



## 1. SCOPE

This specification covers the requirements for the Ethernet cable assemblies type SC-E5EW 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.

- 1) Rack
- 2) Control box
- 3) Indoor pipe
- 4) Duct
- 5) Free access

## 3. LENGTH OF CABLE

0.5m, 1m~100m (At 1m interval)

## 4. CABLE TYPE

(1) Straight connectors on both ends

SC - E5E W - O □M

Length of cable [m] 0.5 [ 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 - O □ M - △

Cable lead out direction A1~A4 : Refer to clause 14.
Length of cable [m] 0.5 [ 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 - △ ▲

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] 0.5 [ 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. UL STANDARDS (Cable Part)

- 1) UL AWM STYLE 20276
- 2) UL1581 VW-1

## 7. 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	Heat Proof PVC		
		Color	Orange		
	Cable Diameter	6.8mm			
	Approximate Net Weight	60g/m			
		Min	Max	Unit	Conditions
	Operating Temperature	-10	60	°C	—
	Maximum Tensile Load	—	110	N	By careless handling (short term)
	Minimum Radius Bend	26* <sup>1</sup>	—	mm	After careless handling
		52* <sup>1</sup>	—		By careless handling (short term)

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

## 8. CONNECTOR CONSTRUCTION

### 8.1 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* <sup>2</sup>	

### 8.2 M12 connector with shield

Table 3. Connector construction

Item	Specification	
Connection Method	Straight Connection	
IP rating	IP67* <sup>2</sup>	

## 8.3 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.

## 9. CABLE CHARACTERISTICS (20°C)

Table 5. 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 6. 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 7. Temperature Characteristics of Insertion Loss ( As at 100MHz )

Item	-10°C~20°C	30°C	40°C	50°C	60°C
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 8. Fire-resistant and others

Item	Condition	Content
Fire-resistant	Pass the test of UL1581 VW-1.	Effect the test of UL1581 VW-1 by final product cable.
	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 35	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  
 $\lambda$  AWM 20276 VW-1 60°C 30V E105859-K
- Marking pitch : 500mm
- Marking color : Black



Fig.1. Marking of SC-E5EW

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

## 12. CONSTRUCTION FIGURE

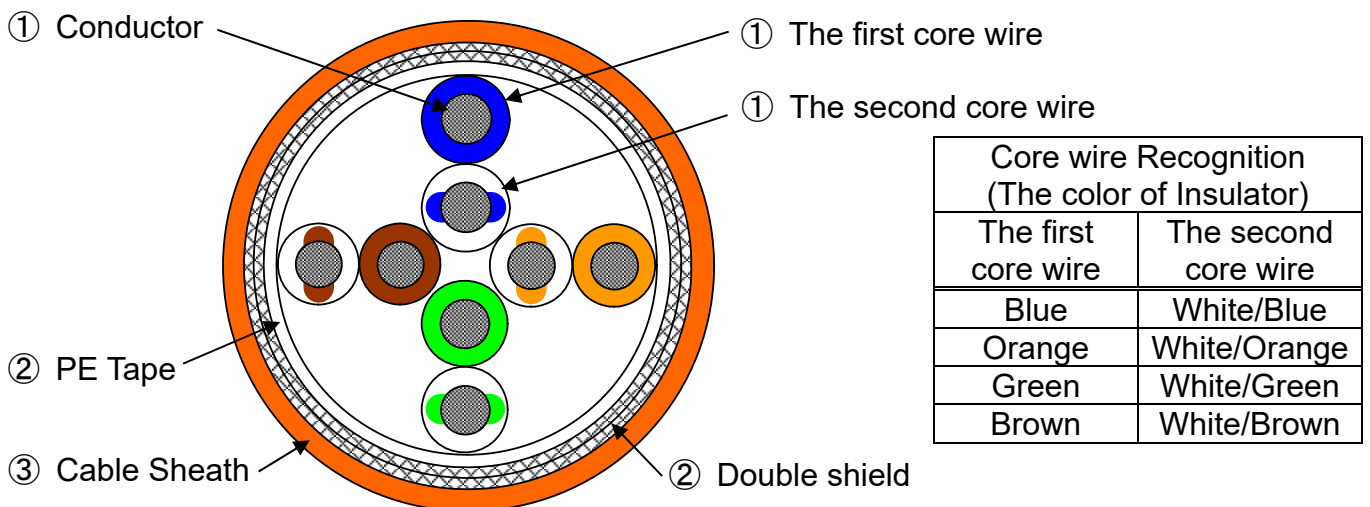


Fig.2. Construction of SC-E5EW

### 13. OUTLINE DRAWING

#### (1) SC-E5EW-S□M

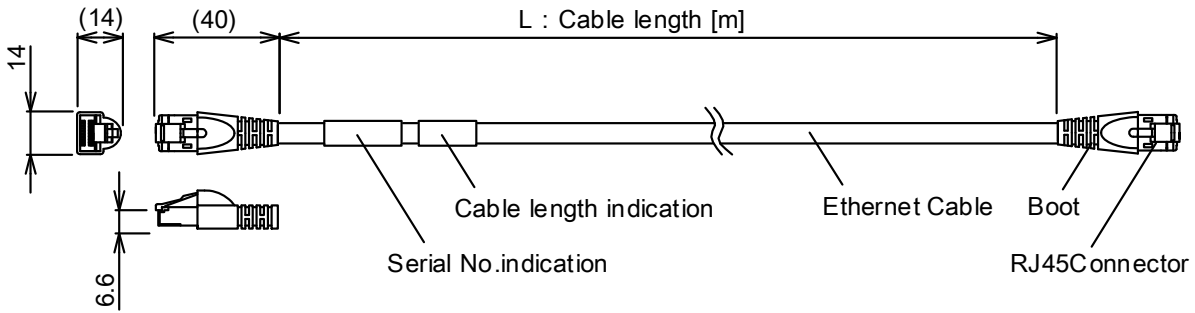


Fig.3. Configuration of SC-E5EW-S□M

[mm]

#### (2) SC-E5EW-X□M

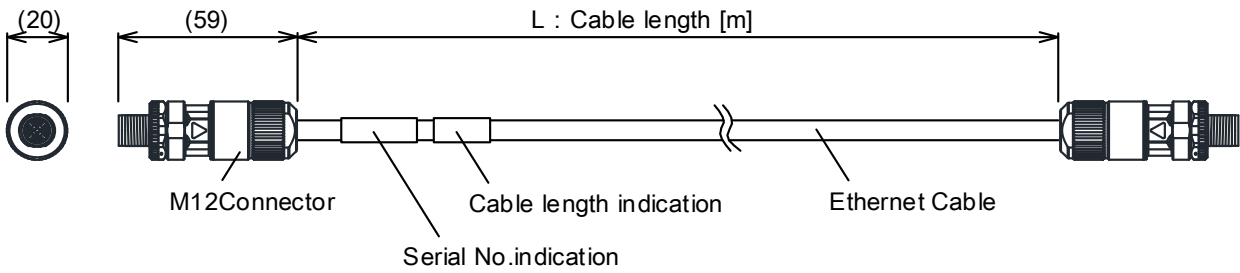


Fig.4. Configuration of SC-E5EW-X□M

[mm]

#### (3) SC-E5EW-SX□M

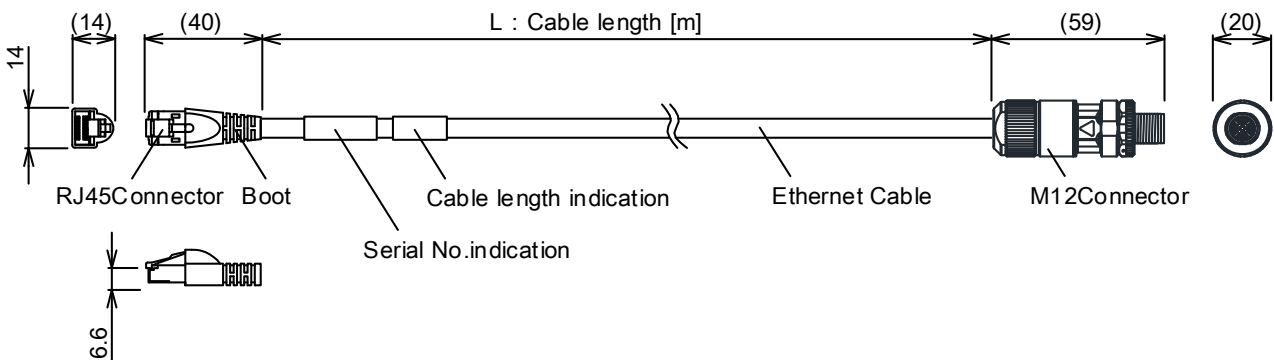


Fig.5. Configuration of SC-E5EW-SX□M

[mm]

(4) SC-E5EW-A□M-△▲

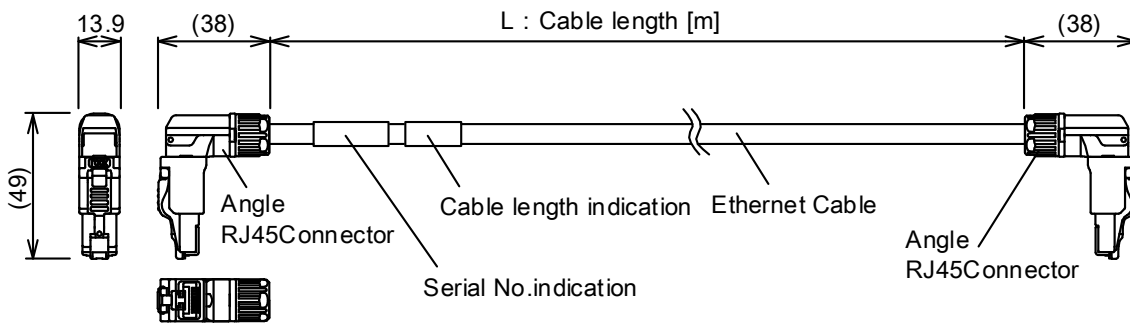


Fig.6. Configuration of SC-E5EW-A□M-△▲

[mm]

(5) SC-E5EW-SA□M-△

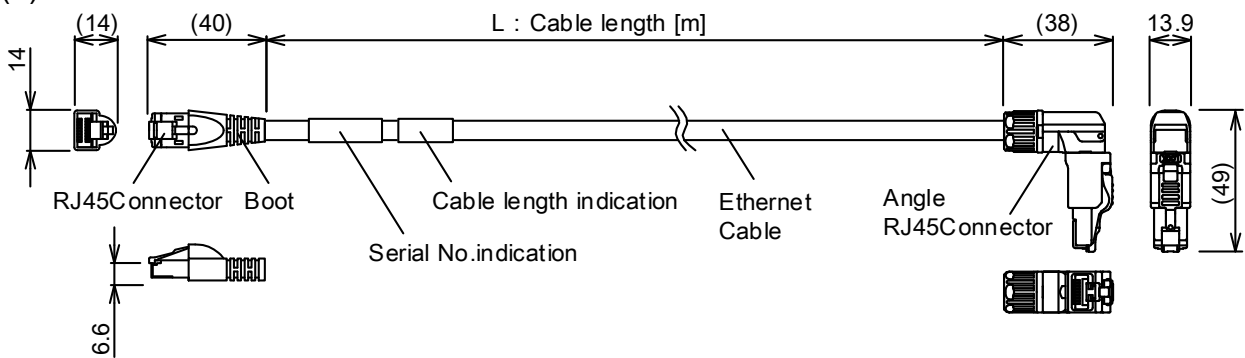


Fig.7. Configuration of SC-E5EW-SA□M-△

[mm]

(6) SC-E5EW-XA□M-△

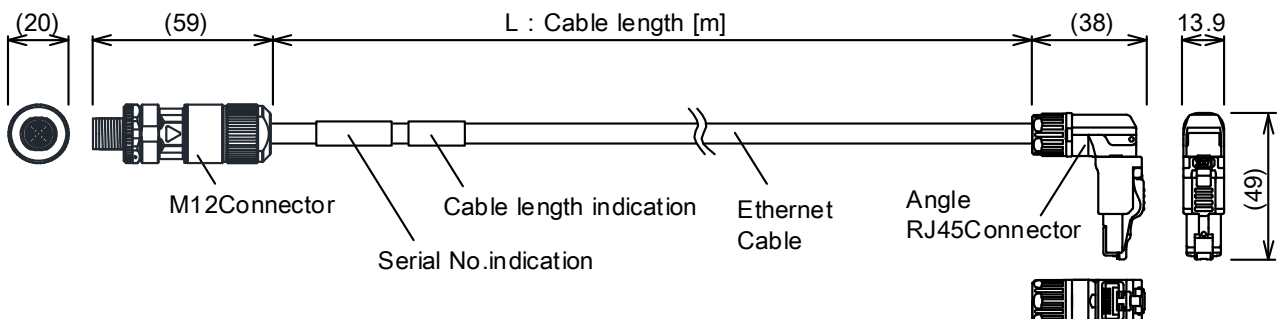


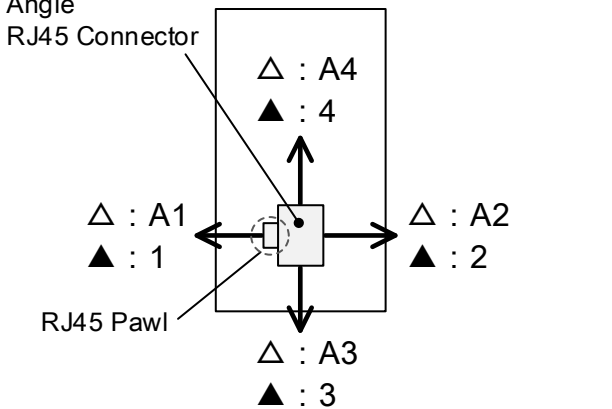
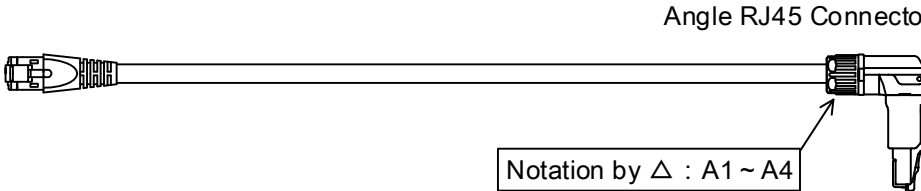
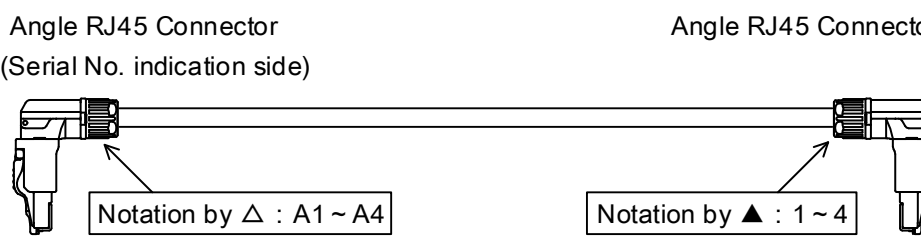
Fig.8. Configuration of SC-E5EW-XA□M-△

[mm]



### 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
 <p>Angle RJ45 Connector</p> <p>△ : A4 ▲ : 4</p> <p>△ : A1 ▲ : 1</p> <p>△ : A2 ▲ : 2</p> <p>△ : A3 ▲ : 3</p> <p>RJ45 Pawl</p>	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
<p>Straight connector on one end / Angle connector on one end</p>  <p>Angle RJ45 Connector</p> <p>Notation by △ : A1 ~ A4</p>			
<p>Angle connectors on both ends</p>  <p>Angle RJ45 Connector (Serial No. indication side)</p> <p>Angle RJ45 Connector</p> <p>Notation by △ : A1 ~ A4</p> <p>Notation by ▲ : 1 ~ 4</p>			

(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.