UNITRONIC-FD® CP plus UL/CSA

The UL/CSA approved, highly flexible data transmission cable with EMC protection and polyurethane outer sheath for power chain systems

-CMX approved
-low capacity
-cold flexible

Application

Automated production processes require data transmission cables of more and more higher flexibility and durability. UNITRONIC-FD® CP plus UL/CSA , the screened, highly flexible data transmission cable, is a cable with polyurethane outer sheath for a cost effective service life also for use in cold conditions. The cable is approved according to the UL and CSA standard. Thus it is ideal for the export-orientated machine and apparatus engineering.

Special Feature

The copper screening, with high coverage effectively screens interference from inside and outside. The cut-resistant polyurethane outer sheath is resistant against mineral oils and abrasion in power chains. The new version is due to especially used materials suitable for temperatures down to -40°C. The cable is additionally **halogen free** and has a **low capacity**.

Note

Twisted pair and sceened versions see , for larger cross-sections, see the ÖLFLEX-FD® range from onwards.
Please follow the assembly guidelines for UNITRONIC-FD® cables in power supply chains in table T3. LAPP KABEL® recommendation: Handle FD cables on drums until installation.

Cable Make-up

Superfine strands of plain copper wire, polyolefine core insulation, cores in acc. to DIN 47100 colour code, twisted in layers with short lay lengths, textile wrapping over the outer layer, tinned copper screen braid, outer sheath of special polyurethane-based compound, adhesion-free, resistant to hydrolysis and microbes, flame-retardant according to VDE 0482, part 265-2-1/ IEC 60332-1 (acc.to VDE 0472 part 804 test type b), silver-grey (RAL 7001).

Technical Data

- Minimum bending radius for flexing: 7,5 x cable diameter
- Temperature range: flexing: -40 °C up to +70 °C
- Conductor stranding: strands, superfine wire acc. to VDE 0295, single wire diameter 0,1 mm Ø
- Core ident code: DIN 47100, table T9
- Conductor resistance: see table T11
- Insulation: specific insulation resistance: > 5 GOhm x cm
- Mutual capacitance: C/C approx. 60 nF/km C/S approx. 160 nF/km
- Inductance: approx. 0,65 mH/km
- Peak working voltage: (not for purposes of power/ high-voltage current): 250 V
- Test voltage: 1500 V
- Approval: CMX (UL/CSA)

Part number	No. of cores and mm² per conductor	AWG size	Max. outside diameter in mm	Copper weight kg/km	Approx. weight kg/km
0028 880	2 x 0,14	26	4,5	11,2	33
0028 881	3 x 0,14	26	4,7	14,1	36
0028 882	4 x 0,14	26	5,0	15,5	40
0028 883	5 x 0,14	26	5,4	18,3	45
0028 884	7 x 0,14	26	6,0	27,8	67
0028 885	10 x 0,14	26	7,0	39,3	87
0028 886	14 x 0,14	26	7,1	45,3	102
0028 887	18 x 0,14	26	7,7	54,1	118
0028 888	25 x 0,14	26	9,2	68,4	157
0028 889	2 x 0,25	24	5,1	14,9	38
0028 890	3 x 0,25	24	5,4	18,8	45
0028 891	4 x 0,25	24	5,8	21,3	52
0028 892	5 x 0,25	24	6,2	31,0	69
0028 893	7 x 0,25	24	7,0	39,6	84
0028 894	10 x 0,25	24	8,5	53,9	109
0028 895	14 x 0,25	24	8,6	64,2	136
0028 896	18 x 0,25	24	9,4	78,4	161
0028 897	25 x 0,25	24	11,4	101,0	213
0028 898	2 x 0,34	22	5,6	18,1	45
0028 899	3 x 0,34	22	5,9	28,7	61
0028 900	4 x 0,34	22	6,3	35,7	77
0028 901	5 x 0,34	22	6,8	39,1	83
0028 902	7 x 0,34	22	7,7	52,7	109
0028 903	10 x 0,34	22	9,4	67,4	147
0028 904	14 x 0,34	22	9,5	85,8	186
0028 905	18 x 0,34	22	10,7	99,7	216
0028 906	25 x 0,34	22	12,9	155,0	314

No cutting charge for standard stock units (50, 100, 250, 500, 1000 m).
Please declare us your desired design (e.g. 1 x 500 m drum or 5 x 100 rings).
Rings < 30 kg, beyond automatically drums.

T9: Core Ident Code according to DIN Colour Code

DIN 47100/January 1988 – Colour code for UNITRONIC® twisted pairs.

Each pair comprises one a-core and one b-core. From 23 pairs upwards the marking repeats for the first time and from 45 pairs upwards for the second time. The first colour is always the basic colour of the core and the second colour is printed in rings.

Pair No.	Colour a-core	Colour b-core	Pair No.	Colour a-core	Colour b-core
1	white	brown	13	white/black	brown/black
2	green	yellow	14	grey/green	yellow/grey
3	grey	pink	15	pink/green	yellow/pink
4	blue	red	16	green/blue	yellow/blue
5	black	violet	17	green/red	yellow/red
6	grey/pink	red/blue	18	green/black	yellow/black
7	white/green	brown/green	19	grau/blue	pink/blue
8	white/yellow	yellow/brown	20	grau/red	pink/red
9	white/grey	grey/brown	21	grau/black	pink/black
10	white/pink	pink/brown	22	blau/black	red/black
11	white/blue	brown/blue	23–44	see 1–22	see 1–22
12	white/red	brown/red	45–66	see 1–22	see 1–22

DIN 47100 Colour Code (but in contrast to DIN: without colour repetition after the 44th core)

Core No.	Colour	Core No.	Colour	Core No.	Colour	Core No.	Colour
1	white	17	white/grey	33	green/red	49	white/green/black
2	brown	18	grey/brown	34	yellow/red	50	brown/green/black
3	green	19	white/pink	35	green/black	51	white/yellow/black
4	yellow	20	pink/brown	36	yellow/black	52	yellow/brown/black
5	grey	21	white/blue	37	grey/blue	53	white/grey/black
6	pink	22	brown/blue	38	pink/blue	54	grey/brown/black
7	blue	23	white/red	39	grey/red	55	white/pink/black
8	red	24	brown/red	40	pink/red	56	pink/brown/black
9	black	25	white/black	41	grey/black	57	white/blue/black
10	violet	26	brown/black	42	pink/black	58	brown/blue/black
11	grey/pink	27	grey/green	43	blue/black	59	white/red/black
12	red/blue	28	yellow/rey	44	red/black	60	brown/red/black
13	white/green	29	pink/green	45	white/brown/black	61	black /white
14	brown/green	30	yellow/pink	46	yellow/green/black		
15	white/yellow	31	green/blue	47	grey/pink/black		
16	yellow/brown	32	yellow/blue	48	red/blue/black		

The first colour indicates the basic colour of the core insulation, the second colour indicates the colour of the printed ring.
Where three colours are indicated, the second and third colours are printed on the basic colour.

T 11: Conductor Resistances and Conductor Make-up (metric)

Conductor Resistances

Conductor resistances for copper conductors (extract from VDE 0295 and in accordance with international rules, e.g. IEC 60228).
Conductor make-up is specified by the maximum single wire diameter and the maximum conductor resistance.

Nominal cross-section in mm²	Conductor resistance for 20°C for 1 km in Ω (maximum value)			
	of tinned copper wire		of untinned copper wire	
	Class 1 + 2	Class 5 + 6	Class 1 + 2	Class 5 + 6
0,08		250,0		243,0
0,14		142,0		138,0
0,25		82,0		79,0
0,34		59,0		57,0
0,5	36,7	40,1	36,0	39,0
0,75	24,8	26,7	24,5	26,0
1	18,2	20,0	18,1	19,5
1,5	12,2	13,7	12,1	13,3
2,5	7,56	8,21	7,41	7,98
4	4,70	5,09	4,61	4,95
6	3,11	3,39	3,08	3,30
10	1,84	1,95	1,83	1,91
16	1,16	1,24	1,15	1,21
25	0,734	0,795	0,727	0,780
35	0,529	0,565	0,524	0,554
50	0,391	0,393	0,387	0,386
70	0,270	0,277	0,268	0,272
95	0,195	0,210	0,193	0,206
120	0,154	0,164	0,153	0,161
150	0,126	0,132	0,124	0,129
185	0,100	0,108	0,0991	0,106
240	0,0762	0,0817	0,0754	0,0801
300	0,0607	0,0654	0,0601	0,0641
400	0,0475	0,0495	0,0470	0,0486
500	0,0369	0,0391	0,0366	0,0384

Conductor make-up: VDE 0295 resp. from 0,5 mm² in accordance with IEC 60228

Cross section in mm²	Multi-strands to VDE 0295 Class 2	Multi-wire conductors	Fine-wire conductors VDE 0295 Class 5	Superfine strands to VDE 0295 Class 6			
0,14				~ 18 x 0,10	~ 18 x 0,1	~ 36 x 0,07	~ 72 x 0,05
0,25			~ 14 x 0,15	~ 32 x 0,10	~ 32 x 0,1	~ 65 x 0,07	~ 128 x 0,05
0,34		7 x 0,25	~ 19 x 0,15	~ 42 x 0,10	~ 42 x 0,1	~ 88 x 0,07	~ 174 x 0,05
0,38		7 x 0,27	~ 12 x 0,20	~ 21 x 0,15	~ 48 x 0,1	~ 100 x 0,07	~ 194 x 0,05
0,5	7 x 0,30	7 x 0,30	~ 16 x 0,20	~ 28 x 0,15	~ 64 x 0,1	~ 131 x 0,07	~ 256 x 0,05
0,75	7 x 0,37	7 x 0,37	~ 24 x 0,20	~ 42 x 0,15	~ 96 x 0,1	~ 195 x 0,07	~ 384 x 0,05
1,0	7 x 0,43	7 x 0,43	~ 32 x 0,20	~ 56 x 0,15	~ 128 x 0,1	~ 260 x 0,07	~ 512 x 0,05
1,5	7 x 0,52	7 x 0,52	~ 30 x 0,25	~ 84 x 0,15	~ 192 x 0,1	~ 392 x 0,07	~ 768 x 0,05
2,5	7 x 0,67	~ 19 x 0,41	~ 50 x 0,25	~ 140 x 0,15	~ 320 x 0,1	~ 651 x 0,07	~ 1280 x 0,05
4	7 x 0,85	~ 19 x 0,52	~ 56 x 0,30	~ 224 x 0,15	~ 512 x 0,1	~ 1040 x 0,07	
6	7 x 1,05	~ 19 x 0,64	~ 84 x 0,30	~ 192 x 0,20	~ 768 x 0,1	~ 1560 x 0,07	
10	7 x 1,35	~ 49 x 0,51	~ 80 x 0,40	~ 320 x 0,20	~ 1280 x 0,1	~ 2600 x 0,07	
16	7 x 1,70	~ 49 x 0,65	~ 128 x 0,40	~ 512 x 0,20	~ 2048 x 0,1		
25	7 x 2,13	~ 84 x 0,62	~ 200 x 0,40	~ 800 x 0,20	~ 3200 x 0,1		
35	7 x 2,52	~ 133 x 0,58	~ 280 x 0,40	~ 1120 x 0,20			
50	~ 19 x 1,83	~ 133 x 0,69	~ 400 x 0,40	~ 705 x 0,30			
70	~ 19 x 2,17	~ 189 x 0,69	~ 356 x 0,50	~ 990 x 0,30			
95	~ 19 x 2,52	~ 259 x 0,69	~ 485 x 0,50	~ 1340 x 0,30			
120	~ 37 x 2,03	~ 336 x 0,67	~ 614 x 0,50	~ 1690 x 0,30			
150	~ 37 x 2,27	~ 392 x 0,69	~ 765 x 0,50	~ 2123 x 0,30			
185	~ 37 x 2,52	~ 494 x 0,69	~ 944 x 0,50	~ 1470 x 0,40			
240	~ 61 x 2,24	~ 627 x 0,70	~ 1225 x 0,50	~ 1905 x 0,40			
300	~ 61 x 2,50	~ 790 x 0,70	~ 1530 x 0,50	~ 2385 x 0,40			
400	~ 61 x 2,89		~ 2035 x 0,50				
500	~ 61 x 3,23		~ 1768 x 0,60				

The number of wires in columns 3-7 is optional. VDE 0295 specifies only the maximum diameter of the individual wires and the maximum resistance assigned to the cross-section.