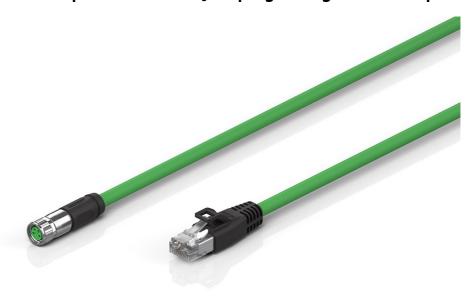
# ZK1090-3291-6xxx | EtherCAT cable, PUR, 1 x 4 x AWG22, capable of torsion



M8, socket, straight, female, 4-pin, A-coded – RJ45, plug, straight, male, 4-pin



## Plugs

Electrical data	Head A	Head B	
Rated voltage	30 V (according to IEC 61076-2-104)	150 V	
Rated current	4 A at 40°C (according to IEC 61076-2-104)	1.5 A	
Shielding	yes	yes	
Insulation resistance	≥ 100 M $\Omega$ (according to IEC 60512)	$\geq$ 10 G $\Omega$ (according to IEC 60512-2)	
Mechanical data			
Installation size	M8	RJ45	
Connector type	socket	plug	
Configuration	straight	straight	
Contact type	female	male	
Number of positions (face)	4-pin	4-pin	
Coding	A-coded		
Recommended torque, nut	0.4 Nm	-	
Mating cycles	≥ 100	≥ 750	
Way of locking	screw	-	



Weight per piece	0.028 kg (0.0617 lb)	-
Body color	black	black
Body material	TPU, UL94	TPU, UL 94 HB
Coupling nut material	CuZn, Ni	-
Seal	FPM	-
Contact carrier color	green	-
Contact carrier material	PA 6, UL 94 V0	PC UL 94 V-0
Contact plating	Ni, Au gal.	Ni, Au gal.
Contact material	CuZn	CuZn
Environmental data		
RoHS compliant	yes	yes
Ambient temperature (operation)	-30+85°C, -22+185°F	-40+70°C, -40+158°F
Protection rating	IP65/67 in screwed condition (according to IEC 60529)	IP20
Pollution level	3/2 (according to IEC 60664-1)	-

### Cable

Electrical data	
Rated voltage	600 V
Insulation resistance	$\geq 5G\Omega * km$
Mutual capacitance	48 nF/km
Characteristic impedance (Ethernet)	100 Ω ±15 Ω
Loop resistance (Ethernet)	≤ 115 Ω/km
Signal running time (Ethernet)	5.3 ns/m
Electrical parameters (Ethernet)	based on Cat.5
Test voltage	1500 V, 50 Hz, 1 min.
Mechanical data	
Cable structure (Ethernet)	star quad
Conductor construction (Ethernet)	19-strand
Cross-section (Ethernet)	1 x 4 x 0.34 mm <sup>2</sup> (AWG22)
Outer cable diameter	6.6 mm ± 0.2mm (0.259" ± 0.0079")
Min. bending radius, moved	10 x outer cable diameter
Min. bending radius, fixed installation	5 x outer cable diameter
Conductor material (Ethernet)	copper, tinned
Shielding	two layers of conductive wrapping and braiding of special wires
Optical covering factor of shielding (Ethernet)	≥ 85 %



ZK1090-3291-6xxx www.beckhoff.com/ZK1090-3291-6xxx

Use     suitable for torsion/robotic application       Max. acceleration     20 m/s²       Max. speed     4 m/s       Max. travel distance     5 m       Max. number of cycles     1 million       Jacket color     green       Material jacket     PUR (polyurethane)       Material jacket, further characteristics of halogen-free, flame-retardant, matt and low adhesion       Wire color code     yellow, orange, white, blue       Wire insulation material     PO (Polyolefine)       Printing on the jacket     XXXX Beckhoff Automation GmbH & Co. KG-Germany-ZB9021 EtherCAT CatSe Torsion AWG22/19 E170315 cRUus> AWM21209 AWM I/II A/B 90°C 600V MM/YY CE       Printing color     black       Torsion angle in °/m     max. ± 180°/m       Torsion speed     36 cycle/min.       Number of torsion cycles     5 million       Load weight     20 N		
Max. speed 4 m/s  Max. travel distance 5 m  Max. number of cycles 1 million  Jacket color green  Material jacket PUR (polyurethane)  Material jacket, further characteristics of halogen-free, flame-retardant, matt and low adhesion  Wire color code yellow, orange, white, blue  Wire insulation material PO (Polyolefine)  Printing on the jacket XXXX Beckhoff Automation GmbH & Co. KG-Germany-ZB9021 EtherCAT Cat5e Torsion AWG22/19 E170315 cRUus> AWM21209 AWM I/II A/B 90°C 600V MM/YY CE  Printing color black  Torsion angle in °/m max. ± 180°/m  Torsion speed 36 cycle/min.  Number of torsion cycles 5 million	Use	suitable for torsion/robotic application
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Torsion speed 36 cycle/min.  Number of torsion cycles 5 million	Printing color	black
Number of torsion cycles 5 million	Torsion angle in °/m	max. ± 180°/m
,	Torsion speed	36 cycle/min.
Load weight 20 N	Number of torsion cycles	5 million
	Load weight	20 N
Claimed torsion length 1 m	Claimed torsion length	1 m
Environmental data	Environmental data	
Operation temperature range, moved -30+90°C, -22+194°F	Operation temperature range, moved	-30+90°C, -22+194°F
Operation temperature range, fixed installation -40+90°C, -40+194°F		-40+90°C, -40+194°F
Oil resistance according to DIN EN 60811-404 (7x24 h/90 °C)	Oil resistance	according to DIN EN 60811-404 (7x24 h/90 °C)
Flame-retardant VW-1 Flame Test UL 1581 section 1080 and IEC 60332-1-2	Flame-retardant	VW-1 Flame Test UL 1581 section 1080 and IEC 60332-1-2
Halogen-free according to IEC 60754 or DIN VDE 0472 part 815	Halogen-free	according to IEC 60754 or DIN VDE 0472 part 815
UL yes, UL E-file number: E170315	UL	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]	-	4.9	7.8	9.9	11.1	14.1	62.5	26.4
[db/100 ft]	-	1.5	2.4	3	3.4	4.3	19.1	8
Min. near-end crosstalk attenuation								
Frequency [MHz]	1	4	10	16	20	31.25	62.5	100
[db/100 m]	-	56.3	50.3	47.2	45.8	42.9	38.4	35.3
[db/100 ft]	-	17.2	15.3	14.4	14	13.1	11.7	10.8



#### **Dimensions**





A1	40.00 mm
A2	Ø 10.1 mm
B1	43.80 mm

#### **Notes**

- Depending on the cable length (L), the following length tolerances apply: 0 m...<0.2 m:  $\pm$  10 mm | 0.2...4.0 m:  $\pm$  40 mm |  $\geq$  4.0 m:  $\pm$  1%
- Illustrations similar
- Further cable length on request.

Ordering information	Length
ZK1090-3291-6020	2.00 m
ZK1090-3291-6050	5.00 m

Accessories	
ZB8801-0000	torque wrench for hexagonal plugs, adjustable
ZB8801-0001	torque cable key, M8/wrench size 9, for ZB8801-0000
ZB8803-0001	Flange/Panel feed-through for M8 pre-assembled, for fixing the connector, plastic
ZK1096-9696-0000	RJ45, socket, straight, female, 8-pin – RJ45, socket, straight, female, 8-pin



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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