Specification
for
Ethernet Cable Assemblies
for CC-Link IE TSN / CC-Link IE Field network

Type SC-E5EW-○□M-△▲-L

MITSUBISHI ELECTRIC SYSTEM & SERVICE

Note

Revision				Drawn	Check	Design	Approved
A	8 Feb., 2021						
B	12 Mar.,2021						

Send to	Date	Dwg
	1 September,2014	
	Order	X903703D50045-H01B

1.SCOPE

This specification covers the requirements for the Ethernet cable assemblies type SC-E5EW-L for CC-Link IE TSN / CC-Link IE Field network.

※ The Products covered in this specification don't include the toxic substances in RoHS.

※ UL's Wiring Harnesses Traceability program provides traceability for this cable.

2.USE ENVIRONMENT

The cable shall be used in following conditions.

Indoor
1) Rack
2) Indoor pipe
3) Duct
4) Free access

Outdoor
1) Rack
2) Pipe (underground)
3) Trough

3.LENGTH OF CABLE

1m~100m (At 1m interval)

4.CABLE TYPE

(1) Straight connectors on both ends

SC - E5E W - ○ □M - L

Indoor / Outdoor
Length of cable [m] 1~100 [m] (At 1m interval) (cable only : 1~200 [m] (At 1m interval))
Applicable connector (All connectors are shielded) S : RJ45 connectors on both ends X : M12 connectors on both ends SX : RJ45 connector on one end / M12 connector on one end blank : cable only
Cable type Straight cable with Double shielded / STP
Ethernet cable for CC-Link IE Field network

(2) Straight connector on one end / Angle connector on one end

SC - E5E W - ○ □M - △ - L

Indoor / Outdoor
Cable lead out direction A1~A4：Refer to clause 14.
Length of cable [m] 1~100 [m] (At 1m interval)
Applicable connector (All connectors are shielded) SA : RJ45 connector on one end (Serial № indication side) / Angle RJ45 connector on one end XA : M12connector on one end (Serial № indication side) / Angle RJ45 connector on one end
Cable type Straight cable with Double shielded / STP
Ethernet cable for CC-Link IE Field network

(3) Angle connectors on both ends

SC - E5E W - A □M - △ ▲ - L

Indoor / Outdoor
Cable lead out direction 1~4：Refer to clause 14.
Cable lead out direction (Serial № indication side) A1~A4：Refer to clause 14.
Length of cable [m] 1~100 [m] (At 1m interval)
Applicable connector (All connectors are shielded) A：Angle RJ45 connectors on both ends
Cable type Straight cable with Double shielded / STP
Ethernet cable for CC-Link IE Field network

5.COMFORMING STANDARDS

1) IEEE802.3 1000BASE-T
2) ANSI/TIA/EIA-568-B（Category 5e）
3) ISO/IEC 11801

6.CABLE CONSTRUCTION

Table 1. Cable construction

No.	Item		Construction			
	Type		Straight cable with Double shielded/STP			
①	Number of wires in core		8 wires (4 twisted pairs)			
	Conductor	Materials	Annealed Copper Single Line for Power			
		Diameter	24AWG			
	Insulator	Materials	PE			
		Color	See Fig 2.			
②	Double shield		Aluminum / PE tape			
			Tin-plated copper wire braid			
③	Sheath	Materials	PVC			
		Color	Orange			
	Cable Diameter		6.5mm			
			Min	Max	Unit	Conditions
	Maximum Tensile Load		—	110	N	By careless handling (short term)
	Minimum Radius Bend		26*1	—	mm	After careless handling
			52*1	—		By careless handling (short term)

*1 Do not apply force on the connector connection or on the connector under head.

7. CONNECTOR CONSTRUCTION

7.1 RJ45 connector with shield

Table 2. Connector construction

Item		Specification
Connection Method		Straight Connection
Boot	Materials	PVC (UL94 V-0)
	Color	Light grey
IP rating		IP20*2

7.2 M12 connector with shield

Table 3. Connector construction

Item	Specification
Connection Method	Straight Connection
IP rating	IP67*2

7.3 Angle RJ45 connector with shield

Table 4. Connector construction

Item	Specification
Connection Method	Straight Connection
IP rating	IP20*2

*2 The IP rating indicated is for the connector's protection against ingress of dust and water when coupled to a servo amplifier/servo motor. If the IP rating of the servo amplifier/servo motor differs from that of these connectors, overall IP rating depends on the lowest of all.

8.LAP THEATH CONSTRUCTION

Table 5. LAP Sheath construction

No.	Item		Construction			
	Type		LAP Sheath, Outdoor Use			
④	Sheath	Materials	LAP Sheath			
		Color	Black			
	LAP Sheath Diameter		10mm			
	Approximate Net Weight		90g/m			
			Min	Max	Unit	Conditions
	Operating Temperature		-10	60	℃	—
	Maximum Tensile Load		—	110	N	By careless handling (short term)
	Minimum Radius Bend		60	—	mm	After careless handling
			150	—		By careless handling (short term)

9.CABLE CHARACTERISTICS (20℃)

Table 6. Cable characteristics [1]

Item	Specifications
Conductor Resistance	Under 93.8Ω/km
Resistance unbalance	Under 2.0%
Insulation Resistance	More than 5000MΩkm
Voltage Proof	AC1000V/min
Capacitance	Under 5.6nF/100m (1kHz)
Capacitance unbalance pair to ground	Under 330pF/100m (1kHz)
Differential characteristic Impedance	85~115Ω (1~100MHz)

Table 7. Cable characteristics [2]

Item	Unit	Frequency（MHz）										
		0.772	1	4	8	10	16	20	25	31.25	62.5	100
Return Loss	More than dB	—	20.0	23.0	24.5	25.0	25.0	25.0	24.3	23.6	21.5	20.1
Insertion Loss	Under dB/100m	1.8	2.0	4.1	5.8	6.5	8.2	9.3	10.4	11.7	17.0	22.0
NEXT	More than dB	67.0	65.3	56.3	51.8	50.3	47.2	45.8	44.3	42.9	38.4	35.3
PSNEXT	More than dB	64.0	62.3	53.3	48.8	47.3	44.2	42.8	41.3	39.9	35.4	32.3
ELFEXT	More than dB/100m	—	63.8	51.7	45.7	43.8	39.7	37.8	35.8	33.9	27.9	23.8
PSELFEXT	More than dB/100m	—	60.8	48.7	42.7	40.8	36.7	34.8	32.8	30.9	24.9	20.8
Link delay	Under ns/100m	—	570	—	—	545	—	—	—	—	—	538
Link delay skew	Under ns/100m	—	45									

Table 8. Temperature Characteristics of Insertion Loss（As at 100MHz）

Item	-10℃~20℃	30℃	40℃	50℃	60℃
Insertion Loss	22.0dB/100m	22.0dB/98.5m	22.0dB/97.0m	22.0dB/95.5m	22.0dB/93.0m

Reference Standards）ANSI/TIA/EIA-568-B.2-1 Annex G

10. Fire-resistant and others

Table 9. Fire-resistant and others

Item	Condition	Content
Fire-resistant	Do not to spread to the top.	Effect the vertical tray test of JIS C 3521(IEEE 383) by final product cable.
Oxygen index of Sheath	More than 25	Effect the test of JIS K 7201.
The amount of hydrochloric	Under 250mg/g	Effect the test of JCS 7397.

11.MARKING

The Ethernet cable shall be printed following marking format on the one side of sheath by regular interval.

- Marking content : CC-Link IE ****** CAT.5E T568B SHIELDED CABLE
- Marking pitch : 500mm
- Marking color : White

Fig.1 Marking of SC-E5EW-L

※ Please acknowledge it though the print display might rub when transporting, and careless handling it and it disappear.

12.CONSTRUCTION FIGURE

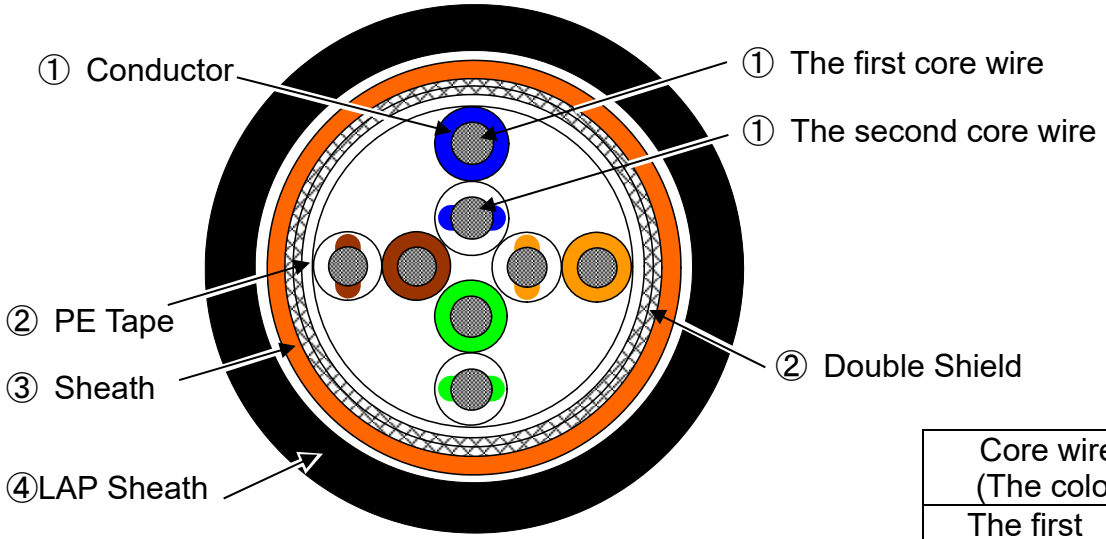
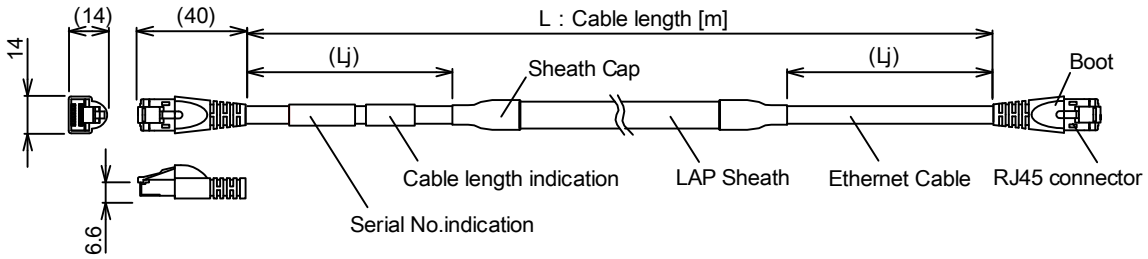


Fig.2 Construction of SC-E5EW-L

Core wire Recognition (The color of Insulator)	
The first core wire	The second core wire
Blue	White/Blue
Orange	White/Orange
Green	White/Green
Brown	White/Brown

13. Outline Drawing

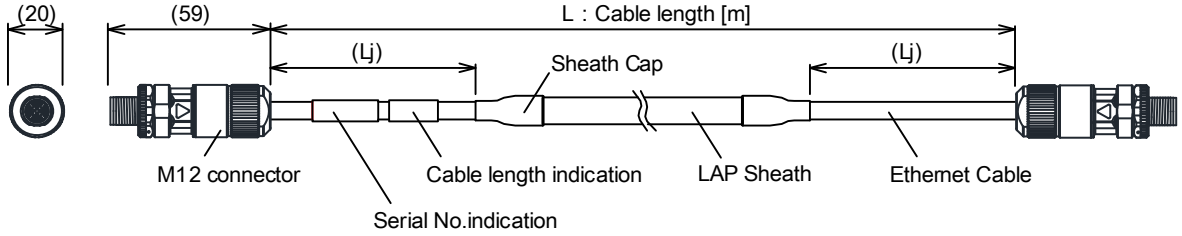
(1) SC-E5EW-S☐M-L



Length of removing sheath [mm]
In case L=1m, Lj=150[mm]
In case L≧2m, Lj=550[mm]

Fig.3. Configuration of SC-E5EW-S☐M-L

(2) SC-E5EW-X☐M-L

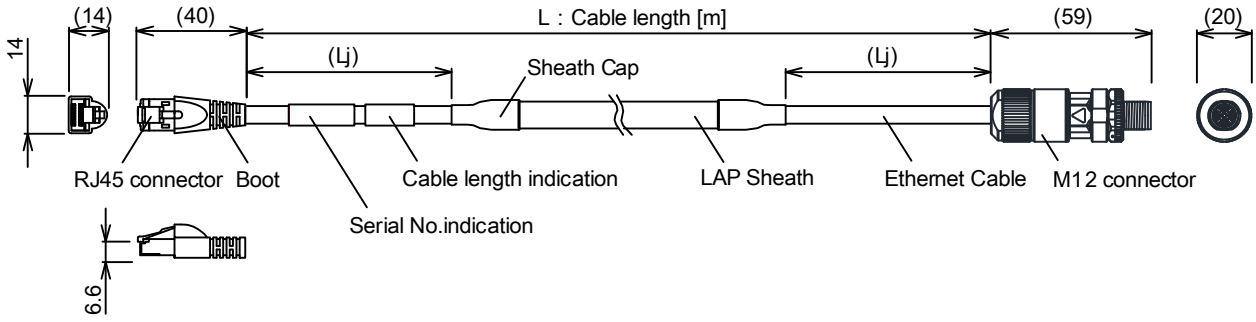


[mm]

Length of removing sheath
In case L=1m, Lj=150[mm]
In case L≧2m, Lj=550[mm]

Fig.4. Configuration of SC-E5EW-X☐M-L

(3) SC-E5EW-SX☐M-L

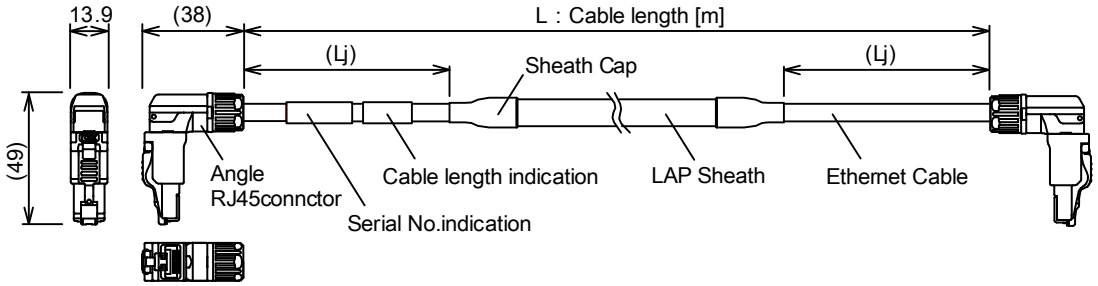


[mm]

Length of removing sheath
In case L=1m, Lj=150[mm]
In case L≧2m, Lj=550[mm]

Fig.5. Configuration of SC-E5EW-SX☐M-L

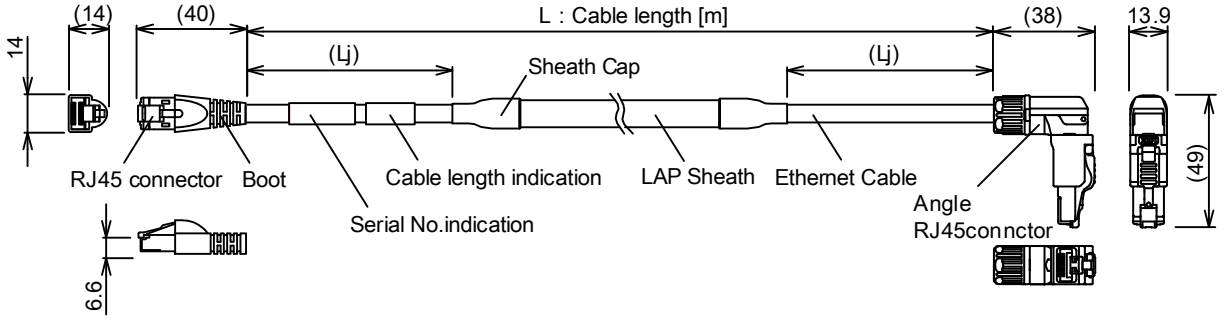
(4) SC-E5EW-A□M-△▲-L



Length of removing sheath [mm]
In case L=1m, Lj=150[mm]
In case L≧2m, Lj=550[mm]

Fig.6. Configuration of SC-E5EW-A□M-△▲-L

(5) SC-E5EW-SA□M-△-L

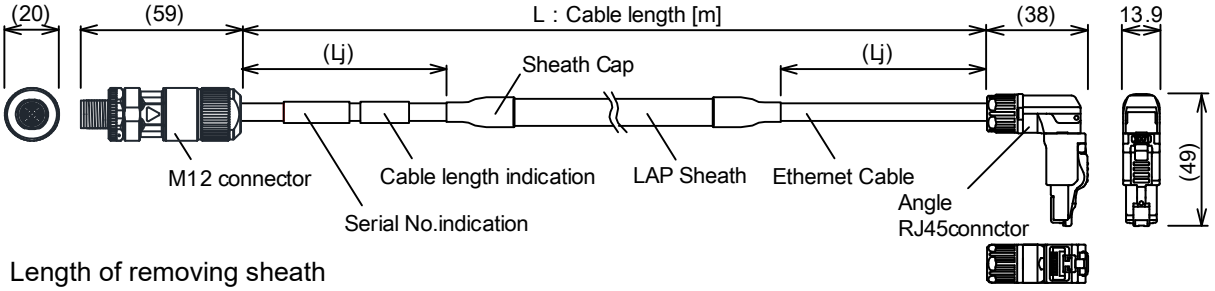


[mm]

Length of removing sheath
In case L=1m, Lj=150[mm]
In case L≧2m, Lj=550[mm]

Fig.7. Configuration of SC-E5EW-SA□M-△-L

(6) SC-E5EW-XA□M-△-L



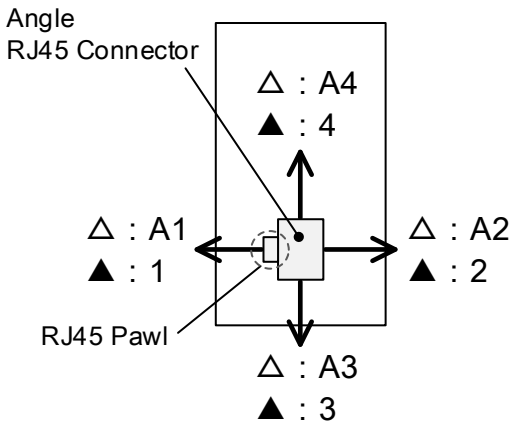
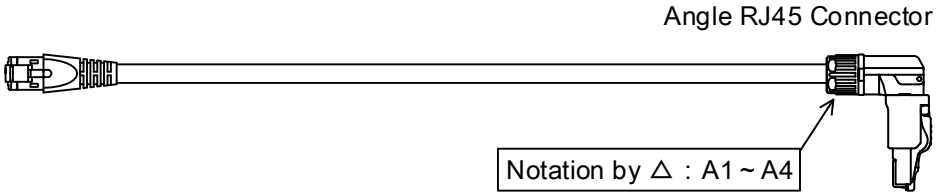
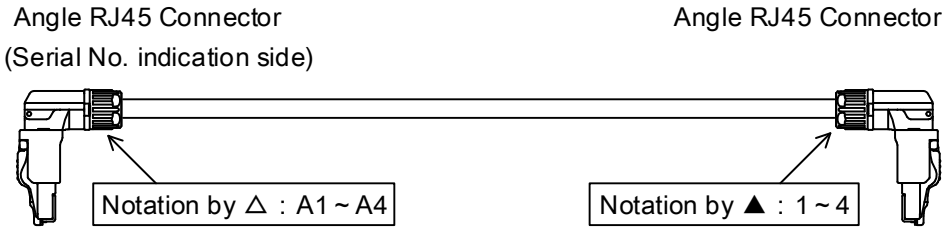
Length of removing sheath
In case L=1m, Lj=150[mm]
In case L≧2m, Lj=550[mm]

[mm]

Fig.8. Configuration of SC-E5EW-XA□M-△-L

14. CABLE LEAD OUT DIRECTION

For the angle RJ45 connector, the cable lead out direction can be specified as follows.

Cable lead out direction (View from cable insertion direction)	Sign △	Sign ▲	Cable lead out direction
	A1	1	RJ45 pawl side
	A2	2	Opposite of J45 pawl
	A3	3	Left side of J45 pawl
	A4	4	Right side of J45 pawl
Straight connector on one end / Angle connector on one end 			
Angle connectors on both ends 			

(Note) Depending on the situation such as installation environment or combination of cables and connectors, there is a chance not to complete installation.
(Even though it's mentioned above)
Please make sure the cable lead out direction before your purchase.