



SSEL

First Step Guide Fifth Edition

Thank you for purchasing our product.
Make sure to read the Safety Guide and detailed Instruction Manual as well as this First Step Guide to ensure correct use.
This Instruction Manual is original.

Warning : Read the instruction manual carefully and follow the instruction manual when handling this equipment.
Please download the user's manual from our website.
You can download it free of charge. User registration is required for first time users.
URL:www.iai-robot.co.jp/data_dl/CAD_MANUAL/
Keep a printout of the introduction manual near the equipment in which this product is installed so that it can be checked at all times, or display it on your computer, tablet terminal, etc. so that you can check it immediately.
If you need a bound copy of the instruction manual, order it from the nearest sales office listed in the First Step Guide or at the end of the instruction manual. It will be provided for a fee.

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- 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:

1. Parts

No.	Part Name	Model
1	Controller	Refer to "How to understand the Model Name Plate" and "How to understand the Model No."
Accessories		
2	I/O Flat cable	CB-DS-PIO□□□ □□□ indicates the cable length
3	Battery for saving Absolute Data *1	AB-5
4	AC Power Supply plug	MSTB2.5/6-STF-5.08 (Maker : PHOENIX CONTACT)
5	System I/O plug (2 Units)	FMC1.5/4-ST-3.5
6	First Step Guide	ME0209
7	Safety Guide	M0194

*1: It is attached when the unit is absolute type.

2. Teaching Tool (to be purchased separately)

A teaching tool such as PC software is necessary to perform commissioning of this product. Any of the following teaching tools may be used.

No.	Part Name	Model
1	PC Software (with RS232C Cable +Emergency Stop Box + Connector conversion adapter)	IA-101-X-MW-J
2	PC Software (USB Cable with a dummy plug)	IA-101-X-USB
3	Teaching Pendant	SEL-T
4	Teaching Pendant (with deadman switch)	SEL-TD
5	Teaching Pendant (with deadman switch + TP adapter (IA-LB-TG))	SEL-TG
6	Teaching Pendant	TB-01/01D/01DR
7	Touch Panel Teaching Pendant	TB-02/02D
8	Panel Unit *2	PU-1

*2: It is the unit specially for "Status" indication.

3. Instruction Manuals related to this product

No.	Name	Catalog No.
1	SSEL Controller Instruction Manual	ME0157
2	PC Software IA-101-X-MW/ IA-101-X-USBMW	ME0154
3	Teaching pendant SEL-T/TD/TG	ME0183
4	Touch Panel Teaching Pendant TB-01/01D/01DR Applicable for Program Controller Instruction Manual	ME0325
5	Touch Panel Teaching Pendant TB-02/02D Applicable for Program Controller Instruction Manual	ME0356
6	DeviceNet Instruction Manual	ME0124
7	CC-Link Instruction Manual	ME0123
8	PROFIBUS-DP Instruction Manual	ME0153
9	EtherCAT Instruction Manual	ME0309
10	EtherNet/IP Instruction Manual	ME0308

4. How to read the model plate

Model —————> MODEL SSEL-C-2-200A-100AB-NP-2-1
Serial number —————> SERIAL No. 600061190 MADE IN JAPAN

5. How to read the model of the controller [SSEL]

<u>SSEL</u>	<u>-</u>	<u>C</u>	<u>-</u>	<u>2</u>	<u>-</u>	<u>200A</u>	<u>-</u>	<u>100AB</u>	<u>-</u>	<u>NP</u>	<u>-</u>	<u>2</u>	<u>-</u>	<u>0</u>
①		②		③		④		④		⑤		⑥		⑦

Model table

① Series	② Controller Type	③ Number of axes	④ Details of axis 1 to axis 2						⑤ Standard I/O	⑥ I/O Flat cable length	⑧ Power-supply voltage
			Motor Output	Encoder Type	Brake	Creep	Home Sensor	Synchro-nization Design-ation			
SSEL	C (Standard Type)	1 (1-axis)	30D (30W for RCS2) 30R (30W for RS) 60 (60W) 100 (100W) 150 (150W) 200 (200W) 300 (300W) 400 (400W) 600 (600W) 750 (750W)	WAI (battery-less absolute/ Incremental)	Not Specified (w/o brake)	Not Specified (w/o creep)	Not Specified (w/o home sensor)	Not Specified (No synchro-nization)	NP Standard PIO Input 24/ Output 8 NPN type	2 : 2m (Standard) 3 : 3m 5 : 5m 0 : None	1 : Single-phase 100V 2 : Single-phase 200V
	CS (Standard Type)	2 (2-axis)	200 (200W) 300 (300W) 400 (400W) 600 (600W) 750 (750W)	A (Abso-lute)	B (w/ brake)	C (w/ creep)	L (Applicable to Home Sensor LS)	M (Master-axis designation) S (Slave-axis designation)	PN Standard PIO Input 24/ Output 8 PNP type		

Basic Specifications

SSEL Specifications

Specification Item		Single-Axis Type	Double-Axis Type
Max. Connected Axis Output	AC100V Specification AC200V Specification	400W 800W	
Control Power Source Voltage	AC100V Specification AC200V Specification	Single-phase 100V to 115V ± 10% Single-phase 200V to 230V ± 10%	
Motor Power Source Voltage	AC100V Specification AC200V Specification	Single-phase 100V to 115V ± 10% Single-phase 200V to 230V ± 10%	
Power frequency		50/60Hz	
Load Current *1		55A (Control) 55A (Driving)	55A (Control) 110A (Driving)
Leakage Current *2		1.0mA or less	
Power Capacity for Electro-magnetic Brake Power Unit *3 (In the case of the actuator with a brake)		DC24V ± 10% Rated 0.5A MAX 1A	DC24V ± 10% Rated 1A MAX 2A
Heating Value for Electro-magnetic Brake Power Unit (In the case of the actuator with a brake)		12W	24W
Momentary Power Interruption Tolerance		50Hz : 10msec, 60Hz : 8msec	
Insulation Resistance		DC500V 100MΩ or more	
Insulation Strength		AC1500V for 1min. (actuator the time of connection 1000V AC for 1min.)	
Axis Control System		AC Full -digital Servo	
Position detection method		Incremental Encoder or Absolute Encoder	
Battery for Backup		For Absolute Data Backup : Manufactured by our company AB-5 (Option) For System Memory Backup : Manufactured by our company AB-5 (Option)	
Program language		Super SEL language	
Max. Number of program steps		9999 steps	
Max. Number of position		20000 positions	
Max. Number of programs		128 programs	
Max. Number of multitask programs		8 programs	
Data storage device		Flash ROM + SRAM Backup (Option)	
Data storage method		Teaching pendant or PC software	
I/O Interface		24 Input Points (Total of Dedicated Input Points + Universal Input Points) 8 Output Points (Total of Dedicated Output Points + Universal Output Points)	
PIO Interface Power Supply		DC24V ± 10% (Externally supplied)	
Serial Communication Interface		RS232C: 1CH... Dedicated protocol (at AUTO Mode) or for connection to PC software	
USB Interface		1CH (B Connector)... Dedicated protocol (at AUTO Mode) or for connection to PC software	
Communication cable length	RS232C USB	15m or less 5m or less	
System I/O		Emergency-stop input, safety gate input	
Protective functions		Overvoltage, motor over current, motor overload, driver temperature abnormality, and Encoder abnormality etc.	
Drive-source cutoff method		Internal Relay	
Regenerative Resistance		Built-in 20W Power Source (External Expansion Available)	
Environ-ment	Surrounding air temperature	0 to +40°C	
	Surrounding humidity	10% to 95%RH (non-condensing)	
	Surrounding environment	There should not be any corrosive gas. In particular, there should not be much dust accumulation.	
	Surrounding storage temperature	-25 to 70 degrees (However, except for battery (option))	
	Surrounding storage humidity	10% to 95%RH (non-condensing)	
	Vibration strength	XYZ directions 10 to 57Hz Pulsating amplitude 0.035mm (continuous) 0.075mm (intermittent) 57 to 150Hz 4.9m/s ² (continuous) 9.8m/s ² (intermittent)	
	Impact	147mm/s ² , 11ms Semi-sine wave pulse three times to each of the directions X, Y and Z	
Protection class		IP20	
Cooling method		Forced air-cooling	
Weight		1380g	
External dimensions		(Refer to the Item for the External dimensions Dimension)	

- *1 Rush current at the power connection continues for about 5 msec. Consider the safety rate at the time when rush current passes. The rush current value varies depending on the impedance of the power line.
- *2 The leaked current value is for the single controller not connected to the actuator. The leaked current varies depending on the surrounding environment. When the leakage protective measure is taken, measure the leakage current at the leakage breaker installation location.
- *3 The brake is an instantaneous over excitation brake. Current of max. 1A per axis passes during 100msec of brake release.

Table 1: Motor Power Unit Capacity and Heating Value

Actuator or Motor Capacity [W]	Rated Motor Power Capacity [VA]	Momentary Maximum Motor Power Capacity [VA]	Heating Value in reaching the rated motor power capacity [W]
20	26	78	1.6
30	46	138	2.1
60	138	415	3.9
100	234	701	6.1
150	328	984	8.3
200	421	1263	9.1
400	796	2388	19.8
600	1164	3492	27.2
750	1521	4564	29.8
100(Linear Actuator S6SS)	101	303	3.7
100(Linear Actuator S8SS)	159	477	4.1
100(Linear Actuator S8HS)	216	648	3.8
100(Linear Actuator N10SS)	379	1137	4.5
200(Linear Actuator S10SS)	343	1029	5.3
200(Linear Actuator S10HS)	417	1251	5.0
200(Linear Actuator H8SS)	189	567	5.4
200(Linear Actuator H8HS)	379	1137	5.4
200(Linear Actuator L15SS)	189	567	5.4
200(Linear Actuator N15SS)	486	1458	4.4
200(Linear Actuator N15HS)	773	2319	6.4
300(Linear Actuator M19SS)	662	1986	11.6
400(Linear Actuator W21SS)	920	2760	16.7

Table 2: Control Power Unit Capacity and Heating Value

Control Power Capacity [VA]	Control Power Unit Heating Value [W]
60	36

[Power Capacity and Heating Value]

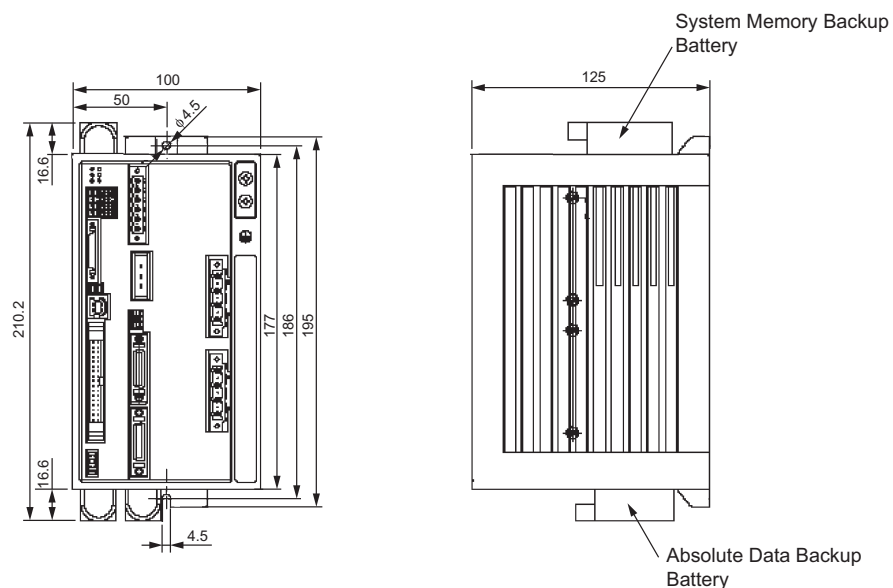
Rated Power Capacity [VA] = First Axis Momentary Maximum Motor Power Capacity [VA]*1 + Second Axis Momentary Maximum Motor Power Capacity [VA]*1 + Control Power Capacity [VA]*2

Momentary Maximum Power Capacity [VA] = First Axis Momentary Maximum Motor Power Capacity [VA]*3 + Second Axis Momentary Maximum Motor Power Capacity [VA]*3 + Control Power Capacity [VA]*1

Heating Value in reaching the Rated Capacity [W] = First Axis Motor Power Unit Heating Value in reaching the Rated Capacity [W]*4 + Second Axis Motor Power Unit Heating Value in reaching the Rated Capacity [W]*4 + Control Power Unit Heating Value [W]*5

- *1 Select the Rated Motor Power Capacity from Table 1.
*2 Select the Control Power Capacity from Table 2.
*3 Select the Momentary Maximum Motor Power Capacity from Table 1.
*4 Select the Motor Power Unit Heating Value in reaching the Rated Capacity from Table 1
*5 Select the Control Power Unit Heating Value from Table 2.

External Dimensions



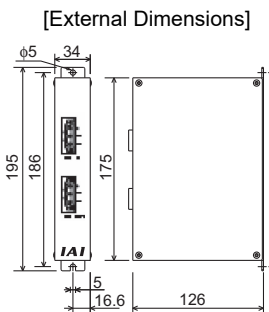
* Same dimensions are applied to both the single axis and double axis units.

* The above figure shows the condition where the system memory backup battery (option) and absolute data backup battery have been attached.

Regeneration Resistor Unit (Option) : REU-1, REU-2

Regenerative Resistor Unit: This unit converts the regenerative current brought at the time of the motor deceleration into heat

[Specification]		
Item		Specification
Dimensions		W34mm × H195mm × D126mm
Weight		0.9kg
Built-in regeneration resistor		235Ω 80W
Connection Cable (Accessories)	REU-1	Model : CB-ST-REU010 1m
	REU-2	Model : CB-SC-REU010 1m



[Installation Standards]

When it is installed horizontally:

Connected Actuator Motor Capacity Total	No. of Connected Regenerative Resistance Units
to 200W	Not required
to 800W	1

When it is installed vertically:

Connected Actuator Motor Capacity Total	No. of Connected Regenerative Resistance Units
to 200W	Not required
to 600W	1
to 800W	2

* There may be a case that it requires more regenerative resistance than stated above depending on the operation condition.

Installation Environment

Do not use this product in the following environment:

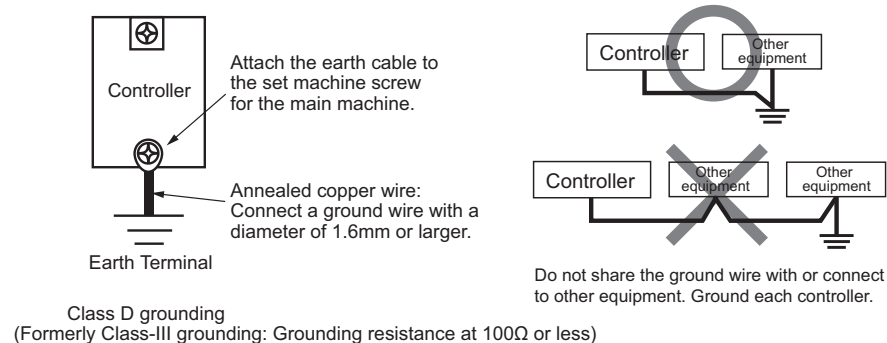
- Location where the surrounding air temperature exceeds the range of 0 to 40°C
- Location where condensation occurs due to abrupt temperature changes
- Location where relative humidity smaller than 30% or larger than 95%RH
- Location exposed to corrosive gases or combustible gases
- Location exposed 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

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

Installation and Noise Elimination

1. Noise Elimination Grounding (Frame Ground)



2. Precautions Regarding Wiring Method

- Use a twisted cable for connection to power supply
- Separate the I/O line, communication line and power or driving line to each other.

3. Noise Sources and Elimination

Carry out noise elimination measures for power devices on the same power path and in the same equipment.

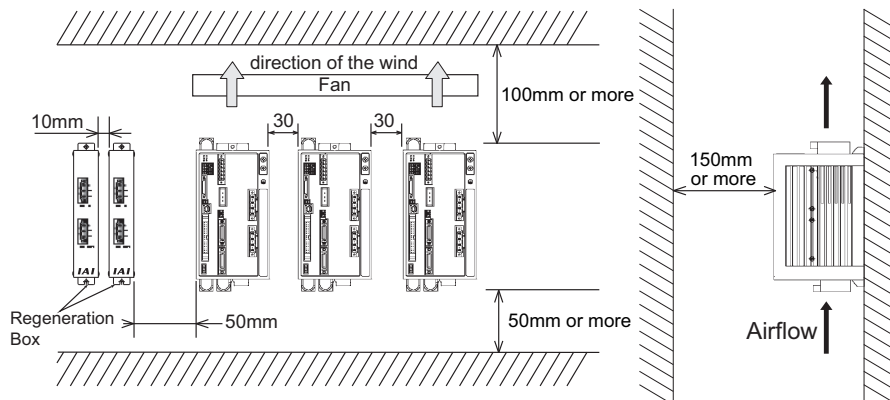
The following are examples of measures to eliminate noise sources:

- 1) AC solenoid valves, magnet switches and relays
[Measure] Install a noise killer parallel with the coil.

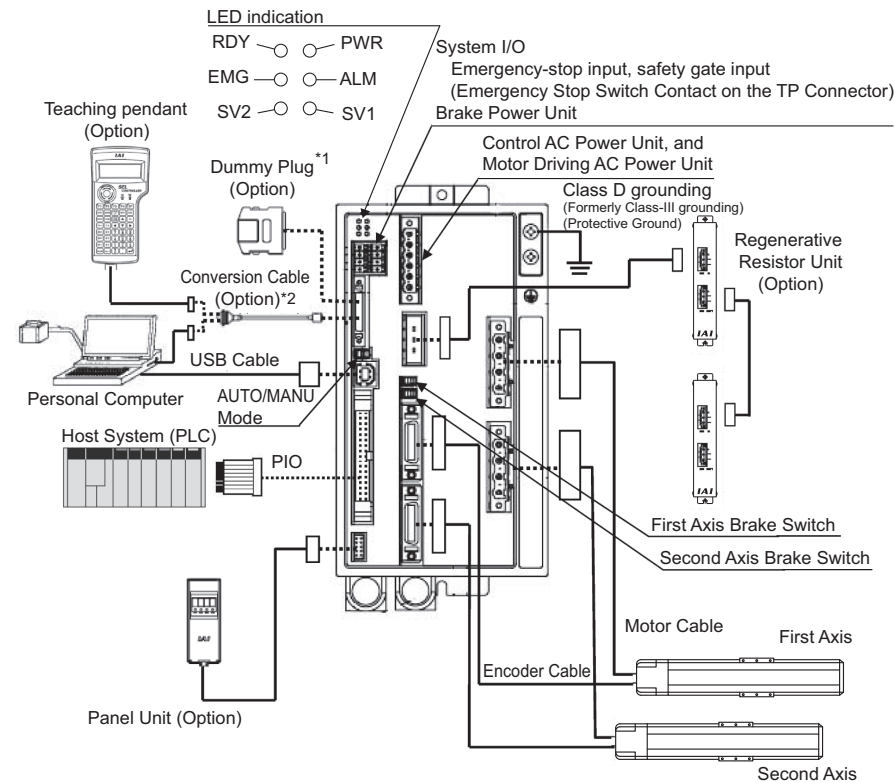
- 2) DC solenoid valves, magnet switches and relays
[Measure] Install a diode parallel with the coil. Use a DC relay with a built-in diode.

4. Heat Radiation and Installation

Conduct design and manufacture in consideration of the control box size, controller layout and cooling in such a way that the temperature around the controller will be 40°C or less.



Connection Diagram



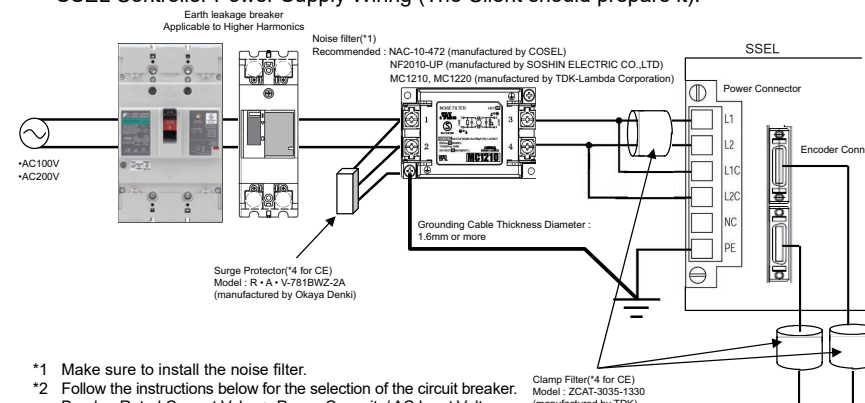
- *1 When the PC is connected to the controller using the USB cable, it is required to attach the dummy plug to the controller to short circuit the Safety Gate Signal for the PC application software and teaching pendant.
- *2 The conversion cable and dummy plug differ depending on the model code of SSEL.

Model	Applicable Conversion Cable	Applicable Dummy Plug
SSEL-C	CB-SEL-SJ002	DP-3
SSEL-CS	CB-SEL-SJS002	DP-4S

 **Warning** When the PC is connected to the controller using the USB cable, the emergency stop box can not be connected. In the case of stop in an emergency, process it in the system.

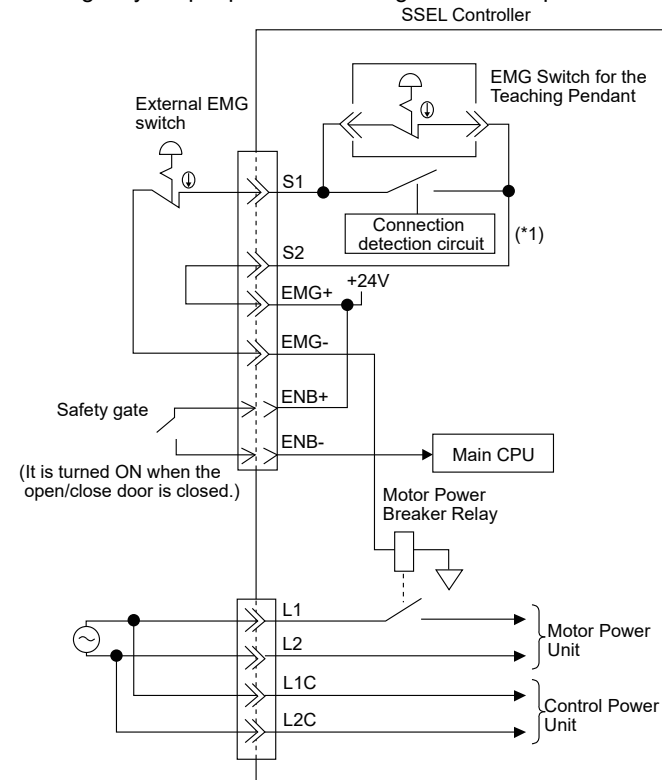
Wiring for the Power/Emergency Stop Circuit and Brake Forced Release Switch

- SSEL Controller Power Supply Wiring (The Client should prepare it).

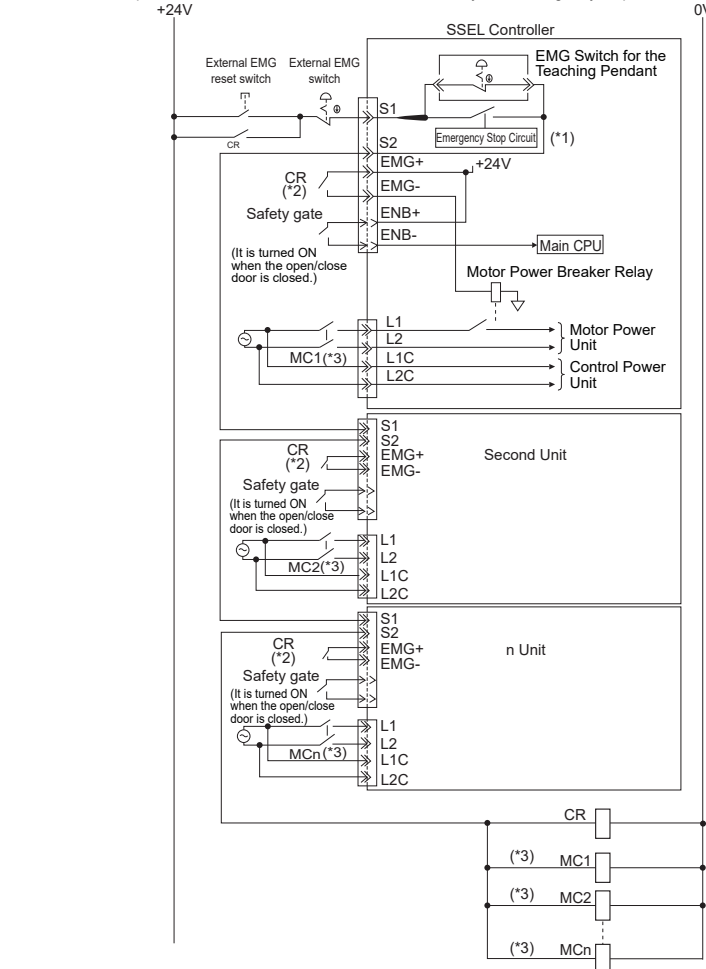


- *1 Make sure to install the noise filter.
- *2 Follow the instructions below for the selection of the circuit breaker.
Breaker Rated Current Value > Power Capacity/ AC Input Voltage
(Refer to "Power Capacity and Heating Value" for Power Capacity.)
 - The current might pass through the controller three times more of the rated current at the acceleration. Select one that does not trip when the above current passes. When it trips, select the breaker with a rated current one rank above.
 - Select the breaker that does not trip with the rush current. (Refer to the operating characteristic curve described in the manufacturer's catalog.)
 - For the rated breaking current, select the current value which can break the current even when a short circuit occurs.
Rated Breaking Current > Short-circuit Current = Primary Power Supply Capacity/Power Voltage
Select the breaking current value for the circuit breaker leaving some margin.
- *3 When the leakage breaker is to be installed, it is required to select it with the purpose clarified such as protection from fire or human body protection.
For the leakage breaker, measure the leakage current at the location where the leakage breaker is installed, and select it. Use the "applicable to higher harmonics type" leakage breaker.
- *4 For the CE marked type, the attachment of the clamp filter for each model shown in the figure, and the connection to the surge protector, are required.
In addition, for all the cables to be connected to SSEL, arrange them with a length less than 30m.

• Emergency Stop Input Cable Arrangement Example



Shown is an example when two or more controllers on the whole system emergency stop circuit, are stopped in an emergency.



*1 The connection of the teaching pendant is automatically recognized using the controller.

*2 For the CR contacts between EMG "+" and EMG "-", use DC24V, 0.5A/contact or more.

*3 When the safety category demands a break in the driving source, connect the MC.

Select contact rating for MC based on the current value found in the circuit breaker selection. Make sure the total current to flow in S1 and S2 do not exceed 0.5A. In case it does, have a supportive relay to be equipped.

I/O Signals

Program Mode

Input

Pin No.	Electric wire color	Port No.	Function in Standard Setting (in Delivery)	Parameter No.	Parameter Name	Input Function Set Value (at the delivery from factory)	Input Function Set Value *1	Function
1 A	BR-1	-	I/O power connector + 24V	-	-	-	0	Universal Input
1 B	RD-1	016	Program No. 1 Selection (LSB)	251	Input Function Selection 016	9	1	Program Start (BCD) (ON Edge) Signal
2A	OR-1	017	Program No. 2 Selection (The second bit)	252	Input Function Selection 017	10	2	Program Start (BIN) (ON Edge) Signal
2B	YW-1	018	Program No. 3 Selection (The third bit)	253	Input Function Selection 018	11	3	Software Reset (Turning ON for 1 second)
3A	GN-1	019	Program No. 4 Selection (The fourth bit)	254	Input Function Selection 019	12	4	Servo ON signal (ON Edge)
3B	BL-1	020	Program No. 10 Selection (The fifth bit)	255	Input Function Selection 020	13	5	Automatic Start Program Start-up Signal (ON Edge)
4A	PL-1	021	Program No. 20 Selection (The sixth bit)	256	Input Function Selection 021	14	6	All servo-axes soft interlock (OFF level)
4B	GY-1	022	Program No. 40 Selection (MSB•The seventh bit)	257	Input Function Selection 022	15	7	Operation Pause Cancellation (ON Edge)
5A	WT-1	023	Software Reset	258	Input Function Selection 023	3	8	Pause Signal (OFF level)
5B	BK-1	000	Program Start	30	Input Function Selection 000	1	9	Program No. appointment (LSB)
6A	BR-2	001	Universal Input	31	Input Function Selection 001	0	10	Program No. appointment (The second bit)
6B	RD-2	002	Universal Input	32	Input Function Selection 002	0	11	Program No. appointment (The third bit)
7A	OR-2	003	Universal Input	33	Input Function Selection 003	0	12	Program No. appointment (The fourth bit)
7B	YW-2	004	Universal Input	34	Input Function Selection 004	0	13	Program No. appointment (The fifth bit)
8A	GN-2	005	Universal Input	35	Input Function Selection 005	0	14	Program No. appointment (The sixth bit)
8B	BL-2	006	Universal Input	36	Input Function Selection 006	0	15	Program No. appointment (MSB•The seventh bit)
9A	PL-2	007	Universal Input	37	Input Function Selection 007	0	16	Error Reset (ON edge)
9B	GY-2	008	Universal Input	38	Input Function Selection 008	0	17	Driving Power Interruption Cancellation Input (ON Edge)
10A	WT-2	009	Universal Input	39	Input Function Selection 009	0	18	Homing Command Signal for All Effective Axes (ON Edge)
10B	BK-2	010	Universal Input	40	Input Function Selection 010	0	19	All Increment Effective Axes Homing(ON Edge)
11A	BR-3	011	Universal Input	41	Input Function Selection 011	0	20	PC and Teaching Pendant Servo-Motor Movement Command Receipt Permission Input
11B	RD-3	012	Universal Input	42	Input Function Selection 012	0	21	Remote Mode Control Input
12A	OR-3	013	Universal Input	43	Input Function Selection 013	0	22	First Axis Brake Forced Release Input
12B	YW-3	014	Universal Input	44	Input Function Selection 014	0	23	Second Axis Brake Forced Release Input
13A	GN-3	015	Universal Input	45	Input Function Selection 015	0		

*1 When the input function set values (0 to 23) are set in the I/O parameters 30 to 45 (input function selection 000 to 015) and I/O parameters 251 to 258 (input function selection 016 to 023), the set functions are allocated.

Program Mode

Output

Pin No.	Electric wire color	Port No.	Function in Standard Setting (in Delivery)	Parameter No.	Parameter Name	Output Function Set Value (at the delivery from factory)	Output Function Set Value *1	Function
13B	BL-3	300	Alarm Output	46	Output Function Selection 300	2	0	Universal Input
14A	PL-3	301	READY Output	47	Output Function Selection 301	7	1	Error Output at the Operation Cancellation Level or more(ON)
14B	GY-3	302	Universal Output	48	Output Function Selection 302	0	2	Error Output at the Operation Cancellation Level or more(OFF)
15A	WT-3	303	Universal Output	49	Output Function Selection 303	0	3	Error Output at the Operation Cancellation Level or more+ Emergency-stop Output (ON)
15B	BK-3	304	Universal Output	50	Output Function Selection 304	0	4	Error Output at the Operation Cancellation Level or more+ Emergency-stop Output (OFF)
16A	BR-4	305	Universal Output	51	Output Function Selection 305	0	5	READY Output (PIO Trigger Program Operation Available)
16B	RD-4	306	Universal Output	52	Output Function Selection 306	0	6	READY Output (PIO Trigger Program Operation Available) and without occurrence of any error at the operation cancellation level or more
17A	OR-4	307	Universal Output	53	Output Function Selection 307	0	7	READY Output (PIO Trigger Program Operation Available) and READY Output (PIO Trigger Program Operation Available, and without occurrence of any error at the cold start level or more or more level or more
17B	YW-4	N	I/O power connector 0V	-	-	-	8	Emergency-stop Output(ON)
							9	Emergency-stop Output (OFF)
							10	AUTO Mode Output
							11	Output during the Automatic Operation
							12	Output at the time of "All Effective Axes Homing (=0)"
							13	Output when all the effective axes homing is completed
							14	Output when all the effective axes home preset coordinates are set
							15	System Memory Battery (Option) Voltage Drop Warning Output
							16	Voltage Drop Warning Output for the Battery (Option) for maintaining the Absolute Data
							17	Driving Source Interception (SDN) Notification Output
							24	Output during the first axis servo ON
							25	Output during the second axis servo ON

*1 When the output function set values (0 to 17, 24, 25) are set in the I/O parameters 46 to 53 (output function selection 300 to 307), the set functions are allocated. The mixed allocation of output function set values 1, 2, 3 and 4 is not available. The mixed allocation of output function set value 5, 6 and 7 is not available.

Positioner Mode Function description for I/O Signals

Input

Signal Abbreviation	Signal Name	Function Description	Parameter No.25				
			1	2	3	4	16
PC1 to PC13 PC1 to PC11	Command Position No. Signal	Input of the position number to move (binary input)	○				○
Item Change Mode PC1 to PC16	Position/Item No. Signal	Input of the No. of item to be moved and position No. (Binary Input)		○			
DC-S-C1 Interchangeable Mode PC1 to PC1000	Command Position No. Signal	Input of the position number to move (BCD input) (PC1 to 8 : Units Digit, PC10 to 80 : Tens Digit, PC100 to 800 : Hundreds Digit, PC1000 : Thousands Digit)					○
RES	Reset Signal	An alarm will be reset when this signal is turned ON. Also, when it is turned ON in the pause mode (*STP is turned OFF), the remaining movement amount can be cancelled.	○	○	○	○	
CSTR	PTP Strobing Signal (Start Signal)	The actuator will start to move to the position set by the command position number.	○	○			○
Double Axis Independent Mode CSTR1, CSTR2	PTP Strobing Signal (Start Signal)	The actuator will start to move to the position set by the command position number. • CSTR1 : First Axis • CSTR2 : Second Axis			○		
HOME	Home Return Signal	The controller will perform home return operation when this signal is turned ON.	○	○			
Double Axis Independent Mode HOME1, HOME2	Home Return Signal	The controller will perform home return operation when this signal is turned ON. • HOME1 : First Axis • HOME2 : Second Axis			○		
SON	Servo ON signal	The servo remains ON while this signal is ON, or OFF while this signal is OFF.	○	○			○
Double Axis Independent Mode SON1, SON2	Servo ON signal	The servo remains ON while this signal is ON, or OFF while this signal is OFF. • SON1 : First Axis • SON2 : Second Axis			○		
PUSH	Pressing Signal	When the command position No. signal and start signal are input in the Signal ON mode, the pressing operation is performed.	○	○			
*STP	Pause Signal	When this signal turns OFF while the actuator is moving, the actuator will decelerate to stop. The remaining movement is retained and will resume when the signal is turned ON again.	○	○			○
Double Axis Independent Mode *STP1, *STP2	Pause Signal	When this signal turns OFF while the actuator is moving, the actuator will decelerate to stop. The remaining movement is retained and will resume when the signal is turned ON again. • *STP1 : First Axis • *STP2 : Second Axis			○		
DC-S-C1 Interchangeable Mode STP	Pause Signal	When this signal turns ON while the actuator is moving, the actuator will decelerate to stop. The remaining movement is retained and will resume when the signal is turned OFF again.					○
*CANC	Cancel Signal	When this signal turns OFF while the actuator is moving, the actuator will decelerate to stop. During the stop condition, the remaining movement amount is cancelled, so even when this signal is turned ON, the movement is not restarted.	○	○			
Double Axis Independent Mode *CANC1, *CANC2	Cancel Signal	When this signal turns OFF while the actuator is moving, the actuator will decelerate to stop. During the stop condition, the remaining movement amount is cancelled, so even when this signal is turned ON, the movement is not restarted. • *CANC1 : First Axis • *CANC2 : Second Axis			○		
LINE	Interpolation Signal	When the double axis unit is used and this signal is turned ON, the two axes perform the linear interpolation operation	○	○			○
DC-S-C1 Interchangeable Mode CPRES	CPU Reset Signal	When this signal is turned ON the controller is re-started up.					○
Teaching Mode JOG1 +, JOG1 - JOG2 +, JOG2 -	Jog Signal	When the MODE signal is turned ON and the mode is set to Teaching Mode, using the ON edge detection of this signal, the jog operation is performed in plus or minus direction. When the OFF edge is detected during the jog operation, it is decelerated and stopped. • JOG1 +, JOG1 - : First Axis • JOG2 +, JOG2 - : First Axis				○	
Teaching Mode IC001 IC01 IC05 IC1	Inching (Manual Axis Operation) Distance Signal	When the MODE signal is turned ON and the mode is set to Teaching Mode, specifying the inching (manual axis operation) distance and entering the jog signal (JOG1+, JOG1-, JOG2+ or JOG2-), performs the inching (manual axis) operation. • IC001 : Set the Inching (manual axis operation) Distance to "0.01mm". • IC01 : Set the Inching (manual axis operation) Distance to "0.1mm". • IC05 : Set the Inching (manual axis operation) Distance to "0.5mm". • IC1 : Set the Inching (manual axis operation) Distance to "1mm". When two or more inching (manual axis operation) distances (IC001 to IC1) are set, the inching (manual axis operation) is performed for the total distance.				○	
Teaching Mode CSTR/PWRT	PTP Strobing Signal (Start Signal)/ Current Position Write Signal	When the MODE signal is turned OFF and the mode is set to Normal Positioning Mode, it is used as the start signal. When the MODE signal is turned ON and the mode is set to Teaching Mode, it is used as the current position write signal. Specifying the write position and turning ON this signal for 20msec or more, writes the current position onto the specified position.				○	
Teaching Mode MODE	Teaching Mode Specifying Signal	When the MODE signal is turned OFF, the mode is set to Normal Positioning Mode. When the MODE signal is turned ON, the mode is changed to Teaching Mode. (When the SERVO is turned ON and jog signal is turned ON, turning ON the MODE signal starts up the actuator. Be careful.)				○	

Output

Signal Abbreviation	Signal Name	Function Description	Parameter No.25				
			1	2	3	4	16
*ALM	Controller Alarm Status Signal	When the controller is turned ON normally, it is turned ON and when the controller is in alarm mode, it is turned OFF. When the controller is recovered from alarm mode, it is turned ON again.	○	○	○	○	
DC-S-C1 Interchangeable Mode ALM	Controller Alarm Status Signal	When the controller is turned OFF normally, it is turned ON and when the controller is in alarm mode, it is turned ON. When the controller is recovered from alarm mode, it is turned OFF again.					○
RDY	Ready Signal	When the controller initialization is completed normally and the control is enabled, it is turned ON.	○	○	○	○	○
PEND	Positioning Completion Signal	This signal is turned ON when the positioning is completed (the actuator reaches within the positioning range). When the start signal is turned ON and the movement command is issued, this signal is turned OFF. Then, after the movement, the start signal is turned OFF and the actuator reaches within the positioning width, this signal is turned ON. Until the start signal is turned ON, even when the actuator is out of the positioning width, this signal is not turned ON. When the start signal continues to be turned ON, even when the actuator reaches within the positioning width, this signal is not turned ON.	○	○			○
Double Axis Independent Mode PEND1 PEND2	Positioning Completion Signal	This signal is turned ON when the positioning is completed (the actuator reaches within the positioning range). When the start signal is turned ON and the movement command is issued, this signal is turned OFF. Then, after the movement, the start signal is turned OFF and the actuator reaches within the positioning width, this signal is turned ON. Until the start signal is turned ON, even when the actuator is out of the positioning width, this signal is not turned ON. When the start signal continues to be turned ON, even when the actuator reaches within the positioning width, this signal is not turned ON. • PEND1 : First Axis • PEND2 : Second Axis			○		
HEND	Homing Completion Signal	When the power is input, it is in the OFF mode. This signal will turn ON when home return has been completed. It is turned ON when the homing command is issued.	○	○			○
Double Axis Independent Mode HEND1, HEND2	Homing Completion Signal	When the power is input, it is in the OFF mode. This signal will turn ON when home return has been completed. It is turned ON when the homing command is issued. • HEND1 : First Axis • HEND2 : Second Axis			○		
SVON	Servo ON Status Signal	This signal will remain ON while the servo is ON.	○	○			○
Double Axis Independent Mode SVON1, SVON2	Servo ON Status Signal	This signal will remain ON while the servo is ON. • SVON1 : First Axis • SVON2 : Second Axis			○		
PSED	Pressing Completion Signal	In the pressing operation, when the operation is completed, this is turned ON. When the swing error does not occur (when the pressing operation is completed), the turning-off condition is continued.	○	○			
SSER*1	System Battery Error Signal	When the system memory battery (option) voltage drops, it is turned ON.	○	○			○
ABER*1	Battery for the Absolute Data Maintenance	When the absolute data preservation battery (option) voltage drops, it is turned ON.	○	○			○
Teaching Mode PEND/WEND	Positioning Completion Signal/Writing Completion Signal	In the normal positioning mode (MODE signal is turned OFF), it is used as the positioning completion signal. This signal will turn ON when the target position has been reached after movement and the actuator has entered the in-position range. In the teaching mode (MODE signal is turned ON), it is used as the writing completion signal. At the moment when the current position data writing is completed, it is turned ON.					○
Teaching Mode TCMD	Operation Mode Status Signal	It is turned OFF in the Normal Positioning Mode and turned ON in the Teaching Mode.					○

*1 Turn ON the lamp, etc., with this signal. Use this signal for the alarm for battery change.

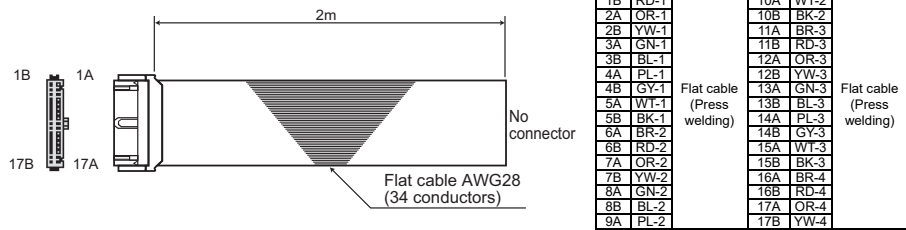
Positioner Mode

Mode			Standard Mode	Item Change Mode	Double Axis Independent Mode	Teaching Mode	DS-S-C1 Interchangeable Mode
Other Parameter No. 25			1	2	3	4	16
Pin No.	Electric wire color	Category					
1A	BR-1	+24V	P24				
1B	RD-1		PC10	PC10	PC7	JOG1-	PC1000
2A	OR-1		PC11	PC11	PC8	JOG2+	PC2000
2B	YW-1		PC12	PC12	PC9	JOG2-	PC4000
3A	GN-1		PC13	PC13	PC10	IC001	PC8000
3B	BL-1		PC14	PC14	PC11	IC01	PC10000
4A	PL-1		PC15	PC15	PC12	IC05	PC20000
4B	GY-1		PC16	PC16	PC13	IC1	-
5A	WT-1		RES	RES	RES	CPRES	-
5B	BK-1		CSTR	CSTR	CSTR1	CSTR/PWRT	CSTR
6A	BR-2		HOME	HOME	HOME1	STP	-
6B	RD-2		SON	SON	SON1	*STP	CANC
7A	OR-2		PUSH	PUSH	*STP1	PC1	LINE
7B	YW-2		*STP	*STP	*CANC1	PC2	PC1
8A	GN-2		*CANC	*CANC	CSTR2	PC3	PC2
8B	BL-2		LINE	LINE	HOME2	PC4	PC4
9A	PL-2		PC1	PC1	SON2	PC5	PC8
9B	GY-2		PC2	PC2	*STP2	PC6	PC10
10A	WT-2		PC3	PC3	*CANC2	PC7	PC20
10B	BK-2		PC4	PC4	PC1	PC8	PC40
11A	BR-3		PC5	PC5	PC2	PC9	PC80
11B	RD-3		PC6	PC6	PC3	PC10	PC100
12A	OR-3		PC7	PC7	PC4	PC11	PC200
12B	YW-3		PC8	PC8	PC5	MODE	PC400
13A	GN-3	Output	PC9	PC9	PC6	JOG1+	PC800
13B	BL-3		*ALM	*ALM	*ALM	*ALM	ALM
14A	PL-3		RDY	RDY	RDY	RDY	RDY
14B	GY-3		PEND	PEND	PEND1	PEND/WEND	PEND
15A	WT-3		HEND	HEND	HEND1	HEND	-
15B	BK-3		SVON	SVON	SVON1	SVON	-
16A	BR-4		PSER	PSER	PEND2	TCMD	-
16B	RD-4		SSER	SSER	HEND2	SSER	SSER
17A	OR-4		ABER	ABER	SVON2	ABER	ABER
17B	YW-4				N		

I/O Flat cable

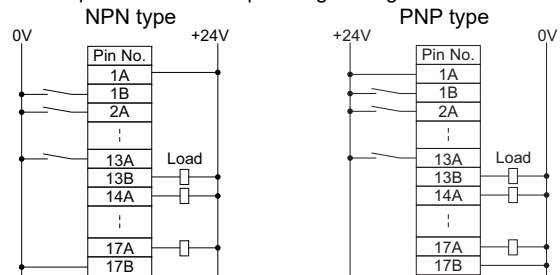
Model CB-DS-PIO□□□

* Enter the cable length (L) in□□□ (up to 10m)
Example) 080=8m



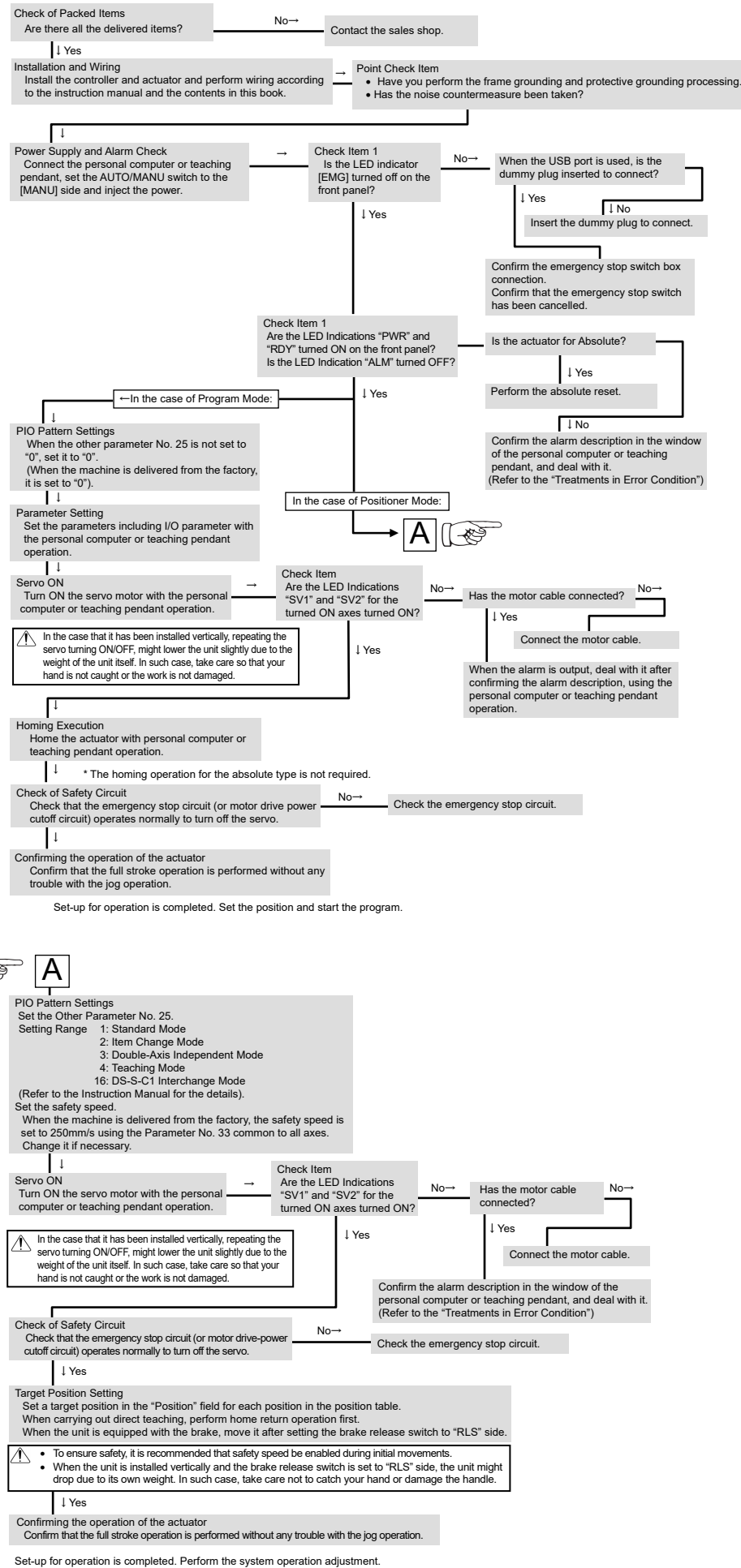
Specification	Input section		Output section	
	Item	Specification	Item	Specification
ON/OFF Voltage	Input voltage	DC24V ± 10%	Load voltage	DC24V
	Input current	7mA	Peak load electric current	100mA/1 point 400mA/8 points *1
	ON/OFF Voltage	NPN ON Voltage: MIN. DC16.0V OFF Voltage: MAX. DC5.0V PNP ON Voltage: MIN. DC8.0V OFF Voltage: MAX. DC19.0V	Leakage Current	MAX. 0.1mA
NPN	Controller		Controller	
	Diagram showing NPN input circuit with external power source, input terminal, and internal power source.		Diagram showing NPN output circuit with internal power source, surge absorber, load, and output terminal.	
PNP	Controller		Controller	
	Diagram showing PNP input circuit with external power source, input terminal, and internal power source.		Diagram showing PNP output circuit with internal power source, surge absorber, load, and output terminal.	

The I/O circuit is an equivalent circuit expressing the logic.



Starting Procedures

When using this product for the first time, make sure to avoid mistakes and incorrect wiring by referring to the procedure below.



Troubleshooting

The following alarm displays are frequently generated at the start-up operation. Process it referring to the following description. Deal with each of them referring to the following table.

Code	Status contents	Cause and Remedy	Status display		
			LED	Personal Computer TB	Panel Unit (Option)
EMG	During emergency-stop	It is not an alarm. • It is generated when the emergency stop switch in the teaching pendant or the personal computer application software is not cancelled. In such case, cancel it. • It is generated when the personal computer cable is not connected to the emergency stop box. • Check the emergency stop circuit.	○		E-C
enb	Safety gate remains opening Deadman switch OFF	It is not an alarm. • It is generated when the system I/O ENB signal is opened. Check the ENB signal. (It is generated when the safety gate is open. Close the safety gate.) • It is generated when the personal computer or the teaching pendant is not connected. Connect the personal computer or the teaching pendant or set the AUTO/MANU switch to "AUTO". • When the actuator is to be started up, hold the deadman switch on the teaching pendant to turn it on.			Enb
ACF	AC Power Interruption Momentary Power Failure Power Voltage Drop	It is generated when the power voltage is not supplied. It will be generated, for example, in the case that the AC100V is supplied to the controller with AC200V specified. Check the power supply.			ACF
CA1	Absolute Data Backup Battery Voltage Error	It is caused when the battery is not attached or battery voltage drops. In the case of the actuator for the single-axis robots or Cartesian robots with the absolute data specifications, it is generated when the power is connected for the first time. Perform the absolute reset.	○		ECA1
D12	Encoder Disconnection Error	It is generated when the cable is broken or the encode cable is not connected to the controller. Check the wiring.		○	Ed12
D19	Encoder Reception Time Out	It is generated when the encoder is broken down, the cable is broken or the encoder cable is not connected to the controller. Check the wiring.		○	Ed19
E69 E6C	24V I/O Error DO output current error	It is generated when the +24V power for I/O is not supplied. Check the power supply. (How to start up the controller without connecting the I/O 24V power) Set both the I/O parameter No. 10 to "0".		○	E69 E6C
D5□	Field Bus Error	It is generated when the field bus link connection is not established. Check the link cable connection, I/O parameter and PLC parameter settings. (How to start up the controller without connecting the field bus) Set both the I/O parameter No. 10 to "0".		○	Ed5□

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