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HELUKABEL® USA



North American Cables & Accessories

# INDUSTRIAL AUTOMATION

Ed. 3 // EN



**(Channeling  
POWER)** 

# Icons

## Approvals / Standards



UL



CSA



HAR



VDE REG Number



SPAIN



EAC



CCC



CE



DNV-GL



IPA



DESINA

## Properties / Applications



Halogen-Free



UV Radiation



Robust



Drag Chain



Torsion



Wind-Offshore



Meter Marking



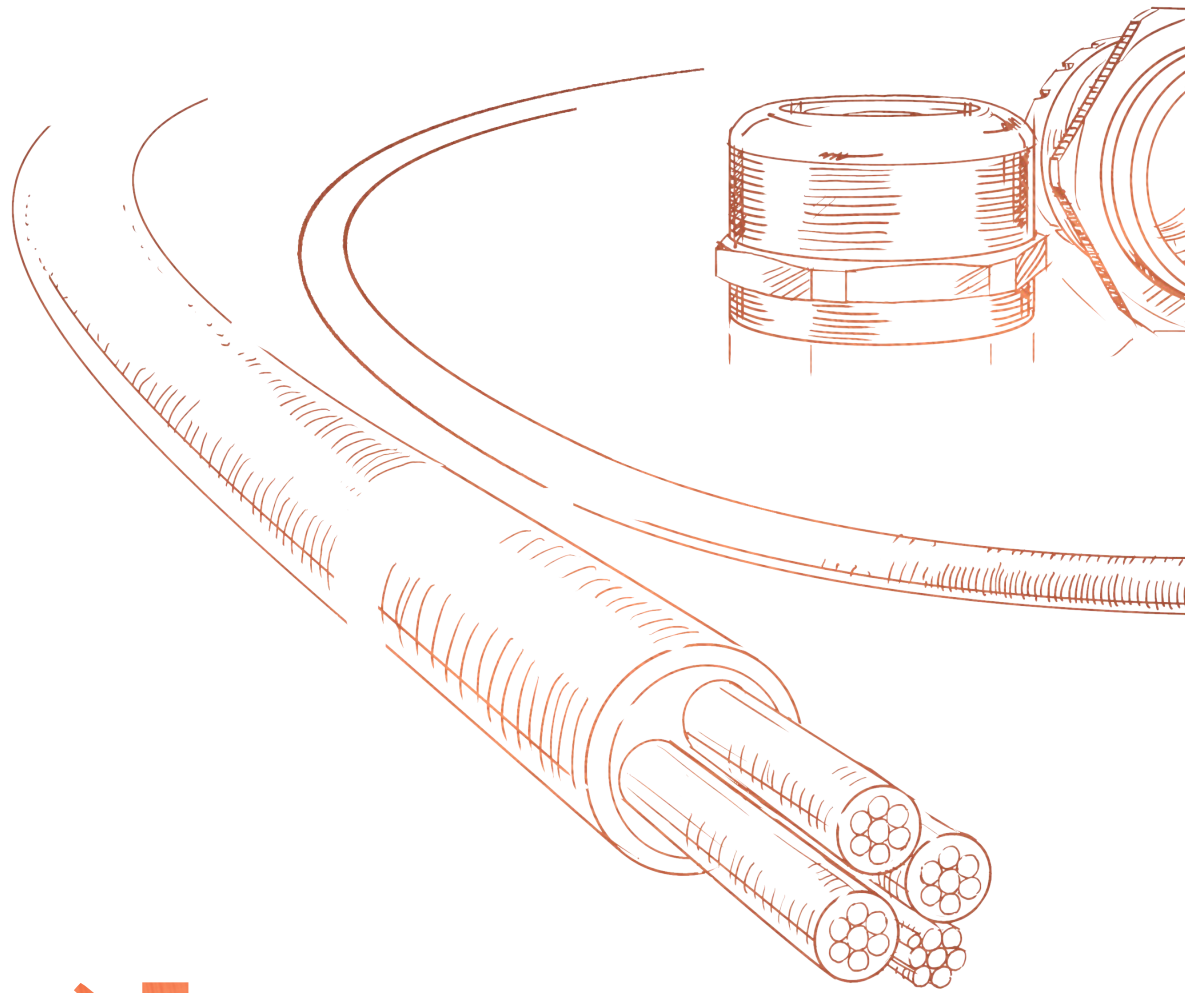
In Feet

### Explanation of the icons used in the brochure:

The icons are intended to provide a general overview of material properties and certifications. For details, please refer to the information in the data sheets.

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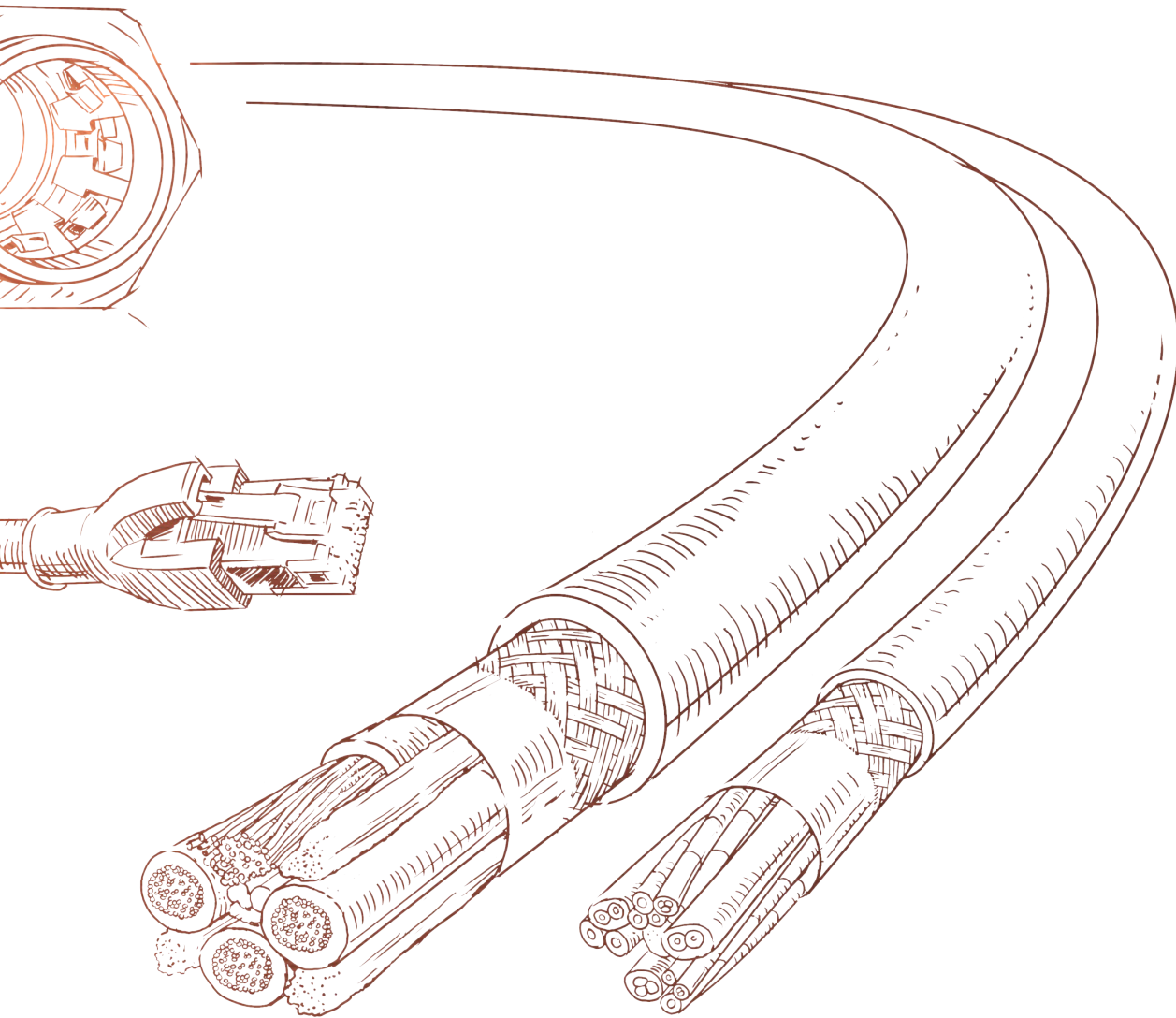


# ( Channeling POWER )

We at HELUKABEL have made it our mission to bring energy and communication to our customers' applications reliably and consistently at all times, and to make the impossible, possible! "Channeling Power" succinctly summarizes this mission and is our commitment to you.

In this third edition of the HELUKABEL North American Cables and Accessories catalog, we've included a broad range of products for industrial automation - control, VFD/servo

motor, data, network, and bus cables, as well as the complementary accessories. These featured products are specifically designed for use in the North American market in accordance with UL, NEC, NFPA 79 and CSA guidelines. Our objective with this 96-page catalog is to guide you to your desired cable and accessory products quickly and easily. However, in cases where you need to look at our entire product portfolio, the full line "Cables, Wires & Accessories" catalog is always



available at your request, or you can use the product finder at [www.helukabel.com](http://www.helukabel.com)!

If our 33,000+ standard products still don't fit your unique application, our engineers are one call/email away to develop a superior customized solution.

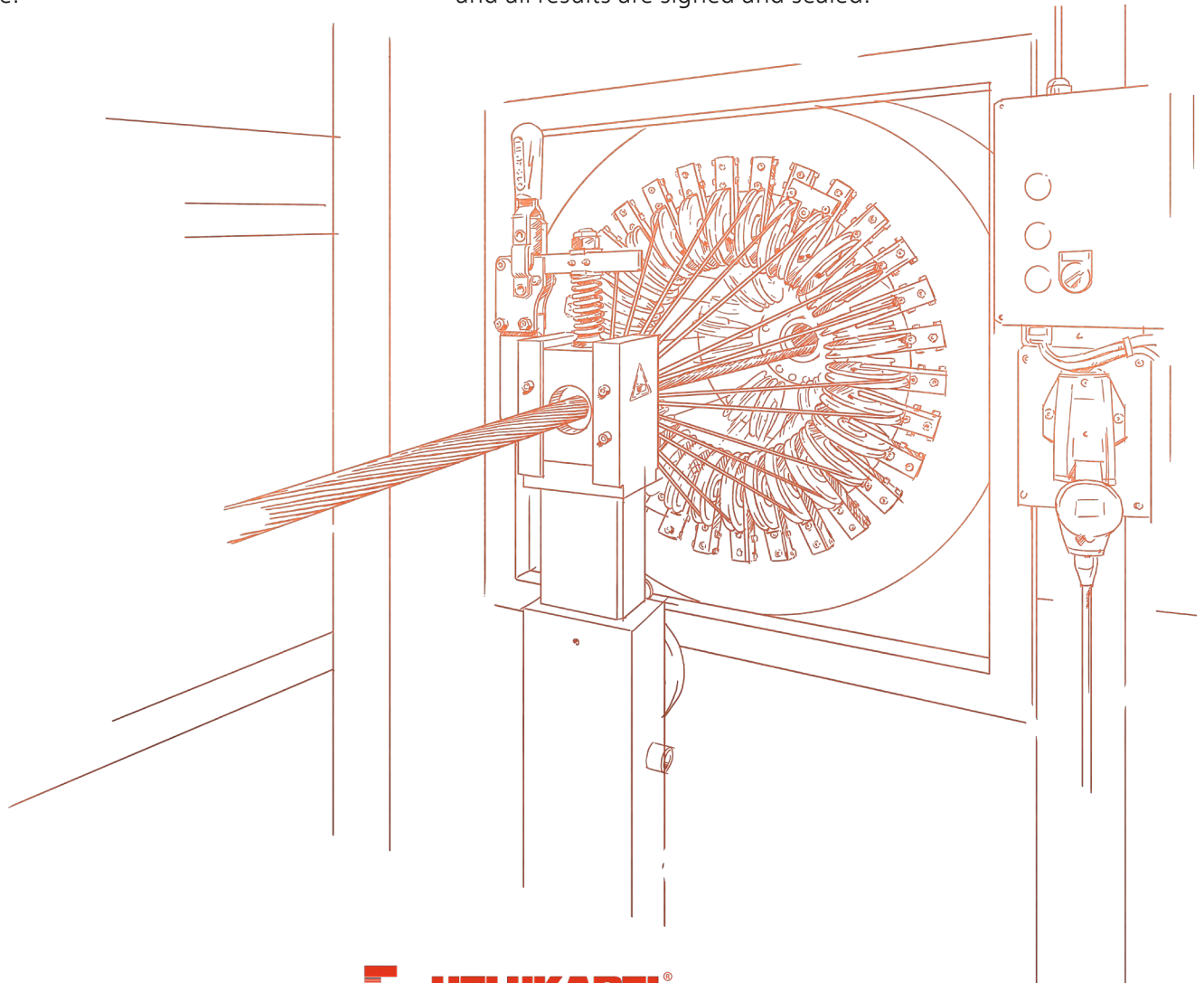
We understand that the world is becoming smaller due to globalization, and companies are building machines and exporting equipment to fulfill customer needs on a

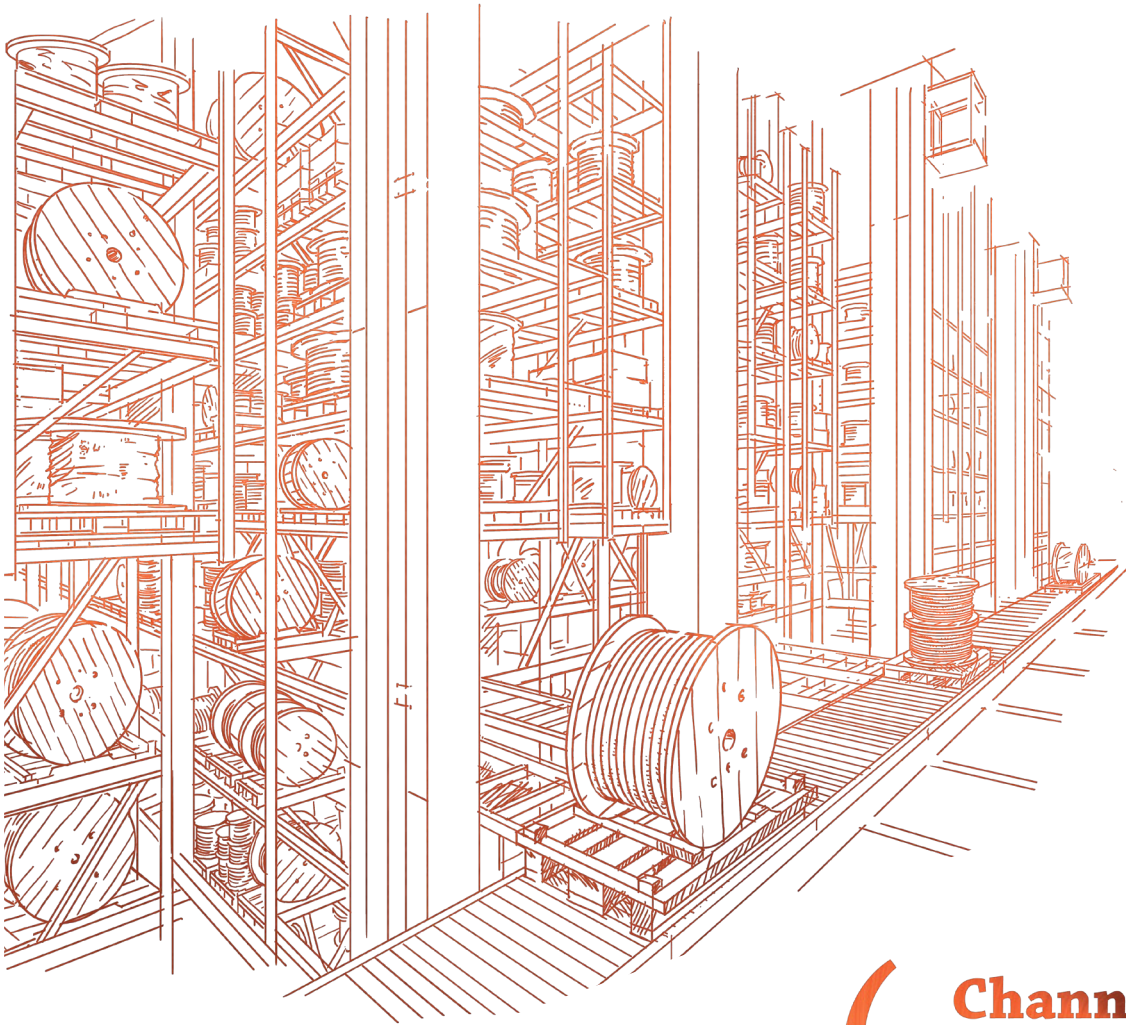
daily basis. HELUKABEL's global reach of 57 locations in 36 countries around the world all but assures our customers that the industrial machinery being built in Europe or Asia for export to North America can be supplied with the required UL/CSA cables and wires, as if it were being built and installed domestically.

# Channeling **INNOVATION**

A cable is only as good as the minds that ask the right questions before it's made. We have a lot of bright minds at HELUKABEL who spend every day searching for intelligent answers. This is important because the challenges faced by modern cables and wires are multifaceted: moving applications with more than 10 million cycles, exposure to extreme mechanical and chemical loads, tricky bending radii and space-saving hybrid solutions, for example.

For each situation, HELUKABEL has answers to help you. To ensure there are no issues during use, all newly developed products undergo rigorous testing at our R&D center in Windsbach, near Nuremberg, Germany. Here we bend, pull, grind and ignite the cable for all it's worth. Our special aging ovens are time machines that simulate a cable's life cycle and beyond. Our cables are tested to comply with national and international standards, and all results are signed and sealed.



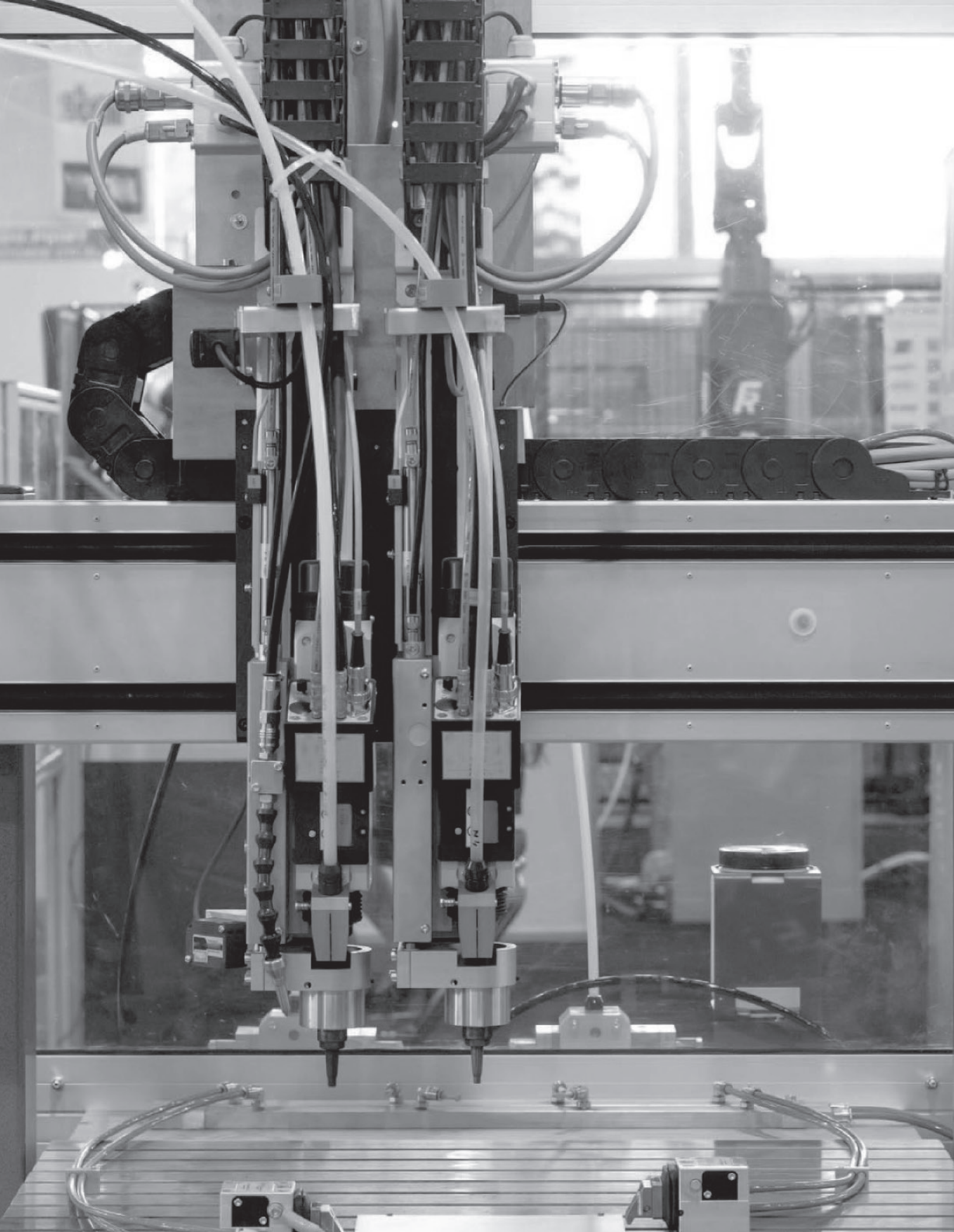


## Channeling **LOGISTICS**

Where there's no cable there's no data or electricity. When everything's going according to plan, cables are of little interest to anyone; but inevitably the day comes when a machine starts malfunctioning or a missing cable is holding up the completion of a project. Whatever the situation in which problems occur, the downtime can be tense and critical for everyone involved.

At HELUKABEL, we try to remove the stress you're experiencing as quickly as possible. To this end, we built the biggest distribution center for cable products in Europe.

With over 40,000 products stored in a fully automated, high-bay warehouse, we're ready to act upon your needs quickly and ship you the right cable at a moment's notice. Our "known shipper" status with the Federal Office of Civil Aviation means that your goods are checked in and pass security control directly at our warehouse, which speeds up the shipment process. On top of this, we have 32 additional warehouses on five continents so you can order your cables in Spanish, Russian, Chinese or in 23 other languages.





# 600 / 1000V Control Cables

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# TRAYCONTROL® 600 flexible, oil-resistant, exposed run TC-ER,

PLTC-ER, ITC-ER, NFPA 79, torsion rated



HELUKABEL © TRAYCONTROL 600 P/N 62960 12 AWG (3.31mm2)/4C (UL) TC-ER 90C DRY / WET 600V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "FLEXING" OR WTTTC 1000V OR c(UL) CIC-TC PVC/N FT4 --- LL257839 CSA AWM I/II A/B 90C 600V FT4 CE

## Technical data

- PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTTC 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**  
flexing 5x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Conductors stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- TC-ER, Tray Cable Exposed Run
- Simple installation
- Outstanding flexibility
- Torsion resistant for wind power application

## Application

NFPA 79 conformant flexible control and power cable up to 600 V (WTTTC 1000 V), for all machinery in new plant construction. Torsion resistant, exceptional flexibility and abrasion resistance. Suitable for installation in dry, humid and damp environments, outdoors and pipes. For underground installation and for open, unprotected installation from the cable tray to machines in industrial plants.

☑ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62020	0,507	2 x 20	6,7	10,3	55,0
62021	0,507	3 x 20	7,0	13,7	64,0
62022	0,507	4 x 20	7,5	18,3	74,0
62023	0,507	5 x 20	8,1	22,9	88,0
62024	0,507	7 x 20	8,7	32,0	109,0
62025	0,507	9 x 20	10,1	41,7	137,0
62026	0,507	12 x 20	11,1	55,1	168,0
62027	0,507	18 x 20	12,9	82,9	231,0
62028	0,507	25 x 20	15,7	115,5	335,0
62902	0,963	2 x 18	7,3	19,2	67,0
62903	0,963	3 x 18	7,6	26,8	82,0
62904	0,963	4 x 18	8,2	34,5	100,0
62905	0,963	5 x 18	8,9	44,6	118,0
62906	0,963	7 x 18	9,6	62,7	149,0
62907	0,963	9 x 18	11,0	81,4	186,0
62908	0,963	10 x 18	11,8	90,3	205,0
62909	0,963	12 x 18	12,2	109,5	234,0
62910	0,963	15 x 18	14,4	134,4	314,0
62911	0,963	16 x 18	14,4	143,3	327,0
62912	0,963	18 x 18	15,1	161,3	363,0
62913	0,963	19 x 18	15,1	170,4	369,0
62914	0,963	25 x 18	17,4	188,4	475,0
62915	0,963	27 x 18	17,7	242,3	501,0
62916	0,963	34 x 18	19,7	305,2	618,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62917	0,963	37 x 18	19,7	332,3	652,0
62918	0,963	41 x 18	21,0	368,3	716,0
62919	0,963	50 x 18	24,0	449,3	912,0
62920	0,963	61 x 18	25,2	548,4	1071,0
62921	1,31	2 x 16	7,8	24,0	79,0
62922	1,31	3 x 16	8,2	36,2	104,0
62923	1,31	4 x 16	8,8	48,1	121,0
62924	1,31	5 x 16	9,6	60,4	143,0
62925	1,31	6 x 16	10,5	72,9	167,0
62926	1,31	7 x 16	10,5	87,8	183,0
62927	1,31	8 x 16	11,2	96,6	208,0
62928	1,31	9 x 16	12,0	108,8	231,0
62929	1,31	10 x 16	13,0	120,8	251,0
62930	1,31	12 x 16	13,4	145,4	289,0
62931	1,31	14 x 16	14,9	169,5	359,0
62932	1,31	15 x 16	15,6	181,6	384,0
62933	1,31	16 x 16	15,6	193,8	402,0
62934	1,31	18 x 16	16,4	218,6	446,0
62935	1,31	19 x 16	16,4	230,1	457,0
62936	1,31	20 x 16	17,1	242,3	482,0
62937	1,31	25 x 16	18,9	303,7	588,0
62938	1,31	27 x 16	19,3	327,4	621,0
62939	1,31	30 x 16	20,0	334,0	685,0
62940	1,31	34 x 16	22,5	412,7	815,0

# TRAYCONTROL® 600 flexible, oil-resistant, open installation

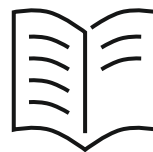
TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62941	1,31	40 x 16	23,2	485,9	929,0
62942	1,31	41 x 16	24,0	497,6	952,0
62943	1,31	50 x 16	26,0	607,3	1131,0
62944	1,31	61 x 16	27,5	741,1	1333,0
62945	2,08	2 x 14	8,8	37,7	103,0
62946	2,08	3 x 14	9,2	56,6	131,0
62947	2,08	4 x 14	10,1	75,6	137,0
62948	2,08	5 x 14	10,9	94,5	190,0
62949	2,08	6 x 14	11,9	113,5	228,0
62950	2,08	7 x 14	12,0	132,6	251,0
62951	2,08	9 x 14	14,7	170,7	350,0
62952	2,08	10 x 14	15,8	189,7	384,0
62953	2,08	12 x 14	16,4	233,8	442,0
62954	2,08	16 x 14	18,0	303,9	555,0
62955	2,08	18 x 14	18,9	347,0	615,0
62956	2,08	19 x 14	18,9	361,0	640,0
62957	2,08	25 x 14	22,8	478,0	879,0
62958	3,31	2 x 12	9,7	62,2	137,0
62959	3,31	3 x 12	10,2	93,5	179,0
62960	3,31	4 x 12	11,2	125,2	223,0
62961	3,31	5 x 12	12,2	156,4	271,0
62962	3,31	6 x 12	13,3	187,5	317,0
62963	3,31	7 x 12	13,4	218,8	357,0
62964	3,31	9 x 12	16,4	281,7	484,0
62965	3,31	12 x 12	18,3	376,1	625,0
62966	3,31	16 x 12	20,1	502,0	789,0
11009458	3,31	18 x 12	22,3	564,8	936,0
62967	3,31	19 x 12	22,3	596,2	982,0
62968	3,31	20 x 12	23,3	627,9	1024,0
62969	3,31	25 x 12	25,8	785,3	1257,0
62970	5,26	2 x 10	11,8	99,7	195,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62971	5,26	3 x 10	12,5	149,6	260,0
62972	5,26	4 x 10	14,4	200,2	360,0
62973	5,26	5 x 10	15,8	251,2	435,0
62974	5,26	7 x 10	17,1	353,6	570,0
62975	5,26	9 x 10	19,9	449,6	716,0
62976	5,26	12 x 10	23,3	622,8	981,0
11009459	5,26	18 x 10	27,2	958,7	1415,0
62977	5,26	19 x 10	27,2	1031,3	1452,0
11009460	5,26	25 x 10	31,6	1377,1	1833,0
11009461	8,37	3 x 8	17,4	238,1	454,0
62978	8,37	4 x 8	19,2	311,8	573,0
62979	8,37	5 x 8	21,0	390,2	692,0
710466	8,37	7 x 8	23,9	552,6	1009,0
62980	13,3	3 x 6	19,5	378,3	634,0
62981	13,3	4 x 6	22,3	504,9	863,0
62982	13,3	5 x 6	24,5	631,9	1049,0
63134	13,3	7 x 6	26,7	884,0	1391,0
62983	21,2	3 x 4	24,6	598,2	1031,0
62984	21,2	4 x 4	26,9	800,3	1257,0
62985	21,2	5 x 4	29,9	998,1	1540,0
62986	33,6	3 x 2	26,7	937,5	1399,0
62987	33,6	4 x 2	29,4	1250,1	1845,0
62988	33,6	5 x 2	32,3	1564,1	2292,0
62989	42,4	4 x 1	35,6	1549,2	2388,0
62990	53,5	4 x 1/0	37,0	2099,1	2939,0
62991	67,4	4 x 2/0	40,3	2560,8	3568,0
62992	84,7	4 x 3/0	44,0	2938,7	4402,0
62993	107,0	4 x 4/0	46,8	4078,2	5149,0
62994	127,0	4 x 250 kcmil	54,2	4910,9	6416,0
62995	175,0	4 x 350 kcmil	60,6	6989,9	8560,0
62996	256,0	4 x 500 kcmil	71,5	9896,3	12222,0

Dimensions and specifications may be changed without prior notice. (RN01)



### Looking for more?

Download our full line catalog "Cables, Wires & Accessories" by scanning the QR code.



# TRAYCONTROL® 600-C flexible, oil-resistant, shielded, EMC-preferred type, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



HELUKABEL® TRAYCONTROL 600-C P/N 63069 12 AWG (3.31mm<sup>2</sup>/4C (UL) TC-ER 90C DRY / WET 600V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "FLEXING" OR WTTTC 1000V OR c(UL) CIC-TC PVC/N FT4 --- LL257839 CSA AWM I/II A/B 90C 600V FT4 CE

## Technical data

- Shielded, PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTTC 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**  
max. 250 Ohm/km
- **Minimum bending radius**  
flexing 6x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Conductors stranded in layers with optimal lay length
- Foil separator
- Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special PVC outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- TC-ER, Tray Cable Exposed Run
- Simple installation
- Outstanding flexibility
- Torsion resistant for wind power application

## Application

NFPA 79 conformant, shielded, flexible control and power cable up to 600 V (WTTTC 1000 V), for all machinery in new plant construction. Torsion resistant, exceptional flexibility and abrasion resistance. Suitable for installation in dry, humid and damp environments, outdoors and pipes. For underground installation and for open, unprotected installation from the cable tray to machines in industrial plants.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009462	0,507	2 x 20	7,3	26,6	76,0
11009463	0,507	3 x 20	7,6	33,3	88,0
11009464	0,507	4 x 20	8,1	40,8	103,0
11009465	0,507	5 x 20	8,7	48,2	118,0
11009466	0,507	7 x 20	9,3	61,5	143,0
11009467	0,507	9 x 20	10,5	76,9	174,0
11009468	0,507	12 x 20	11,6	97,3	213,0
11009469	0,507	18 x 20	13,6	136,8	284,0
11009470	0,507	25 x 20	16,2	182,9	405,0
710465	0,963	2 x 18	7,8	32,0	89,0
63049	0,963	3 x 18	8,2	43,9	106,0
63050	0,963	4 x 18	8,8	54,9	126,0
63051	0,963	5 x 18	9,4	66,3	149,0
63052	0,963	7 x 18	10,1	86,0	179,0
11009471	0,963	9 x 18	11,6	110,3	222,0
11009472	0,963	10 x 18	12,4	122,0	244,0
63053	0,963	12 x 18	12,8	150,9	275,0
11009473	0,963	15 x 18	14,9	172,5	359,0
11009474	0,963	16 x 18	14,9	181,4	372,0
63054	0,963	18 x 18	15,6	201,8	402,0
11009475	0,963	19 x 18	15,6	210,7	420,0
63055	0,963	25 x 18	18,0	280,7	543,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009476	0,963	27 x 18	18,4	307,6	576,0
11009477	0,963	34 x 18	19,7	369,9	662,0
11009478	0,963	37 x 18	20,3	406,1	734,0
11009479	0,963	41 x 18	22,7	448,8	865,0
11009480	0,963	50 x 18	24,5	537,4	1013,0
11009481	0,963	61 x 18	26,0	665,7	1205,0
59855	1,31	2 x 16	8,4	43,0	100,0
62997	1,31	3 x 16	8,7	52,8	124,0
63056	1,31	4 x 16	9,4	65,9	149,0
63057	1,31	5 x 16	10,1	81,4	173,0
11009482	1,31	6 x 16	10,9	100,0	196,0
63058	1,31	7 x 16	10,9	106,6	216,0
11009483	1,31	8 x 16	11,7	121,7	240,0
11009484	1,31	9 x 16	12,5	141,8	265,0
11009485	1,31	10 x 16	14,3	157,2	323,0
63059	1,31	12 x 16	14,7	193,5	365,0
11009486	1,31	14 x 16	15,3	209,4	405,0
11009487	1,31	15 x 16	16,1	223,8	430,0
11009488	1,31	16 x 16	16,1	236,2	448,0
63060	1,31	18 x 16	16,8	285,3	499,0
11009489	1,31	19 x 16	16,8	289,9	524,0
11009490	1,31	20 x 16	17,8	305,5	552,0

# TRAYCONTROL® 600-C flexible, oil-resistant, shielded, EMC-preferred type, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63061	1,31	25 x 16	19,5	371,4	662,0
11009491	1,31	27 x 16	19,9	400,0	699,0
11009492	1,31	30 x 16	20,6	439,5	759,0
11009493	1,31	34 x 16	23,1	494,7	908,0
11009494	1,31	40 x 16	23,9	571,3	1022,0
11009495	1,31	41 x 16	24,7	586,9	1052,0
11009496	1,31	50 x 16	26,8	729,4	1263,0
11009497	1,31	61 x 16	28,3	871,6	1476,0
11009498	2,08	2 x 14	9,4	60,4	129,0
63062	2,08	3 x 14	9,8	76,5	161,0
63063	2,08	4 x 14	10,6	102,7	195,0
63064	2,08	5 x 14	11,5	124,4	231,0
11009499	2,08	6 x 14	12,5	147,2	263,0
63065	2,08	7 x 14	12,5	162,8	290,0
11009500	2,08	9 x 14	15,2	211,0	390,0
11009501	2,08	10 x 14	16,3	233,6	432,0
63066	2,08	12 x 14	16,9	288,7	504,0
11009502	2,08	15 x 14	18,6	353,6	603,0
11009503	2,08	16 x 14	18,6	372,8	628,0
63067	2,08	18 x 14	19,5	415,2	689,0
11009504	2,08	19 x 14	19,5	434,4	716,0
63068	2,08	25 x 14	23,7	563,6	997,0
11009505	3,31	2 x 12	10,3	86,3	165,0
11009506	3,31	3 x 12	10,8	118,6	208,0
63069	3,31	4 x 12	11,8	163,3	265,0
63070	3,31	5 x 12	12,8	202,2	313,0
11009507	3,31	6 x 12	14,7	220,4	384,0
63071	3,31	7 x 12	14,7	251,1	418,0
11009508	3,31	9 x 12	16,8	319,5	525,0
11009509	3,31	12 x 12	18,8	434,2	680,0
11009510	3,31	15 x 12	20,8	534,5	820,0
11009511	3,31	16 x 12	20,8	565,2	857,0
11009512	3,31	18 x 12	22,8	631,1	1006,0
11009513	3,31	19 x 12	22,8	661,8	1045,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009514	3,31	20 x 12	23,9	697,2	1100,0
11009515	3,31	25 x 12	26,5	884,7	1354,0
11009516	5,26	2 x 10	12,3	130,1	232,0
11009517	5,26	3 x 10	13,0	181,7	299,0
63072	5,26	4 x 10	15,0	258,0	412,0
63073	5,26	5 x 10	16,3	320,0	506,0
63074	5,26	7 x 10	17,8	407,0	640,0
11009518	5,26	9 x 10	20,6	517,7	798,0
11009519	5,26	12 x 10	24,0	676,1	1013,0
11009520	5,26	18 x 10	27,9	1013,9	1530,0
11009521	5,26	19 x 10	27,9	1063,3	1591,0
11009522	5,26	25 x 10	32,4	1383,5	2034,0
11009523	8,37	3 x 8	18,1	299,6	525,0
63075	8,37	4 x 8	19,9	397,2	670,0
11009524	8,37	5 x 8	22,6	472,8	838,0
11009525	8,37	7 x 8	24,5	639,0	1074,0
11009526	13,3	3 x 6	20,1	445,1	701,0
63076	13,3	4 x 6	23,2	595,1	975,0
11009527	13,3	5 x 6	25,1	711,5	1128,0
11009528	13,3	7 x 6	27,5	994,8	1496,0
11009529	21,2	3 x 4	25,2	685,9	1101,0
63077	21,2	4 x 4	27,8	910,8	1406,0
11009530	21,2	5 x 4	30,4	1133,5	1702,0
11009531	33,6	3 x 2	29,3	1071,2	1565,0
63078	33,6	4 x 2	32,3	1413,8	2076,0
11009532	33,6	5 x 2	35,4	1729,4	2411,0
63330	42,4	4 x 1	36,4	1622,1	2626,0
11009533	53,5	4 x 1/0	37,8	2152,3	2973,0
11009534	67,4	4 x 2/0	41,1	2716,8	3628,0
11009535	84,7	4 x 3/0	43,3	3365,8	4342,0
710467	107,0	4 x 4/0	47,4	4166,9	5618,0
11009536	127,0	4 x 250 kcmil	54,9	4885,6	6503,0
11009537	175,0	4 x 350 kcmil	60,1	6769,7	8650,0
11009538	256,0	4 x 500 kcmil	70,7	9637,3	11790,0

Dimensions and specifications may be changed without prior notice. (RN01)

# TRAYCONTROL® 500 flexible, oil-resistant, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



HELUKABEL TRAYCONTROL 500 P/N 63111 14 AWG (2.08mm<sup>2</sup>) 4C (UL) TC-ER 90C DRY / WET 600V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "FLEXING" OR WTTC 1000V OR c(UL) CIC-TC FT4 LL257839 CSA AWM I/II A/B 90C 600V FT4 CE

## Technical data

- PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**  
flexing 5x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Conductors stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, easy to install

### Available on request

- With blue conductors (DC)
- With red conductors (AC)
- Black or TPE outer jacket

## Application

TRAYCONTROL® 500 is a flexible, oil-resistant control and power cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for machines throughout industrial plants, according to NFPA 79. It is approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (Oil Res I/II) guarantees a long service life in dry, damp and wet industrial environments. Recommended applications: production lines, machine building, switch cabinets, conveyor systems, packaging machines, bottling plants and automotive manufacturing facilities.

☞ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63079	0,507	2 x 20	6,7	10,3	55,0
63080	0,507	3 x 20	7,1	13,7	61,0
63081	0,507	4 x 20	7,6	18,3	79,0
63082	0,507	5 x 20	8,1	22,9	88,0
63083	0,507	7 x 20	8,7	32,0	109,0
63084	0,507	9 x 20	10,1	41,7	137,0
63085	0,507	12 x 20	11,1	55,1	168,0
63086	0,507	18 x 20	12,9	82,9	231,0
63087	0,507	25 x 20	15,7	115,4	335,0
63088	0,963	2 x 18	7,3	19,3	67,0
63089	0,963	3 x 18	7,6	26,7	82,0
63090	0,963	4 x 18	8,2	34,5	100,0
63091	0,963	5 x 18	8,9	44,6	118,0
63092	0,963	7 x 18	9,6	62,7	149,0
63093	0,963	9 x 18	11,1	81,3	186,0
63094	0,963	10 x 18	11,8	90,4	205,0
63095	0,963	12 x 18	12,2	109,5	234,0
63096	0,963	15 x 18	14,4	134,5	314,0
63097	0,963	16 x 18	14,4	143,3	327,0
63098	0,963	18 x 18	15,1	161,4	363,0
63099	0,963	19 x 18	15,1	170,3	369,0
63100	0,963	25 x 18	17,4	188,4	475,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63101	0,963	27 x 18	17,7	242,2	501,0
63102	0,963	34 x 18	19,7	305,2	618,0
63103	0,963	37 x 18	19,7	332,3	652,0
63104	0,963	41 x 18	21,0	368,2	716,0
63105	0,963	50 x 18	24,0	449,2	912,0
63106	0,963	61 x 18	25,2	548,4	1071,0
63107	1,31	2 x 16	7,8	24,0	79,0
63108	1,31	3 x 16	8,2	36,1	104,0
63109	1,31	4 x 16	8,8	48,1	121,0
63110	1,31	5 x 16	9,6	60,4	143,0
63112	1,31	6 x 16	10,5	72,9	167,0
63113	1,31	7 x 16	10,5	87,8	183,0
63114	1,31	8 x 16	11,2	96,6	208,0
63115	1,31	9 x 16	12,0	108,8	228,0
63116	1,31	10 x 16	13,0	120,9	251,0
63117	1,31	12 x 16	13,4	145,3	292,0
63118	1,31	14 x 16	14,9	169,4	359,0
63119	1,31	15 x 16	15,6	181,6	384,0
63120	1,31	16 x 16	15,6	193,7	402,0
63121	1,31	18 x 16	16,4	218,6	443,0
63122	1,31	19 x 16	16,4	230,1	457,0
63123	1,31	20 x 16	17,1	242,3	482,0

# TRAYCONTROL® 500 flexible, oil-resistant, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63124	1,31	25 x 16	18,9	303,7	588,0
63125	1,31	27 x 16	19,3	327,4	621,0
63126	1,31	30 x 16	20,0	364,0	685,0
63127	1,31	34 x 16	22,5	412,7	826,0
63128	1,31	40 x 16	23,2	485,8	929,0
63129	1,31	41 x 16	24,0	497,7	952,0
63130	1,31	50 x 16	26,1	607,3	1138,0
63131	1,31	61 x 16	27,5	741,1	1333,0
63132	2,08	2 x 14	8,8	37,7	103,0
63133	2,08	3 x 14	9,2	56,6	134,0
63111	2,08	4 x 14	10,1	75,6	168,0
63164	2,08	5 x 14	10,9	94,5	190,0
63165	2,08	6 x 14	12,0	113,6	228,0
63166	2,08	7 x 14	12,0	132,6	251,0
63167	2,08	9 x 14	14,7	170,7	350,0
63168	2,08	10 x 14	15,8	189,7	384,0
63169	2,08	12 x 14	16,4	233,8	439,0
63170	2,08	16 x 14	18,0	303,9	555,0
63171	2,08	18 x 14	18,9	347,1	615,0
63172	2,08	19 x 14	18,9	361,0	640,0
63173	2,08	25 x 14	23,0	478,0	885,0
63174	3,31	2 x 12	9,7	62,2	137,0
63175	3,31	3 x 12	10,2	93,5	179,0
63176	3,31	4 x 12	11,2	125,1	223,0
63177	3,31	5 x 12	12,2	156,4	277,0
63178	3,31	6 x 12	13,4	187,5	317,0
63179	3,31	7 x 12	13,4	218,8	357,0
63180	3,31	9 x 12	16,4	281,7	484,0
63181	3,31	12 x 12	18,3	376,1	625,0
63182	3,31	16 x 12	20,1	502,0	789,0
11009539	3,31	18 x 12	22,3	564,8	936,0
63183	3,31	19 x 12	22,3	596,1	982,0
63184	3,31	20 x 12	23,3	627,9	1024,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63185	3,31	25 x 12	25,8	785,3	1257,0
63186	5,26	2 x 10	11,8	99,6	195,0
63187	5,26	3 x 10	12,5	149,6	260,0
63188	5,26	4 x 10	14,4	200,2	360,0
63189	5,26	5 x 10	15,8	251,2	435,0
63190	5,26	7 x 10	17,1	353,6	570,0
63191	5,26	9 x 10	19,9	449,6	716,0
63192	5,26	12 x 10	23,3	622,8	981,0
11009540	5,26	18 x 10	27,2	958,7	1415,0
63193	5,26	19 x 10	27,2	1031,3	1452,0
11009541	5,26	25 x 10	31,6	1376,6	1833,0
63194	8,37	3 x 8	17,4	238,1	454,0
63195	8,37	4 x 8	19,2	311,8	573,0
63196	8,37	5 x 8	21,0	390,2	692,0
11009542	8,37	7 x 8	23,9	552,1	1009,0
63197	13,3	3 x 6	19,5	378,3	634,0
63198	13,3	4 x 6	22,4	504,9	871,0
63199	13,3	5 x 6	24,5	631,9	1046,0
11009543	13,3	7 x 6	26,7	884,0	1391,0
62802	21,2	3 x 4	24,6	598,2	1031,0
62803	21,2	4 x 4	27,0	800,3	1265,0
62804	21,2	5 x 4	29,7	998,2	1579,0
62805	33,6	3 x 2	28,5	943,4	1488,0
62806	33,6	4 x 2	31,5	1259,4	1972,0
62807	33,6	5 x 2	34,6	1576,1	2344,0
62808	42,4	4 x 1	35,6	1549,4	2421,0
62809	53,5	4 x 1/0	37,0	2099,1	2969,0
62810	67,4	4 x 2/0	40,3	2560,9	3568,0
62811	84,7	4 x 3/0	44,0	2938,7	4402,0
62812	107,0	4 x 4/0	46,8	4078,2	5149,0
11009544	127,0	4 x 250 kcmil	53,5	4933,3	6418,0
11009545	177,0	4 x 350 kcmil	60,6	6989,9	8560,0
11009546	253,0	4 x 500 kcmil	71,5	9896,3	12222,0

Dimensions and specifications may be changed without prior notice. (RN01)

# TRAYCONTROL® 500-C flexible, oil-resistant, shielded, EMC-preferred type, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



HELUKABEL TRAYCONTROL 500-C P/N 62855 12 AWG (3,31mm<sup>2</sup>) 4C (UL) TC-ER 90C DRY / WET 600V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "FLEXING" OR WTTC 1000V OR c(UL) CIC-TC FT4 LL257839 CSA AWM I/II A/B 90C 600V FT4 CE

## Technical data

- Shielded, PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**  
max. 250 Ohm/km
- **Minimum bending radius**  
flexing 6x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Conductors stranded in layers with optimal lay length
- Foil separator
- Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant according to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, easy to install

### Available on request

- With blue conductors (DC)
- With red conductors (AC)
- Black or TPE outer jacket

## Application

TRAYCONTROL® 500-C is a flexible, shielded, and oil-resistant control and power cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for machines throughout industrial plants, according to NFPA 79. It is approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (Oil Res I/II) guarantees a long service life in dry, damp and wet industrial environments. Recommended applications: production lines, machine building, switch cabinets, conveyor systems, packaging machines, bottling plants and automotive manufacturing facilities.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

☞ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62813	0,507	2 x 20	7,3	26,6	76,0
62814	0,507	3 x 20	7,6	33,3	88,0
11009547	0,507	4 x 20	8,1	40,8	103,0
11009548	0,507	5 x 20	8,7	48,2	118,0
62815	0,507	7 x 20	9,3	61,5	143,0
11009549	0,507	9 x 20	10,5	76,9	174,0
62816	0,507	12 x 20	11,6	97,3	213,0
11009550	0,507	18 x 20	13,6	136,8	284,0
62817	0,507	25 x 20	16,2	182,9	405,0
62818	0,963	2 x 18	7,8	32,0	89,0
62819	0,963	3 x 18	8,2	43,9	107,0
62820	0,963	4 x 18	8,8	54,9	126,0
62821	0,963	5 x 18	9,4	66,3	150,0
62822	0,963	7 x 18	10,1	86,0	180,0
62823	0,963	9 x 18	11,6	110,3	222,0
62824	0,963	10 x 18	12,4	122,0	244,0
62825	0,963	12 x 18	12,8	150,9	278,0
62826	0,963	15 x 18	14,9	172,5	359,0
11009551	0,963	16 x 18	14,9	181,0	372,0
62827	0,963	18 x 18	15,6	201,8	402,0
62828	0,963	19 x 18	15,6	210,7	420,0
62829	0,963	25 x 18	17,9	280,7	543,0
11009552	0,963	27 x 18	18,4	307,6	576,0
11009553	0,963	34 x 18	20,3	379,2	695,0
11009554	0,963	37 x 18	20,3	406,1	734,0
11009555	0,963	41 x 18	22,7	448,4	865,0
11009556	0,963	50 x 18	24,5	537,4	1013,0
11009557	0,963	61 x 18	26,0	665,7	1205,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009558	1,31	2 x 16	8,4	43,0	100,0
62830	1,31	3 x 16	8,7	52,8	124,0
62831	1,31	4 x 16	9,4	65,9	149,0
62832	1,31	5 x 16	10,1	81,4	173,0
62833	1,31	6 x 16	10,9	100,0	196,0
62834	1,31	7 x 16	10,9	106,6	216,0
11009559	1,31	8 x 16	11,7	121,7	240,0
62835	1,31	9 x 16	12,5	141,8	265,0
62836	1,31	10 x 16	14,3	157,2	323,0
62837	1,31	12 x 16	14,7	193,5	365,0
11009560	1,31	14 x 16	15,3	209,4	405,0
62838	1,31	15 x 16	16,1	223,8	430,0
11009561	1,31	16 x 16	16,1	236,2	448,0
62839	1,31	18 x 16	16,8	279,2	499,0
62840	1,31	19 x 16	16,8	289,9	524,0
62841	1,31	20 x 16	17,8	305,5	552,0
62842	1,31	25 x 16	19,5	371,4	662,0
11009562	1,31	27 x 16	19,9	400,0	699,0
11009563	1,31	30 x 16	20,6	439,5	759,0
11009564	1,31	34 x 16	23,1	494,7	908,0
11009565	1,31	40 x 16	23,9	571,3	1022,0
11009566	1,31	41 x 16	24,7	586,9	1052,0
11009567	1,31	50 x 16	26,8	729,3	1263,0
11009568	1,31	61 x 16	28,3	871,6	1476,0
11009569	2,08	2 x 14	9,4	60,4	129,0
62843	2,08	3 x 14	9,8	76,5	161,0
62844	2,08	4 x 14	10,6	102,7	171,0
62845	2,08	5 x 14	11,5	124,4	231,0



# TRAYCONTROL® 500-C flexible, oil-resistant, shielded, EMC-preferred type, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, torsion rated



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009570	2,08	6 x 14	12,5	147,2	263,0
62846	2,08	7 x 14	12,5	162,8	290,0
62847	2,08	9 x 14	15,2	211,0	390,0
62848	2,08	10 x 14	16,3	233,6	443,0
62849	2,08	12 x 14	16,8	288,7	506,0
62850	2,08	15 x 14	18,6	353,6	603,0
11009571	2,08	16 x 14	18,6	372,8	628,0
62851	2,08	18 x 14	19,5	415,2	673,0
62852	2,08	19 x 14	19,5	434,4	716,0
62853	2,08	25 x 14	23,7	563,6	997,0
11009572	3,31	2 x 12	10,3	86,3	165,0
62854	3,31	3 x 12	10,8	118,6	208,0
62855	3,31	4 x 12	11,8	163,3	333,0
62856	3,31	5 x 12	12,8	202,2	313,0
62857	3,31	6 x 12	14,7	220,4	384,0
62858	3,31	7 x 12	14,7	251,1	418,0
62859	3,31	9 x 12	16,8	319,5	525,0
62860	3,31	12 x 12	18,8	434,2	680,0
62861	3,31	15 x 12	20,8	534,5	820,0
11009573	3,31	16 x 12	20,8	565,2	857,0
11009574	3,31	18 x 12	22,8	631,1	1006,0
62862	3,31	19 x 12	22,8	661,8	1045,0
62863	3,31	20 x 12	23,9	697,2	1100,0
62864	3,31	25 x 12	26,5	884,6	1354,0
11009575	5,26	2 x 10	12,3	130,1	232,0
62865	5,26	3 x 10	13,0	181,7	299,0
62866	5,26	4 x 10	15,0	258,0	412,0
62867	5,26	5 x 10	16,3	320,0	506,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62868	5,26	7 x 10	17,8	407,0	640,0
62869	5,26	9 x 10	20,6	517,7	798,0
62870	5,26	12 x 10	24,0	676,1	1013,0
11009576	5,26	18 x 10	27,9	1013,9	1530,0
62871	5,26	19 x 10	27,9	1063,3	1591,0
11009577	5,26	25 x 10	32,4	1383,5	2034,0
11009578	8,37	3 x 8	18,1	299,6	525,0
62872	8,37	4 x 8	19,9	397,2	670,0
11009579	8,37	5 x 8	22,6	472,8	838,0
11009580	8,37	7 x 8	24,5	639,0	1074,0
11009581	13,3	3 x 6	20,1	445,1	701,0
62873	13,3	4 x 6	23,2	595,1	975,0
11009582	13,3	5 x 6	25,1	711,5	1128,0
11009583	13,3	7 x 6	27,5	994,8	1496,0
11009584	21,2	3 x 4	25,2	685,9	1101,0
62874	21,2	4 x 4	27,8	910,8	1406,0
11009585	21,2	5 x 4	30,4	1133,5	1702,0
11009586	33,6	3 x 2	29,3	1071,2	1565,0
62875	33,6	4 x 2	32,3	1413,8	2076,0
11009587	33,6	5 x 2	35,4	1729,4	2411,0
11009588	42,4	4 x 1	36,4	2154,9	2626,0
11009589	53,5	4 x 1/0	37,8	2152,3	2973,0
11009590	67,4	4 x 2/0	41,1	2716,8	3628,0
11009591	84,7	4 x 3/0	43,3	3365,8	4342,0
11009592	107,0	4 x 4/0	47,4	4166,9	5618,0
11009593	127,0	4 x 250 kcmil	53,1	4970,5	6503,0
11009594	175,0	4 x 350 kcmil	60,1	6769,7	8560,0
11009595	276,0	4 x 500 kcmil	70,7	9637,3	11790,0

Dimensions and specifications may be changed without prior notice.

# JZ-602 / OZ-602

90°C, 600 V



## TECHNICAL DATA

PVC control and connection cable acc. to UL Std. 758 (AWM) Style 2587, CSA Std. C22.2 No. 210 - AWM I/II A/B

Temperature range	flexing -10°C to +90°C static -40°C to +90°C
Nominal voltage	UL (AWM) AC 600 V
Test voltage core/core	3000 V
Breakdown voltage	6000 V
Minimum bending radius	flexing 7.5x Outer Ø static 4x Outer Ø

## ■ CABLE STRUCTURE

- Bare copper wire, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5
- Conductor insulation: PVC acc. to UL Std. 758 (AWM) Style 11008, CSA Std. C22.2 No. 210
- Conductor identification acc. to DIN VDE 0293-334, black conductors with consecutive white numbers
- Protective conductor: starting with 3 conductors, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor (OZ)
- Conductors stranded in layers with optimal lay lengths
- Outer jacket: PVC acc. to UL Std. 758 (AWM) Style 2587, CSA Std. C22.2 No. 210

- Jacket color: gray (RAL 7001)
- Length marking: in meters

## ■ PROPERTIES

- Largely resistant to: oil
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## ■ TESTS

- Flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1

## ■ APPLICATION

UL/CSA-approved, flexible control cable (up to 600 V) for machine, tool and plant construction. Suitable for medium mechanical stress with free movement, without tensile stress and without forced movements in dry, damp and wet rooms, however, not suitable for outdoor use.

## ■ NOTES

- The conductor is metrically (mm<sup>2</sup>) constructed, AWG numbers are approximated, and are for reference only

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
83090	2 x 0.5	20	5.0	10.8	49.0
83091	3 G 0.5	20	5.3	16.1	58.0
83092	4 G 0.5	20	5.7	21.5	69.0
83093	5 G 0.5	20	6.2	27.0	84.0
83094	7 G 0.5	20	6.7	37.6	123.0
83100	8 G 0.5	20	7.2	43.0	140.0
83101	9 G 0.5	20	7.8	48.4	177.0
83095	12 G 0.5	20	8.8	64.5	192.0
83096	18 G 0.5	20	10.5	97.0	256.0
83097	25 G 0.5	20	12.4	134.5	358.0
83098	34 G 0.5	20	14.3	182.8	487.0
83099	41 G 0.5	20	15.4	220.4	580.0
83080	2 x 1	18	5.8	19.2	53.0
83081	3 G 1	18	6.1	27.0	61.0
83565	3 x 1	18	6.1	27.0	61.0
83082	4 G 1	18	6.6	38.4	74.0
83083	5 G 1	18	7.3	48.0	90.0
83084	7 G 1	18	7.9	67.0	130.0
83102	8 G 1	18	8.8	76.8	144.0
83103	9 G 1	18	9.4	86.4	180.0
83085	12 G 1	18	10.6	115.2	198.0
83086	18 G 1	18	12.7	173.0	274.0
83087	25 G 1	18	15.0	240.0	384.0
83088	34 G 1	18	17.5	326.0	494.0
83089	41 G 1	18	18.8	394.0	508.0
83070	2 x 1.5	16	6.4	28.8	73.0
83071	3 G 1.5	16	6.8	44.0	94.0

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
83072	4 G 1.5	16	7.4	58.0	117.0
83073	5 G 1.5	16	8.1	72.0	140.0
83074	7 G 1.5	16	9.0	101.0	186.0
83104	9 G 1.5	16	10.7	129.7	244.0
83075	12 G 1.5	16	11.8	173.0	319.0
83076	18 G 1.5	16	14.4	260.0	451.0
83077	25 G 1.5	16	17.0	360.0	625.0
83078	34 G 1.5	16	19.8	490.0	840.0
83079	41 G 1.5	16	21.5	590.0	1032.0
83060	2 x 2.5	14	7.6	48.0	115.0
83061	3 G 2.5	14	8.1	72.0	143.0
83062	4 G 2.5	14	9.0	96.0	185.0
83063	5 G 2.5	14	9.9	120.0	221.0
83064	7 G 2.5	14	11.0	168.0	293.0
83065	9 G 2.5	14	13.1	216.0	429.0
83066	12 G 2.5	14	14.7	288.0	563.0
83067	18 G 2.5	14	17.8	432.0	854.0
83068	19 G 2.5	14	17.8	456.0	914.0
83069	25 G 2.5	14	21.2	600.0	1188.0
83051	3 G 4	12	9.5	115.0	232.0
83052	4 G 4	12	10.6	154.0	298.0
83053	5 G 4	12	11.7	192.0	358.0
83054	7 G 4	12	13.0	269.0	460.0
83041	3 G 6	10	11.5	173.0	360.0
83042	4 G 6	10	12.8	231.0	402.0
83043	5 G 6	10	14.3	288.0	484.0
83044	7 G 6	10	15.8	403.0	630.0

# JZ-602 / OZ-602

90°C, 600 V



Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
83031	3 G 10	8	14.9	288.0	535.0
83032	4 G 10	8	16.5	384.0	653.0
83033	5 G 10	8	18.5	480.0	786.0
83034	7 G 10	8	20.4	672.0	1100.0
83020	2 x 16	6	17.6	307.0	640.0
83021	3 G 16	6	18.6	461.0	810.0
83022	4 G 16	6	20.5	615.0	1045.0
83023	5 G 16	6	23.0	768.0	1260.0
83024	7 G 16	6	25.2	1075.0	1760.0
83011	3 G 25	4	23.1	720.0	1180.0
83012	4 G 25	4	25.4	960.0	1507.0
83013	5 G 25	4	28.4	1200.0	1858.0
83014	7 G 25	4	31.4	1680.0	2830.0
83001	3 G 35	2	25.4	1008.0	1590.0

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
83002	4 G 35	2	28.2	1344.0	2123.0
83003	5 G 35	2	31.5	1680.0	2612.0
83004	3 G 50	1	30.1	1440.0	2652.0
83005	4 G 50	1	33.4	1920.0	3058.0
83006	5 G 50	1	37.3	2400.0	4093.0
83007	3 G 70	2/0	34.2	2016.0	3307.0
83008	4 G 70	2/0	37.9	2688.0	4254.0
83009	5 G 70	2/0	42.4	3360.0	5661.0
83010	3 G 95	3/0	38.6	2736.0	4867.0
83015	4 G 95	3/0	42.7	3648.0	5762.0
83016	5 G 95	3/0	47.8	4560.0	7208.0
83017	3 G 120	4/0	42.9	3456.0	5580.0
83018	4 G 120	4/0	47.6	4608.0	7280.0
83019	5 G 120	4/0	53.1	5760.0	8692.0

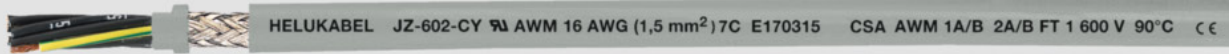


### Large Inventory & Short Lead Times

Having an extensive in-stock product offering allows our staff to package and ship most orders within the same business day.

# JZ-602-CY

Screened two approval control cable, 90°C, 600 V, meter marking, EMC-preferred type



## Technical data

- Control cable of special-PVC acc. to UL CSA AWM I/II A/B Style 2587 and CSA
- **Temperature range** flexing -5°C to +90°C fixed installation -40°C to +90°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Minimum bending radius** flexing 10x cable Ø fixed installation 5x cable Ø
- **Coupling resistance** max. 250 Ohm/km

## Cable structure

- Bare copper conductor, fine wire acc. to DIN VDE 0295 cl.5 / IEC 60228 cl.5
- Core insulation PVC UL type 90°C acc. to UL Std. 758 as well as CSA Std. C22.2 No.210
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above in the outer layer
- Cores stranded in layers with optimal lay length
- Inner sheath PVC UL type 90°C acc. to UL Std. 758 as well as CSA Std. C22.2 No.210
- Braided screen of tinned Cu wires approx. 85% coverage
- Outer sheath PVC UL type 90°C acc. to UL Std. 758 as well as CSA Std. C22.2 No.210
- Sheath colour: grey (RAL 7001)
- With meter marking

## Properties

- Extensively oil resistant
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## Tests

- Flame retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2 / UL VW-1 / CSA FT1

## Note

- G = with GN-YE conductor x = without GN-YE conductor (OZ)
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- AWG sizes are approximate equivalent values. The actual cross section is in mm<sup>2</sup>.
- Unscreened analogue type: **JZ-602**

## Application

UL and CSA approved flexible control cables up to 600 V, for all machinery in tooling and plant construction, suitable for installation in dry, moist or wet environments for medium mechanical loads. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada. The thick braiding screen ensures compliance with electromagnetic requirements.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

**CE** = Product conforms with Low-Voltage Directive 2014/35/EU.

Part no.	No. cores x cross-sec. mm <sup>2</sup>	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82990	2 x 0,5	20	7,0	35,0	93,0
82991	3 G 0,5	20	7,3	42,0	124,0
82992	4 G 0,5	20	7,7	47,0	133,0
82993	5 G 0,5	20	8,2	56,0	153,0
82994	7 G 0,5	20	8,9	69,0	191,0
82995	9 G 0,5	20	10,0	87,0	243,0
82996	12 G 0,5	20	11,0	108,0	322,0
82997	18 G 0,5	20	13,1	145,0	374,0
82998	25 G 0,5	20	15,0	240,0	436,0
82999	34 G 0,5	20	16,9	312,0	560,0
83000	41 G 0,5	20	18,4	348,0	663,0
82979	2 x 1	18	7,8	50,0	107,0
82980	3 G 1	18	8,2	60,0	130,0
82981	4 G 1	18	8,9	71,0	155,0
82982	5 G 1	18	9,5	88,0	181,0
82983	7 G 1	18	10,1	111,0	209,0
82984	9 G 1	18	11,8	139,0	321,0
82985	12 G 1	18	13,3	184,0	341,0
82986	18 G 1	18	15,3	260,0	473,0
82987	25 G 1	18	18,0	349,0	650,0
82988	34 G 1	18	20,5	486,0	781,0

Part no.	No. cores x cross-sec. mm <sup>2</sup>	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82989	41 G 1	18	22,0	531,0	892,0
82968	2 x 1,5	16	8,4	63,0	136,0
82969	3 G 1,5	16	9,0	80,0	165,0
82970	4 G 1,5	16	9,6	97,0	192,0
82971	5 G 1,5	16	10,5	119,0	224,0
82972	7 G 1,5	16	11,2	147,0	273,0
82973	9 G 1,5	16	13,3	182,0	340,0
82974	12 G 1,5	16	14,7	267,0	461,0
82975	18 G 1,5	16	17,0	374,0	674,0
82976	25 G 1,5	16	20,2	526,0	950,0
82977	34 G 1,5	16	23,0	629,0	1203,0
82978	41 G 1,5	16	25,1	801,0	1588,0
82959	2 x 2,5	14	9,8	96,0	173,0
82960	3 G 2,5	14	10,5	144,0	220,0
82961	4 G 2,5	14	11,2	148,0	270,0
82962	5 G 2,5	14	12,5	181,0	329,0
82963	7 G 2,5	14	13,6	255,0	428,0
82964	9 G 2,5	14	15,9	309,0	580,0
82965	12 G 2,5	14	17,5	441,0	761,0
82966	18 G 2,5	14	21,0	570,0	1140,0
82967	25 G 2,5	14	24,6	738,0	1551,0

# JZ-602-CY

Screened two approval control cable, 90°C, 600 V,  
meter marking, EMC-preferred type



Part no.	No. cores x cross-sec. mm <sup>2</sup>	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82954	2 x 4	12	11,2	120,0	209,0
82955	3 G 4	12	12,0	174,0	310,0
82956	4 G 4	12	13,3	230,0	456,0
82957	5 G 4	12	14,6	273,0	532,0
82958	7 G 4	12	15,8	316,0	737,0
82949	2 x 6	10	13,4	173,0	318,0
82950	3 G 6	10	14,3	240,0	411,0
82951	4 G 6	10	15,4	305,0	572,0
82952	5 G 6	10	16,9	439,0	732,0
82953	7 G 6	10	18,6	505,0	961,0
82945	3 G 10	8	17,7	350,0	741,0
82946	4 G 10	8	19,8	535,0	988,0
82947	5 G 10	8	21,7	592,0	1202,0
82948	7 G 10	8	23,6	810,0	1743,0
82941	3 G 16	6	21,9	585,0	1088,0
82942	4 G 16	6	24,0	740,0	1662,0
82943	5 G 16	6	26,6	895,0	2021,0
82944	7 G 16	6	28,8	1282,0	2720,0

Part no.	No. cores x cross-sec. mm <sup>2</sup>	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82937	3 G 25	4	26,7	1070,0	1947,0
82938	4 G 25	4	29,1	1140,0	2591,0
82939	5 G 25	4	32,3	1380,0	3197,0
82940	7 G 25	4	35,2	1870,0	4530,0
82934	3 G 35	2	29,1	1240,0	2701,0
82935	4 G 35	2	32,1	1576,0	3277,0
82936	5 G 35	2	35,4	1930,0	4530,0
82488	3 G 50	1	34,0	1675,0	2870,0
82780	4 G 50	1	37,4	2155,0	3960,0
82781	5 G 50	1	41,3	2794,0	4371,0
82782	3 G 70	2/0	38,4	2288,0	3647,0
82783	4 G 70	2/0	42,3	3120,0	4882,0
82914	5 G 70	2/0	46,7	3705,0	5876,0
82915	3 G 95	3/0	42,9	3010,0	4751,0
82916	4 G 95	3/0	47,2	4043,0	6368,0
82917	5 G 95	3/0	52,4	5026,0	7843,0
82918	3 G 120	4/0	47,3	3812,0	5899,0
82919	4 G 120	4/0	52,2	5069,0	8010,0
82920	5 G 120	4/0	57,9	5877,0	9205,0

Dimensions and specifications may be changed without prior notice. (RN01)

# TRAYCONTROL® 530 flexible, oil-resistant, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79



## Technical data

- PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTTC 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**  
flexing 5x cable Ø

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Blue conductors with continuous white numbering & 1 GN-YE conductor. When 3 conductors or more, second conductor is blue/white neutral.
- Conductors stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Available on request

- Red, black, yellow or orange conductors
- Black or TPE outer jacket

## Application

TRAYCONTROL® 530 is a flexible, oil-resistant control and power cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for AC, DC or control wiring in accordance with NFPA 79. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (Oil Res I/II) guarantees a long service life for industrial applications in dry, damp and wet environments. Recommended applications: machine tools, production lines, and automotive industry manufacturing operations.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009596	0,507	2 x 20	6,7	10,3	55,0
11009597	0,507	3 x 20	7,0	13,7	64,0
11009598	0,507	4 x 20	7,5	18,3	74,0
11009599	0,507	5 x 20	8,1	22,9	88,0
11009600	0,507	7 x 20	8,7	32,0	109,0
11009601	0,507	9 x 20	10,1	41,7	137,0
11009602	0,507	12 x 20	11,1	55,1	168,0
11009603	0,507	18 x 20	12,9	82,9	231,0
11009604	0,507	25 x 20	15,7	115,5	335,0
66840	0,963	2 x 18	7,3	19,2	67,0
66841	0,963	3 x 18	7,6	26,8	82,0
66842	0,963	4 x 18	8,2	34,5	100,0
66843	0,963	5 x 18	8,9	44,6	118,0
66844	0,963	7 x 18	9,6	62,7	149,0
66845	0,963	9 x 18	11,1	81,4	185,0
66846	0,963	10 x 18	11,9	90,3	205,0
66847	0,963	12 x 18	12,2	109,5	234,0
66848	0,963	15 x 18	14,4	134,4	313,0
66849	0,963	16 x 18	14,4	143,3	327,0
66850	0,963	18 x 18	15,1	161,3	363,0
66851	0,963	19 x 18	15,1	170,4	372,0
66852	0,963	25 x 18	17,4	188,4	475,0
66853	0,963	27 x 18	17,7	242,3	501,0
66854	0,963	33 x 18	19,0	295,5	592,0
66855	0,963	34 x 18	19,7	305,2	618,0
11009605	0,963	37 x 18	19,7	332,3	652,0
66856	0,963	41 x 18	21,1	368,3	717,0
66857	0,963	42 x 18	21,1	376,2	729,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66858	0,963	49 x 18	23,9	438,9	900,0
66859	0,963	50 x 18	23,9	449,3	912,0
66860	0,963	61 x 18	25,2	548,4	1071,0
66861	0,963	65 x 18	26,0	582,0	1132,0
66862	1,31	2 x 16	7,8	24,0	77,0
66863	1,31	3 x 16	8,2	36,2	104,0
66864	1,31	4 x 16	8,8	48,1	121,0
66865	1,31	5 x 16	9,6	60,4	143,0
11009606	1,31	6 x 16	10,5	72,9	167,0
66866	1,31	7 x 16	10,5	87,8	247,0
11009607	1,31	8 x 16	11,2	96,6	208,0
66867	1,31	9 x 16	12,0	108,8	231,0
66868	1,31	10 x 16	13,0	120,8	251,0
66869	1,31	12 x 16	13,4	145,4	292,0
11009608	1,31	14 x 16	14,9	169,5	359,0
66870	1,31	15 x 16	15,6	181,6	384,0
66871	1,31	16 x 16	15,6	193,8	402,0
710137	1,31	17 x 16	16,4	207,2	424,0
66872	1,31	18 x 16	16,4	218,6	446,0
66873	1,31	19 x 16	16,4	230,1	457,0
11009609	1,31	20 x 16	17,1	242,3	482,0
66874	1,31	25 x 16	18,9	303,7	588,0
66875	1,31	27 x 16	19,3	327,4	621,0
11009610	1,31	30 x 16	20,0	364,0	685,0
66876	1,31	33 x 16	20,7	402,1	735,0
66877	1,31	34 x 16	22,5	412,7	815,0
11009611	1,31	40 x 16	23,2	485,9	929,0
66878	1,31	41 x 16	24,0	497,6	952,0

# TRAYCONTROL® 530 flexible, oil-resistant, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66879	1,31	42 x 16	24,0	511,9	970,0
66880	1,31	49 x 16	26,0	597,2	1113,0
66881	1,31	50 x 16	26,0	607,3	1131,0
66882	1,31	61 x 16	27,5	741,1	1333,0
66883	1,31	65 x 16	28,3	792,3	1411,0
66884	2,08	2 x 14	8,8	37,7	103,0
66885	2,08	3 x 14	9,2	56,6	131,0
66886	2,08	4 x 14	10,1	75,6	137,0
66887	2,08	5 x 14	10,9	94,5	190,0
66888	2,08	6 x 14	11,9	113,5	228,0
66889	2,08	7 x 14	12,0	132,6	251,0
66890	2,08	9 x 14	14,7	170,7	350,0
66891	2,08	10 x 14	15,8	189,7	382,0
66892	2,08	12 x 14	16,4	233,8	442,0
66893	2,08	16 x 14	18,0	303,9	555,0
66894	2,08	18 x 14	18,9	347,0	615,0
66895	2,08	19 x 14	18,9	361,0	640,0
66896	2,08	25 x 14	22,8	478,0	879,0
66897	3,31	2 x 12	9,7	62,2	137,0
66898	3,31	3 x 12	10,2	93,3	179,0
66899	3,31	4 x 12	11,2	125,2	228,0
66900	3,31	5 x 12	12,2	156,4	278,0
66901	3,31	6 x 12	13,3	187,5	317,0
66902	3,31	7 x 12	13,4	218,8	357,0
66903	3,31	9 x 12	16,4	281,7	484,0
66904	3,31	12 x 12	18,3	376,1	625,0
66905	3,31	16 x 12	20,1	502,0	789,0
11009612	3,31	18 x 12	22,3	564,8	936,0
66906	3,31	19 x 12	22,3	596,2	982,0
66907	3,31	20 x 12	23,3	627,9	1024,0
66908	3,31	25 x 12	25,8	785,3	1257,0
11009613	5,26	2 x 10	11,8	99,7	195,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009614	5,26	3 x 10	12,5	149,6	260,0
11009615	5,26	4 x 10	14,4	200,2	360,0
11009616	5,26	5 x 10	15,8	251,2	435,0
11009617	5,26	7 x 10	17,1	353,6	570,0
11009618	5,26	9 x 10	19,9	449,6	716,0
11009619	5,26	12 x 10	23,3	622,9	981,0
11009620	5,26	18 x 10	27,2	958,7	1415,0
11009621	5,26	19 x 10	27,2	1031,3	1452,0
11009622	5,26	25 x 10	31,6	1377,1	1833,0
11009623	8,37	3 x 8	17,4	238,1	454,0
11009624	8,37	4 x 8	19,2	311,8	573,0
11009625	8,37	5 x 8	21,0	390,2	692,0
11009626	8,37	7 x 8	23,9	552,6	1009,0
11009627	13,3	3 x 6	19,5	378,3	634,0
11009628	13,3	4 x 6	22,3	504,9	863,0
11009629	13,3	5 x 6	24,5	631,9	1049,0
11009630	13,3	7 x 6	26,7	884,0	1391,0
11009631	21,2	3 x 4	24,6	598,2	1031,0
11009632	21,2	4 x 4	26,9	800,3	1257,0
11009633	21,2	5 x 4	29,9	998,1	1540,0
11009634	33,6	3 x 2	28,5	943,5	1488,0
11009635	33,6	4 x 2	31,4	1259,4	1902,0
11009636	33,6	5 x 2	34,6	1576,1	2344,0
11009637	42,4	4 x 1	35,6	1549,2	2388,0
11009638	53,5	4 x 1/0	37,0	2099,1	2939,0
11009639	67,4	4 x 2/0	40,3	2560,8	3568,0
11009640	84,7	4 x 3/0	44,0	2938,7	4402,0
11009641	107,0	4 x 4/0	46,8	4078,2	5149,0
11009642	127,0	4 x 250 kcmil	53,5	4933,3	6418,0
11009643	175,0	4 x 350 kcmil	60,6	6989,9	8560,0
11009644	256,0	4 x 500 kcmil	71,5	9896,3	12222,0

Dimensions and specifications may be changed without prior notice.

# TRAYCONTROL® 550 TPE flexible, oil-resistant, exposed run



TC-ER, PLTC-ER, ITC-ER, NFPA 79



## Technical data

- TPE control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC 1000 V
- **Test voltage**  
3000 V
- **Minimum bending radius**  
flexing 5x cable ø

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Blue conductors with continuous white numbering & 1 GN-YE conductor. When 3 conductors or more, second conductor is blue/white neutral.
- Conductors stranded in layers with optimal lay length
- Separator
- Special TPE outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Available on request

- Red, black, yellow or orange conductors
- Black outer jacket
- Shielded variant - consult factory as minimum length required

## Application

TRAYCONTROL® 550 TPE is a flexible, oil-resistant control and power cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for AC, DC or control wiring in accordance with NFPA 79. Approved for open, unprotected installation in cable trays to the machine. Its outstanding oil resistance (Oil Res I/II) guarantees a long service life for industrial applications in dry, damp and wet environments. Recommended applications: machine tools, production lines, and automotive industry manufacturing operations.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009645	0,507	2 x 20	6,7	9,4	52,0
11009646	0,507	3 x 20	7,0	14,1	63,0
11009647	0,507	4 x 20	7,5	18,8	74,0
11009648	0,507	5 x 20	8,1	23,5	86,0
11009649	0,507	7 x 20	8,7	32,8	107,0
11009650	0,507	9 x 20	10,1	42,2	131,0
11009651	0,507	12 x 20	11,1	56,3	162,0
11009652	0,507	18 x 20	12,9	84,4	223,0
11009653	0,507	25 x 20	15,7	117,3	324,0
11009654	0,824	2 x 18	7,1	15,0	61,0
709962	0,824	3 x 18	7,4	22,2	74,0
709963	0,824	4 x 18	8,1	29,6	91,0
709964	0,824	5 x 18	8,7	37,1	106,0
709965	0,824	7 x 18	9,5	52,0	134,0
709966	0,824	9 x 18	10,8	66,9	165,0
709967	0,824	10 x 18	11,6	74,4	183,0
709968	0,824	12 x 18	12,0	89,4	207,0
709969	0,824	15 x 18	13,2	111,7	250,0
709970	0,824	16 x 18	13,2	119,2	262,0
709971	0,824	18 x 18	14,7	134,1	318,0
709972	0,824	19 x 18	14,7	141,5	330,0
709973	0,824	25 x 18	17,0	186,5	418,0
11009655	0,824	27 x 18	17,2	202,5	443,0
11009656	0,824	34 x 18	19,1	255,0	540,0
11009657	0,824	37 x 18	19,1	277,3	574,0
11009658	0,824	41 x 18	20,5	307,4	632,0
11009659	0,824	50 x 18	23,3	374,9	807,0
11009660	0,824	61 x 18	24,6	457,4	946,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009661	1,31	2 x 16	7,8	24,4	76,0
709974	1,31	3 x 16	8,2	36,0	95,0
709975	1,31	4 x 16	8,8	48,1	118,0
709976	1,31	5 x 16	9,6	60,4	138,0
11009662	1,31	6 x 16	10,4	73,1	161,0
709977	1,31	7 x 16	10,4	84,5	179,0
11009663	1,31	8 x 16	11,2	97,5	201,0
709978	1,31	9 x 16	12,0	108,8	223,0
709979	1,31	10 x 16	13,0	121,0	246,0
709980	1,31	12 x 16	13,4	145,2	283,0
11009664	1,31	14 x 16	14,9	170,6	351,0
709981	1,31	15 x 16	15,6	181,5	374,0
709982	1,31	16 x 16	15,6	193,7	391,0
709983	1,31	18 x 16	16,4	218,1	432,0
709984	1,31	19 x 16	16,4	230,3	448,0
11009665	1,31	20 x 16	17,1	243,8	472,0
709985	1,31	25 x 16	18,9	303,3	571,0
11009666	1,31	27 x 16	19,3	329,1	609,0
11009667	1,31	30 x 16	20,0	365,7	665,0
11009668	1,31	34 x 16	22,5	414,4	807,0
11009669	1,31	40 x 16	23,2	487,6	911,0
11009670	1,31	41 x 16	24,0	499,7	938,0
11009671	1,31	50 x 16	26,0	609,4	1112,0
11009672	1,31	61 x 16	27,5	743,5	1314,0
11009673	2,08	2 x 14	8,8	38,4	100,0
710468	2,08	3 x 14	9,2	57,7	128,0
11009674	2,08	4 x 14	10,1	76,9	159,0
11009675	2,08	5 x 14	10,9	96,1	190,0



# TRAYCONTROL® 550 TPE flexible, oil-resistant, exposed run

TC-ER, PLTC-ER, ITC-ER, NFPA 79



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009676	2,08	6 x 14	11,9	115,3	222,0
11009677	2,08	7 x 14	11,9	134,5	247,0
11009678	2,08	9 x 14	14,7	173,0	339,0
11009679	2,08	10 x 14	15,8	192,2	379,0
11009680	2,08	12 x 14	16,4	230,6	430,0
11009681	2,08	16 x 14	18,0	307,5	545,0
11009682	2,08	18 x 14	18,9	345,9	604,0
11009683	2,08	19 x 14	18,9	365,1	629,0
11009684	2,08	25 x 14	22,8	480,4	863,0
11009685	3,31	2 x 12	9,7	63,1	132,0
11009686	3,31	3 x 12	10,2	94,7	174,0
11009687	3,31	4 x 12	11,2	126,3	220,0
11009688	3,31	5 x 12	12,2	157,9	265,0
11009689	3,31	6 x 12	13,3	189,4	311,0
11009690	3,31	7 x 12	13,3	221,0	350,0
11009691	3,31	9 x 12	16,4	284,2	475,0
11009692	3,31	12 x 12	18,3	378,9	606,0
11009693	3,31	16 x 12	20,1	505,2	778,0
11009694	3,31	18 x 12	21,2	568,3	865,0
11009695	3,31	19 x 12	21,2	599,9	903,0
11009696	3,31	20 x 12	23,3	631,5	1007,0
11009697	3,31	25 x 12	25,8	789,3	1228,0
11009698	5,26	2 x 10	11,8	98,7	190,0
11009699	5,26	3 x 10	12,5	148,0	256,0
11009700	5,26	4 x 10	14,3	197,3	354,0
11009701	5,26	5 x 10	15,8	246,7	426,0
11009702	5,26	7 x 10	27,1	345,3	560,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11009703	5,26	9 x 10	19,9	44,0	705,0
11009704	5,26	12 x 10	23,3	592,0	964,0
11009705	5,26	18 x 10	27,2	888,0	1371,0
11009706	5,26	19 x 10	27,2	937,3	1432,0
11009707	5,26	25 x 10	31,6	1233,3	1847,0
11009708	8,37	3 x 8	17,3	236,8	442,0
11009709	8,37	4 x 8	19,2	315,7	563,0
11009710	8,37	5 x 8	21,0	394,7	682,0
11009711	8,37	7 x 8	23,9	552,5	961,0
11009712	13,3	3 x 6	20,2	382,5	621,0
11009713	13,3	4 x 6	22,3	510,0	882,0
11009714	13,3	5 x 6	24,5	637,5	1098,0
11009715	13,3	7 x 6	26,7	892,5	1362,0
11009716	21,2	3 x 4	24,6	581,1	1013,0
11009717	21,2	4 x 4	26,9	774,8	1298,0
11009718	21,2	5 x 4	29,9	968,4	1640,0
11009719	33,6	3 x 2	28,5	988,2	1518,0
11009720	33,6	4 x 2	31,4	1317,6	1954,0
11009721	33,6	5 x 2	34,6	1647,0	2432,0
11009722	42,4	4 x 1	35,6	1621,1	2433,0
11009723	53,5	4 x 1/0	36,4	1973,3	2820,0
11009724	67,4	4 x 2/0	39,2	2519,8	3460,0
11009725	84,7	4 x 3/0	41,9	3157,3	4182,0
11009726	107,0	4 x 4/0	47,4	3977,0	5313,0
11009727	127,0	4 x 250 kcmil	52,9	4715,9	6250,0
11009728	175,0	4 x 350 kcmil	59,4	6552,6	8393,0
11009729	256,0	4 x 500 kcmil	71,7	9604,8	11994,0

Dimensions and specifications may be changed without prior notice.



### One-Stop Shop

Whether you need stock or custom cables, accessories or tools, testing services, or just technical advice, we offer it all under one roof. Our vast product portfolio includes 33,000+ line items for virtually every industrial application.

# TRAYCONTROL® X XLPE insulation, flexible, oil-resistant, WTTC, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, 105°C, torsion rated



## Technical data

- XLPE-insulated, PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**  
flexing 5x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special XLPE conductor insulation
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Conductors stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277) & WTTC (2277) - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), XHHW-2 (14 AWG-500 kcmil), AWM 2586 - 105°C 600V, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Application

NFPA 79 conformant flexible control and power cable with cross-linked (thermoset) polyethylene (XLPE) insulation. XLPE insulation is ideal for applications that require long cable runs due to its low capacitance. A higher current load rating is possible due to the conductor temperature resistance of 105°C. Rated for up to 600 V (WTTC 1000 V), these tray cables are suitable for all machinery in tool and plant construction, and can be installed in dry, humid and damp environments, in the open and in pipes. For underground installation and for open, unprotected installation from the cable rack to machines in industrial plants. They are approved for use in 1kV wind turbine cable tray applications and tested for torsion applications.

CE The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
713207	0,507	2 x 20	7,8	9,2	71,0
713208	0,507	3 x 20	8,3	13,9	73,0
713209	0,507	4 x 20	8,9	18,5	85,0
713210	0,507	5 x 20	9,7	23,2	98,0
713211	0,507	7 x 20	10,5	32,5	121,0
713212	0,507	9 x 20	12,1	41,9	153,0
713213	0,507	12 x 20	13,4	56,0	185,0
713214	0,507	18 x 20	16,4	83,8	286,0
713215	0,507	25 x 20	19,0	116,8	379,0
713216	0,963	2 x 18	8,4	17,4	86,0
713217	0,963	3 x 18	8,9	26,1	92,0
713218	0,963	4 x 18	9,6	34,8	109,0
713219	0,963	5 x 18	10,4	43,7	129,0
713220	0,963	7 x 18	11,3	61,2	161,0
713221	0,963	9 x 18	13,1	78,8	204,0
713222	0,963	10 x 18	15,0	87,7	249,0
713223	0,963	12 x 18	15,4	105,1	277,0
713224	0,963	15 x 18	17,0	131,6	333,0
713225	0,963	16 x 18	17,0	140,4	348,0
713226	0,963	18 x 18	17,9	157,9	382,0
713227	0,963	19 x 18	17,9	166,7	396,0
713228	0,963	25 x 18	20,7	219,8	506,0
713229	0,963	27 x 18	21,1	237,2	539,0
713230	0,963	34 x 18	24,6	299,3	714,0
713231	0,963	37 x 18	24,6	325,7	747,0
713232	0,963	41 x 18	26,3	360,9	829,0
713233	0,963	50 x 18	28,6	440,1	973,0
713234	0,963	61 x 18	30,3	539,0	1143,0
713235	1,31	2 x 16	8,9	24,0	92,0
713236	1,31	3 x 16	9,5	36,1	112,0

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
713237	1,31	4 x 16	8,8	48,1	129,0
713238	1,31	5 x 16	9,6	60,3	153,0
713239	1,31	6 x 16	10,2	72,5	179,0
713240	1,31	7 x 16	10,5	84,6	193,0
713241	1,31	8 x 16	11,1	96,7	222,0
713242	1,31	9 x 16	12,0	108,9	274,0
713243	1,31	10 x 16	12,4	121,1	298,0
713244	1,31	12 x 16	13,6	145,4	333,0
713245	1,31	14 x 16	14,5	169,6	378,0
713246	1,31	15 x 16	15,2	181,9	411,0
713247	1,31	16 x 16	16,0	194,1	421,0
713248	1,31	18 x 16	16,4	218,3	470,0
713249	1,31	19 x 16	16,6	230,5	485,0
713250	1,31	20 x 16	17,2	242,8	516,0
713251	1,31	25 x 16	18,9	303,8	673,0
713252	1,31	27 x 16	19,3	328,1	713,0
713253	1,31	30 x 16	20,0	364,6	777,0
713254	1,31	34 x 16	22,5	413,2	875,0
713255	1,31	40 x 16	23,5	486,6	982,0
713256	1,31	41 x 16	24,0	498,8	1012,0
713257	1,31	50 x 16	26,1	608,3	1204,0
713258	1,31	61 x 16	27,5	742,8	1414,0
713259	2,08	2 x 14	10,0	37,9	119,0
713260	2,08	3 x 14	10,5	56,9	143,0
713261	2,08	4 x 14	11,4	75,9	173,0
713262	2,08	5 x 14	12,5	95,0	204,0
713263	2,08	6 x 14	14,5	114,3	265,0
713264	2,08	7 x 14	14,5	133,1	227,0
713265	2,08	9 x 14	16,7	171,8	368,0
713266	2,08	10 x 14	18,0	191,0	402,0

# TRAYCONTROL® X XLPE insulation, flexible, oil-resistant, WTTc, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79, 105°C, torsion rated



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
713267	2,08	12 x 14	18,6	229,2	452,0	11009453	5,26	18 x 10	28,7	888,0	1427,0
713268	2,08	16 x 14	20,5	306,0	576,0	713291	5,26	19 x 10	28,7	961,4	1491,0
713269	2,08	18 x 14	22,7	344,2	689,0	11009454	5,26	25 x 10	33,5	1233,4	1923,0
713270	2,08	19 x 14	22,7	363,3	713,0	11009455	8,37	3 x 8	17,9	236,8	457,0
713271	2,08	25 x 14	26,3	478,5	917,0	713292	8,37	4 x 8	19,6	311,7	615,0
713272	3,31	2 x 12	10,9	60,5	153,0	713293	8,37	5 x 8	22,6	390,8	756,0
713273	3,31	3 x 12	11,5	90,8	189,0	11009456	8,37	7 x 8	24,6	552,6	994,0
713274	3,31	4 x 12	12,6	121,0	231,0	713294	13,3	3 x 6	19,3	368,2	622,0
713275	3,31	5 x 12	14,6	151,7	301,0	713295	13,3	4 x 6	21,2	491,5	841,0
713276	3,31	6 x 12	15,0	182,3	368,0	713296	13,3	5 x 6	24,3	615,2	985,0
713277	3,31	7 x 12	15,8	212,7	388,0	11009457	13,3	7 x 6	28,2	871,2	1357,0
713278	3,31	9 x 12	18,4	274,1	516,0	713297	21,2	3 x 4	23,0	585,4	981,0
713279	3,31	12 x 12	20,5	365,8	674,0	713298	21,2	4 x 4	25,2	785,3	1257,0
713280	3,31	16 x 12	23,8	488,2	920,0	713299	21,2	5 x 4	27,7	984,5	1537,0
11009452	3,31	18 x 12	25,0	568,3	1019,0	713300	33,6	3 x 2	26,6	925,2	1369,0
713281	3,31	19 x 12	25,0	579,7	1063,0	713301	33,6	4 x 2	29,2	1234,8	1726,0
713282	3,31	20 x 12	26,3	610,8	1119,0	713302	33,6	5 x 2	32,2	1548,1	2106,0
713283	3,31	25 x 12	29,1	764,3	1365,0	713303	42,3	4 x 1	33,1	1552,5	2158,0
713284	5,26	2 x 10	12,4	100,3	214,0	713304	52,9	4 x 1/0	35,9	1948,2	2626,0
713285	5,26	3 x 10	13,1	150,5	269,0	713305	67,3	4 x 2/0	38,7	2487,6	3222,0
713286	5,26	4 x 10	15,2	201,3	360,0	713306	84,4	4 x 3/0	41,0	3106,9	3914,0
713287	5,26	5 x 10	16,6	251,8	430,0	713307	106,7	4 x 4/0	46,5	3926,3	4978,0
713288	5,26	7 x 10	18,1	352,8	563,0	713308	128,4	4 x 250 kcmil	52,1	4614,7	5848,0
713289	5,26	9 x 10	21,0	454,5	728,0	713309	181,9	4 x 350 kcmil	58,5	7431,8	7918,0
713290	5,26	12 x 10	24,6	606,6	963,0	713310	257,6	4 x 500 kcmil	69,2	9289,7	11097,0

Dimensions and specifications may be changed without prior notice.

# TRAYCONTROL® 670 HDP / 670-C HDP

flexible, oil-resistant, exposed run TC-ER, NFPA 79



## Technical data

- TPE motor supply cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC/CSA 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**  
flexing 5x cable Ø  
flexing 6x cable Ø (-C type)
- **Coupling resistance (-C type)**  
max. 250 Ohm/km

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor in the outer layer
- Conductors stranded in layers with optimal lay length
- Separator
- Special TPE outer jacket
- Orange (RAL 2003) jacket
- With length marking in feet
- **-C Type**
- Braided, tinned copper shield, approx. 85% coverage

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277), Bus Drop, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 318, Oil Res I/II, 90°C Dry/Wet
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

- HDP = Heavy Duty Power

## Application

TRAYCONTROL® 670 HDP / 670-C HDP are multi-conductor, heavy duty motor supply cables with Bus Drop, TC-ER and CIC-TC approvals. Superior oil resistance (Oil Res I/II) ensures a long cable life and Class I Div. 2 per NEC 501 permits use in hazardous (classified) locations. A special extruded jacket and fine copper stranding provide excellent flexibility, which makes it easier to pull than standard tray cables. Suitable for installation in cable trays or pipes, open, unprotected exposed runs from the tray to the machines according to NFPA 79, and direct burial.

Recommended applications: connecting motors in environments with industrial automated equipment, machine tools, and industries such as automotive and renewable energy.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

## TRAYCONTROL® 670 HDP

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66820	0,963	4 x 18	8,2	35,9	101,0
66821	1,31	4 x 16	8,8	49,3	118,0
66822	2,08	4 x 14	10,1	75,6	137,0
66823	3,31	4 x 12	11,2	125,2	223,0
66824	5,26	4 x 10	14,5	200,2	357,0
66825	8,37	4 x 8	19,2	311,8	573,0
66826	13,3	4 x 6	22,3	504,9	859,0
66827	21,2	4 x 4	26,9	800,3	1251,0
66828	33,6	4 x 2	31,4	1259,4	1897,0
710006	53,5	4 x 1/0	36,0	1973,3	2749,0
710007	67,4	4 x 2/0	38,8	2519,8	3408,0
710008	84,7	4 x 3/0	41,6	3157,3	4122,0
710009	107,0	4 x 4/0	47,1	3977,0	5246,0
710010	127,0	4 x 250 kcmil	53,1	4616,0	6213,0
710011	151,0	4 x 300 kcmil	55,9	5598,2	7351,0
710012	175,0	4 x 350 kcmil	59,6	6478,6	8393,0
710013	202,0	4 x 400 kcmil	63,6	7431,7	9516,0
710014	256,0	4 x 500 kcmil	71,9	9289,7	11935,0

## TRAYCONTROL® 670-C HDP

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66829	0,963	4 x 18	8,9	56,3	122,0
66830	1,31	4 x 16	9,5	71,0	144,0
66831	2,08	4 x 14	10,7	103,1	190,0
66832	3,31	4 x 12	11,8	156,3	257,0
66833	5,26	4 x 10	15,2	247,9	412,0
66834	8,37	4 x 8	19,8	386,3	641,0
66835	13,3	4 x 6	23,3	598,7	949,0
66836	21,2	4 x 4	27,9	921,0	1424,0
66837	33,6	4 x 2	32,3	1400,4	2013,0
11009730	53,5	4 x 1/0	36,9	2248,9	2991,0
11009731	67,4	4 x 2/0	39,6	2814,9	3668,0
11009732	84,7	4 x 3/0	42,4	3471,7	4405,0
11009733	107,0	4 x 4/0	47,9	4319,5	5551,0
11009734	127,0	4 x 250 kcmil	53,9	4999,5	6563,0
11009735	151,0	4 x 300 kcmil	56,7	6002,7	7723,0
11009736	175,0	4 x 350 kcmil	60,4	6760,1	8795,0
11009737	202,0	4 x 400 kcmil	65,9	7890,2	10186,0
11009738	256,0	4 x 500 kcmil	72,7	9795,8	12411,0

Dimensions and specifications may be changed without prior notice.

## Why Use Flexible Tray Cables?

Tray cable (TC) is a viable alternative to traditional command and power cables (MTW, ST, SJT, SOOW, THHN, etc.) used in industrial applications. Products that are UL listed also meet NFPA 79 requirements, which allows users to store only one cable type in their warehouse. Here are some additional reasons for when and why you should consider using flexible, tray-rated cable in the United States and Canada –

### Applicable Industries

Industrial Automation, Event, Theater and Stage Engineering, Food and Beverage, Machine Building, Material Handling, New Plant/Facility Construction, Renewable Energy, Robotics, Wood, Pulp and Paper Manufacturing, and Ferrous/Non-ferrous Metal Manufacturing, among many others.

### Installation

Cables that are TC rated are capable of being installed in cable trays instead of in conduit. Compared to less flexible Class B-stranded tray cable, finely-stranded (Class K) cables have a much smaller bend radius due to their increased flexibility. Therefore, installers can have tighter cable routing, and easily terminate using standard cable glands instead of using conduit which is more labor intensive to install, costs more to inspect, and harder to move during a plant reconfiguration. Overall, this results in substantial cost savings in both materials and labor (reduced installation time). Additionally, tray cables can exit the tray and be exposed for up to six feet if they are exposed run (-ER) rated, i.e. TC-ER, PLTC-ER, ITC-ER.

In Canada, there is no exposed run approval and therefore unarmored tray cables cannot exit the tray for more than three feet before it has to be protected in a flexible conduit or similar. The advantages of unarmored tray cable are its reduced weight, better bend radius and easier strain relieving using standard cable strain relief connectors. This results in significant overall project cost savings over using armored tray rated cable.

Finally, tray cables are safe for use in Class 1, Division 2 hazardous locations (gases and vapors not normally present, but may appear), Class 2 control circuits, and when needed they can be directly buried or installed in sunlight due to their resistance to UV rays.

### Oil Resistance

Tray cable is rated Oil Res I/II to withstand many types of oils, lubricants and fluids, and therefore suitable for the demands of the electrical requirements found in industrial applications.

### Operating Temperature

New compound formulations allow tray cables to operate at 90°C in both dry and wet applications. Additionally, they also pass the UL -40°C cold bend test and the -25°C cold impact test required in Canada.

### Voltage

Most tray cable is approved for 600 V applications, but tray cables that are WTTTC rated are approved for 1000 V applications such as in wind turbine applications. Tray cables marked as Flexible Motor Supply are approved for 1000 V demands found in VFD drives both with and without signal pairs, i.e. flexible motor supply.

### Flame Retardancy

Tray cables are self-extinguishing and flame retardant according to the UL VW-1 (UL 1581) and the CSA FT4 Vertical Flame tests.

### Approvals

Tray cable's versatility comes from the many approvals that it meets such as TC-ER (UL 1277), WTTTC (UL 2277), PLTC-ER, ITC-ER, NFPA 79, MTW, CIC-TC FT-4 (C22.2 No. 230 & 239) and CSA AWM I/II A/B (C22.2 No. 210). For companies that heavily export, the CENELEC (CE) approval is required for tray cables to be used in the European Union. Having this stamp means that tray cable products conform to CE low-voltage directives.

### What are UL Standards 1277 & 2277?

#### UL 1277 – Electrical Power & Control Tray Cables

Cables must be 18 AWG and larger, and carry a maximum voltage rating of 600 V. They can be denoted as TC or TC-ER. The -ER or "exposed run" allows cable to come out of the cable tray unprotected for ≤1.8m (6 ft.) if it passes crush and impact tests.

#### UL 2277 – Flexible Motor Supply Cable & Wind Turbine Tray Cable

Cables must be 18 AWG and larger, and carry a maximum voltage rating of 1000 V. They can be denoted as WTTTC for cables being used in control power applications or Flexible Motor Supply Cable if being used as a VFD motor power cable.

### What are CSA Standards C22.2 No. 230 & C22.2 No. 239?

#### CSA C22.2 No. 230 – Tray Cables

Applies to both single and multi-conductor cables, without metal sheath or armor, suitable for use in cable trays and other applications when installed in accordance with the Canadian Electrical Code, Part 1.

#### CSA C22.2 No. 239 – Control & Instrumentation Cables

Applies to multiple-conductor control and instrumentation cables (incl. thermocouple and thermocouple extension cables) having a voltage rating not exceeding 1000 V and intended for installation in accordance with the Canadian Electrical Code, Part 1.



Application	USA
1 High Flex, Power	UL cable marked "flexing". UR AWM-type cable for flexing application or cable track. <b>NFPA 79*</b>
2 Closed Cable Tray	Cable type: TC-ER, TC, MTW, THHN
3 Open Cable Tray	Cable type: TC-ER
4 Control Application	Cable type: CMG, CM, CMX, ITC, PLTC
5 Hazardous Location	Cable suitable for use in hazardous location. <b>Attention:</b> Cable selection depends on the area classification
6 VFD & Servo Motor	<b>FIXED</b> TC-ER or UR AWM cable rated for tray/conduit installation. <b>FLEXING</b> UL or UR AWM cable rated for continuous flexing applications). <b>NFPA 79**</b>
7 Fixed, Power	Cable type:TC-ER. UR AWM cable for flexing application + conduit listed (ex. LFNC). <b>NFPA 79*</b>
8 In-Floor Cable Tray	TC-type cable marked "Dir Bur" (Direct Burial). TC-type cable inside raceway listed for direct burial
9 Industrial Control Panel	Single conductor, AWM cable UL Style 1015 Single conductor, MTW cable



**Canada**

cUL or CSA cable marked "flexing". cUR or CSA-type cable for flexing application or cable track. **NFPA 79\***

Cable type: TC, TEW, CIC

Cable type: TC

Cable type: CMG, CM, CIC, CMX

**FIXED** TC or cUR AWM cable rated for tray/conduit installation. **FLEXING** cUL, cUR or CSA cable rated for continuous flexing applications. **NFPA 79\*\***

Cable type: TC. cUR AWM cable for flexing application + conduit listed (ex. LFNC). **NFPA 79\***

TC-type cable marked "Dir Bur" (Direct Burial). TC-type cable inside raceway listed for direct burial

Single conductor, AWM cable UL Style 1015 Single conductor, TEW cable

# MULTIFLEX 600 highly flexible, oil-resistant, exposed run TC-ER

PLTC-ER, ITC-ER, NFPA 79



HELUKABEL® MULTIFLEX® 600 P/N 63136 14 AWG (1.31mm<sup>2</sup>)/4C (UL) TC-ER 90C DRY / WET 600V SUN RES DIR BUR OIL RES I/II E330430 OR MTW "CONSTANT FLEXING" OR WTTTC 1000V OR DP-1 OR ITC-ER OR PLTC-ER OR C(UL) CIC-TC PVC/N FT4 --- 257839 CSA AWM I/II A/B 90C 600V FT4 --- CE

## Technical data

- Highly flexible PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +90°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTTC 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**  
flexing 7,5x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded (Cl. M), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Cores stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant in acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, simple installation

### Available on request

- With blue conductors (DC)
- With red conductors (AC)
- Gray or TPE outer jacket

## Application

MULTIFLEX 600 is a highly flexible, oil-resistant control and power cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for machines located in industrial plants in accordance with NFPA 79. Approved for open, unprotected installation from cable trays to the machine in dry, damp & wet environments. Its outstanding oil resistance (Oil Res I/II) guarantees a long service life.

Recommended applications: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, and within the automotive industry. Please observe applicable installation instructions for use in drag chains.

CE The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62502	0,519	2 x 20	6,9	9,7	56,0
62503	0,519	3 x 20	7,2	14,6	66,0
62504	0,519	4 x 20	7,7	19,3	80,0
62505	0,519	5 x 20	8,3	24,3	89,0
62506	0,519	7 x 20	9,7	33,9	122,0
62507	0,519	12 x 20	11,2	58,2	165,0
62508	0,519	18 x 20	13,0	87,2	231,0
62509	0,519	25 x 20	16,5	121,1	358,0
62510	0,519	34 x 20	17,9	164,6	440,0
62511	0,824	3 x 18	7,5	22,9	79,0
62512	0,824	4 x 18	8,1	30,5	96,0
62513	0,824	5 x 18	8,8	38,2	109,0
62514	0,824	7 x 18	10,3	53,4	150,0
62515	0,824	12 x 18	12,0	91,7	208,0
62516	0,824	15 x 18	13,2	114,6	259,0
62517	0,824	18 x 18	14,7	137,5	325,0
62518	0,824	25 x 18	17,6	190,9	458,0
62519	0,824	34 x 18	19,1	259,5	558,0
62520	0,824	36 x 18	19,1	274,9	571,0
62521	0,824	42 x 18	20,7	320,7	663,0
62522	1,31	3 x 16	8,5	36,3	103,0
62523	1,31	4 x 16	9,2	48,4	126,0
62524	1,31	5 x 16	10,0	60,6	146,0
62525	1,31	7 x 16	11,9	84,7	204,0
62526	1,31	9 x 16	14,3	108,9	292,0
62527	1,31	12 x 16	14,7	145,2	317,0
62528	1,31	18 x 16	17,0	217,7	447,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62529	1,31	25 x 16	20,5	302,4	636,0
62530	1,31	34 x 16	23,3	411,3	837,0
62531	1,31	41 x 16	25,2	496,0	984,0
62532	1,31	50 x 16	27,1	604,9	1146,0
62533	1,31	60 x 16	28,7	725,9	1325,0
62534	2,08	3 x 14	9,1	58,6	132,0
63136	2,08	4 x 14	9,9	78,1	164,0
62535	2,08	5 x 14	10,7	97,6	192,0
62536	2,08	7 x 14	12,8	136,8	270,0
62537	2,08	9 x 14	15,4	175,9	381,0
62538	2,08	12 x 14	15,9	234,4	424,0
62539	2,08	18 x 14	18,4	351,7	606,0
62540	2,08	25 x 14	23,2	488,4	919,0
62541	3,31	3 x 12	10,7	93,0	182,0
62542	3,31	4 x 12	11,6	124,1	230,0
62543	3,31	5 x 12	12,7	155,1	273,0
62544	3,31	7 x 12	16,1	217,1	420,0
62545	5,21	4 x 10	14,8	191,7	365,0
62546	5,21	5 x 10	16,1	239,6	433,0
62547	5,21	7 x 10	19,4	335,3	614,0
62548	8,37	4 x 8	18,5	312,7	568,0
62549	8,37	5 x 8	20,3	390,9	683,0
62550	13,3	4 x 6	20,3	501,5	788,0
62551	13,3	5 x 6	23,3	627,0	1012,0
62552	21,2	4 x 4	26,4	876,1	1356,0
62554	33,6	4 x 2	31,5	1371,6	1970,0



# MULTIFLEX 600-C highly flexible, oil-resistant, shielded, EMC-preferred type, exposed run TC-ER, PLTC-ER, ITC-ER, NFPA 79



## Technical data

- Highly flexible PVC control and power cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +90°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTTC 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**  
max. 250 Ohm/km
- **Minimum bending radius**  
flexing 7,5x cable Ø
- **Insulation resistance**  
min. 20 MOhm x km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded (Cl. M), bare copper acc. to AWG standards
- Special PVC conductor insulation with transparent nylon coating
- Conductor identification to DIN VDE 0293 black conductors with continuous white numbering
- GN-YE conductor, 3 conductors and above in the outer layer
- Conductors stranded in layers with optimal lay length
- Foil separator
- Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special PVC outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant in acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTTC (2277) & DP-1 - (18 AWG-500 kcmil), ITC-ER & PLTC-ER - (20-12 AWG), MTW, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (18-4/0 AWG), C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, simple installation

### Available on request

- With blue conductors (DC)
- With red conductors (AC)
- Gray or TPE outer jacket

## Application

MULTIFLEX 600-C is a highly flexible, shielded, oil-resistant control and power cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for machines located in industrial plants in accordance with NFPA 79. Approved for open, unprotected installation from cable trays to the machine in dry, damp & wet environments. Its outstanding oil resistance (Oil Res I/II) guarantees a long service life. Recommended applications: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, and within the automotive industry. Please observe applicable installation instructions for use in drag chains.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

☑ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62556	0,519	2 x 20	7,4	25,0	81,0	62580	1,31	18 x 16	17,7	278,6	535,0
62557	0,519	3 x 20	7,7	30,8	93,0	62581	1,31	25 x 16	21,1	378,6	745,0
62558	0,519	4 x 20	8,2	37,5	108,0	62582	1,31	34 x 16	24,0	495,6	958,0
62559	0,519	5 x 20	8,8	44,2	120,0	62583	2,08	3 x 14	9,6	81,4	167,0
62560	0,519	7 x 20	10,2	58,6	159,0	62584	2,08	4 x 14	10,4	103,6	203,0
62561	0,519	12 x 20	11,7	87,8	209,0	62585	2,08	5 x 14	11,3	125,7	234,0
62562	0,519	18 x 20	13,5	122,5	282,0	62586	2,08	7 x 14	13,3	171,6	321,0
62563	0,519	25 x 20	17,0	165,0	422,0	62587	2,08	9 x 14	16,0	216,5	441,0
62564	0,519	34 x 20	18,5	229,6	534,0	62588	2,08	12 x 14	16,4	276,5	486,0
62565	0,824	3 x 18	8,1	40,5	107,0	62589	2,08	18 x 14	19,1	418,8	703,0
62566	0,824	4 x 18	8,6	50,2	126,0	62590	2,08	25 x 14	23,9	572,2	1040,0
62567	0,824	5 x 18	9,3	59,8	141,0	62591	3,31	3 x 12	11,2	120,8	224,0
62568	0,824	7 x 18	10,8	80,1	189,0	62592	3,31	4 x 12	12,2	155,1	276,0
62569	0,824	12 x 18	12,5	123,7	255,0	62593	3,31	5 x 12	13,2	189,4	323,0
62570	0,824	15 x 18	13,7	150,6	311,0	62594	3,31	7 x 12	16,6	259,8	482,0
62571	0,824	18 x 18	15,2	175,8	381,0	62595	5,21	4 x 10	15,4	230,4	424,0
62572	0,824	25 x 18	18,2	254,5	549,0	62596	5,21	5 x 10	16,6	282,5	496,0
62573	0,824	34 x 18	19,8	329,9	659,0	62597	5,21	7 x 10	20,0	406,9	716,0
62574	1,31	3 x 16	9,0	57,1	135,0	62598	8,37	4 x 8	19,3	397,8	693,0
62575	1,31	4 x 16	9,8	71,6	162,0	62599	8,37	5 x 8	21,1	485,3	817,0
62576	1,31	5 x 16	10,5	86,2	184,0	62600	13,3	4 x 6	21,1	596,3	926,0
62577	1,31	7 x 16	12,4	116,4	250,0	62602	13,3	5 x 6	24,1	732,0	1163,0
62578	1,31	9 x 16	14,8	145,8	347,0	62603	21,2	4 x 4	27,2	998,1	1534,0
62579	1,31	12 x 16	15,2	183,5	393,0	62605	33,6	4 x 2	32,3	1521,3	2187,0

# MULTIFLEX 512®-PUR UL/CSA

for extreme mechanical stress



HELUKABEL® MULTIFLEX 512®-PUR UL/CSA 12G1,5 QMM 1000 V E170315 CE

## TECHNICAL DATA

PUR drag chain cable acc. to UL Std. 758 (AWM) Style 21209, CSA Std. C22.2 No. 210 - AWM I/II A/B

<b>Temperature range</b>	flexing -30°C to +90°C static -40°C to +90°C
<b>Permissible operating temperature of the conductor</b>	+90°C
<b>Nominal voltage</b>	UL (AWM) AC 1000 V
<b>Test voltage cond./cond.</b>	3000 V
<b>Minimum bending radius</b>	flexing 5x Outer Ø static 3x Outer Ø

## CABLE STRUCTURE

- Bare copper wire, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Conductor insulation: special PP
- Conductor identification acc. to DIN VDE 0293-334, black conductors with consecutive white numbers
- Protective conductor: starting with 3 conductors, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor
- Conductors stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer, from 4 mm<sup>2</sup> without fleece wrapping
- Outer jacket: special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TPU), UL Std. 758 (AWM) Style 21209
- Jacket color: gray (RAL 7001)
- Length marking: in meters

## PROPERTIES

- Resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater, drilling fluids, drilling mud
- Highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion
- For outdoor use
- Suitable for use in drag chains

- Halogen-free
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## TESTS

- Flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- Oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Drilling mud resistant acc. to NEK TS 606
- UV-resistant acc. to DIN EN ISO 4892-2
- Weather-resistant acc. to DIN EN ISO 4892-2
- Alternate bending test: tested on approx. 10 million cycles
- Certifications: DNV GL

## APPLICATION

Industrial application: UL/CSA-approved drag chain cable for use in machine and tool manufacturing, in robotics and in other constantly moving machine parts; for continuous-flexing applications moving freely without tensile stress and without movement control in dry, damp and wet rooms as well as outdoors. A slippery PP conductor insulation, along with a cut-resistant and low-adhesion PUR outer jacket guarantees optimum durability and excellent cost-efficiency. Oil and gas sector: for use as a control and instrumentation cable on drilling platforms and ships, in land drilling as well as in chemical and petrochemical plants; resistant to drilling mud according to NEK TS 606 and thus ideal for high-performance applications such as pumping stations, compressors, generators and emergency power supply systems.

## NOTES

- The conductor is metrically (mm<sup>2</sup>) constructed, AWG numbers are approximated, and are for reference only
- For use in drag chain systems:
  - 1) The assembly instructions must be observed
  - 2) For further application parameters, please refer to the selection tables
  - 3) For special applications, we recommend contacting us and using our data entry form for drag chain systems

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21559	2 x 0.5	20	5.9	10.8	38.0
21560	3 G 0.5	20	6.2	16.1	46.0
21561	4 G 0.5	20	6.7	21.5	59.0
21562	5 G 0.5	20	7.2	27.0	68.0
21563	7 G 0.5	20	8.3	37.6	88.0
21564	12 G 0.5	20	9.7	64.5	131.0
21565	18 G 0.5	20	11.2	97.0	197.0
21566	20 G 0.5	20	11.8	107.5	260.0
21567	25 G 0.5	20	13.6	134.5	282.0
21568	30 G 0.5	20	13.9	161.3	315.0
21569	36 G 0.5	20	15.1	193.5	374.0
21570	2 x 0.75	19	6.6	14.4	47.0

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21571	3 G 0.75	19	7.0	21.6	58.0
21572	4 G 0.75	19	7.5	29.0	69.0
21573	5 G 0.75	19	8.1	36.0	85.0
21574	7 G 0.75	19	9.4	50.0	118.0
21575	12 G 0.75	19	11.2	86.0	183.0
21576	18 G 0.75	19	13.0	130.0	270.0
21577	20 G 0.75	19	13.8	144.0	290.0
21523	21 G 0.75	19	14.7	151.0	302.0
21578	25 G 0.75	19	16.3	180.0	374.0
21579	30 G 0.75	19	16.5	216.0	420.0
21580	36 G 0.75	19	18.0	259.0	498.0
21581	2 x 1	18	6.9	19.2	55.0

# MULTIFLEX 512®-PUR UL/CSA

for extreme mechanical stress



Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21582	3 G 1	18	7.3	29.0	70.0
21583	4 G 1	18	7.9	38.0	86.0
21584	5 G 1	18	8.5	48.0	102.0
21585	7 G 1	18	10.0	67.0	143.0
21586	12 G 1	18	11.8	115.0	225.0
21587	18 G 1	18	13.9	173.0	334.0
21588	20 G 1	18	14.9	192.0	370.0
21589	25 G 1	18	17.2	240.0	460.0
21590	30 G 1	18	17.7	288.0	530.0
21591	36 G 1	18	19.2	346.0	625.0
21592	41 G 1	18	20.9	410.0	779.0
21593	50 G 1	18	22.8	498.0	953.0
21594	65 G 1	18	26.0	650.0	1205.0
21595	2 x 1.5	16	7.7	29.0	70.0
21596	3 G 1.5	16	8.2	43.0	90.0
21597	4 G 1.5	16	8.9	58.0	106.0
21598	5 G 1.5	16	9.6	72.0	145.0
21599	7 G 1.5	16	11.3	101.0	205.0
21600	12 G 1.5	16	13.7	173.0	320.0
21601	18 G 1.5	16	16.4	259.0	465.0
21602	20 G 1.5	16	17.2	288.0	510.0
21603	25 G 1.5	16	20.2	360.0	650.0
21604	30 G 1.5	16	20.7	432.0	750.0
21605	36 G 1.5	16	22.5	518.0	880.0
21606	42 G 1.5	16	24.4	628.0	1209.0

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21607	50 G 1.5	16	26.8	749.0	1449.0
21608	61 G 1.5	16	29.6	912.0	1712.0
21609	2 x 2.5	14	8.5	48.0	115.0
21610	3 G 2.5	14	9.0	72.0	162.0
21611	4 G 2.5	14	9.8	96.0	196.0
21612	5 G 2.5	14	10.7	120.0	230.0
21613	7 G 2.5	14	12.7	168.0	312.0
21614	12 G 2.5	14	15.5	288.0	532.0
21615	18 G 2.5	14	18.6	432.0	762.0
21616	20 G 2.5	14	19.8	480.0	858.0
21617	25 G 2.5	14	23.1	600.0	998.0
21618	4 G 4	12	11.2	154.0	283.0
21619	5 G 4	12	12.3	192.0	349.0
21620	7 G 4	12	15.0	269.0	498.0
11017371	3 G 6	10	11.6	173.0	350.0
21621	4 G 6	10	12.7	230.0	432.0
21622	5 G 6	10	14.1	288.0	529.0
21623	7 G 6	10	17.2	403.0	782.0
21624	4 G 10	8	16.7	384.0	685.0
21625	5 G 10	8	18.6	480.0	817.0
21626	7 G 10	8	22.8	672.0	1023.0
11017372	3 G 16	6	17.6	461.0	792.0
21627	4 G 16	6	19.6	614.0	1042.0
21628	5 G 16	6	21.9	768.0	1292.0
21629	7 G 16	6	26.8	1075.0	1709.0

# MULTIFLEX 512®-C-PUR UL/CSA

EMC-preferred type, for extreme mechanical stress



HELUKABEL® MULTIFLEX 512®-C-PUR UL/CSA 12G1 QMM 1000 V E170315 CE

## TECHNICAL DATA

PUR drag chain cable acc. to UL Std. 758 (AWM) Style 21209, CSA Std. C22.2 No. 210 - AWM I/II A/B

<b>Temperature range</b>	flexing -30°C to +90°C static -40°C to +90°C
<b>Permissible operating temperature of the conductor</b>	+90°C
<b>Nominal voltage</b>	UL (AWM) AC 1000 V
<b>Test voltage cond./cond.</b>	3000 V
<b>Coupling resistance</b>	at 30 MHz, approx. 250 Ohm/km
<b>Minimum bending radius</b>	flexing 7.5x Outer Ø static 4x Outer Ø

## CABLE STRUCTURE

- Bare copper wire, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Conductor insulation: special PP
- Conductor identification acc. to DIN VDE 0293-334, black conductors with consecutive white numbers
- Protective conductor: starting with 3 conductors, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor
- Conductors stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer, from 4 mm² without fleece wrapping
- Inner jacket: TPE
- Fleece wrapping
- Shield: braided shield of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer jacket: special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TmpU), UL Std. 758 (AWM) Style 21209
- Jacket color: gray (RAL 7001)
- Length marking: in meters

## PROPERTIES

- Resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater, drilling fluids, drilling mud
- Highly abrasion-resistant, notch-resistant, tear-resistant, cut-resistant, wear-resistant, low adhesion

- For outdoor use
- Suitable for use in drag chains
- Halogen-free
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## TESTS

- Flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1
- Oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- Drilling mud resistant acc. to NEK TS 606
- UV-resistant acc. to DIN EN ISO 4892-2
- Weather-resistant acc. to DIN EN ISO 4892-2
- Alternate bending test: tested on approx. 10 million cycles
- Certifications: DNV GL

## APPLICATION

Industrial application: UL/CSA approved drag chain cable for use in machine and tool manufacturing, in robotics and in other constantly moving machine parts; for continuous-flexing applications moving freely without tensile stress and without movement control in dry, damp and wet rooms as well as outdoors. A slippery PP conductor insulation, along with a cut-resistant and low-adhesion PUR outer jacket guarantees optimum durability and excellent cost-efficiency. Oil and gas sector: for use as a control and instrumentation cable on drilling platforms and ships, in land drilling as well as in chemical and petrochemical plants; resistant to drilling mud according to NEK TS 606 and thus ideal for high-performance applications such as pumping stations, compressors, generators and emergency power supply systems. EMC= Electromagnetic Compatibility; in order to optimize EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

## NOTES

- The conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- For use in drag chain systems:
  - 1) The assembly instructions must be observed
  - 2) For further application parameters, please refer to the selection tables
  - 3) For special applications, we recommend contacting us and using our data entry form for drag chain systems

Part no.	No. conductors x cross sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21630	2 x 0.5	20	7.8	30.0	90.0
21631	3 G 0.5	20	8.1	38.0	105.0
21632	4 G 0.5	20	8.6	50.0	124.0
21633	5 G 0.5	20	9.1	65.0	132.0
21634	7 G 0.5	20	10.2	70.0	175.0
21635	12 G 0.5	20	11.8	100.0	250.0
21636	18 G 0.5	20	13.9	157.0	325.0
21637	20 G 0.5	20	14.7	167.0	350.0

Part no.	No. conductors x cross sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21638	25 G 0.5	20	16.6	240.0	450.0
21639	30 G 0.5	20	17.0	273.0	510.0
21640	36 G 0.5	20	18.2	306.0	580.0
21641	2 x 0.75	19	8.5	39.0	110.0
21642	3 G 0.75	19	8.9	49.0	120.0
21643	4 G 0.75	19	9.4	60.0	148.0
21644	5 G 0.75	19	10.1	70.0	160.0
21645	7 G 0.75	19	11.6	95.0	205.0

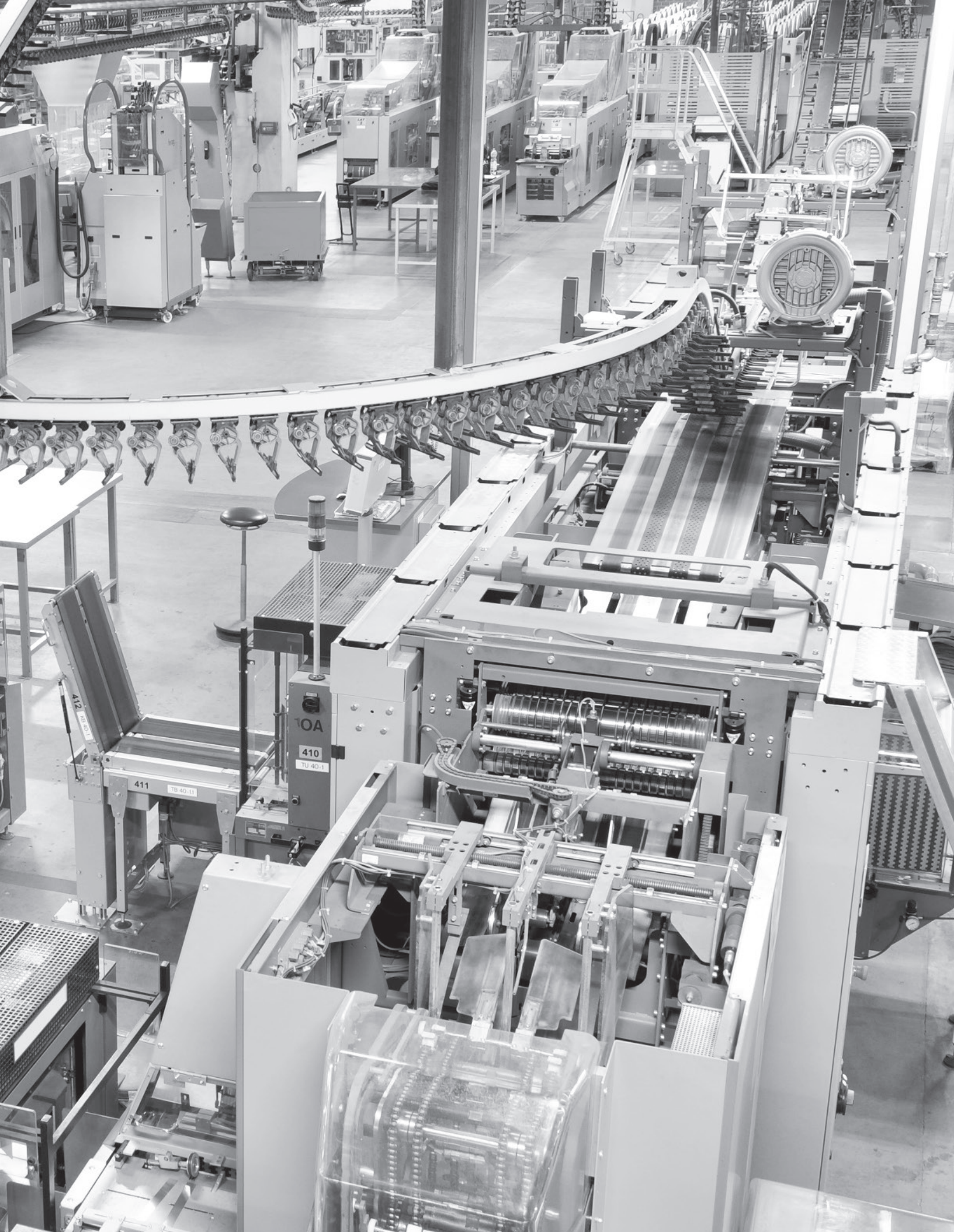
# MULTIFLEX 512®-C-PUR UL/CSA

EMC-preferred type, for extreme mechanical stress



Part no.	No. conductors x cross sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21646	12 G 0.75	19	13.9	140.0	308.0
21647	18 G 0.75	19	15.9	220.0	420.0
21648	20 G 0.75	19	16.8	249.0	450.0
21649	25 G 0.75	19	19.6	313.0	579.0
21650	30 G 0.75	19	19.8	470.0	630.0
21651	36 G 0.75	19	21.5	500.0	745.0
21652	2 x 1	18	8.8	50.0	120.0
21653	3 G 1	18	9.2	60.0	135.0
21654	4 G 1	18	9.8	73.0	173.0
21655	5 G 1	18	10.5	81.0	187.0
21656	7 G 1	18	12.1	114.0	240.0
21657	12 G 1	18	14.7	186.0	360.0
21658	18 G 1	18	17.1	254.0	498.0
21659	20 G 1	18	18.0	322.0	568.0
21660	25 G 1	18	20.9	377.0	670.0
21661	30 G 1	18	21.2	429.0	774.0
21662	36 G 1	18	22.8	516.0	895.0
21663	41 G 1	18	24.6	610.0	1032.0
21664	50 G 1	18	27.1	690.0	1160.0
21665	65 G 1	18	30.7	852.0	1660.0
21666	2 x 1.5	16	9.7	64.0	145.0
21667	3 G 1.5	16	10.1	84.0	168.0
21668	4 G 1.5	16	11.0	99.0	217.0
21669	5 G 1.5	16	11.8	129.0	235.0
21670	7 G 1.5	16	14.0	148.0	325.0
21671	12 G 1.5	16	16.6	279.0	481.0
21672	18 G 1.5	16	19.7	393.0	675.0

Part no.	No. conductors x cross sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
21673	25 G 1.5	16	24.1	584.0	927.0
21674	30 G 1.5	16	24.4	607.0	1025.0
21675	36 G 1.5	16	26.6	702.0	1210.0
21676	42 G 1.5	16	28.7	829.0	1441.0
21677	50 G 1.5	16	31.3	1025.0	1709.0
21678	61 G 1.5	16	34.3	1190.0	2025.0
21679	2 x 2.5	14	10.5	104.0	198.0
21680	3 G 2.5	14	11.1	140.0	284.0
21681	4 G 2.5	14	12.0	164.0	378.0
21682	5 G 2.5	14	12.9	190.0	423.0
21683	7 G 2.5	14	15.6	236.0	486.0
21684	12 G 2.5	14	18.6	390.0	756.0
21685	18 G 2.5	14	22.3	607.0	1127.0
21686	20 G 2.5	14	23.7	661.0	1210.0
21687	25 G 2.5	14	27.4	796.0	1530.0
21688	4 G 4	12	13.9	222.0	448.0
21689	5 G 4	12	15.2	328.0	533.0
21690	7 G 4	12	18.1	360.0	678.0
21691	4 G 6	10	15.6	305.0	636.0
21692	5 G 6	10	17.3	441.0	772.0
21693	7 G 6	10	20.9	505.0	1028.0
21694	4 G 10	8	20.0	485.0	1052.0
21695	5 G 10	8	22.3	610.0	1096.0
21696	7 G 10	8	27.1	820.0	1530.0
21697	4 G 16	6	23.1	840.0	1386.0
21698	5 G 16	6	25.9	1050.0	1759.0
21699	7 G 16	6	31.3	1510.0	2087.0



# 300V Control Cables

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# TRAYCONTROL® 300 flexible, oil-resistant, exposed run

PLTC-ER, ITC-ER, NFPA 79



## Technical data

- PVC signal and control cable
- **Temperature range**  
flexing +5°C to +50°C  
static -25°C to +105°C
- **Nominal voltage**  
300 V
- **Test voltage**  
2000 V
- **Minimum bending radius**  
flexing 6x cable Ø
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded, tinned copper acc. to AWG standards
- Special PVC conductor insulation (22-16 AWG with transparent nylon coating)
- Conductor identification to international color code
- Conductors stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant (22-16 AWG)
- Direct burial rated (18-16 AWG)
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL (28-24 AWG)**  
AWM 2517, CM, NFPA 79, NEC Art. 725, 760 & 800, -40°C Cold Bend
- **UL (22-16 AWG)**  
PLTC-ER, ITC-ER, AWM 2517, CM, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 725, 760 & 800, Oil Res I/II, -40°C Cold Bend
- **CSA:**  
CMG FT4, C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, easy to install
- Rated Oil Res I/II

### Available on request

- PUR or TPE outer jacket
- Jacket color to customer requirements

## Application

TRAYCONTROL® 300 is a multi-conductor PVC signal and control cable. PLTC-ER and ITC-ER approvals make it suitable for open, unprotected installation from cable trays to the machine. Their outstanding oil resistance (Oil Res I/II) makes them ideally suited as a connecting cable and also for control, signal and measuring systems in industrial plants. A flexible cable structure facilitates installation inside and outside of machines and switch cabinets. Applications: machine tools, control panels, control and instrumentation technology, production automation, cable ducts, and renewable energy.

CE = The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62625	0,099	2 x 28	3,8	1,6	18,0
62626	0,099	3 x 28	3,9	2,5	19,0
62627	0,099	4 x 28	4,2	3,3	22,0
62628	0,099	6 x 28	4,7	4,9	28,0
62629	0,099	8 x 28	5,0	6,6	33,0
62630	0,099	10 x 28	5,6	8,2	39,0
62631	0,099	15 x 28	6,2	12,3	51,0
62632	0,099	20 x 28	6,8	16,4	61,0
62633	0,099	25 x 28	7,6	20,5	77,0
62634	0,099	30 x 28	8,0	24,6	88,0
62635	0,099	40 x 28	8,8	32,8	107,0
62636	0,099	50 x 28	9,8	41,0	129,0
62637	0,154	2 x 26	4,0	2,8	21,0
62638	0,154	3 x 26	4,2	4,2	24,0
62639	0,154	4 x 26	4,4	5,6	27,0
62640	0,154	6 x 26	5,0	8,4	34,0
62641	0,154	8 x 26	5,3	11,2	40,0
62642	0,154	10 x 26	6,0	14,0	49,0
62643	0,154	15 x 26	6,7	21,0	64,0
62644	0,154	20 x 26	7,5	28,0	83,0
62645	0,154	25 x 26	8,2	35,0	98,0
62646	0,154	30 x 26	8,6	42,0	112,0
62647	0,154	40 x 26	9,5	56,0	140,0

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62648	0,154	50 x 26	11,1	70,0	185,0
62649	0,241	2 x 24	4,3	4,4	24,0
62650	0,241	3 x 24	4,5	6,7	28,0
62651	0,241	4 x 24	4,8	8,9	36,0
62652	0,241	6 x 24	5,5	13,3	43,0
62653	0,241	8 x 24	5,8	17,7	51,0
62654	0,241	10 x 24	6,6	22,2	61,0
62655	0,241	15 x 24	7,7	33,2	88,0
62656	0,241	20 x 24	8,4	44,3	107,0
62657	0,241	25 x 24	9,1	55,4	128,0
62658	0,241	30 x 24	9,6	66,5	147,0
62659	0,241	40 x 24	11,2	88,6	201,0
62660	0,241	50 x 24	12,4	110,8	243,0
62661	0,382	2 x 22	6,5	7,0	49,0
62662	0,382	3 x 22	6,7	10,6	55,0
62663	0,382	4 x 22	7,2	14,1	67,0
62664	0,382	6 x 22	8,3	21,1	89,0
62665	0,382	8 x 22	8,8	28,2	107,0
62666	0,382	10 x 22	10,1	35,2	129,0
62667	0,382	15 x 22	11,4	52,8	170,0
62668	0,382	20 x 22	12,5	70,4	211,0
62669	0,382	25 x 22	14,6	88,0	284,0
62670	0,382	30 x 22	15,4	105,6	324,0



# TRAYCONTROL® 300 flexible, oil-resistant, exposed run

PLTC-ER, ITC-ER, NFPA 79



Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62671	0,382	40 x 22	17,0	140,9	409,0
62672	0,382	50 x 22	19,1	176,1	491,0
62673	0,616	2 x 20	6,9	11,2	60,0
62674	0,616	3 x 20	7,2	16,8	70,0
62675	0,616	4 x 20	7,8	22,5	82,0
62676	0,616	6 x 20	9,0	33,7	112,0
62677	0,616	8 x 20	9,6	44,9	134,0
62678	0,616	10 x 20	11,0	56,2	161,0
62679	0,616	15 x 20	12,5	84,2	220,0
62680	0,616	20 x 20	14,5	112,3	305,0
62681	0,616	25 x 20	16,0	140,4	366,0
62682	0,616	30 x 20	16,8	168,5	417,0
62683	0,616	40 x 20	18,7	224,7	525,0
62684	0,616	50 x 20	21,0	280,8	638,0
62685	0,963	2 x 18	7,4	18,0	70,0
62686	0,963	3 x 18	7,7	27,1	86,0
62687	0,963	4 x 18	8,3	36,1	104,0
62688	0,963	6 x 18	9,7	54,1	140,0
62689	0,963	8 x 18	10,4	72,1	171,0

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62690	0,963	10 x 18	11,9	90,2	211,0
62691	0,963	15 x 18	13,5	135,2	293,0
62692	0,963	20 x 18	15,8	180,3	394,0
62693	0,963	25 x 18	17,4	225,4	490,0
62694	0,963	30 x 18	18,3	270,5	548,0
62695	0,963	40 x 18	20,4	360,7	698,0
62696	0,963	50 x 18	23,9	450,8	915,0
62697	1,31	2 x 16	7,9	24,4	82,0
62698	1,31	3 x 16	8,3	36,6	101,0
62699	1,31	4 x 16	8,9	48,8	124,0
62700	1,31	6 x 16	10,3	73,1	165,0
62702	1,31	8 x 16	11,2	97,5	205,0
62703	1,31	10 x 16	13,0	121,9	251,0
62704	1,31	15 x 16	15,6	182,8	382,0
62705	1,31	20 x 16	17,1	243,8	482,0
62706	1,31	25 x 16	18,9	304,7	582,0
62707	1,31	30 x 16	19,9	365,7	677,0
62708	1,31	40 x 16	23,2	487,6	927,0
62709	1,31	50 x 16	26,0	609,4	1129,0

Dimensions and specifications may be changed without prior notice.



### Solutions Provider

We have provided cable solutions for over 40 years. We share our technical expertise with customers and help them select the proper cable for their application.

# TRAYCONTROL® 300-C flexible, oil-resistant, shielded, EMC-preferred type, exposed run PLTC-ER, ITC-ER, NFPA 79



## Technical data

- Shielded, PVC signal and control cable
- **Temperature range**  
flexing +5°C to +50°C  
static -25°C to +105°C
- **Nominal voltage**  
300 V
- **Test voltage**  
2000 V
- **Minimum bending radius**  
flexing 6x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded, tinned copper acc. to AWG standards
- Special PVC conductor insulation (22-16 AWG with transparent nylon coating)
- Conductor identification to international color code
- Conductors stranded in layers with optimal lay length
- 1. Special aluminum foil shield
- Drain wire
- 2. Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant (22-16 AWG)
- Direct burial rated (18-16 AWG)
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL (28-24 AWG)**  
AWM 2517, CM, NFPA 79, NEC Art. 725, 760 & 800, -40°C Cold Bend
- **UL (22-16 AWG)**  
PLTC-ER, ITC-ER, AWM 2517, CM, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 725, 760 & 800, Oil Res I/II, -40°C Cold Bend
- **CSA:**  
CMG FT4, C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, easy to install
- Rated Oil Res I/II

### Available on request

- PUR or TPE outer jacket
- Jacket color to customer requirements

## Application

TRAYCONTROL® 300-C is a shielded, multi-conductor PVC signal and control cable. PLTC-ER and ITC-ER approvals make it suitable for open, unprotected installation in cable trays to the machine. Their outstanding oil resistance (Oil Res I/II) makes them ideally suited as a connecting cable and also for control, signal and measuring systems in industrial plants. A flexible cable structure facilitates installation inside and outside of machines and switch cabinets. The double-shielding with aluminum foil (100% coverage) and copper braid (approx. 85% coverage) guarantee superior EMC protection. Applications: machine tools, control panels, control and instrumentation technology, production automation, cable ducts, and renewable energy.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62710	0,099	2 x 28	4,2	8,6	27,0
62711	0,099	3 x 28	4,3	9,4	28,0
62712	0,099	4 x 28	4,6	11,5	33,0
62713	0,099	6 x 28	5,1	14,4	39,0
62714	0,099	8 x 28	5,5	18,9	46,0
62715	0,099	10 x 28	6,1	22,4	55,0
62716	0,099	15 x 28	6,7	28,6	68,0
62717	0,099	20 x 28	7,5	34,7	85,0
62718	0,099	25 x 28	8,1	41,1	98,0
62719	0,099	30 x 28	8,5	46,1	109,0
62720	0,099	40 x 28	9,3	58,3	134,0
62721	0,099	50 x 28	10,7	68,6	170,0
62722	0,154	2 x 26	4,4	10,4	30,0
62723	0,154	3 x 26	4,5	12,2	33,0
62724	0,154	4 x 26	4,8	14,3	37,0
62725	0,154	6 x 26	5,5	21,3	49,0
62726	0,154	8 x 26	5,8	25,0	55,0
62727	0,154	10 x 26	6,5	30,8	68,0

Part no.	Cross section mm²	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62728	0,154	15 x 26	7,4	39,9	88,0
62729	0,154	20 x 26	8,0	49,1	104,0
62730	0,154	25 x 26	8,7	58,6	122,0
62731	0,154	30 x 26	9,1	66,3	137,0
62732	0,154	40 x 26	10,5	83,2	180,0
62733	0,154	50 x 26	11,6	101,0	214,0
62734	0,241	2 x 24	4,7	14,0	34,0
62735	0,241	3 x 24	4,9	16,2	39,0
62736	0,241	4 x 24	5,3	21,6	52,0
62737	0,241	6 x 24	6,2	28,5	67,0
62738	0,241	8 x 24	6,6	34,0	77,0
62739	0,241	10 x 24	7,3	41,2	89,0
62740	0,241	15 x 24	8,2	55,3	115,0
62741	0,241	20 x 24	8,8	68,7	132,0
62742	0,241	25 x 24	9,6	82,5	156,0
62743	0,241	30 x 24	10,6	94,5	189,0
62744	0,241	40 x 24	11,6	120,7	241,0
62745	0,241	50 x 24	12,9	146,3	243,0

# TRAYCONTROL® 300-C flexible, oil-resistant, shielded, EMC-preferred type, exposed run PLTC-ER, ITC-ER, NFPA 79



Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62746	0,382	2 x 22	6,9	24,2	68,0
62747	0,382	3 x 22	7,2	28,7	80,0
62748	0,382	4 x 22	7,7	34,1	94,0
62749	0,382	6 x 22	8,8	45,7	119,0
62750	0,382	8 x 22	9,3	53,4	141,0
62751	0,382	10 x 22	10,5	65,4	165,0
62752	0,382	15 x 22	11,9	87,8	211,0
62753	0,382	20 x 22	13,0	108,1	249,0
62754	0,382	25 x 22	15,1	130,6	324,0
62755	0,382	30 x 22	15,9	150,3	365,0
62756	0,382	40 x 22	17,7	207,4	469,0
62757	0,382	50 x 22	19,7	247,8	558,0
62758	0,616	2 x 20	7,4	32,1	83,0
62759	0,616	3 x 20	7,7	38,9	94,0
62760	0,616	4 x 20	8,3	46,7	112,0
62761	0,616	6 x 20	9,4	62,0	141,0
62762	0,616	8 x 20	10,1	77,2	171,0
62763	0,616	10 x 20	11,5	91,0	204,0
62764	0,616	15 x 20	12,9	119,0	260,0
62765	0,616	20 x 20	15,1	156,9	359,0
62766	0,616	25 x 20	16,5	189,6	424,0
62767	0,616	30 x 20	17,5	233,0	476,0
62768	0,616	40 x 20	19,3	297,8	594,0
62769	0,616	50 x 20	22,6	364,3	769,0

Part no.	Cross section mm <sup>2</sup>	No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62770	0,963	2 x 18	7,8	43,7	100,0
62771	0,963	3 x 18	8,2	54,6	118,0
62772	0,963	4 x 18	8,8	65,3	138,0
62773	0,963	6 x 18	10,1	87,5	179,0
62774	0,963	8 x 18	10,8	108,2	213,0
62775	0,963	10 x 18	12,4	131,6	256,0
62776	0,963	15 x 18	14,9	182,9	372,0
62777	0,963	20 x 18	16,3	232,6	442,0
62778	0,963	25 x 18	18,0	297,8	542,0
62779	0,963	30 x 18	18,9	344,4	618,0
62780	0,963	40 x 18	21,2	465,2	799,0
62781	0,963	50 x 18	24,7	569,0	1024,0
62782	1,31	2 x 16	8,4	54,9	116,0
62783	1,31	3 x 16	8,7	68,2	131,0
62784	1,31	4 x 16	9,4	83,1	164,0
62785	1,31	6 x 16	10,9	112,9	205,0
62786	1,31	8 x 16	11,7	142,8	256,0
62787	1,31	10 x 16	13,4	170,7	299,0
62788	1,31	15 x 16	16,1	237,9	433,0
62789	1,31	20 x 16	17,8	319,0	554,0
62790	1,31	25 x 16	19,5	384,7	658,0
62791	1,31	30 x 16	20,6	450,2	756,0
62792	1,31	40 x 16	24,0	583,4	1015,0
62793	1,31	50 x 16	26,8	715,3	1223,0

Dimensions and specifications may be changed without prior notice. (RN02)

# TRAYCONTROL® 300 TP twisted pair, flexible, oil-resistant, exposed run PLTC-ER, ITC-ER, NFPA 79



## Technical data

- PVC signal and control cable
- **Temperature range**  
flexing +5°C to +50°C  
static -25°C to +105°C
- **Nominal voltage**  
300 V
- **Test voltage**  
2000 V
- **Minimum bending radius**  
flexing 6x cable Ø
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded, tinned copper acc. to AWG standards
- Special PVC conductor insulation (22-18 AWG with transparent nylon coating)
- Conductor pair identification to international color code
- Conductors stranded in pairs with optimal lay length
- Pairs stranded in layers with optimal lay length
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant (22-18 AWG)
- Direct burial rated (18 AWG)
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL (28-24 AWG)**  
AWM 2517, CM, NFPA 79, NEC Art. 725, 760 & 800, -40°C Cold Bend
- **UL (22-16 AWG)**  
PLTC-ER, ITC-ER, AWM 2517, CM, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 725, 760 & 800, Oil Res I/II, -40°C Cold Bend
- **CSA:**  
CMG FT4, C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, easy to install
- Rated Oil Res I/II

### Available on request

- PUR or TPE outer jacket
- Jacket color to customer requirements

## Application

TRAYCONTROL® 300 TP is a twisted pair signal and control cable. PLTC-ER and ITC-ER approvals make it suitable for open, unprotected installation from cable trays to the machine. Their outstanding oil resistance (Oil Res I/II) makes them ideally suited as a connecting cable and also for control, signal and measuring systems in industrial plants. A flexible cable structure facilitates installation inside and outside of machines and switch cabinets. Applications: machine tools, control panels, control and instrumentation technology, production automation, cable ducts, and renewable energy.

CE = The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62794	0,154	1 x 2 x 26	4,0	2,8	18,0
62795	0,154	2 x 2 x 26	5,2	5,6	28,0
62796	0,154	3 x 2 x 26	5,5	8,4	34,0
62797	0,154	4 x 2 x 26	5,9	11,2	40,0
62798	0,154	5 x 2 x 26	6,4	14,0	48,0
62799	0,154	6 x 2 x 26	6,9	16,8	54,0
62800	0,154	7 x 2 x 26	6,9	19,6	58,0
61928	0,154	8 x 2 x 26	7,6	22,4	70,0
61929	0,154	10 x 2 x 26	8,7	28,0	85,0
61930	0,154	12 x 2 x 26	9,0	33,6	95,0
61931	0,154	14 x 2 x 26	9,4	39,2	106,0
61932	0,154	15 x 2 x 26	10,4	42,0	126,0
61933	0,154	16 x 2 x 26	10,4	44,8	131,0
61934	0,154	18 x 2 x 26	10,9	50,4	143,0
61935	0,154	20 x 2 x 26	11,4	56,0	155,0
61936	0,154	22 x 2 x 26	11,9	61,6	167,0
61937	0,154	24 x 2 x 26	12,5	67,2	180,0
61938	0,154	25 x 2 x 26	12,5	70,0	185,0

Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61939	0,241	1 x 2 x 24	4,3	4,4	22,0
61940	0,241	2 x 2 x 24	5,7	8,9	34,0
61941	0,241	3 x 2 x 24	6,0	13,3	42,0
61942	0,241	4 x 2 x 24	6,5	17,7	51,0
61943	0,241	5 x 2 x 24	7,0	22,2	60,0
61944	0,241	6 x 2 x 24	7,8	26,6	74,0
61945	0,241	7 x 2 x 24	7,8	31,0	80,0
61946	0,241	8 x 2 x 24	8,4	35,5	89,0
61947	0,241	10 x 2 x 24	9,7	44,3	109,0
61948	0,241	12 x 2 x 24	10,6	53,2	137,0
61949	0,241	14 x 2 x 24	11,0	62,1	153,0
61950	0,241	15 x 2 x 24	11,6	66,5	164,0
61951	0,241	16 x 2 x 24	11,6	70,9	170,0
61952	0,241	18 x 2 x 24	12,2	79,8	186,0
61953	0,241	20 x 2 x 24	12,8	88,6	202,0
61954	0,241	22 x 2 x 24	13,3	97,5	219,0
61955	0,241	24 x 2 x 24	14,0	106,4	237,0
61956	0,241	25 x 2 x 24	14,0	110,8	243,0

# TRAYCONTROL® 300 TP twisted pair, flexible, oil-resistant, exposed run PLTC-ER, ITC-ER, NFPA 79



Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61957	0,382	1 x 2 x 22	6,5	7,0	46,0
61958	0,382	2 x 2 x 22	8,8	14,1	74,0
61959	0,382	3 x 2 x 22	9,2	21,1	94,0
61960	0,382	4 x 2 x 22	10,0	28,2	110,0
61961	0,382	5 x 2 x 22	10,9	35,2	128,0
61962	0,382	6 x 2 x 22	11,8	42,3	147,0
61963	0,382	7 x 2 x 22	11,8	49,3	161,0
61964	0,382	8 x 2 x 22	12,7	56,3	180,0
61965	0,382	10 x 2 x 22	15,6	70,4	251,0
61966	0,382	12 x 2 x 22	16,1	84,5	281,0
61967	0,382	14 x 2 x 22	16,9	98,6	315,0
61968	0,382	15 x 2 x 22	17,8	105,6	336,0
61969	0,382	16 x 2 x 22	17,8	112,7	350,0
61970	0,382	18 x 2 x 22	18,6	126,8	384,0
61971	0,382	20 x 2 x 22	19,6	140,9	418,0
61972	0,382	22 x 2 x 22	20,5	154,9	452,0
61973	0,382	24 x 2 x 22	22,7	169,0	542,0
61974	0,382	25 x 2 x 22	22,7	176,1	557,0
61975	0,616	1 x 2 x 20	6,9	11,2	54,0
61976	0,616	2 x 2 x 20	9,6	22,5	89,0
61977	0,616	3 x 2 x 20	10,1	33,7	126,0

Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61978	0,616	4 x 2 x 20	10,9	44,9	149,0
61979	0,616	5 x 2 x 20	11,9	56,2	158,0
61980	0,616	6 x 2 x 20	12,9	67,4	183,0
61981	0,616	7 x 2 x 20	12,9	78,6	201,0
61982	0,616	8 x 2 x 20	14,8	89,9	254,0
61983	0,616	10 x 2 x 20	17,1	112,3	311,0
61984	0,616	12 x 2 x 20	17,7	134,8	351,0
61985	0,616	14 x 2 x 20	18,5	157,3	394,0
61986	0,616	15 x 2 x 20	19,5	168,5	421,0
61987	0,616	16 x 2 x 20	19,5	179,7	439,0
61988	0,616	18 x 2 x 20	20,5	202,2	484,0
61989	0,616	20 x 2 x 20	22,1	224,7	555,0
61990	0,616	22 x 2 x 20	23,1	247,1	601,0
61991	0,616	24 x 2 x 20	24,4	269,6	650,0
61992	0,616	25 x 2 x 20	24,4	280,8	668,0
61993	0,963	1 x 2 x 18	7,4	18,0	65,0
61994	0,963	2 x 2 x 18	10,3	36,1	110,0
61995	0,963	3 x 2 x 18	10,8	54,1	138,0
61996	0,963	6 x 2 x 18	14,9	108,2	268,0
61997	0,963	9 x 2 x 18	17,2	162,3	335,0
61998	0,963	15 x 2 x 18	21,3	270,5	554,0

Dimensions and specifications may be changed without prior notice.

# TRAYCONTROL® 300-C TP twisted pair, flexible, shielded, oil-resistant, EMC-preferred type, exposed run PLTC-ER, ITC-ER, NFPA 79



## Technical data

- Shielded, PVC signal and control cable
- **Temperature range**  
flexing +5°C to +50°C  
static -25°C to +105°C
- **Nominal voltage**  
300 V
- **Test voltage**  
2000 V
- **Minimum bending radius**  
flexing 6x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km
- **Radiation resistance**  
up to 80x10<sup>6</sup> cJ/kg (up to 80 Mrad)

## Cable structure

- Finely stranded, tinned copper acc. to AWG standards
- Special PVC conductor insulation (22-18 AWG with transparent nylon coating)
- Conductor pair identification to international color code
- Conductors stranded in pairs with optimal lay length
- Pairs stranded in layers with optimal lay length
- 1. Special aluminum foil shield
- Drain wire
- 2. Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special PVC outer jacket
- Gray (RAL 7001) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant (22-18 AWG only)
- Direct burial rated (18 AWG only)
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL (28-24 AWG)**  
AWM 2517, CM, NFPA 79, NEC Art. 725, 760 & 800, -40°C Cold Bend
- **UL (22-16 AWG)**  
PLTC-ER, ITC-ER, AWM 2517, CM, NFPA 79, Class I Div. 2 per NEC Art. 501, NEC Art. 725, 760 & 800, Oil Res I/II, -40°C Cold Bend
- **CSA:**  
CMG FT4, C22.2 No. 210 - AWM I/II A/B FT4

## Note

### Advantages

- Highly flexible, easy to install
- Rated Oil Res I/II

### Available on request

- PUR or TPE outer sheath
- Jacket color to suit customer requirements

## Application

TRAYCONTROL® 300-C TP is a shielded, twisted pair signal and control cable. PLTC-ER and ITC-ER approvals make it suitable for open, unprotected installation in cable trays to the machine. Their outstanding oil resistance (Oil Res I/II) makes them ideally suited as a connecting cable and also for control, signal and measuring systems in industrial plants. A flexible cable structure facilitates installation inside and outside of machines and switch cabinets. The double-shielding with aluminum foil (100% coverage) and copper braid (approx. 85% coverage) guarantee superior EMC protection. Applications: machine tools, control panels, control and instrumentation technology, production automation, cable ducts, and renewable energy.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

CE = The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61999	0,154	1 x 2 x 26	4,4	10,9	30,0
59760	0,154	2 x 2 x 26	5,7	17,9	45,0
59761	0,154	3 x 2 x 26	6,0	21,5	51,0
59762	0,154	4 x 2 x 26	6,4	25,7	58,0
59763	0,154	5 x 2 x 26	6,9	30,0	65,0
59764	0,154	6 x 2 x 26	7,6	34,4	79,0
59765	0,154	7 x 2 x 26	7,6	37,2	83,0
59766	0,154	8 x 2 x 26	8,1	41,7	92,0
59767	0,154	10 x 2 x 26	9,2	50,9	110,0
59768	0,154	12 x 2 x 26	9,4	57,3	122,0
59769	0,154	14 x 2 x 26	10,4	64,3	147,0
59770	0,154	15 x 2 x 26	10,9	68,7	158,0
59771	0,154	16 x 2 x 26	10,9	71,5	162,0
59772	0,154	18 x 2 x 26	11,4	78,6	176,0
59773	0,154	20 x 2 x 26	11,9	85,9	189,0
59774	0,154	22 x 2 x 26	12,4	93,2	204,0

Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59775	0,154	24 x 2 x 26	13,0	100,8	219,0
59776	0,154	25 x 2 x 26	13,0	103,6	223,0
59777	0,241	1 x 2 x 24	4,7	14,4	34,0
59778	0,241	2 x 2 x 24	6,2	23,6	52,0
59779	0,241	3 x 2 x 24	6,5	28,9	61,0
59780	0,241	4 x 2 x 24	7,2	35,0	76,0
59781	0,241	5 x 2 x 24	7,8	41,2	86,0
59782	0,241	6 x 2 x 24	8,3	47,5	98,0
59783	0,241	7 x 2 x 24	8,3	51,9	104,0
59784	0,241	8 x 2 x 24	8,9	58,2	116,0
59785	0,241	10 x 2 x 24	10,8	71,3	153,0
59786	0,241	12 x 2 x 24	11,0	81,1	170,0
59787	0,241	14 x 2 x 24	11,5	91,6	188,0
59788	0,241	15 x 2 x 24	12,1	97,8	199,0
59789	0,241	16 x 2 x 24	12,1	102,3	205,0
59790	0,241	18 x 2 x 24	12,6	113,0	225,0

# TRAYCONTROL® 300-C TP twisted pair, flexible, shielded, oil-resistant, EMC-preferred type, exposed run PLTC-ER, ITC-ER, NFPA 79



Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59791	0,241	20 x 2 x 24	13,2	123,7	243,0
59792	0,241	22 x 2 x 24	13,8	134,5	262,0
59793	0,241	24 x 2 x 24	14,5	145,7	281,0
59794	0,241	25 x 2 x 24	14,5	150,1	287,0
59795	0,382	1 x 2 x 22	6,9	22,7	65,0
59796	0,382	2 x 2 x 22	9,3	37,5	101,0
59797	0,382	3 x 2 x 22	9,7	46,0	121,0
59798	0,382	4 x 2 x 22	10,5	55,6	141,0
59799	0,382	5 x 2 x 22	11,4	65,5	164,0
59800	0,382	6 x 2 x 22	12,3	75,5	186,0
59801	0,382	7 x 2 x 22	12,3	82,5	199,0
59802	0,382	8 x 2 x 22	13,2	92,6	222,0
59803	0,382	10 x 2 x 22	15,9	113,5	292,0
59804	0,382	12 x 2 x 22	16,6	129,1	333,0
59805	0,382	14 x 2 x 22	17,5	159,7	384,0
59806	0,382	15 x 2 x 22	18,4	170,5	409,0
59807	0,382	16 x 2 x 22	18,4	177,6	423,0
59808	0,382	18 x 2 x 22	19,3	195,6	460,0
59809	0,382	20 x 2 x 22	20,2	213,7	499,0
59810	0,382	22 x 2 x 22	21,2	231,8	537,0
59811	0,382	24 x 2 x 22	23,3	250,8	634,0
59812	0,382	25 x 2 x 22	23,3	257,9	647,0
59813	0,616	1 x 2 x 20	7,5	30,5	77,0

Part no.	Cross section mm²	No. pairs x No. conductors x AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59814	0,616	2 x 2 x 20	10,0	50,4	122,0
59815	0,616	3 x 2 x 20	10,5	63,3	144,0
59816	0,616	4 x 2 x 20	11,4	77,4	171,0
59817	0,616	5 x 2 x 20	12,4	91,8	199,0
59818	0,616	6 x 2 x 20	13,4	106,4	228,0
59819	0,616	7 x 2 x 20	13,4	117,6	246,0
59820	0,616	8 x 2 x 20	15,3	132,3	304,0
59821	0,616	10 x 2 x 20	17,6	162,4	368,0
59822	0,616	12 x 2 x 20	18,3	201,3	426,0
59823	0,616	14 x 2 x 20	19,2	227,6	473,0
59824	0,616	15 x 2 x 20	20,1	243,1	504,0
59825	0,616	16 x 2 x 20	20,1	254,3	522,0
59826	0,616	18 x 2 x 20	21,2	281,2	571,0
59827	0,616	20 x 2 x 20	23,2	308,2	677,0
59828	0,616	22 x 2 x 20	24,3	335,2	729,0
59829	0,616	24 x 2 x 20	25,7	384,6	808,0
59830	0,616	25 x 2 x 20	25,7	395,9	826,0
59831	0,963	1 x 2 x 18	7,8	42,1	92,0
59832	0,963	2 x 2 x 18	10,8	69,8	149,0
59833	0,963	3 x 2 x 18	11,3	89,6	180,0
59834	0,963	6 x 2 x 18	15,4	154,2	338,0
59835	0,963	9 x 2 x 18	17,9	230,3	440,0
59836	0,963	15 x 2 x 18	21,9	356,1	649,0

Dimensions and specifications may be changed without prior notice. (RN02)



### Quality & Reliability

We pay close attention to material and design. Our durable cables have been tested for multi-million cycles, ensuring our products can withstand the harshest environments.

# Color Codes

## TRAYCONTROL 300 / TRAYCONTROL 300-C (AWG 28-22)

No.	Conductor/ring Color	No.	Conductor/ring Color	No.	Conductor/ring Color
1	Black	18	White/Violet	35	White/Red/Orange
2	Brown	19	White/Gray	36	White/Red/Yellow
3	Red	20	White/Black/Brown	37	White/Red/Green
4	Orange	21	White/Black/Red	38	White/Red/Blue
5	Yellow	22	White/Black/Orange	39	White/Red/Violet
6	Green	23	White/Black/Yellow	40	White/Red/Gray
7	Blue	24	White/Black/Green	41	White/Orange/Yellow
8	Violet	25	White/Black/Blue	42	White/Orange/Green
9	Gray	26	White/Black/Violet	43	White/Orange/Blue
10	White	27	White/Black/Gray	44	White/Orange/Violet
11	White/Black	28	White/Brown/Red	45	White/Orange/Gray
12	White/Brown	29	White/Brown/Orange	46	White/Yellow/Green
13	White/Red	30	White/Brown/Yellow	47	White/Yellow/Blue
14	White/Orange	31	White/Brown/Green	48	White/Yellow/Violet
15	White/Yellow	32	White/Brown/Blue	49	White/Yellow/Gray
16	White/Green	33	White/Brown/Violet	50	White/Green/Blue
17	White/Blue	34	White/Brown/Gray		

## TRAYCONTROL 300 / TRAYCONTROL 300-C (AWG 20-16)

No.	Conductor/ring Color	No.	Conductor/ring Color	No.	Conductor/ring Color
1	Black	18	White/Green	35	White/Red/Red
2	Red	19	White/Yellow	36	White/Red/Green
3	White	20	White/Blue	37	White/Red/Blue
4	Green	21	White/Brown	38	White/Red/Brown
5	Orange	22	White/Orange	39	White/Red/Violet
6	Blue	23	White/Gray	40	White/Green/Black
7	Brown	24	White/Violet	41	White/Green/Red
8	Yellow	25	White/Black/Red	42	White/Green/Green
9	Violet	26	White/Black/Green	43	White/Green/Blue
10	Gray	27	White/Black/Yellow	44	White/Green/Brown
11	Pink	28	White/Black/Blue	45	White/Green/Violet
12	Tan	29	White/Black/Brown	46	White/Blue/Black
13	Red/Green	30	White/Black/Orange	47	White/Blue/Red
14	Red/Yellow	31	White/Black/Gray	48	White/Blue/Green
15	Red/Black	32	White/Black/Violet	49	White/Blue/Blue
16	White/Black	33	White/Black/Black	50	White/Blue/Brown
17	White/Red	34	White/Red/Black		



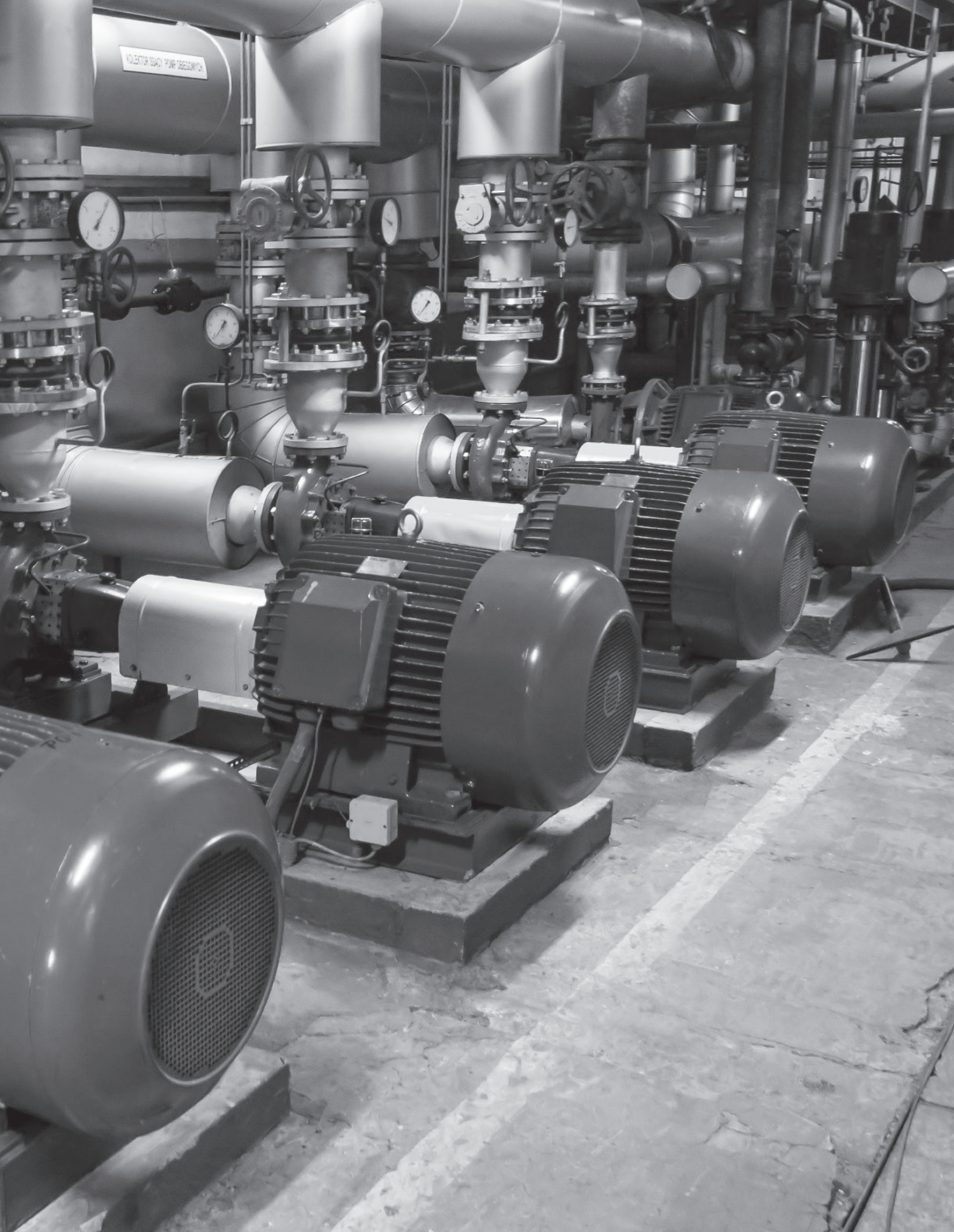
# Pair Color Codes

## TRAYCONTROL 300 TP / TRAYCONTROL 300 TP-C (AWG 20-18)

Pair No.	Conductor	Color	Pair No.	Conductor	Color	Pair No.	Conductor	Color
1	A	Black	10	A	Red	19	A	White
	B	Red		B	Blue		B	Blue
2	A	Black	11	A	Red	20	A	White
	B	White		B	Yellow		B	Brown
3	A	Black	12	A	Red	21	A	White
	B	Green		B	Brown		B	Orange
4	A	Black	13	A	Red	22	A	White
	B	Blue		B	Orange		B	Yellow
5	A	Black	14	A	Green	23	A	Blue
	B	Brown		B	Blue		B	Brown
6	A	Black	15	A	Green	24	A	Blue
	B	Yellow		B	White		B	Orange
7	A	Black	16	A	Green	25	A	Blue
	B	Orange		B	Brown		B	Yellow
8	A	Red	17	A	Green			
	B	Green		B	Orange			
9	A	Red	18	A	Green			
	B	White		B	Yellow			

## TRAYCONTROL 300 TP / TRAYCONTROL 300 TP-C (AWG 26-22)

Pair No.	Conductor	Color	Pair No.	Conductor	Color	Pair No.	Conductor	Color
1	A	White	10	A	Black	19	A	Brown
	B	Black		B	Brown		B	Orange
2	A	White	11	A	Black	20	A	Brown
	B	Brown		B	Red		B	Yellow
3	A	White	12	A	Black	21	A	Brown
	B	Red		B	Orange		B	Green
4	A	White	13	A	Black	22	A	Brown
	B	Orange		B	Yellow		B	Blue
5	A	White	14	A	Black	23	A	Brown
	B	Yellow		B	Green		B	Violet
6	A	White	15	A	Black	24	A	Brown
	B	Green		B	Blue		B	Gray
7	A	White	16	A	Black	25	A	Red
	B	Blue		B	Violet		B	Orange
8	A	White	17	A	Black			
	B	Violet		B	Gray			
9	A	White	18	A	Brown			
	B	Gray		B	Red			



# VFD / Servo Power Cables

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# TOPFLEX® 600 VFD XLPE insulation, EMC-preferred type, flexible motor power supply cable, oil-resistant, NFPA 79 Ch. 4



## Technical data

- XLPE-insulated motor supply cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC/Flexible Motor Supply/CSA 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**  
flexing 10x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km

## Cable structure

- Finely stranded (Cl. K), tinned copper acc. to AWG standards
- Special XLPE conductor insulation
- Black conductors with continuous white numbering
- GN-YE conductor in the outer layer
- Conductors stranded in layers with optimal lay length
- Overall non-woven separator
- 1. Special aluminum foil shield  
2. Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special PVC outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277), ITC-ER & PLTC-ER (18-12 AWG), 44 (14-2 AWG), NFPA 79 Ch, 4, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4  
C22.2 No. 210 - AWM I/II A/B FT4

## Note

- VFD = Variable Frequency Drive

## Available on request

- Orange (RAL 2003) jacket

## Application

Flexible, extremely oil-resistant, thermoset-insulated motor supply cable for modern servomotors; the double-shielding with special aluminum foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbances and the resultant failures. XLPE insulation makes this compliant with the requirements outlined in the current edition of NFPA 79 Chapter 4. The special PVC jacket is extremely resistant to oil, coolants and solvents making it the perfect solution for industrial applications. Open, unprotected installation in cable trays and from cable trays to the machine, as well as in pipes and direct burial are approved.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

CE The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	No. conductor x AWG No.	Cross section mm <sup>2</sup>	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63139	4 x 18	0,824	11,8	60,0	201,0
63140	4 x 16	1,31	12,5	81,5	238,0
63137	4 x 14	2,08	14,7	113,2	327,0
63141	4 x 12	3,31	15,7	163,3	409,0
63142	4 x 10	5,26	17,7	254,7	536,0
63143	4 x 8	8,37	23,0	389,9	856,0
63144	4 x 6	13,3	24,7	600,7	1131,0
63145	4 x 4	21,2	27,7	913,3	1518,0
63146	4 x 2	33,6	31,8	1383,1	2106,0

Dimensions and specifications may be changed without prior notice.

# TOPFLEX® 650 VFD

XLPE insulation, EMC-preferred type,  
flexible motor power supply w/ control conductors, oil-resistant, NFPA 79 Ch. 4



## Technical data

- XLPE-insulated motor supply cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +105°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTTC/Flexible Motor Supply 1000 V
- **Test voltage**  
power supply conductors 4000 V  
control conductors 2000 V
- **Minimum bending radius**  
flexing 10x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km

## Cable structure

- Finely stranded (Cl. K), tinned copper acc. to AWG standards
- Special XLPE conductor insulation
- Black supply conductors with continuous white numbering
- 1 or 2 black control conductors with numbers 5+6 (1 pair), 7+8 (2 pair)
- GN-YE conductor in the outer layer
- Control conductors shielded in pairs with special aluminum foil, tinned drain wire
- Control conductors stranded in pairs and laid up in layers with optimal lay length with the power supply conductors
- Overall non-woven separator
- 1. Special aluminum foil shield  
2. Braided, tinned copper shield, approx. 85% coverage
- Tinned drain wire between foil and braid shields
- Separator
- Special TPE outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTTC (2277), ITC-ER & PLTC-ER (18-12 AWG), 44 (14-2 AWG), NFPA 79 Ch. 4, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4  
C22.2 No. 210 - AWM I/II A/B FT4

## Note

- VFD = Variable Frequency Drive

## Available on request

Orange (RAL 2003) jacket

## Application

Flexible, extremely oil-resistant, thermoset-insulated motor supply cable for modern servomotors; the double-shielding with special aluminum foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbances and the resultant failures. XLPE insulation makes this compliant with the requirements outlined in the current edition of NFPA 79 Chapter 4. The special TPE jacket is extremely resistant to oil, coolants and solvents making it the perfect solution for industrial applications. Open, unprotected installation in cable trays and from cable trays to the machine, as well as in pipes and direct burial are approved.

## EMC = Electromagnetic compatibility

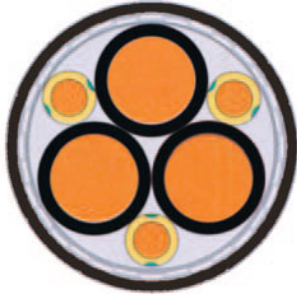
To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

☑ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	No. conductor x AWG No.	Cross section mm <sup>2</sup>	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63156	4x AWG 16 +2x AWG 18	1,31 / 0,963	15,6	117,6	320,0
11018367	4x AWG 16 +2x 2x AWG 18	1,31 / 0,963	17,5	166,7	385,0
63157	4x AWG 14 +2x AWG 18	2,08 / 0,963	16,7	154,8	379,0
11018368	4x AWG 14 +2x 2x AWG 18	2,08 / 0,963	18,5	183,0	446,0
63138	4x AWG 14 +2x AWG 16	2,08 / 1,31	17,0	165,2	394,0
11018369	4x AWG 14 +2x 2x AWG 16	2,08 / 1,31	19,0	230,7	472,0
63158	4x AWG 12 +2x AWG 18	3,31 / 0,963	17,7	206,9	454,0
11018370	4x AWG 12 +2x 2x AWG 18	3,31 / 0,963	19,6	253,0	536,0
63159	4x AWG 12 +2x AWG 16	3,31 / 1,31	18,0	217,3	469,0
11018371	4x AWG 12 +2x 2x AWG 16	3,31 / 1,31	20,1	294,7	549,0
63160	4x AWG 10 +2x AWG 16	5,26 / 1,31	19,7	318,5	603,0
11018372	4x AWG 10 +2x 2x AWG 16	5,26 / 1,31	22,6	395,9	735,0
63161	4x AWG 8 +2x AWG 16	8,37 / 1,31	24,8	486,6	945,0
11018373	4x AWG 8 +2x 2x AWG 16	8,37 / 1,31	26,4	564,0	1027,0
63162	4x AWG 6 +2x AWG 16	13,3 / 1,31	26,2	695,0	1190,0
11018374	4x AWG 6 +2x 2x AWG 16	13,3 / 1,31	27,7	770,9	1271,0
63163	4x AWG 4 +2x AWG 16	21,2 / 1,31	29,0	1007,5	1579,0
11018375	4x AWG 4 +2x 2x AWG 16	21,2 / 1,31	30,3	1083,4	1655,0

Dimensions and specifications may be changed without prior notice

# TOPFLEX® 1000 VFD XLPE insulation, EMC-preferred type, flexible motor power supply cable w/ 3 symmetrical ground conductors, oil-resistant, NFPA 79 Ch. 4



## Technical data

- XLPE-insulated, VFD motor power supply cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC/Flexible Motor Supply/CSA 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**  
flexing 10x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km

## Cable structure

- Finely stranded (Cl. K), bare copper acc. to AWG standards
- Special XLPE conductor insulation
- Black conductors with continuous white numbering
- GN-YE conductor (divided into 3)
- Conductors stranded in concentric layers
- 3 power + 3 ground conductor design
- 1. Special aluminum foil shield
- 2. Braided, tinned copper shield, approx. 85% coverage
- Special TPE outer jacket
- Black (RAL 9005) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- Due to the optimal shielding, interference-free operation is obtained
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL**  
TC-ER (1277), WTTC (2277), 44, AWM 21270 (250-500 kcmil), NFPA 79, Oil Res I/II, 90°C Dry/Wet, Class I Div. 2 per NEC Art. 501
- **CSA**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4 (8 - 4/0 AWG)  
C22.2 No. 210 - AWM I/II A/B FT4

## Note

- VFD = Variable Frequency Drive

## Application

Flexible, extremely oil-resistant, thermoset-insulated power supply cable for average mechanical stress in fixed installation and sometimes for free movement in dry, moist wet rooms and outside. XLPE insulation makes this compliant with the requirements outlined in the current edition of NFPA 79 Chapter 4. Suitable for use in the automotive industry, food processing industry, transfer streets, packaging industry, machine tools, handling equipment. Other industrial uses include pumps, fans, transport belts and in air conditioning systems, etc. Safe for use in explosion proof areas.

**EMC** = Electromagnetic compatibility

The shield must be connected at both ends and ensure large-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

☑ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	No. power conductor x AWG No.	No. ground conductor x AWG No.	No. conductor x cross section mm <sup>2</sup>	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59398	3x AWG 8 +	3x AWG 14	(3x 8,37 + 3x 2,08)	20,0	361,8	714,0
59399	3x AWG 6 +	3x AWG 12	(3x 13,3 + 3x 3,31)	23,0	536,2	982,0
59400	3x AWG 4 +	3x AWG 12	(3x 21,2 + 3x 3,31)	25,0	790,9	1302,0
59401	3x AWG 2 +	3x AWG 10	(3x 33,6 + 3x 5,26)	29,0	1203,5	1808,0
59402	3x AWG 1 +	3x AWG 8	(3x 42,4 + 3x 8,37)	33,0	1552,1	2426,0
59403	3x AWG 1/0 +	3x AWG 8	(3x 53,3 + 3x 8,37)	36,0	1906,3	2850,0
59404	3x AWG 2/0 +	3x AWG 8	(3x 67,4 + 3x 8,37)	38,0	2334,5	3304,0
59405	3x AWG 3/0 +	3x AWG 6	(3x 84,7 + 3x 13,3)	41,0	2943,3	4025,0
59406	3x AWG 4/0 +	3x AWG 6	(3x 107 + 3x 13,3)	46,0	3582,8	4896,0
59407	3x AWG 250 kcmil +	3x AWG 6	(3x 127 + 3x 13,3)	51,0	4097,0	5685,0
59408	3x AWG 300 kcmil +	3x AWG 4	(3x 152 + 3x 21,2)	53,0	5074,6	6830,0
59409	3x AWG 350 kcmil +	3x AWG 4	(3x 175 + 3x 21,2)	56,0	5747,3	7545,0
59410	3x AWG 400 kcmil +	3x AWG 2	(3x 203 + 3x 33,6)	61,0	6808,0	8914,0
59411	3x AWG 500 kcmil +	3x AWG 2	(3x 256 + 3x 33,6)	66,0	8217,9	10536,0

Dimensions and specifications may be changed without prior notice.

# TOPSERV® 600 VFD XLPE insulation, EMC-preferred type, highly flexible motor power supply cable, oil-resistant, NFPA 79 Ch. 4



## Technical data

- XLPE-insulated motor supply cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC/Flexible Motor Supply 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**  
flexing 10x cable Ø  
permanently flexing 7,5x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km

## Cable structure

- Finely stranded (Cl. M 18-10AWG; Cl. K 8-2 AWG), tinned copper acc. to AWG standards
- Special XLPE conductor insulation
- Black conductors with continuous white numbering
- GN-YE conductor in the outer layer
- Conductors stranded in layers with optimal lay length
- Overall non-woven separator
- Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special TPE outer jacket
- Orange (RAL 2003) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277), ITC-ER & PLTC-ER (18-12 AWG), 44 (14-2 AWG), NFPA 79 Ch. 4, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4  
C22.2 No. 210 - AWM I/II A/B FT4

## Note

- VFD = Variable Frequency Drive
- Available on request**
- Black (RAL 9005) jacket

## Application

Highly flexible, extremely oil-resistant, thermoset-insulated motor supply cable for modern servomotors; the double-shielding with special aluminum foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbances and the resultant failures. XLPE insulation makes this compliant with the requirements outlined in the current edition of NFPA 79 Chapter 4. The special TPE jacket is extremely resistant to oil, coolants and solvents making it the perfect solution for industrial applications. Open, unprotected installation in cable trays and from cable trays to the machine, as well as in pipes and direct burial are approved.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	No. conductor x AWG No.	Cross section mm <sup>2</sup>	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62616	4 x 18	0,824	11,9	60,9	182,0
62617	4 x 16	1,31	12,9	82,5	219,0
62618	4 x 14	2,08	14,5	115,2	290,0
62619	4 x 12	3,31	16,5	170,7	379,0
62620	4 x 10	5,26	18,0	239,3	484,0
62621	4 x 8	8,37	23,2	392,9	796,0
62622	4 x 6	13,3	24,9	606,6	1042,0
62623	4 x 4	21,2	28,0	921,9	1429,0
62624	4 x 2	33,6	32,0	1396,5	2009,0

Dimensions and specifications may be changed without prior notice.

# TOPSERV® 650 VFD

XLPE insulation, EMC-preferred type, highly flexible motor power supply w/ control conductors, oil-resistant, NFPA 79 Ch. 4



## Technical data

- XLPE-insulated motor supply cable acc. to UL Std. 1277 and 2277
- **Temperature range**  
UL/CSA TC -40°C to +90°C  
flexing +5°C to +50°C  
static -40°C to +105°C
- **Nominal voltage**  
UL/CSA TC 600 V  
UL WTTC/Flexible Motor Supply 1000 V
- **Test voltage**  
power supply conductors 4000 V  
control conductors 2000 V
- **Minimum bending radius**  
flexing 10x cable Ø  
permanently flexing 7,5x cable Ø
- **Coupling resistance**  
max. 250 Ohm/km

## Cable structure

- Finely stranded (Cl. M 18-10AWG; Cl. K 8-2 AWG), tinned copper acc. to AWG standards
- Special XLPE conductor insulation
- Black supply conductors with continuous white numbering
- 1 or 2 black control conductors with numbers 5+6 (1 pair), 7+8 (2 pair)
- GN-YE conductor in the outer layer
- Control conductors wrapped in non-woven separator and braided, tinned copper shield, approx. 85% coverage
- Control conductors stranded in pairs and laid up in layers with the power supply conductors in optimal lay lengths
- Overall non-woven separator
- Braided, tinned copper shield, approx. 85% coverage
- Separator
- Special TPE outer jacket
- Orange (RAL 2003) jacket
- With length marking in feet

## Properties

- Self-extinguishing and flame retardant acc. to CSA FT4
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- UV-resistant
- Direct burial rated
- Resistant to cleaning and disinfecting agents acc. to



## Tests

- **UL:**  
TC-ER (1277), WTTC (2277), ITC-ER & PLTC-ER (18-12 AWG), 44 (14-2 AWG), NFPA 79 Ch. 4, Class I Div. 2 per NEC Art. 501, NEC Art. 336 & 392, Oil Res I/II, 90°C Dry/Wet, -40°C Cold Bend
- **CSA:**  
C22.2 No. 230 & 239 - c(UL) CIC-TC FT4  
C22.2 No. 210 - AWM I/II A/B FT4

## Note

- VFD = Variable Frequency Drive

## Available on request

- Black (RAL 9005) jacket

## Application

Highly flexible, extremely oil-resistant, thermoset-insulated motor supply cable for modern servomotors; the double-shielding with special aluminum foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbances and the resultant failures. XLPE insulation makes this compliant with the requirements outlined in the current edition of NFPA 79 Chapter 4. The special TPE jacket is extremely resistant to oil, coolants and solvents making it the perfect solution for industrial applications. Open, unprotected installation in cable trays and from cable trays to the machine, as well as in pipes and direct burial are approved.

**EMC** = Electromagnetic compatibility

To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

☑ The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no.	No. conductor x AWG No.	Cross section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59846	4x AWG 16 +2x AWG 18	1,31 / 0,824	16,2	105,2	335,0
710015	4x AWG 16 +2x 2x AWG 18	1,31 / 0,824	18,5	127,9	418,0
59847	4x AWG 14 +2x AWG 18	2,08 / 0,824	16,8	136,9	379,0
712804	4x AWG 14 +2x 2x AWG 18	2,08 / 0,824	19,1	159,5	464,0
59848	4x AWG 14 +2x AWG 16	2,08 / 1,31	17,3	147,3	400,0
710017	4x AWG 14 +2x 2x AWG 16	2,08 / 1,31	19,9	180,0	506,0
59849	4x AWG 12 +2x AWG 18	3,31 / 0,824	18,6	188,7	469,0
710018	4x AWG 12 +2x 2x AWG 18	3,31 / 0,824	20,9	229,5	573,0
59850	4x AWG 12 +2x AWG 16	3,31 / 1,31	19,1	199,1	490,0
710019	4x AWG 12 +2x 2x AWG 16	3,31 / 1,31	22,4	249,6	661,0
59851	4x AWG 10 +2x AWG 16	5,26 / 1,31	20,6	292,1	613,0
710020	4x AWG 10 +2x 2x AWG 16	5,26 / 1,31	24,0	326,5	774,0
59852	4x AWG 8 +2x AWG 16	8,37 / 1,31	25,4	451,9	945,0
710021	4x AWG 8 +2x 2x AWG 16	8,37 / 1,31	27,5	487,3	1054,0
59853	4x AWG 6 +2x AWG 16	13,3 / 1,31	26,8	641,5	1168,0
710022	4x AWG 6 +2x 2x AWG 16	13,3 / 1,31	28,8	676,4	1280,0
59854	4x AWG 4 +2x AWG 16	21,2 / 1,31	29,6	954,1	1563,0
710023	4x AWG 4 +2x 2x AWG 16	21,2 / 1,31	31,3	987,8	1667,0

Dimensions and specifications may be changed without prior notice.



## Why Use VFD Cables?

VFD cables are a critical component in order to extend a motor's life cycle within a VFD system. Three areas where VFD cables set themselves apart over traditional tray-rated power cables are:

### 1. Address high and low frequency noise issues with proper shielding

Shielding on cables is what prevents systems from interacting with each other. In short, a cable's shield is its defense against noise. THHN and most generic control/tray cable are constructed using either an aluminum shield or they are unshielded. HELUKABEL's VFD cables are constructed using either a foil (100% coverage) + tinned copper braid (85% coverage), or a triple shield comprising of a semi-conductive fleece + foil + braid shield (80% coverage). Cables with the proper shielding prevent the VFD system from radiating electrical noise that can interfere with surrounding networking, instrumentation, wireless communication, and industrial devices.

### 2. Ability to withstand voltage spikes/reflected wave voltage

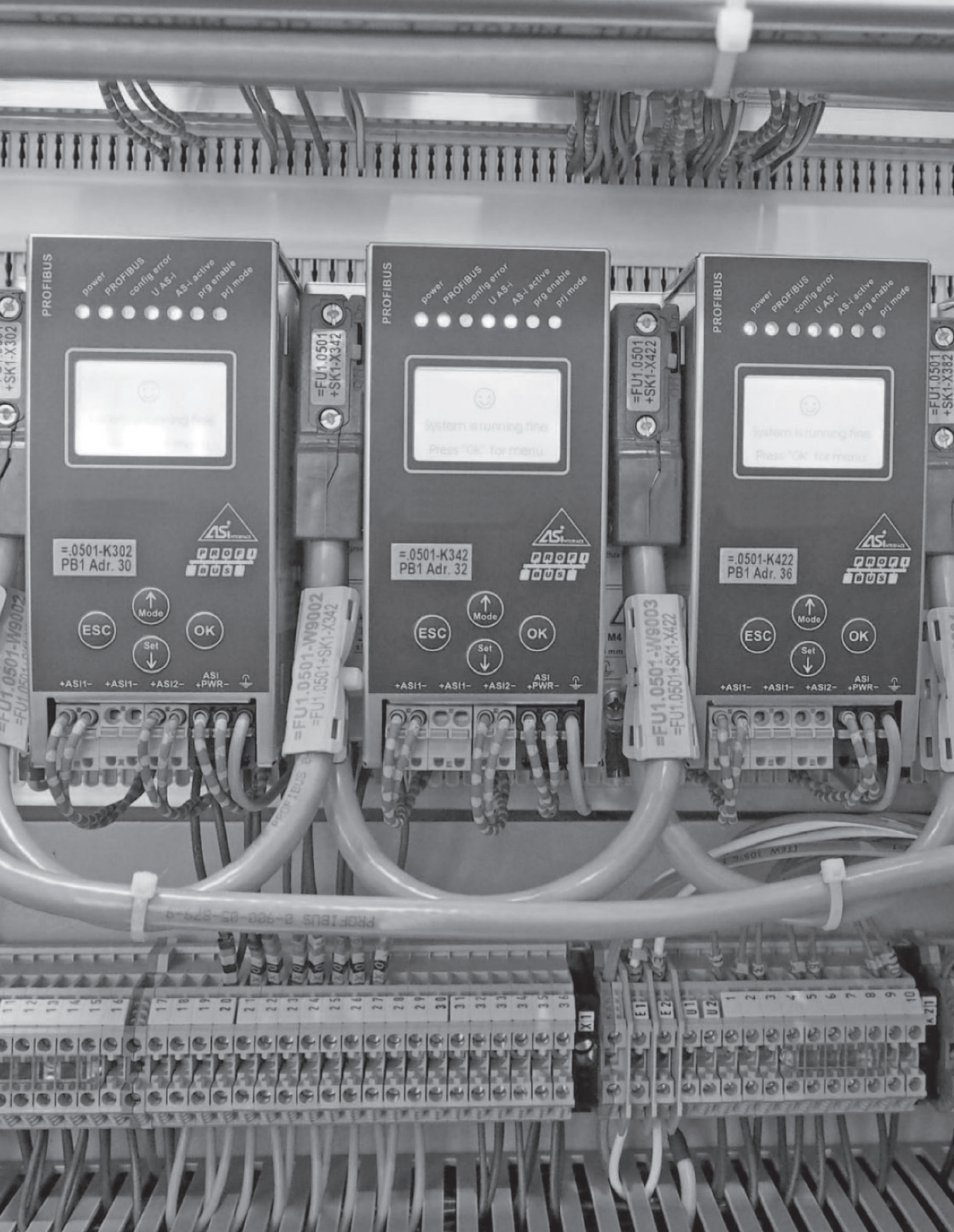
A cable combats voltage spikes with insulation material and wall thickness. HELUKABEL's VFD cables use XLPE insulation as its conductor insulation. XLPE has a much lower capacitance (higher corona inception voltage) than THHN and generic control/tray cable which just use PVC. This is particularly important in wet or damp environments as PVC is more susceptible to absorbing moisture, which results in less than half the insulation capability of XLPE. The wall thickness of a VFD cable tends to be thicker allowing it to withstand voltage spikes significantly better.

### 3. High temperature resistance

A cable's type of insulation plays a significant role in how it responds to thermal stress. Thermoset insulation won't melt or drip in higher temperatures like the thermoplastic insulation found in THHN and generic control/tray cables. If thermoplastic insulation is used, you run the risk that it will melt, drip, or simply deform, which reduces the insulation properties, and can cause damage to critical and expensive equipment/machinery.

## Motor Current Rating Chart

Horsepower	AC Induction Motors						
	Single Phase		Three phase				
	115 Volt @ 60 HZ	230 Volt @ 60 HZ	200 Volt @ 60 HZ	230 Volt @ 60 HZ	380-415 Volt @ 60 HZ	460 Volt @ 60 HZ	575 Volt @ 60 HZ
1	16.0	8.0	4.8	4.2	2.3	2.1	1.7
1 1/2	20.0	10.0	6.9	6.0	3.3	3.0	2.4
2	24.0	12.0	7.8	6.8	4.3	3.4	2.7
3	34.0	17.0	11.0	9.6	6.1	4.8	3.9
5	56.0	28.0	17.5	15.2	9.7	7.6	6.1
7 1/2	80.0	40.0	25.3	22.0	14.0	11.0	9.0
10	100	50.0	32.2	28.0	18.0	14.0	11.0
15	135	68.0	48.3	42.0	27.0	21.0	17.0
20	~	88.0	62.1	54.0	34.0	27.0	22.0
25	~	110	78.2	68.0	44.0	34.0	27.0
30	~	136	92.0	80.0	51.0	40.0	32.0
40	~	176	120	104	66.0	52.0	41.0
50	~	216	150	130	83.0	65.0	52.0
60	~	~	177	154	103	77.0	62.0
75	~	~	221	192	128	96.0	77.0
100	~	~	285	248	165	124	99.0
125	~	~	359	312	208	156	125
150	~	~	414	360	240	180	144
175	~	~	475	413	275	207	168
200	~	~	552	480	320	240	192
250	~	~	692	604	403	302	242
300	~	~	~	722	482	361	289
350	~	~	~	828	560	414	336
400	~	~	~	954	636	477	382
450	~	~	~	1030	711	515	412
500	~	~	~	1180	786	590	472



PROFIBUS

power  
PROFIBUS  
config error  
U AS-1  
AS-1 active  
prg enable  
prj mode



=.0501-K302  
PB1 Adr. 30



ESC Mode OK  
Set

+ASI1- +ASI1- +ASI2- ASI +PWR-

PROFIBUS

power  
PROFIBUS  
config error  
U AS-1  
AS-1 active  
prg enable  
prj mode



=.0501-K342  
PB1 Adr. 32



ESC Mode OK  
Set

+ASI1- +ASI1- +ASI2- ASI +PWR-

PROFIBUS

power  
PROFIBUS  
config error  
U AS-1  
AS-1 active  
prg enable  
prj mode



=.0501-K422  
PB1 Adr. 36



ESC Mode OK  
Set

+ASI1- +ASI1- +ASI2- ASI +PWR-

=FU1.0501  
+SK1-X342

=FU1.0501-W9002  
=FU1.0501+SK1-X342

=FU1.0501  
+SK1-X422

=FU1.0501-W9003  
=FU1.0501+SK1-X422

=FU1.0501  
+SK1-X382

PROFIBUS 0-900-05-878-9



# Single Conductor Cables

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# FIVENORM HAR-UL-CSA-AWM-MTW, PVC single conductor, UL Style 10269/UL Standard 1063, 600 V, 105°C



## Technical data

- PVC single conductor acc. to DIN VDE 0285-525-2-31 / DIN EN 50525-2-31, UL Std. 1063, UL AWM Style 10269 and CSA TEW and CSA AWM I/A/B
- **Temperature range**  
H05V2-K / H07V2-K flexing +5°C to +90°C static -40°C to +90°C  
UL (AWM) -40°C to +105°C  
UL (MTW) -40°C to +90°C  
CSA (TEW) -40°C to +105°C
- **Nominal voltage**  
up to 18 AWG (1 mm<sup>2</sup>) H05V2-K:  
U<sub>0</sub>/U 450/750 V  
from 16 AWG (1,5 mm<sup>2</sup>) H07V2-K:  
U<sub>0</sub>/U 450/750 V  
UL (AWM) 1000 V (ac)  
UL (AWM) 1250 V (dc)  
UL (MTW) 600 V  
CSA (TEW) 600 V
- **Test voltage**  
H05V2-K / H07V2-K 2000 V
- **Test voltage** (Spark Test)  
AWG 22 = 5 kV  
> AWG 20 = 6 kV
- **Insulation resistance**  
min. 20 MΩ x km
- **Minimum bending radius**  
fixed installation for conductor Ø:  
≤ 8 mm: 4x conductor Ø  
> 8-12 mm: 5x conductor Ø  
> 12 mm: 6x conductor Ø

## Cable structure

- Finely stranded, bare copper acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5, acc. to UL Std. 758
- PVC T13 compound conductor insulation acc. to DIN VDE 0207-363-3 / DIN EN 50363-3, CSA C 22.2 No. 210 tab.12 class H and UL Std. 1581 class 43
- Conductor identification to DIN VDE 0293

## Properties

- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## Tests

- Self-extinguishing and flame retardant PVC acc. to VDE 0482-332-1-2, DIN EN 60332-1-2 / IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B), UL VW-1, CSA FT1

## Note

- Tinned copper on request.
- Up to = 18 AWG (1,0 mm<sup>2</sup>) = H05V2-K, from 16 AWG (1,5 mm<sup>2</sup>) up to 2 AWG (35 mm<sup>2</sup>) = H07V2-K.  
Cross sections up to 2 AWG (35 mm<sup>2</sup>) are acc. to DIN VDE 0285-525-2-31. Due to this cross section > 2 AWG (35 mm<sup>2</sup>) is the type H07V-K but with an increased heat-resistant PVC T13 compound.
- **Type H05V:**  
Approved one-color mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white, green and yellow.  
Two-color mark in any combination of the above individual colors.
- **Type H07V:**  
Approved mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white and green-yellow.  
Other marks are available as (H).

## Application

Single conductor hook-up wire with five approvals designed primarily for export-oriented machine tool builders. HAR, UL: AWM & MTW, CSA: AWM & TEW approvals make economical warehousing and part list simplification possible.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

## H05V2-K

Cross sec. mm <sup>2</sup> / AWG no.	Outer Ø app. mm	Cop. weight kg / km	BK	GN-YE	BU	BN	RD	WH	GY	VT	YE	PK	GN	TRANS	D-BU	OG	o.col.	2-col.
app. RAL			9005	-	5015	8003	3000	1013	7000	4005	1021	3015	6018	-	5010	2003	-	-
Part no. 0,5 / 22	2,65	5,2	64075	64076	64077	64078	64079	64080	64081	64082	64083	64084	64085	64086	64087	64088	64089	64090
Part no. 0,75 / 20	2,6	7,2	64091	64092	64093	64094	64095	64096	64097	64098	64099	64100	64101	64102	64103	64104	64105	64106
Part no. 1 / 18	2,8	9,6	64107	64108	64109	64110	64111	64112	64113	64114	64115	64116	64117	64118	64119	64120	64121	64122

Continuation ▶

# FIVENORM HAR-UL-CSA-AWM-MTW, PVC single conductor,

UL Style 10269/UL Standard 1063, 600 V, 105°C



## H07V2-K

Cross sec. mm <sup>2</sup> / AWG no. app. RAL	Outer Ø app. mm	Cop. weight kg / km	BK	GN-YE	BU	BN	RD	WH	GY	VT	YE	PK	GN	TRANS	D-BU	OG	o.col.	2-col.
Part no. 1,5 / 16	3,0	14,4	9005	-	5015	8003	3000	1013	7000	4005	1021	3015	6018	-	5010	2003	-	-
Part no. 2,5 / 14	3,6	24,0	64123	64124	64125	64126	64127	64128	64129	64130	64131	64132	64133	64134	64135	64136	64137	64138
Part no. 4 / 12	4,1	38,0	64139	64140	64141	64142	64143	64144	64145	64146	64147	64148	64149	64150	64151	64152	64153	64154
Part no. 6 / 10	4,8	58,0	64155	64156	64157	64158	64159	64160	64161	64162	64163	64164	64165	64166	64167	64168	64169	64170
Part no. 10 / 8	6,4	96,0	64171	64172	64173	64174	64175	64176	64177	64178	64179	64180	64181	64182	64183	64184	64185	64186
Part no. 16 / 6	8,1	154,0	64187	64188	64189	64190	64191	64192	64193	64194	64195	64196	64197	64198	64199	64200	64201	64202
Part no. 25 / 4	9,6	240,0	64203	64204	64205	64206	64207	64208	64209	64210	64211	64212	64213	64214	64215	64216	64217	64218
Part no. 35 / 2	10,8	336,0	64219	64220	64221	64222	64223	64224	64225	64226	64227	64228	64229	64230	64231	64232	64233	64234
Part no. 50 / 1	13,6	480,0	64235	64236	64237	64238	64239	64240	64241	64242	64243	64244	64245	64246	64247	64248	64249	64250
Part no. 70 / 2/0	15,2	672,0	64251	64252	64253	64254	64255	64256	64257	64258	64259	64260	64261	64262	64263	64264	64265	64266
Part no. 95 / 3/0	16,8	912,0	64267	64268	64269	64270	64271	64272	64273	64274	64275	64276	64277	64278	64279	64280	64281	64282
Part no. 120 / 4/0	19,5	1152,0	64283	64284	64285	64286	64287	64288	64289	64290	64291	64292	64293	64294	64295	64296	64297	64298
Part no. 150 / 300 kcmil	22,2	1440,0	64299	64300	64301	64302	64303	64304	64305	64306	64307	64308	64309	64310	64311	64312	64313	64314
			64315	64316	64317	64318	64319	64320	64321	64322	64323	64324	64325	64326	64327	64328	64329	64330

## H05V2-K, barrel (with various capacity)

Cross sec. mm <sup>2</sup> / AWG no. app. RAL	Outer Ø app. mm	Cop. weight kg / km	BK	GN-YE	BU	BN	RD	WH	GY	VT	YE	PK	GN	TRANS	D-BU	OG	o.col.	2-col.
Part no. 0,5 / 22	2,5	5,2	9005	-	5015	8003	3000	1013	7000	4005	1021	3015	6018	-	5010	2003	-	-
Part no. 0,75 / 20	2,65	7,2	65402	65403	65404	65405	65406	65407	65408	65409	65413	65410	65412	-	65414	65411	-	-
Part no. 1 / 18	2,8	9,6	65415	65416	65417	65418	65419	65420	65421	65422	65426	65423	65425	-	65427	65424	-	-
			65428	65429	65430	65431	65432	65433	65434	65435	65439	65436	65438	-	65440	65437	-	-

## H07V2-K, barrel (with various capacity)

Cross sec. mm <sup>2</sup> / AWG no. app. RAL	Outer Ø app. mm	Cop. weight kg / km	BK	GN-YE	BU	BN	RD	WH	GY	VT	YE	PK	GN	TRANS	D-BU	OG	o.col.	2-col.
Part no. 1,5 / 16	3,05	14,4	9005	-	5015	8003	3000	1013	7000	4005	1021	3015	6018	-	5010	2003	-	-
Part no. 2,5 / 14	3,6	24,0	65441	65442	65443	65444	65445	65446	65447	65448	65452	65449	65451	-	65453	65450	-	-
Part no. 4 / 12	4,1	38,0	65454	65455	65456	65457	65458	65459	65460	65461	65465	65462	65464	-	65466	65463	-	-
			65467	65468	65469	65470	65471	65472	65473	65474	65478	65475	65477	-	65479	65476	-	-

## H05V2-K two color

Cross sec. mm <sup>2</sup> / AWG no. app. RAL	Outer Ø app. mm	Cop. weight kg / km	BU/WH	WH/BU	D-BU/WH	WH/OG	WH/RD	BK/OG	D-BU/OG	RD/WH	WH/D-BU	YE/BN	OG/BU
Part no. 0,5 / 22	2,5	5,2	63402	63403	63404	63405	63406	63482	63332	63352	63372	65386	69625
Part no. 0,75 / 20	2,65	7,2	63407	63408	63409	63410	63411	63483	63333	63353	63373	65387	69626
Part no. 1 / 18	2,8	9,6	63412	63413	63414	63415	63416	63484	63334	63354	63374	65388	69627

## H05V2-K two color

Cross sec. mm <sup>2</sup> / AWG no. app. RAL	Outer Ø app. mm	Cop. weight kg / km	WH/YE	OG/D-BU	YE/BU	BU/OG	OG/RD	OG/BK	OG/WH	YE/RD	BK/YE
Part no. 0,5 / 22	2,5	5,2	69827	69828	69829	69830	69831	69832	69833	69834	69835
Part no. 0,75 / 20	2,65	7,2	69836	69837	69838	69839	69840	69841	69842	69843	69844
Part no. 1 / 18	2,8	9,6	69845	69846	69847	69848	69849	69850	69851	69852	69853

Continuation ▶

# FIVENORM HAR-UL-CSA-AWM-MTW, PVC single conductor, UL Style

10269/UL Standard 1063, 600 V, 105°C



## (H)07V2-K two color

Cross sec. mm <sup>2</sup> / AWG no.	Outer Ø app. mm	Cop. weight kg / km	BU/WH	WH/BU	D-BU/WH	WH/OG	WH/RD	BK/OG	D-BU/OG	RD/WH	WH/D-BU	YE/BN	OG/BU
Part no. 1,5 / 16	3,05	14,4	63417	63418	63419	63420	63421	63485	63335	63355	63375	65389	69628
Part no. 2,5 / 14	3,6	24,0	63422	63423	63424	63425	63426	63486	63336	63356	63376	65390	69629
Part no. 4 / 12	4,1	38,0	63427	63428	63429	63430	63431	63487	63337	63357	63377	65391	69630
Part no. 6 / 10	4,8	58,0	63432	63433	63434	63435	63436	63488	63338	63358	63378	65392	69655
Part no. 10 / 8	6,4	96,0	63437	63438	63439	63440	63441	63489	63339	63359	63379	65393	69656
Part no. 16 / 6	8,1	154,0	63442	63443	63444	63445	63446	63490	63340	63360	63380	65394	69657
Part no. 25 / 4	9,6	240,0	63447	63448	63449	63450	63451	63491	63342	63362	63382	65395	69658
Part no. 35 / 2	10,8	336,0	63452	63453	63454	63455	63456	63492	63343	63363	63383	65396	69659
Part no. 50 / 1	13,6	480,0	63457	63458	63459	63460	63461	63493	63344	63364	63384	65397	69660
Part no. 70 / 2/0	15,2	627,0	63462	63463	63464	63465	63466	63494	63345	63365	63385	65398	69738
Part no. 95 / 3/0	16,8	912,0	63467	63468	63469	63470	63471	63495	63346	63366	63386	65499	69739
Part no. 120 / 4/0	19,5	1152,0	63472	63473	63474	63475	63476	63496	63347	63367	63387	65400	69740
Part no. 150 / 300 kcmil	22,2	1440,0	63477	63478	63479	63480	63481	63497	63348	63368	63388	65401	69741

## (H)07V2-K two color

Cross sec. mm <sup>2</sup> / AWG no.	Outer Ø app. mm	Cop. weight kg / km	WH/YE	OG/D-BU	YE/BU	BU/OG	OG/RD	OG/BK	OG/WH	YE/RD	BK/YE
Part no. 1,5 / 16	3,05	14,4	69854	69855	69856	69857	69858	69859	69860	69861	69862
Part no. 2,5 / 14	3,6	24,0	69863	69864	69865	69866	69867	69868	69869	69870	69871
Part no. 4 / 12	4,1	38,0	69872	69873	69874	69875	69876	69877	69878	69879	69880
Part no. 6 / 10	4,8	58,0	69881	69882	69883	69884	69885	69886	69887	69888	69889
Part no. 10 / 8	6,4	96,0	69890	69891	69892	69893	69894	69895	69896	69897	69898
Part no. 16 / 6	8,1	154,0	69899	69900	69901	69902	69903	69904	69905	69906	69907

## H05V2-K two color, barrel (with various capacity)

Cross-sec. mm <sup>2</sup> / AWG-no.	Outer Ø app. mm	Cop. weight kg / km	BU/WH	WH/BU	D-BU/WH	WH/OG	WH/RD	BK/OG	D-BU/OG	RD/WH	WH/D-BU	YE/BN	OG/BU
Part no. 0,5 / 22	2,5	5,2	65479	65480	65481	65482	65483	65484	65485	65486	65487	65488	65489
Part no. 0,75 / 20	2,65	7,2	65490	65491	65492	65493	65494	65495	65496	65497	65498	65502	65503
Part no. 1 / 18	2,8	9,6	65504	65505	65506	65507	65508	65509	65510	65511	65512	65514	65515

## (H)07V2-K two color, barrel (with various capacity)

Cross sec. mm <sup>2</sup> / AWG no.	Outer Ø app. mm	Cop. weight kg / km	BU/WH	WH/BU	D-BU/WH	WH/OG	WH/RD	BK/OG	D-BU/OG	RD/WH	WH/D-BU	YE/BN	OG/BU
Part no. 1,5 / 16	3,05	14,4	65516	65517	65518	65519	65520	65521	65522	65523	65524	65525	65526
Part no. 2,5 / 14	3,6	24,0	65527	65528	65529	65530	65531	65532	65533	65534	65535	65536	65537
Part no. 4 / 12	4,1	38,0	65538	65539	65540	65541	65542	65543	65544	65545	65546	65547	65548

Dimensions and specifications may be changed without prior notice. (RN06)

# HELUTHERM® 145 UL/CSA 600V

temperature-resistant, cross-linked



## TECHNICAL DATA

Single conductor acc. to UL Std. 758 (AWM) Style 3578, CSA Std. C22.2 No. 210 - AWM I/II A/B

<b>Temperature range</b>	flexing -35°C to +120°C static -55°C to +145°C UL (AWM) flexing -35°C to +105°C UL (AWM) static -55°C to +105°C
<b>Nominal voltage</b>	UL (AWM) AC 600 V
<b>Test voltage</b>	3000 V
<b>Minimum bending radius</b>	flexing 12.5x Outer Ø static 4x Outer Ø

- No fire propagation

## TESTS

- Halogen-free acc. to DIN VDE 0482-754-1 / DIN EN 60754-1 / IEC 60754-1
- Corrosiveness of combustion gases acc. to DIN VDE 0482-754-2 / DIN EN 60754-2 / IEC 60754-2
- Flame-retardant acc. to CSA FT1
- bundle fire test acc. to DIN VDE 0482-332-3-24 / DIN EN 60332-3-24 / IEC 60332-3-24
- Smoke density acc. to DIN VDE 0482-1034-1+2 / DIN EN 61034-1+2 / IEC 61034-1+2
- Certifications:  
0.5 - 50 mm<sup>2</sup>: DNV GL

## CABLE STRUCTURE

- Tinned copper wire, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5
- Conductor insulation: cross-linked polyolefin
- Conductor identification: see table

## APPLICATION

Temperature-resistant, single conductor for the internal wiring of lighting fixtures, heaters, electrical machinery, switching systems and distributors in industrial equipment as well as plant and machine construction; suitable for laying in tubes, on and under plaster as well as closed installation ducts. Not suitable for direct laying in cable ladders and cable trays.

## PROPERTIES

- Resistant to: UV radiation, ozone, weathering effects
- Abrasion-resistant, notch-resistant
- Halogen-free
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## NOTES

- The conductor is metrically (mm<sup>2</sup>) constructed, AWG numbers are approximated, and are for reference only

Cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.	black (RAL 9005)	green-yellow	blue (RAL 5015)	brown (RAL 8003)	red (RAL 3000)	white (RAL 9010)	grey (RAL 7001)	purple (RAL 4005)
					Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	Part no.	
0.25	24	2.3	2.4	7.0	59473	59472	59474	59475	59476	59477	59478	59479
0.5	20	2.6	4.8	11.0	59487	59486	59488	59489	59490	59491	59492	59493
0.75	19	2.8	7.2	14.0	59501	59500	59502	59503	59504	59505	59506	59507
1	18	2.9	9.6	17.0	59515	59514	59516	59517	59518	59519	59520	59521
1.5	16	3.1	14.4	22.0	59529	59528	59530	59531	59532	59533	59534	59535
2.5	14	3.6	24.0	33.0	59543	59542	59544	59545	59546	59547	59548	59549
4	12	4.3	38.4	53.0	59557	59556	59558	59559	59560	59561	59562	59563
6	10	5.0	57.6	78.0	59571	59570	59572	59573	59574	59575	59576	59577
10	8	6.4	96.0	136.0	59585	59584	59586	59587	59588	59589	59590	59591
16	6	7.5	154.0	203.0	59599	59598	59600	59601	59602	59603	59604	59605
25	4	9.6	240.0	300.0	59613	59612	59614	59615	59616	59617	59618	59619
35	2	10.8	336.0	405.0	59627	59626	59628	59629	59630	59631	59632	59633
50	1	12.6	480.0	580.0	59641	59640	59642	59643	59644	59645	59646	59647

Continuation ▶

# HELUTHERM® 145 UL/CSA 600V

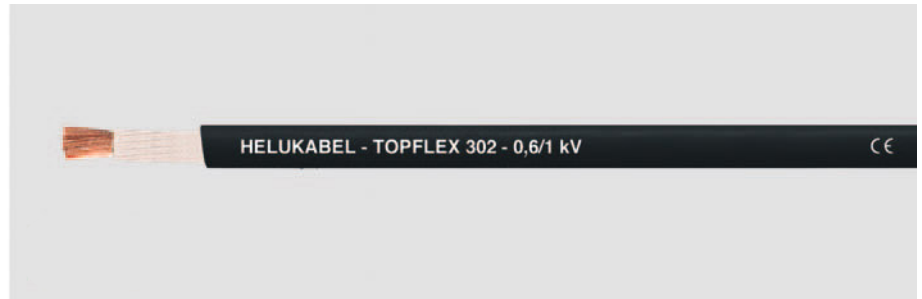
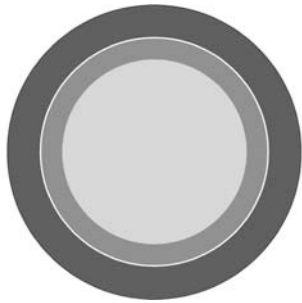
temperature-resistant, cross-linked



Cross sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.	yellow	orange	green	pink	beige
					(RAL 1021) Part no.	(RAL 2003) Part no.	(RAL 6018) Part no.	(RAL 3015) Part no.	(RAL 1001) Part no.
0.25	24	2.3	2.4	7.0	<b>59480</b>	<b>59481</b>	<b>59482</b>	<b>59483</b>	<b>59484</b>
0.5	20	2.6	4.8	11.0	<b>59494</b>	<b>59495</b>	<b>59496</b>	<b>59497</b>	<b>59498</b>
0.75	19	2.8	7.2	14.0	<b>59508</b>	<b>59509</b>	<b>59510</b>	<b>59511</b>	<b>59512</b>
1	18	2.9	9.6	17.0	<b>59522</b>	<b>59523</b>	<b>59524</b>	<b>59525</b>	<b>59526</b>
1.5	16	3.1	14.4	22.0	<b>59536</b>	<b>59537</b>	<b>59538</b>	<b>59539</b>	<b>59540</b>
2.5	14	3.6	24.0	33.0	<b>59550</b>	<b>59551</b>	<b>59552</b>	<b>59553</b>	<b>59554</b>
4	12	4.3	38.4	53.0	<b>59564</b>	<b>59565</b>	<b>59566</b>	<b>59567</b>	<b>59568</b>
6	10	5.0	57.6	78.0	<b>59578</b>	<b>59579</b>	<b>59580</b>	<b>59581</b>	<b>59582</b>
10	8	6.4	96.0	136.0	<b>59592</b>	<b>59593</b>	<b>59594</b>	<b>59595</b>	<b>59596</b>
16	6	7.5	154.0	203.0	<b>59606</b>	<b>59607</b>	<b>59608</b>	<b>59609</b>	<b>59610</b>
25	4	9.6	240.0	300.0	<b>59620</b>	<b>59621</b>	<b>59622</b>	<b>59623</b>	<b>59624</b>
35	2	10.8	336.0	405.0	<b>59634</b>	<b>59635</b>	<b>59636</b>	<b>59637</b>	<b>59638</b>
50	1	12.6	480.0	580.0	<b>59648</b>	<b>59649</b>	<b>59650</b>	<b>59651</b>	<b>59652</b>



# TOPFLEX® 302 / 302-UL highly flexible, PVC single conductor, double insulated, 0,6/1kV



## Technical data

### TOPFLEX® 302

- Special PVC single conductor cable with double insulation, flexible at low temps
- **Temperature range**  
flexing -15°C to +80°C  
static -40°C to +80°C
- **Nominal voltage**  
U<sub>0</sub>/U 600/1000 V
- **A.C. test voltage**, 50 Hz  
3000 V
- **Insulation resistance**  
min. 20 MΩ x km
- **Minimum bending radius**  
flexing 5x cable Ø

### TOPFLEX® 302-UL

- Technical data as above, but with additional UL AWM Style 10107
- **Nominal voltage**  
UL 600 V

## Cable structure

- Finely stranded bare copper, acc. to DIN VDE 0295 cl.6 and IEC 60228 cl.6
- PVC insulation, natural
- PVC TM2 compound outer jacket
- Black (RAL 9005) jacket

## Properties

- UV-resistant jacket
- Self-extinguishing and flame retardant PVC acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- Chemical resistance see Technical Information
- The cable is permissible for over voltage category II

## Application

These cables are specially designed for use as connecting cables in drag chains, automatic handling devices, robots, machine tools, machining and processing equipment, and nearly any area requiring flexible use with free movement.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

### TOPFLEX® 302 without UL approval

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
72946	1 x 1,5	16	4,0	14,4	25,0
73924	1 x 2,5	14	4,5	24,0	42,0
72950	1 x 4	12	5,6	38,4	58,0
72945	1 x 6	10	6,1	57,6	85,0
75450	1 x 10	8	8,0	96,0	130,0
72947	1 x 16	6	9,8	153,6	190,0
75451	1 x 25	4	11,8	240,0	280,0
75452	1 x 35	2	12,9	336,0	400,0
75453	1 x 50	1	14,6	480,0	520,0
72944	1 x 70	2/0	17,5	672,0	720,0
75454	1 x 95	3/0	20,2	912,0	1050,0
75455	1 x 120	4/0	21,6	1152,0	1220,0
75456	1 x 150	300 kcmil	23,5	1440,0	1500,0
75457	1 x 185	350 kcmil	25,7	1776,0	1940,0
75458	1 x 240	500 kcmil	29,5	2304,0	2675,0

### TOPFLEX® 302 with UL approval

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
700231	1 x 1,5	16	5,2	14,4	25,0
700232	1 x 2,5	14	6,4	24,0	42,0
700233	1 x 4	12	7,0	38,4	58,0
700234	1 x 6	10	7,5	57,6	85,0
701351	1 x 10	8	9,1	96,0	130,0
700114	1 x 16	6	10,8	153,6	190,0
701352	1 x 25	4	13,1	240,0	280,0
701353	1 x 35	2	14,1	336,0	400,0
701354	1 x 50	1	15,8	480,0	520,0
700235	1 x 70	2/0	19,0	672,0	720,0
701355	1 x 95	3/0	21,5	912,0	1050,0
701356	1 x 120	4/0	23,2	1152,0	1220,0
701357	1 x 150	300 kcmil	25,2	1440,0	1500,0
701358	1 x 185	350 kcmil	27,0	1776,0	1940,0
701359	1 x 240	500 kcmil	31,5	2304,0	2675,0

Dimensions and specifications may be changed without prior notice.

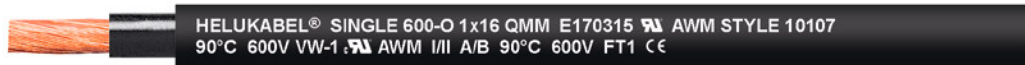


### Innovation

Our Research & Development team is constantly working on developing new top-of-the-line products that meet and exceed our customers' ever-changing application requirements.

# Single 600-J / Single 600-O

600 V



## TECHNICAL DATA

PVC-jacketed, single conductor cable acc. to UL Std. 758 (AWM) Style 10107, CSA Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31

<b>Temperature range</b>	flexing -5°C to +90°C static -40°C to +90°C
<b>Permissible operating temperature of the conductor</b>	+90°C
<b>Nominal voltage</b>	VDE AC U <sub>0</sub> /U 600/1000 V UL (AWM) AC 600 V
<b>Test voltage</b>	4000 V
<b>Breakdown voltage</b>	8000 V
<b>Minimum bending radius</b>	flexing 7.5x Outer Ø static 4x Outer Ø

## CABLE STRUCTURE

- Bare copper wire, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5
- Conductor insulation: special PVC acc. to UL Std. 1581
- Conductor identification: see table
- G = with protective conductor GN-YE,  
x = without protective conductor
- Outer jacket: PVC acc. to DIN VDE 0207-5 (compound type YM5), UL Std. 1581
- Jacket color: black (RAL 9005)
- Length marking: in meters

## PROPERTIES

- Resistant to: UV radiation
- Largely resistant to: oil,  
for details, see "Technical Information"
- For outdoor use
- The materials used during manufacturing are cadmium-free,  
contain no silicone and are free from substances harmful to the wetting properties of lacquers

## TESTS

- Flame-retardant acc. to DIN VDE 0482-332-1-2 /  
DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1

## APPLICATION

PVC-jacketed, single conductor cable suitable for medium mechanical stress with free movement, without tensile stress and without forced movements in dry, damp and wet rooms, as well as outdoors. May not be laid directly in soil or water. These two-standard, jacketed single conductor cables are preferably used in export-oriented mechanical engineering on machine tools, production lines and in plant construction.

## NOTES

- The conductor is metrically (mm<sup>2</sup>) constructed, AWG numbers are approximated, and are for reference only

### Single 600-J, Conductor identification: green-yellow

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
10881	1 G 6	10	7.8	58.0	118.0
10883	1 G 10	8	9.0	96.0	180.0
10885	1 G 16	6	10.0	154.0	250.0
10887	1 G 25	4	11.4	240.0	370.0
10889	1 G 35	2	13.0	336.0	490.0
10891	1 G 50	1	15.6	480.0	665.0
10893	1 G 70	2/0	17.9	672.0	910.0
10895	1 G 95	3/0	19.5	912.0	1195.0
10897	1 G 120	4/0	22.3	1152.0	1545.0
10899	1 G 150	250 kcmil	25.0	1440.0	1750.0
10901	1 G 185	350 kcmil	28.6	1776.0	2320.0
10903	1 G 240	450 kcmil	31.7	2304.0	2960.0

### Single 600-O, Conductor identification: black

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
10882	1 x 6	10	7.8	58.0	118.0
10884	1 x 10	8	9.0	96.0	180.0
10886	1 x 16	6	10.0	154.0	250.0
10888	1 x 25	4	11.4	240.0	370.0
10890	1 x 35	2	13.0	336.0	490.0
10892	1 x 50	1	15.6	480.0	665.0
10894	1 x 70	2/0	17.9	672.0	910.0
10896	1 x 95	3/0	19.5	912.0	1195.0
10898	1 x 120	4/0	22.3	1152.0	1545.0
10900	1 x 150	250 kcmil	25.0	1440.0	1750.0
10902	1 x 185	350 kcmil	28.6	1776.0	2320.0
10904	1 x 240	450 kcmil	31.7	2304.0	2960.0

# Single 602-RC-J / Single 602-RC-O

600 V



## TECHNICAL DATA

PVC-jacketed, single conductor cable acc. to **UL Std. 758 (AWM) Style 10107, CSA Std. C22.2 No. 210 - AWM I/II A/B, in alignment with DIN VDE 0285-525-2-31 / DIN EN 50525-2-31**

<b>Temperature range</b>	flexing -5°C to +90°C static -40°C to +90°C
<b>Permissible operating temperature of the conductor</b>	+90°C
<b>Nominal voltage</b>	VDE AC U <sub>0</sub> /U 600/1000 V UL (AWM) AC 600 V
<b>Test voltage</b>	4000 V
<b>Breakdown voltage</b>	8000 V
<b>Minimum bending radius</b>	flexing 7.5x Outer Ø static 3x Outer Ø

## CABLE STRUCTURE

- Bare copper wire, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Conductor insulation: special PVC acc. to UL Std. 1581
- Conductor identification: see table
- G = with protective conductor GN-YE,  
x = without protective conductor
- Outer jacket: PVC acc. to DIN VDE 0207-5 (compound type YM5), UL Std. 1581
- Jacket color: black (RAL 9005)
- Length marking: in meters

## PROPERTIES

- Resistant to: UV radiation

- Largely resistant to: oil
- For outdoor use
- Suitable for use in drag chains
- The materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

## TESTS

- Flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2, UL VW-1, CSA FT1

## APPLICATION

Highly flexible, special single conductor cable for use in drag chains with medium mechanical stresses and free movement without tensile stress or forced movements in dry and moist locations as well as for outdoor use. These two-norm cables are primarily designed for export-orientated manufacturers of machines, machine tools, robotics, and other movable, automated machine parts. RC= Robotics Cable

## NOTES

- The conductor is metrically (mm<sup>2</sup>) constructed, AWG numbers are approximated, and are for reference only
- For use in drag chain systems:
  - 1) The assembly instructions must be observed
  - 2) For further application parameters, please refer to the selection tables
  - 3) For special applications, we recommend contacting us and using our data entry form for drag chain systems

### Single 602-RC-J, Conductor identification: green-yellow

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
69601	1 G 10	8	9.4	96.0	180.0
69603	1 G 16	6	10.5	154.0	250.0
69605	1 G 25	4	11.6	240.0	370.0
69607	1 G 35	2	14.0	336.0	490.0
69609	1 G 50	1	16.6	480.0	665.0
69611	1 G 70	2/0	18.4	672.0	910.0
69613	1 G 95	3/0	19.6	912.0	1195.0
69615	1 G 120	4/0	23.0	1152.0	1545.0
69617	1 G 150	250 kcmil	25.2	1440.0	1750.0
69619	1 G 185	350 kcmil	29.0	1776.0	2320.0
69621	1 G 240	450 kcmil	32.5	2304.0	2960.0
69623	1 G 300	550 kcmil	36.4	2880.0	3550.0

### Single 602-RC-O, Conductor identification: black

Part no.	No. conductors x cross sec. mm <sup>2</sup>	AWG, approx.	Outer Ø mm, approx.	Cu weight kg/km	Weight kg/km, approx.
69602	1 x 10	8	9.4	96.0	180.0
69604	1 x 16	6	10.5	154.0	250.0
69606	1 x 25	4	11.6	240.0	370.0
69608	1 x 35	2	14.0	336.0	490.0
69610	1 x 50	1	16.6	480.0	665.0
69612	1 x 70	2/0	18.4	672.0	910.0
69614	1 x 95	3/0	19.6	912.0	1195.0
69616	1 x 120	4/0	23.0	1152.0	1545.0
69618	1 x 150	250 kcmil	25.2	1440.0	1750.0
69620	1 x 185	350 kcmil	29.0	1776.0	2320.0
69622	1 x 240	450 kcmil	32.5	2304.0	2960.0
69624	1 x 300	550 kcmil	36.4	2880.0	3550.0

**INDUSTRIAL  
ETHERNET**



**AS-INTERFACE**

**LWL** - Multi-Mode • POF • Single-Mode • HCS



**PROFINET**

**PROFIBUS**



**INTERBUS**

**LAN** - Cat. 5, 6, 7, 8



**DEVICENET**

**EIB**



**PLUG CONNECTORS**

**LON**



**LONMARK®**



**CC-LINK**

**HOSPITAL BUS**



**CAN**

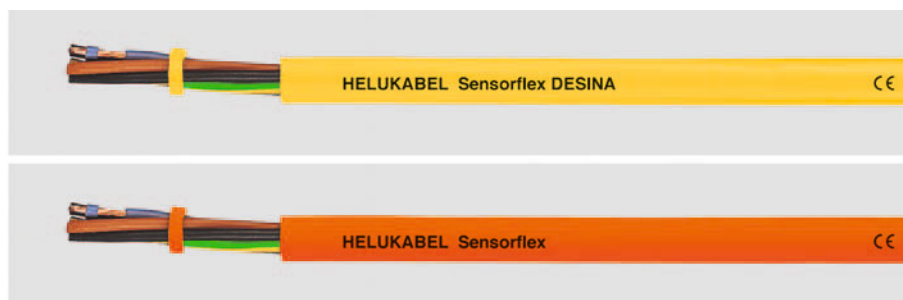
**FOUNDATION  
FIELD BUS**



**PROFIBUS PA**

# Data, Network & Bus Cables

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## Technical data

- **Temperature range**  
flexing -5°C to +80°C  
static -30°C to +80°C
- **Peak operating voltage**  
up to 24 AWG (0,25 mm<sup>2</sup>) 350 V  
from 22 AWG (0,34 mm<sup>2</sup>) 500 V
- **A.C. test voltage**, 50 Hz  
up to 24 AWG (0,25 mm<sup>2</sup>) 1200 V  
from 22 AWG (0,34 mm<sup>2</sup>) 2000 V
- **Minimum bending radius**  
SENSORFLEX® PUR 7,5x cable Ø  
SENSORFLEX® PVC/PUR 7,5x cable Ø  
SENSORFLEX® PVC 15x cable Ø

## Cable structure

### SENSORFLEX®PVC

- Finely stranded, bare copper acc. to DIN VDE 0295 cl.5 or cl.6, BS 6360 cl.5 or cl.6, IEC 60228 cl.5 or cl.6
- PVC conductor insulation
- Conductor identification see table below
- Special PVC outer jacket

### SENSORFLEX®PUR

- Finely stranded, bare copper acc. to DIN VDE 0295 cl.6, BS 6360 cl.6, IEC 60228 cl.6
- PVC conductor insulation
- Conductor identification see table below
- PUR outer jacket

### SENSORFLEX®PVC/PUR

- Construction as per SENSORFLEX® PVC
- Co-extruded PVC (inner) and PUR (outer) jacket

## Properties

### SENSORFLEX®PVC

- Extensively oil resistant; chemical resistant
- Self-extinguishing and flame retardant PVC acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

### SENSORFLEX®PUR

- Low adhesion, extremely abrasion resistant, resistant to hydrolysis and microbial attack

### Special feature

- Cables with highly flexible, cl. 6, conductor stranding are **suitable for drag chain applications**

### Note:

- All cables can be delivered with Cu shield
- DESINA®: yellow (RAL 1021) jacket

## Application

For decentralized installation and control technology. These cables are used for connecting sensor and actuator systems. Combined with molded circular connectors and mounted actuator-sensor boxes, they provide an important link between peripherals and the PLC in production operations. The pre-assembled cable offers interesting cost-cutting opportunities for the entire automation industry. Fieldbus technology made it possible to route the peripheral interfaces from the control cabinet to the machines and systems. By relocating the I/O points to the plant peripherals, installation costs can be significantly reduced.

CE= The product conforms to EC Low-Voltage Directive 2006/95/EC.

Part no. yellow	orange	gray	Cable structure		Conductor colors	Fine wire	High flex **	Outer Ø approx. mm	Cop. weight kg / km	Weight approx. kg / km	AWG No.
			No. conductors x cross sec. mm <sup>2</sup>	Jacket material							
76061	76076	73473	3 x 0,25	PVC	BN, BU, BK		X	4,4	7,2	22,0	24
76062	76077	73466	3 x 0,25	PUR	BN, BU, BK		X	4,4	7,2	22,0	24
76063	76078	73474	4 x 0,25	PVC	BN, BU, BK, WH		X	4,7	9,6	26,0	24
76064	76079	73471	4 x 0,25	PUR	BN, BU, BK, WH		X	4,7	9,6	26,0	24
76065	76080	76094	5 G 0,25	PVC	BN, BU, BK, WH, GN-YE		X	4,8	12,0	30,0	24
76066	76081	76095	5 G 0,25	PVC/PUR	BN, BU, BK, WH, GN-YE		X	4,8	12,0	30,0	24
76071	76086	73472	3 G 0,34	PVC/PUR	BN, BU, GN-YE		X	4,9	9,8	30,0	22
76070	76085	76099	3 x 0,34	PVC	BN, BU, BK		X	4,9	9,8	30,0	22
73485	76087	73368	4 x 0,34	PVC	BN, BU, BK, WH	X		5,2	13,1	43,0	22
73484	76088	72973	4 x 0,34	PVC/PUR	BN, BU, BK, WH		X	5,2	13,1	43,0	22
78240	78241	73728	5 x 0,34	PVC	BN, BU, BK, WH, GY		X	5,9	16,4	54,0	22
76072	76089	73657	5 G 0,34	PVC	BN, BU, BK, WH, GN-YE		X	5,9	16,4	54,0	22
73870	76090	73548	5 G 0,34	PVC/PUR	BN, BU, BK, WH, GN-YE		X	5,9	16,4	54,0	22

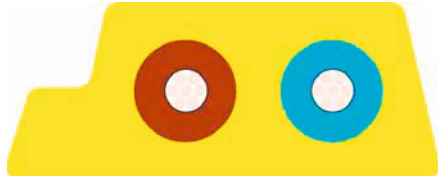
Dimensions and specifications may be changed without prior notice.

# BUS Cables

AS-i PUR, UL/CSA



PUR



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Separator:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Outer jacket color:

## Electrical data

Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Nominal voltage:  
Test voltage:

## Technical data

Weight:  
Bending radius, repeated:  
Operating temperature range min.:  
Operating temperature range max.:  
Caloric load, approx. value:  
Copper weight:

## Norms

Applicable standards:

UL Style:

CSA standard:

## Application

AS-i PUR is ideal for use in wet/dry areas thanks to its outstanding characteristics when exposed to common coolants/lubricants. This version can also be used in cable trays (special installation conditions must be observed: place wide cable side on inside radius, use partitions and install flat/round cables separately). These types are approved for use in the American market (UL 1581, FT2) thanks to use of special materials.

## Part no.

Dimensions and specifications may be changed without prior notice.

## Actuator Sensor Interface 2x1.5 mm<sup>2</sup>

Copper, tinned  
PO  
bu, bn  
-  
-  
-  
PUR  
Yellow similar to RAL 1023

13,7 Ohm/km  
1 GOhm x km  
27,4 Ohm/km max.  
32 V  
1 kV at 15 min.

app. 64 kg/km  
30 mm  
-40°C  
+80°C  
0,965 MJ/m  
31,00 kg/km

AS-i standard  
Halogen-free acc. to 60754-1  
Flame-retardant acc. to IEC 60332-1-2  
AWM Style 20549  
CSA FT2

## Actuator Sensor Interface 2x1.5 mm<sup>2</sup>

Copper, tinned  
PO  
bu, bn  
-  
-  
-  
PUR  
Black similar to RAL 9005

13,7 Ohm/km  
1 GOhm x km  
27,4 Ohm/km max.  
48 V  
1 kV at 15 min.

app. 64 kg/km  
30 mm  
-40°C  
+80°C  
0,965 MJ/m  
31,00 kg/km

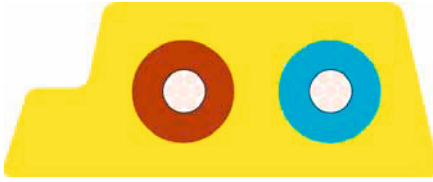
AS-i standard  
Halogen-free acc. to 60754-1  
Flame-retardant acc. to IEC 60332-1-2  
AWM Style 20549  
CSA FT2

# BUS Cables

AS-i PUR 2X2.5 PUR, Long Distance, UL/CSA



PUR



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Separator:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Outer jacket color:

## Drag chain applications 2x2.5 mm<sup>2</sup>

Copper, tinned  
PO  
bu, bn  
-  
-  
-  
PUR  
Yellow similar to RAL 1023

## Drag chain applications 2x2.5 mm<sup>2</sup>

Copper, tinned  
PO  
bu, bn  
-  
-  
-  
PUR  
Black similar to RAL 9005

## Electrical data

Conductor resistance, max.:  
Loop resistance:  
Nominal voltage:

8,21 Ohm/km  
16,42 Ohm/km max.  
32 V

8,21 Ohm/km  
16,42 Ohm/km max.  
48 V

## Technical data

Weight:  
Bending radius, repeated:  
Operating temperature range min.:  
Operating temperature range max.:  
Caloric load, approx. value:  
Copper weight:

app. 140 kg/km  
30 mm  
-40°C  
+80°C  
0,90 MJ/m  
49,00 kg/km

app. 140 kg/km  
30 mm  
-40°C  
+80°C  
0,90 MJ/m  
49,00 kg/km

## Norms

Applicable standards:

AS-i standard  
Halogen-free acc. to 60754-1  
Flame-retardant CSA FT2  
AWM Style 20549  
CSA FT2

AS-i standard  
Halogen-free acc. to 60754-1  
Flame-retardant CSA FT2  
AWM Style 20549  
CSA FT2

## Application

AS-i components are interconnected with this special system cable. With the AS-Interface, the cable assembly from the control system to the sensor/ actuator is not needed. The AS-Interface is the field bus system that transmits both data and power in one single cable. With fast contacting in penetration technique, the possibility of errors in cabling is largely reduced. The special outer jacket provides protection against oil, grease, and refrigerant lubricants, and the cable is therefore even suitable for applications in wet surroundings, in machinery and plant construction, as well as in the machine tool and automotive industry. The PUR variant is suitable for heavy-duty industrial environments. Because of the cross section 2,5qmm it is possible to realize longer distances. These types are certified for the American market (UL 1581, FT2) through the use of special materials.

## Part no.

**804410**, AS-i PUR

**804411**, AS-i PUR

Dimensions and specifications may be changed without prior notice.

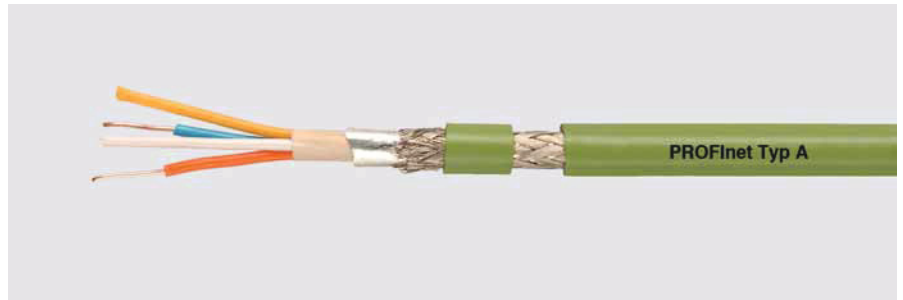
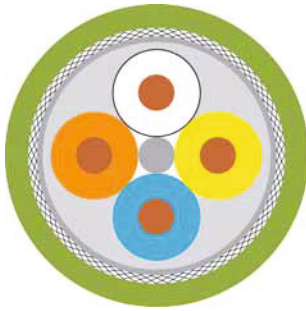


# Industrial Ethernet

PROFINET Type A fixed installation + robust



PVC + PUR



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Stranding element:  
Separator:  
Inner jacket material:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

## Fixed installation, indoor 2x2x0.64 mm

Copper, bare (AWG 22/1)  
PE  
wh, ye, bu, og  
Star quad  
Polyester foil over stranded bundle  
PVC  
Al-Foil  
Cu braid, tinned  
PVC  
app. 6,5 mm ± 0,2 mm  
Green similar to RAL 6018

## Industrial Area 2x2x0.64 mm

Copper, bare (AWG 22/1)  
PE  
wh, ye, bu, og  
Star quad  
Polyester foil over stranded bundle  
PVC  
Al-Foil  
Cu braid, tinned  
PUR  
app. 6,5 mm ± 0,2 mm  
Green similar to RAL 6018

## Electrical data

Characteristic impedance:  
Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Mutual capacitance:  
Test voltage:

100 Ohm ± 15 Ohm at 1 to 100 MHz  
57,5 Ohm/km  
5 GOhm x km  
115 Ohm/km max.  
48 nF/km nom.  
2 kV

100 Ohm ± 15 Ohm at 1 to 100 MHz  
62,5 Ohm/km  
0,5 GOhm x km  
115 Ohm/km max.  
50 nF/km nom.  
2 kV

## Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	5,2	6,9	15,0	19,5
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	64,8	58,1	40,0	30,5

## Technical data

Weight:	app. 67 kg/km	app. 64 kg/km
Bending radius, repeated:	65 mm	65 mm
Operating temperature range min.:	-40°C	-40°C
Operating temperature range max.:	+80°C	+70°C
Caloric load, approx. value:	0,34 MJ/m	0,91 MJ/m
Copper weight:	32,00 kg/km	32,00 kg/km

## Norms

Applicable standards:	PROFINET Guideline + IEC 61158-2 Acc. to ISO/IEC 11801 Acc. to EN 50173 Category 5e Flame-retardant acc. to IEC 60332-3 CMG 75°C or PLTC or AWM 21694 600V CSA FT 4	PROFINET Guideline + IEC 61158-2 Acc. to ISO/IEC 11801 Acc. to EN 50173 Category 5e Flame-retardant acc. to IEC 60332-1-2 -
UL Style:		-
CSA standard:		-

## Application

HELUKAT® PROFINET Type A Category 5e for fixed installation in industrial networks, rugged. It guarantees excellent transmission characteristics and may be used even under the harshest conditions. The cable listed here corresponds to PROFINET Type A; this means the version with PVC jacket is designed for normal fixed installations and the version with PUR sheath is for difficult fixed installations in harsh industrial environments.

## Part no.

**800653**, PROFINET type A (SK)

**801194**, PROFINET type A (SK)

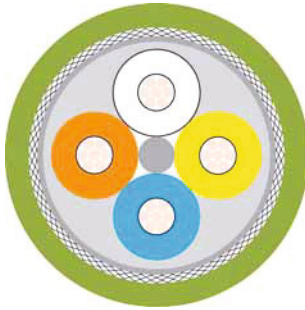
Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

## PROFINET Type B flexible



PVC + FRNC



### Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Stranding element:  
Separator:  
Inner jacket material:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

### Mobile use 2x2x0,75 mm (stranded)

Copper, tinned (AWG 22/7)  
PE  
wh, ye, bu, og  
Star quad  
Polyester foil over stranded bundle  
PVC  
Al-Foil  
Cu braid, tinned  
PVC  
app. 6,5 mm ± 0,2 mm  
Green similar to RAL 6018

### Mobile use 2x2x0,75 mm (stranded)

Copper, tinned (AWG 22/7)  
PE  
wh, ye, bu, og  
Star quad  
Polyester foil over stranded bundle  
FRNC  
Al-Foil  
Cu braid, tinned  
FRNC  
app. 6,5 mm ± 0,2 mm  
Green similar to RAL 6018

### Electrical data

Characteristic impedance:  
Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Mutual capacitance:  
Test voltage:  
Relative propagation velocity:

100 Ohm ± 15 Ohm at 1 to 100 MHz  
57,5 Ohm/km  
0,5 GOhm x km  
115 Ohm/km max.  
48 nF/km nom.  
2 kV  
65 %

100 Ohm ± 15 Ohm at 1 to 100 MHz  
60 Ohm/km  
0,5 GOhm x km  
120 Ohm/km max.  
52 nF/km nom.  
2 kV  
-

### Typical values

Frequency (MHz)	10	16	62,5	100
Attenuation (dB/100m)	6,3	8,0	16,5	21,3
Next (db)	70,0	65,0	55,0	50,0
ACR (db)	64,0	57,4	39,0	29,0

### Technical data

Weight: app. 67 kg/km  
Bending radius, repeated: 100 mm  
Operating temperature range min.: -40°C  
Operating temperature range max.: +80°C  
Caloric load, approx. value: 0,32 MJ/m  
Copper weight: 32,00 kg/km

app. 65 kg/km  
100 mm  
-25°C  
+75°C  
0,32 MJ/m  
32,00 kg/km

### Norms

Applicable standards:

PROFINET Guideline + IEC 61158-2  
Acc. to ISO/IEC 11801  
Acc. to EN 50173  
Category 5e  
Flame-retardant acc. to IEC 60332-3

PROFINET Guideline + IEC 61158-2  
Acc. to ISO/IEC 11801  
Acc. to EN 50173  
Category 5e  
Halogen-free acc. to 60754-1  
Flame-retardant acc. to IEC 60332-3

UL Style:  
CSA standard:

CMG 75°C or PLTC or AWM 21694 600V  
CSA FT 4

CMG 75°C or PLTC or AWM 21279 600V  
CSA FT 4

### Application

HELUKAT® PROFINET Type B (flexible) Cat.5e is for use on moving parts. The cables listed here correspond to the PROFINET classifications Type B for moving cables and are designed to withstand mechanical loads. The PVC version is the standard cable; the FRNC version is used for halogen free requirements.

### Part no.

**800654**, PROFINET type B (SK)

**805654**, PROFINET type B (SK)

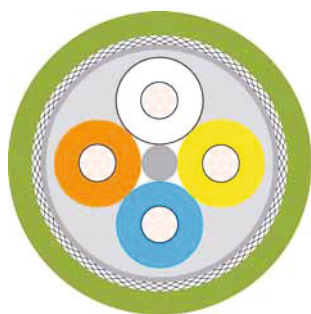
Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

PROFINET Type C highly flexible

**HELUKAT®**

PVC + PUR



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Stranding element:  
Separator:  
Inner jacket material:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

## Drag chain applications 2x2x0.75 mm (stranded)

Copper, tinned (AWG 22/7)  
PE  
wh, ye, bu, og  
Star quad  
Polyester foil over stranded bundle  
PVC  
Al-Foil  
Cu braid, tinned  
PVC  
app. 6,5 mm ± 0,2 mm  
Green similar to RAL 6018

## Drag chain applications 2x2x0.75 mm (stranded)

Copper, tinned (AWG 22/7)  
PE  
wh, ye, bu, og  
Star quad  
Polyester foil over stranded bundle  
FRNC  
Al-Foil  
Cu braid, tinned  
PUR  
app. 6,5 mm ± 0,2 mm  
Green similar to RAL 6018

## Electrical data

Characteristic impedance:  
Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Mutual capacitance:  
Test voltage:

100 Ohm ± 15 Ohm at 1 to 100 MHz  
60 Ohm/km  
0,5 GOhm x km  
120 Ohm/km max.  
52 nF/km nom.  
1,5 kV

100 Ohm ± 15 Ohm at 1 to 100 MHz  
60 Ohm/km  
0,5 GOhm x km  
120 Ohm/km max.  
52 nF/km nom.  
1,5 kV

## Typical values

Frequency	(MHz)	10	16	62,5	100
Attenuation	(dB/100m)	6,3	8,0	16,5	21,3
Next	(db)	70,0	65,0	55,0	50,0
ACR	(db)	64,0	57,4	39,0	29,0

## Technical data

Weight:	app. 68 kg/km	app. 61 kg/km
Bending radius, repeated:	55 mm	55 mm
Operating temperature range min.:	-20°C	-30°C
Operating temperature range max.:	+70°C	+75°C
Caloric load, approx. value:	0,85 MJ/m	0,85 MJ/m
Copper weight:	32,00 kg/km	32,00 kg/km

## Norms

Applicable standards:	PROFINET Guideline + IEC 61158-2 Acc. to ISO/IEC 11801 Acc. to EN 50173 Category 5e Flame-retardant acc. to IEC 60332-3	PROFINET Guideline + IEC 61158-2 Acc. to ISO/IEC 11801 Acc. to EN 50173 Category 5e Halogen-free acc. to 60754-1 Flame-retardant acc. to IEC 60332-1-2 CMX 75°C (shielded)
UL Style:	CMG 75°C or PLTC or AWM 21694 600V	
CSA standard:	CSA FT 4	-

## Application

HELUKAT® PROFINET Type C PVC (highly flexible) Category 5e is for use on moving parts and in cable carriers. The cable listed here correspond to the PROFINET classifications Type C for moving cables and are designed to withstand mechanical loads. Thanks to the flame retardant jacket the PVC cable has UL CMG PLTC FT4 AWM 600V approval. The PUR version has UL CMX listing and offers higher values in chain and chemical resistance.

## Part no.

**802914**, PROFINETtype C (SK)

**800655**, PROFINETtype C (SK)

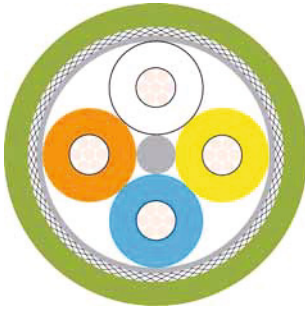
Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

## PROFINET Type R Torsion

**HELUKAT**<sup>®</sup>

PUR



### Type Cable structure

Stranding:  
Conductor insulation:  
Stranding element:  
Separator:  
Shielding 1:  
Shield 1 over conductor:  
Shield 2 over conductor:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

### Industrial patch cables 2x2x0,74mm

Copper, tinned (AWG 22/19)  
PO  
Quad  
Polyester foil over stranded bundle  
-  
Al-Foil  
Cu braid  
PUR  
app. 6,5 mm  
Green similar to RAL 6018

### Electrical data

Characteristic impedance:  
Loop resistance:  
Mutual capacitance:

100 Ohm  $\pm$  15 Ohm at 1 to 100 MHz  
60 Ohm/km max.  
52 nF/km nom.

### Technical data

Weight:  
Bending radius, repeated:  
Operating temperature range min.:  
Operating temperature range max.:  
Copper weight:

app. 60 kg/km  
75 mm  
-40°C  
+80°C  
32,00 kg/km

### Norms

Applicable standards:

Acc. to ISO/IEC 11801  
Acc. to EN 50173  
Acc. to EIA/TIA 568-A  
Category 5e  
Halogen-free acc. to 60754-1  
Flame-retardant acc. to IEC 60332-1-2  
AWM Style 21161 80°C

UL Style:

### Application

HELUKAT<sup>®</sup> PROFINET Type R Category 5e TORSION offers excellent transmission characteristics with double shielding and is designed for applications with torsion loads, e.g. in robots. The cable listed here corresponds to the classification for continuous movement.

### Part no.

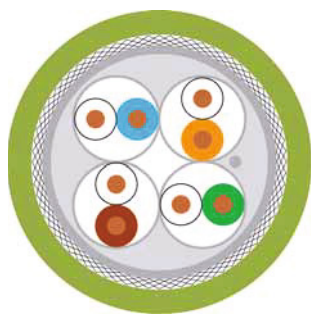
**806740**

Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

10GIG

**HELUKAT®** 500IND  
CC-Link IEC **field** S/FTP, Category 6A



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Stranding element:  
Separator:  
Inner jacket material:  
Shielding 1:  
Total shielding:  
Drain wire:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

## Industrial area S/FTP 4x2xAWG 22/1

Copper, bare (AWG 22/1)  
Foam-skin-PE  
wh/bu, wh/og, wh/gn, wh/bn  
Dual Conductor  
-  
FRNC  
Al-Foil  
AL-Foil + braid  
yes  
PVC  
app. 9,6 mm ± 0,3 mm  
Green similar to RAL 6018

## Electrical data

Characteristic impedance:

100 Ohm ± 15 Ohm at 1 to 100 MHz  
100 Ohm ± 20 Ohm at 101 to 500 MHz

Conductor resistance, max.:

59 Ohm/km

Insulation resistance, min.:

0,5 GOhm x km

Loop resistance:

118 Ohm/km max.

Mutual capacitance:

72 nF/km nom.

Test voltage:

0,7 kV

Relative propagation velocity:

62 %

## Typical values

Frequency (MHz)	10	16	62,5	100	250	500
Attenuation (db/100m)	5,9	7,5	15,0	19,1	31,1	45,3
Next (dB)	60,3	57,2	48,4	45,3	39,3	34,8
PSNext (dB)	57,3	54,2	45,4	42,3	36,3	31,8

## Technical data

Weight: app. 115 kg/km  
Bending radius, repeated: 80 mm  
Operating temperature range min.: -20°C  
Operating temperature range max.: +60°C  
Caloric load, approx. value: 1,63 MJ/m  
Copper weight: 44,00 kg/km

## Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6A, Flame-retardant acc. to IEC 60332-3, CMG FT4

## Application

HELUKAT® 500IND was designed specially for extreme industrial applications for fixed installation. The copper data cable is especially well-suited for **Category 6A 10 Gigabit/500MHz (IEC 61156-5)** Ethernet applications. It guarantees excellent transmission characteristics and may be used even under the harshest conditions.

## Part no.

**803693**, INDUSTRIAL ETHERNET KAT.6A 10GIG PVC

Dimensions and specifications may be changed without prior notice.

# Industrial Ethernet

Drag Chain PUR

**HELUKAT® 250S**

SF/UTP, Category 6



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Stranding element:  
Separator:  
Inner jacket material:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

## Drag chain applications SF/UTP 4x2x0.15 mm<sup>2</sup> (stranded) PUR

Copper, tinned (AWG 26/19)  
PP  
whbu/bu, whog/og, whgn/gn, whbn/bn  
Dual Conductor  
-  
FRNC  
-  
AL-Foil + braid  
PUR  
app. 7,8 mm ± 0,2 mm  
Green similar to RAL 6018

## Electrical data

Characteristic impedance:  
Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Mutual capacitance:  
Test voltage:  
Relative propagation velocity:

100 Ohm ± 15 Ohm at 1 to 100 MHz  
100 Ohm ± 20 Ohm bei 101 bis 250 MHz  
140 Ohm/km  
5 GOhm x km  
280 Ohm/km max.  
50 nF/km nom.  
0,7 kV  
67 %

## Typical values

Frequency (MHz)	10	16	62,5	100	250
Attenuation (db/10m)	0,9	1,2	2,4	2,9	4,9
Next (db)	60,3	57,2	48,4	45,3	39,3
ACR (db)	59,4	56,0	46,0	42,4	34,4

## Technical data

Weight:  
Bending radius, repeated:  
Operating temperature range min.:  
Operating temperature range max.:  
Caloric load, approx. value:  
Copper weight:

app. 63 kg/km  
60 mm  
-30°C  
+70°C  
1,35 MJ/m  
34,00 kg/km

## Norms

Acc. to ISO/IEC 11801, Acc. to EN 50173, Acc. to EIA/TIA 568-A, Category 6, Flame-retardant acc. to IEC 60332-1-2, Halogen-free acc. to 60754-1, CMX 75°C (shielded) or AWM 21576 1000V

## Application

HELUKAT® 250S trailing cable Category 6 is designed for use in cable carriers and the recurring loads caused by moving machine components. It provides excellent transmission characteristics under extremely difficult conditions.

## Part no.

**803387**, INDUSTRIAL ETHERNET CAT.6

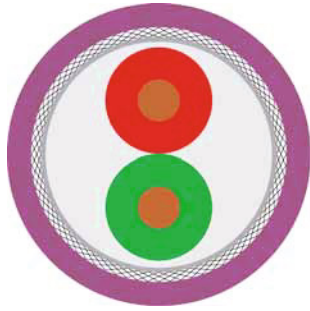
Dimensions and specifications may be changed without prior notice.

# BUS Cables

**PROFIBUS SK fixed installed Indoor + Outdoor**



PVC + PE



## Type Cable structure

Stranding:  
Conductor insulation:  
Conductor colors:  
Stranding element:  
Separator:  
Inner jacket material:  
Shielding 1:  
Total shielding:  
Outer jacket material:  
Cable external diameter:  
Outer jacket color:

## Fixed installation, indoor 1x2x0.64 mm

Copper, bare (AWG 22/1)  
Foam-skin-PE  
rd, gn  
Dual Conductor  
Polyester foil over stranded bundle  
PVC  
Al-Foil  
Cu braid, tinned  
PVC  
app. 8,0 mm ± 0,4 mm  
Violet similar to RAL 4001

## Fixed installation, outdoor 1x2x0.64 mm

Copper, bare (AWG 22/1)  
Foam-skin-PE  
rd, gn  
Dual Conductor  
Polyester foil over stranded bundle  
PVC  
Al-Foil  
Cu braid, tinned  
PE  
app. 8,0 mm ± 0,4 mm  
Black similar to RAL 9005

## Electrical data

Characteristic impedance:  
Conductor resistance, max.:  
Insulation resistance, min.:  
Loop resistance:  
Mutual capacitance:  
Test voltage:  
Attenuation:

150 Ohm ± 10 %  
55 Ohm/km  
1 GOhm x km  
110 Ohm/km max.  
35 nF/km nom.  
1,5 kV  
9,6 kHz < 2,5 dB/km  
38,4 kHz < 4,0 dB/km  
4,0 MHz < 22,0 dB/km  
16,0 MHz < 42,0 dB/km

150 Ohm ± 10 %  
55 Ohm/km  
1 GOhm x km  
110 Ohm/km max.  
35 nF/km nom.  
1,5 kV  
9,6 kHz < 2,5 dB/km  
38,4 kHz < 4,0 dB/km  
4 MHz < 22,0 dB/km  
16 MHz < 42,0 dB/km

## Technical data

Weight:  
Bending radius, repeated:  
Operating temperature range min.:  
Operating temperature range max.:  
Caloric load, approx. value:  
Copper weight:

app. 79 kg/km  
120 mm  
-40°C  
+80°C  
1,068 MJ/m  
24,00 kg/km

app. 65 kg/km  
120 mm  
-20°C  
+70°C  
1,451 MJ/m  
24,00 kg/km

## Norms

Applicable standards:

PROFIBUS acc. to DIN 19245 T3 and EN50170  
Flame-retardant acc. to IEC 60332-3  
CMG 75°C or CL3 or AWM 21694 600V  
CSA FT 4

PROFIBUS acc. to DIN 19245 T3 and EN50170

UL Style:

-

CSA standard:

-

## Application

HELUKABEL® PROFIBUS SK Indoor + Outdoor have a special structure for processing with the Fast Connect Stripping Tool from Siemens. The Indoor version is used for normal requirements in fixed installation applications in equipment; the Outdoor version is used in open-air applications, i.e. can withstand wind, weather and sun (not for burial directly in the ground).

## Part no.

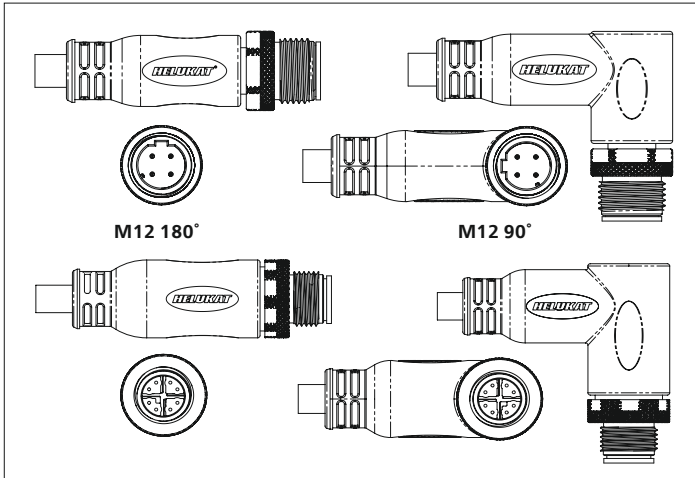
**81903**, PROFIBUS SK

**81904**, PROFIBUS SK

Dimensions and specifications may be changed without prior notice.






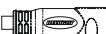
# HELUKAT® CONNECTING SYSTEMS INDUSTRIAL PATCH CABLES

## M12 - MALE CONNECTOR IP67













## M12 - FEMALE



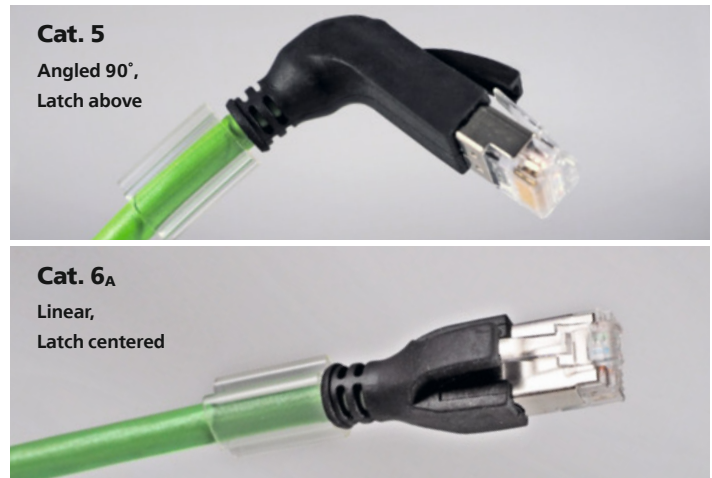
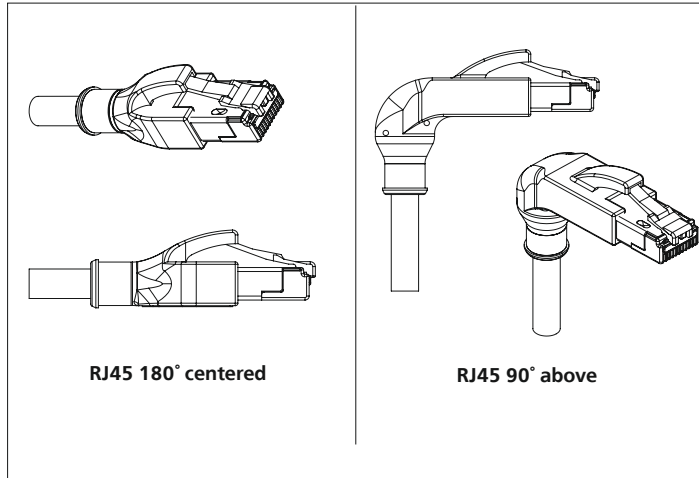
Part #	Cable type	Connector	Combination	Length		
806393	PROFINET A 2x2xAWG22/1 with PVC jacket for fixed laying UL CMG 75°C, PLTC or AWM 21694 600V CSA FT4 (for further technical details refer to item no. 800653)	RJ45 IP20 4P	straight on both sides	0.5 m		
806394				1.0 m		
806395				2.0 m		
806396				3.0 m		
806397				5.0 m		
806398				10.0 m		
806399				15.0 m		
806400				25.0 m		
806425			angled 90° above		0.5 m	
806426					1.0 m	
806427					2.0 m	
806428					3.0 m	
806429					5.0 m	
806430					10.0 m	
806431					15.0 m	
806432		25.0 m				
806457		M12 D-coded IP 67			straight on both sides	0.5 m
806458						1.0 m
806459			2.0 m			
806460				3.0 m		
806461				5.0 m		
806462			10.0 m			
806463			15.0 m			
806464			25.0 m			
806489			angled 90° on both sides		0.5 m	
806490	1.0 m					
806491	2.0 m					
806492	3.0 m					
806493	5.0 m					
806494	10.0 m					
806495	15.0 m					
806496	25.0 m					

\*Female connectors also available

Part #	Cable type	Connector	Combination	Length		
806401	PROFINET B 2x2xAWG22/7 with PVC jacket for flexible use UL CMG 75°C, PLTC or AWM 21694 600V CSA FT4 (for further technical details refer to item no. 800654)	RJ45 IP20 4P	straight on both sides	0.5 m		
806402				1.0 m		
806403				2.0 m		
806404				3.0 m		
806405				5.0 m		
806406				10.0 m		
806407				15.0 m		
806408				25.0 m		
806433			angled 90° above		0.5 m	
806434					1.0 m	
806435					2.0 m	
806436					3.0 m	
806437					5.0 m	
806438					10.0 m	
806439					15.0 m	
806440		25.0 m				
806465		M12 D-coded IP 67			straight on both sides	0.5 m
806466						1.0 m
806467			2.0 m			
806468				3.0 m		
806469				5.0 m		
806470			10.0 m			
806471			15.0 m			
806472			25.0 m			
806497			angled 90° on both sides		0.5 m	
806498	1.0 m					
806499	2.0 m					
806500	3.0 m					
806501	5.0 m					
806502	10.0 m					
806503	15.0 m					
806504	25.0 m					
806521	PROFINET B 2x2xAWG22/7 with PVC jacket for flexible use UL CMG 75°C, PLTC or AWM 21694 600V CSA FT4 (for further technical details refer to item no. 800654)	RJ45 IP20 4P	straight on both sides	5.0 m		
806522				10.0 m		
806523				20.0 m		
806524			25.0 m			
806525			40.0 m			
806526		to	50.0 m			
806527		M12	60.0 m			
806528		D-coded	70.0 m			
806529		IP67	80.0 m			
806530			90.0 m			
806531			100.0 m			



## RJ45 - MALE CONNECTOR IP20



Part #	Cable type	Connector	Combination	Length	
806409	PROFINET C 2x2xAWG22/7 with PUR jacket for drag chains UL CMX 75°C (for further technical details refer to item no. 800655)	RJ45 IP20 4P	straight on both sides	0.5 m	
806410				1.0 m	
806411				2.0 m	
806412			3.0 m		
806413			5.0 m		
806414			10.0 m		
806415			15.0 m		
806416			25.0 m		
806449			angled 90° above	straight on both sides	0.5 m
806450					1.0 m
806451					2.0 m
806452				3.0 m	
806453				5.0 m	
806454				10.0 m	
806455				15.0 m	
806456		25.0 m			
806481		M12 D-coded IP67		straight on both sides	0.5 m
806482					1.0 m
806483					2.0 m
806484				3.0 m	
806485				5.0 m	
806486				10.0 m	
806487				15.0 m	
806488			25.0 m		
806505			angled 90° on both sides	straight on both sides	0.5 m
806506					1.0 m
806507					2.0 m
806508				3.0 m	
806509				5.0 m	
806510				10.0 m	
806511	15.0 m				
806512	25.0 m				
11008341	RJ45 IP20 4P to M12 D-coded IP67	straight on both sides		0.5 m	
11008342			1.0 m		
11008343		2.0 m			
11008344		3.0 m			
11008345		5.0 m			
11008346		10.0 m			
11008347		15.0 m			
11008348		25.0 m			

Part #	Cable type	Connector	Combination	Length	
806417	PROFINET C 2x2xAWG22/7 with PVC jacket for drag chains UL CMG 75°, PLTC or AWM 600V CSA FT4 (for further technical details refer to item no. 802914)	RJ45 IP20 4P	straight on both sides	0.5 m	
806418				1.0 m	
806419				2.0 m	
806420			3.0 m		
806421			5.0 m		
806422			10.0 m		
806423			15.0 m		
806424			25.0 m		
806441			angled 90° above	straight on both sides	0.5 m
806442					1.0 m
806443					2.0 m
806444				3.0 m	
806445				5.0 m	
806446				10.0 m	
806447				15.0 m	
806448		25.0 m			
806473		M12 D-coded IP67		straight on both sides	0.5 m
806474					1.0 m
806475					2.0 m
806476				3.0 m	
806477				5.0 m	
806478				10.0 m	
806479				15.0 m	
806480			25.0 m		
806513			angled 90° on both sides	straight on both sides	0.5 m
806514					1.0 m
806515					2.0 m
806516				3.0 m	
806517				5.0 m	
806518				10.0 m	
806519	15.0 m				
806520	25.0 m				
11007406	RJ45 IP20 4P to M12 D-coded IP67	straight on both sides		0.5 m	
11007407			1.0 m		
11007408		2.0 m			
11007409		3.0 m			
11007410		5.0 m			
11007411		10.0 m			
11007412		15.0 m			
11007413		25.0 m			

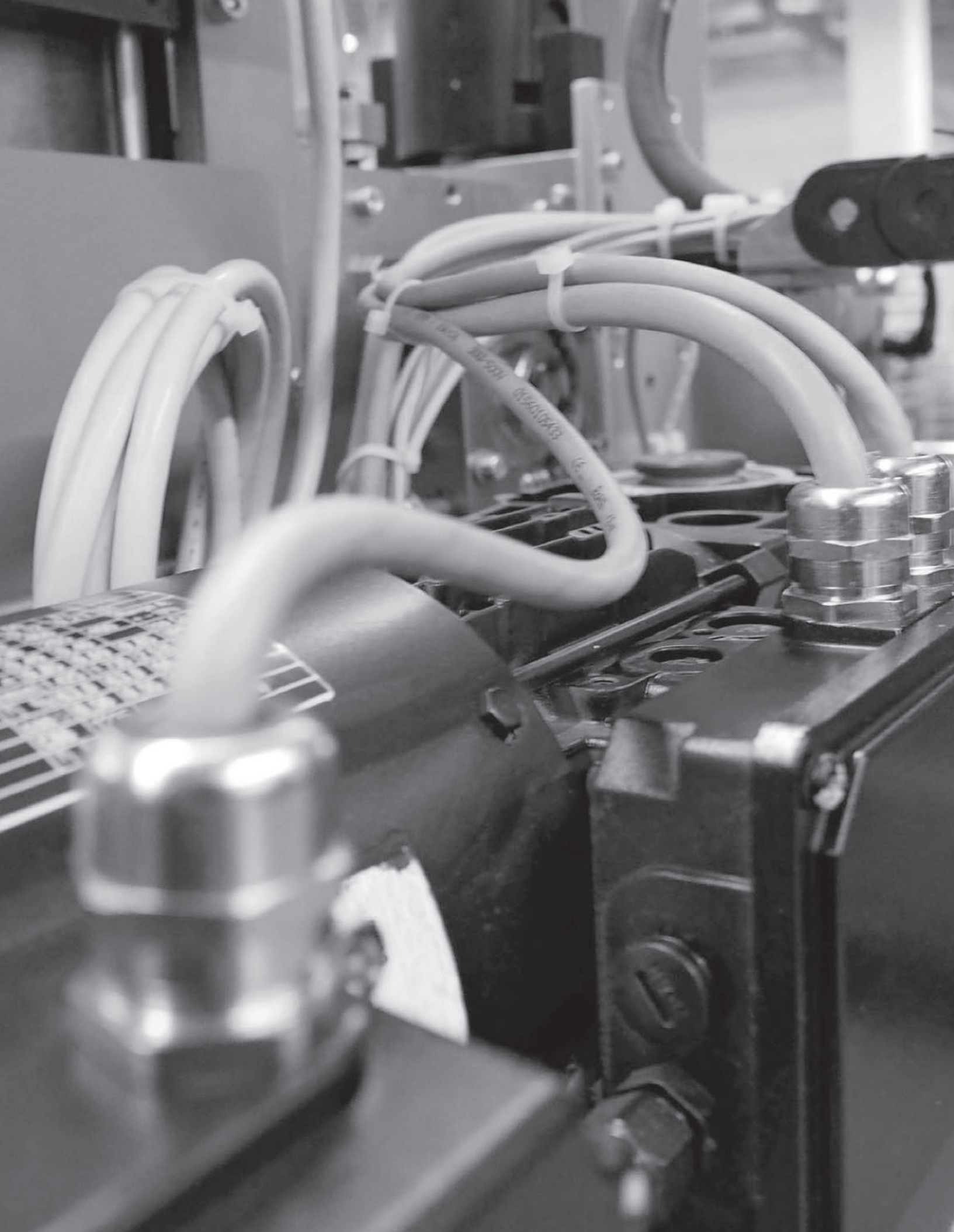
\*Female connectors also available

# HELUKABEL® UL-LISTED DATA, NETWORK & BUS CABLES

Cable	Part #	Catalog Page*	Insulation Material	Outer Jacket Material	UL Standard	Flame Tested	Voltage (V)
Materials				Technical Properties			
<b>Industrial Ethernet</b>							
HELUKAT® 600S Cat 7 Drag Chain	805614	125	PE Foam	PUR	444	X	600
HELUKAT® 600S Cat 7 Torsional	805828	125	PE Foam	PUR	444	X	600
HELUKAT® 500IND Cat 6A Fixed	11007777	128	PE Foam	FRNC	444	X	300
HELUKAT® 500IND Cat 6A Fixed	11007778	129	PE Foam	PUR	444	X	300
HELUKAT® 500IND Cat 6A Fixed	11007776	130	PE Foam	PVC	444	X	600
HELUKAT® 500S Cat 6A Drag Chain	805704	132	PE Foam	PVC	444	X	300
HELUKAT® 500S Cat 6A Drag Chain	805703	132	PE Foam	PUR	444	X	300
HELUKAT® 500S Cat 6A Drag Chain	805548	133	PE Foam	PUR	444	X	1000
HELUKAT® 250IND Cat 6 Fixed	805655	134	Solid PE	PVC	444	X	300
HELUKAT® 250S Cat 6 Drag Chain	805658	136	PE Foam	PVC	444	X	300
<b>PROFINET</b>							
PROFINET Type B Shipline	802185	153	PE	FRNC	444	X	300
PROFINET Type B Festoon	803295	153	PE	PVC	444	X	600
<b>PROFIBUS L2</b>							
PROFIBUS L2 Standard Gray	80384	158	PE Foam	PVC	444	X	300
PROFIBUS L2 Standard Violet	81448	158	PE Foam	PVC	444	X	300
PROFIBUS L2 Torsional	800109	166	PE Foam	PUR	444	X	300
PROFIBUS L2 Festoon	800649	166	PE Foam	PVC	444	X	600
<b>PROFIBUS SK</b>							
PROFIBUS SK	81501	171	PE Foam	FRNC	444	X	300
PROFIBUS SK 7-Wire	805656	172	PE Foam	PVC	444	X	300
PROFIBUS SK Drag Chain Violet	801659	173	PE Foam	PUR	444	X	300
PROFIBUS SK Drag Chain Turquoise	81906	173	PE Foam	PUR	444	X	300
<b>DeviceNet</b>							
DeviceNet Thick	800683	208	PE Foam	PVC	444	X	300
DeviceNet Thin	800684	208	PE Foam	PVC	444	X	300
DeviceNet Thick	800681	209	PE Foam	FRNC	444	X	300
DeviceNet Thin	800682	209	PE Foam	FRNC	444	X	300
DeviceNet Thick	81909	210	PE Foam	PUR	444	X	300
DeviceNet Thin	81910	210	PE Foam	PUR	444	X	300
<b>CC-Link Bus &amp; IE</b>							
CC-Link Bus	800497	211	PE Foam	PVC	444	X	300
CC-Link IE Drag Chain	805614	125	PE Foam	PUR	444	X	300
<b>Safety Bus</b>							
Safety Bus Drag Chain	800652	212	PE Foam	PUR	444	X	300
<b>CAN Bus</b>							
CAN Bus 2x2x0.34mm <sup>2</sup>	803344	190	PE Foam	PVC	444	X	300
CAN Bus 2x2x0.50mm <sup>2</sup>	803722	192	PE Foam	PVC	444	X	300
CAN Bus 1x2x0.34mm <sup>2</sup> Drag Chain	802182	196	PE Foam	PUR	444	X	300
CAN Bus 4x1x0.34mm <sup>2</sup> Drag Chain	802339	196	PE Foam	PUR	444	X	300
CAN Bus 1x2x0.50mm <sup>2</sup> Drag Chain	805685	197	PE Foam	PUR	444	X	300
CAN Bus 4x1x0.50mm <sup>2</sup> Drag Chain	805696	197	PE Foam	PUR	444	X	300
<b>AS-i Bus</b>							
AS-i Bus Yellow	805693	206	TPE	TPE	444	X	300
AS-i Bus Black	805694	206	TPE	TPE	444	X	300

\*Pages refer to the Data, Network and Bus Technology Ed. 12

	UL Max. Temp. (°C)	ITC/ PLTC	AWM	Class / Group	Halogen-Free	Oil Res	Sun Res	Chemical Res	Flexible = F High Flex = HF	CMX	CM	CMG	RoHS	CE
Ratings													Misc.	
	75	-	X	-	X	X	X	X	HF	X	-	-	X	X
	75	-	X	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	-	-	-	-	-	X	-	X	X
	75	-	-	-	X	X	X	X	-	X	-	-	X	X
	75	-	X	CL 2		X (I)	-	-	-	-	-	X	X	X
	75	-	-	-		X (I)	-	-	HF	-	X	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	X	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-		X (I)	-	-	-	-	-	X	X	X
	75	-	-	-		X (I)	-	-	HF	-	-	X	X	X
	75	X	-	-	X	LTD	X	-	F	-	-	X	X	X
	75	X	X	-	-	X	X	-	HF	-	-	X	X	X
	75	-	-	-	-	-	-	-	-	X	-	-	X	X
	75	-	-	-	-	-	-	-	-	X	-	-	X	X
	75	-	-	-	-	X	X	X	HF	X	-	-	X	X
	75	-	X	CL 2	-	X (I)	X	-	HF	-	-	X	X	X
	75	-	-	-	X	LTD	X	-	-	-	X	-	X	X
	75	-	-	-	-	-	-	-	F	-	-	X	X	X
	75	-	-	-	-	X	X	X	HF	X	-	-	X	X
	75	-	-	-	-	X	X	X	HF	X	-	-	X	X
	75	X	-	-	-	-	-	-	-	-	-	X	X	X
	75	X	-	-	-	-	-	-	-	-	-	X	X	X
	75	-	-	-	X	-	-	-	-	-	-	X	X	X
	75	-	-	-	X	-	-	-	-	-	-	X	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	X	-	-	-	-	-	-	F	-	X	-	X	X
	75	-	X	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	-	X	X	X	X	HF	X	-	-	X	X
	75	-	-	CL 2	-	-	-	-	F	-	-	X	X	X
	75	-	-	CL 2	-	-	-	-	F	-	-	X	X	X



# Accessories

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### TECHNICAL DATA

Plastic cable gland acc. to EN62444 with vibration protection

Protection class: IP 66 / IP 68 - 5 bar, 30 min /  
IP 69K acc. to DIN EN 60529

Temperature range: -20°C up to +100°C

Dimensions:  
G Thread size  
GL Thread length  
SW Spanner size

### MATERIAL

- Polyamide PA 6, V2 acc. to UL 94
- Seal: chloroprene rubber (CR)
- Phosphor-free
- Silicone-free
- Cadmium-free

### PROPERTIES

- Optimum strain relief through clamping lamella
- Easy to assemble
- Large clamping areas

### APPLICATION

- Plant and machine construction
- Robot construction
- Automation technology
- Vehicle construction and shipbuilding
- Rail technology
- Installation technology
- Control cabinet construction

#### Metric thread

Part no. light grey RAL 7035	Part no. dark grey RAL 7001	Part no. black RAL 9005	Size Metr.	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit Pcs.
93908	93923	93937	M 12 x 1.5	3.0 - 6.5	8.0	15	100
93909	93924	93938	M 16 x 1.5	4.0 - 8.0	8.0	19	50
907275	907276	907277	M 16 x 1.5	5.0 - 10.0	8.0	19	50
92667	92668	92669	M 16 x 1.5	5.0 - 10.0	10.0	22	50
93910	93925	93939	M 20 x 1.5	6.0 - 12.0	10.0	24	50
93911	93926	93940	M 25 x 1.5	11.0 - 17.0	8.0	29	50
93912	93927	93941	M 32 x 1.5	15.0 - 21.0	10.0	36	25
93913	93928	93942	M 40 x 1.5	19.0 - 28.0	10.0	40	20
93914	93929	93943	M 50 x 1.5	30.0 - 38.0	18.0	60	10
93915	93930	93944	M 63 x 1.5	34.0 - 44.0	18.0	65	10

#### Metric thread - mit Reduziereinsatz

Part no. light grey RAL 7035	Part no. dark grey RAL 7001	Part no. black RAL 9005	Size Metr.	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit Pcs.
903532	903542	903552	M 12 x 1.5	2.0 - 5.0	8.0	15	100
903533	903543	903553	M 16 x 1.5	2.0 - 6.0	8.0	19	50
903534	903544	903554	M 20 x 1.5	5.0 - 9.0	10.0	24	50
903535	903545	903555	M 25 x 1.5	9.0 - 13.0	8.0	29	50
903536	903546	903556	M 32 x 1.5	11.0 - 15.0	10.0	36	25
903537	903547	903557	M 40 x 1.5	16.0 - 23.0	10.0	46	20
903538	903548	903558	M 50 x 1.5	25.0 - 31.0	18.0	60	10
903539	903549	903559	M 63 x 1.5	29.0 - 35.0	18.0	65	10

# HELUTOP® HT

## Cable gland



### PG thread

Part no. light grey RAL 7035	Part no. dark grey RAL 7001	Part no. black RAL 9005	Size PG	Cable Ø from / to mm	Thread length mm	Spanner size mm	VPE Pcs.
99300	99310	99320	7	3.0 - 6.5	8.0	15	100
99301	99311	99321	9	4.0 - 8.0	8.0	19	50
99302	99312	99322	11	5.0 - 10.0	8.0	22	50
99303	99313	99323	13.5	6.0 - 12.0	9.0	24	50
99304	99314	99324	16	10.0 - 14.0	10.0	27	50
99305	99315	99325	21	13.0 - 18.0	11.0	33	25
99306	99316	99326	29	18.0 - 25.0	11.0	42	20
99307	99317	99327	36	22.0 - 32.0	13.0	53	10
99308	99318	99328	42	30.0 - 38.0	13.0	60	10
99309	99319	99329	48	34.0 - 44.0	14.0	65	10

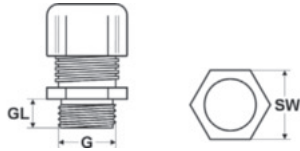
### NPT thread

Part no. light grey RAL 7035	Part no. dark grey RAL 7001	Part no. black RAL 9005	Size BSP	Cable Ø from / to mm	Thread length mm	Spanner size mm	VPE Pcs.
92780	92790	92800	3/8"	5.0 - 10.0	15.0	22	50
92781	92791	92801	1/2"	6.0 - 12.0	15.0	24	50
92782	92792	92802	1/2"	10.0 - 14.0	15.0	27	50
92783	92793	92803	3/4"	13.0 - 18.0	15.0	33	25
92784	92794	92804	1"	18.0 - 25.0	18.0	42	20



### Personalized Service

As a family-owned company, we build strong, long-lasting relationships with our customers. We do this by delivering quality cable products and by providing cable technology expertise and personalized service, from start from finish.



### TECHNICAL DATA

Nickel-coated brass cable gland acc. to EN62444.

<b>Protection class:</b>	IP 66 / 68 - 5 bar, 30 min / IP 69K
<b>Temperature range:</b>	-20°C up to +100°C
<b>Temperature range temporary:</b>	-40°C up to +150°C
<b>Dimensions:</b>	G Thread size
	GL Thread length
	SW Spanner size

### MATERIAL

- Brass, nickel plated
- Clamp: polyamide PA 6
- Seal: chloroprene rubber (CR)
- O-ring: NBR

### PROPERTIES

- Optimum strain relief through clamping plates
- Easy to assemble
- Large clamping areas

### APPLICATION

- Plant and machine construction
- Robot construction
- Automation technology
- Vehicle construction and shipbuilding
- Rail technology
- Installation technology
- Control cabinet construction

### NOTE

- Brass surcharge will be charged for these items.

#### metric thread

Part no.	Size Metr.	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit Pcs.
90760	M 12 x 1.5	3.0 - 6.5	6.0	14	50
99960	M 16 x 1.5	5.0 - 10.0	7.0	20	50
90762	M 20 x 1.5	6.0 - 12.0	8.0	22	50
99961	M 25 x 1.5	11.0 - 17.0	8.0	27	25
94624	M 32 x 1.5	15.0 - 21.0	9.0	34	20
99962	M 40 x 1.5	19.0 - 28.0	9.0	43	5
99963	M 50 x 1.5	27.0 - 38.0	10.0	58	5
90767	M 63 x 1.5	34.0 - 44.0	10.0	64/68	5
906199	M 63 x 1.5	44.0 - 55.0	10.0	75	5

#### metric thread - with reducing seal

Part no.	Size Metr.	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit Pcs.
903560	M 12 x 1.5	2.0 - 5.0	6.0	14	50
903561	M 16 x 1.5	2.0 - 6.0	7.0	17/18	50
903562	M 20 x 1.5	5.0 - 9.0	8.0	22	50
903563	M 25 x 1.5	7.0 - 12.0	8.0	24/27	25
903564	M 32 x 1.5	9.0 - 16.0	9.0	30/34	20
903565	M 40 x 1.5	12.0 - 20.0	9.0	40/43	5
903566	M 50 x 1.5	20.0 - 26.0	10.0	50/55	5
903567	M 63 x 1.5	29.0 - 35.0	14.0	64/68	5



# HELUTOP® HT-MS

## Cable gland



### PG thread

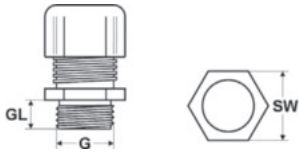
Part no.	Size PG	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit Pcs.
90750	7	3.0 - 6.5	6.0	14	50
90751	9	4.0 - 8.0	6.0	17	50
90752	11	5.0 - 10.0	6.0	20	50
90753	13.5	6.0 - 12.0	6.5	22	50
90754	16	10.0 - 14.0	6.5	24	25
90755	21	13.0 - 18.0	7.2	30	25
90756	29	18.0 - 25.0	8.0	40	20
90757	36	30.0 - 32.0	9.0	50	5
90758	42	30.0 - 38.0	12.0	58	5
90759	48	34.0 - 44.0	14.0	64	5

### NPT thread

Part no.	Size BSP	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit Pcs.
99965	3/8"	4.0 - 8.0	11.5	17/19	50
99966	1/2"	6.0 - 12.0	13.0	22	50
99967	3/4"	13.0 - 18.0	13.0	30	25
99968	1"	18.0 - 25.0	13.0	40/43	10

# HELUTOP® MS-EP4

EMC cable gland



## TECHNICAL DATA

EMC cable gland acc. to EN 62444 with integrated contact system.

**Protection class:** IP 68 - 5 bar, 30 min

**Temperature range:** -20°C to +100°C

**Contact system:** Patented

**Dimensions:**  
 G Thread size  
 GL Thread length  
 SW Spanner size

## MATERIAL

- Brass, nickel plated
- Contact system: copper beryllium
- Clamp: polyamide PA 6
- Seal: chloroprene rubber (CR)
- O-ring: NBR

## PROPERTIES

- Easy installation
- Secure contact
- High vibration resistance

## APPLICATION

- Plant and machine construction
- Robot construction
- Automation technology
- Vehicle construction and shipbuilding
- Rail technology
- Installation technology
- Control cabinet construction

## NOTE

- Brass surcharge will be charged for these items.

### metric thread

Part no.	Size Metr.	Cable Ø from / to mm	Thread length mm	Spanner size mm	Unit pcs.
905181	M 12 x 1.5	3.0 - 6.5	6.0	14	50
905182	M 16 x 1.5	5.0 - 10.0	6.0	20	50
905183*	M 20 x 1.5	6.0 - 12.0	6.0	22	50
905184	M 20 x 1.5	7.5 - 14.0	8.0	24/26	50
905185	M 25 x 1.5	10.0 - 18.0	8.0	30	25
905186	M 32 x 1.5	16.0 - 25.0	9.0	40	10
905187	M 40 x 1.5	22.0 - 32.0	9.0	50	5
905188	M 50 x 1.5	30.0 - 38.0	9.0	58	5
905189	M 63 x 1.5	34.0 - 44.0	14.0	64/68	5
905248*	M 63 x 1.5	37.0 - 53.0	10.0	75	5

\* no CSA at 905183 and 905248.



### Now Available!

Our HELUTOP® MS-EP5 is now available. Download the information sheet now!

# HELUTOOL 250 pocket, 190 drum unwinder



## Drum unwinder HELUTOOL

For simple reeling of cable drums.

- Dynamic brake for constant traction: retarding effect corresponds to the weight bearing on.
- Small weight
- Small size
- Can be used with broken drums

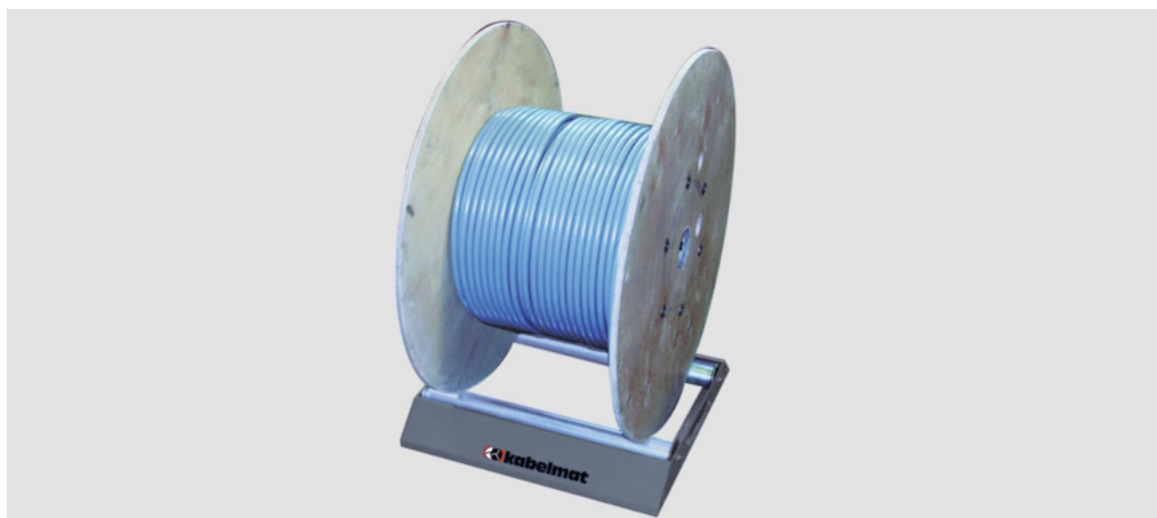
### drum unwinder

Part no.	Type	Weight app. kg	Load capacity kg	Diameter app. mm	Reel width mm	Unit
903716	HELUTOOL 250 pocket	1,0	190	250	-	1
93529	HELUTOOL 190	7,0	380	500	-	1

Dimensions and specifications may be changed without prior notice.

# TROMBOI 500 drum decoiler

shaftless



## Shaftless drum decoiler TROMBOI 500

For drums with different diameters and weights.

- Solid construction
- Loading ramp
- Sturdy welded steel construction
- Specially suitable for one-way drums
- Ball bearing axles

### drum decoiler

Part no.	Type	Weight app. kg	Load capacity kg	Reel-Ø app. mm	Reel width mm	Unit	Net EUR/item at a purchase of		
							1	2 - 4	5 - 10
904760	TROMBOI 500	8,0	140	150 - 700	520	1	o. r.	o. r.	o. r.
904761	TROMBOI 500 castor (1 set = 4 items)	-	-	-	-	1	o. r.	o. r.	o. r.

Dimensions and specifications may be changed without prior notice.

o. r. = on request

# Technical Information



# AWG Strand Make Up

AWG/kcmil Size	Strand Classes								
	Class A	Class B	Class C	Class D	Class G	Class H	Class I 24 AWG	Class K 30 AWG	Class M 34 AWG
26									7
24									10
22		7	19					7	19
20		7	19					10	26
18		7	19					16	41
16		7	19					26	65
14		7	19	37	49			41	105
12		7	19	37	49			65	168
10		7	19	37	49		27	105	259
8		7	19	37	49	133	37	168	413
6		7	19	37	49	133	61	266	665
4	7	7	19	37	49	133	105	420	1064
2	7	7	19	37	49	133	150	665	1666
1	7	19	37	61	133	259	225	836	2107
1/0	7	19	37	61	133	259	275	1045	2646
2/0	7	19	37	61	133	259	325	1330	3325
3/0	7	19	37	61	133	259	450	1672	4256
4/0	7	19	37	61	133	259	550	2109	5320
250 kcmil	19	37	61	91	259	427	627	2500	6384
300 kcmil	19	37	61	91	259	427	735	2989	7581
350 kcmil	19	37	61	91	259	427	888	3458	8810
400 kcmil	19	37	61	91	259	427	980	3990	10100
500 kcmil	37	37	61	91	259	427	1221	5054	12961

## Common Wire & Cable Classes

Class	Common Wire & Cable
B	Power Cables (PV/RHH/RHW/THW/TW/XHHW/USE-2/CP/THHN/THWN)
C	Power cables where more flexible stranding than Class B is desired (MTW/THHN/THWN)
D	Power cables where extra flexible stranding is desired
G	All cables for portable use (GPTM/SGT)
H	Cables where extreme flexibility is required (SIS/TEW/HYP/GPT/TGGT/MGT)
I	Apparatus cable and motor leads (DLO/DLIH/SBC)
K	Cords and cables composed of No. 30 AWG copper wires. Stationary service (Copper Grounding Cable/Welding Cable/SOW/SJOW/STOW/TFF/TFN/TFN/XLPVC)
M	Cords and cables composed of No. 34 AWG copper wires. Constant service (Welding Cable/SO)

# Information and Installation Instructions

for UL and CSA cables

UL/CSA cables must be protected against mechanical, thermal and chemical damages.

## Installation in switchboards and control boards

- Inside switchboards, flexible single conductor cables must be installed in plastic cable channels.
- As American cables are not as flexible, the minimum bending radius must be taken into consideration during flexible installation.

## For machinery and equipment connections

- Permissible tube and conduit  $\varnothing$ :  
minimum  $\varnothing = 1/2''$  (inch)  
maximum  $\varnothing = 4''$  (inch)  
Minimum wall-thickness of the conduit = 1,9 mm
- Normal steel armored tubes with transition socket PG-NPT is used. Additional metal cable channels must also be used.
- The cables are permitted to fill a max. 50% of the cross section of the cable channel.
- Flexible single conductors must be installed in PVC tubes inside the conduits.
- If connectors are used, both the main and the control cables should be installed separately.

## Delivery program:

- PVC tubes
- Metal tubes and glands
- Fixed material
- Steel armored tubes.

## Cable channels

- Cable channels in switchboards must be made out of a flame resistant PVC and must have enough spare space.
- Cable channels on machines and equipment must be made out of metal. They must also be closed and oil resistant.

## Cable identification

- Cable identification is achieved through continuous numbers, letters or number/letter combinations. The beginning and end of the cable have the same identification system.

## Connecting cable to an apparatus

### • Main and control cables

The type of connection to the apparatus determines if screw or press clamps are used.

- In USA, it is normal to install cables without using cable lugs or crimped ferrules. The connection is only possible with the UL-sized wires. These sizes are not designed with a fine-wire stranding make-up.

## Conductor cross section

### General rules

- Motor Cables
- Control Cables
  - in switchboards
  - in the installed system

### Minimum cross section

AWG 14  
AWG 18  
AWG 16

This rule does not apply to electronic devices and systems.

In case, electronic cables and other circuits are installed together, all cables must be set for maximum voltage.

## Color identification

- **Black**  
For main circuits, control and subcircuits, directly connected to main voltage.
- **Blue**  
For direct voltage (D/C), control and subcircuits, which are connected to the main circuit.
- **Red**  
For alternating voltage (A/C), control and subcircuits.
- **Yellow or brown**  
For interlock circuits from an external power source.
- **White or gray**  
For current carrying ground conductors at main, control and subcircuits.
- **Green or green-yellow**  
For insulated grounds as a protective conductor.

## Voltages

200 / 230 / 460 / 575 V, 60 Hz

## Driving voltage

Normally the driving voltage is 120 V, 60 Hz or lower. Transformers must be operated with separate windings.

# Allowable Ampacity Tables

Table 310.15(B)(17) Allowable Ampacities Of Single-Insulated Conductors Rated Up To And Including 2000 Volts In Free Air, Based On Ambient Temperature Of 30°C (86°F)\*

Allowable Ampacities of Single-Insulated Conductors			
Size AWG or kcmil	Temperature Rating of Conductor		
	60°C (140°F)	75°C (167°F)	90°C (194°F)
	COPPER		
18	-	-	18
16	-	-	24
14**	25	30	35
12**	30	35	40
10**	40	50	55
8	60	70	80
6	80	95	105
4	105	125	140
3	120	145	165
2	140	170	190
1	165	195	220
1/0	195	230	260
2/0	225	265	300
3/0	260	310	350
4/0	300	360	405
250	340	405	455
300	375	445	500
350	420	505	570
400	455	545	615
500	515	620	700
600	575	690	780
700	630	755	850
750	655	785	885
800	680	815	920
900	730	870	980
1000	780	935	1055
1250	890	1065	1200
1500	980	1175	1325
1750	1070	1280	1445
2000	1155	1385	1560

Table 310.15(B)(16) Allowable Ampacities Of Insulated Conductors Rated Up To And Including 2000 Volts, 60°C Through 90°C (140°F Through 194°F), Not More Than Three Current-Carrying Conductors In Raceway, Cable, Or Earth (Directly Buried). Based On Ambient Temperature Of 30°C (86°F).

Allowable Ampacities of Insulated Conductors			
Size AWG or kcmil	Temperature Rating of Conductor		
	60°C (140°F)	75°C (167°F)	90°C (194°F)
	COPPER		
18**	-	-	14
16**	-	-	18
14**	15	20	25
12**	20	25	30
10**	30	35	40
8	40	50	55
6	55	65	75
4	70	85	95
3	85	100	115
2	95	115	130
1	110	130	145
1/0	125	150	170
2/0	145	175	195
3/0	165	200	225
4/0	195	230	260
250	215	255	290
300	240	285	320
350	260	310	350
400	280	335	380
500	320	380	430
600	350	420	475
700	385	460	520
750	400	475	535
800	410	490	555
900	435	520	585
1000	455	545	615
1250	495	590	665
1500	525	625	705
1750	545	650	735
2000	555	665	750

\*Refer to 310.15 (B)(2) for the ampacity correction factors where the ambient temperature is other than 30°C (86°F). Refer to 310.15(B)(3) (a) for more than three current-carrying conductors.

\*\*Refer to 240.4(D) for conductor overcurrent protection limitation.

# Allowable Ampacity Tables

Table 310.15(B)(2)(b) Ambient Temperature Correction Factors Based on 40°C (104°F)

For ambient temperatures other than 40°C (140°F), multiply the allowable ampacities specified in the ampacity table by the appropriate correction factor shown below.							
Ambient Temperature (°C)	Temperature Rating of Conductor						Ambient Temperature (°F)
	60°C	75°C	90°C	150°C	200°C	250°C	
10 or less	1.58	1.36	1.26	1.13	1.09	1.07	50 or less
11-15	1.50	1.31	1.22	1.11	1.08	1.06	51-59
16-20	1.41	1.25	1.18	1.09	1.06	1.05	60-68
21-25	1.32	1.20	1.14	1.07	1.05	1.04	69-77
26-30	1.22	1.13	1.10	1.04	1.03	1.02	78-86
31-35	1.12	1.07	1.05	1.02	1.02	1.01	87-95
36-40	1.00	1.00	1.00	1.00	1.00	1.00	96-104
41-45	0.87	0.93	0.95	0.98	0.98	0.99	105-113
46-50	0.71	0.85	0.89	0.95	0.97	0.98	114-122
51-55	0.50	0.76	0.84	0.93	0.95	0.96	123-131
56-60	-	0.65	0.77	0.90	0.94	0.95	132-140
61-65	-	0.53	0.71	0.88	0.90	0.94	141-149
66-70	-	0.38	0.63	0.85	0.88	0.93	150-158
71-75	-	-	0.55	0.83	0.87	0.91	169-167
76-80	-	-	0.45	0.80	0.83	0.90	168-176
81-90	-	-	-	0.74	0.80	0.87	177-194
91-100	-	-	-	0.67	0.79	0.85	195-212
101-110	-	-	-	0.60	0.75	0.82	213-230
111-120	-	-	-	0.52	0.71	0.79	231-248
121-130	-	-	-	0.43	0.66	0.76	249-266
131-140	-	-	-	0.30	0.61	0.72	267-284
141-160	-	-	-	-	0.50	0.65	285-320
161-180	-	-	-	-	0.35	0.58	321-356
181-200	-	-	-	-	-	0.49	357-392
201-225	-	-	-	-	-	0.35	393-437

Table 310.15(B)(3)(a) Adjustment Factors For More Than Three Current-Carrying Conductors

Number of Conductors <sup>1</sup>	Percent of Values in Table 310.15(B)(16) Through Table 310.15(B)(19) as Adjusted for Ambient Temperature if Necessary
4-6	80
7-9	70
10-20	50
21-30	45
31-40	40
40 and above	35

<sup>1</sup>Number of conductors is the total number of conductors in the raceway or cable, including spare conductors. The count shall be adjusted in accordance with 310.15(B)(5) and (6). The count shall not include conductors that are connected to electrical components that cannot be simultaneously energized.



# Conversion Chart, AWG to mm<sup>2</sup>

AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>
30	0.05	12	4	300 kcmil	150
28	0.08	10	6	350 kcmil	185
26	0.14	8	10	500 kcmil	240
24	0.25	6	16	600 kcmil	300
22	0.34	4	25	750 kcmil	400
21	0.38	2	35	1000 kcmil	500
20	0.50	1	50		
18	0.75				
17	1.00	2/0	70		
16	1.50	3/0	95		
14	2.50	4/0	120		

This cross reference list shows equivalent nominal values. Actual cross sections may vary.

## General Measuring Units

Length	Equivalent	Weight	Equivalent	Pressure	Equivalent
1 mil	0.0254 mm	1 grain	64.8 mg	1 psi (lb/sq.)	68.95 mbar
1 in (inch)	25.4 mm	1 dram	1.77 g		6.895 · 10 <sup>-3</sup> Nmm <sup>2</sup>
1 ft (foot)	0.3048 m	1 oz (ounce)	28.35 g	1 lb/sq. ft.	0.478 mbar
1 yd (yard)	0.9144 m	1 lb (pound)	0.4536 Kp	1 pdl/sq. ft.	1.489 N/m <sup>2</sup>
1 ch (chain)	20.1 m	1 stone	6.35 Kp	1 in Hg	33.86 mbar
1 mile (land mile)	1.609 km 1,760 yards	1 US-cwt (hundred-weight)	45.36 Kp	1 ft H <sub>2</sub> O	29.89 mbar
1 mile (nautic mile)	1.852 km	1 qu (quarter)	12.7 Kp	1 in H <sub>2</sub> O	2.491 mbar
1 mm	0.0394 in	1 US ton (short ton)	0.907 t	1 N/mm <sup>2</sup>	145 psi
1 m	39.3701 in	1 Brit. ton (long ton)	1.016 t		10 bar
<b>Area</b>	<b>Equivalent</b>	<b>Power Rate</b>	<b>Equivalent</b>	1 kp/mm <sup>2</sup>	1,422 psi
1 CM (circ. mil)	0.507 · 10 <sup>-3</sup> mm <sup>2</sup>	1 PS	0.736 kW	1 at	736 Torr
1 MCM	0.5067 mm <sup>2</sup>	1 kW	1.36 PS	1 Torr	1 mm Hg
1 sq. inch (sq. inch)	645.16 mm <sup>2</sup>	1 hp	0.7457 kW	1 bar	0.1 H Pa
1 sq. ft. (sq. foot)	0.0929 m <sup>2</sup>	1 kW	1.31 hp	1 Pa	1 N/m <sup>2</sup>
1 square yard	0.836 m <sup>2</sup>	<b>Density</b>		<b>Horse power</b>	<b>Equivalent</b>
1 acre	4,047 m <sup>2</sup>	1 lb/cu. ft.	16.02 kg/m <sup>3</sup>	1 hp · h	1.0139 PS · h
1 square mile	2.59 km <sup>2</sup>	1 lb/cu. in.	27.68 t/m <sup>3</sup>		2.684 · 10 <sup>6</sup> Joule
<b>Volume</b>	<b>Equivalent</b>	<b>Force</b>	<b>Equivalent</b>		746 W · h
1 cu. in. (cubic inch)	16.39 cm <sup>3</sup>	1 lb	4.448 N	1 BTU (Brit. therm. unit)	1,055 Joule
1 cu. ft. (cubic foot)	0.0283 m <sup>3</sup>	1 Brit. ton	9,954 N	<b>Electrical units</b>	<b>Equivalent</b>
1 cu. yd. (cubic yard)	0.7646 m <sup>3</sup>	1 pdl (Poundal)	0.1383 N	1 ohm/1000 yd	1.0936 Ω/km
1 gal. (US gallon)	3.785 L	1 kp	9.81 N	1 ohm/1000 ft	3.28 Ω/km
1 gal. (Brit gallon)	4.546 L	1 N	0.102 kp	1 μF/mile	0.62 μF/km
1 US pint	0.473 L	<b>Energy</b>	<b>Equivalent</b>	1 megohm/mile	1.61 MΩ/km
1 US quart	0.946 L	1 lb/mile	0.282 kg/m	1 μuf/foot	3.28 pF/m
1 US barrel	158.8 L	1 lb/yd	0.496 kg/m	1 decibel/mile	71.5 mN/m
<b>Temperature</b>	<b>Equivalent</b>	1 lb/foot	1.488 kg/m		
F (Fahrenheit)	(1.8 · C) + 3°	<b>Radiation absorbed dose</b>	<b>Equivalent</b>		
C (Celsius)	0.5556 · (F-32°)	1 Gray	1 J/kg		
<b>Velocity</b>	<b>Equivalent</b>	1 rad	10 <sup>-2</sup> J/kg = 1 Centi Gy		
1 mile/h	1.609 km/h		0.01 Gy		
1 Knoten	1.852 km/h	1 Centi	100 Joule		
1 ft/s	0.305 m/s	1 rad	cJ/kg = 0.01Gy		
1 ft/min	5.08 · 10 <sup>-3</sup> m/s	1 Mrad	1 · 10 <sup>6</sup> cJ/kg		

# Cable Selection by Industry

	AUTOMATION	CHEMICAL	ELECTRONICS	EVENT THEATER & STAGE ENGINEERING	FOOD & BEVERAGE	MACHINE BUILDING	MATERIAL HANDLING	PLANT CONSTRUCTION	WIND POWER	SOLAR POWER	ROBOTICS	SHIPBUILDING/OFFSHORE PLATFORMS	STEEL	TRANSPORTATION	PAGE
<b>600/1000V Control Cables</b>															
TRAYCONTROL® 600	•	•	•	•	•	•	•	•	•	•	•	•	•	•	8
TRAYCONTROL® 600-C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	10
TRAYCONTROL® 500	•	•	•	•	•	•	•	•	•	•	•	•	•	•	12
TRAYCONTROL® 500-C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	14
JZ-602	•	•	•	•	•	•	•	•	•	•	•	•	•	•	16
JZ-602-CY	•	•	•	•	•	•	•	•	•	•	•	•	•	•	18
TRAYCONTROL® 530	•	•	•	•	•	•	•	•	•	•	•	•	•	•	20
TRAYCONTROL® 550 TPE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	22
TRAYCONTROL® X	•	•	•	•	•	•	•	•	•	•	•	•	•	•	24
TRAYCONTROL® 670 HDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	26
TRAYCONTROL® 670-C HDP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	26
MULTIFLEX 600	•	•	•	•	•	•	•	•	•	•	•	•	•	•	30
MULTIFLEX 600-C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	31
MULTIFLEX 512®-PUR UL/CSA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	32
MULTIFLEX 512®-C-PUR UL/CSA	•	•	•	•	•	•	•	•	•	•	•	•	•	•	34
<b>300V Control Cables</b>															
TRAYCONTROL® 300	•	•	•	•	•	•	•	•	•	•	•	•	•	•	38
TRAYCONTROL® 300-C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	40
TRAYCONTROL® 300 TP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	42
TRAYCONTROL® 300-C TP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	44
<b>VFD/Servo Power Cables</b>															
TOPFLEX® 600 VFD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	50
TOPFLEX® 650 VFD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	51
TOPFLEX® 1000 VFD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	52
TOPSERV® 600 VFD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	53
TOPSERV® 650 VFD	•	•	•	•	•	•	•	•	•	•	•	•	•	•	54
<b>Single Conductor Cables</b>															
FIVENORM	•	•	•	•	•	•	•	•	•	•	•	•	•	•	58
HELUTHERM® 145	•	•	•	•	•	•	•	•	•	•	•	•	•	•	61
TOPFLEX® 302 UL	•	•	•	•	•	•	•	•	•	•	•	•	•	•	63
Single 600 J/O	•	•	•	•	•	•	•	•	•	•	•	•	•	•	64
Single 602-RC J/O	•	•	•	•	•	•	•	•	•	•	•	•	•	•	65
<b>Data, Network &amp; Bus Cables</b>															
SENSORFLEX®	•	•	•	•	•	•	•	•	•	•	•	•	•	•	68
AS-i BUS PUR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	69
AS-i BUS PUR Long Distance	•	•	•	•	•	•	•	•	•	•	•	•	•	•	70
HELUKAT® PROFINET Type A IE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	71
HELUKAT® PROFINET Type B IE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	72
HELUKAT® PROFINET Type C IE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	73
HELUKAT® PROFINET Type R Torsion IE	•	•	•	•	•	•	•	•	•	•	•	•	•	•	74
HELUKAT® 500IND Industrial Ethernet	•	•	•	•	•	•	•	•	•	•	•	•	•	•	75
HELUKAT® 250S PUR Industrial Ethernet	•	•	•	•	•	•	•	•	•	•	•	•	•	•	76
PROFIBUS SK	•	•	•	•	•	•	•	•	•	•	•	•	•	•	77
RJ45 Patch Cables	•	•	•	•	•	•	•	•	•	•	•	•	•	•	78
M12 Patch Cables	•	•	•	•	•	•	•	•	•	•	•	•	•	•	78
<b>Accessories</b>															
HELUTOP® HT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	84
HELUTOP® HT-MS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	86
HELUTOP® MS-EP4	•	•	•	•	•	•	•	•	•	•	•	•	•	•	88

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