

Splash-proof Single-axis Robot

ISWA/SPWA



 INTELLIGENT
ACTUATOR

The lineup of splash-proof sliders has been extended.
 You can now choose a splash-proof actuator of desired size to match your specific application.

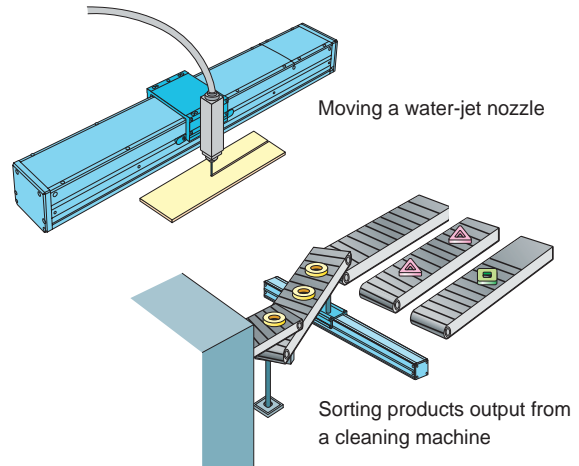


Features

- The new slider structure keeps water out of the internal parts. When air purge is performed, the robot conforms to IP65. (Note 1)
 The high-speed robot achieves a maximum speed of 1000 mm/sec. (Note 2)
- The maximum load capacity is 70 kg, so heavy loads can be transferred effortlessly. (Note 3)
- The high-precision specification (ISPWA) with a C5-equivalent precision rolled screw boasts a positioning repeatability of ± 0.01 mm.
 The standard specification (ISWA) also ensures high accuracy equivalent to ± 0.02 mm.
- Select from the three sizes of S (94 mm wide), M (125 mm wide) and L (155 mm wide).

(Note 1) The protection class is IP54 without air purge.
 (Note 2) M type, 200 W/20-mm lead.
 (Note 3) M type, 100 W/5-mm lead or 200 W/10-mm lead.
 L type, 200W/10-mm lead or 400W/20-mm lead.

Example of Use



Model

Actuator Model

ISWA - M - A - 200 - 20 - 500 - T1 - M - RT

Series	Type	Encoder type	Motor Output	Lead	Stroke	Applicable controller	Cable length	Options
ISWA Standard specification ISPWA: High-precision specification	S: Actuator width 94 mm M: Actuator width 125 mm L: Actuator width 155 mm	A: Absolute I: Incremental	60:60W 100:100W 200:200W 400:400W	4:4mm 5:5mm 8:8mm 10:10mm 16:16mm 20:20mm	100~1200mm * Varies depending on the model.	T1:XSEL-KE/KET T2: SCON SSEL XSEL-P/Q	N: No cable S:3m M:5m X□□: Specify the desired length. * The standard cable is a robot cable.	RT: Guide with ball-retaining mechanism NM: Reversed home specification

Controller Model See the back cover.

Specification Table

Slider type	Motor type	Stroke (mm) and maximum speed (mm/sec) (Note 1)														Load capacity (Note 2)		Motor (W)	Lead (mm)	Model																														
		100		150		200		250		300		350		400		450					500		550		600		650		700		750		800		850		900		950		1000		1050		1100		1150		1200	
		(kg)	(kg)																																															
Straight motor type	60	800				760				7	-	16	IS(P)WA-S-60-16-□□□□																																					
		400				380				20	-	8	IS(P)WA-S-60-8-□□□□																																					
	100	200				190				45	-	4	IS(P)WA-S-60-4-□□□□																																					
		500				455				365	300	250	30	-	10	IS(P)WA-M-100-10-□□□□																																		
	200	250				225				180	150	125	70	-	5	IS(P)WA-M-100-5-□□□□																																		
		1000				915				735	600	500	30	-	20	IS(P)WA-M-200-20-□□□□																																		
	400	500				455				365	300	250	70	-	10	IS(P)WA-M-200-10-□□□□																																		
		1000				930				765	640	545	465	30	-	20	IS(P)WA-L-200-20-□□□□																																	
	200	500				465				380	320	270	230	70	-	10	IS(P)WA-L-200-10-□□□□																																	
		1000				930				765	640	545	465	70	-	400	20	IS(P)WA-L-400-20-□□□□																																

(Note 1) The figure in each band indicates the maximum speed at the applicable stroke.
 (Note 2) The load capacity is based on operation at an acceleration of 0.3 G.

Notes on Use

- ◎ The ISWA/ISPWA must always be used in a horizontal application in the specified orientation. Be sure to observe this requirement, since water will enter the housing if these robots are positioned on their side or used in a vertical application.
- ◎ The protection class of each splash-proof model indicates protection against entry of water. Please contact IAI if you require protection against oil and coolant.
- ◎ Be sure to implement air purge if the robot is used in a humid place (humidity of 85% or above). The purge air must be clean, dry air supplied from an air drier.

ISWA-S

Single-Axis Robot, Compact Splash-Proof Type,
Actuator Width 94 mm, 60 W, Straight Shape

ISPWA-S

Single-Axis Robot, Compact Splash-Proof Type,
Actuator Width 94 mm, 60 W, Straight Shape **High-precision specification**

Type **Compact splash-proof** Stroke **100-600mm** Load capacity **45 kg (horizontal)**

Model specification items Series Type Encoder type Motor output Lead Stroke Controller Cable length Options
(Example) ISWA- S - A - 60 - 8 - 600 - T1 - S - RT



Model/Specifications

Model	Encoder type	Motor output (W)	Lead (mm)	Stroke (in increments of 50-mm)	Speed (Note 1) (mm/s)	Load capacity (kg) (Note 2)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
ISWA [ISPWA]-S- 1 - 60-16- 2 - 3 - 4 - 5	A: Absolute I: Incremental	60	16	100-600	800	7	—	63.7
ISWA [ISPWA]-S- 1 - 60-8- 2 - 3 - 4 - 5			8		400	20	—	127.4
ISWA [ISPWA]-S- 1 - 60-4- 2 - 3 - 4 - 5			4		200	45	—	254.8

* 1, 2, 3, 4 and 5 in the model numbers shown above respectively indicate the encoder type, stroke, applicable controller, cable length and applicable options.

Options

Name	Code	Remarks
Reversed home specification	NM	The home direction is on the motor opposite side
Guide with ball-retaining mechanism	RT	A spacer is inserted between adjacent guide balls

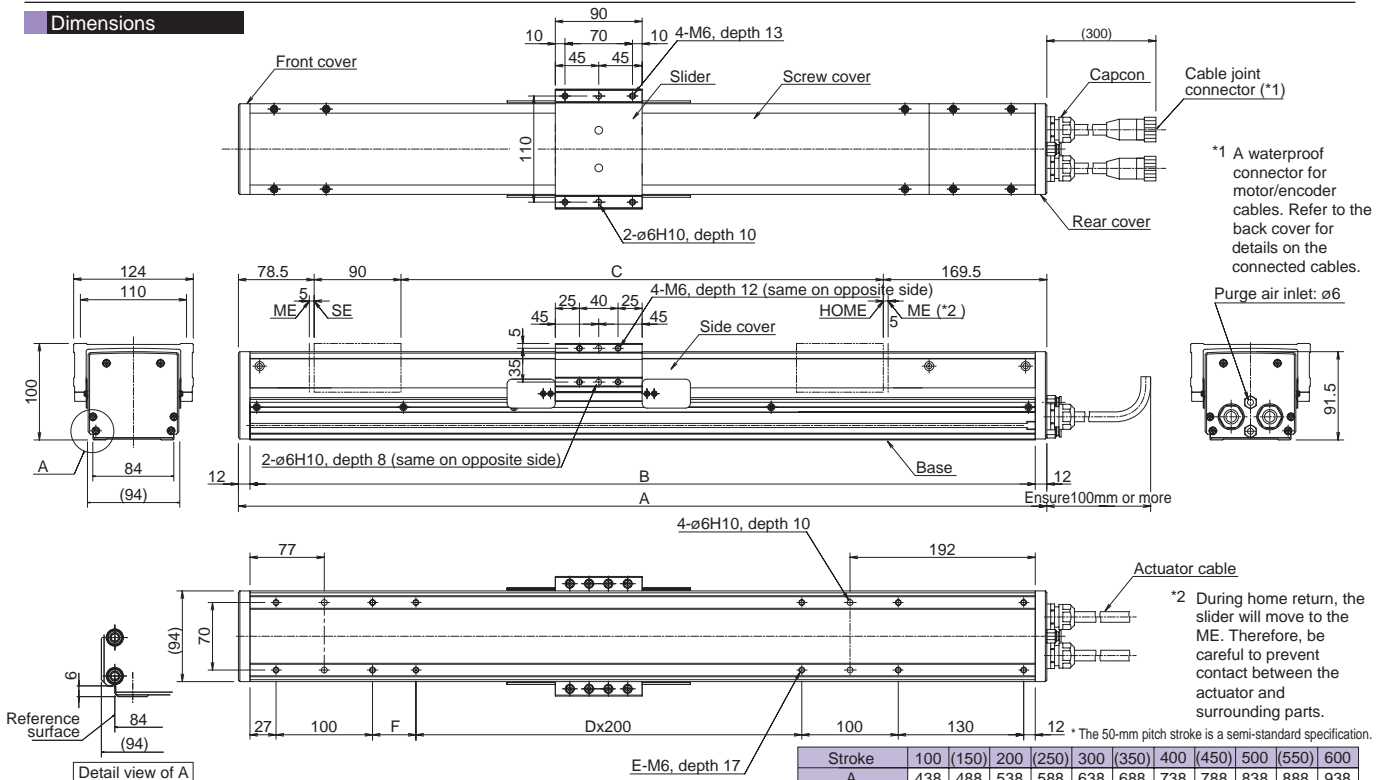
Materials of Key Components

Name	Materials
Base, slider	Aluminum (A6063S-T5 or equivalent) with white alumite treatment
Side cover, screw cover	Aluminum (A6063S-T5 or equivalent) with white alumite treatment
Front cover, rear cover	A5052 with white alumite treatment
Actuator cable	PVC
Capcon	Nylon 66

Common Specifications

Drive System (Note 3)	Ball screw, rolled C10 [rolled C5 or equivalent]
Positioning repeatability (Note 3)	±0.02mm [±0.01mm]
Backlash (Note 3)	0.05 mm or less [0.02 mm or less]
Guide	Integrated with the base
Allowable load moment (Note 6)	Ma: 14.2 N·m, Mb: 20.1 N·m, Mc: 32.9 N·m
Overhang load length	450 mm or less in Ma, Mb or Mc direction
Grease	Food grease (Medallion FM Grease No. 2)
Cable length (Note 4)	N: No cable, S: 3 m, M: 5 m, X□□: Specified length
Protection class (Note 5)	IP65
Operating temperature/humidity	0 ~ 40°C, 85%RH or below (non-condensing)

Dimensions



Stroke	100 (150)	200 (250)	300 (350)	400 (450)	500 (550)	600						
A	438	488	538	588	638	688	738	788	838	888	938	
B	414	464	514	564	614	664	714	764	814	864	914	
C	100	150	200	250	300	350	400	450	500	550	600	
D	—	—	—	—	1	1	1	1	2	2	2	
E	10	10	10	10	10	12	12	12	14	14	14	
F	45	95	145	195	45	95	145	195	45	95	145	
Weight (kg)	6.9	7.4	7.8	8.3	8.7	9.2	9.6	10.1	10.5	11.0	11.4	
Maximum speed (mm/s)	Lead: 16		800		760		Lead: 8		400		380	
	Lead: 4		200		190							

Applicable Controller Specifications

Applicable controller	Maximum number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/incremental	Programming	1-3-phase 230VAC
X-SEL-KE/KET	4 axes	Absolute/incremental	Programming	1-phase 115VAC/230VAC
SSEL	1 axis	Absolute/incremental	Programming	
SCON	1 axis	Absolute/incremental	Positioner/Pulse-train	



(Note 1) A longer stroke will result in a lower maximum speed to prevent the ball screw from reaching a dangerous speed. (Refer to the above table for the maximum speed at a given stroke.)
(Note 2) Based on an acceleration of 0.3 G.
(Note 3) The figures in square brackets apply to the ISPWA series.
(Note 4) The maximum cable length is 30 m. Specify the desired length in meters (e.g., X08 = 8 m).
(Note 5) IP65 applies when air purge is performed. Without air purge, the protection class is IP54.
The ISWA/ISPWA must be installed horizontally. If the actuator is installed on its side or oriented vertically, water may enter the interior.
(Note 6) For case of 10000 km service life.

ISWA-M-200

Single-Axis Robot, Medium Splash-Proof Type,
Actuator Width 125 mm, 200 W, Straight Shape

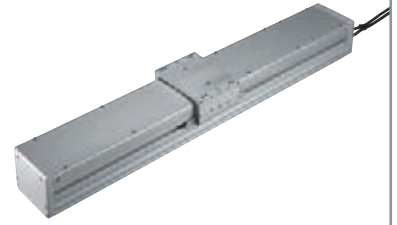
ISPWA-M-200

Single-Axis Robot, Medium Splash-Proof Type,
Actuator Width 125 mm, 200 W, Straight Shape High-precision specification

Type Medium splash-proof Stroke 100~1000mm Load capacity 70 kg (horizontal)

Model specification items Series Type Encoder type Motor output Lead Stroke Controller Cable length Options

(Example) ISWA - M - A - 200 - 20 - 1000 - T1 - S - RT



Model/Specifications

Model	Encoder Type	Motor output (W)	Lead (mm)	Stroke (in increments of 50-mm)	Speed (Note 1) (mm/s)	Load capacity (kg) (Note 2)		Rated thrust (N)
						Horizontal (kg)	Vertical (kg)	
ISWA [ISPWA]-M-①-200-20-②-③-④-⑤	A: Absolute	200	20	100~1000	1000	30	—	169.5
ISWA [ISPWA]-M-①-200-10-②-③-④-⑤	I: Incremental		10			500	70	—

* ①, ②, ③, ④ and ⑤ in the model numbers shown above respectively indicate the encoder type, stroke, applicable controller, cable length and applicable options.

Options

Name	Code	Remarks
Reversed home specification	NM	The home direction is on the motor opposite side
Guide with ball-retaining mechanism	RT	A spacer is inserted between adjacent guide balls

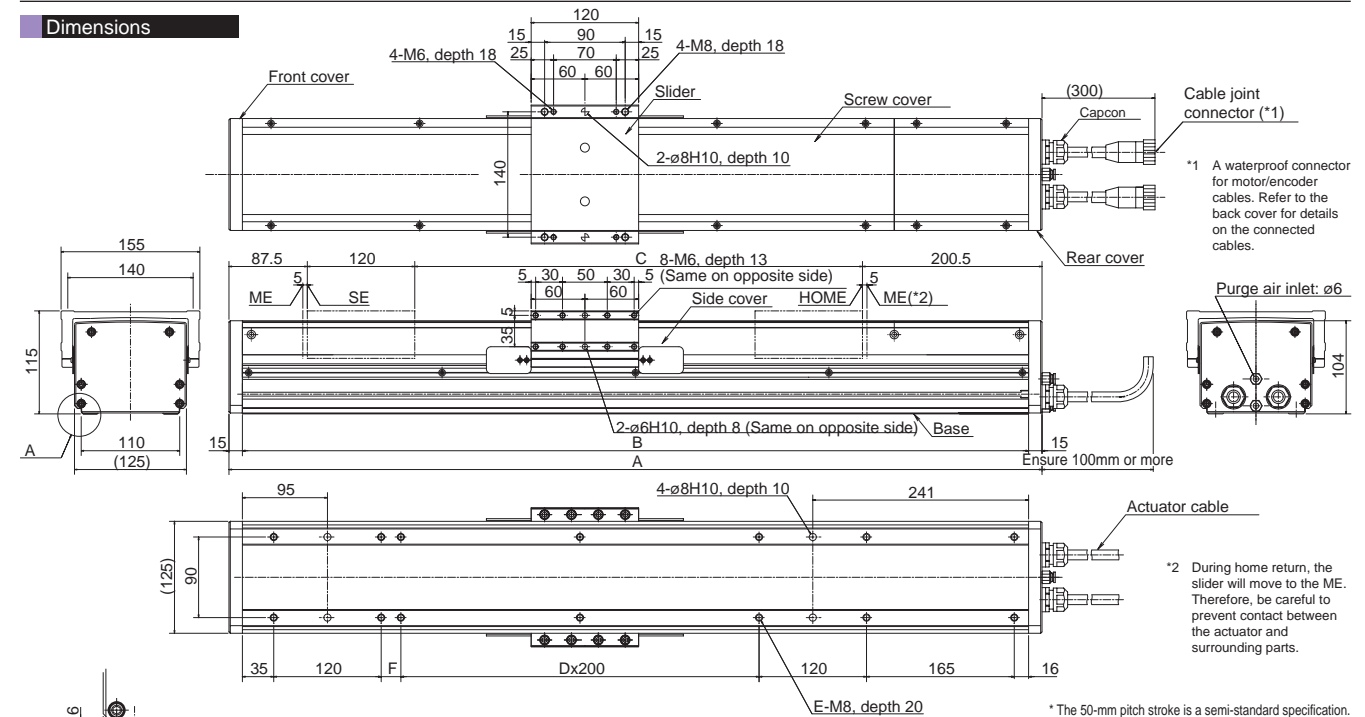
Materials of Key Components

Name	Materials
Base, slider	Aluminum (A6063S-T5 or equivalent) with white alumite treatment
Side cover, screw cover	Aluminum (A6063S-T5 or equivalent) with white alumite treatment
Front cover, rear cover	A5052 with white alumite treatment
Actuator cable	PVC
Capcon	Nylon 66

Common Specifications

Drive System (Note 3)	Ball screw, rolled C10 [rolled C5 or equivalent]
Positioning repeatability (Note 3)	±0.02mm [±0.01mm]
Backlash (Note 3)	0.05 mm or less [0.02 mm or less]
Guide	Integrated with the base
Allowable load moment (Note 6)	Ma: 34.8 N·m, Mb: 49.5 N·m, Mc: 80.8 N·m
Overhang load length	600 mm or less in Ma, Mb or Mc direction
Grease	Food grease (Medallion FM Grease No. 2)
Cable length (Note 4)	N: No cable, S: 3 m, M: 5 m, X□□: Specified length
Protection class (Note 5)	IP65
Operating temperature/humidity	0 ~ 40°C, 85%RH or below (non-condensing)

Dimensions



*1 A waterproof connector for motor/encoder cables. Refer to the back cover for details on the connected cables.

*2 During home return, the slider will move to the ME. Therefore, be careful to prevent contact between the actuator and surrounding parts.

* The 50-mm pitch stroke is a semi-standard specification.

Stroke	(50)	100	(150)	200	(250)	300	(350)	400	(450)	500	(550)	600	(650)	700	(750)	800	(850)	900	(950)	1000
A	458	508	558	608	658	708	758	808	858	908	958	1008	1058	1108	1158	1208	1258	1308	1358	1408
B	428	478	528	578	628	678	728	778	828	878	928	978	1028	1078	1128	1178	1228	1278	1328	1378
C	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
D	—	—	—	—	—	1	1	1	1	2	2	2	2	3	3	3	3	4	4	4
E	10	10	10	10	10	12	12	12	12	14	14	14	14	16	16	16	16	18	18	18
F	-28	22	72	122	172	22	72	122	172	22	72	122	172	22	72	122	172	22	72	122
Weight (kg)	11.1	11.9	12.8	13.6	14.5	15.3	16.2	17.0	17.9	18.7	19.6	20.4	21.3	22.1	23.0	23.8	24.7	25.5	26.4	27.2
Maximum speed (mm/s) *Varies depending on the stroke.	Lead 20		1000										915	735	600	500				
	Lead 10		500										455	365	300	250				

Applicable Controller Specifications

Applicable controller	Maximum number of controlled axes	Connectable encoder type	Operating method	Power-supply voltage
X-SEL-P/Q	6 axes	Absolute/incremental	Programming	1/3-phase 230VAC
X-SEL-KE/KET	4 axes	Absolute/incremental	Programming	1-phase
SSEL	1 axis	Absolute/incremental	Programming	115VAC/230VAC
SCON	1 axis	Absolute/incremental	Positioner/Pulse-train	



(Note 1) A longer stroke will result in a lower maximum speed to prevent the ball screw from reaching a dangerous speed. (Refer to the above table for the maximum speed at a given stroke.)
 (Note 2) Based on an acceleration of 0.3 G.
 (Note 3) The figures in square brackets apply to the ISPWA series.
 (Note 4) The maximum cable length is 30 m. Specify the desired length in meters (e.g., X08 = 8 m).
 (Note 5) IP65 applies when air purge is performed. Without air purge, the protection class is IP54. The ISWA/ISPWA must be installed horizontally. If the actuator is installed on its side or oriented vertically, water may enter the interior.
 (Note 6) For case of 10000 km service life.

Controller

A controller of programming or positioner type can be selected according to your specific control needs.

* Refer to the separate catalog for the details of each controller.

XSEL Controller

A high-function, multi-axis controller equipped with Super SEL, a programming language that allows for easy programming of complex operations.

- [Features]
- Simultaneous control of up to 6 axes
 - Registration of up to 128 programs/20000 positions
 - Absolute or incremental specification
 - Supporting DeviceNet, CC-Link, ProfiBus and Ethernet



SSEL Controller

Up to 2-axes of program control that enables easy positioning operation. The SSEL program controller has various control functions combined into a single unit similar to that of the XSEL.

- [Features]
- Up to 20000 positioning points
 - Support of both absolute and incremental actuators and FieldBus Networks. (DeviceNet/CC-Link/ProfiBus)
 - With 2 axes, arc interpolation and path operation can be performed



SCON Controller

Position controller capable of 1 axis control.

- [Features]
- Supports up to 512 positioning points
 - FieldBus Network (DeviceNet/CC-Link/ProfiBus)
 - Post Driver

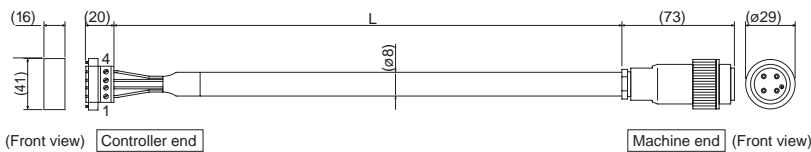


Motor/Encoder Cables

* Enter the desired cable length up to 30 m (L) in □□□□. Example:080 = 8 m

Motor Cable (Splash-Proof Specification) for XSEL-KE/KET/P/Q, SSEL, SCON

[Model: CB-XEU-MA□□□□]



Wiring Diagram

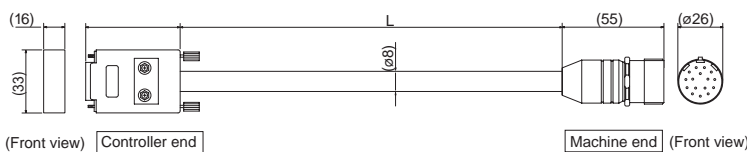
Plug connector: GIC2.5/4-STF-7.62. (Phoenix)

Wire	Signal	No.	No.	Signal	Wire
0.75sq	PE	1	⊕	PE	0.75sq (crimped)
	U	2	1	U	
	V	3	2	V	
	W	4	3	W	

Plug connector: 99-4222-00-04 (BINDER)

Encoder Cable (Splash-Proof Specification) for XSEL-KE/KET

[Model: CB-X-PA□□□□-WC]



Wiring Diagram

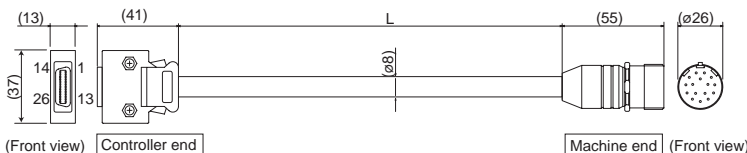
Plug connector: 17HE-23150-C (D13A) (DDK)

Wire	Signal	No.	No.	Signal	Wire
0.15sq (crimped)	1	1	1	SD	0.15sq (soldered)
	2	2	2	SD	
	3	3	3	-	
	4	4	4	-	
	5	5	5	-	
	6	6	6	-	
	7	7	7	-	
	8	8	8	-	
	9	9	9	-	
	10	10	10	VCC	
	11	11	11	GND	
	12	12	12	BAT+	
	13	13	13	BAT-	
	14	14	14	-	
	15	15	15	BK-	
	16	16	16	BK+	

Note 1: The shielded wire is connected to the ground plane.

Encoder Cable (Splash-Proof Specific.) for XSEL-P/Q, SSEL, SCON

[Model: CB-X1-PA□□□□-WC]



Wiring Diagram

Plug connector: 10126-3000VE (Sumitomo 3M)

Wire	Signal	No.	No.	Signal	Wire
AWG26 (soldered)	10	10	1	SD	AWG26 (soldered)
	11	11	2	SD	
	E24V	12	3	-	
	OV	13	4	-	
	LS	26	5	-	
	CLEEP	25	6	-	
	OT	24	7	-	
	RSV	23	8	-	
	9	9	9	-	
	18	18	10	VCC	
	19	19	11	GND	
	A+	1	12	BAT+	
	A-	2	13	BAT-	
	B+	3	14	-	
	B-	4	15	BK-	
	Z+	5	16	BK+	
	Z-	6	17	-	
	SRD+	7	18	-	
	SRD-	8	19	-	
	BAT+	14	20	-	
	BAT-	15	21	-	
	VCC	16	22	-	
	GND	17	-	-	
	BKR-	20	-	-	
	BKR+	21	-	-	

Note 1: The shielded wire is connected to the ground plane.