

## Title: Shielded Cables For SGMJV & SGMJV Motors

**Product(s):** YAI-CSM21-xx-P-E, YAI-CSM31-xx-P-E  
 YAI-CSM22-xx-P-E, YAI-CSM32-xx-P-E  
 YAI-CSM23-xx-P-E, YAI-CSM33-xx-P-E

**Doc No.:** PN.SIGMA-5.01

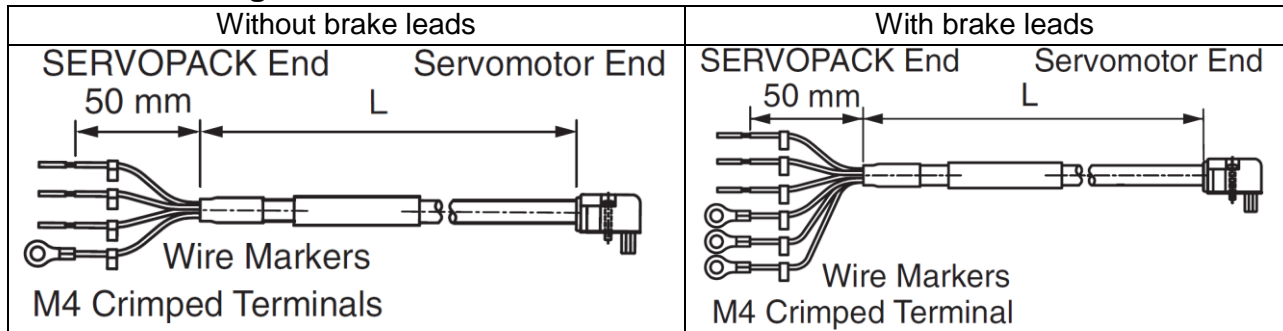
### Table Of Applicable Cable Part Numbers

Length (L)	Without brake leads			With brake leads		
3 meters	YAI-CSM21-03-P-E	YAI-CSM22-03-P-E	YAI-CSM23-03-P-E	YAI-CSM31-03-P-E	YAI-CSM32-03-P-E	YAI-CSM33-03-P-E
5 meters	YAI-CSM21-05-P-E	YAI-CSM22-05-P-E	YAI-CSM23-05-P-E	YAI-CSM31-05-P-E	YAI-CSM32-05-P-E	YAI-CSM33-05-P-E
10 meters	YAI-CSM21-10-P-E	YAI-CSM22-10-P-E	YAI-CSM23-10-P-E	YAI-CSM31-10-P-E	YAI-CSM32-10-P-E	YAI-CSM33-10-P-E
15 meters	YAI-CSM21-15-P-E	YAI-CSM22-15-P-E	YAI-CSM23-15-P-E	YAI-CSM31-15-P-E	YAI-CSM32-15-P-E	YAI-CSM33-15-P-E
20 meters	YAI-CSM21-20-P-E	YAI-CSM22-20-P-E	YAI-CSM23-20-P-E	YAI-CSM31-20-P-E	YAI-CSM32-20-P-E	YAI-CSM33-20-P-E
30 meters	YAI-CSM21-30-P-E	YAI-CSM22-30-P-E	YAI-CSM23-30-P-E	YAI-CSM31-30-P-E	YAI-CSM32-30-P-E	YAI-CSM33-30-P-E
40 meters	YAI-CSM21-40-P-E	YAI-CSM22-40-P-E	YAI-CSM23-40-P-E	YAI-CSM31-40-P-E	YAI-CSM32-40-P-E	YAI-CSM33-40-P-E
50 meters	YAI-CSM21-50-P-E	YAI-CSM22-50-P-E	YAI-CSM23-50-P-E	YAI-CSM31-50-P-E	YAI-CSM32-50-P-E	YAI-CSM33-50-P-E

Note 1: Length (L) is designated on the cable diagram.

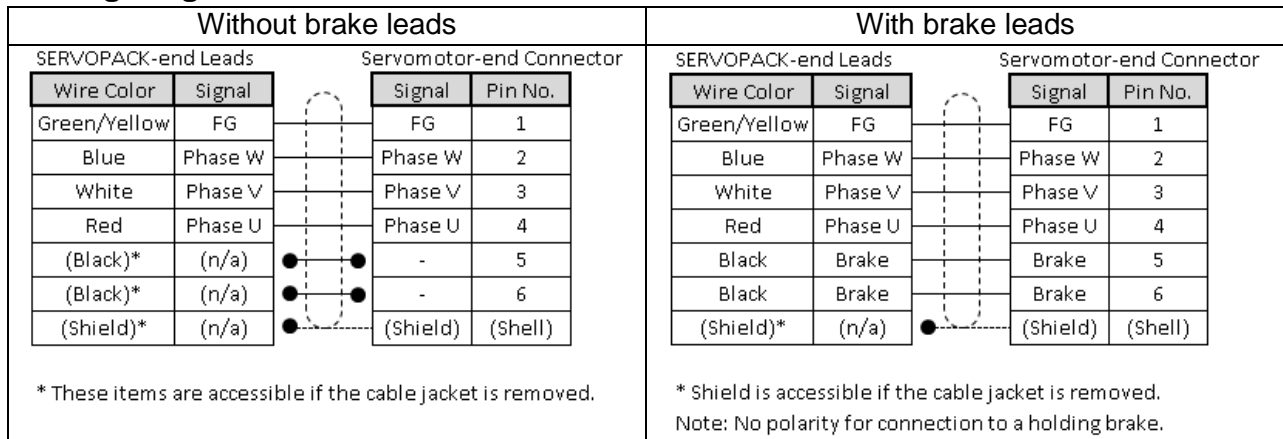
Note 2: "xx" is used to denote wildcard. Example: YAI-CSM21-xx-P-E refers to YAI-CSM21-03-P-E, YAI-CSM21-05-P-E, etc.

### Outline Drawing



Note: The Servomotor end is not an accurate dimensional representation of the connector. Refer to the photos in this document.

### Wiring Diagram



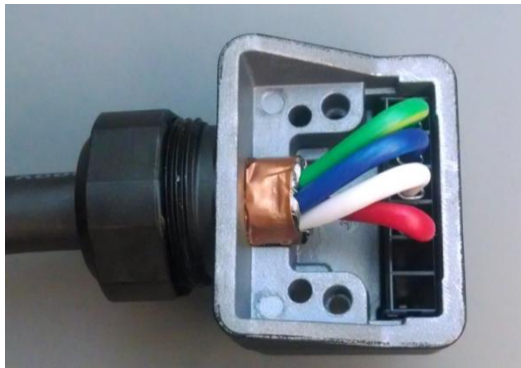
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## Shield Grounding

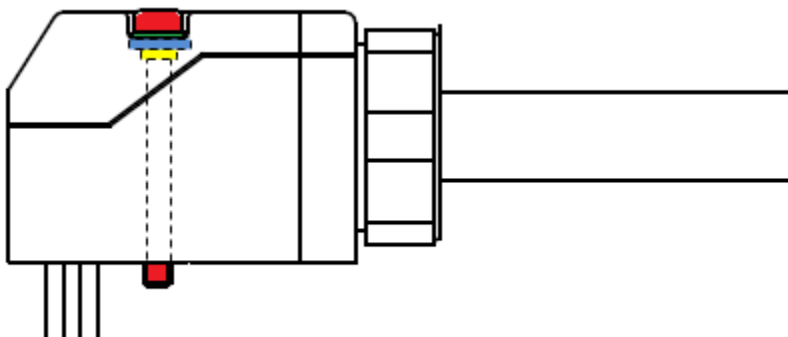
Cable shield is electrically bonded to connector shell including copper foil wrap around the cable shield, as shown in the image below.



The connector shell is electrically bonded to the motor housing through the following means:

1. The connection screw (Red) is electrically bonded to the motor housing when the connector screw is tightened to the motor.
2. The connection screw (Red) is electrically bonded to the connector shell by means of a spring lock washer (Green) and standard washer (Blue) when the connector screw is tightened to the motor.

Note: The Nitrile washer (Yellow) is used to achieve IP65 rating and does not interfere with the bonding of the standard washer (Blue) to the connector shell.



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### Connector Details

The connector is a proprietary connector that is not sold separately by Yaskawa. Thus, a part number is not disclosed.

Overall connector on YAI-CSM21-xx-P-E & YAI-CSM31-xx-P-E

			
View of top + side + front of connector	View of top + side + back of connector	View of bottom + side + front of connector	View of bottom + side + front of connector

Length of connector on YAI-CSM21-xx-P-E & YAI-CSM31-xx-P-E

	
Length (front to back) without cable nut	Length (front to back) with cable nut*

\* Note: Measurement may vary since nut is not cylindrical.

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Width of connector on YAI-CSM21-xx-P-E & YAI-CSM31-xx-P-E



Width (side to side) without cable nut



Width (side to side) with cable nut\*

\* Note: Measurement may vary since nut is not cylindrical.

Height of connector on YAI-CSM21-xx-P-E & YAI-CSM31-xx-P-E



Height (top to bottom) without receptacle housing\*





\* Note: The receptacle housing fits into the servomotor, and thus is not a factor in the final combination of servomotor + connector dimensions.

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Overall connector on YAI-CSM22-xx-P-E & YAI-CSM32-xx-P-E

			
View of top + side + front of connector	View of top + side + back of connector	View of bottom + side + front of connector	View of bottom + side + front of connector

Length of connector on YAI-CSM22-xx-P-E & YAI-CSM32-xx-P-E

	
Length (front to back) without cable nut	Length (front to back) with cable nut*

\* Note: Measurement may vary since nut is not cylindrical.

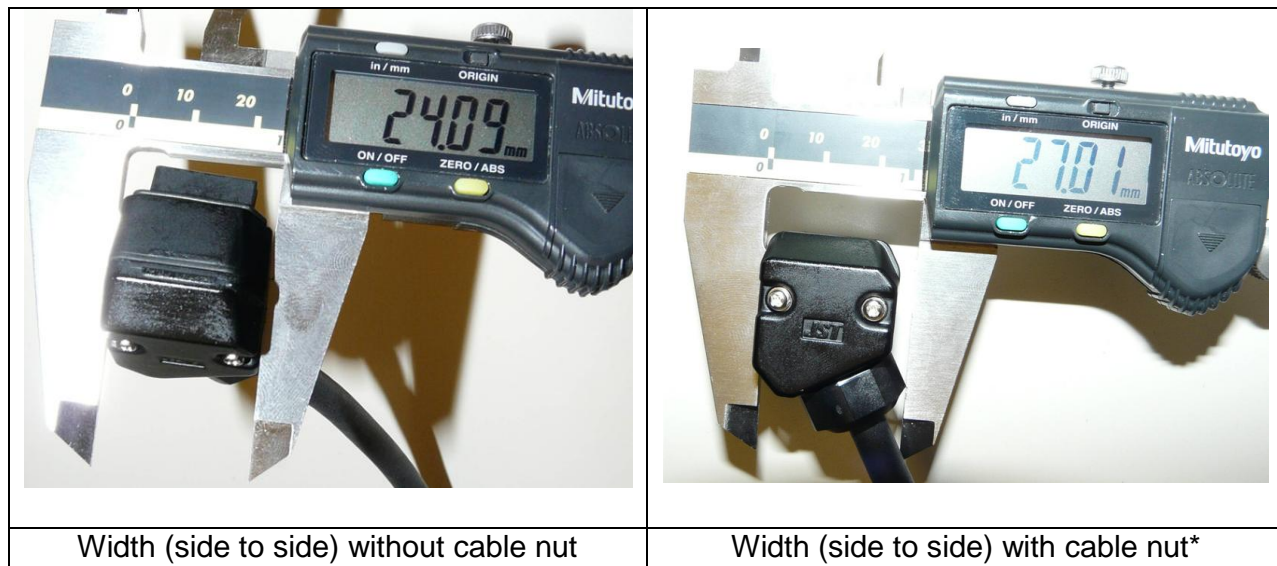


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Width of connector on YAI-CSM22-xx-P-E & YAI-CSM32-xx-P-E



\* Note: Measurement may vary since nut is not cylindrical.

Height of connector on YAI-CSM22-xx-P-E & YAI-CSM32-xx-P-E







\* Note: The receptacle housing fits into the servomotor, and thus is not a factor in the final combination of servomotor + connector dimensions.

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Overall connector on YAI-CSM23-xx-P-E & YAI-CSM33-xx-P-E

			
View of top + side + front of connector	View of top + side + back of connector	View of bottom + side + front of connector	View of bottom + side + front of connector

Length of connector on YAI-CSM23-xx-P-E & YAI-CSM33-xx-P-E

	
Length (front to back) without cable nut	Length (front to back) with cable nut

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Width of connector on YAI-CSM23-xx-P-E & YAI-CSM33-xx-P-E



Width (side to side)

Height of connector on YAI-CSM23-xx-P-E & YAI-CSM33-xx-P-E



Height (top to bottom) without receptacle housing\*

\* Note: The receptacle housing fits into the servomotor, and thus is not a factor in the final combination of servomotor + connector dimensions.



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### Raw Cable Specifications

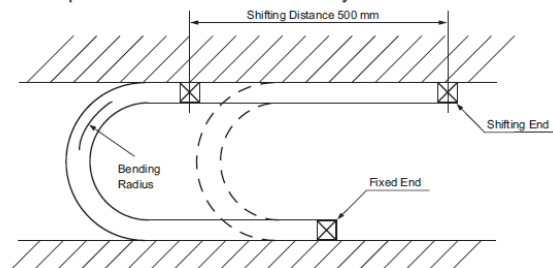
	YAI-CSM21-xx-P-E YAI-CSM31-xx-P-E YAI-CSM22-xx-P-E YAI-CSM32-xx-P-E	YAI-CSM23-xx-P-E YAI-CSM33-xx-P-E
<b>Jacket Type</b>	PVC	
<b>Color</b>	Black	
<b>Outer Diameter</b>	7mm +/- 0.3mm	8mm +/- 0.3mm
<b>Recommended Bend Radius</b>	90mm	90mm
<b>Flex Rating</b>	10 million cycles	
<b>Max voltage</b>	1500 Volts per minute	
<b>Shielding</b>	Tinned copper	
<b>Temp Rating</b>	80 degrees C	
<b>Flame Rating</b>	VW-1 / FT2 / EN50265-2-1	
<b>Standards Approvals</b>	UL / c-UL / CE	
<b>Conductors</b>	6	
<b>AWG</b>	21	16AWG x 4 (power) + 22AWG x 2 (brake)
<b>Conductor Jacket</b>	XLPE	

### Flex Specification

The flexible cable supports several million cycles or more of bending life with the recommended bending radius under the following test conditions.

• Conditions

- 1 Repeat moving one end of the cable forward and backward for 500 mm using the test equipment shown in the following figure.
- 2 Connect the lead wires in parallel, and count the number of cable return motion times until a lead wire is disconnected. Note that one reciprocation is counted as one cycle.



Notes: 1 The life of flexible cable differs largely depending on the amount of mechanical shocks, mounting to the cable, and fixing methods.

The life of flexible cable is limited under the specified conditions.

2 The life of flexible cable indicates the number of bending times in which lead wires are electrically conducted and by which no cracks and damages that affect the performance of cable sheathing are caused. Disconnecting the shield wire is not taken into account.

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### Wiring Precautions

Even if the recommended bending radius is followed in the mechanical design, incorrect wiring may cause early disconnection. Observe the following precautions when wiring.

(a) Cable twisting

Straighten the flexible cables wiring.

Twisted cables cause early disconnection. Check the indication on the cable surface to make sure the cable is not twisted.

(b) Fixing method

Do not fix the moving points of the flexible cable, or stress on the fixed points may cause early disconnection. Fix the cable at the minimum number of points. Do not put stress on the servomotor-end and SERVOPACK-end connectors.

(c) Cable length

If the cable length is too long, it may result in the cable sagging. If the cable length is too short, excessive tension on the fixed points will cause early disconnection. Use a flexible cable with the optimum length.

(d) Interference between cables

Avoid interference between cables.

Interference limits the motion of flexible cable, which causes early disconnection. Keep enough distance between cables, or provide a partition when wiring.