IAI Quality and Innovation

Position Controller with Built-in PLC Function

SCON-LC/LCG

First Step Guide First 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 downloaded the user's manual from our website.
You can download it free of change. 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.

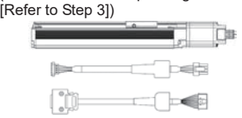
When using this product for the first time, refer to the processes shown below and make sure not to have any missing in checking or mistake in wiring.

Step1 Confirm all the necessary things are prepared (Contact us or our sales agency in case of any missing)

Refer to Section "Product Check" in this manual for details.

☆ SCON-LC/LCG

☆ Actuator and Connection Cable
(The cable differs depending on the actuator type [Refer to Step 3])



☆ CD-ROM (Enclosed in RCM-101-□□)
(The following software is included)
1) RC PC Software

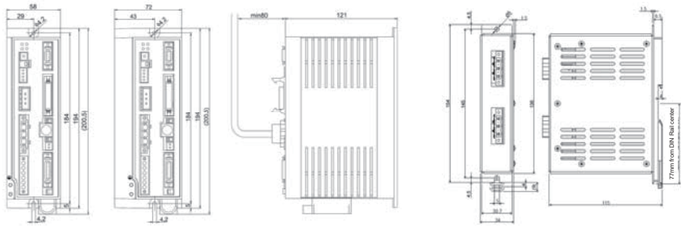
☆ Ladder Edit Program (LC-LDS-01)
Download it in IAI homepage
(www.iai-robot.co.jp)

Step2 Installation

Refer to "Installation Environment" and "Installation and Noise Elimination" in this manual, or "1.6 Installation and Storage Environment" and "1.7 Noise Elimination and Mounting Method" in SCON

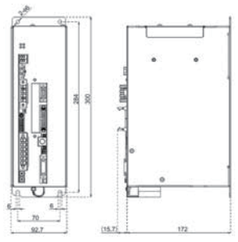
• External Dimensions

to 400W or less 400 to 750W

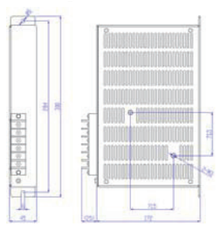


Reginerative resistor

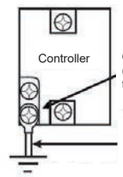
3000 to 3300W



Reginerative resistor



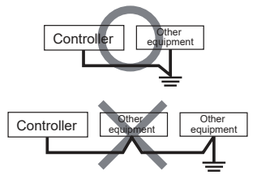
1. Noise Elimination Grounding (Frame Ground)



Connect using FG connection terminal (PE terminal for 3000W and higher) on the main unit.

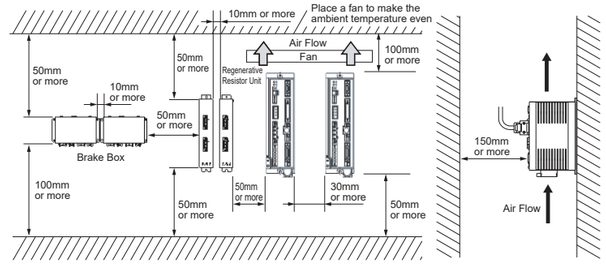
Use a copper wire cable with its width 2.0mm² (AWG14) or more with rated temperature 60deg or more for wiring.

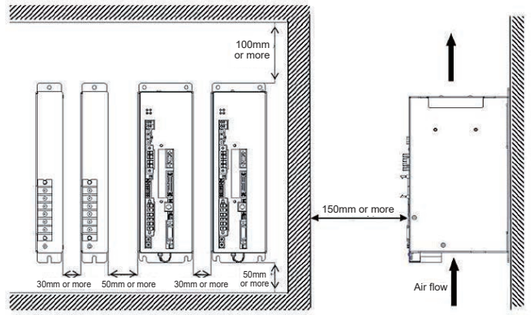
Earth terminal: Grounding resistance at 100Ω or less
(Class D grounding: Formerly Class-III grounding)



Do not share the ground wire with or connect to other equipment. Ground each controller.

2. Cooling Factors and Installation
Keep the ambient temperature of the controller at 40°C or less.



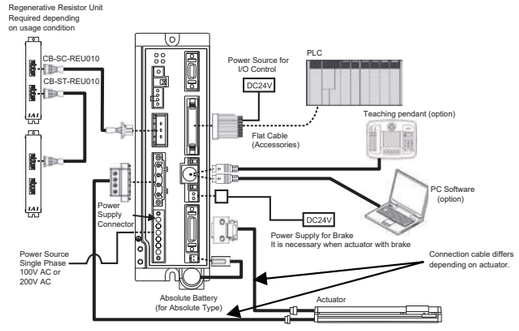


Step3 Wiring

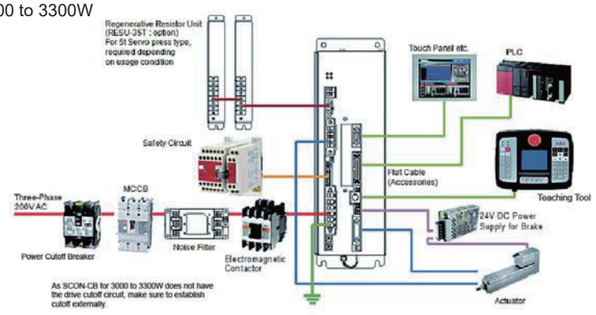
Refer to the contents below or Chapter 2 "Wiring" in SCON Instruction Manual

Example for Basic Wiring

● to 750W

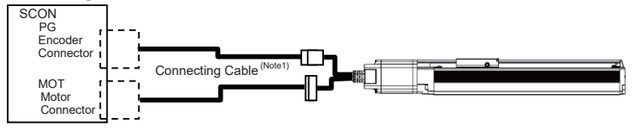


● 3000 to 3300W

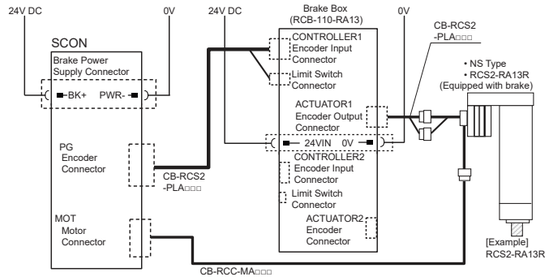


Connection of Actuator

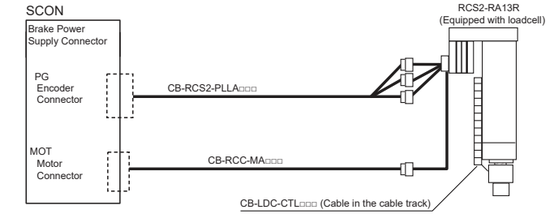
1) Connection of Single Axis Robots



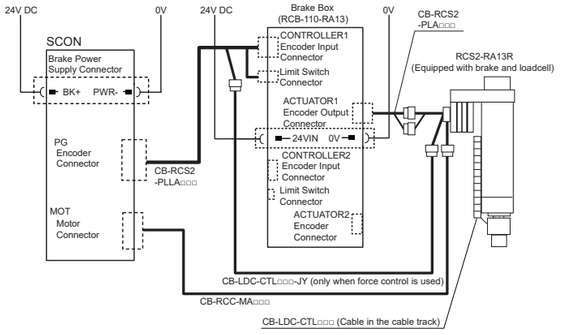
2) Connection of RCS2-RA13R actuator equipped with brake or NS-type equipped with brake



3) Connection when RCS2-RA13R with loadcell (with no brake)



4) Connection of actuator RCS2-RA13R equipped with loadcell and brake

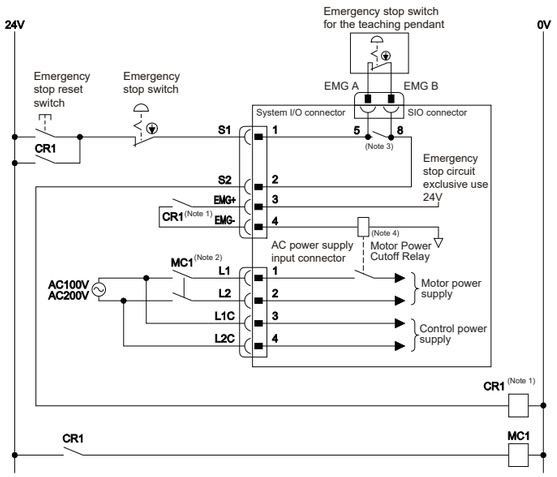


Note 1 Connection Cable Model Codes □□□: Cable Length e.g.)030=3m

Type	Actuator Series Name	Cable
Encoder Cable	For Connecting to Single Axis Robots	CB-X1-PA□□□
	For connecting to Single Axis Robots equipped with LS Type	CB-X1-PLA□□□
	For connecting to ISWA	CB-X1-PA□□□-WC
	For connecting to NS/Linear Servo/RCS2	CB-X3-PA□□□
	For connecting to NS/Linear Servo/RCS2 equipped with LS	CB-X2-PLA□□□
	For RCS2	CB-RCS2-PA□□□
	For RCS2-RT/RA13R	CB-RCS2-PLA□□□
	Equipped with Loadcell of RCS3	CB-RCS2-PLDA□□□
	Equipped with Loadcell of RCS3 (Robot Cable)	CB-RCS2-PLDA□□□-RB
	For Equipped with Loadcell of RCS2-RA13R	CB-RCS2-PLLA□□□
	For Equipped with Loadcell of RCS2-RA13R (Robot Cable)	CB-RCS2-PLLA□□□-RB
Motor Cable	For Linear (Other than Large Type)	CB-X-MA□□□
	For Large Type Linear	CB-XMC-MA□□□
	For Connecting to Single Axis Robots	CB-RCC-MA□□□
	For Connecting to Single Axis Robots (Robot Cable)	CB-RCC-MA□□□-RB
	For ISWA	CB-XEU-MA□□□

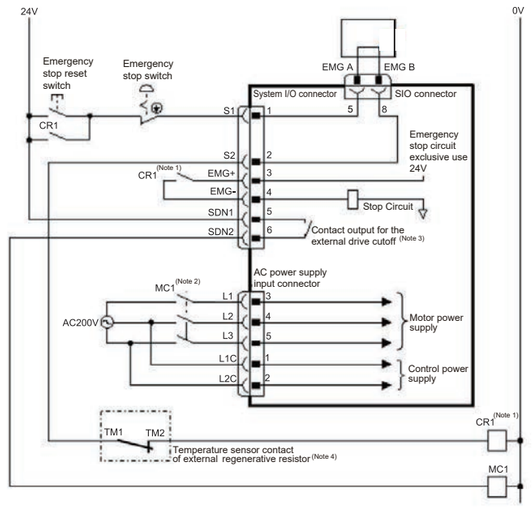
Example for Power Source Emergency Stop Circuit

● to 750W



Note 1 The power rating of the motor power-OFF relay turning ON/OFF with contact CR1 is 24V DC and 10mA or less.
Note 2 Connect such as a connector to L1/L2 terminals when cutting OFF the motor power source externally.
Note 3 S1 and S2 make short-circuit inside the controller if a teaching pendant is not connected.
Note 4 Select the CR1 coil current and 0.1A or less.

● 3000 to 3300W



Note 1 The power rating of the motor power-off relay turning ON/OFF with contact CR1 is 24V DC and 10mA or less.
Note 2 Connect such as a connector to L1/L2/L3 terminals when cutting off the motor power source externally. (This controler not equipped with the drive cutoff relay mounted inside the controller.)
Note 3 It is the contact output to control the drive source breaker connected externally. The rating is 30V DC and 20mA or less.
Note 4 Connect a temperature sensor when an external regenerative resistor unit is connected.

Wiring of I/O (When using input and output of PIO)

Refer to “Wiring of I/O” in this manual or Chapter 2 “Wiring” in SCON Instruction Manual.

Wiring of Fieldbus (When using fieldbus)

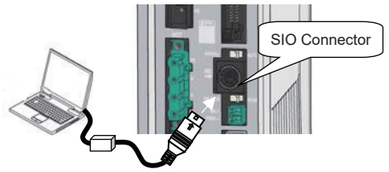
Refer to the section for wiring of each field network or Chapter 2 “Wiring” in each fieldbus Instruction Manual.

Step4 Establish SCON-LC Initial Setting

Software Necessary for Initial Setting

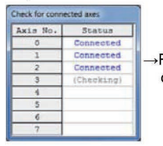
1) RC PC Software

Connect the PC to SCON-LC with the dedicated cable enclosed in the PC software.

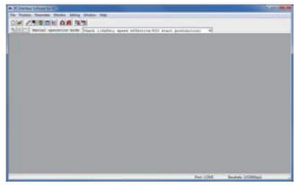


1. Setting of Target Position **(Note) It excludes the case that operation is made with the direct numerical commands on the fieldbus. ⇒ go to Step5**

(1) Start up RC PC Software.

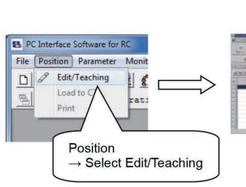


→For the number of connectable actuators→

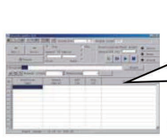


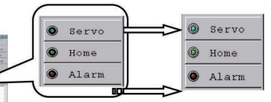
Initial screen

(2) After the position table is opened, the incremental type conducts the home-return operation.



Position → Select Edit/Teaching



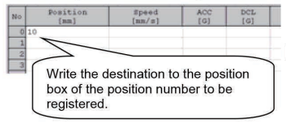


1) Press the Servo
2) Turn on the Servo lamp
3) Press the Home (for Incremental Type)
4) Turn on the Home lamp
(The lamp is always kept on once the absolute reset is complete for the absolute type)

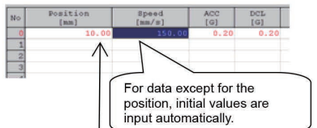
(3) The destination can be defined by using the following two methods:
1) Read out the coordinate values from such a tool as CAD.
2) Drive the slider or rod with the JOG operation to the destination, and reading the position data.

(4) Type the destination in the column of Position in Position Table. Once the position is filled, the initial value for Speed and Acceleration/Deceleration are automatically input.

☆ When writing a number directly;



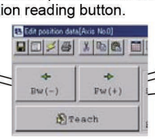
Write the destination to the position box of the position number to be registered.



For data except for the position, initial values are input automatically.

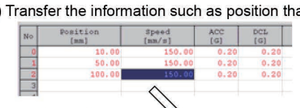
☆ When setting direct position with JOG operation;
Move the actuator to the desired position with the JOG button and press the position reading button.

JOG (Backward)



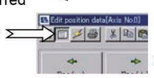
JOG (Forward)

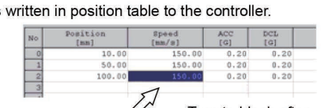
(5) Transfer the information such as position that is written in position table to the controller.



Written in red before transferred

Press “Transfer to Controller”





Turn to black after transfer complete

Press the OK

Step5 Creating of Ladder Program

Software and instruction manuals necessary for creating
- Ladder Edit Program (LC-LDS-01)
- LC Ladder Edit Soft Manual (ME0330)
- LC Ladder Programming Manual (ME0329)
- SCON-LC/CB Instruction Manual (ME0340)
- SCON-LC-F/CB-F Servo Press Function Instruction Manual (ME0345)
- Each fieldbus instruction manual (such as ME0254 [Refer to Section 1.1.3 in the instruction manual of SCON-LC/CB or SCON-LC-F/CB-F])

Referring to the points of the PLC built-in type described below and LC ladder edit software manuals, edit the ladder program. (Note: Not applicable for pulse train control)

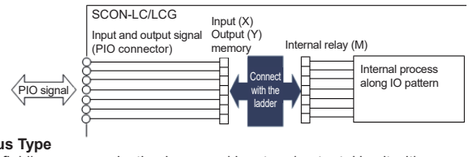
• Outline

LC Type is equipped with a built-in PLC function, and is capable to control SCON with ladder programs instead of the host PLC if the programs are in small scale.

• External Interface

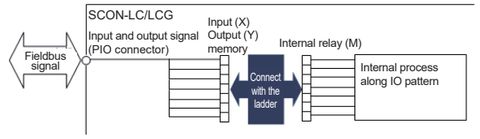
(1) PIO Type

Each signal of PIO is general input and output. Use it with connecting to internal relay, which each IO pattern is assigned to, with the ladder program if necessary.



(2) Fieldbus Type

Each bit in fieldbus communication is general input and output. Use it with connecting to internal relay, which each IO pattern is assigned to, with the ladder program if necessary.



For fieldbus communication, the data volume transferred in one time of communication is restricted.
CC-Link : 1station 1time, Other than CC-Link : Input 8byte, Output 8byte

• Operation Pattern (Assignment), and Setting

The operation pattern is to be set in Parameter No. 84 “Fieldbus Operation Mode”.

Parameter No.84 Setting	Operation Pattern	Parameter No.84 Setting	Operation Pattern
0	Remote I/O mode	5	Posiiton/Simple Direct Mode 2
1	Posiiton/Simple Direct Mode, Full Functional Mode (dedicated for servo press)	6	Half Direct Mode 2
2	Half Direct Mode	7	Remote I/O mode 3
3	Full Direct Mode	8	Half Direct Mode 3
4	Remote I/O mode 2		

The set operation patterns are assigned to the internal relay (input signals to M2048 to 2303, output signals to M2304 to M2559).
* For the servo press type, it is applicable only in the remote I/O mode and full functional mode.

Figure below shows an example for Remote I/O Mode (occupied 2 bytes).

★ Internal relay ⇒ Example of SCON input side Assignment

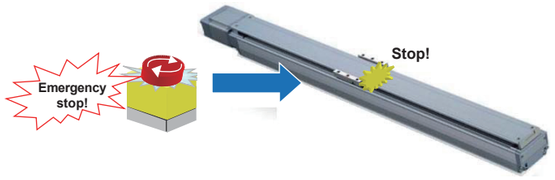
Bit No.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	M2319	M2318	M2317	M2316	M2315	M2314	M2313	M2312	M2311	M2310	M2309	M2308	M2307	M2306	M2305	M2304
Port No.	*Port 15*	*Port 14*	*Port 13*	*Port 12*	*Port 11*	*Port 10*	*Port 9*	*Port 8*	*Port 7*	*Port 6*	*Port 5*	*Port 4*	*Port 3*	*Port 2*	*Port 1*	*Port 0*
Signal Name (For PIO Pattern 0)	SON	RES	CSTR	*STP	HOME	RMOD	BKRL	—	—	—	PC32	PC16	PC8	PC4	PC2	PC1

★ SCON output ⇒ Example of internal relay Assignment

Bit No.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	M2063	M2062	M2061	M2060	M2059	M2058	M2057	M2056	M2055	M2054	M2053	M2052	M2051	M2050	M2049	M2048
Port No.	*Port 15*	*Port 14*	*Port 13*	*Port 12*	*Port 11*	*Port 10*	*Port 9*	*Port 8*	*Port 7*	*Port 6*	*Port 5*	*Port 4*	*Port 3*	*Port 2*	*Port 1*	*Port 0*
Signal Name (For PIO Pattern 0)	*BALM	*ALM	*EMGS	SV	PEND	HEND	RMDS	PZONE	ZONE1	MOVE	PM32	PM16	PM8	PM4	PM2	PM1

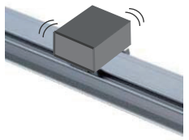
Step6 Test Run

1) Have an operation check on the emergency stop circuit.

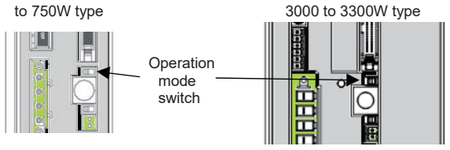


2) Without any work piece mounted, check in low speed for any debugging in the ladder, operation of the actuator, and also the cooperation with peripheral devices.

3) Check the operation in the desired speed with a work piece loaded. Check the condition of the actuator attachment and adjust the servo if there is any abnormal noise.



4) Put the operation mode setting switch on SCON-LC to AUTO, and have an operation.

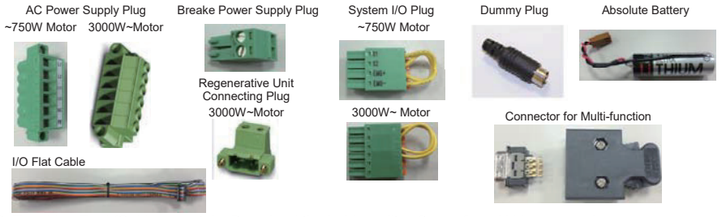


Product Check

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”		
Accessories					
2	I/O Flat Cable		CB-PAC-PIO***		***shows the cable length
3	Service Connector for Pulse Train Control (Connector for Multi-function)		Plug : 10114-3000PE Shell :10314-52F0	(Supplier:3M)	
4	System I/O Plug	~750W Motor	FMC1.5/4-ST-3.5	(Supplier:PHOENIX CONTACT)	Recommended cable size 0.5mm² (AWG20)
		3000W~Motor	FMC1.5/6-ST-3.5	(Supplier:PHOENIX CONTACT)	
5	Breake Power Supply Plug		MC1.5/2-ST-3.5	(Supplier:PHOENIX CONTACT)	
6	ACPower Supply Plug	~750W Motor	MSTB2.5/6-STF-5.08	(Supplier:PHOENIX CONTACT)	Recommended cable size 2.0mm² (AWG14)
		3000W~ Motor	PC5/6-STF-7.62	(Supplier:PHOENIX CONTACT)	Recommended cable size 3.3mm² (AWG12)
7	Absolute Battery		AB-5		Enclosed for Absolute Type (dedicated for battery-less absolute)
8	Dummy Plug		DP-5		Enclosed for SCON-LCG
9	External Regenerative Unit Connecting Plug		GIC2,5/2-STF-7.62	(Supplier:PHOENIX CONTACT)	Recommended cable size 0.75mm² (AWG18)
10	First Step Guide		ME0363		
11	Safety Guide		M0194		



2. Teaching Tool (Sold separately: Download the ladder edit software from IAI homepage)

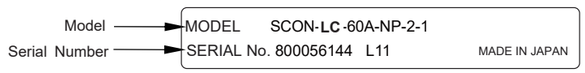
A teaching tool such as PC software is necessary when performing the setup for position setting, parameter setting, etc. that can only be done on the teaching tool. Please prepare either of the following teaching tools.

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	Touch Panel Teaching TB-02	TB-02
4	Touch Panel Teaching TB-01	TB-01
5	LC Ladder Edit Soft	LC-LDS-01

3. Instruction manuals related to this product

No.	Name	Manual No.
1	SCON Controller Instruction Manual	ME0340
2	SCON Controller Servo Press Function Instruction Manual	ME0345
3	PC Software RCM-101-MW/RCM-101-USB Instruction Manual	ME0155
4	Touch Panel Teaching TB-02	ME0355
5	Touch Panel Teaching TB-01	ME0324
6	LC Programming Manual	ME0329
7	LC Ladder Edit Soft Manual	ME0330

4. How to read the model plate



5. How to read controller model code

SCON-LC-20 I HA-NP-3-1-**

<Series>
<Type>
LC : High Performance Type
LCG : Safety Categories Complied Type
CB : High Performance Type
CGB : Safety Categories Complied Type

<Actuator Characteristics>
[Motor Type]
12 : 12W
20 : 20W
30D : 30W (excluded)
30R : 30W (For RS)
60 : 60W
100 : 100W
100S : 100W (LSA)
150 : 150W
200 : 200W
200S : 200W (LSA)
300S : 300W (LSA)
400 : 400W
600 : 600W
750 : 750W
750S : Equipped with Loadcell RCS2-RA13R
3000 : 3000W
3300 : 3300W

<Encoder Type>
A : Absolute
WAI : Battery-less Absolute
G : Spurious Absolute

<Option>
No Indication : Standard Type
I : Index Absolute (DD)
F : Servo Press Type (dedicated for servo press actuators)
HA : High Acceleration/deceleration Type
M : Multi-Rotation Absolute (DD)

<Identification for IAI use only>
* There is no identification in some cases

<Power-supply Voltage>
1 : Single-phase AC100V
2 : Single-phase AC200V
3 : Three-phase AC200V

<I/O Cable Length>
0 : No cable
2 : 2m
3 : 3m(Standard)
5 : 5m

<I/O Type>
NP : NPN Specification (Sink Type) (Standard)
ML : MECHATROLINK- Ⅰ/Ⅱ Connection Type
PN : PNP Specification (Source Type)
CN : CompoNet Connection Type
DV : DeviceNet Connection Type
EC : EtherCAT Connection Type
CC : CC-Link Connection Type
EP : EtherNet/IP Connection Type
PR : PROFIBUS Connection Type
PRT : PROFINET-IO Connection Type

Basic Specifications

Specifications

Item		SCON-LC/LCG/LC-F/LCG-F		
		400W or less	400 to 750W	3000 to 3300W
Applicable Motor Capacity		12W to 399W	400W to 750W	3000 to 3300W
Power Supply Voltage (Power-supply Fluctuation±10% or less)		Single-phase AC100 to 115V Single-phase AC200 to 230V	Single-phase AC200 to 230V	Three-phase AC200 to 230V
Rush Current *1	Power Supply Voltage AC100V	20A (Control Side), 70A (Drive Side)		
	Power Supply Voltage AC200V		30A (Control Side), 80A (Drive Side)	40A (Control Side), 40A (Drive Side)
Leak Current *2		3.0mA (Primary side when noise filter is connected to power supply line)		3.5mA
Load Capacity, Heat Generation		Refer to Power Capacity and Heat Generation.		
Power Supply Frequency		50/60Hz		
PIO Power Supply *3		DC24V±10%		
Electromagnetic Brake Power Supply (for actuator equipped with brake)		DC24V±10% 1A(Max.)		DC24V±10% 0.1A (Max.) (Note) Necessary to supply 1.5A (max.) to actuator separately
Transient Power Cutoff Durability		20ms (50Hz), 16ms (60Hz)		
Motor Control System		Sinusoidal Wave PWM Vector Current Control		
Applicable Encoder		• Incremental Serial, • Absolute Serial, • ABZ (UVW) Pararell, • Battery-less Absolute		
Encoder Resolution		• Battery-less Absolute (ISB): 131072 pulse/rev • Battery-less Absolute (RCS2/3): 16384 pulse/rev * In any models other than above, refer to instruction manual of each actuator.		
Actuator Cable Length		Max. 20m		
Serial Communication Interface		• For Connect the teaching tool or connect the link RS485 : 1CH … based on Modbus Protocol RTU/ASCII Speed: 9.6 to 230.4Kbps		
External Interface	PIO Type	Signal I/O dedicated for 24V DC (selected from NPN/PNP) … Input 16 ports max., output 16 ports max.		
	Fieldbus Type	DeviceNet, CC-Link, PROFIBUS, CompoNet, MECHATROLINK- Ⅰ/Ⅱ, EtherCAT, EtherNET/IP, PROFINET IO		
External Interface (Multi-function connector)	Serial Communication Interface 2	• RS485 : 1CH … based on Modbus Protocol RTU/ASCII Speed : 9.6 to 230.4Kbps Control available with serial communication in the modes other than the pulse train		
	Feedback Pulse	Differential System (Line Driver System) MAX. 2.5Mpps Open Collector System MAX. 500Kpps (under condition JM-08 is used)		
	Analog Output	1system (load data) 4 to 20mA Current Output (±1%) Load resistance 10 to 600Ω		
Cable Length	PIO	Max. 10m		
	RS485	Total Cable Length 100m o less		
	Fieldbus	Refer to each Fieldbus specification		
Data Setting and Input		PC Software, Touch Panel Teaching		
Data Retention Memory		Position Data, Saves position data and parameters to non-volatile memory (There is no limitation in number of writing)		
Operation Mode		Positioner Mode (Servo Press Type is dedicated for press program operation mode)		
Number of Positioning Points (Except for Servo Press Type)		512ponts (PIO Type), 768pints (dedicated for fieldbus type) (Note) Number of positions differs depending on the selection in operation pattern (fieldbus operation mode).		
LED Display (Mounted on Front Panel)		PWR (Green) : Controller in normal condition, SV (Green) : Servo ON, ALM (Orange) : Alarm generated, EMG (Red): Emergency Stop,		
Forcibly Releasing of Electromagnetic Brake (Mounted on Front Panel)		Switchover of NOM (normal) / BK RLS (compulsory release)		
Insulation Resistance		DC500V 10MΩor more		
Insulation Strength		AC1500V For 1minite (Note) Withstand voltage of force control loadcell is 50V DC		
Environment	Surrounding air temperature	0 to 40°C		
	Surrounding humidity	85%RH or less (non-condensing)		
	Surrounding environment	[Refer to Installation and Storage Environment.]		
	Surrounding storage temperature	-20 to 70°C (non-condensing)		
	Surrounding storage humidity	85% or less (non-condensing)		
	Vibration Durability	XYZ Each direction 10 to 57Hz Pulsating amplitude 0.035mm (continuous) 0.075mm (intermittent) 57 to 150Hz 4.9m/s²(continuous) 9.8m/s² (intermittent)		
Weight		Approx. 900g	Approx. 1200g	Approx. 2800g
Cooling Method		Natural air-cooling	Forced air-cooling	Forced air-cooling
External Dimensions		58W × 194H × 121D	72W × 194H × 121D	92.7W × 300H × 187.7D

● Power Capacity and Heat Generation

Rated Power Capacity = Motor Power Capacity + Control Power Capacity
Peek Max. Power Capacity = Peek Max. Motor Power Capacity + Control Power Capacity

Actuator Motor Wattage	Motor Power Capacity [VA]	Peek Max. Motor Power Capacity [VA]	Control Power Capacity [VA]	Rated Power Capacity [VA]	Peek Max. Power Capacity [VA]	Heat Generation [W]
12	41	123	48	89	171	30
20	26	78		74	126	30
30D (RS excluded)	46	138		94	186	31
30R (For RS)	138	414		186	462	33
60	138	414		186	462	33
60 (RCS3-CTZ5)	197	591		245	639	32
100	234	702		282	750	35
100S (LSA)	283	851		331	899	36
150	328	984		376	1032	37
200	421	1263		469	1311	38
200(DD)	503	1509		551	1557	7.5
200S (LSA excluding LSA-N15H)	486	1458		534	1506	38
200S (LSA-N15H)	773	2319		821	2367	56
300S (LSA)	662	1986		710	2034	40
400	920	2760		968	2808	45
400 (RCS3-CT8)	1230	3690		1278	3738	47
600	1164	2328		1212	2376	56
600 (DD)	1462	4386		1510	4434	20.8
750	1521	3042		1569	3090	58
750S		4563			4611	
3000	5657	16970		5705	17018	180
3300	6014	18041		6062	18099	182

RS: Rotary Axis LSA: Linear Actuator DD: Direct Drive Motor

Selection of Circuit Breaker

- 3 times of the rated current may flow to the controller during the acceleration/deceleration. Select an interrupter that does not trip with this value of current. If a trip occurs, select an interrupter that possesses the rated current of one grade higher. (Refer to the operation characteristics curves in the product catalog.)
- Select an interrupter that does not trip with the in-rush current. (Refer to the operation characteristics curves in the product catalog.)
- Consider the current that enables to cutoff the current even when a short circuit current is flown for the rated cutoff current. Rated Interrupting Current > Short Circuit Current + Primary Power Capacity / Power Voltage

● For ~750W Motor
Rated Current for Circuit Interrupter > (Rated Motor Power Capacity [VA] + Control Power Capacity [VA]) / AC Input Voltage × Safety Margin (reference 1.2 to 1.4 times)

● For 3000~3300W Motor
Rated Current for Circuit Interrupter > (Rated Motor Power Capacity [VA] + Control Power Capacity [VA]) / AC Input Voltage × Safety Margin (reference 1.2 to 1.4 times) / √3

Regenerative Resistor Unit (Option)

This is a unit that converts the regenerative current to heat when the motor decelerates.
• Screw fixed : RESU-1, RESU-2, DIN rail fixed : RESUD-1, RESUD-2 (For SCON to 750W)

[Specification]

Item			Specification
Body Size			W35.6mm × H158mm × D115mm
Body Weight			0.7kg
Internal Regenerative Resistor			235Ω 80W
Accessories	2nd unit or later	RESU-1, RESUD-1	Controller Connection Cable (Model Code CB-ST-REU010) 1m
	First Unit	RESU-2, RESUD-2	Controller Connection Cable (Model Code CB-SC-REU010) 1m

[Reference Connectable Quantity]

Motor Wattage Horizontal Mount/Vertical Mount	Connectable Number of Regenerative Resistor Units
to 100W (Note3)	Not necessary
101 to 400W	1
401 to 750W	2

(Note 1) This is a reference for the case when the actuator is ran forward and backward on 1,000mm stroke with the operation duty 50% under the rated acceleration/deceleration speed and rated load.
(Note 2) It is necessary to have the regenerative resistor listed above when the operation duty is above 50%.
The maximum quantity of the external regenerative resistor units that can be connected is as stated below:
• 2 units for less than 400W • 4 units for 400W or more
(Note 3) It is necessary to have one unit for LSA/LSAS-N10S Type.

• RESU-35T (For SCON 3000 to 3300W)

[Specification]

Item		Specification
Body Size		W45mm × H300mm × D197mm
Body Weight		1.8kg
Internal Regenerative Resistor		30Ω 450W
Built-in Temp. Sensor	Operation Temp.	130°C±5°C
	Contact Format	b contact
	Contact Open-Close Capacity	DC30V, 200mA (MAX)

[Reference Connectable Quantity]
They are not necessary for RCS3-RA15R. RCS3-RA20R requires two units at maximum depending on the cycle time.
[Refer to servo press function instruction manual for details.]

Loadcell

This is the pressing force measurement unit that is used for the force control.
This is used by connecting to the actuator corresponding to the force control or servo press.
[Specification] *1 R.C: Rated Capacity [Refer to servo press function instruction manual for each actuators.]

Item		Specification					
Loadcell System		Strain Gauge					
Rated Capacity [N]		200	600	2000	6000	20000	50000
Allowable Overload [%R.C*1]		200		200	200	200	200
Loadcell Accuracy [%R.C*1]		±1		±1	±1		
Temperature Drift [%R.C*1/10°C]	Zero	±0.2		±0.35	±0.2		
	Output	±0.1		±0.2	±0.1		
Applicable Temperature Range [°C]		0 to 40					

Installation Environment

This product is capable for use in the environment of pollution degree 2*1 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 Installation and Noise Elimination]

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

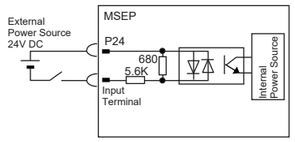
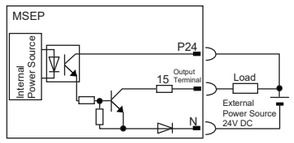
2. Storage Environment

- Storage environment follows the installation environment. Especially in a long-term storage, consider to avoid condensation of surrounding air.
Unless specially specified, moisture absorbency 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.

Noise Elimination and Installation

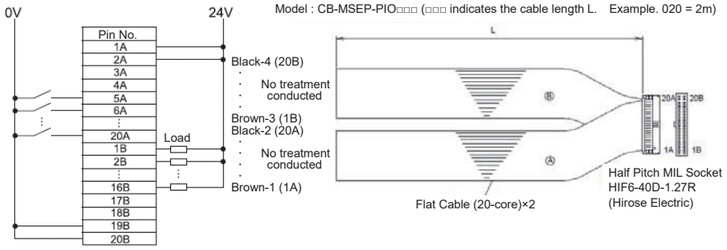
1. Precautions regarding wiring method
   1) Wire is to be twisted for the 24V DC power supply.
   2) Separate the signal and encoder lines from the power supply and power lines.
2. Noise Sources and Elimination
   Carry out noise elimination measures for electrical devices on the same power path and in the same equipment.
   The following are examples of measures to eliminate noise sources.
   1) AC solenoid valves, magnet switches and relays
   2) DC solenoid valves, magnet switches and relays
3. Heat Radiation 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.

● PIO Interface Type

	Input section		Output section	
Specification	Input voltage	DC24V±10%	Load current	DC24V±10%
	Input current	5mA 1circuit	Maximum load current	50mA 1circuit
	ON/OFF voltage	ON voltage MIN. 18V DC OFF voltage MAX. 6V DC	Leakage current	MAX. 2mA/1point
	External circuit insulation with photocoupler			
NPN				

Wiring of I/O

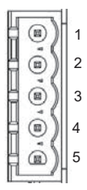
Use the attached cable for the connection.



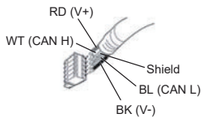
Model : CB-MSEP-PIO□□□ (□□□ indicates the cable length L. Example. 020 = 2m)

Wiring of DeviceNet

Check the instruction manuals for each field network master unit and mounted PLC for the details.



Front view of connector on controller side

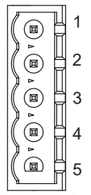


Connector Name	DeviceNet Connector	
Cable Side	MSTB2.5/5-STF-5.08 AU	Enclosed in standard package Manufactured by PHOENIX CONTACT
Controller Side	MSTBA2.5/5-GF-5.08 AU	

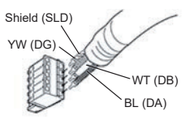
Pin No.	Signal Name	Contents	Applicable Cable
1	V- (BK)	Power Supply Cable Negative Side	DeviceNet Dedicated Cable
2	CAN L (BL)	Communication Data Low Side	
3	Shield (None)	Shield	
4	CAN H (WT)	Communication Data High Side	
5	V+ (RD)	Power Supply Cable Positive Side	

Wiring of CC-Link

Check the instruction manuals for each field network master unit and mounted PLC for the details.



Front view of connector on controller side

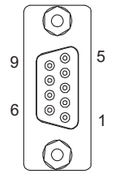


Connector Name	CC-Link Connector	
Cable Side	SMSTB2.5/5-STF-5.08 AU	Enclosed in standard package Manufactured by PHOENIX CONTACT
Controller Side	MSTBA2.5/5-GF-5.08AU	

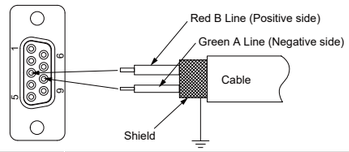
Pin No.	Signal Name	Contents	Applicable Cable
1	DA (BL)	Communications Line A	CC-Link Dedicated Cable
2	DB (WT)	Communications Line B	
3	DG (YW)	Digital GND	
4	SLD	Connect the shield of the shielded cable (Connect the FG of the 5 pins and controller FG internally)	
5	FG	Frame Ground (Connect the SLD of the 4 pins and controller FG internally)	

Wiring of PROFIBUS-DP

Check the instruction manuals for each Field Network master unit and mounted PLC for the details.



Front view of connector on controller side

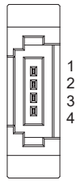


Connector Name	PROFIBUS-DP Connector	
Cable Side	D-sub 9-pin Connector (Male)	Please prepare separately
Controller Side	D-sub 9-pin Connector (Female)	

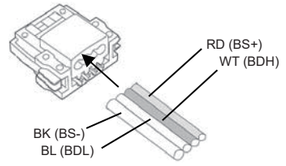
Pin No.	Signal Name	Contents	Applicable Cable
1	NC	Unconnected	PROFIBUS-DP Dedicated Cable (Type A : EN5017)
2	NC	Unconnected	
3	B-Line	Communications Line B (RS485)	
4	RTS	Request for Sending	
5	GND	Signal GND (Insulated)	
6	+5V	+5V Output (Insulated)	
7	NC	Unconnected	
8	A-Line	Communications Line A (RS485)	
9	NC	Unconnected	

Wiring of CompoNet

Check the instruction manuals for each field network master unit and mounted PLC for the details.



Front view of connector on controller side



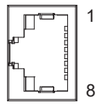
Connector Name	CompoNet Connector	
Cable Side	Connector that complies with CompoNet standards	
Controller Side	XW7D-PB4-R	Manufactured by OMRON

Pin No.	Signal Name	Contents	Applicable Cable
1	BS+ (RD)	Communication Power Supply + (Note 1)	CompoNet Dedicated Cable
2	BDH (WT)	Signal Cable H Side	
3	BDL (BL)	Signal Cable L Side	
4	BS- (BK)	Communication Power Supply - (Note 1)	

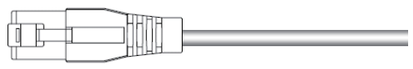
Note 1 It is unnecessary to supply the communication power. (Internal power source is used.)
If conducting multi power supply to other slave devices via communication cables, there is no problem with connecting the power supply to BS+ and BS- terminals.

Wiring of EtherNet/IP, PROFINET-IO, EtherCAT

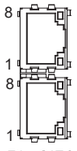
Refer to the instruction manuals for field network master unit and mounted Host Device for the details.



EtherNet/IP, front view of connector on controller side



Connector Name	EtherNet/IP Connector (EtherNet/IP), EtherCAT Connector (EtherCAT), PROFINET-IO Connector (PROFINET-IO)
Cable Side	8P8C Modular Plug
Controller Side	8P8C Modular Jack



EtherCAT front view of connector on controller side

Pin No.	Signal Name	Description	Applicable cable diameter
1	TD+	Data sending +	For EtherNet cable, use a straight STP cable that possesses the performance of Category 5e or more.
2	TD-	Data sending -	
3	RD+	Data receiving +	
4	-	Disconnected	
5	-	Disconnected	
6	RD-	Data receiving -	
7	-	Disconnected	
8	-	Disconnected	

MECHATROLINK-Ⅰ/Ⅱ

Check the instruction manuals for each field network master unit and mounted PLC for the details.

Connector Name	MECHATROLINK-Ⅰ/Ⅱ Connector
Cable Side	MECHATROLINK-Ⅰ/Ⅱ that complies with CompoNet standards

Pin No.	Signal Name (Colors)	Contents	Applicable Cable
1	NC	Disconnected	MECHATROLINK Dedicated Cable
2	/DATA	Signal - Side	
3	DATA	Signal + Side	
4	SH	Disconnected	

Operation Pattern

There are nine patterns of control systems. Set the operation pattern most suitable for the purpose in Parameter No. 84.

No.84 Setting	Mode Name	Occupied Data Volume (Number of Iinternal Relay)	Contents
0	Remote I/O Mode	32	PIO patterns selected in Parameter No. 25 are assigned to the internal relay.
1	Posiiton /Simple Direct Mode	128	Indicate the target position with direct numerical command, or operation can be made in the value in the position data. For other values necessary for operation, the operation modes set in the position data are assigned to the internal relay.
2	Half Direct Mode	256	The operation modes to make operation by indicating the velocity, acceleration /deceleration and pressing current as well as the target position with the direct numbers are assigned to the internal relay.
3	Full Direct Mode	512	The operation modes to make operation by indicating all the values related to the position control with the direct numbers are assigned to the internal relay.
4	Remote I/O Mode 2	192	The operation modes that the current position and the current velocity reading function was added to the remote I/O mode functions are assigned to the internal relay.
5	Posiiton /Simple Direct Mode 2	128	The operation modes that conduct the force control (loadcell pressing) instead of teaching and zone function in the position / simple direct mode are assigned to the internal relay.
6	Half Direct Mode 2	256	The operation modes that read the current load of the loadcell instead of command current reading in the half direct mode are assigned to the internal relay.
7	Remote I/O Mode 3	192	The operation modes that the force control (loadcell pressing) function was added to the remote I/O mode are assigned to the internal relay.
8	Half Direct Mode 3	256	The operation modes that conduct the anti-vibration control instead of JOG function in the half direct mode are assigned to the internal relay.

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Manual No.: ME0363-1B