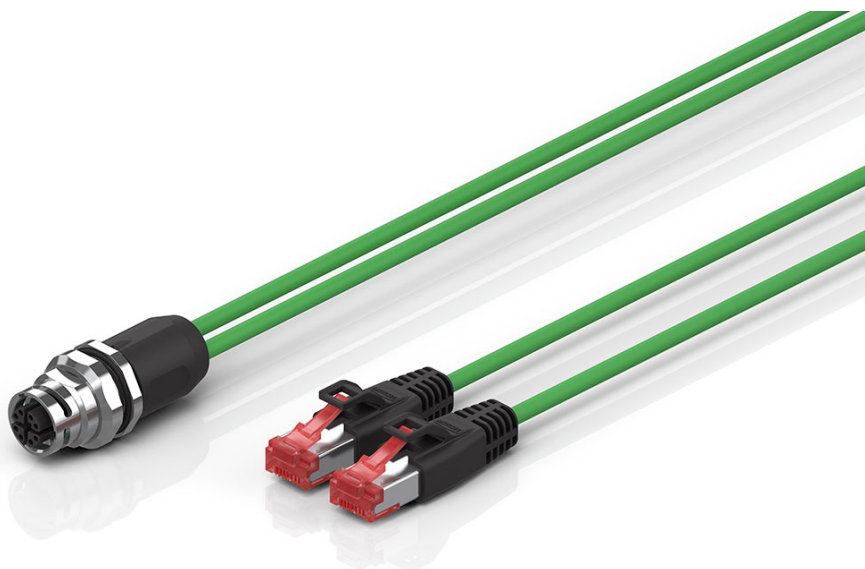


ZK1B90-6591-2xxx | EtherCAT cable, Duo, PUR, AWG26, fixed installation, comfortable installation at short distances



M12, flange rear assembly, straight, female, 8-pin, X-coded – RJ45, plug, straight, male, 8-pin – RJ45, plug, straight, male, 8-pin



Plugs

Electrical data	Head A	Head B	Head D
Rated voltage	48 V AC/48 V DC (according to IEC61076-2-109)	125 V	125 V
Rated current	0.5 A at 40°C	1 A at 40°C	1 A at 40°C
Shielding	-	yes	yes
Insulation resistance	≥ 100 MΩ (according to IEC 60512)	≥ 100 MΩ (according to IEC 60512)	≥ 100 MΩ (according to IEC 60512)
Transmission characteristics	Cat.6A	-	-
Mechanical data			
Installation size	M12	RJ45	RJ45
Connector type	flange rear assembly	plug	plug
Configuration	straight	straight	straight
Contact type	female	male	male
Number of positions (face)	8-pin	8-pin	8-pin

Coding	X-coded	-	-
Recommended torque, nut	1...1.2 Nm	-	-
Mating cycles	≥ 100 (according to IEC 60512-9a)	≥ 750	≥ 750
Way of locking	bayonet	-	-
Body color	black	black	black
Body material	-	PC UL 94 V0	PC UL 94 V0
Coupling nut material	CuZn, Ni	-	-
Contact carrier color	black	-	-
Contact carrier material	LCP	PC UL 94	PC UL 94
Contact plating	Au	Ni, Au gal.	Ni, Au gal.
Contact material	CuZn, Ni b/Au 0.2 gal.	CuZn	CuZn
Environmental data			
RoHS compliant	yes	yes	yes
Ambient temperature (operation)	-40...+85°C, -40...+185°F	-40...+60°C, -40...+140°F	-40...+60°C, -40...+140°F
Protection rating	IP67 in screwed condition (according to IEC 60529)	IP20	IP20
Pollution level	3/2 (according to IEC 60664-1)	3/2 (according to IEC 60664-1)	3/2 (according to IEC 60664-1)
Approvals	-	UL	UL

Cable

Electrical data	Cable by meter	Cable by meter A
Rated voltage	30 V (according to IEC 61076-2-101)	30 V (according to IEC 61076-2-101)
Attenuation of shielding	≥ 50 dB (30...100 MHz)	≥ 50 dB (30...100 MHz)
Insulation resistance	≥ 500 MΩ/km	≥ 500 MΩ/km
Unbalanced capacitance to ground	≤ 2000 pF/km	≤ 2000 pF/km
Mutual capacitance	nom. 50 nF/km	nom. 50 nF/km
Characteristic impedance (Ethernet)	100 Ω ±15 Ω	100 Ω ±15 Ω
Loop resistance (Ethernet)	≤ 260 Ω/km	≤ 260 Ω/km
Unbalanced resistance (Ethernet)	2 %	2 %
Dielectric strength wire/wire (Ethernet)	1 kV AC (50 Hz, 1 min)/1 kV DC (50 Hz)	1 kV AC (50 Hz, 1 min)/1 kV DC (50 Hz)
Dielectric strength wire/shield (Ethernet)	1 kV AC (50 Hz, 1 min.)/1 kV DC (50 Hz)	1 kV AC (50 Hz, 1 min.)/1 kV DC (50 Hz)
Signal running time (Ethernet)	4.8 ns/m	4.8 ns/m
Electrical parameters (Ethernet)	based on Cat.5	based on Cat.5
Test voltage	1000 V, 50 Hz, 1 min.	1000 V, 50 Hz, 1 min.
Mechanical data		

Cable structure (Ethernet)	star quad	star quad
Conductor construction (Ethernet)	7-strand	7-strand
Cross-section (Ethernet)	1 x 4 x 0.14 mm ² (AWG26)	1 x 4 x 0.14 mm ² (AWG26)
Outer cable diameter	3.65 mm ± 0.15 mm (0.1496" ± 0.0059")	3.65 mm ± 0.15 mm (0.1496" ± 0.0059")
Min. bending radius, moved	15 x outer cable diameter	15 x outer cable diameter
Min. bending radius, fixed installation	8 x outer cable diameter, 2.5 x outer cable diameter (fixed with single bend)	8 x outer cable diameter, 2.5 x outer cable diameter (fixed with single bend)
Weight	30.0 kg/km (20.2 lb/1000 ft)	30.0 kg/km (20.2 lb/1000 ft)
Conductor material	copper bare	copper bare
Shielding	braiding of tinned copper wires	braiding of tinned copper wires
Optical covering factor of shielding (Ethernet)	≥ 85 %	≥ 85 %
Use	fixed installation	fixed installation
Jacket color	green	green
Material jacket	PUR (polyurethane)	PUR (polyurethane)
Wire color code	yellow, orange, white, blue	yellow, orange, white, blue
Wire insulation material	PO (Polyolefine)	PO (Polyolefine)
Printing on the jacket	00000m Beckhoff Automation GmbH & Co. KG - Germany – Industrial Ethernet / EtherCAT ZB9034 Cat5e AWG26/7 E170315 AWM 20963 AWM I A/B 80°C 30V Fa.No.xxxxx	00000m Beckhoff Automation GmbH & Co. KG - Germany – Industrial Ethernet / EtherCAT ZB9034 Cat5e AWG26/7 E170315 AWM 20963 AWM I A/B 80°C 30V Fa.No.xxxxx
Printing color	black	black
Environmental data		
Operation temperature range, moved	-30...+70°C, -22...+158°F	-30...+70°C, -22...+158°F
Operation temperature range, fixed installation	-40...+80°C, -40...+176°F	-40...+80°C, -40...+176°F
UV resistance	good	good
Oil resistance	according to DIN EN 60811-404 (7x24 h/90 °C)	according to DIN EN 60811-404 (7x24 h/90 °C)
Acid, lye and solvent resistance	depends on medium, concentration, temperature and duration	depends on medium, concentration, temperature and duration
Flame-retardant	Horizontal flame test according to UL 1581 part 1090	Horizontal flame test according to UL 1581 part 1090
CFC-free	yes	yes
Halogen-free	according to IEC 60754 or DIN VDE 0472 part 815	according to IEC 60754 or DIN VDE 0472 part 815
Silicone-free	yes	yes
UL	yes, UL E-file number: E170315	yes, UL E-file number: E170315

Attenuation

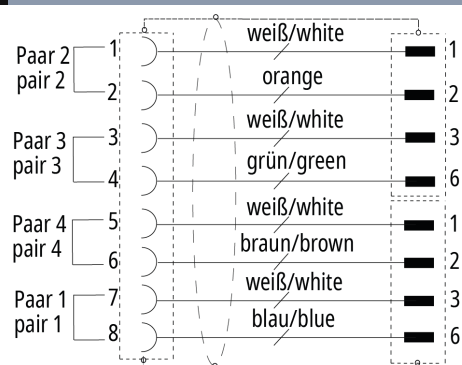
Max. insertion loss

Frequency [MHz]	1	4	10	16	20	31.25	62.5	100
[db/100 m]	3.2	6.2	10.5	13.4	14.7	18.8	27.2	35.0
[db/100 ft]	1	1.9	3.2	4.1	4.5	5.7	8.3	10.7

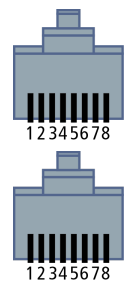
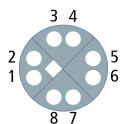
Min. near-end crosstalk attenuation

Frequency [MHz]	1	4	10	16	20	31.25	62.5	100
[db/100 m]	65	56.3	50.3	47.2	45.8	42.9	38.4	35.3
[db/100 ft]	19.8	17.2	15.3	14.4	14	13.1	11.7	10.8

Contact assembly



Dimensions



A1	45 mm
A2	M12 inner diameter, M16 outer diameter
A3	20.5 mm
B1	44.0 mm
D1	44.0 mm

Notes

- Depending on the cable length (L), the following length tolerances apply:
0 m...<0.2 m: ± 10 mm | 0.2...4.0 m: $+ 40$ mm | ≥ 4.0 m: $+ 1\%$

- Illustrations similar
- Further cable length on request.

CE, UL	
CE	yes

Ordering information	Length
ZK1B90-6591-2011	2 x 1.10 m
ZK1B90-6591-2015	2 x 1.50 m
ZK1B90-6591-2020	2 x 2.00 m

Further length on request

Accessories	
ZB8801-0000	torque wrench for hexagonal plugs, adjustable
ZB8801-0002	torque cable key, M12/wrench size 13, for ZB8801-0000



Products marked with a crossed-out wheeled bin shall not be discarded with the normal waste stream. The device is considered as waste electrical and electronic equipment. The national regulations for the disposal of waste electrical and electronic equipment must be observed.

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