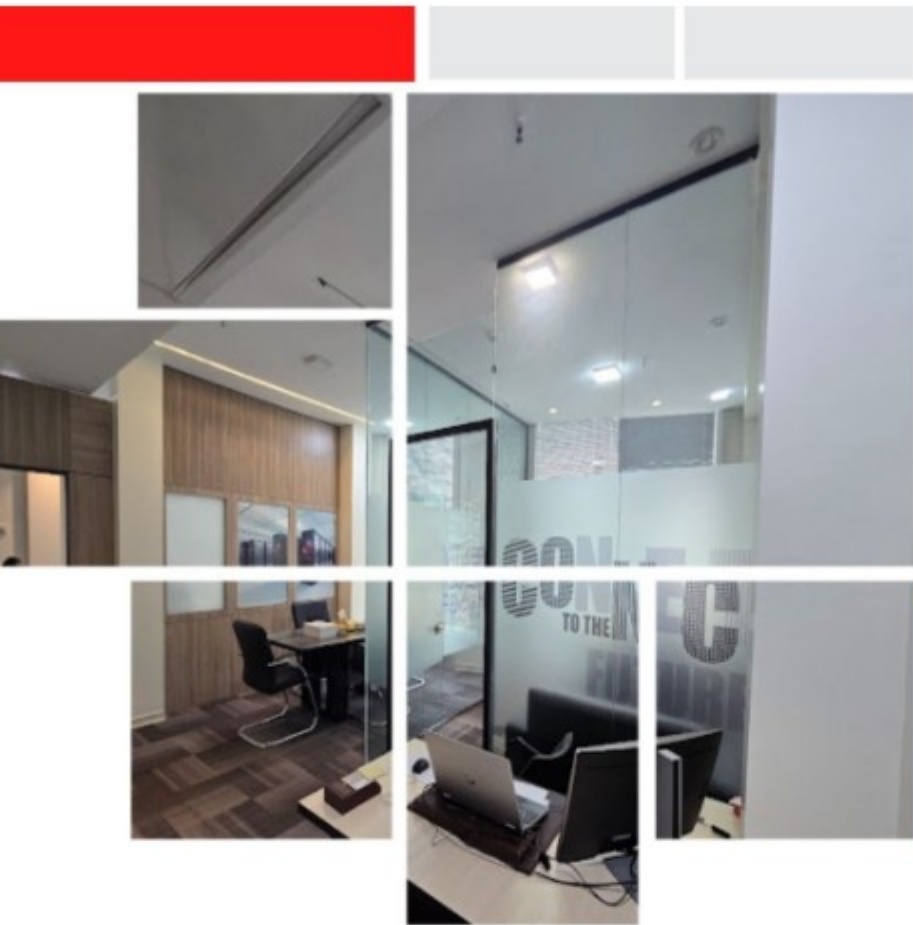




شرکت فرا اتصال رایان عصر

پیشرو در زمینه فناوری اطلاعات و ارتباطات

سیاست کیفیت ما

فرا اتصال رایان عصر با بیش از یک دهه تجربه موفق در زمینه مشاوره و تأمین تجهیزات کابل‌های تخصصی و صنعتی، در حوزه‌های مختلف از جمله صنایع نفت، گاز، پتروشیمی، فولاد، معادن، اتوماسیون، مخابرات و انتقال داده، در کنار صنایع و سازمان‌های کشور عزیزمان فعالیت می‌کند. این شرکت یکی از معتبرترین مراکز تأمین کابل‌های تخصصی برندهای جهانی مانند TMC و Nexans، Hubble Belden، Helukable، Lapp، Prysmian و ... است.

باتکیه بر سال‌ها تجربه و تخصص، ما نیازهای فنی و تخصصی شما را در زمینه کابل‌های مقاوم در برابر حرارت و شرایط محیطی دشوار تا کابل‌های ویژه و سفارشی درک کرده و راه‌حل‌های بهینه‌ای مطابق با آخرین استانداردهای بین‌المللی ارائه می‌دهیم.



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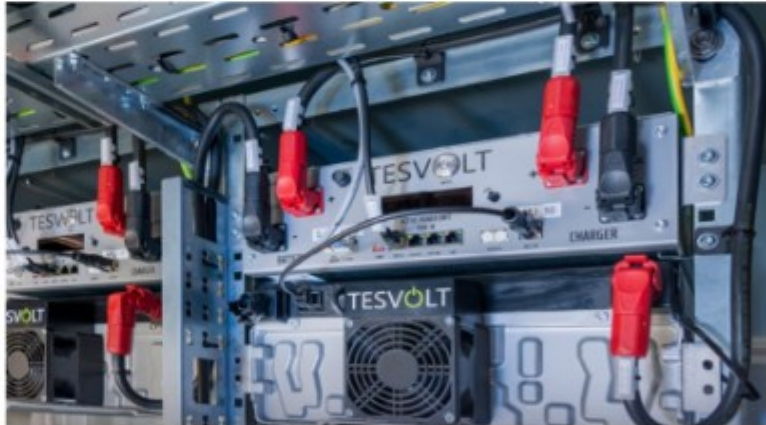
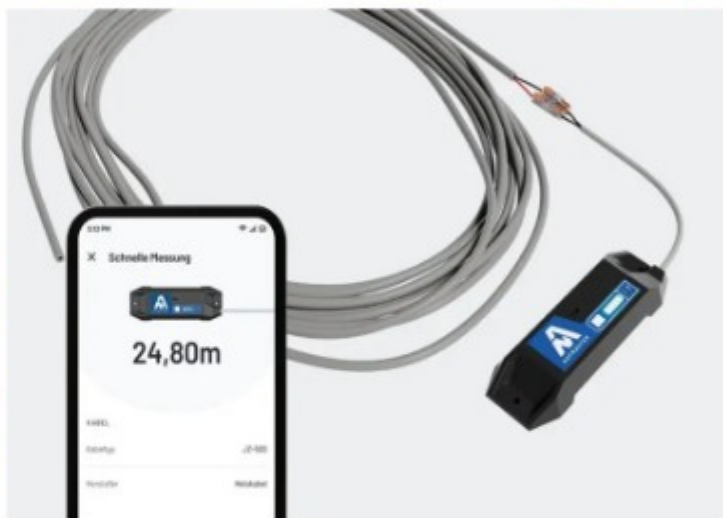
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پیشرو در تأمین کابل‌های تخصصی در تمام صنایع

H07RN-F / 07RN-F

oil resistant, weather-resistant



TECHNICAL DATA

Rubber connection cable, H07RN-F acc. to DIN VDE 0285-525-2-21 / DIN EN 50525-2-21; 07RN-F in alignment with DIN VDE 0285-525-2-21 / DIN EN 50525-2-21

Temperature range	flexible -25°C to +60°C fixed -30°C to +60°C
Permissible operating temperature of the conductor	+60°C
Nominal voltage	AC U ₀ /U 450/750 V
Max. permissible operating voltage	alternating current (AC) conductor/earth 476 V three-phase alternating current (AC) conductor/conductor 825 V direct current (DC) conductor/earth 619 V direct current (DC) conductor/conductor 1238 V
Test voltage core/core	2500 V
Tensile stress	during installation and operation, 15 N/mm ²
Minimum bending radius	fixed 4x Outer-Ø flexible, guidance via roles 7.5x Outer-Ø flexible, winding on drums 5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5
- Core insulation: rubber acc. to DIN VDE 0207-363-1 / DIN EN 50363-1 (compound type E14)

- Core identification acc. to DIN VDE 0293-308,
1 core(s): black
2 - 5 core(s): colour coded
7 - 37 core(s): black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
G = with protective conductor GN-YE, in the outer layer,
x = without protective conductor
- Cores stranded in layers with optimal lay lengths
- Outer sheath: rubber acc. to DIN VDE 0207-363-2-1 / DIN EN 50363-2-1 (compound type EM2)
- Sheath colour: black

PROPERTIES

- resistant to: oil, weathering effects
- for outdoor use

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- certifications and approvals:
H07RN-F: HAR
EAC

APPLICATION

Heavy duty, rubber sheathed cable for use with medium mechanical stress in dry, damp, wet rooms, in agricultural premises and outdoors. Suitable for equipment in commercial operations, e.g. heating plates, hand lamps, electric tools such as drills or circular saws. For fixed installation on plaster as well as in temporary constructions. When installed in pipes or similar enclosed systems, the use of the cable is permitted up to and including 1000 V AC voltage or up to 750 V DC voltage against earth.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only

H07RN-F

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
37019	2 x 1	18	7.7 - 10.0	19.0	98.0
37027	3 G 1	18	8.3 - 10.7	29.0	130.0
37044	4 G 1	18	9.2 - 11.9	38.0	150.0
37001	1 x 1.5	16	5.7 - 7.1	14.4	58.0
37020	2 x 1.5	16	6.5 - 11.0	29.0	135.0
37028	3 G 1.5	16	9.2 - 11.9	43.0	165.0
37080	3 x 1.5	16	9.2 - 11.9	43.0	165.0
37045	4 G 1.5	16	10.2 - 13.1	58.0	200.0
37061	5 G 1.5	16	11.2 - 14.4	72.0	240.0
37092	7 G 1.5	16	14.7 - 18.7	101.0	375.0

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
37093	12 G 1.5	16	17.6 - 22.4	175.0	460.0
37095	24 G 1.5	16	24.3 - 30.7	346.0	1015.0
37002	1 x 2.5	14	6.3 - 7.9	24.0	71.0
37021	2 x 2.5	14	10.2 - 13.1	48.0	193.0
37029	3 G 2.5	14	10.9 - 14.0	72.0	235.0
37081	3 x 2.5	14	10.9 - 14.0	72.0	235.0
37046	4 G 2.5	14	12.1 - 15.5	96.0	290.0
37062	5 G 2.5	14	13.3 - 17.0	120.0	345.0
37079	7 G 2.5	14	17.1 - 21.8	168.0	520.0
37096	12 G 2.5	14	20.6 - 26.2	288.0	760.0

Continued on next page

H07RN-F / 07RN-F

oil resistant, weather-resistant



H07RN-F

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
37097	18 G 2.5	14	24.4 - 30.9	432.0	850.0
37099	24 G 2.5	14	28.8 - 36.4	576.0	1390.0
37003	1 x 4	12	7.2 - 9.0	38.0	100.0
37022	2 x 4	12	11.8 - 15.1	77.0	280.0
37030	3 G 4	12	12.7 - 16.2	115.0	320.0
37082	3 x 4	12	12.7 - 16.2	115.0	320.0
37047	4 G 4	12	14.0 - 17.9	154.0	395.0
37063	5 G 4	12	15.6 - 19.9	192.0	485.0
37004	1 x 6	10	7.9 - 9.8	58.0	130.0
37023	2 x 6	10	13.1 - 16.8	115.0	330.0
37031	3 G 6	10	14.1 - 18.0	173.0	420.0
37083	3 x 6	10	14.1 - 18.0	173.0	495.0
37048	4 G 6	10	15.7 - 20.0	230.0	540.0
37064	5 G 6	10	17.5 - 22.2	288.0	650.0
37005	1 x 10	8	9.5 - 11.9	96.0	230.0
37024	2 x 10	8	17.7 - 22.6	192.0	586.0
37032	3 G 10	8	19.1 - 24.2	288.0	810.0
37084	3 x 10	8	19.1 - 24.2	288.0	880.0
37049	4 G 10	8	20.9 - 26.5	384.0	950.0
37089	4 x 10	8	20.9 - 26.5	384.0	1065.0
37065	5 G 10	8	22.9 - 29.1	480.0	1200.0
37006	1 x 16	6	10.8 - 13.4	154.0	290.0
37025	2 x 16	6	20.2 - 25.7	307.0	810.0
37033	3 G 16	6	21.8 - 27.6	461.0	1050.0
37085	3 x 16	6	21.8 - 27.6	461.0	1095.0
37050	4 G 16	6	23.8 - 30.1	614.0	1260.0
37066	5 G 16	6	26.4 - 33.3	768.0	1550.0
37007	1 x 25	4	12.7 - 15.8	240.0	420.0
37026	2 x 25	4	24.3 - 30.7	480.0	1160.0
37034	3 G 25	4	26.1 - 33.0	720.0	1250.0
37086	3 x 25	4	26.1 - 33.0	720.0	1450.0
37051	4 G 25	4	28.9 - 36.6	960.0	1860.0
37090	4 x 25	4	28.9 - 36.6	960.0	1995.0
37067	5 G 25	4	32.0 - 40.4	1200.0	2250.0
37008	1 x 35	2	14.3 - 17.9	336.0	530.0

07RN-F

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
40152	7 G 1	18	13.3 - 15.3	68.0	280.0
40153	12 G 1	18	17.4 - 19.4	116.0	415.0
40154	18 G 1	18	20.3 - 22.3	173.0	575.0
40155	24 G 1	18	23.5 - 25.5	231.0	730.0
40156	36 G 1	18	27.4 - 29.4	346.0	1030.0
37094	19 G 1.5	16	20.7 - 26.3	274.0	810.0
37075	27 G 1.5	16	25.5 - 31.5	385.0	1100.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
37035	3 G 35	2	29.3 - 37.1	1008.0	1900.0
37087	3 x 35	2	29.3 - 37.1	1008.0	1900.0
37052	4 G 35	2	32.5 - 41.1	1344.0	2380.0
37068	5 G 35	2	35.7 - 45.1	1680.0	2750.0
37009	1 x 50	1	16.5 - 20.6	480.0	750.0
37036	3 G 50	1	34.1 - 42.9	1440.0	2600.0
37088	3 x 50	1	34.1 - 42.9	1440.0	2600.0
37053	4 G 50	1	37.7 - 47.5	1920.0	3190.0
37091	5 G 50	1	41.8 - 53.0	2400.0	3950.0
37010	1 x 70	2/0	18.6 - 23.3	672.0	960.0
37037	3 G 70	2/0	38.4 - 48.3	2016.0	3400.0
37054	4 G 70	2/0	42.7 - 54.0	2688.0	4260.0
37154	5 G 70	2/0	47.5 - 60.0	3360.0	4740.0
37011	1 x 95	3/0	20.8 - 26.0	912.0	1250.0
37038	3 G 95	3/0	43.3 - 54.0	2736.0	4450.0
37055	4 G 95	3/0	48.4 - 61.0	3648.0	5600.0
34090	5 G 95	3/0	54.0 - 67.0	4560.0	6600.0
37012	1 x 120	4/0	22.8 - 28.6	1152.0	1560.0
37039	3 G 120	4/0	47.4 - 60.0	3456.0	5180.0
37056	4 G 120	4/0	53.0 - 66.0	4608.0	6830.0
37013	1 x 150	300 kcmil	25.2 - 31.4	1440.0	1900.0
37040	3 G 150	300 kcmil	52.0 - 66.0	4320.0	6500.0
37057	4 G 150	300 kcmil	58.0 - 73.0	5760.0	8320.0
37014	1 x 185	350 kcmil	27.6 - 34.4	1776.0	2300.0
37041	3 G 185	350 kcmil	57.0 - 72.0	5328.0	7860.0
37058	4 G 185	350 kcmil	64.0 - 80.0	7104.0	9800.0
37015	1 x 240	500 kcmil	30.6 - 38.3	2304.0	2950.0
37042	3 G 240	500 kcmil	65.0 - 82.0	6912.0	10224.0
37059	4 G 240	500 kcmil	72.0 - 91.0	9216.0	12100.0
37016	1 x 300	600 kcmil	33.5 - 41.9	2880.0	3600.0
37043	3 G 300	600 kcmil	72.0 - 90.0	8640.0	12620.0
37060	4 G 300	600 kcmil	80.0 - 101.0	11520.0	15200.0
37017	1 x 400	750 kcmil	37.4 - 46.8	3840.0	4600.0
37018	1 x 500	1000 kcmil	41.3 - 52.0	4800.0	6000.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
37098	19 G 2.5	14	25.5 - 31.0	456.0	1075.0
37076	27 G 2.5	14	30.0 - 37.0	640.0	1521.0
37077	37 G 2.5	14	34.0 - 37.5	720.0	1940.0
34349	5 G 120	4/0	58.0 - 73.0	5760.0	8180.0
34127	5 G 150	300 kcmil	64.0 - 80.0	7200.0	10600.0
11017183	5 G 185	350 kcmil	71.0 - 89.0	8880.0	12060.0
11022923	5 G 240	500 kcmil	80.0 - 100.0	11520.0	15840.0

NSHTÖU

reelable, oil resistant



TECHNICAL DATA

Reelable control and connection cable acc. to DIN VDE 0250-814

Temperature range	flexible -25°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U ₀ /U 600/1000 V
Max. permissible operating voltage	alternating current (AC) conductor/earth 700 V three-phase alternating current (AC) conductor/conductor 1200 V direct current (DC) conductor/earth 900 V direct current (DC) conductor/conductor 1800 V
Test voltage core/core	2500 V
Tensile stress	during installation and operation, 15 N/mm ²
Minimum bending radius	flexible ≤ 20 mm: 5x Outer-Ø > 20 mm: 6x Outer-Ø

CABLE STRUCTURE

- Copper conductor tinned, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5
- Core insulation: rubber acc. to DIN VDE 0207-20 (compound type 3GI3)
- Core identification acc. to DIN VDE 0293-308,
3 - 5 core(s): colour coded
7 - 50 core(s): black cores with consecutive labeling in white digits
- G = with protective conductor GN-YE, in the outer layer
- Cores stranded in layers with optimal lay lengths
- Textile bandage
- Inner sheath: rubber
- Anti-torsion protective layer

- Outer sheath: rubber acc. to DIN VDE 0207-21 (compound type 5GM3)
- Sheath colour: black

PROPERTIES

- resistant to: oil, ozone, solvents, petrol, acids, chemicals, greases
- abrasion-resistant
- for outdoor use
- operating parameters for reeling applications
acceleration (max.): 0.4 m/s²
velocity (max.): 120 m/min
- for horizontal reeling operations

TESTS

- flame-retardant acc. to DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2
- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- certifications and approvals:
EAC

APPLICATION

Reeling cables are used for applications involving high mechanical stress, especially for applications requiring frequent winding and unwinding with simultaneous tensile and torsional stress; for construction machinery, conveying and lifting equipment and crane systems. For use as a robust and weather resistant cable in roughest operations such as mobile transport equipment, railway engines and in mining. Suitable for installation in dry, damp and wet rooms as well as outdoors.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for use in reeling applications:
1) the assembly instructions must be observed
2) for special applications, we recommend that you contact us and complete our form for reelable cables

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
26001	3 G 1.5	16	11.3 - 14.8	43.0	236.0
26029	4 G 1.5	16	12.1 - 15.6	58.0	274.0
26002	5 G 1.5	16	13.0 - 16.5	72.0	316.0
26003	7 G 1.5	16	15.0 - 19.0	101.0	440.0
26004	12 G 1.5	16	19.1 - 21.9	173.0	606.0
26005	16 G 1.5	16	20.9 - 23.1	230.0	696.0
26006	18 G 1.5	16	21.7 - 25.0	260.0	750.0
26007	24 G 1.5	16	24.6 - 28.6	346.0	1150.0
26008	30 G 1.5	16	25.8 - 29.6	432.0	1325.0
26009	3 G 2.5	14	12.7 - 16.3	72.0	305.0
26010	4 G 2.5	14	14.8 - 17.7	96.0	350.0
26011	5 G 2.5	14	15.9 - 18.8	120.0	465.0

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
26012	7 G 2.5	14	16.8 - 21.1	168.0	576.0
26013	12 G 2.5	14	21.0 - 25.1	288.0	850.0
26014	18 G 2.5	14	24.9 - 28.7	432.0	1181.0
26015	24 G 2.5	14	29.2 - 33.2	576.0	1550.0
26016	30 G 2.5	14	30.7 - 34.4	720.0	1810.0
26017	40 G 2.5	14	35.6 - 39.4	960.0	3110.0
26018	50 G 2.5	14	43.9 - 45.6	1200.0	3200.0
26019	4 G 4	12	16.4 - 19.2	154.0	510.0
26020	5 G 4	12	17.7 - 20.4	192.0	635.0
26021	4 G 6	10	17.6 - 20.6	230.0	650.0
26022	5 G 6	10	19.8 - 23.2	288.0	800.0
26023	4 G 10	8	21.8 - 24.9	384.0	1010.0

NSHTÖU

reelable, oil resistant



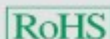
Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
26022	5 G 10	8	24.4 - 26.7	480.0	1200.0
26023	4 G 16	6	25.1 - 29.1	614.0	1300.0
26032	5 G 16	6	27.1 - 31.4	768.0	1700.0
26024	4 G 25	4	31.6 - 35.5	960.0	2000.0
26025	4 G 35	2	33.7 - 38.3	1344.0	2610.0

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer-Ø min - max mm	Cu-weight kg/km	Weight kg/km, approx.
26026	4 G 50	1	39.4 - 43.6	1920.0	3500.0
26027	4 G 70	2/0	43.8 - 48.7	2688.0	4600.0
26028	4 G 95	3/0	50.1 - 57.3	3648.0	6100.0
72328	4 G 120	4/0	55.7 - 62.0	4860.0	7200.0



HELUKABEL NEO-flach 12G1,5 QMM / 28006 300/500 V 001042630

CE



Technical data

- Special Neoprene-flat cable adapted to DIN VDE 0250 part 809
- **Temperature range**
flexing -30°C to +80°C
fixed installation -40°C to +80°C
- **Nominal voltage** U_n/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
10x cable thickness
- **Radiation resistance**
up to 50×10^6 cJ/kg (up to 50 Mrad)

Cable structure

- Copper-conductor bare or tinned to DIN VDE 0295, BS 6360, IEC 60228
- Conductor construction
35-120 mm² class 5: fine-wire
1,5-25 mm² class 6 col.4: extra-fine-wire
- Special rubber core insulation
- Core identification to DIN VDE 0293
- up to 5 cores coloured
- from 7 cores, black with continuous white numbering
- Cores laying parallel
- GN-YE conductor
- Outer sheath of special rubber 5GM3, to DIN VDE 0207 part 21
- Sheath colour black

Properties

- Special rubber outer sheath, cold-resistant
- Extensively oil resistant, oil-/chemical resistance see table Technical Informations
- Extremely small bending radius
- High flexibility
- Minimum waste of space
- Packaging possibility
- Outdoor application

Tests

- Behaviour in fire
to DIN VDE 0482-332-1-2
DIN EN 60332-2-1, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow conductor
- Part no. 28007 and 28013 (6x4).
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Neoprene type of flat cables are used mainly as trailing cable for crane installations, floor conveyer systems and shelf control units. These cables are also available for export with UL-approval on request.

Installation notes

Cables reels with flat cables must be transported in standing position on the flange. A bending flexibility can be achieved on a plane surface. For this purpose, the corresponding fitting instructions should be followed.

- Put the cable trolley on the guiding rail or upon carrier beam and push them together at the starting point. The distance between the bedding surface of two cable trolleys must be wider than the double thickness of a cable-packet.
- During the packaging performance, it must be started with the smaller cross-section which lays on the bedding surface and will be build successively so that the biggest cross-section is laying on the top.
- Further, be careful of a symmetrical load distribution.
- In case of multicore flat cables with small cross-section, smaller than 2,5 mm², is very critical due to its low tensile stress. In such case, you should add 10% reserve wire for calculation.

CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. cores x cross-sec. mm ²	Outer dimension app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
28001	4 G 1,5	5,9 x 16,2	58,0	234,0	16
28002	5 G 1,5	5,9 x 23,7	72,0	304,0	16
28003	7 G 1,5	5,9 x 30,5	101,0	391,0	16
28004	8 G 1,5	5,9 x 34,0	115,0	441,0	16
28005	10 G 1,5	5,9 x 43,5	144,0	460,0	16
28006	12 G 1,5	6,5 x 50,4	173,0	646,0	16
28007	24 G 1,5 (6 x 4)	13,0 x 56,0	346,0	1290,0	16
28008	4 G 2,5	7,2 x 19,6	96,0	316,0	14
28009	5 G 2,5	7,2 x 27,8	120,0	391,0	14
28010	7 G 2,5	7,2 x 36,1	168,0	533,0	14
28011	8 G 2,5	7,2 x 40,2	192,0	602,0	14
28012	12 G 2,5	7,8 x 59,4	288,0	890,0	14
28013	24 G 2,5 (6 x 4)	15,5 x 66,8	576,0	1480,0	14
28014	4 G 4	8,8 x 24,2	154,0	506,0	12
28015	5 G 4	8,8 x 33,4	192,0	621,0	12
28016	7 G 4	8,8 x 42,5	269,0	851,0	12
28017	4 G 6	9,6 x 27,4	230,0	661,0	10
28018	5 G 6	9,6 x 37,4	288,0	740,0	10
28019	7 G 6	9,6 x 47,2	403,0	1004,0	10
28020	4 G 10	10,4 x 30,8	384,0	1027,0	8
28021	5 G 10	10,4 x 41,6	480,0	1171,0	8

Part no.	No. cores x cross-sec. mm ²	Outer dimension app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
28022	4 G 16	11,6 x 35,6	614,0	1430,0	6
28023	5 G 16	12,2 x 48,2	768,0	1590,0	6
28024	4 G 25	14,1 x 45,8	960,0	1890,0	4
28025	5 G 25	14,7 x 58,3	1200,0	2215,0	4
28026	7 G 25	15,3 x 78,7	1680,0	3000,0	4
28027	4 G 35	15,8 x 50,8	1344,0	2460,0	2
28028	5 G 35	16,4 x 64,4	1680,0	2880,0	2
28029	7 G 35	16,4 x 86,4	2352,0	4100,0	2
28030	4 G 50	18,6 x 60,2	1920,0	3385,0	1
28031	4 G 70	21,0 x 68,0	2688,0	4480,0	2/0
28032	4 G 95	24,1 x 78,6	3648,0	5990,0	3/0
28033	4 G 120	25,5 x 84,2	4608,0	7240,0	4/0

Dimensions and specifications may be changed without prior notice. (RJ01)

NEO-Flat-C (MCHÖU) screened, EMC-preferred type

EAC



HELUKABEL NEO-Flat-C 8x0,5 QMM / 28100 300/500 V 001042631

CE

RoHS

Technical data

- Special-Neoprene-flat cable, screened, adapted to DIN VDE 0250 part 809
- **Temperature range**
flexing -30°C bis +80°C
fixed installation -40°C to +80°C
- **Nominal voltage** U_c/U 300/500 V
- **Test voltage** 3000 V
- **Minimum bending radius**
15x cable thickness
- **Radiation resistance**
up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Copper-conductor bare or tinned to DIN VDE 0295 cl.6, extra fine-wire, BS 6360 cl.6, IEC 60228 cl.6
- Core insulation of special rubber
- Core identification to DIN VDE 0293
- up to 5 cores coloured
- from 7 cores, black with continuous white numbering
- GN-YE conductor
- Cores screened individually
- Cores laying parallel
- Copper screened braiding, approx. 85% coverage
- Outer sheath of special Neoprene
- Outer sheath color black (RAL 9005)

Properties

- Outer sheath cold resistant
- Extensively oil resistant
- Extremely small bending radius
- High flexibility
- Minimum waste of space
- Packaging possibility
- The high degree of screening density assures disturbance-free transmission of all signal and impulses
- Outdoor application

Tests

- Behaviour in fire
to DIN VDE 0482-332-1-2
DIN EN 60332-2-1, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- G = with green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Neoprene screened flat cables are used mainly as trailing cable for crane installations, floor conveyer systems and shelf control units. These cables are also available for export with UL-approval on request.

Installation notes

Cables reels with flat cables must be transported in standing position on the flange. A bending flexibility can be achieved on a plane surface. For this purpose, the corresponding fitting instructions should be followed.

- Put the cable trolly on the guiding rail or upon carrier beam and push them together at the starting point. The distance between the bedding surface of two cable trollys must be wider than the double thickness of a cable-packet.
- During the packaging performance, it must be started with the smaller cross-section which lays on the bedding surface and will be build successively so that the biggest cross-section is laying on the top.
- Further, be careful of a symmetrical load distribution.
- In case of multicore flat cables with small cross-section, smaller than 2,5 mm², is very critical due to its low tensile stress. In such case, you should add 10% reserve wire for calculation.

EMC = Electromagnetic compatibility

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

CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. cores x cross-sec. mm ²	Outer dimension app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
28100	8 G 1,5	7,9 x 42,0	231,0	520,0	16
28101	12 G 1,5	7,9 x 61,0	346,0	790,0	16
28102	4 G 2,5	8,5 x 25,5	164,0	420,0	14

Part no.	No. cores x cross-sec. mm ²	Outer dimension app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
28103	6 G 2,5	8,5 x 34,5	247,0	540,0	14
28104	12 G 2,5	8,9 x 68,0	494,0	1000,0	14
28302	4 G 25	16,0 x 51,0	1116,0	1650,0	4

Dimensions and specifications may be changed without prior notice. (RJ01)

MULTIFLEX 512®-C-PUR

for high mechanical stress, EMC-preferred type



HELUKABEL® MULTIFLEX 512®-C-PUR 12G1 QMM / 22598 300/500 V CE

TECHNICAL DATA

PUR drag chain cable in alignment with DIN VDE 0285-525-2-21 / DIN EN 50525-2-21

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	AC U ₀ /U 300/500 V
Test voltage core/core	3000 V
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 7.5x Outer-Ø fixed 4x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 Class 6 / IEC 60228 Class 6
- Core insulation: Special-PP
- Core identification acc. to DIN VDE 0293-334, black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores, G = with protective conductor GN-YE, in the outer layer, x = without protective conductor
- Cores stranded in layers with optimally matched lay lengths
- Fleece wrapping over each stranding layer, from 4 mm² without fleece wrapping
- Inner sheath: TPE
- Fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Fleece wrapping
- Outer sheath: Special grade of full polyurethane acc. to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 (compound type TMPU)
- Sheath colour: grey (RAL 7001)
- Length marking: in metres

PROPERTIES

- resistant to: oil, UV radiation, ozone, oxygen, weathering effects, hydrolysis, microbes, coolants, hydraulic fluids, acids, alkalis, greases, seawater and wastewater
- 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

- oil-resistant acc. to DIN VDE 0473-811-404 / DIN EN 60811-404 / IEC 60811-404
- 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 and approvals: EAC

APPLICATION

These specially screened drag chain cables offer application possibilities in areas where external high-frequency influences disturb pulse transmissions. They are used for permanently flexible applications in machine and tool construction, in robotics and on permanently moving machine parts for continuous use in multi-shift operations. With free movement, without tensile stress and without forced motion control capabilities, these cables have proven their reliable performance in drag chain applications. This highly flexible cable with gliding PP core insulation and cut-resistant low adhesive PUR outer sheath, guarantees an optimum service life and very high economic efficiency. EMC = Electromagnetic Compatibility; in order to optimise 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
- please note "cleanroom qualification" in your order
- for use in energy supply systems:
 - the assembly instructions must be observed
 - for further application parameters, please refer to the selection tables
 - for special applications, we recommend contacting us and using our data entry form for energy supply systems

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
22571	2 x 0.5	20	8.3	30.0	90.0
22572	3 G 0.5	20	8.6	38.0	105.0
22573	4 G 0.5	20	9.1	50.0	124.0
22574	5 G 0.5	20	9.8	65.0	132.0
22575	7 G 0.5	20	11.3	70.0	175.0
22576	12 G 0.5	20	12.9	100.0	250.0
22577	18 G 0.5	20	14.8	157.0	325.0
22578	20 G 0.5	20	15.6	167.0	350.0
22579	25 G 0.5	20	17.6	240.0	450.0
22580	30 G 0.5	20	18.3	273.0	510.0

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
22581	36 G 0.5	20	19.5	306.0	580.0
22582	2 x 0.75	19	9.1	39.0	110.0
22583	3 G 0.75	19	9.7	49.0	120.0
22584	4 G 0.75	19	10.2	60.0	148.0
22585	5 G 0.75	19	11.1	70.0	160.0
22586	7 G 0.75	19	12.6	95.0	205.0
22587	12 G 0.75	19	15.0	140.0	308.0
22588	18 G 0.75	19	17.4	220.0	420.0
22589	20 G 0.75	19	18.1	249.0	450.0
22590	25 G 0.75	19	20.8	313.0	579.0

Continued on next page

SiHF/GL-P

increased temperature resistance, tinned wire, galvanised steel wire braid



TECHNICAL DATA

Silicone control and connection cable in alignment with DIN VDE 0250-1, DIN VDE 0285-525-2-83 / DIN EN 50525-2-83

Temperature range	flexible +5°C to +180°C fixed -60°C to +180°C
Permissible operating temperature of the conductor	+180°C
Nominal voltage	AC U ₀ /U 300/500 V
Test voltage core/core	2000 V
Breakdown voltage	4000 V
Minimum bending radius	flexible 10x Outer-Ø fixed 5x Outer-Ø

CABLE STRUCTURE

- Copper wire tinned, finely stranded acc. to DIN VDE 0295 Class 5 / IEC 60228 Class 5
- Core insulation: silicone
- Core identification acc. to DIN VDE 0293-308,
2 - 5 core(s): colour coded
6 - 24 core(s): black cores with consecutive labeling in white digits
- Protective conductor: starting with 3 cores,
G = with protective conductor GN-YE, in the outer layer,
x = without protective conductor
- Cores stranded in layers with optimal lay lengths
- Outer sheath: silicone
- Sheath colour: redbrown
- Glass silk tape wrapping
- Steel wire braid, galvanised

PROPERTIES

- halogen-free

- high flash point
- leaves an insulating layer of SiO₂ when exposed to flames
- no significant changes in dielectric strength and insulation resistance even at higher temperatures

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 DIN VDE 0482-332-1-2 / DIN EN 60332-1-2 / IEC 60332-1-2

APPLICATION

Silicone cables screened with steel braiding were evolved for use whenever insulation is subjected to extreme temperature changes. The good performance of the environmental resistant properties means that silicone cables can be used at temperatures down to -60°C. Silicone cables are halogen-free cables and are especially suited for installation in power stations. They have also found their uses in the steel producing industries, aviation industry, ship building as well as in ceramic, glass and cement factories. Only suitable for use in dry conditions.

NOTES

- the conductor is metrically (mm²) constructed, AWG numbers are approximated, and are for reference only
- for fixed installation, always install in open, ventilated pipe or duct systems; otherwise, a combination of high temperatures above 90°C and the absence of air would affect the mechanical properties of silicone

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
23062	2 x 0.75	19	7.5	14.4	90.0
23063	3 G 0.75	19	7.9	21.6	101.0
23064	4 G 0.75	19	8.7	29.0	129.0
23065	5 G 0.75	19	9.6	36.0	157.0
23067	7 G 0.75	19	10.3	50.0	177.0
23068	2 x 1	18	7.7	19.0	97.0
23069	3 G 1	18	8.1	29.0	122.0
23070	4 G 1	18	9.0	38.0	141.0
23071	5 G 1	18	9.9	48.0	166.0
23073	7 G 1	18	10.6	67.0	197.0
23074	2 x 1.5	16	8.7	29.0	127.0
23075	3 G 1.5	16	9.1	43.0	145.0
23076	4 G 1.5	16	9.9	58.0	173.0
23077	5 G 1.5	16	10.7	72.0	202.0
23078	6 G 1.5	16	11.5	86.0	240.0
23079	7 G 1.5	16	11.5	101.0	244.0
23080	8 G 1.5	16	12.4	115.0	261.0
23081	12 G 1.5	16	15.3	173.0	327.0
23082	14 G 1.5	16	16.0	202.0	382.0

Part no.	No. cores x cross-sec. mm ²	AWG, approx.	Outer Ø mm, approx.	Cu-weight kg/km	Weight kg/km, approx.
23083	18 G 1.5	16	18.3	259.0	440.0
23084	24 G 1.5	16	21.1	346.0	600.0
23085	2 x 2.5	14	9.9	48.0	187.0
23086	3 G 2.5	14	10.8	72.0	205.0
23087	4 G 2.5	14	11.7	96.0	278.0
23088	5 G 2.5	14	12.7	120.0	322.0
23089	6 G 2.5	14	13.7	144.0	351.0
23090	7 G 2.5	14	13.7	168.0	380.0
23091	2 x 4	12	11.9	77.0	240.0
23092	3 G 4	12	12.6	115.0	311.0
23093	4 G 4	12	13.7	154.0	384.0
23094	5 G 4	12	15.2	192.0	454.0
23095	7 G 4	12	16.9	269.0	633.0
23096	2 x 6	10	13.5	115.0	321.0
23097	3 G 6	10	14.5	173.0	432.0
23098	4 G 6	10	16.0	230.0	544.0
23099	5 G 6	10	17.9	288.0	656.0
23100	7 G 6	10	19.9	403.0	768.0
23101	4 G 10	8	20.7	384.0	925.0

Continued on next page

PAAR-TRONIC-Li-2YCYv

low capacitance, reinforced outer sheath, EMC-preferred type



HELUKABEL® PAAR-TRONIC-Li-2YCYv 4x2x0,34 QMM / 21137 C€

TECHNICAL DATA

PVC data cable

Temperature range	flexible -5°C to +70°C fixed -30°C to +80°C
Peak operating voltage	250 V (not for high power current installation purposes)
Test voltage core/core	2000 V
Test voltage core/screen	1000 V
Conductor resistance at 20°C	0.22 mm²: max. 93.0 Ohm/km 0.34 mm²: max. 57.5 Ohm/km 0.5 mm²: max. 39.3 Ohm/km 1 mm²: max. 19.6 Ohm/km
Mutual capacitance core/core	at 800 Hz 2 - 4 pairs: approx. 72 pF/m 8 - 10 pairs: approx. 60 pF/m
Crosstalk attenuation	at 1 MHz, 50.00 dB at 10 MHz, 40.00 dB (approx. value)
Inductance	approx. 0.66 mH/km
Coupling resistance	at 30 MHz, approx. 250 Ohm/km
Minimum bending radius	flexible 12x Outer-Ø fixed 7.5x Outer-Ø

CABLE STRUCTURE

- Copper wire bare, stranded
- Wire structure:
0.22 mm²: 7 x 0.2 mm
0.34 mm²: 7 x 0.25 mm
0.5 mm²: 7 x 0.3 mm
1 mm²: 7 x 0.42 mm
- Core insulation: PE acc. to DIN VDE 0819-103 / DIN EN 50290-2-23 (compound type LD/MD)
- Core identification acc. to DIN 47100 (paired stranding), colour coded
- x = without protective conductor
- Cores stranded in pairs with optimal lay lengths, Pairs stranded in layers with optimal lay lengths

- Foil wrapping
- Drain wire, tinned copper
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PVC acc. to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 (compound type TM2), reinforced (v)
- Sheath colour: black (RAL 9005)
- Length marking: in metres

PROPERTIES

- resistant to: UV radiation, weathering effects
- for outdoor use
- direct burial
- 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
- UV-resistant acc. to DIN EN ISO 4892-2
- weather-resistant acc. to DIN EN ISO 4892-2
- certifications and approvals:
EAC

APPLICATION

PE-insulated data cable with twisted pairs, for interference-free transmission of data and signals over longer distances. The twisted-pair lay-up prevents electrical unbalances within the cable and this thus effectively suppresses cross-talking effects. The high transmission rates are particularly suitable for RS 422 and RS 485 interfaces; suitable for fixed installations in dry, damp and wet rooms, as well as outdoors and direct burial. EMC= Electromagnetic Compatibility; in order to optimise 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

Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
21129	2 x 2 x 0.22	24	8.3	26.0	60.0
21130	3 x 2 x 0.22	24	8.6	31.0	79.0
21131	4 x 2 x 0.22	24	9.2	38.0	96.0
21132	8 x 2 x 0.22	24	11.6	62.0	140.0
21133	10 x 2 x 0.22	24	12.4	79.0	184.0
21135	2 x 2 x 0.34	22	9.5	35.0	83.0
21136	3 x 2 x 0.34	22	9.9	44.0	92.0
21137	4 x 2 x 0.34	22	10.6	53.0	112.0
21138	8 x 2 x 0.34	22	13.7	86.0	179.0
21139	10 x 2 x 0.34	22	15.0	104.0	219.0

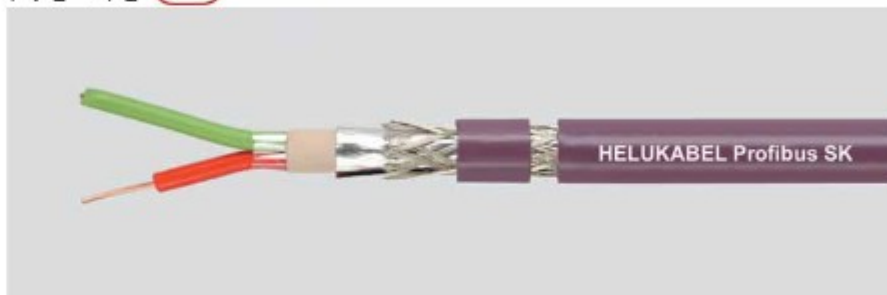
Part no.	No. cores x cross-sec. mm²	AWG, approx.	Outer Ø mm, approx.	Cu factor per km	Weight kg/km, approx.
21141	2 x 2 x 0.5	20	10.0	49.0	90.0
21142	3 x 2 x 0.5	20	10.5	60.0	126.0
21143	4 x 2 x 0.5	20	11.2	73.0	146.0
21144	8 x 2 x 0.5	20	14.9	124.0	246.0
21145	10 x 2 x 0.5	20	16.0	155.0	292.0
21146	2 x 2 x 1	18	11.9	81.0	141.0
21147	3 x 2 x 1	18	12.5	102.0	170.0
21148	4 x 2 x 1	18	13.5	130.0	203.0
21149	8 x 2 x 1	18	18.3	240.0	361.0
21150	10 x 2 x 1	18	20.0	282.0	387.0

BUS Cables

Profibus SK fixed installed Indoor + Outdoor



PVC + PE



Type

Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Separator:
Inner sheath material:
Shielding 1:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Fixed installation, indoor 1x2x0.64 mm

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

Fixed installation, outdoor 1x2x0.64 mm

Copper, bare (AWG 22/1)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PVC
Al-Foil
Cu braid, tinned
PE
app. 8,0 mm $\pm$ 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 $\pm$ 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 $\pm$ 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.

BUS Cables

Profibus SK drag chain



Type Cable structure

Inner conductor diameter:
Core insulation:
Core colours:
Stranding element:
Separator:
Inner sheath material:
Shielding 1:
Total shielding:
Outer sheath material:
Cable external diameter:
Outer sheath colour:

Electrical data

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

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:

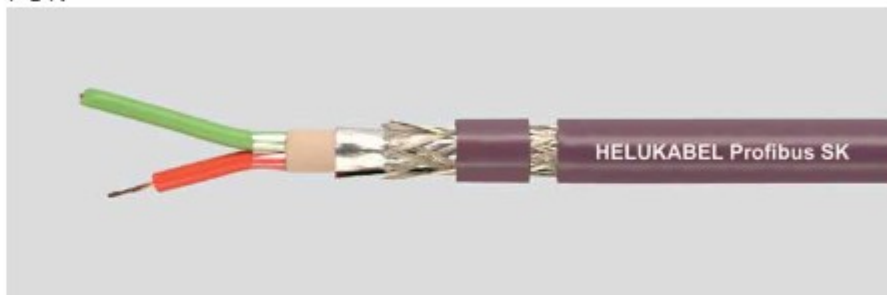
Application

HELUKABEL® Profibus SK drag chain is designed for continuous motion in cable carriers and has a special structure for processing with the Fast Connect Stripping Tool from Siemens. Thanks to the PU sheath, it also offers excellent resistance to common mineral oils, greases and cooling lubricants. Depending on the application, the colour petrol or violet is available.

Part no.

Dimensions and specifications may be changed without prior notice.

PUR



Drag chain applications 1x2x0.65 mm (stranded)

Copper, bare (AWG 24/19)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PVC
Al-Foil
Cu braid, tinned
PUR
app. 8,0 mm ± 0,4 mm
Violet similar to RAL 4001

150 Ohm ± 10 %
67 Ohm/km
1 GOhm x km
134 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 49,0 dB/km

app. 70 kg/km
100 mm
-40°C
+70°C
1,53 MJ/m
25,00 kg/km

Profibus acc. to DIN 19245 T3 and EN50170
Flame-retardant acc. to IEC 60332-1-2
CMX 75°C (shielded)
CSA FT1

Drag chain applications 1x2x0.65 mm (stranded)

Copper, bare (AWG 24/19)
Foam-skin-PE
rd, gn
Double core
Polyester foil over stranded bundle
PVC
Al-Foil
Cu braid, tinned
PUR
app. 8,0 mm ± 0,4 mm
Petrol similar to RAL 5018

150 Ohm ± 10 %
67 Ohm/km
1 GOhm x km
134 Ohm/km max.
35 nF/km nom.
1,5 kV
9,6 kHz < 3,0 dB/km
38,4 kHz < 5,0 dB/km
4 MHz < 25,0 dB/km
16 MHz < 49,0 dB/km

app. 70 kg/km
100 mm
-40°C
+70°C
1,53 MJ/m
25,00 kg/km

Profibus acc. to DIN 19245 T3 and EN50170
Flame-retardant acc. to IEC 60332-1-2
CMX 75°C (shielded)
CSA FT1

81906, Profibus SK