20B	BK-6	
21A	BR-3		21B	BR-7	
22A	RD-3		22B	RD-7	
23A	OR-3		23B	OR-7	
24A	YW-3		24B	YW-7	
25A	GN-3		25B	GN-7	
26A	BL-3		26B	BL-7	
27A	PL-3		27B	PL-7	
28A	GY-3		28B	GY-7	
29A	WT-3		29B	WT-7	
30A	BK-3		30B	BK-7	
31A	BR-4		31B	BR-8	
32A	RD-4		32B	RD-8	
33A	OR-4		33B	OR-8	
34A	YW-4		34B	YW-8	

Starting Procedures

When using this product for the first time, make sure to avoid mistakes and incorrect wiring by referring to the procedure below. "PC" stated in this section means "PC software".



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