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HELUKABEL®

Cables & Wires

Selection Table for UL/CSA Cables & Wires

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NFPA 79 EDITION 2012

Challenges and solutions

In 1897 the first edition of the National Electrical Code (NEC), also referred to as NFPA 70, was published. The NEC is the only code for electrical installations that is recognized at the national level in the USA. It deals with fire triggered by electricity. It is updated every three years, i.e. the 2012 edition appeared in 2011. In article 670 "Industrial Machinery", the NEC refers to NFPA code no. 79 (Electrical Standard for Industrial Machinery). This standard cites basic requirements imposed on the electrical equipment of machines and devices. Manufacturers and owners of machines and equipment must comply with this standard, for example, to meet product liability and insurance requirements.

Machines placed in service in the USA are always subject to an approval obligation. This can occur either through the individual acceptance of a piece of equipment prior to commissioning (e.g. in Germany) or through a test institute recognized in the USA. The final decision concerning commissioning is made on site through a local inspector, who may not necessarily be a specialist in the area of electronic equipment. The inspector can mandate the provisional stoppage of the machine if there are doubts relative to the machine's conformity with US standards.

NFPA 79: 2007 in chapter 12.2.7.3 "When part of a listed assembly suitable for the intended application, type AWM shall be permissible." Allows AWM cables, if they have been used as part of a listed system, and were suitable for the intended application.

However there are applications for which previously there were no NFPA 79 cables. For example, cables for use in energy drag chains or those with superstructures. There were objections and protests from the industry in this regard. The NFPA reacted accordingly and called in a committee of experts. As a result, in NFPA 79: Edition 2012, use of AWM cables under certain conditions was again approved. As before, unrestricted use is not permitted. Rather the responsibility for the implementation is now placed on the manufacturer or the erector of the equipment. Article 12.2.7. of edition 2007 was completely eliminated. All recommendations have been summarized in the new article 12.9.

SUMMARY

- Machines and equipment that is already certified (e.g. through UL) may continue to be repaired, modified, or extended in accordance with the previous rules.
- New certified machines and equipment may continue to be built in accordance with the previous rules. The certification will be recognized.
- For new machines and equipment without certification, in some areas higher requirements imposed on certain cables (e.g. UL Listing) could apply. In this case the important thing is to consult with the respective certification authority.

In many cases, HELUKABEL recommends the use of UL-listed lines, as before. Our technical dept. would be pleased to provide additional information at tel. +49 7150 92 09 -0.

THE COMPLETE ORIGINAL WORDING

12.9 Special Cables and Conductors

12.9.1 Other listed cables and conductors shall be permitted where identified as suitable for the identified use

12.9.2 Appliance Wiring Material (AWM) shall be permitted under 12.9.2.1 through 12.9.2.3

12.9.2.1 Where part of an assembly that has been identified for intended use

12.9.2.2 Where specified for use with approved equipment and used in accordance with the equipment manufacturers instructions.

12.9.2.3 Where its construction meets all applicable requirements of sections 12.2 – 12.6 with modifications as follows:
(1) Stranded conductors with wire sizes smaller than those listed in 12.2.2 shall have a minimum of 7 strands.
(2) Conductor insulation and cable jacket materials not specified in 12.3.1 have flame resistant properties in compliance with applicable standards for intended use such as FT2 (horizontal wire) flame test or VW-1 (Vertical Wire) flame test in ANSI/UL 1581-2001, Reference Standard for Electrical Wires, Cables and Flexible Cords.
(3) Minimum insulation thickness for single conductor AWM shall be as specified in 12.3.2. Minimum insulation thickness for conductors that are part of a multi conductor jacketed AWM cable shall be as specified by the AWM Style number and by the marked voltage rating of the cable.
(4) AWM shall be marked in accordance with 12.4.1, 12.4.3 and 12.4.4. The legend shall include manufacturer's name or trademark, AWM style number, voltage rating (unless marking is prohibited by 12.4.2), wire gauge(s), temperature rating and flame resistance. Additional markings for properties such as oil, water, UV and chemical resistance identifiers shall be permitted where in compliance with applicable standards for intended use. Where markings alone are insufficient to identify for the intended application, suitable information shall be included with the technical machine documentation.

CABLES ACCORDING TO INTERNATIONAL APPROVALS

	Temperature (°C) - flexing	Temperature (°C) - fixed	Nominal voltage U_o/U / Nominal voltage	Bending radius - flexing x Ø	Bending radius - fixed x Ø	Halogen-free	UV-resistant	Outdoor use	Drag chain	Colored cores/VDE 0293	Screened/shielded	HAR/VDE REG no./VDE	UL/CSA	NFPA 79	Page
PVC control lines UL/CSA															
JZ-602	-5 to +90	-40 to +90	600	7.5x	4x							X			356
JZ-603	-5 to +90	-40 to +90	600	7.5x	4x						X	X			358
TRAYCONTROL® 500	-5 to +90	-40 to +90	600	4x	4x							X	X		359
TRAYCONTROL® 530	-5 to +90	-40 to +90	600	5x	5x							X	X		361
JZ-600 UL/CSA	-5 to +80	-40 to +80	1000	7.5x	4x		X	X				X			362
JZ 604 TC TRAY CABLE	-5 to +75	-25 to +75	600	7.5x	7.5x		X	X				X	X		364
TRAYCONTROL® 600		-40 to +90	600	5x	5x		X	X				X	X		366
H05VV-F/SJT	-5 to +60	-40 to +60	300	7.5x	7.5x					X		X	X		368
H05VV-F/SJT	-5 to +60	-40 to +60	300	7.5x	7.5x					X		X	X		369
H05VV-F/UL	-5 to +75	-40 to +75	300/500	7.5x	7.5x					X		X	X		370
FROR CEI 20-22 II	-5 to +70	-35 to +70	300/500	10x	10x					(X)					371
C.N.O.M.O	-5 to +80	-30 to +80	500	15x	15x										372
JZ-602-CY	-5 to +90	-40 to +90	600	10x	5x						X		X		373
JZ-603-CY	-5 to +90	-40 to +90	600	10x	5x						X	X	X		375
TRAYCONTROL® 500-C	-5 to +90	-40 to +90	600	6x	6x						X		X	X	376
JZ-600-Y-CY UL/CSA	-5 to +80	-40 to +80	1000	10x	5x		X	X			X		X		378
JZ 604-FCY TC TRAY CABLE	-5 to +75	-25 to +75	600	10x	10x		X	X			X		X	X	380
JZ 604-YCY TC TRAY CABLE	-5 to +75	-25 to +75	600	10x	10x		X	X			X		X	X	381
TRAYCONTROL® 600-C		-40 to +90	600	6x	6x		X	X			X		X	X	382
PUR/TPE control lines UL/CSA															
JZ-602-PUR	-5 to +80	-40 to +80	600	7.5x	4x		X	X					X		384
JZ-602-PUR DC/AC	-5 to +80	-40 to +80	600	7.5x	4x		X	X					X		386
JZ-600 PUR	-5 to +80	-40 to +80	1000	7.5x	4x		X	X					X		387
JZ-602-C-PUR	-5 to +80	-40 to +80	600	10x	5x		X	X			X		X		389
JZ-600-YC-PUR	-5 to +80	-40 to +80	1000	10x	5x		X	X			X		X		390
TRAYCONTROL® 670 HDP / 670-C HDP		-40 to +105	600	7.5x	7.5x			X			/ X		X	X	392
Halogen-free control lines UL/CSA															
MEGAFLEX® 500	-30 to +80	-40 to +80	600	10x	4x	X	X	X					X		394
MEGAFLEX® 600	-30 to +80	-40 to +80	600	10x	4x	X	X	X					X		396
MEGAFLEX® 500-C	-30 to +80	-40 to +80	600	10x	4x	X	X	X			X		X		398
MEGAFLEX® 600-C	-30 to +80	-40 to +80	600	10x	4x	X	X	X			X		X		400
Data lines UL/CSA															
Command Cable UL (LiYY)	-10 to +80	-20 to +80	300	15x	7.5x					X			X		403
Command Cable UL (LiYY)	-10 to +105	-20 to +105	600	15x	7.5x					X			X		404
TRAYCONTROL® 300		-25 to +105	300	6x	6x					X			X	X	405
Command Cable UL (LiYY-TP))	-10 to +80	-20 to +80	300	15x	7.5x					X			X		407
TRAYCONTROL® 300 TP		-25 to +105	300	6x	6x					X			X	X	409
VERTEILERFLEX two-approvals	-5 to +80	-30 to + 80	300/500	15x/7.5x	15x/7.5x				(X)	X			X		411
Command Cable UL (LiYCY)	-10 to +80	-20 to +80	300	15x	7.5x					X	X		X		413
Command Cable UL (LiYCY)	-10 to +105	-20 to +105	600	15x	7.5x					X	X		X		415
TRAYCONTROL® 300-C		-25 to +105	300	6x	6x					X	X		X	X	416

The selection table is intended as an initial orientation.
Please see the relevant page of the catalogue for detailed information on the product properties.

CABLES ACCORDING TO INTERNATIONAL APPROVALS

	Temperature (°C) - flexing	Temperature (°C) - fixed	Nominal voltage U_o/U / Nominal voltage	Bending radius - flexing x Ø	Bending radius - fixed x Ø	Halogen-free	UV-resistant	Outdoor use	Drag chain	Colored cores/VDE 0293	Screened/shielded	HAR/VDE REG no./VDE	UL/CSA	NFPA 79	Page
Data lines UL/CSA															
Command Cable UL (LiYCY-TP)	-10 to +80	-20 to +80	300	15x	7.5x					X	X		X		418
TRAYCONTROL® 300-C TP		-25 to +105	300	6x	6x					X	X		X	X	420
Drag chain cables UL/CSA															
JZ-602 RC	-5 to +90	-40 to +90	600	7.5x	4x		X	X	X				X		423
MULTIFLEX 600	-5 to +90	-40 to +90	600	7.5x	7.5x		X	X	X				X	X	424
MULTISPEED® 500-PVC UL/CSA	-5 to +80	-30 to +80	600	7.5x	4x		X	X	X				X		425
JZ-HF-FCY	-5 to +80	-40 to +80	1000	10x	5x				X		X		X		426
JZ-602 RC -CY	-5 to +90	-40 to +90	600	10x	5x		X	X	X		X		X		427
MULTIFLEX 600-C	-5 to +90	-40 to +90	600	10x	10x		X	X	X		X		X	X	428
MULTISPEED® 500-C-PVC UL/CSA	-5 to +80	-30 to +80	600	7.5x	4x		X	X	X		X		X		429
JZ-602 RC -PUR	-5 to +80	-40 to +80	600	7.5x	4x		X	X	X				X		430
MULTIFLEX 512® PUR UL/CSA	-30 to +80	-40 to +80	600	5x	3x	X	X	X	X				X		431
MULTISPEED® 500-PUR UL/CSA	-30 to +80	-40 to +80	600	7.5x	4x	X	X	X	X				X		433
PURö-JZ-HF-FCP	-5 to +80	-40 to +80	1000	10x	5x		X	X	X		X		X		435
JZ-602 RC -C-PUR	-5 to +80	-40 to +80	600	10x	5x		X	X	X		X		X		436
MULTIFLEX 512® C-PUR UL/CSA	-30 to +80	-40 to +80	600	7.5x	4x	X	X	X	X		X		X		437
MULTISPEED® 500-C-PUR UL/CSA	-30 to +80	-40 to +80	600	7.5x	4x	X	X	X	X		X		X		439
MULTISPEED® 500-TPE UL/CSA	-30 to +80	-40 to +80	600	5x	3x	X	X	X	X				X		441
MULTISPEED® 500-C-TPE UL/CSA	-30 to +80	-40 to +80	600	5x	3x	X	X	X	X		X		X		443
SUPERTRONIC®-310-PVC	-5 to +80	-40 to +80	300	5x	3x					X			X		445
SUPERTRONIC®-310-C-PVC	-5 to +80	-40 to +80	300	7.5x	4x					X	X		X		446
SUPERTRONIC®-330 PURö	-30 to +80	-40 to +80	300	5x	3x	X	X	X	X	X			X		447
MULTISPEED® TRONIC-PUR	-30 to +80	-40 to +80	300	7.5x	4x	X	X	X	X	X			X		448
SUPERTRONIC® 330 C-PURö	-30 to +80	-40 to +80	300	7.5x	4x	X	X	X	X	X	X		X		449
MULTISPEED® TRONIC-C-PUR	-30 to +80	-40 to +80	300	7.5x	4x	X	X	X	X	X	X		X		450
SUPER-PAAR-TRONIC 340-C-PUR	-30 to +80	-40 to +80	300	10x	5x	X	X	X	X	X	X		X		451
Motor, servo, feedback cables UL/CSA															
TOPFLEX® - EMV-UV-2YSLCYK-J	-5 to +80	-40 to +80	1000	20x	10x		X	X		X	X		X		453
TOPFLEX® - EMV-UV-3 PLUS 2YSLCYK-J	-5 to +80	-40 to +80	1000	20x	10x		X	X		X	X		X		455
TOPFLEX® MOTOR-EMV 103	-5 to +70	-40 to +80	1000	20x	10x					X	X		X		457
TOPFLEX® 600 VFD		-25 to +90	600	6x	6x		X	X			X		X	X	458
TOPFLEX® 650 VFD	-25 to +105	-25 to +105	600	6x	6x		X	X			X		X	X	459
TOPFLEX® 1000 VFD	-25 to +90	-25 to +90	600	15x	7.5x		X	X			X		X	X	460
TOPFLEX® EMV UV 2YSLC11Y-J	-5 to +80	-40 to +80	1000	20x	10x		X	X		X	X		X		461
TOPFLEX® MOTOR EMV 1/1	-30 to +80	-40 to +80	1000	20x	10x		X	X		X	X		X		462
TOPFLEX® MOTOR EMV 3/3	-30 to +80	-40 to +80	1000	20x	10x		X	X		X	X		X		463
TOPSERV® PVC 108, 112, 119	-0 to +60	-20 to +80	1000	15x	5x						X		X		465
TOPGEBER 511 PVC	-0 to +60	-20 to +80	30	15x	6x					X	X		X		467
TOPSERV® PUR 109, 113, 121	-30 to +80	-40 to +80	1000	7.5x	4x		X	X	X		X		X		468
TOPGEBER 512 PUR	-30 to +80	-40 to +80	30	10x	6x		X	X	X	X	X		X		470
TOPSERV® 600 VFD	-25 to +90	-25 to +90	600	7.5x	5x		X	X	X		X		X	X	472

The selection table is intended as an initial orientation.
Please see the relevant page of the catalogue for detailed information on the product properties.

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CABLES ACCORDING TO INTERNATIONAL APPROVALS

	Temperature (°C) - flexing	Temperature (°C) - fixed	Nominal voltage U_o/U / Nominal voltage	Bending radius - flexing x Ø	Bending radius - fixed x Ø	Halogen-free	UV-resistant	Outdoor use	Drag chain	Colored cores/VDE 0293	Screened/shielded	HAR/VDE REG no./VDE	UL/CSA	NFPA 79	Page
Motor, servo, feedback cables UL/CSA															
TOPSERV® 650 VFD	-25 to +105	-25 to +105	600	7.5x	5x		X	X	X		X		X	X	473
TOPSERV® Hybrid	-30 to +80	-40 to +80	1000	7.5x	4x		X	X	/X		X		X		474
Heat-resistant cables UL/CSA															
SiHF UL/CSA		-50 to +150	600	7.5x	4x	X		X		X			X		476
SiHF-C-Si UL/CSA		-50 to +150	600	10x	5x	X		X		X	X		X		478
All-weather cables & rubber cables UL/CSA															
Rubber cable/neoprene hose cable		-40 to +90	300				X	X		X			X		480
H07RN-F/SOOW		-40 to +90	600	10x	7.5x		X	X		X		X	X		481
Easy-to-wind cables UL/CSA															
TROMM-PUR®-H	-40 to +80	-50 to +80	1000	6x	6x	X	X	X					X		483
Single-core UL/CSA															
UL-Style 1007, CSA TR 64	-5 to +80	-30 to +80	300	10x	5x					X			X		485
UL-Style 1569, CSA TR 64	-5 to +105	-30 to +105	300	10x	5x					X			X		486
UL-Style 1015	-5 to +105	-30 to +105	600	10x	5x					X			X		487
THREENORM	+5 to +70	-10 to +70	600		6x					X		X	X		488
FIVENORM	+5 to +90	-40 to +90	600		6x					X		X	X	X	490
THHN/THWN		/ +90	600	8x	8x								X	X	493
PVC single-cores	-5 to +80	-30 to +80	300/300		6x					X					494
HELUTHERM® 145	-35 to +105	-55 to +105	300	12.5x	4x	X	X	X		X			X		495
HELUTHERM® 145	-35 to +105	-55 to +105	600	12.5x	4x	X	X	X		X			X		496
UL-Style 3135		-60 to +200	600	15x	15x	X				X			X		497
Single 600-J/-O	-5 to +90	-40 to +90	600	7.5x	4x		X	X					X		498
Single 600-CY -J/-O	-5 to +90	-40 to +90	600	7.5x	4x		X	X			X		X		499
TOPFLEX® 302 / 302-UL	-15 to +80	-40 to +80	0.6/1 kV	5x	5x		X	X					/X		500
Single 602-RC -J/O	-5 to +90	-40 to +90	600	7.5x	3x				X				X		501
Single 602-RC-CY -J/O	-5 to +90	-40 to +90	600	7.5x	3x				X		X		X		502
TOPFLEX® 304 / 304-C	-5 to +80	-40 to +80	1000	5x	5x				X		/X		X		503
MULTISPEED® 600-PUR -J/-O	-30 to +80	-40 to +80	1000	5x	3x	X	X	X	X				X		504
MULTISPEED® 600-C-PUR -J/-O	-30 to +80	-40 to +80	1000	5x	3x	X	X	X	X		X		X		505
TOPFLEX® 301 / 301-C	-15 to +80		1000	7.5x	7.5x		X	X	X		/X		X		506
British standard cables															
HELUKABEL BS 5308-1		-20 to +65	300/500		6x					X	X				508
HELUKABEL BS 5308-2		-20 to +65	300/500		6x					X	X				509
HELUKABEL BS 5467	0 to +90	-15 to +90	0.6/1 kV		8x			X		X	X				510
HELUKABEL BS 6724	0 to +90	-20 to +90	0.6/1 kV		8x	X				X	X				511

The selection table is intended as an initial orientation.
Please see the relevant page of the catalogue for detailed information on the product properties.

SELECTION TABLE - DRAG CHAIN CABLES

	Max. movement distance in m (10 m up to 25-cores)	Min. bending radius - flexing (D=outerØ)	Max. speed (m/s)	Max. acceleration (m/s²)	Max. cycles	Material	Nominal voltage U_0/U / Operating voltage	Temperature (°C) - flexing	Approvals	Page
PVC drag chain cables UL/CSA										
SUPERTRONIC®-310-PVC	5	5 x D	2	10	9 Mio	PVC/PVC	300V	-5° to +80°	UL/CSA	445
SUPERTRONIC®-310-C-PVC	5	7.5 x D	2	10	9 Mio	PVC/CU/PVC	300V	-5° to +80°	UL/CSA	446
MULTISPEED® 500-PVC UL/CSA	100	7.5 x D	5	50	9 Mio	PP/PVC	600V	-5° to +80°	UL/CSA	425
MULTISPEED® 500-C-PVC UL/CSA	100	7.5 x D	5	50	9 Mio	PP/CU/PVC	600V	-5° to +80°	UL/CSA	429
JZ-HF-FCY	10	10 x D	2	10	9 Mio	PVC/CU/PVC	1000V	-5° to +80°	UL/CSA	426
JZ-602 RC	10	7.5 x D	2	10	9 Mio	PVC/PVC	600V	-5° to +90°	UL/CSA	423
JZ-602 RC-CY	10	10 x D	2	10	9 Mio	PVC/CU/PVC	600V	-5° to +90°	UL/CSA	427
MULTIFLEX 600	10	7.5 x D	2	10	9 Mio	PVC/PVC	600V	-5° to +90°	UL/CSA	424
MULTIFLEX 600-C	10	10 x D	2	10	9 Mio	PVC/CU/PVC	600V	-5° to +90°	UL/CSA	428
PUR & TPE drag chain cables UL/CSA										
SUPERTRONIC®-330 PURö	15	5 x D	4	10	11 Mio	PP/PUR	300V	-30° to +80°	UL/CSA	447
SUPERTRONIC®-330 C-PURö	15	7.5 x D	4	10	11 Mio	PP/CU/PUR	300V	-30° to +80°	UL/CSA	449
SUPER-PAAR-TRONIC 340-C-PUR	30	10 x D	4	50	11 Mio	PP/CU/PUR	300V	-30° to +80°	UL/CSA	451
JZ-602 RC-PUR	15	7.5 x D	3	10	9 Mio	PVC/PUR	600V	-5° to +80°	UL/CSA	430
JZ 602 RC-C-PUR	15	10 x D	3	10	9 Mio	PVC/CU/PUR	600V	-5° to +80°	UL/CSA	436
PURö-JZ-HF-FCP	15	10 x D	3	10	9 Mio	PVC/CU/PUR	1000V	-5° to +80°	UL/CSA	435
MULTIFLEX 512®-PUR UL/CSA	100	5 x D	4	10	11 Mio	PP/PUR	600V	-30° to +80°	UL/CSA	431
MULTIFLEX 512®-C-PUR UL/CSA	100	7.5 x D	4	10	11 Mio	PP/CU/PUR	600V	-30° to +80°	UL/CSA	437
MULTISPEED®-TRONIC-PUR	450	7.5 x D	5	50	11 Mio	PP/PUR	300V	-30° to +80°	UL/CSA	448
MULTISPEED®-TRONIC-C-PUR	450	7.5 x D	5	50	11 Mio	PP/CU/PUR	300V	-30° to +80°	UL/CSA	450
MULTISPEED® 500-PUR UL/CSA	450	7.5 x D	5	50	11 Mio	PP/PUR	600V	-30° to +80°	UL/CSA	433
MULTISPEED® 500-C-PUR UL/CSA	450	7.5 x D	5	50	11 Mio	PP/CU/PUR	600V	-30° to +80°	UL/CSA	439
MULTISPEED® 500-TPE UL/CSA	450	5 x D	5	50	11 Mio	PP/TPE	600V	-30° to +80°	UL/CSA	441
MULTISPEED® 500-C-TPE UL/CSA	450	5 x D	5	50	11 Mio	PP/CU/TPE	600V	-30° to +80°	UL/CSA	443
Single-cores for drag chain cables UL/CSA										
SINGLE 602-RC-J/-O	5	7.5 x D	2	10	9 Mio	PVC/PVC	600V	-5° to +90°	UL/CSA	501
SINGLE 602-RC-CY-J/-O	5	7.5 x D	2	10	9 Mio	PVC/CU/PVC	600V	-5° to +90°	UL/CSA	502
MULTISPEED® 600-PUR-J/-O	450	5 x D	5	50	11 Mio	Poly/PUR	1000V	-30° to +80°	UL/CSA	504
MULTISPEED® 600-C-PUR-J/-O	450	5 x D	5	50	11 Mio	Poly/CU/TPE	1000V	-30° to +80°	UL/CSA	505
TOPFLEX® 301	5	7.5 x D	2	10	10 Mio	PVC/PUR	1000V	-15° to +80°	UL/CSA	506
TOPFLEX® 301 C	5	7.5 x D	2	10	10 Mio	PVC/CU/PUR	1000V	-15° to +80°	UL/CSA	506
TOPFLEX® 304	5	5 x D	2	10	9 Mio	PVC/PVC	1000V	-5° to +80°	UL/CSA	503
TOPFLEX® 304 C	5	5 x D	2	10	9 Mio	PVC/CU/PVC	1000V	-5° to +80°	UL/CSA	503

A cycle is a double lift: a representative sample has been tested and measurot in our Test Workshop. The cycle count is only valid when appropriatel and professionally installed (see the installation manual: cable installation in drag chains, see pages 1036 and 1037).

The selection table is intended as an initial orientation.
Please see the relevant page of the catalogue for detailed information on the product properties and the selection tables cables in drag chains, see pages 1030 and 1031.

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SELECTION TABLE - DRAG CHAIN CABLES

	Max. movement distance in m (10 m up to 25-cores)	Min. bending radius - flexing (D=outerØ)	Max. speed (m/s)	Max. acceleration (m/s²)	Max. cycles	Material	Nominal voltage U_0/U / Operating voltage	Temperature (°C) - flexing	Approvals	Page
Motor cables & servo cables for drag chain cables UL/CSA										
TOPSERV® 109 PUR	30	7.5 x D	4	10	11 Mio	PP/CU/PUR	1000V	-30° to +80°	UL/CSA	**468**
TOPSERV® 113 PUR	30	7.5 x D	4	10	11 Mio	PP/CU/PUR	1000V	-30° to +80°	UL/CSA	**468**
TOPSERV® 121 PUR	30	7.5 x D	4	10	11 Mio	PP/CU/PUR	1000V	-30° to +80°	UL/CSA	**468**
TOPSERV® 600 VFD	10	7.5 x D	2	10	9 Mio	PVC/CU/TPE	600V	-25° to +90°	UL/CSA	**472**
TOPSERV® 650 VFD	10	7.5 x D	2	10	9 Mio	PVC/CU/TPE	600V	-25° to +90°	UL/CSA	**473**
Feedback cables for drag chain cables UL/CSA										
TOPGEBER 512 PUR	30	10 x D	4	50	11 Mio	PP/CU/PUR	30V	-30° to +80°	UL/CSA	**470**
TOPSERV® HYBRID PVC	5	7.5 x D	0,5	2	5 Mio	PP/PVC	1000V	-30° to +80°	UL/CSA	**474**
TOPSERV® HYBRID PUR	50	7.5 x D	5	30	5 Mio	PP/PUR	1000V	-30° to +80°	UL/CSA	**474**

A cycle is a double lift: a representative sample has been tested and measurot in our Test Workshop. The cycle count is only valid when appropriatel and professionally installed (see the installation manual: cable installation in drag chains, see pages 1036 and 1037).

The selection table is intended as an initial orientation.
Please see the relevant page of the catalogue for detailed information on the product properties and the selection tables cables in drag chains, see pages 1030 and 1031.

UL/CSA CONTROL CABLES

JZ-602 two approval control cable, 90°C, 600 V, oil resistant, meter marking

Technical data

- Control cable of special-PVC acc. to UL CSA AWM I/II A/B Style 2587(sheath insulation) 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
- **Insulation resistance**
  min 20 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of PVC compound type TI3 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- Core identification 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
- Outer sheath of special PVC compound type YM5 to DIN VDE 0207 part 5 and class 43 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils and coolant
- The outer sheath is approved with an improved oil-resistance-test
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- Please note the cleanroom qualification when ordering.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type:
  JZ-602-CY, confer page 373

Application

UL-approved and CSA certified flexible control cable rated at 600 V. Used in machine tools, control systems, connection between control panels and machines, assembly lines and other industrial equipment. Suitable for installation in dry, moist or wet environment and moderate flexing applications.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83090	2 x 0,5	20	5,6	9,6	49,0
83091	3 G 0,5	20	5,9	14,0	58,0
83092	4 G 0,5	20	6,4	19,0	69,0
83093	5 G 0,5	20	6,9	24,0	84,0
83094	7 G 0,5	20	7,5	34,0	123,0
83100	8 G 0,5	20	8,3	38,4	140,0
83101	9 G 0,5	20	8,9	43,2	177,0
83095	12 G 0,5	20	9,8	58,0	192,0
83096	18 G 0,5	20	12,0	86,0	256,0
83097	25 G 0,5	20	14,3	120,0	358,0
83098	34 G 0,5	20	16,5	163,0	487,0
83099	41 G 0,5	20	17,9	197,0	580,0
83080	2 x 1	18	6,3	19,2	53,0
83081	3 G 1	18	6,6	27,0	61,0
83082	4 G 1	18	7,2	38,4	74,0
83565	3 x 1	18	6,6	27,0	61,0
83083	5 G 1	18	7,9	48,0	90,0
83084	7 G 1	18	8,7	67,0	130,0
83102	8 G 1	18	9,5	76,8	144,0
83103	9 G 1	18	10,4	86,4	180,0
83085	12 G 1	18	11,2	115,2	198,0
83086	18 G 1	18	14,1	173,0	274,0
83087	25 G 1	18	16,8	240,0	384,0
83088	34 G 1	18	19,5	326,0	494,0
83089	41 G 1	18	21,2	394,0	508,0
83070	2 x 1,5	16	6,8	28,8	73,0
83071	3 G 1,5	16	7,2	44,0	94,0
83072	4 G 1,5	16	7,9	58,0	117,0
83073	5 G 1,5	16	8,7	72,0	140,0
83074	7 G 1,5	16	9,7	101,0	186,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83104	9 G 1,5	16	11,5	129,7	244,0
83075	12 G 1,5	16	12,6	173,0	319,0
83076	18 G 1,5	16	15,8	260,0	451,0
83077	25 G 1,5	16	18,3	360,0	625,0
83078	34 G 1,5	16	21,4	490,0	840,0
83079	41 G 1,5	16	23,3	590,0	1032,0
83060	2 x 2,5	14	7,8	48,0	115,0
83061	3 G 2,5	14	8,5	72,0	143,0
83062	4 G 2,5	14	9,3	96,0	185,0
83063	5 G 2,5	14	10,4	120,0	221,0
83064	7 G 2,5	14	11,5	168,0	293,0
83065	9 G 2,5	14	13,9	216,0	429,0
83066	12 G 2,5	14	15,2	288,0	563,0
83067	18 G 2,5	14	18,7	432,0	854,0
83068	19 G 2,5	14	18,7	456,0	914,0
83069	25 G 2,5	14	22,2	600,0	1188,0
83051	3 G 4	12	9,7	115,0	232,0
83052	4 G 4	12	10,6	154,0	298,0
83053	5 G 4	12	11,8	192,0	358,0
83054	7 G 4	12	13,1	269,0	460,0
83041	3 G 6	10	11,3	173,0	360,0
83042	4 G 6	10	12,5	231,0	402,0
83043	5 G 6	10	13,9	288,0	484,0
83044	7 G 6	10	15,4	403,0	630,0
83031	3 G 10	8	14,7	288,0	535,0
83032	4 G 10	8	16,3	384,0	653,0
83033	5 G 10	8	18,3	480,0	786,0
83034	7 G 10	8	20,2	672,0	1100,0

Continuation ▸

JZ-602 two approval control cable, 90°C, 600 V, oil resistant, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83020	2 x 16	6	18,8	307,0	640,0
83021	3 G 16	6	20,2	461,0	810,0
83022	4 G 16	6	22,3	615,0	1045,0
83023	5 G 16	6	24,9	768,0	1260,0
83024	7 G 16	6	27,5	1075,0	1760,0
83011	3 G 25	4	24,0	720,0	1180,0
83012	4 G 25	4	26,9	960,0	1507,0
83013	5 G 25	4	31,9	1200,0	1858,0
83014	7 G 25	4	33,0	1680,0	2830,0
83001	3 G 35	2	26,2	1008,0	1590,0
83002	4 G 35	2	29,7	1344,0	2123,0
83003	5 G 35	2	33,0	1680,0	2612,0
83004	3 G 50	1	31,9	1440,0	2652,0
83005	4 G 50	1	35,6	1920,0	3058,0
83006	5 G 50	1	39,7	2400,0	4093,0
83007	3 G 70	2/0	36,8	2016,0	3307,0
83008	4 G 70	2/0	40,9	2688,0	4254,0
83009	5 G 70	2/0	45,6	3360,0	5661,0
83010	3 G 95	3/0	40,9	2736,0	4867,0
83015	4 G 95	3/0	45,6	3648,0	5762,0
83016	5 G 95	3/0	50,7	4560,0	7208,0
83017	3 G 120	4/0	48,1	3456,0	5580,0
83018	4 G 120	4/0	53,3	4608,0	7280,0
83019	5 G 120	4/0	58,9	5760,0	8692,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS

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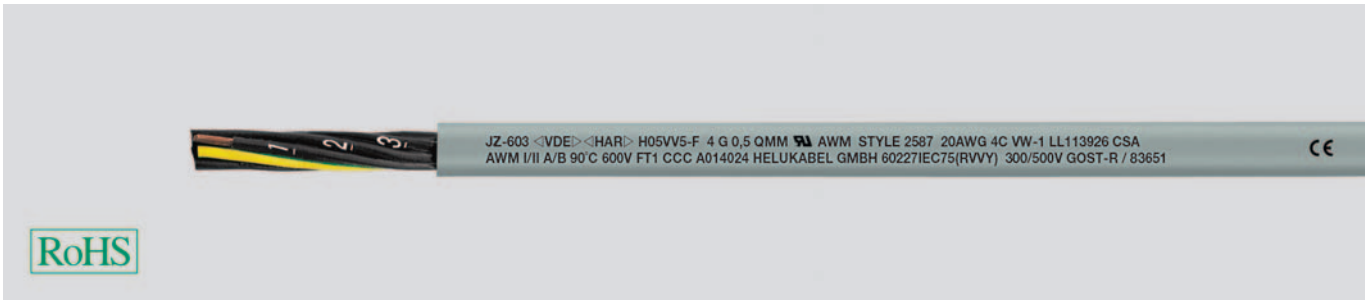
JZ-603 Multi approval control cable, oil resistant, meter marking



Technical data

- Special PVC control cable with oil resistant outer sheath to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51 and UL-Style 2587
- **Temperature range**
  HAR
  flexing -5°C to +70°C
  fixed installation -40°C to +70°C
  UL/CSA
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  HAR U_0/U 300/500 V
  UL/CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- 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
- Outer sheath of oil resistant special PVC compound type TM5 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- Oil resistant to DIN VDE 0473-811-404/ DIN EN 60811-404, UL-Std.1581 part 50.182

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type:
  JZ-603-CY, confer page 375

Application

UL-CSA-HAR approved cables offer any company exporting anywhere in the world, primarily designed for exporters, used in machine tools, control systems, assembly lines and other industrial equipment. These cables are suitable for flexible use for mechanical stresses with free movements in dry, moist and wet rooms but not for open air.

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

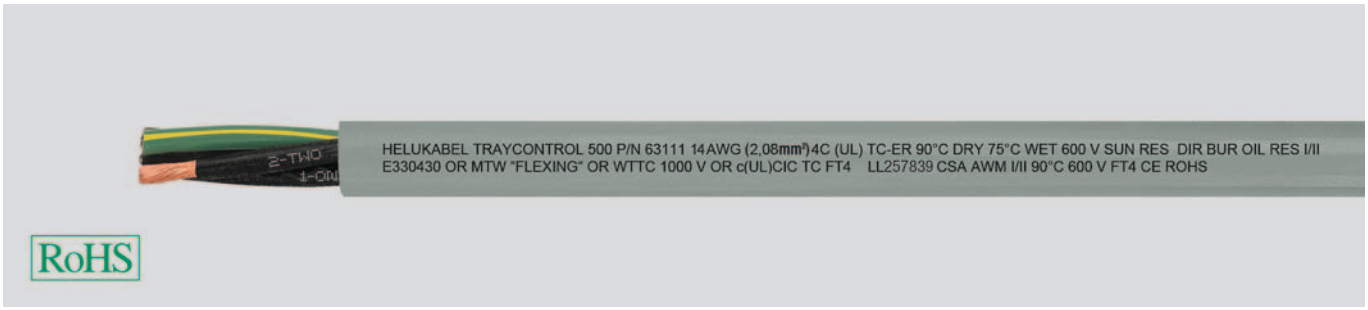
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83704	2 x 0,5	20	5,8	9,6	52,0
83650	3 G 0,5	20	6,1	14,0	63,0
83651	4 G 0,5	20	6,7	19,0	69,0
83652	5 G 0,5	20	7,3	24,0	87,0
83653	7 G 0,5	20	8,8	34,0	119,0
83654	12 G 0,5	20	11,1	58,0	198,0
83655	18 G 0,5	20	12,9	86,0	266,0
83656	25 G 0,5	20	16,0	120,0	380,0
83657	34 G 0,5	20	17,7	163,0	508,0
83658	41 G 0,5	20	19,5	197,0	594,0
83659	50 G 0,5	20	21,3	240,0	715,0
83660	61 G 0,5	20	23,8	293,0	840,0
83705	2 x 0,75	19	6,1	14,4	66,0
83661	3 G 0,75	19	6,5	22,0	76,0
83662	4 G 0,75	19	7,1	29,0	85,0
83663	5 G 0,75	19	7,9	36,0	113,0
83664	7 G 0,75	19	9,5	50,0	144,0
83665	12 G 0,75	19	11,6	86,0	245,0
83666	18 G 0,75	19	13,9	130,0	327,0
83667	25 G 0,75	19	17,1	180,0	466,0
83668	34 G 0,75	19	19,1	245,0	626,0
83669	41 G 0,75	19	20,9	296,0	747,0
83670	50 G 0,75	19	23,0	360,0	896,0
83671	61 G 0,75	19	25,3	439,0	1070,0
83706	2 x 1	18	6,4	19,2	70,0
83672	3 G 1	18	6,8	29,0	88,0
83673	4 G 1	18	7,5	39,0	99,0
83674	5 G 1	18	8,4	48,0	132,0
83675	7 G 1	18	10,0	67,0	170,0
83676	12 G 1	18	12,5	115,0	285,0
83677	18 G 1	18	14,7	173,0	405,0
83678	25 G 1	18	18,0	240,0	570,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83679	34 G 1	18	20,3	326,0	742,0
83680	41 G 1	18	22,4	394,0	885,0
83681	50 G 1	18	24,3	480,0	1071,0
83682	61 G 1	18	26,8	586,0	1265,0
83707	2 x 1,5	16	7,4	28,8	91,0
83683	3 G 1,5	16	8,0	43,0	110,0
83684	4 G 1,5	16	8,7	58,0	141,0
83685	5 G 1,5	16	9,8	72,0	167,0
83686	7 G 1,5	16	11,9	101,0	225,0
83687	12 G 1,5	16	14,5	173,0	361,0
83688	18 G 1,5	16	17,4	259,0	518,0
83689	25 G 1,5	16	21,3	360,0	730,0
83690	34 G 1,5	16	24,1	490,0	945,0
83691	41 G 1,5	16	26,2	591,0	1135,0
83692	50 G 1,5	16	28,8	720,0	1381,0
83693	61 G 1,5	16	31,5	878,0	1640,0
83708	2 x 2,5	14	9,1	48,0	125,0
83694	3 G 2,5	14	9,9	72,0	169,0
83695	4 G 2,5	14	11,0	96,0	209,0
83696	5 G 2,5	14	12,0	120,0	256,0
83697	7 G 2,5	14	14,6	168,0	340,0
83698	12 G 2,5	14	18,1	288,0	579,0
83699	18 G 2,5	14	22,1	432,0	851,0
83700	25 G 2,5	14	26,5	600,0	1175,0
83701	34 G 2,5	14	29,9	816,0	1529,0
83702	50 G 2,5	14	35,2	1200,0	2290,0
83703	61 G 2,5	14	38,4	1464,0	2724,0

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

TRAYCONTROL® 500 flexible, oil-resistant, open installation

TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2012



Technical data

- PVC control cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range**
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  AWM 1000 V
  TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**
  flexing 4x cable Ø
- **Insulation resistance**
  min. 20 MOhm x km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire with AWG dimensions
- Core insulation of special PVC with transparent nylon skin
- 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
- Separator
- Outer sheath of special PVC
- Sheath colour grey (RAL 7001)
- With lenght marking in feet

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- **UL:**TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2012, WTTC 1000V, DP-1, OIL RES I & II, 90°C dry / 75°C wet, Class 1 Div. 2 per NEC Art. 336, 392, 501, crush impact test acc. to UL 1277
  CSA:
  c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install

Available on request

- with blue cores (DC)
- with red cores (AC)
- Black or TPE outer sheath

Application

HELUKABEL® TRAYCONTROL® 500 is a flexible, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 edition 2012. 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: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry.

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

N

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63079	0,507	2 x 20	6,6	9,8	58,0
63080	0,507	3 x 20	7,0	14,6	61,0
63081	0,507	4 x 20	7,5	19,5	76,0
63082	0,507	5 x 20	8,1	24,4	89,0
63083	0,507	7 x 20	8,7	34,1	120,0
63084	0,507	9 x 20	9,8	43,8	201,0
63085	0,507	12 x 20	10,1	58,4	250,0
63086	0,507	18 x 20	12,9	87,6	295,0
63087	0,507	25 x 20	15,7	121,7	362,0
63088	0,963	2 x 18	7,3	18,5	68,0
63089	0,963	3 x 18	7,6	27,8	88,0
63090	0,963	4 x 18	8,2	37,0	98,0
63091	0,963	5 x 18	8,9	46,3	116,0
63092	0,963	7 x 18	9,6	64,8	149,0
63093	0,963	9 x 18	11,0	83,2	186,0
63094	0,963	10 x 18	11,6	92,5	199,0
63095	0,963	12 x 18	12,2	111,0	245,0
63096	0,963	15 x 18	13,5	138,7	292,0
63097	0,963	16 x 18	13,6	147,9	306,0
63098	0,963	18 x 18	15,0	166,4	366,0
63099	0,963	19 x 18	15,1	175,7	384,0
63100	0,963	25 x 18	17,4	231,2	451,0
63101	0,963	27 x 18	17,7	249,6	521,0
63102	0,963	34 x 18	19,7	314,4	625,0
63103	0,963	37 x 18	20,1	342,0	684,0
63104	0,963	41 x 18	21,0	379,0	744,0
63105	0,963	50 x 18	24,0	462,3	933,0
63106	0,963	61 x 18	25,2	564,0	1095,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63107	1,31	2 x 16	7,8	25,2	80,0
63108	1,31	3 x 16	8,2	37,8	86,0
63109	1,31	4 x 16	8,8	50,3	115,0
63110	1,31	5 x 16	9,6	62,9	126,0
63112	1,31	6 x 16	10,2	75,5	164,0
63113	1,31	7 x 16	10,5	88,0	171,0
63114	1,31	8 x 16	11,1	100,7	201,0
63115	1,31	9 x 16	12,0	113,2	237,0
63116	1,31	10 x 16	12,4	125,8	259,0
63117	1,31	12 x 16	13,6	151,0	301,0
63118	1,31	14 x 16	14,5	176,1	365,0
63119	1,31	15 x 16	15,2	188,7	379,0
63120	1,31	16 x 16	16,0	201,3	405,0
63121	1,31	18 x 16	16,4	226,4	443,0
63122	1,31	19 x 16	16,6	239,0	458,0
63123	1,31	20 x 16	17,2	251,6	491,0
63124	1,31	25 x 16	18,9	314,5	564,0
63125	1,31	27 x 16	19,3	339,6	629,0
63126	1,31	30 x 16	20,0	377,3	701,0
63127	1,31	34 x 16	22,5	427,6	775,0
63128	1,31	40 x 16	23,5	503,1	946,0
63129	1,31	41 x 16	24,0	515,7	967,0
63130	1,31	50 x 16	26,1	628,8	1137,0
63131	1,31	61 x 16	27,5	767,2	1345,0
63132	2,08	2 x 14	8,9	40,0	100,0
63133	2,08	3 x 14	9,2	60,0	112,0
63111	2,08	4 x 14	10,1	80,0	141,0
63164	2,08	5 x 14	10,9	100,0	152,0

Continuation ▸

TRAYCONTROL® 500 flexible, oil-resistant, open installation

TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2012

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63165	2,08	6 x 14	11,5	120,0	205,0
63166	2,08	7 x 14	12,0	140,0	216,0
63167	2,08	9 x 14	14,7	180,0	312,0
63168	2,08	10 x 14	15,8	200,0	378,0
63169	2,08	12 x 14	16,4	240,0	434,0
63170	2,08	16 x 14	18,0	320,0	550,0
63171	2,08	18 x 14	18,9	359,0	616,0
63172	2,08	19 x 14	19,0	380,0	634,0
63173	2,08	25 x 14	23,0	500,0	817,0
63174	3,31	2 x 12	9,7	63,0	132,0
63175	3,31	3 x 12	10,2	95,0	177,0
63176	3,31	4 x 12	11,2	127,0	201,0
63177	3,31	5 x 12	12,3	159,0	274,0
63178	3,31	6 x 12	13,6	191,0	315,0
63179	3,31	7 x 12	13,9	222,0	353,0
63180	3,31	9 x 12	16,4	286,0	476,0
63181	3,31	12 x 12	18,3	381,0	613,0
63182	3,31	16 x 12	19,8	508,0	783,0
63183	3,31	19 x 12	22,3	604,0	918,0
63184	3,31	20 x 12	23,1	636,0	961,0
63185	3,31	25 x 12	25,8	794,0	1236,0
63186	5,26	2 x 10	12,2	101,0	213,0
63187	5,26	3 x 10	12,9	151,5	283,0
63188	5,26	4 x 10	15,0	202,0	387,0
63189	5,26	5 x 10	16,3	252,5	473,0
63190	5,26	7 x 10	17,7	353,5	607,0
63191	5,26	9 x 10	20,6	454,5	771,0
63192	5,26	12 x 10	24,1	606,0	1061,0
63193	5,26	19 x 10	27,2	959,5	1528,0
63194	8,37	3 x 8	17,0	241,1	420,0
63195	8,37	4 x 8	19,2	321,4	662,0
63196	8,37	5 x 8	21,0	401,8	784,0
63197	13,3	3 x 6	19,5	383,1	701,0
63198	13,3	4 x 6	22,4	510,7	908,0
63199	13,3	5 x 6	24,5	638,4	1149,0
62802	21,2	3 x 4	24,4	610,6	1061,0
62803	21,2	4 x 4	27,0	814,1	1366,0
62804	21,2	5 x 4	29,9	1017,6	1631,0
62805	33,6	3 x 2	28,2	967,7	1480,0
62806	33,6	4 x 2	31,4	1290,3	1922,0
62807	33,6	5 x 2	34,6	1612,8	2363,0
62808	42,3	4 x 1	35,6	1624,0	2397,0
62809	52,9	4 x 1/0	38,7	2031,0	2938,0
62810	67,3	4 x 2/0	42,1	2584,0	3559,0
62811	84,4	4 x 3/0	49,4	3256,0	4181,0
62812	106,7	4 x 4/0	52,0	4097,0	5747,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

TRAYCONTROL® 530 flexible TC-ER control cable with coloured cores

Technical data

- Flexible PVC tray cable to UL-Std.1277 and UL-Std.2277
  Temperature range
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  AWM 1000 V
  TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**
  5x cable Ø

Cable structure

- Bare copper conductor, fine wire with AWG dimensions
- Core insulation of special PVC with transparent nylon skin
- Core identification
  2 cores = blue-with
  from 3 cores = blue cores with continuous white numbering
- GN-YE conductor, 3 cores and above in the outer layer
- Conductor cabled with non-wicking fillers
- Separator
- Outer sheath of special PVC
- Sheath colour grey (RAL 7001)

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- **UL:** TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2012, WTTC 1000V, DP-1, OIL RES I & II, 90°C dry / 75°C wet, Class 1 Div. 2 per NEC Art. 336, 392, 501, crush impact test in accordance with UL 1277
- **CSA**:
  c(UL) CIC-TC FT4
  CSA AWM I/II
  A/B FT4

Note

Available on request

- with red, black, yellow or orange cores
- Black or TPE outer sheath

Application

TRAYCONTROL® 530 is a flexible, oil-resistant control 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 Edition 2012. 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: automotive industry, machine tool, production lines.

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

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66840	2 x 1	18	7,0	19,0	68,0
66841	3 G 1	18	7,1	29,0	88,0
66842	4 G 1	18	8,0	38,0	98,0
66843	5 G 1	18	8,6	48,0	116,0
66844	7 G 1	18	9,3	67,0	149,0
66845	9 G 1	18	10,7	86,0	186,0
66846	10 G 1	18	11,6	96,0	199,0
66847	12 G 1	18	11,9	115,0	245,0
66848	15 G 1	18	13,2	144,0	292,0
66849	16 G 1	18	13,3	154,0	306,0
66850	18 G 1	18	14,6	173,0	366,0
66851	19 G 1	18	14,7	182,0	384,0
66852	25 G 1	18	17,0	240,0	451,0
66853	27 G 1	18	17,4	259,0	521,0
66854	33 G 1	18	18,7	317,0	590,0
66855	34 G 1	18	19,3	326,0	625,0
66856	41 G 1	18	20,7	394,0	744,0
66857	42 G 1	18	20,8	403,0	758,0
66858	49 G 1	18	23,0	470,0	917,0
66859	50 G 1	18	23,5	480,0	933,0
66860	61 G 1	18	24,9	624,0	1095,0
66861	65 G 1	18	25,6	624,0	1125,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66862	2 x 1,32	16	7,5	25,0	80,0
66863	3 G 1,32	16	7,8	38,0	86,0
66864	4 G 1,32	16	8,5	51,0	115,0
66865	5 G 1,32	16	9,3	63,0	126,0
66866	7 G 1,32	16	10,1	89,0	171,0
66867	9 G 1,32	16	11,7	114,0	237,0
66868	10 G 1,32	16	12,4	127,0	259,0
66869	12 G 1,32	16	12,9	152,0	301,0
66870	15 G 1,32	16	15,0	190,0	379,0
66871	16 G 1,32	16	15,2	203,0	405,0
66872	18 G 1,32	16	15,9	228,0	443,0
66873	19 G 1,32	16	16,0	241,0	458,0
66874	25 G 1,32	16	18,6	317,0	564,0
66875	27 G 1,32	16	19,0	342,0	629,0
66876	33 G 1,32	16	20,4	418,0	758,0
66877	34 G 1,32	16	20,5	431,0	775,0
66878	41 G 1,32	16	23,4	520,0	967,0
66879	42 G 1,32	16	24,1	532,0	972,0
66880	49 G 1,32	16	25,5	621,0	1132,0
66881	50 G 1,32	16	25,6	634,0	1137,0
66882	61 G 1,32	16	27,2	773,0	1345,0
66883	65 G 1,32	16	28,5	824,0	1376,0

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

Suitable accessories can be found in Chapter X.

• Cable Gland - HELUTOP® HT-E

JZ-600 UL/CSA flexible, number coded, 1000 V, meter marking

Technical data

- Special PVC control cables adapted to DIN VDE 0276 part 627, DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, with insulation thickness for 1 kV type and to UL-Std.758 Style 21179
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- 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
- Outer sheath of special PVC compound type TM2 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour black (RAL 9005) or grey (RAL 7001)
- with meter marking

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- UV-resistant (building with black sheath)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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) UL VW1, CSA FT1

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **JZ-600-Y-CY UL/CSA**, confer page 378

Application

Wiring cable for measuring and controlling purposes in tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation, building with black sheath). Is not suitable to be used as direct burrial- or as underwater cable. The cores have been numbered in such a way that the numbers are easily identifiable, even if the cable has only been stripped back a few cm. The core numbers have been underlined to avoid confusion. The earth core is located in the outer layer. The black, special PVC outer sheath is resistant to the ultra violet radiation. Mainly used in South-European, Eastern and Arabian countries.

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

Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11815	2 x 0,5	20	6,4	9,6	56,0
11816	3 G 0,5	20	6,8	14,4	68,0
11817	4 G 0,5	20	7,6	19,0	100,0
11818	5 G 0,5	20	8,2	24,0	117,0
11819	7 G 0,5	20	9,8	33,6	138,0
11820	12 G 0,5	20	12,2	58,0	200,0
11821	18 G 0,5	20	14,4	86,0	276,0
11822	25 G 0,5	20	17,2	120,0	335,0
11823	2 x 0,75	19	6,8	14,4	66,0
11824	3 G 0,75	19	7,2	21,6	74,0
11825	4 G 0,75	19	8,0	29,0	126,0
11826	5 G 0,75	19	8,8	36,0	140,0
11827	7 G 0,75	19	10,7	50,0	190,0
11828	12 G 0,75	19	13,1	86,0	257,0
11829	18 G 0,75	19	15,6	130,0	362,0
11830	25 G 0,75	19	18,9	180,0	486,0
11831	2 x 1	18	7,4	19,2	80,0
11832	3 G 1	18	8,0	29,2	96,0
11833	4 G 1	18	8,8	38,4	100,0
11834	5 G 1	18	9,8	48,0	130,0
11835	7 G 1	18	11,7	67,0	170,0
11836	12 G 1	18	14,5	115,0	290,0
11837	18 G 1	18	17,3	173,0	405,0
11838	25 G 1	18	21,1	240,0	570,0
11839	2 x 1,5	16	8,4	29,0	95,0
11840	3 G 1,5	16	9,1	43,0	112,0
11841	4 G 1,5	16	9,9	58,0	139,0
11842	5 G 1,5	16	11,0	72,0	170,0
11843	7 G 1,5	16	13,3	101,0	225,0
11844	12 G 1,5	16	16,6	173,0	370,0
11845	18 G 1,5	16	19,7	259,0	520,0
11846	25 G 1,5	16	23,9	360,0	730,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11880	2 x 0,5	20	6,4	9,6	56,0
11881	3 G 0,5	20	6,8	14,4	68,0
11882	4 G 0,5	20	7,6	19,0	100,0
11883	5 G 0,5	20	8,2	24,0	117,0
11884	7 G 0,5	20	9,8	33,6	138,0
11885	12 G 0,5	20	12,2	58,0	200,0
11886	18 G 0,5	20	14,4	86,0	276,0
11887	25 G 0,5	20	17,2	120,0	335,0
11888	2 x 0,75	19	6,8	14,4	66,0
11889	3 G 0,75	19	7,2	21,6	74,0
11890	4 G 0,75	19	8,0	29,0	126,0
11891	5 G 0,75	19	8,8	36,0	140,0
11892	7 G 0,75	19	10,7	50,0	190,0
11893	12 G 0,75	19	13,1	86,0	257,0
11894	18 G 0,75	19	15,6	130,0	362,0
11895	25 G 0,75	19	18,9	180,0	486,0
11896	2 x 1	18	7,4	19,2	80,0
11897	3 G 1	18	8,0	29,2	96,0
11898	4 G 1	18	8,8	38,4	100,0
11899	5 G 1	18	9,8	48,0	130,0
11900	7 G 1	18	11,7	67,0	170,0
11901	12 G 1	18	14,5	115,0	290,0
11902	18 G 1	18	17,3	173,0	405,0
11903	25 G 1	18	21,1	240,0	570,0
11904	2 x 1,5	16	8,4	29,0	95,0
11905	3 G 1,5	16	9,1	43,0	112,0
11906	4 G 1,5	16	9,9	58,0	139,0
11907	5 G 1,5	16	11,0	72,0	170,0
11908	7 G 1,5	16	13,3	101,0	225,0
11909	12 G 1,5	16	16,6	173,0	370,0
11910	18 G 1,5	16	19,7	259,0	520,0
11911	25 G 1,5	16	23,9	360,0	730,0

Continuation ▸

JZ-600 UL/CSA flexible, number coded, 1000 V, meter marking

Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11847	2 x 2,5	14	9,4	48,0	160,0
11848	3 G 2,5	14	9,9	72,0	175,0
11849	4 G 2,5	14	11,1	96,0	203,0
11850	5 G 2,5	14	12,4	120,0	251,0
11851	7 G 2,5	14	15,0	168,0	330,0
11852	12 G 2,5	14	18,4	288,0	553,0
11853	18 G 2,5	14	22,0	432,0	795,0
11854	25 G 2,5	14	26,9	600,0	1110,0
11855	2 x 4	12	11,4	77,0	180,0
11856	3 G 4	12	12,3	115,0	230,0
11857	4 G 4	12	13,8	154,0	310,0
11858	5 G 4	12	15,3	192,0	410,0
11859	7 G 4	12	16,8	269,0	540,0
11860	12 G 4	12	22,9	461,0	860,0
11861	3 G 6	10	14,1	173,0	370,0
11862	4 G 6	10	15,6	230,0	430,0
11863	5 G 6	10	17,3	288,0	650,0
11864	7 G 6	10	19,3	403,0	860,0
11865	3 G 10	8	16,5	288,0	660,0
11866	4 G 10	8	18,1	384,0	790,0
11867	5 G 10	8	20,5	480,0	960,0
11868	7 G 10	8	22,5	672,0	1300,0
11869	3 G 16	6	19,6	461,0	760,0
11870	4 G 16	6	21,7	614,0	1100,0
11871	5 G 16	6	24,2	768,0	1600,0
11872	7 G 16	6	25,7	1075,0	1890,0
11873	3 G 25	4	24,0	720,0	1450,0
11874	4 G 25	4	26,9	960,0	1600,0
11875	5 G 25	4	29,4	1200,0	2050,0
11876	7 G 25	4	32,8	1680,0	2900,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
11912	2 x 2,5	14	9,4	48,0	160,0
11913	3 G 2,5	14	9,9	72,0	175,0
11914	4 G 2,5	14	11,1	96,0	203,0
11915	5 G 2,5	14	12,4	120,0	251,0
11916	7 G 2,5	14	15,0	168,0	330,0
11917	12 G 2,5	14	18,4	288,0	553,0
11918	18 G 2,5	14	22,0	432,0	795,0
11919	25 G 2,5	14	26,9	600,0	1110,0
11920	2 x 4	12	11,4	77,0	180,0
11921	3 G 4	12	12,3	115,0	230,0
11922	4 G 4	12	13,8	154,0	310,0
11923	5 G 4	12	15,3	192,0	410,0
11924	7 G 4	12	16,8	269,0	540,0
11925	12 G 4	12	22,9	461,0	860,0
11926	3 G 6	10	14,1	173,0	370,0
11927	4 G 6	10	15,6	230,0	430,0
11928	5 G 6	10	17,3	288,0	650,0
11929	7 G 6	10	19,3	403,0	860,0
11930	3 G 10	8	16,5	288,0	660,0
11931	4 G 10	8	18,4	384,0	790,0
11932	5 G 10	8	20,5	480,0	960,0
11933	7 G 10	8	22,5	672,0	1300,0
11934	3 G 16	6	19,6	461,0	760,0
11935	4 G 16	6	21,7	614,0	1100,0
11936	5 G 16	6	24,2	768,0	1600,0
11937	7 G 16	6	25,7	1075,0	1890,0
11938	3 G 25	4	24,0	720,0	1450,0
11939	4 G 25	4	26,9	960,0	1600,0
11940	5 G 25	4	29,3	1200,0	2050,0
11941	7 G 25	4	32,6	1680,0	2900,0

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

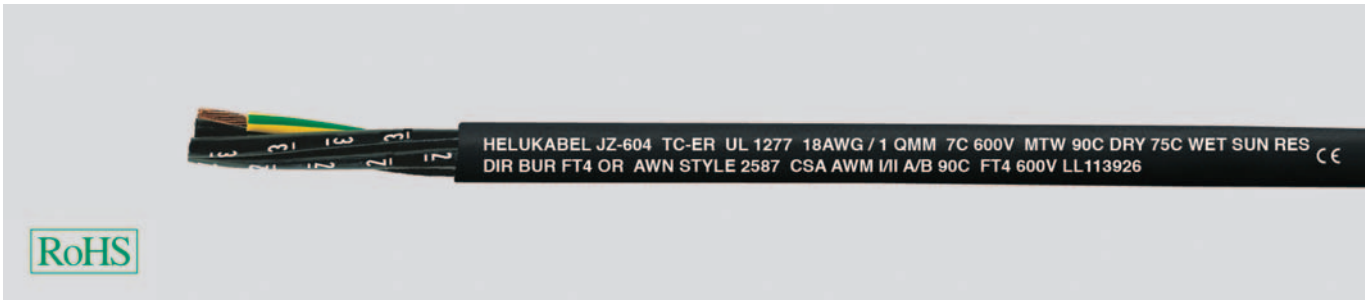
Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS

N

JZ-604 TC TRAY CABLE PVC power cable, exposed run, NFPA79

Edition 2012, 90°C, 600 V, meter marking



Technical data

- PVC power cable to UL-Std.1277 TRAY CABLE
- **Multinorm**
  The TRAY CABLE also conforms to the following standards:
  AWM-Style 2587 to UL-Std.758 and CSA C22.2 No 210 I/II A/B 90C 600 V
- **Temperature range**
  dry environment
  flexing -5°C to +90°C
  fixed installation -25°C to +90°C
  wet environment
  flexing -5°C to +75°C
  fixed installation -25°C to +75°C
- **Nominal voltage** UL 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  7,5x cable Ø
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC class 12 B to tab. 50.155 UL-standard 1581, type TFF acc. to UL-Std. 62(AWG 20-AWG 16)
  type THHW acc. to UL-Std. 83 (≥AWG 14)
- 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
- Outer sheath of special PVC acc. to UL-Std.1277 tab.11.2
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- uv-resistant

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type:
  JZ-604-FCY TC TRAY CABLE,
  confer page 380
  JZ-604-YCY TC TRAY CABLE,
  confer page 381

Application

USA NFPA79, edition 2012 conformant flexible power cables up to 600 V, for all machinery in tool and plant constuction, suitable for installation 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 and industrial plants.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69661	2 x 1	18	8,0	19,2	72,0
69662	3 G 1	18	8,4	29,0	84,0
69663	4 G 1	18	9,1	39,0	96,0
69664	5 G 1	18	10,0	48,0	114,0
69665	7 G 1	18	11,7	67,0	147,0
69666	9 G 1	18	12,6	84,0	172,0
69667	10 G 1	18	14,3	96,0	206,0
69668	12 G 1	18	14,7	115,0	256,0
69669	18 G 1	18	17,1	173,0	367,0
69670	25 G 1	18	20,3	240,0	477,0
69671	34 G 1	18	23,7	326,0	551,0
69672	50 G 1	18	26,1	480,0	959,0
69673	2 x 1,5	16	8,4	28,8	88,0
69674	3 G 1,5	16	8,8	43,0	102,0
69675	4 G 1,5	16	9,6	58,0	119,0
69676	5 G 1,5	16	10,5	72,0	144,0
69677	7 G 1,5	16	12,3	101,0	192,0
69678	8 G 1,5	16	13,3	115,0	213,0
69679	9 G 1,5	16	13,3	130,0	261,0
69680	10 G 1,5	16	15,1	144,0	294,0
69681	12 G 1,5	16	15,6	173,0	328,0
69682	16 G 1,5	16	17,1	230,0	402,0
69683	18 G 1,5	16	18,2	259,0	427,0
69684	25 G 1,5	16	22,7	360,0	594,0
69685	34 G 1,5	16	25,3	489,0	714,0
69686	41 G 1,5	16	27,0	590,0	803,0
69687	50 G 1,5	16	27,3	720,0	1021,0
69688	61 G 1,5	16	29,4	878,0	1238,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69689	2 x 2,5	14	9,4	48,0	108,0
69690	3 G 2,5	14	9,9	72,0	137,0
69691	4 G 2,5	14	10,8	96,0	157,0
69692	5 G 2,5	14	11,8	120,0	190,0
69693	7 G 2,5	14	14,7	168,0	253,0
69694	8 G 2,5	14	16,0	192,0	339,0
69695	9 G 2,5	14	16,0	216,0	341,0
69696	10 G 2,5	14	17,1	240,0	392,0
69697	12 G 2,5	14	17,7	288,0	470,0
69698	18 G 2,5	14	20,8	432,0	682,0
69699	25 G 2,5	14	25,8	600,0	891,0
69700	3 G 4	12	11,0	115,0	187,0
69701	4 G 4	12	12,0	154,0	226,0
69702	5 G 4	12	13,2	192,0	280,0
69703	7 G 4	12	16,5	269,0	390,0
69704	9 G 4	12	17,8	346,0	480,0
69705	12 G 4	12	19,9	461,0	841,0
69706	18 G 4	12	24,2	691,0	981,0
69707	3 G 6	10	12,5	173,0	290,0
69708	4 G 6	10	14,5	230,0	381,0
69709	5 G 6	10	15,8	288,0	465,0
69710	7 G 6	10	17,3	403,0	654,0
69711	3 G 10	8	16,9	288,0	511,0
69712	4 G 10	8	18,6	384,0	584,0
69713	5 G 10	8	20,4	480,0	781,0
69714	7 G 10	8	23,5	672,0	970,0

Continuation ▸

JZ-604 TC TRAY CABLE PVC power cable, exposed run, NFPA79

Edition 2012, 90°C, 600 V, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69715	3 G 16	6	21,0	461,0	651,0
69716	4 G 16	6	23,9	614,0	866,0
69717	5 G 16	6	26,3	768,0	1117,0
69718	7 G 16	6	28,8	1075,0	1364,0
69719	3 G 25	4	24,9	720,0	1090,0
69720	4 G 25	4	27,2	960,0	1421,0
69721	5 G 25	4	30,3	1200,0	1611,0
69722	7 G 25	4	33,1	1680,0	1943,0
69723	3 G 35	2	27,1	1008,0	1734,0
69724	4 G 35	2	29,8	1344,0	2011,0
69725	5 G 35	2	33,0	1680,0	2347,0
69726	3 G 50	1	33,2	1440,0	2041,0
69727	4 G 50	1	36,7	1920,0	2539,0
69728	5 G 50	1	41,5	2400,0	2894,0
69729	3 G 70	2/0	37,6	2016,0	2831,0
69730	4 G 70	2/0	42,0	2688,0	3494,0
69731	5 G 70	2/0	47,6	3360,0	4260,0
69732	3 G 95	3/0	41,8	2736,0	5010,0
69733	4 G 95	3/0	47,0	3648,0	6104,0
69734	5 G 95	3/0	52,5	4560,0	7891,0
69735	3 G 120	4/0	46,0	3456,0	5940,0
69736	4 G 120	4/0	51,5	4608,0	7604,0
69737	5 G 120	4/0	56,5	5760,0	8751,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

N

TRAYCONTROL® 600 flexible, oil-resistant, open installation (TC-ER), NFPA 79 Edition 2012

Technical data

- PVC-power cable according to UL-Std.1277 and UL-Std.2277
  Temperature range
  UL/CSA TC -40°C to +90°C
  UL/AWM -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  AWM 1000 V
  WTTC 1000 V
- **Test voltage** 3000 V
- **Minimum bending radius**
  5x cable Ø
- **Insulation resistance**
  min. 20 MOhm x km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, fine wire with AWG dimensions
- Core insulation of special PVC with transparent nylon skin
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and abovein the outer layer
- Cores stranded in layers with optimal lay-length
- Separator
- Outer sheath of special PVC
- Sheath colour black (RAL 9005)
- With lenght marking in feet

Properties

- self-extinguishing and flame retardant according to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- **UL:**
  TC-ER, PLTC-ER (AWG 18 - AWG 12),
  ITC-ER (AWG 18 - AWG 12),
  UL Type WTTC, UL Type MTW,
  NFPA 79 2012, Oil Res I (Oil Res II also available), 90° C dry / 75° C wet,
  Class 1 Div. 2 per NEC Art. 336, 392, 501
- **CSA**:
  c(UL) CIC-TC FT4
  CSA AWM I/II A/B FT4

Note

Advantages

- TC-ER, Tray Cable Exposed Run
- simple Installation
- outstanding flexibility

Application

USA NFPA 79 edition 2012 conformant flexible power cables up to 600 V (WTTC 1000 V), for all machinery in tool and plant constuction, suitable for installation 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 and industrial plants.

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

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62020	0,507	2 x 20	6,6	9,8	60,0
62021	0,507	3 x 20	7,0	14,6	64,0
62022	0,507	4 x 20	7,5	19,5	79,0
62023	0,507	5 x 20	8,1	24,4	92,0
62024	0,507	7 x 20	8,7	34,1	124,0
62025	0,507	9 x 20	9,8	43,8	210,0
62026	0,507	12 x 20	10,1	58,4	263,0
62027	0,507	18 x 20	12,9	87,6	305,0
62028	0,507	25 x 20	15,7	121,7	371,0
62902	0,963	2 x 18	7,3	18,5	68,0
62903	0,963	3 x 18	7,6	27,8	68,0
62904	0,963	4 x 18	8,2	37,0	97,0
62905	0,963	5 x 18	8,9	46,3	116,0
62906	0,963	7 x 18	9,6	64,8	147,0
62907	0,963	9 x 18	11,0	83,2	186,0
62908	0,963	10 x 18	11,6	92,5	199,0
62909	0,963	12 x 18	12,2	111,0	250,0
62910	0,963	15 x 18	13,5	138,7	292,0
62911	0,963	16 x 18	13,6	147,9	306,0
62912	0,963	18 x 18	15,0	166,4	365,0
62913	0,963	19 x 18	15,1	175,7	384,0
62914	0,963	25 x 18	17,4	231,2	480,0
62915	0,963	27 x 18	17,7	249,6	521,0
62916	0,963	34 x 18	19,7	314,4	625,0
62917	0,963	37 x 18	20,1	342,0	684,0
62918	0,963	41 x 18	21,0	379,0	744,0
62919	0,963	50 x 18	24,0	462,3	933,0
62920	0,963	61 x 18	25,2	564,0	1095,0
62921	1,31	2 x 16	7,8	25,2	80,0
62922	1,31	3 x 16	8,2	37,8	86,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62923	1,31	4 x 16	8,8	50,3	120,0
62924	1,31	5 x 16	9,6	62,9	130,0
62925	1,31	6 x 16	10,2	75,5	164,0
62926	1,31	7 x 16	10,5	88,0	188,0
62927	1,31	8 x 16	11,1	100,7	201,0
62928	1,31	9 x 16	12,0	113,2	238,0
62929	1,31	10 x 16	12,4	125,8	259,0
62930	1,31	12 x 16	13,6	151,0	301,0
62931	1,31	14 x 16	14,5	176,1	356,0
62932	1,31	15 x 16	15,2	188,7	379,0
62933	1,31	16 x 16	16,0	201,3	405,0
62934	1,31	18 x 16	16,4	226,4	430,0
62935	1,31	19 x 16	16,6	239,0	450,0
62936	1,31	20 x 16	17,2	251,6	481,0
62937	1,31	25 x 16	18,9	314,5	564,0
62938	1,31	27 x 16	19,3	339,6	629,0
62939	1,31	30 x 16	20,0	377,3	701,0
62940	1,31	34 x 16	22,5	427,6	775,0
62941	1,31	40 x 16	23,5	503,1	946,0
62942	1,31	41 x 16	24,0	515,7	967,0
62943	1,31	50 x 16	26,1	628,8	1137,0
62944	1,31	61 x 16	27,5	767,2	1345,0
62945	2,08	2 x 14	8,9	40,0	100,0
62946	2,08	3 x 14	9,2	60,0	117,0
62947	2,08	4 x 14	10,1	80,0	141,0
62948	2,08	5 x 14	10,9	100,0	152,0
62949	2,08	6 x 14	11,5	120,0	216,0
62950	2,08	7 x 14	12,0	140,0	255,0
62951	2,08	9 x 14	14,7	180,0	312,0
62952	2,08	10 x 14	15,8	200,0	378,0

Continuation ▸

TRAYCONTROL® 600 flexible, oil-resistant, open installation

(TC-ER), NFPA 79 Edition 2012

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62953	2,08	12 x 14	16,4	240,0	434,0
62954	2,08	16 x 14	18,0	320,0	550,0
62955	2,08	18 x 14	18,9	359,0	616,0
62956	2,08	19 x 14	19,0	380,0	634,0
62957	2,08	25 x 14	23,0	500,0	817,0
62958	3,31	2 x 12	9,7	63,0	132,0
62959	3,31	3 x 12	10,2	95,0	177,0
62960	3,31	4 x 12	11,2	127,0	201,0
62961	3,31	5 x 12	12,3	159,0	274,0
62962	3,31	6 x 12	13,6	191,0	315,0
62963	3,31	7 x 12	13,9	222,0	353,0
62964	3,31	9 x 12	16,4	286,0	476,0
62965	3,31	12 x 12	18,3	381,0	613,0
62966	3,31	16 x 12	19,8	508,0	783,0
62967	3,31	19 x 12	22,3	604,0	918,0
62968	3,31	20 x 12	23,1	636,0	916,0
62969	3,31	25 x 12	25,8	794,0	1286,0
62970	5,26	2 x 10	12,2	101,0	213,0
62971	5,26	3 x 10	12,9	151,5	283,0
62972	5,26	4 x 10	15,0	202,0	387,0
62973	5,26	5 x 10	16,3	252,5	473,0
62974	5,26	7 x 10	17,7	353,5	607,0
62975	5,26	9 x 10	20,6	454,5	771,0
62976	5,26	12 x 10	24,1	606,0	1061,0
62977	5,26	19 x 10	27,2	959,5	1528,0
62978	8,37	4 x 8	19,2	321,4	615,0
62979	8,37	5 x 8	21,0	401,8	768,0
62980	13,3	3 x 6	19,5	383,1	700,0
62981	13,3	4 x 6	22,4	510,7	907,0
62982	13,3	5 x 6	24,5	638,4	1100,0
62983	21,2	3 x 4	24,4	610,6	1061,0
62984	21,2	4 x 4	27,0	814,1	1366,0
62985	21,2	5 x 4	29,9	1017,6	1631,0
62986	33,6	3 x 2	28,2	967,7	1480,0
62987	33,6	4 x 2	31,4	1290,3	1922,0
62988	33,6	5 x 2	34,6	1612,8	2360,0
62989	42,3	4 x 1	35,6	1624,0	2397,0
62990	52,9	4 x 1/0	38,7	2031,0	2938,0
62991	67,3	4 x 2/0	42,1	2584,0	3569,0
62992	84,4	4 x 3/0	49,4	3256,0	4181,0
62993	106,7	4 x 4/0	52,0	4097,0	5747,0
62994	128,4	4 x 250 kcmil	55,8	4931,0	7591,0
62995	181,9	4 x 350 kcmil	64,3	6985,0	8299,0
62996	257,6	4 x 500 kcmil	74,1	9892,0	11549,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

N

H05VV-F/SJT 300 V

Technical data

- PVC control cable to DIN VDE 0285-525-2-11/ DIN EN 50525-2-11 IEC 60227-5 and UL-Std.62 and CSA 22.2 No. 49
- **Temperature range**
  HAR
  flexing -5°C to +70°C
  fixed installation -40°C to +70°C
  UL/CSA
  flexing -5°C to +60°C
  fixed installation -40°C to +60°C
- **Nominal voltage**
  HAR U_0/U 300/500 V
  UL/CSA 300 V
- **Test voltage** 2500 V, 5 min.
- **Breakdown voltage** min. 5000 V
- **Spark-Test** 6000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  7,5x cable Ø
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, fine-wire with AWG dimensions to UL-Std.62
- Core insulation of special PVC, compound type TI2 acc. to DIN VDE 0207-363-3/ DIN EN 50363-3 and class 43 acc. to UL-Std.62 (tab.50.182, UL-Std.1581) acc. to CSA C22.2 No 49 type SJT
- Core identification acc. to DIN VDE 0293-308 one coloured
- GN-YE conductor, 3 cores and above
- Core stranded with optimal lay-length
- Outer sheath of PVC, compound type TM2 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.62 (tab. 50.182, UL-Std.1581) acc. to CSA-Std. C 22.2 No 49 type SJT
- Sheath colour black, white or grey

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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), CSA FT2

Application

These flexible PVC control cables, VDE-HAR-UL-CSA approved, are designed for the export and also for the export-orientated-equipment. These cables are especially suited to use for the appliance with medium mechanical stresses with free movement without tensile stress in households, kitchens and offices, also for household appliances in damp and wet areas, e. g. refrigerators, washing machines, spin-driver etc. , as far as this cable is admitted to the relevant specifications of the equipment. These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences or heat. The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts. They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) and in agriculture plants and for connecting commercial electrical tools.

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

Part no.	Cross-section mm²	No.cores x AWG-No.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28034	1,04	2 x 17	black	7,4	20,0	86,0
28066	1,04	2 x 17	grey	7,4	20,0	86,0
28050	1,04	2 x 17	white	7,4	20,0	86,0
28035	1,04	3 x 17	black	7,9	30,0	98,0
28067	1,04	3 x 17	grey	7,9	30,0	98,0
28051	1,04	3 x 17	white	7,9	30,0	98,0
28036	1,04	4 x 17	black	8,8	40,0	123,0
28068	1,04	4 x 17	grey	8,8	40,0	123,0
28052	1,04	4 x 17	white	8,8	40,0	123,0
28037	1,04	5 x 17	black	9,6	50,0	146,0
28069	1,04	5 x 17	grey	9,6	50,0	146,0
28053	1,04	5 x 17	white	9,6	50,0	146,0
28038	1,65	2 x 15	black	8,1	31,7	106,0
28070	1,65	2 x 15	grey	8,1	31,7	106,0
28054	1,65	2 x 15	white	8,1	31,7	106,0
28039	1,65	3 x 15	black	8,7	47,5	128,0
28071	1,65	3 x 15	grey	8,7	47,5	128,0
28055	1,65	3 x 15	white	8,7	47,5	128,0
28040	1,65	4 x 15	black	9,8	63,4	164,0
28072	1,65	4 x 15	grey	9,8	63,4	164,0
28056	1,65	4 x 15	white	9,8	63,4	164,0
28041	1,65	5 x 15	black	10,8	79,2	201,0
28073	1,65	5 x 15	grey	10,8	79,2	201,0
28057	1,65	5 x 15	white	10,8	79,2	201,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28042	2,63	2 x 13	black	9,5	50,5	150,0
28074	2,63	2 x 13	grey	9,5	50,5	150,0
28058	2,63	2 x 13	white	9,5	50,5	150,0
28043	2,63	3 x 13	black	10,2	75,7	184,0
28075	2,63	3 x 13	grey	10,2	75,7	184,0
28059	2,63	3 x 13	white	10,2	75,7	184,0
28044	2,63	4 x 13	black	11,2	101,0	229,0
28076	2,63	4 x 13	grey	11,2	101,0	229,0
28060	2,63	4 x 13	white	11,2	101,0	229,0
28045	2,63	5 x 13	black	12,5	126,2	281,0
28077	2,63	5 x 13	grey	12,5	126,2	281,0
28061	2,63	5 x 13	white	12,5	126,2	281,0
28046	4,17	2 x 11	black	10,8	80,1	204,0
28078	4,17	2 x 11	grey	10,8	80,1	204,0
28062	4,17	2 x 11	white	10,8	80,1	204,0
28047	4,17	3 x 11	black	11,6	120,1	254,0
28079	4,17	3 x 11	grey	11,6	120,1	254,0
28063	4,17	3 x 11	white	11,6	120,1	254,0
28048	4,17	4 x 11	black	12,8	160,1	315,0
28080	4,17	4 x 11	grey	12,8	160,1	315,0
28064	4,17	4 x 11	white	12,8	160,1	315,0
28049	4,17	5 x 11	black	14,4	200,2	393,0
28081	4,17	5 x 11	grey	14,4	200,2	393,0
28065	4,17	5 x 11	white	14,4	200,2	393,0

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

H05VV-F/SJT 300 V

Technical data

- PVC control cable to DIN VDE 0285-525-2-11/ DIN EN 50525-2-11, IEC 60227-5 and UL-Std.62 and CSA 22.2 No. 49
- **Temperature range**
  HAR
  flexing -5°C to +70°C
  fixed installation -40°C to +70°C
  UL/CSA
  flexing -5°C to +60°C
  fixed installation -40°C to +60°C
- **Nominal voltage**
  HAR U_0/U 300/500 V
  UL/CSA 300 V
- **Test voltage** 2500 V, 5 min.
- **Breakdown voltage** min. 5000 V
- **Spark-Test** 6000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  7,5x cable Ø
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, fine-wire with AWG dimensions acc. to UL-Std.62
- Core insulation of PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std. 62 (tab.50.182, UL-Std.1581) acc. to CSA C22.2 No 49 type SJT
- Core identification to DIN VDE 0293-308 coloured
- GN-YE conductor, 3 cores and above
- Core stranded with optimal lay-length
- Outer sheath of PVC compound type TM2 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.62 (tab.50.182, UL-Std.1581) acc. to CSA-Std. C 22.2 No 49 type SJT
- Sheath colour by request

Properties

- PVC self-extinguishing and flame retardant 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), CSA FT2
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
  0 = approx.RAL 5015 blue
  1 = approx.RAL 6018 green
  2 = approx.RAL 8003 brown
  3 = approx.RAL 1021 yellow
  4 = approx.RAL 3000 red
  5 = approx.RAL 2003 orange
  6 = approx.RAL 4005 violet
  7 = gold
  8 = dusty gold
  Further colours on request.

Application

These flexible PVC control cables, VDE-HAR-UL-CSA approved, are designed for the export and also for the export-orientated-equipment. These cables are especially suited to use for the appliance with medium mechanical stresses with free movement without tensile stress in households, kitchens and offices, also for household appliances in damp and wet areas, e. g. refrigerators, washing machines, spin-driver etc. , as far as this cable is admitted to the relevant specifications of the equipment. These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences or heat. The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts. They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) and in agriculture plants and for connecting commercial electrical tools.

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

N

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
3110x	1,04	2 x 17	7,4	20,0	86,0
3111x	1,04	3 G 17	7,9	30,0	98,0
3112x	1,04	4 G 17	8,8	40,0	123,0
3113x	1,04	5 G 17	9,6	50,0	146,0
3114x	1,65	2 x 15	8,1	31,7	106,0
3115x	1,65	3 G 15	8,7	47,5	128,0
3116x	1,65	4 G 15	9,8	63,4	164,0
3117x	1,65	5 G 15	10,8	79,2	201,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
3118x	2,63	2 x 13	9,5	50,5	150,0
3119x	2,63	3 G 13	10,2	75,7	184,0
3120x	2,63	4 G 13	11,2	101,0	229,0
3121x	2,63	5 G 13	12,5	126,2	281,0
3122x	4,17	2 x 11	10,8	80,1	204,0
3123x	4,17	3 G 11	11,6	120,1	254,0
3124x	4,17	4 G 11	12,8	160,1	315,0
3125x	4,17	5 G 11	14,4	200,2	393,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS

H05VV-F/UL 500 V

Technical data

- PVC control cable to DIN VDE 0285-525-2-11/ DIN EN 50525-2-11, IEC 60227-5 and UL-Std. 758 AWM-Style 20195
- **Temperature range**
  HAR
  flexing -5°C to +70°C
  fixed installation -40°C to +70°C
  UL
  flexing -5°C to +75°C
  fixed installation -40°C to +75°C
- **Nominal voltage**
  HAR U_0/U 300/500 V
  UL U_0/U 300/500 V
- **Test voltage** 2500 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  7,5x cable Ø
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire to DIN VDE 0295 cl.5, BS 6360 cl.5, IEC 60228 cl.5 acc. to UL-Std.62
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3
- Core identification to DIN VDE 0293-308, one coloured
- Core stranded in layers with optimal lay-length
- GN-YE conductor, 3 cores and above
- Outer sheath of special PVC compound type TM2 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1
- Sheath colour by request

Properties

- PVC self-extinguishing and flame retardant acc. to VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor
  x = without green-yellow conductor
- AWG sizes are approximate equivalent
- values. The actual cross-section is in mm².
- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
  0 = approx.RAL 9005 black
  1 = approx.RAL 9003 white
  2 = approx.RAL 5015 blue
  3 = approx.RAL 6018 green
  4 = approx.RAL 8003 brown
  5 = approx.RAL 1021 yellow
  6 = approx.RAL 3000 red
  7 = approx.RAL 2003 orange
  8 = approx.RAL 4005 violet
  9 = approx.RAL 7001/7032 grey
  Further colours on request.

Application

These flexible PVC control cables, VDE-HAR-AWM approved, are designed for the export and also for the export-orientated-equipment. These cables are especially suited to use for the appliance with medium mechanical stresses with free movement without tensile stress in households, kitchens and offices, also for household appliances in damp and wet areas, e. g. refrigerators, washing machines, spin-driver etc. , as far as this cable is admitted to the relevant specifications of the equipment. These cables are suited to be used for cooking and heating apparatus under the condition that cable does not come in direct contact with hot parts of the apparatus and no other influences or heat. The cables are suitable for fixed installation in furnitures, partition walls, decoration covering and in hollow spaces of prefabricated building parts. They are not suitable for use in open air, in industries (also permitted to tailor workshops and of that kind) and in agriculture plants and for connecting commercial electrical tools.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
3269x	2 x 0,75	18	6,4	14,4	50,0
3270x	3 G 0,75	18	6,8	21,6	60,0
3271x	4 G 0,75	18	7,4	29,0	73,0
3272x	5 G 0,75	18	8,3	36,0	88,0
3273x	2 x 1	17	7,3	19,0	57,0
3274x	3 G 1	17	7,8	29,0	73,0
3275x	4 G 1	17	8,6	38,0	85,0
3276x	5 G 1	17	9,4	48,0	105,0
3277x	2 x 1,5	15	7,9	29,0	82,0
3278x	3 G 1,5	15	8,4	43,0	95,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
3279x	4 G 1,5	15	9,3	58,0	117,0
3280x	5 G 1,5	15	10,4	72,0	144,0
3281x	3 G 2,5	13	10,0	72,0	152,0
3282x	4 G 2,5	13	10,9	96,0	192,0
3283x	5 G 2,5	13	12,2	120,0	243,0

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

Suitable accessories can be found in Chapter X.
• Cable Gland - HELUTOP® HT-PA
• Cable Gland - HELUTOP® HT-MS

FROR CEI 20-22 II

Technical data

- Special PVC-sheath flexible cord as per Italian standard CEI 20-22
- **Temperature range**
  flexing -5°C to +70°C
  fixed installation -35°C to +70°C
- **Nominal voltage**
  up to 5-cores U_0/U 450/750 V
  from 7-cores U_0/U 300/500 V
- **Test voltage** 2000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (80 Mrad)
- **Minimum bending radius**
  10x cable Ø

Cable structure

- Bare copper conductor, fine wire stranded to CEI 20-29 cl.5
- Special PVC compound TI2
- Core identification up to 4 cores to HELUKABEL®-JB colour code, from 5 cores black with continuous white number printing
- GN-YE conductor
- Cores stranded in layers with optimal
- lay-length
- Outer sheath of special PVC
- Sheath colour grey, similar to RAL 7035, with printing CEI 20-22 II

Properties

- Oil- and petrol resistant as per CEI 20-22 II
- **Conditionally resistant to**
  Oil
  Solvents
  Acids
  Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant, test methods analog to IEC 60332-3

Note

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

Application

Well known companies (FIAT, COMAU, etc.) use this cable for measurement and control purposes on machine tools and conveyors, as well as on production lines in equipment production and for special mechanical engineering. These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air. Due to special conductor insulation- and sheath compound, this cable is flame resistant in case of fire and self-extinguishing. The good oil- and petrol resistance allows the usage of this cable also in problem areas.

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

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
60250	3 G 1	8,5	29,0	85,0	17
60251	4 G 1	9,5	39,0	100,0	17
60252	5 G 1	10,5	48,0	123,0	17
60253	7 G 1	10,8	67,0	160,0	17
60254	12 G 1	13,8	115,0	270,0	17
60255	18 G 1	16,5	173,0	380,0	17
60256	25 G 1	19,5	240,0	500,0	17
60284	27 G 1	20,0	259,0	560,0	17
60285	33 G 1	20,8	317,0	700,0	17
60257	34 G 1	21,0	326,0	720,0	17
60258	42 G 1	23,3	405,0	800,0	17
60259	50 G 1	25,0	480,0	1050,0	17
60260	3 G 1,5	9,6	43,0	105,0	16
60261	4 G 1,5	11,0	58,0	150,0	16
60262	5 G 1,5	12,0	72,0	190,0	16
60263	7 G 1,5	12,5	101,0	220,0	16
60264	12 G 1,5	16,0	173,0	350,0	16
60265	18 G 1,5	18,8	259,0	515,0	16
60266	25 G 1,5	23,0	360,0	705,0	16
60267	34 G 1,5	26,0	490,0	990,0	16
60286	37 G 1,5	26,5	533,0	1005,0	16
60268	42 G 1,5	29,5	605,0	1080,0	16
60269	50 G 1,5	30,5	720,0	1330,0	16

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
60287	3 G 2,5	11,3	72,0	190,0	14
60270	4 G 2,5	12,3	96,0	215,0	14
60271	5 G 2,5	12,6	120,0	270,0	14
60272	7 G 2,5	14,5	168,0	350,0	14
60273	12 G 2,5	18,0	288,0	550,0	14
60274	4 G 4	14,0	154,0	300,0	12
60275	7 G 4	16,0	269,0	500,0	12
60276	4 G 6	16,0	230,0	430,0	10
60277	4 G 10	19,0	384,0	700,0	8
60278	4 G 16	23,0	614,0	1000,0	6
60279	4 G 25	28,0	960,0	1550,0	4
60280	4 G 35	31,0	1344,0	2070,0	2
60281	4 G 50	37,0	1920,0	2850,0	1
60282	4 G 70	43,0	2688,0	4000,0	2/0
60283	4 G 95	50,0	3648,0	5400,0	3/0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS

C.N.O.M.O Type N0VV5-F according to NFC 32-206

Technical data

- Special PVC based core insulation
- As per to the french motor industry standard for tool machines 04-24-22
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -30°C to +80°C
- **Nominal voltage** 500 V
- **Test voltage** 2000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (80 Mrad)
- **Minimum bending radius**
  15x cable Ø

Cable structure

- Bare copper conductor, fine wire stranded to NFC 32-013 class 5 bzw. IEC 60228 class 5
- Core insulation of special PVC
- Core indetification red or black cores with continuous white numbering
- GN-YE conductor
- Cores stranded in layers with optimal lay-length
- Outer sheath of special PVC
- Sheath colour gray

Properties

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

Tests

- PVC self-extinguishing and flame retardant, text method B and IEC 60332-1
- **Resistant to**
  Oil
  Petrol
  Cutting oil acc. to C.N.O.M.O recommendation E 03.40.150N (VDE 0472 part 803)

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Further types and sizes available on request.

Application

These cables are constructed specially for the french automobile industries and used for the installation in tool making machines, production lines, industrial plants, air conditioning as well as for use in steel production. These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms but not suitable for open air.

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

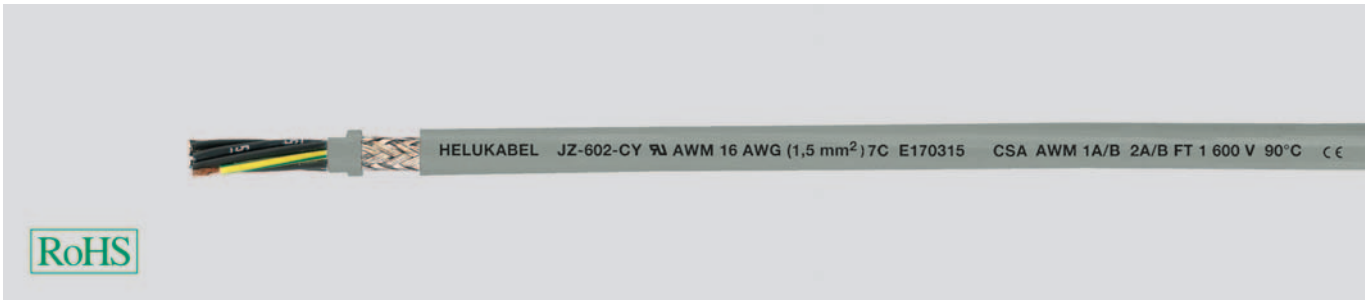
Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
60000	2 x 0,75	6,2	14,4	50,0	18
60001	3 G 0,75	6,6	21,6	59,0	18
60002	4 G 0,75	7,2	29,0	72,0	18
60003	5 G 0,75	8,0	36,0	87,0	18
60004	6 G 0,75	8,9	50,0	105,0	18
60005	12 G 0,75	11,6	86,0	175,0	18
60006	18 G 0,75	13,9	144,0	267,0	18
60007	27 G 0,75	17,2	230,0	404,0	18
60008	36 G 0,75	19,7	288,0	503,0	18
60009	48 G 0,75	22,8	360,0	670,0	18
60010	60 G 0,75	24,9	439,0	805,0	18
60011	2 x 1	6,5	19,0	56,0	17
60012	3 G 1	6,9	29,0	72,0	17
60013	4 G 1	7,7	38,0	84,0	17
60014	5 G 1	8,5	48,0	104,0	17
60015	6 G 1	9,2	67,0	124,0	17
60016	12 G 1	12,4	115,0	219,0	17
60017	18 G 1	15,2	192,0	314,0	17
60018	27 G 1	18,7	308,0	485,0	17
60019	36 G 1	21,1	384,0	620,0	17
60020	48 G 1	24,3	480,0	809,0	17
60021	60 G 1	26,4	586,0	1000,0	17
60022	2 x 1,5	7,5	29,0	76,0	16
60023	3 G 1,5	8,1	43,0	94,0	16
60024	4 G 1,5	9,1	58,0	116,0	16
60025	5 G 1,5	10,1	72,0	143,0	16
60026	6 G 1,5	11,0	101,0	173,0	16
60027	12 G 1,5	15,1	173,0	307,0	16
60028	18 G 1,5	17,9	263,0	464,0	16
60029	24 G 1,5	21,0	341,0	629,0	16
60030	27 G 1,5	21,8	372,0	708,0	16
60031	36 G 1,5	24,5	498,0	985,0	16
60032	48 G 1,5	28,4	641,0	1175,0	16
60033	60 G 1,5	31,3	878,0	1415,0	16

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
60034	2 x 2,5	10,5	48,0	122,0	14
60035	3 G 2,5	11,0	72,0	151,0	14
60036	4 G 2,5	12,0	96,0	191,0	14
60037	5 G 2,5	13,1	120,0	244,0	14
60038	6 G 2,5	15,0	168,0	292,0	14
60039	12 G 2,5	18,0	288,0	524,0	14
60040	2 x 4	10,4	77,0	178,0	12
60041	3 G 4	11,3	115,0	230,0	12
60042	4 G 4	12,8	154,0	300,0	12
60043	5 G 4	14,2	192,0	362,0	12
60044	2 x 6	11,6	115,0	218,0	10
60045	3 G 6	12,7	173,0	325,0	10
60046	4 G 6	14,2	230,0	481,0	10
60047	5 G 6	15,7	288,0	584,0	10
60048	2 x 10	15,0	194,0	505,0	8
60049	3 G 10	16,6	288,0	610,0	8
60050	4 G 10	18,4	384,0	736,0	8
60051	5 G 10	20,9	480,0	913,0	8

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

JZ-602-CY screened two approval control cable, oil resistant,

EMC-preferred type, 90°C, 600 V, meter marking



Technical data

- Special PVC-insulated sheathed cable acc. to UL AWM Style 10012 (core insulation) 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
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 5x cable Ø
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of PVC compound type TI3 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- 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
- PVC-insulated inner sheath YM5 to DIN VDE 0207 part 5
- Braided screen of tinned Cu wires approx. 85% coverage
- Outer sheath of special PVC compound type YM5 to DIN VDE 0207 part 5 and class 43 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils and coolant. The outer sheath is approved with an improved oil-resistance-test.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1

Note

- G = with green-yellow conductor
  x = without green-yellow 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 mm².
- unscreened analogue type:
  JZ-602, confer page 356

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 compatibillity

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.

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82990	2 x 0,5	20	7,4	35,0	93,0
82991	3 G 0,5	20	7,7	42,0	124,0
82992	4 G 0,5	20	8,2	47,0	133,0
82993	5 G 0,5	20	9,0	56,0	153,0
82994	7 G 0,5	20	9,6	69,0	191,0
82995	9 G 0,5	20	11,2	87,0	243,0
82996	12 G 0,5	20	12,3	108,0	322,0
82997	18 G 0,5	20	14,7	145,0	374,0
82998	25 G 0,5	20	17,0	240,0	436,0
82999	34 G 0,5	20	21,4	312,0	560,0
83000	41 G 0,5	20	21,4	348,0	663,0
82979	2 x 1	18	8,1	50,0	107,0
82980	3 G 1	18	8,5	60,0	130,0
82981	4 G 1	18	9,2	71,0	155,0
82982	5 G 1	18	10,1	88,0	181,0
82983	7 G 1	18	10,8	111,0	209,0
82984	9 G 1	18	12,7	139,0	321,0
82985	12 G 1	18	14,1	184,0	341,0
82986	18 G 1	18	16,6	260,0	473,0
82987	25 G 1	18	19,7	349,0	650,0
82988	34 G 1	18	22,6	486,0	781,0
82989	41 G 1	18	24,7	531,0	892,0
82968	2 x 1,5	16	8,6	63,0	136,0
82969	3 G 1,5	16	9,2	80,0	165,0
82970	4 G 1,5	16	10,0	97,0	192,0
82971	5 G 1,5	16	11,0	119,0	224,0
82972	7 G 1,5	16	11,8	147,0	273,0
82973	9 G 1,5	16	14,0	182,0	340,0
82974	12 G 1,5	16	15,3	267,0	461,0
82975	18 G 1,5	16	18,5	374,0	674,0
82976	25 G 1,5	16	21,8	526,0	950,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82977	34 G 1,5	16	25,2	629,0	1203,0
82978	41 G 1,5	16	27,6	801,0	1588,0
82959	2 x 2,5	14	10,1	96,0	173,0
82960	3 G 2,5	14	10,6	144,0	220,0
82961	4 G 2,5	14	11,6	148,0	270,0
82962	5 G 2,5	14	12,7	181,0	329,0
82963	7 G 2,5	14	14,0	255,0	428,0
82964	9 G 2,5	14	16,4	309,0	580,0
82965	12 G 2,5	14	18,1	441,0	761,0
82966	18 G 2,5	14	22,2	570,0	1140,0
82967	25 G 2,5	14	27,0	738,0	1551,0
82954	2 x 4	12	11,2	120,0	209,0
82955	3 G 4	12	11,9	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	15,9	316,0	737,0
82949	2 x 6	10	12,9	173,0	318,0
82950	3 G 6	10	14,0	240,0	411,0
82951	4 G 6	10	15,4	305,0	572,0
82952	5 G 6	10	17,0	439,0	732,0
82953	7 G 6	10	18,3	505,0	961,0
82945	3 G 10	8	16,3	350,0	741,0
82946	4 G 10	8	19,4	535,0	988,0
82947	5 G 10	8	21,6	592,0	1202,0
82948	7 G 10	8	23,9	810,0	1743,0
82941	3 G 16	6	23,9	585,0	1088,0
82942	4 G 16	6	26,4	740,0	1662,0

Continuation ▸

JZ-602-CY screened two approval control cable, oil resistant,

EMC-preferred type, 90°C, 600 V, meter marking

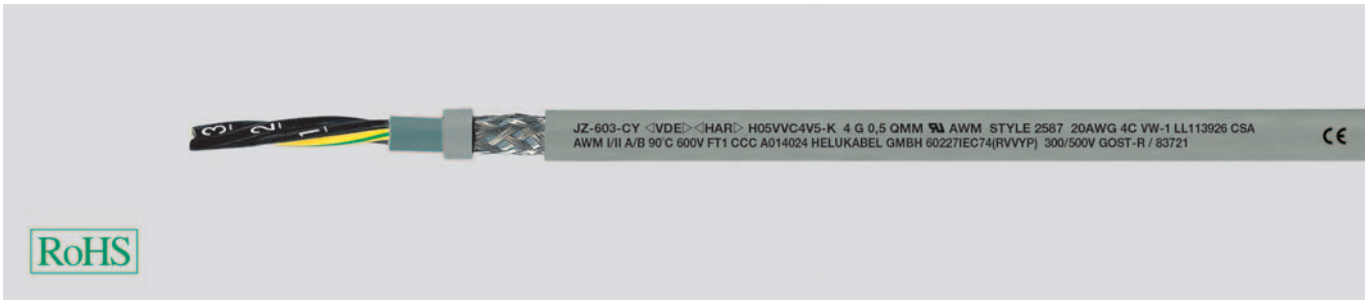
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
82943	5 G 16	6	29,6	895,0	2021,0
82944	7 G 16	6	32,6	1282,0	2720,0
82937	3 G 25	4	28,3	1070,0	1947,0
82938	4 G 25	4	31,4	1140,0	2591,0
82939	5 G 25	4	34,6	1380,0	3197,0
82940	7 G 25	4	38,1	1870,0	4530,0
82934	3 G 35	2	31,3	1240,0	2701,0
82935	4 G 35	2	34,4	1576,0	3277,0
82936	5 G 35	2	38,1	1930,0	4530,0
82488	3 G 50	1	37,0	1675,0	2870,0
82780	4 G 50	1	40,9	2155,0	3960,0
82781	5 G 50	1	45,0	2794,0	4371,0
82782	3 G 70	2/0	42,1	2288,0	3647,0
82783	4 G 70	2/0	46,2	3120,0	4882,0
82914	5 G 70	2/0	50,9	3705,0	5876,0
82915	3 G 95	3/0	46,2	3010,0	4751,0
82916	4 G 95	3/0	50,0	4043,0	6368,0
82917	5 G 95	3/0	56,0	5026,0	7843,0
82918	3 G 120	4/0	52,8	3812,0	5899,0
82919	4 G 120	4/0	58,2	5069,0	8010,0
82920	5 G 120	4/0	63,8	5877,0	9205,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS

JZ-603-CY Multi approval control cable, oil resistant, Cu-screened, EMC-preferred, meter marking



Technical data

- Special PVC control cable with oil resistant outer sheath to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51 and to UL-Style 2587
- **Temperature range**
  HAR
  flexing -5°C to +70°C
  fixed installation -40°C to +70°C
  UL/CSA
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  HAR U_0/U 300/500 V
  UL/CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 5x cable Ø
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded in layers with optimal lay-lengt
- PVC based inner sheath
- Tinned copper braiding screening, 85% coverage
- Outer sheath of special PVC, oil resistant compound type TM5 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Oil resistant to DIN VDE 0473-811-404/ DIN EN 60811-404, UL 1581 part 50.182
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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) UL VW-1, CSA FT1

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type:
  JZ-603, confer page 358

Application

UL-CSA-HAR approved cables offer any company exporting anywhere in the world, primarily designed for exporters, used in machine tools, control systems, assembly lines and other industrial equipment. These cables are suitable for flexible use for medium mechanical stresses with free movements in dry, moist and wet rooms but not for open air.

EMC = Electromagnetic compatibillity

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.

N

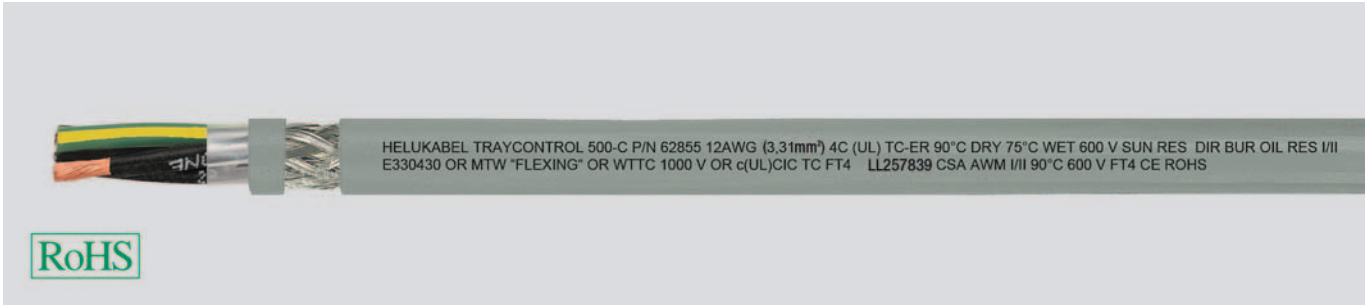
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83709	2 x 0,5	20	8,0	41,0	90,0
83720	3 G 0,5	20	8,3	45,0	105,0
83721	4 G 0,5	20	8,9	54,0	123,0
83722	5 G 0,5	20	9,7	66,0	147,0
83723	7 G 0,5	20	11,2	79,0	195,0
83724	12 G 0,5	20	13,6	137,0	276,0
83725	18 G 0,5	20	15,4	156,0	418,0
83726	25 G 0,5	20	18,6	250,0	504,0
83727	34 G 0,5	20	20,8	316,0	632,0
83728	41 G 0,5	20	22,6	348,0	750,0
83729	50 G 0,5	20	24,8	407,0	968,0
83730	61 G 0,5	20	26,0	520,0	1068,0
83710	2 x 0,75	19	8,3	46,0	101,0
83731	3 G 0,75	19	8,6	57,0	127,0
83732	4 G 0,75	19	9,4	63,0	155,0
83733	5 G 0,75	19	10,1	76,0	180,0
83734	7 G 0,75	19	11,9	100,0	225,0
83735	12 G 0,75	19	14,2	175,0	326,0
83736	18 G 0,75	19	16,6	240,0	457,0
83737	25 G 0,75	19	20,0	306,0	635,0
83738	34 G 0,75	19	22,4	346,0	805,0
83739	41 G 0,75	19	24,0	403,0	908,0
83740	50 G 0,75	19	26,2	470,0	1155,0
83741	61 G 0,75	19	30,0	550,0	1400,0
83711	2 x 1	18	8,6	54,0	113,0
83742	3 G 1	18	9,2	64,0	144,0
83743	4 G 1	18	9,8	76,0	178,0
83744	5 G 1	18	10,7	89,0	205,0
83745	7 G 1	18	12,5	114,0	263,0
83746	12 G 1	18	15,1	186,0	424,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83747	18 G 1	18	17,3	284,0	560,0
83748	25 G 1	18	21,1	387,0	760,0
83749	34 G 1	18	23,5	500,0	945,0
83750	41 G 1	18	25,5	578,0	1151,0
83751	50 G 1	18	27,6	681,0	1300,0
83752	61 G 1	18	32,4	710,0	1500,0
83712	2 x 1,5	16	9,6	64,0	144,0
83753	3 G 1,5	16	10,1	82,0	160,0
83754	4 G 1,5	16	11,0	99,0	210,0
83755	5 G 1,5	16	12,3	123,0	240,0
83756	7 G 1,5	16	14,2	148,0	305,0
83757	12 G 1,5	16	17,1	274,0	482,0
83758	18 G 1,5	16	20,0	386,0	611,0
83759	25 G 1,5	16	24,0	531,0	950,0
83760	34 G 1,5	16	27,1	671,0	1200,0
83761	41 G 1,5	16	29,7	840,0	1400,0
83762	50 G 1,5	16	31,8	997,0	1665,0
83763	61 G 1,5	16	34,6	1120,0	1852,0
83713	2 x 2,5	14	11,4	110,0	189,0
83764	3 G 2,5	14	12,0	148,0	244,0
83765	4 G 2,5	14	13,4	169,0	296,0
83766	5 G 2,5	14	14,6	220,0	367,0
83767	7 G 2,5	14	17,2	284,0	478,0
83768	12 G 2,5	14	21,2	470,0	622,0
83769	18 G 2,5	14	24,8	572,0	1010,0
83770	25 G 2,5	14	29,8	740,0	1375,0
83771	34 G 2,5	14	33,4	1179,0	1893,0
83772	50 G 2,5	14	39,0	1660,0	2666,0
83773	61 G 2,5	14	41,0	1992,0	3077,0

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

TRAYCONTROL® 500-C flexible, oil-resistant, screened,

EMC-preferred type, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2012



Technical data

- PVC control cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range**
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  AWM 1000 V
  TC Wind Turbine (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 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire with AWG dimensions
- Core insulation of special PVC with transparent nylon skin
- 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
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Separator
- Outer sheath of special PVC
- Sheath colour - grey (RAL 7001)
- with lenght marking in feet

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- **UL**:
  TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2012, WTTC 1000V, DP-1, OIL RES I & II, 90°C dry / 75°C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
- **CSA**:
  c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install

Available on request

- with blue cores (DC)
- with red cores (AC)
- Black or TPE outer sheath

Application

HELUKABEL® TRAYCONTROL® 500-C is a flexible, screened and oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 edition 2012. 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: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry.

EMC = Electromagnetic compatibillity

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.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62813	0,507	2 x 20	7,0	35,0	95,0
62814	0,507	3 x 20	7,6	42,0	115,0
62815	0,507	7 x 20	9,4	69,0	164,0
62816	0,507	12 x 20	11,0	108,0	266,0
62817	0,507	25 x 20	16,1	240,0	435,0
62818	0,963	2 x 18	8,1	50,0	110,0
62819	0,963	3 x 18	8,2	60,0	118,0
62820	0,963	4 x 18	8,8	71,0	136,0
62821	0,963	5 x 18	9,4	88,0	148,0
62822	0,963	7 x 18	10,1	111,0	192,0
62823	0,963	9 x 18	11,4	140,0	244,0
62824	0,963	10 x 18	12,0	150,0	283,0
62825	0,963	12 x 18	12,9	184,0	329,0
62826	0,963	15 x 18	14,8	207,0	377,0
62827	0,963	18 x 18	15,7	260,0	435,0
62828	0,963	19 x 18	15,7	280,0	443,0
62829	0,963	25 x 18	17,7	349,0	571,0
62830	1,31	3 x 16	8,9	74,0	144,0
62831	1,31	4 x 16	9,6	90,0	172,0
62832	1,31	5 x 16	10,3	104,0	188,0
62833	1,31	6 x 16	10,5	120,0	203,0
62834	1,31	7 x 16	11,3	134,0	244,0
62835	1,31	9 x 16	12,6	165,0	308,0
62836	1,31	10 x 16	12,9	180,0	346,0
62837	1,31	12 x 16	15,1	244,0	423,0
62838	1,31	15 x 16	16,4	270,0	441,0
62839	1,31	18 x 16	17,3	319,0	512,0
62840	1,31	19 x 16	17,6	327,0	503,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62841	1,31	20 x 16	17,5	340,0	524,0
62842	1,31	25 x 16	19,6	434,0	704,0
62843	2,08	3 x 14	9,8	112,0	179,0
62844	2,08	4 x 14	10,7	121,0	222,0
62845	2,08	5 x 14	11,6	150,0	266,0
62846	2,08	7 x 14	12,5	200,0	326,0
62847	2,08	9 x 14	15,0	240,0	435,0
62848	2,08	10 x 14	16,3	264,0	427,0
62849	2,08	12 x 14	16,9	350,0	592,0
62850	2,08	15 x 14	18,3	409,0	635,0
62851	2,08	18 x 14	19,5	471,0	780,0
62852	2,08	19 x 14	19,7	505,0	799,0
62853	2,08	25 x 14	23,3	652,0	1042,0
62854	3,31	3 x 12	11,4	137,0	237,0
62855	3,31	4 x 12	12,2	169,0	314,0
62856	3,31	5 x 12	13,4	201,0	386,0
62857	3,31	6 x 12	14,6	236,0	425,0
62858	3,31	7 x 12	15,5	262,0	496,0
62859	3,31	9 x 12	17,7	334,0	740,0
62860	3,31	12 x 12	19,7	434,0	887,0
62861	3,31	15 x 12	21,0	531,0	903,0
62862	3,31	19 x 12	23,1	720,0	1123,0
62863	3,31	20 x 12	25,0	764,0	1490,0
62864	3,31	25 x 12	27,1	914,0	1865,0
62865	5,26	3 x 10	14,1	240,0	389,0
62866	5,26	4 x 10	15,5	305,0	549,0
62867	5,26	5 x 10	16,8	399,0	610,0
62868	5,26	7 x 10	18,2	505,0	851,0

Continuation ▸

TRAYCONTROL® 500-C flexible, oil-resistant, screened,

EMC-preferred type, open installation TC-ER, PLTC-ER, ITC-ER, NFPA 79 Edition 2012

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62869	5,26	9 x 10	20,9	704,0	1132,0
62870	5,26	12 x 10	24,4	940,0	1523,0
62871	5,26	19 x 10	27,5	1210,0	1952,0
62872	8,37	4 x 8	19,9	535,0	852,0
62873	13,3	4 x 6	23,3	740,0	1202,0
62874	21,2	4 x 4	28,6	1140,0	1971,0
62875	33,6	4 x 2	33,2	1576,0	2887,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-MS-EP4

N

JZ-600-Y-CY UL/CSA flexible, number coded, 1000 V, EMC-preferred type, meter marking

Technical data

- Special PVC control cables adapted to DIN VDE 0276 part 627, DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, with insulation thickness for 1 kV type and UL-Std.758 Style 21179
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 10x cable Ø fixed installation 5x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- 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
- PVC-insulated inner sheath TM2, to DIN VDE 0207-363-4-1/DIN EN 50363-4-1, class 43 acc. to UL-Std.1581
- Braided screen of tinned Cu wires, coverage approx. 85%
- Outer sheath of special PVC compound type TM2 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour black (RAL 9005) or grey (RAL 7001)
- with meter marking

Properties

- Extensively oil resistant, oil-/ chemical Resistance - see table Technical Informations
- UV-resistant (building with black sheath)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-600 UL/CSA**, confer page 362

Application

PVC control cable for measuring, monitoring and control purposes in tool machinery, conveyor belts and production lines in machinery, in air conditioning, in foundries and steel mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation, building with black sheath). Is not suitable to be used as direct burrial- or as underwater cable. Interference-free transmission of signals and pulses is assured by the high degree of screening.
EMC = Electromagnetic compatibillity
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. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12345	2 x 0,5	20	8,3	41,0	129,0
12346	3 G 0,5	20	8,6	45,0	150,0
12347	4 G 0,5	20	9,4	54,0	170,0
12348	5 G 0,5	20	10,1	66,0	199,0
12349	7 G 0,5	20	12,1	79,0	235,0
12350	12 G 0,5	20	14,7	137,0	320,0
12351	18 G 0,5	20	17,3	156,0	428,0
12352	25 G 0,5	20	20,6	250,0	503,0
12353	2 x 0,75	19	8,7	46,0	143,0
12354	3 G 0,75	19	9,0	57,0	155,0
12355	4 G 0,75	19	9,9	63,0	190,0
12356	5 G 0,75	19	10,8	76,0	228,0
12357	7 G 0,75	19	13,0	100,0	323,0
12358	12 G 0,75	19	15,8	175,0	410,0
12359	18 G 0,75	19	17,9	240,0	560,0
12360	25 G 0,75	19	22,8	306,0	730,0
12361	2 x 1	18	9,4	54,0	150,0
12362	3 G 1	18	9,8	64,0	163,0
12363	4 G 1	18	10,8	76,0	200,0
12364	5 G 1	18	12,1	89,0	239,0
12365	7 G 1	18	14,5	114,0	289,0
12366	12 G 1	18	17,4	186,0	464,0
12367	18 G 1	18	20,7	284,0	628,0
12368	25 G 1	18	24,8	387,0	855,0
12369	2 x 1,5	16	10,2	64,0	162,0
12370	3 G 1,5	16	10,9	82,0	187,0
12371	4 G 1,5	16	12,2	99,0	240,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12410	2 x 0,5	20	8,3	41,0	129,0
12411	3 G 0,5	20	8,6	45,0	150,0
12412	4 G 0,5	20	9,4	54,0	170,0
12413	5 G 0,5	20	10,1	66,0	199,0
12414	7 G 0,5	20	12,1	79,0	235,0
12415	12 G 0,5	20	14,7	137,0	320,0
12416	18 G 0,5	20	17,3	156,0	428,0
12417	25 G 0,5	20	20,6	250,0	503,0
12418	2 x 0,75	19	8,7	46,0	143,0
12419	3 G 0,75	19	9,0	57,0	155,0
12420	4 G 0,75	19	9,9	63,0	190,0
12421	5 G 0,75	19	10,8	76,0	228,0
12422	7 G 0,75	19	13,0	100,0	323,0
12423	12 G 0,75	19	15,8	175,0	410,0
12424	18 G 0,75	19	17,9	240,0	560,0
12425	25 G 0,75	19	22,8	306,0	730,0
12426	2 x 1	18	9,4	54,0	150,0
12427	3 G 1	18	9,8	64,0	163,0
12428	4 G 1	18	10,8	76,0	200,0
12429	5 G 1	18	12,1	89,0	239,0
12430	7 G 1	18	14,5	114,0	289,0
12431	12 G 1	18	17,4	186,0	464,0
12432	18 G 1	18	20,7	284,0	628,0
12433	25 G 1	18	24,8	387,0	855,0
12434	2 x 1,5	16	10,2	64,0	162,0
12435	3 G 1,5	16	10,9	82,0	187,0
12436	4 G 1,5	16	12,2	99,0	240,0

Continuation ▸

JZ-600-Y-CY UL/CSA flexible, number coded, 1000 V, EMC-preferred type, meter marking

Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12372	5 G 1,5	16	13,3	123,0	289,0
12373	7 G 1,5	16	16,0	148,0	383,0
12374	12 G 1,5	16	19,6	274,0	592,0
12375	18 G 1,5	16	23,4	386,0	806,0
12376	25 G 1,5	16	28,2	531,0	1241,0
12377	2 x 2,5	14	11,5	110,0	272,0
12378	3 G 2,5	14	12,2	148,0	298,0
12379	4 G 2,5	14	13,4	169,0	345,0
12380	5 G 2,5	14	14,9	220,0	427,0
12381	7 G 2,5	14	17,9	284,0	561,0
12382	12 G 2,5	14	21,9	470,0	857,0
12383	18 G 2,5	14	26,1	572,0	1355,0
12384	25 G 2,5	14	31,9	740,0	1995,0
12385	2 x 4	12	14,3	124,0	306,0
12386	3 G 4	12	15,1	178,0	391,0
12387	4 G 4	12	16,7	234,0	527,0
12388	5 G 4	12	18,6	284,0	700,0
12389	7 G 4	12	20,0	321,0	920,0
12390	3 G 6	10	17,0	245,0	629,0
12391	4 G 6	10	18,7	316,0	731,0
12392	5 G 6	10	20,7	442,0	1105,0
12393	7 G 6	10	23,0	530,0	1465,0
12394	3 G 10	8	19,6	367,0	1125,0
12395	4 G 10	8	21,9	549,0	1345,0
12396	5 G 10	8	24,1	604,0	1635,0
12397	7 G 10	8	26,8	820,0	2210,0
12398	3 G 16	6	23,5	653,0	1395,0
12399	4 G 16	6	26,4	807,0	1870,0
12400	5 G 16	6	28,8	940,0	2720,0
12401	7 G 16	6	31,9	1345,0	3213,0
12402	3 G 25	4	28,0	920,0	2465,0
12403	4 G 25	4	32,5	1169,0	2750,0
12404	5 G 25	4	35,7	1420,0	3490,0
12405	7 G 25	4	39,0	1921,0	4980,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12437	5 G 1,5	16	13,3	123,0	289,0
12438	7 G 1,5	16	16,0	148,0	383,0
12439	12 G 1,5	16	19,6	274,0	592,0
12440	18 G 1,5	16	23,4	386,0	806,0
12441	25 G 1,5	16	28,2	531,0	1241,0
12442	2 x 2,5	14	11,5	110,0	272,0
12443	3 G 2,5	14	12,2	148,0	298,0
12444	4 G 2,5	14	13,4	169,0	345,0
12445	5 G 2,5	14	14,9	220,0	427,0
12446	7 G 2,5	14	17,9	284,0	561,0
12447	12 G 2,5	14	21,9	470,0	857,0
12448	18 G 2,5	14	26,1	572,0	1355,0
12449	25 G 2,5	14	31,9	740,0	1995,0
12450	2 x 4	12	14,3	124,0	306,0
12451	3 G 4	12	15,1	178,0	391,0
12452	4 G 4	12	16,7	234,0	527,0
12453	5 G 4	12	18,6	284,0	700,0
12454	7 G 4	12	20,0	321,0	920,0
12455	3 G 6	10	17,0	245,0	629,0
12456	4 G 6	10	18,7	316,0	731,0
12457	5 G 6	10	20,7	442,0	1105,0
12458	7 G 6	10	23,0	530,0	1465,0
12459	3 G 10	8	19,6	367,0	1125,0
12460	4 G 10	8	21,9	549,0	1345,0
12461	5 G 10	8	24,1	604,0	1635,0
12462	7 G 10	8	26,8	820,0	2210,0
12463	3 G 16	6	23,5	653,0	1395,0
12464	4 G 16	6	26,4	807,0	1870,0
12465	5 G 16	6	28,8	940,0	2720,0
12466	7 G 16	6	31,9	1345,0	3213,0
12467	3 G 25	4	28,0	920,0	2465,0
12468	4 G 25	4	32,5	1169,0	2750,0
12469	5 G 25	4	35,7	1420,0	3490,0
12470	7 G 25	4	39,0	1921,0	4980,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-MS-EP4

N

JZ-604-FCY TC TRAY CABLE PVC power cable, exposed run, screened, NFPA 79 Edition 2012, 90°C, 600 V, EMC-preferred type, meter marking

Technical data

- PVC power cable, screened to UL-Std.1277 TRAY CABLE
- **Multinorm** AWM-Style 2587 to UL-Std.758 and CSA C22.2 No 210 I/II A/B 90°C 600 V
- **Temperature range** dry environment flexing -5°C to +90°C fixed installation -25°C to +90°C wet environment flexing -5°C to +75°C fixed installation -25°C to +75°C
- **Nominal voltage** UL 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** 10x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC class 12 B to tab.50.155 acc. to UL-Std.1581, type TFF acc. to UL-Std. 62 (AWG 20-AWG 16), type THHW acc. to UL-Std.83 (AWG 14)
- 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
- Special separation foil
- Tinned copper braided screening, approx. 85% coverage
- Outer sheath of special PVC acc. to UL-Std.1277 tab.11.2
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- uv-resistant

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-604 TC TRAY CABLE**, confer page 364

Application

USA NFPA 79 edition 2012 conformant flexible power cables up to 600 V, for all machinery in tool and plant constuction, suitable for installation 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 and industrial plants.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69750	2 x 1	18	8,6	50,0	151,0
69751	3 G 1	18	9,0	60,0	164,0
69752	4 G 1	18	9,7	71,0	200,0
69753	5 G 1	18	10,5	88,0	229,0
69754	7 G 1	18	12,2	111,0	306,0
69755	9 G 1	18	13,2	139,0	371,0
69756	10 G 1	18	15,0	150,0	411,0
69757	12 G 1	18	15,4	184,0	460,0
69758	18 G 1	18	17,8	260,0	624,0
69759	25 G 1	18	21,9	349,0	845,0
69760	34 G 1	18	24,5	486,0	984,0
69761	50 G 1	18	26,2	625,0	1096,0
69762	2 x 1,5	16	9,0	63,0	161,0
69763	3 G 1,5	16	9,4	80,0	181,0
69764	4 G 1,5	16	10,2	97,0	240,0
69765	5 G 1,5	16	11,1	119,0	274,0
69766	7 G 1,5	16	12,9	147,0	367,0
69767	8 G 1,5	16	14,5	170,0	431,0
69768	9 G 1,5	16	14,5	182,0	437,0
69769	10 G 1,5	16	15,8	193,0	511,0
69770	12 G 1,5	16	16,2	267,0	598,0
69771	16 G 1,5	16	17,9	315,0	630,0
69772	18 G 1,5	16	18,9	374,0	787,0
69773	25 G 1,5	16	22,3	526,0	1240,0
69774	34 G 1,5	16	24,9	629,0	1401,0
69775	41 G 1,5	16	26,7	801,0	2671,0
69776	50 G 1,5	16	33,7	885,0	3614,0
69777	61 G 1,5	16	36,0	1100,0	4089,0
69778	2 x 2,5	14	10,0	96,0	269,0
69779	3 G 2,5	14	10,5	144,0	294,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69780	4 G 2,5	14	11,4	148,0	341,0
69781	5 G 2,5	14	12,4	181,0	420,0
69782	7 G 2,5	14	15,3	255,0	551,0
69783	8 G 2,5	14	16,5	285,0	583,0
69784	9 G 2,5	14	16,5	309,0	593,0
69785	10 G 2,5	14	17,9	340,0	631,0
69786	12 G 2,5	14	18,4	441,0	847,0
69787	18 G 2,5	14	22,4	570,0	1336,0
69788	25 G 2,5	14	26,5	738,0	1921,0
69789	3 G 4	12	11,6	174,0	381,0
69790	4 G 4	12	12,6	230,0	504,0
69791	5 G 4	12	14,5	273,0	692,0
69792	7 G 4	12	17,1	316,0	908,0
69793	9 G 4	12	18,4	402,0	1104,0
69794	12 G 4	12	20,5	507,0	1497,0
69795	18 G 4	12	25,0	751,0	2104,0
69796	3 G 6	10	13,8	240,0	623,0
69797	4 G 6	10	15,1	305,0	729,0
69798	5 G 6	10	16,4	439,0	1082,0
69799	7 G 6	10	18,0	505,0	1414,0
69800	3 G 10	8	17,6	350,0	1108,0
69801	4 G 10	8	19,3	535,0	1324,0
69802	5 G 10	8	22,1	592,0	1596,0
69803	7 G 10	8	24,2	810,0	2186,0

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

JZ-604-YCY TC TRAY CABLE PVC power cable, exposed run, screened, NFPA 79 Edition 2012, 90°C, 600 V, EMC-preferred type, meter marking

Technical data

- PVC power cable, screened to UL-Std.1277 TRAY CABLE
- **Multinorm**
  also conforms to the following standards: AWM-Style 2587 to UL-Std.758 (cUL) and CSA type TC FT4 to C22.2 no 230, CSA C22.2 No 210 I/II A/B 90°C 600 V FT4
- **Temperature range**
  dry environment
  flexing -5°C to +90°C
  fixed installation -25°C to +90°C
  wet environment
  flexing -5°C to +75°C
  fixed installation -25°C to +75°C
- **Nominal voltage** UL 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  10x cable Ø
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC class 12 B to tab.50.155 acc. to UL-Std.1581 type TFF acc. to UL-Std.62 (AWG 20-AWG 16)
  type THHW to UL-Std.83 (AWG 14)
- 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
- PVC-inner sheath acc. to UL-Std.1277 tab.11.2
- Tinned copper braided screening, approx. 85% coverage
- Outer sheath of special PVC acc. to UL-Std.1277 tab.11.2,
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- uv-resistant

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type:
  JZ 604 TC TRAY CABLE, confer page 364

Application

USA NFPA 79 edition 2012 conformant flexible power cables up to 600 V, for all machinery in tool and plant constuction, suitable for installation 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 and industrial plants.

EMC = Electromagnetic compatibillity

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.

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69804	3 G 16	6	25,2	653,0	1385,0
69805	4 G 16	6	27,8	807,0	1861,0
69806	5 G 16	6	31,2	940,0	2614,0
69807	7 G 16	6	34,5	1345,0	3211,0
69808	3 G 25	4	29,0	920,0	2455,0
69809	4 G 25	4	32,4	1169,0	2721,0
69810	5 G 25	4	34,2	1420,0	3490,0
69811	7 G 25	4	40,3	1921,0	4960,0
69812	3 G 35	2	32,4	1250,0	3130,0
69813	4 G 35	2	36,2	1680,0	4100,0
69814	5 G 35	2	40,5	2020,0	4921,0
69815	3 G 50	1	40,4	1887,0	4560,0
69816	4 G 50	1	45,5	2370,0	5761,0
69817	5 G 50	1	50,0	2880,0	7186,0
69818	3 G 70	2/0	47,1	2516,0	5580,0
69819	4 G 70	2/0	51,1	3257,0	7387,0
69820	5 G 70	2/0	56,0	4032,0	9290,0
69821	3 G 95	3/0	50,1	3086,0	8520,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69822	4 G 95	3/0	55,0	4060,0	10200,0
69823	5 G 95	3/0	60,5	5244,0	13800,0
69824	3 G 120	4/0	54,0	4176,0	11090,0
69825	4 G 120	4/0	59,5	5231,0	13620,0
69826	5 G 120	4/0	64,5	6624,0	15420,0

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

TRAYCONTROL® 600-C flexible, oil-resistant, screened,

EMC-preferred type, open installation (TC-ER), NFPA 79 Edition 2012

RoHS

Technical data

- PVC power cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range**
  UL+CSA TC -40°C to +90°C
  AWM -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  AWM 1000 V
  WTTC 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**
  max. 250 Ohm/km
- **Minimum bending radius**
  6x cable Ø
- **Insulation resistance**
  min. 20 MOhm x km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire with AWG dimensions
- Core insulation of special PVC with transparent nylon skin
- 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-lengths
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Separator
- Outer sheath of special PVC
- Sheath colour - black (RAL 9005)
- with lenght marking in feet

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- **UV-resistant**

Tests

- **UL:**
  TC-ER, PLTC-ER (AWG 18 - AWG 12),
  ITC-ER (AWG 18 - AWG 12),
  UL Type WTTC, UL Type MTW
  NFPA 79 2012, Oil Res I (Oil Res II also available), 90°C dry / 75°C wet,
  Class 1 Div. 2 per NEC Art. 336, 392, 501
- **CSA**:
  c (UL) CIC-TC FT4,
  CSA AWM I/II A/B FT4

Note

- **Advantages**
- TC-ER, Tray Cable Exposed Run
- Simple installation
- Outstanding flexibility

Application

USA NFPA 79 edition 2012 compliant, screened, flexible power cable to 600 V (WTTC 1000 V), for all tool and plant construction machinery, suitable for installation in dry, damp and wet environments, outdoors and in pipes. For underground installation and for open, unprotected installtion from the cable tray to the machine and industrial plants.

EMC = Electromagnetic compatibillity

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.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63049	0,963	3 x 18	8,2	31,0	118,0
63050	0,963	4 x 18	8,8	52,0	136,0
63051	0,963	5 x 18	9,4	62,0	149,0
63052	0,963	7 x 18	10,1	83,0	193,0
63053	0,963	12 x 18	12,9	143,0	328,0
63054	0,963	18 x 18	15,7	207,0	431,0
63055	0,963	25 x 18	17,7	284,0	569,0
62997	1,31	3 x 16	8,9	57,0	144,0
63056	1,31	4 x 16	9,6	72,0	172,0
63057	1,31	5 x 16	10,3	84,0	186,0
63058	1,31	7 x 16	11,3	124,0	243,0
63059	1,31	12 x 16	15,1	199,0	421,0
63060	1,31	18 x 16	17,3	290,0	510,0
63061	1,31	25 x 16	19,6	384,0	704,0
63062	2,08	3 x 14	9,8	85,0	178,0
63063	2,08	4 x 14	10,7	115,0	220,0

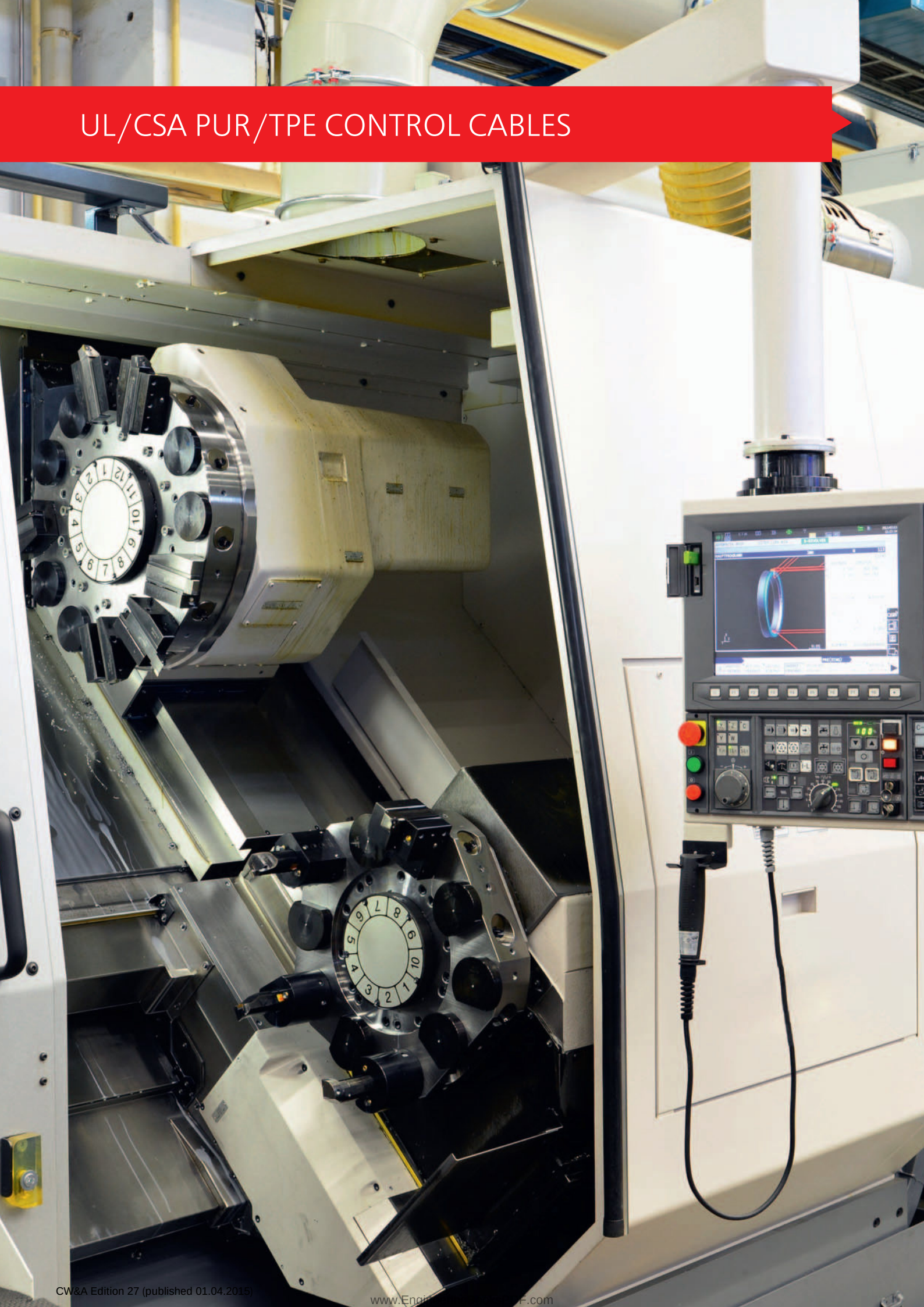
Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63064	2,08	5 x 14	11,6	139,0	264,0
63065	2,08	7 x 14	12,5	185,0	325,0
63066	2,08	12 x 14	16,9	309,0	591,0
63067	2,08	18 x 14	19,5	448,0	780,0
63068	2,08	25 x 14	23,3	632,0	1041,0
63069	3,31	4 x 12	12,2	179,0	313,0
63070	3,31	5 x 12	13,4	223,0	384,0
63071	3,31	7 x 12	15,5	298,0	492,0
63072	5,26	4 x 10	15,5	256,0	547,0
63073	5,26	5 x 10	16,8	312,0	608,0
63074	5,26	7 x 10	18,2	430,0	850,0
63075	8,37	4 x 8	19,9	426,0	851,0
63076	13,3	4 x 6	23,3	657,0	1197,0
63077	21,2	4 x 4	28,6	1026,0	1970,0
63078	33,6	4 x 2	33,2	1412,0	2874,0

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

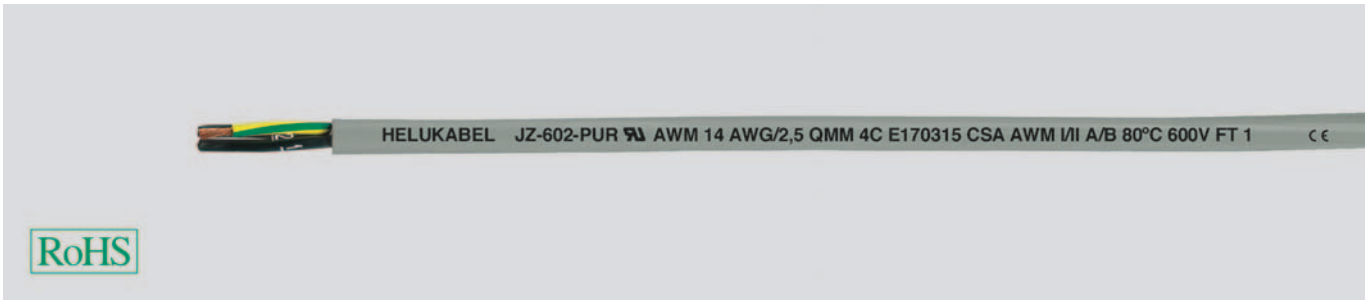
Suitable accessories can be found in Chapter X.

• Cable Gland - HELUTOP® HT-MS-EP4

UL/CSA PUR/TPE CONTROL CABLES



JZ-602-PUR 80°C, 600 V, two approval control cable, meter marking



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (sheath insulation) and CSA
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance** min 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of PVC compound type TI3 to DIN VDE 0207-363-3 / DIN EN 50363-3 and UL-Style 10012
- 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
- Outer sheath of special **full-polyurethane**
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils, coolant, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-602-C-PUR**, confer page 389

Application

UL and CSA approved flexible control cable rated at 600 V, primarily designed for exporters to the US or Canadian market. Used in machine tools, control systems, connection between control panels and machines, assembly lines and other industrial equipment. Suitable for installation in dry, moist, wet and outdoor environment and moderate flexing applications.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12471	2 x 0,5	20	5,8	9,6	52,0
12472	3 G 0,5	20	6,2	14,0	64,0
12473	4 G 0,5	20	6,6	19,0	72,0
12474	5 G 0,5	20	7,2	24,0	88,0
12475	7 G 0,5	20	8,4	34,0	130,0
12476	8 G 0,5	20	9,5	38,4	145,0
12477	9 G 0,5	20	10,3	43,2	180,0
12478	12 G 0,5	20	10,8	58,0	196,0
12479	18 G 0,5	20	12,8	86,0	260,0
12480	25 G 0,5	20	15,4	120,0	368,0
12481	34 G 0,5	20	17,6	163,0	502,0
12482	41 G 0,5	20	19,7	197,0	594,0
12483	2 x 1	18	6,2	19,2	57,0
12484	3 G 1	18	6,6	27,0	68,0
12485	4 G 1	18	7,2	38,4	79,0
12486	5 G 1	18	7,8	48,0	97,0
12487	7 G 1	18	9,1	67,0	141,0
12488	8 G 1	18	9,9	76,8	152,0
12489	9 G 1	18	11,0	86,4	190,0
12490	12 G 1	18	11,7	115,2	211,0
12491	18 G 1	18	14,0	173,0	284,0
12492	25 G 1	18	17,0	240,0	394,0
12493	34 G 1	18	19,2	326,0	521,0
12494	41 G 1	18	21,0	394,0	609,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12495	2 x 1,5	16	6,8	28,8	75,0
12496	3 G 1,5	16	7,4	44,0	96,0
12497	4 G 1,5	16	8,0	58,0	117,0
12498	5 G 1,5	16	8,6	72,0	140,0
12499	7 G 1,5	16	10,5	101,0	186,0
12500	9 G 1,5	16	12,7	129,7	244,0
12501	12 G 1,5	16	13,3	173,0	319,0
12502	18 G 1,5	16	15,7	260,0	451,0
12503	25 G 1,5	16	18,8	360,0	625,0
12504	34 G 1,5	16	22,0	490,0	850,0
12505	41 G 1,5	16	23,6	590,0	1041,0
12506	2 x 2,5	14	8,1	48,0	115,0
12507	3 G 2,5	14	8,6	72,0	143,0
12508	4 G 2,5	14	10,0	96,0	185,0
12509	5 G 2,5	14	10,8	120,0	221,0
12510	7 G 2,5	14	13,0	168,0	293,0
12511	9 G 2,5	14	15,5	216,0	429,0
12512	12 G 2,5	14	16,6	288,0	563,0
12513	18 G 2,5	14	19,5	432,0	854,0
12514	19 G 2,5	14	19,5	456,0	914,0
12515	25 G 2,5	14	23,8	600,0	1188,0
12516	3 G 4	12	11,1	115,0	232,0
12517	4 G 4	12	12,4	154,0	298,0

Continuation ▸

JZ-602-PUR 80°C, 600 V, two approval control cable, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12518	5 G 4	12	13,7	192,0	358,0
12519	7 G 4	12	16,2	269,0	460,0
12520	3 G 6	10	12,8	173,0	360,0
12521	4 G 6	10	14,1	231,0	402,0
12522	5 G 6	10	15,7	288,0	484,0
12523	7 G 6	10	19,2	403,0	630,0
12524	3 G 10	8	16,8	288,0	535,0
12525	4 G 10	8	18,3	384,0	653,0
12526	5 G 10	8	20,1	480,0	786,0
12527	7 G 10	8	22,4	672,0	1100,0
12528	2 x 16	6	19,2	307,0	640,0
12529	3 G 16	6	20,5	461,0	810,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12530	4 G 16	6	23,0	615,0	1045,0
12531	5 G 16	6	25,5	768,0	1260,0
12532	7 G 16	6	28,2	1075,0	1760,0
12533	3 G 25	4	25,0	720,0	1180,0
12534	4 G 25	4	28,1	960,0	1507,0
12535	5 G 25	4	30,9	1200,0	1858,0
12536	7 G 25	4	35,5	1680,0	2830,0
12537	3 G 35	2	28,6	1008,0	1590,0
12538	4 G 35	2	31,7	1344,0	2123,0
12539	5 G 35	2	35,5	1680,0	2612,0
12540	4 G 50	1	35,8	1920,0	3058,0
12541	4 G 70	2/0	41,6	2688,0	4254,0
12542	4 G 95	3/0	46,0	3648,0	5762,0
12543	4 G 120	4/0	52,8	4608,0	7280,0

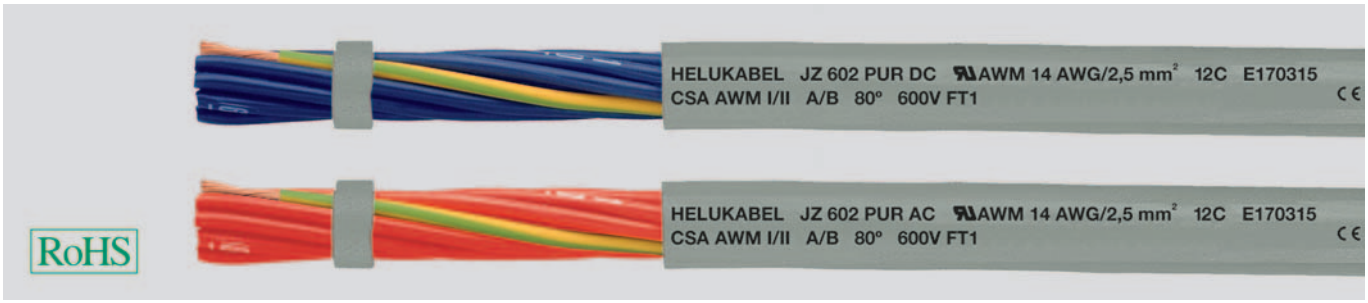
Dimensions and specifications may be changed without prior notice. (RN01)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS
- Cable Gland - HELUTOP® HT-MS-EP 4

N

JZ-602-PUR DC/AC 80°C, 600 V, two approval control cable, meter marking



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (sheath insulation) and CSA
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance** min 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of PVC compound type TI3 to DIN VDE 0207-363-3 / DIN EN 50363-3 and UL-Style 10012
- Core identification blue (DC) or red (AC) with continuous white numbering
- GN-YE conductor
- Cores stranded in layers with optimal lay-length
- Outer sheath of special **full-polyurethane**
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils, coolant, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- High abrasion resistance
- Tear and cut resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor
- DC = blue cores;
- AC = red cores;
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For use on conveyor belts, tooling machines, conveyor system, production lines and automotive production plants. Also for medium mechanical stress in flexible applications with free movement and without tensile stress. UL and CSA approved control cables espacially for U. S. and Canadian markets.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

JZ-602 PUR DC (blue core)

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12805	3 G 1	18	6,6	27,0	68,0
12806	4 G 1	18	7,2	38,0	79,0
12807	5 G 1	18	7,8	48,0	97,0
12808	7 G 1	18	9,1	67,0	141,0
12809	12 G 1	18	11,7	115,0	211,0
12810	18 G 1	18	14,0	173,0	284,0
12811	25 G 1	18	17,0	240,0	394,0
12812	3 G 1,5	16	7,4	44,0	96,0
12813	4 G 1,5	16	8,0	58,0	117,0
12814	5 G 1,5	16	8,6	72,0	140,0
12815	7 G 1,5	16	10,5	101,0	186,0
12816	12 G 1,5	16	13,3	173,0	319,0
12817	18 G 1,5	16	15,7	260,0	451,0
12818	25 G 1,5	16	18,8	360,0	625,0
12819	3 G 2,5	14	8,6	72,0	143,0
12820	4 G 2,5	14	10,0	96,0	185,0
12821	5 G 2,5	14	10,8	120,0	221,0
12822	7 G 2,5	14	13,0	168,0	293,0
12823	12 G 2,5	14	16,6	288,0	563,0
12824	18 G 2,5	14	19,5	432,0	854,0
12825	25 G 2,5	14	23,8	600,0	1188,0

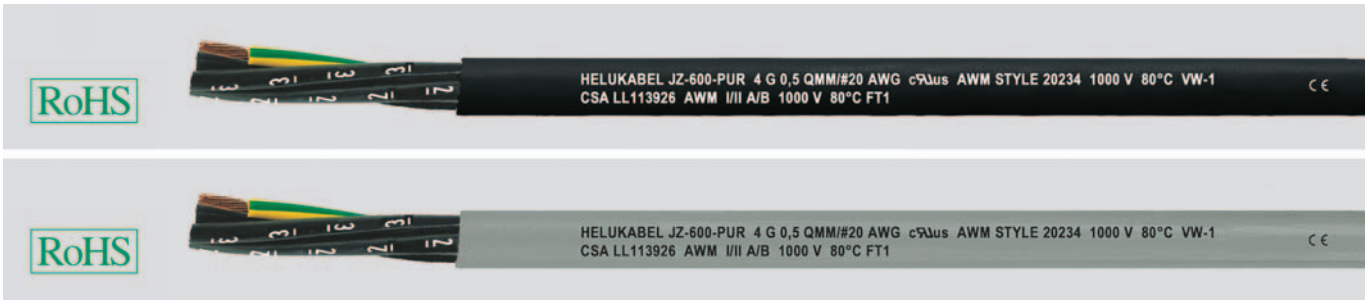
JZ-602 PUR AC (red core)

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12826	3 G 1	18	6,6	27,0	68,0
12827	4 G 1	18	7,2	38,0	79,0
12828	5 G 1	18	7,8	48,0	97,0
12829	7 G 1	18	9,1	67,0	141,0
12830	12 G 1	18	11,7	115,0	211,0
12831	18 G 1	18	14,0	173,0	284,0
12832	25 G 1	18	17,0	240,0	394,0
12833	3 G 1,5	16	7,4	44,0	96,0
12834	4 G 1,5	16	8,0	58,0	117,0
12835	5 G 1,5	16	8,6	72,0	140,0
12836	7 G 1,5	16	10,5	101,0	186,0
12837	12 G 1,5	16	13,3	173,0	319,0
12838	18 G 1,5	16	15,7	260,0	451,0
12839	25 G 1,5	16	18,8	360,0	625,0
12840	3 G 2,5	14	8,6	72,0	143,0
12841	4 G 2,5	14	10,0	96,0	185,0
12842	5 G 2,5	14	10,8	120,0	221,0
12843	7 G 2,5	14	13,0	168,0	293,0
12844	12 G 2,5	14	16,6	288,0	563,0
12845	18 G 2,5	14	19,5	432,0	854,0
12846	25 G 2,5	14	23,8	600,0	1188,0

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

Suitable accessories can be found in Chapter X.
• Cable Gland - HELUTOP® HT-PA
• Cable Gland - HELUTOP® HT-MS
• Cable Gland - HELUTOP® HT-MS-EP 4

JZ-600 PUR tear and coolant resistant, 1000 V, meter marking



Technical data

- Special PUR control cables Adapted to DIN VDE 0276 part 627, DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, with insulation thickness for 1 kV type and UL-Std.758 Style 20234
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 100x10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, as per DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581 UL-Style 10012
- 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
- Outer sheath of special full-polyurethane adapted to DIN VDE 0207-363-10-2/ DIN EN 50363-10-2, flame retardant acc. to UL-Std.758
- Sheath colour black (RAL 9005) or grey (RAL 7001)
- with meter marking

Properties

- High abrasion resistance
- High flexibility
- Resistant to ultra violet rays
- Wear resistant
- resistant to mineral oils and coolant emulsions
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **JZ-600-YC-PUR**, confer page 390

Application

Extremely robust, control cable resistant to mineral oils and to coolant emulsions. In tool machinery, conveyor belts and production lines, for plant installations, air conditioning and in steel production plants and rolling mills. Suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside. Interesting for the export-oriented machinery plants.

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

N

Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28240	2 x 0,5	20	6,9	9,6	60,0
28241	3 G 0,5	20	7,3	14,4	70,0
28242	4 G 0,5	20	7,9	19,0	104,0
28243	5 G 0,5	20	8,5	24,0	120,0
28244	7 G 0,5	20	9,9	33,6	141,0
28245	12 G 0,5	20	12,2	58,0	208,0
28246	18 G 0,5	20	14,4	86,0	289,0
28247	25 G 0,5	20	17,2	120,0	342,0
28248	2 x 0,75	19	7,3	14,4	70,0
28249	3 G 0,75	19	7,7	21,6	78,0
28250	4 G 0,75	19	8,3	29,0	134,0
28251	5 G 0,75	19	9,1	36,0	149,0
28252	7 G 0,75	19	10,7	50,0	201,0
28253	12 G 0,75	19	13,1	86,0	269,0
28254	18 G 0,75	19	15,6	130,0	378,0
28255	25 G 0,75	19	18,9	180,0	498,0
28256	2 x 1	18	7,9	19,2	86,0
28257	3 G 1	18	8,3	29,0	100,0
28258	4 G 1	18	9,1	38,4	107,0
28259	5 G 1	18	9,9	48,0	130,0
28260	7 G 1	18	11,7	67,0	174,0
28261	12 G 1	18	14,5	115,0	290,0
28262	18 G 1	18	17,3	173,0	405,0
28263	25 G 1	18	21,1	240,0	570,0
28264	2 x 1,5	16	8,7	29,0	97,0
28265	3 G 1,5	16	9,2	43,0	118,0
28266	4 G 1,5	16	10,0	58,0	141,0
28267	5 G 1,5	16	11,0	72,0	181,0
28268	7 G 1,5	16	13,3	101,0	234,0
28269	12 G 1,5	16	16,6	173,0	370,0
28270	18 G 1,5	16	19,7	259,0	520,0
28271	25 G 1,5	16	23,9	360,0	730,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28305	2 x 0,5	20	6,9	9,6	60,0
28306	3 G 0,5	20	7,3	14,4	70,0
28307	4 G 0,5	20	7,9	19,0	104,0
28308	5 G 0,5	20	8,5	24,0	120,0
28309	7 G 0,5	20	9,9	33,6	141,0
28310	12 G 0,5	20	12,2	58,0	208,0
28311	18 G 0,5	20	14,4	86,0	289,0
28312	25 G 0,5	20	17,2	120,0	342,0
28313	2 x 0,75	19	7,3	14,4	70,0
28314	3 G 0,75	19	7,7	21,6	78,0
28315	4 G 0,75	19	8,3	29,0	134,0
28316	5 G 0,75	19	9,1	36,0	149,0
28317	7 G 0,75	19	10,7	50,0	201,0
28318	12 G 0,75	19	13,1	86,0	269,0
28319	18 G 0,75	19	15,6	130,0	378,0
28320	25 G 0,75	19	18,9	180,0	498,0
28321	2 x 1	18	7,9	19,2	86,0
28322	3 G 1	18	8,3	29,0	100,0
28323	4 G 1	18	9,1	38,4	107,0
28324	5 G 1	18	9,9	48,0	130,0
28325	7 G 1	18	11,7	67,0	174,0
28326	12 G 1	18	14,5	115,0	290,0
28327	18 G 1	18	17,3	173,0	405,0
28328	25 G 1	18	21,1	240,0	570,0
28329	2 x 1,5	16	8,7	29,0	97,0
28330	3 G 1,5	16	9,2	43,0	118,0
28331	4 G 1,5	16	10,0	58,0	141,0
28332	5 G 1,5	16	11,0	72,0	181,0
28333	7 G 1,5	16	13,3	101,0	234,0
28334	12 G 1,5	16	16,6	173,0	370,0
28335	18 G 1,5	16	19,7	259,0	520,0
28336	25 G 1,5	16	23,9	360,0	730,0

Continuation ▸

JZ-600 PUR tear and coolant resistant, 1000 V, meter marking

Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28272	2 x 2,5	14	9,5	48,0	170,0
28273	3 G 2,5	14	10,0	72,0	181,0
28274	4 G 2,5	14	11,1	96,0	203,0
28275	5 G 2,5	14	12,4	120,0	251,0
28276	7 G 2,5	14	15,0	168,0	330,0
28277	12 G 2,5	14	18,4	288,0	553,0
28278	18 G 2,5	14	22,0	432,0	795,0
28279	25 G 2,5	14	26,9	600,0	1110,0
28280	2 x 4	12	11,4	77,0	190,0
28281	3 G 4	12	12,3	115,0	235,0
28282	4 G 4	12	13,8	154,0	310,0
28283	5 G 4	12	15,3	192,0	410,0
28284	7 G 4	12	16,8	269,0	540,0
28285	12 G 4	12	22,9	461,0	860,0
28286	3 G 6	10	14,1	173,0	370,0
28287	4 G 6	10	15,6	230,0	430,0
28288	5 G 6	10	17,3	288,0	650,0
28289	7 G 6	10	19,3	403,0	860,0
28290	3 G 10	8	16,5	288,0	660,0
28291	4 G 10	8	18,4	384,0	790,0
28292	5 G 10	8	20,5	480,0	960,0
28293	7 G 10	8	22,5	672,0	1300,0
28294	3 G 16	6	19,6	461,0	709,0
28295	4 G 16	6	21,7	614,0	1114,0
28296	5 G 16	6	24,2	768,0	1620,0
28297	7 G 16	6	25,7	1075,0	1900,0
28298	3 G 25	4	24,0	720,0	1450,0
28299	4 G 25	4	26,9	960,0	1600,0
28300	5 G 25	4	29,3	1200,0	2050,0
28301	7 G 25	4	32,6	1680,0	2900,0

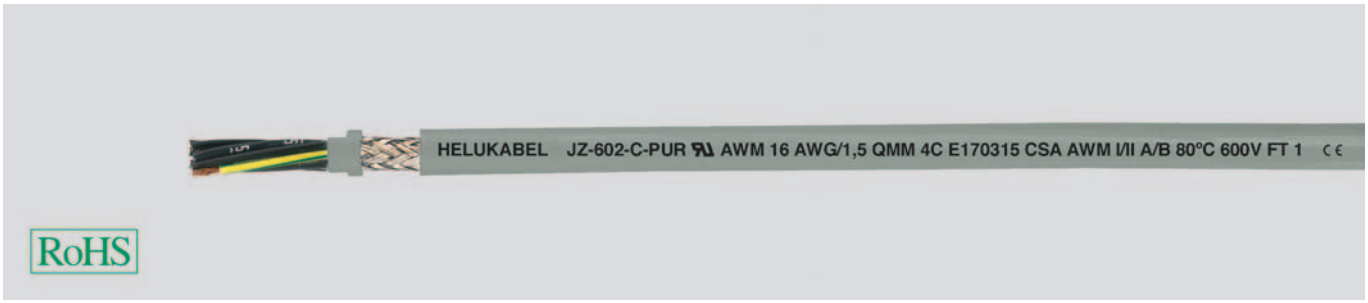
Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28337	2 x 2,5	14	9,5	48,0	170,0
28338	3 G 2,5	14	10,0	72,0	181,0
28339	4 G 2,5	14	11,1	96,0	203,0
28340	5 G 2,5	14	12,4	120,0	251,0
28341	7 G 2,5	14	15,0	168,0	330,0
28342	12 G 2,5	14	18,4	288,0	553,0
28343	18 G 2,5	14	22,0	432,0	795,0
28344	25 G 2,5	14	26,9	600,0	1110,0
28345	2 x 4	12	11,4	77,0	190,0
28346	3 G 4	12	12,3	115,0	235,0
28347	4 G 4	12	13,8	154,0	310,0
28348	5 G 4	12	15,3	192,0	410,0
28349	7 G 4	12	16,8	269,0	540,0
28350	12 G 4	12	22,9	461,0	860,0
28351	3 G 6	10	14,1	173,0	370,0
28352	4 G 6	10	15,6	230,0	430,0
28353	5 G 6	10	17,3	288,0	650,0
28354	7 G 6	10	19,3	403,0	860,0
28355	3 G 10	8	16,5	288,0	660,0
28356	4 G 10	8	18,4	384,0	790,0
28357	5 G 10	8	20,5	480,0	960,0
28358	7 G 10	8	22,5	672,0	1300,0
28359	3 G 16	6	19,6	461,0	709,0
28360	4 G 16	6	21,7	614,0	1114,0
28361	5 G 16	6	24,2	768,0	1620,0
28362	7 G 16	6	25,8	1075,0	1900,0
28363	3 G 25	4	24,0	720,0	1450,0
28364	4 G 25	4	26,9	960,0	1600,0
28365	5 G 25	4	29,3	1200,0	2050,0
28366	7 G 25	4	32,6	1680,0	2900,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-PA
- Cable Gland - HELUTOP® HT-MS
- Cable Gland - HELUTOP® HT-MS-EP 4

JZ-602-C-PUR screened two approval control cable, 80°C, 600 V, EMC-preferred type, meter marking



Technical data

- Special PUR-insulated to UL CSA AWM I/II A/B Style 20939 and CSA
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 3000 V
- **Breakdown voltage** min. 6000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 10x cable Ø fixed installation 5x cable Ø
- **Radiation resistance** up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper, fine wire stranded to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and UL-Style 10012
- 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
- PVC-insulated inner sheath YM5 to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1
- Braided screen of tinned Cu wires, approx. 85% coverage
- Outer sheath of **full-polyurethane**
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils and coolant, UV-radiation, osygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-602 PUR**, confer page 384

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, wet and outdoor environments for medium mechanical loads. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada.

EMC = Electromagnetic compatibillity

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.

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12550	2 x 0,5	20	7,7	41,0	93,0
12551	3 G 0,5	20	8,0	45,0	124,0
12552	4 G 0,5	20	8,6	54,0	133,0
12553	5 G 0,5	20	9,2	66,0	153,0
12554	7 G 0,5	20	10,5	79,0	191,0
12555	9 G 0,5	20	12,3	94,0	243,0
12556	12 G 0,5	20	13,0	137,0	322,0
12557	18 G 0,5	20	15,6	156,0	374,0
12558	25 G 0,5	20	18,2	250,0	436,0
12559	34 G 0,5	20	20,1	316,0	560,0
12560	41 G 0,5	20	22,4	348,0	663,0
12561	2 x 1	18	8,1	54,0	107,0
12562	3 G 1	18	8,4	64,0	130,0
12563	4 G 1	18	9,1	76,0	155,0
12564	5 G 1	18	10,0	89,0	181,0
12565	7 G 1	18	11,3	114,0	209,0
12566	9 G 1	18	13,3	144,0	321,0
12567	12 G 1	18	13,8	186,0	341,0
12568	18 G 1	18	16,2	284,0	473,0
12569	25 G 1	18	19,5	387,0	650,0
12570	34 G 1	18	22,5	500,0	781,0
12571	41 G 1	18	24,2	578,0	892,0
12572	2 x 1,5	16	8,7	64,0	136,0
12573	3 G 1,5	16	9,2	82,0	165,0
12574	4 G 1,5	16	10,0	99,0	192,0
12575	5 G 1,5	16	10,8	123,0	224,0
12576	7 G 1,5	16	12,9	148,0	273,0
12577	9 G 1,5	16	14,8	187,0	340,0
12578	12 G 1,5	16	15,6	274,0	461,0
12579	18 G 1,5	16	18,3	386,0	674,0
12580	25 G 1,5	16	22,5	531,0	950,0
12581	34 G 1,5	16	25,1	671,0	1203,0
12582	41 G 1,5	16	27,3	840,0	1588,0
12583	2 x 2,5	14	10,3	110,0	173,0
12584	3 G 2,5	14	10,8	148,0	220,0
12585	4 G 2,5	14	11,8	169,0	270,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12586	5 G 2,5	14	13,2	220,0	329,0
12587	7 G 2,5	14	15,6	284,0	428,0
12588	9 G 2,5	14	18,1	349,0	580,0
12589	12 G 2,5	14	19,2	470,0	761,0
12590	18 G 2,5	14	23,0	572,0	1140,0
12591	25 G 2,5	14	28,3	740,0	1551,0
12592	2 x 4	12	12,5	124,0	209,0
12593	3 G 4	12	13,1	178,0	310,0
12594	4 G 4	12	14,5	234,0	456,0
12595	5 G 4	12	15,8	284,0	532,0
12596	7 G 4	12	19,0	321,0	737,0
12597	2 x 6	10	14,2	176,0	318,0
12598	3 G 6	10	15,2	245,0	411,0
12599	4 G 6	10	16,6	316,0	572,0
12600	5 G 6	10	18,4	442,0	732,0
12601	7 G 6	10	22,2	530,0	961,0
12602	3 G 10	8	19,1	367,0	741,0
12603	4 G 10	8	21,1	549,0	988,0
12604	5 G 10	8	23,7	604,0	1202,0
12605	7 G 10	8	26,5	820,0	1743,0
12606	3 G 16	6	24,2	653,0	1088,0
12607	4 G 16	6	27,2	807,0	1662,0
12608	5 G 16	6	30,6	940,0	2021,0
12609	7 G 16	6	33,6	1345,0	2720,0
12610	3 G 25	4	30,2	920,0	1947,0
12611	4 G 25	4	33,3	1169,0	2591,0
12612	5 G 25	4	36,8	1420,0	3197,0
12613	7 G 25	4	40,6	1921,0	4530,0
12614	3 G 35	2	33,8	1250,0	2701,0
12615	4 G 35	2	37,7	1680,0	3277,0
12616	5 G 35	2	41,5	2020,0	4530,0
12617	4 G 50	1	40,5	2370,0	3370,0
12618	4 G 70	2/0	46,1	3257,0	4630,0
12619	4 G 95	3/0	50,7	4060,0	6114,0
12620	4 G 120	4/0	57,0	5231,0	7417,0

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

JZ-600-YC-PUR tear and coolant resistant, 1000 V, Cu-screened, EMC-preferred type, meter marking

Technical data

- Special PUR control cables acc. to DIN VDE 0276 part 627, DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, with insulation thickness for 1 kV type and UL-Std.758 Style 20234
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 10x cable Ø fixed installation 5x cable Ø
- **Radiation resistance** up to 100x10^6 cJ/kg (up to 100 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581 UL-Style 10012
- 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
- Oil resistant PVC inner sheath, TM5 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Tinned copper braided screening, approx. 85% coverage
- Outer sheath, special full-polyurethane compound type TMPU adapted to DIN VDE 0207-363-10-2/ DIN EN 50363-10-2, flame retardant acc. to UL-Std.758
- Sheath colour black (RAL 9005) or grey (RAL 7001)
- with meter marking

Properties

- High abrasion resistance
- High flexibility
- Resistant to ultra violet rays
- Wear resistant
- resistant to mineral oils and coolant emulsions
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-600 PUR**, confer page 387

Application

Extremely robust sheated cable, used in machinery, tools and plant, in rolling and steel mills at particularly critical poinst. For medium mechanical stress for flexible use with free movement without tensile stress or forced movements in dry, damp and wet rooms and outdoors. Through the good flexibility quickly and safely to install. Designed for the export-oriented engineering.

EMC = Electromagnetic compatibillity

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. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28370	2 x 0,5	20	9,0	41,0	131,0
28371	3 G 0,5	20	9,3	45,0	154,0
28372	4 G 0,5	20	9,9	54,0	176,0
28373	5 G 0,5	20	10,6	66,0	204,0
28374	7 G 0,5	20	12,2	79,0	237,0
28375	12 G 0,5	20	14,7	137,0	323,0
28376	18 G 0,5	20	17,3	156,0	431,0
28377	25 G 0,5	20	20,6	250,0	507,0
28378	2 x 0,75	19	9,4	46,0	143,0
28379	3 G 0,75	19	9,8	57,0	158,0
28380	4 G 0,75	19	10,4	63,0	193,0
28381	5 G 0,75	19	11,1	76,0	231,0
28382	7 G 0,75	19	13,0	100,0	337,0
28383	12 G 0,75	19	15,8	175,0	424,0
28384	18 G 0,75	19	17,9	240,0	568,0
28385	25 G 0,75	19	22,8	306,0	741,0
28386	2 x 1	18	9,9	54,0	158,0
28387	3 G 1	18	10,3	64,0	169,0
28388	4 G 1	18	11,1	76,0	207,0
28389	5 G 1	18	12,2	89,0	244,0
28390	7 G 1	18	14,5	114,0	292,0
28391	12 G 1	18	17,4	186,0	472,0
28392	18 G 1	18	20,7	284,0	634,0
28393	25 G 1	18	24,8	387,0	861,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28430	2 x 0,5	20	9,0	41,0	131,0
28431	3 G 0,5	20	9,3	45,0	154,0
28432	4 G 0,5	20	9,9	54,0	176,0
28433	5 G 0,5	20	10,6	66,0	204,0
28434	7 G 0,5	20	12,2	79,0	237,0
28435	12 G 0,5	20	14,7	137,0	323,0
28436	18 G 0,5	20	17,3	156,0	431,0
28437	25 G 0,5	20	20,6	250,0	507,0
28438	2 x 0,75	19	9,4	46,0	143,0
28439	3 G 0,75	19	9,8	57,0	158,0
28440	4 G 0,75	19	10,4	63,0	193,0
28441	5 G 0,75	19	11,1	76,0	231,0
28442	7 G 0,75	19	13,0	100,0	337,0
28443	12 G 0,75	19	15,8	175,0	424,0
28444	18 G 0,75	19	17,9	240,0	568,0
28445	25 G 0,75	19	22,8	306,0	741,0
28446	2 x 1	18	9,9	54,0	158,0
28447	3 G 1	18	10,3	64,0	169,0
28448	4 G 1	18	11,1	76,0	207,0
28449	5 G 1	18	12,2	89,0	244,0
28450	7 G 1	18	14,5	114,0	292,0
28451	12 G 1	18	17,4	186,0	472,0
28452	18 G 1	18	20,7	284,0	634,0
28453	25 G 1	18	24,8	387,0	861,0

Continuation ▸

JZ-600-YC-PUR tear and coolant resistant, 1000 V, Cu-screened,

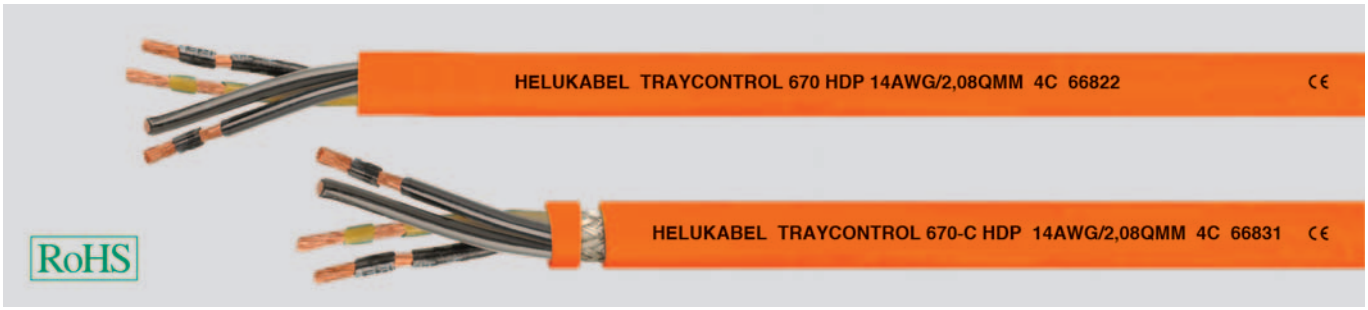
EMC-preferred type, meter marking

Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28394	2 x 1,5	16	10,7	64,0	166,0
28395	3 G 1,5	16	11,2	82,0	192,0
28396	4 G 1,5	16	12,3	99,0	246,0
28397	5 G 1,5	16	13,3	123,0	294,0
28398	7 G 1,5	16	16,0	148,0	392,0
28399	12 G 1,5	16	19,6	274,0	599,0
28400	18 G 1,5	16	23,4	386,0	817,0
28401	25 G 1,5	16	28,2	531,0	1261,0
28402	2 x 2,5	14	11,8	110,0	280,0
28403	3 G 2,5	14	12,3	148,0	301,0
28404	4 G 2,5	14	13,4	169,0	352,0
28405	5 G 2,5	14	14,9	220,0	433,0
28406	7 G 2,5	14	17,9	284,0	569,0
28407	12 G 2,5	14	21,9	470,0	864,0
28408	18 G 2,5	14	26,1	572,0	1365,0
28409	25 G 2,5	14	31,9	740,0	1997,0
28410	2 x 4	12	14,3	124,0	310,0
28411	3 G 4	12	15,1	178,0	396,0
28412	4 G 4	12	16,7	234,0	531,0
28413	5 G 4	12	18,6	284,0	704,0
28414	7 G 4	12	20,0	321,0	932,0
28415	3 G 6	10	17,0	245,0	633,0
28416	4 G 6	10	18,7	316,0	742,0
28417	5 G 6	10	20,7	442,0	1117,0
28418	3 G 10	8	19,6	367,0	1131,0
28419	4 G 10	8	21,9	549,0	1357,0
28420	5 G 10	8	24,1	604,0	1646,0
28421	3 G 16	6	23,5	653,0	1397,0
28422	4 G 16	6	26,4	807,0	1880,0
28423	5 G 16	6	28,8	940,0	2721,0

Part no. Sheath colour grey	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
28454	2 x 1,5	16	10,7	64,0	166,0
28455	3 G 1,5	16	11,2	82,0	192,0
28456	4 G 1,5	16	12,3	99,0	246,0
28457	5 G 1,5	16	13,3	123,0	294,0
28458	7 G 1,5	16	16,0	148,0	392,0
28459	12 G 1,5	16	19,6	274,0	599,0
28460	18 G 1,5	16	23,4	386,0	817,0
28461	25 G 1,5	16	28,2	531,0	1261,0
28462	2 x 2,5	14	11,8	110,0	280,0
28463	3 G 2,5	14	12,3	148,0	301,0
28464	4 G 2,5	14	13,4	169,0	352,0
28465	5 G 2,5	14	14,9	220,0	433,0
28466	7 G 2,5	14	17,9	284,0	569,0
28467	12 G 2,5	14	21,9	470,0	864,0
28468	18 G 2,5	14	26,1	572,0	1365,0
28469	25 G 2,5	14	31,9	740,0	1997,0
28470	2 x 4	12	14,3	124,0	310,0
28471	3 G 4	12	15,1	178,0	396,0
28472	4 G 4	12	16,7	234,0	531,0
28473	5 G 4	12	18,6	284,0	704,0
28474	7 G 4	12	20,0	321,0	932,0
28475	3 G 6	10	17,0	245,0	633,0
28476	4 G 6	10	18,7	316,0	742,0
28477	5 G 6	10	20,7	442,0	1117,0
28478	3 G 10	8	19,6	367,0	1131,0
28479	4 G 10	8	21,9	549,0	1357,0
28480	5 G 10	8	24,1	604,0	1646,0
28481	3 G 16	6	23,5	653,0	1397,0
28482	4 G 16	6	26,4	807,0	1880,0
28483	5 G 16	6	28,8	940,0	2721,0

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

TRAYCONTROL® 670 HDP / 670-C HDP flexible, oil-resistant, open installation (TC-ER), NFPA 79 Edition 2012



Technical data

- TPE motor supply cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range** flexing -40°C bis +105°C
- **Nominal voltage** TC 600 V AWM 1000 V TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius** 7,5 cable Ø
- **Coupling resistance (-C-type)** max. 250 Ohm/km

Cable structure

- Bare copper-conductor, fine-wire with AWG dimensions
- Core insulation of special PVC with transparent nylon skin
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded in layers with optimal lay-length
- Separator
- Outer sheath of special TPE
- Sheath colour orange (RAL 2003)
- with length marking in feet
- **C-Type** Screening with braid of tinned copper wires, optimal coverage, approx. 85%

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- **UL:** TC-ER, WTTC, MTW, NFPA 79 2012, UL AWM 105°C, OIL RES I & II, 75° C wet Bus Drop Cable, Class 1 Div. 2 per NEC Art. 336, 318, 501
- **CSA:** c (UL) CIC-TC FT4, AWM I/II A/B FT4

Note

- HDP = Heavy Duty Power

Application

HELUKABEL® TRAYCONTROL® 670 HDP / 670-C-HDP are multi-conductor severe duty motor supply cables with Bus Drop, TC-ER and CIC/TC approval. Superior oil performance for long cable life and permitted to be used in hazardous (classified) locations Class I Div 2 per NEC 336, 318 and 501. Special extruded sheath and fine copper stranding approved for exposed run, pipes and burial installation. Excellent flexibility and easier to pull than standard tray cables. Suitable for installation in the open unprotected installation on cable tray and from cable tray to machines according to NFPA 79 edition 2012.
Recommended Applications: Motor connections in industrial and automation environments, machine tool, automotive and renewable energies.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

TRAYCONTROL® 670 HDP

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66820	4 x 1	18	8,4	39,0	103,0
66821	4 G 1,32	16	9,2	51,0	133,0
66822	4 G 2,08	14	10,0	80,0	170,0
66823	4 G 3,31	12	11,2	127,0	229,0
66824	4 G 6	10	15,2	230,0	393,0
66825	4 G 10	8	19,3	384,0	626,0
66826	4 G 16	6	22,4	614,0	885,0
66827	4 G 25	4	26,7	960,0	1301,0
66828	4 G 35	2	31,5	1344,0	1983,0

TRAYCONTROL® 670-C HDP

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
66829	4 x 1	18	9,8	52,0	133,0
66830	4 G 1,32	16	10,5	72,0	159,0
66831	4 G 2,08	14	11,7	115,0	222,0
66832	4 G 3,31	12	12,8	179,0	283,0
66833	4 G 6	10	16,9	256,0	460,0
66834	4 G 10	8	22,1	426,0	741,0
66835	4 G 16	6	26,2	657,0	1059,0
66836	4 G 25	4	30,8	1026,0	1497,0
66837	4 G 35	2	35,0	1412,0	2058,0

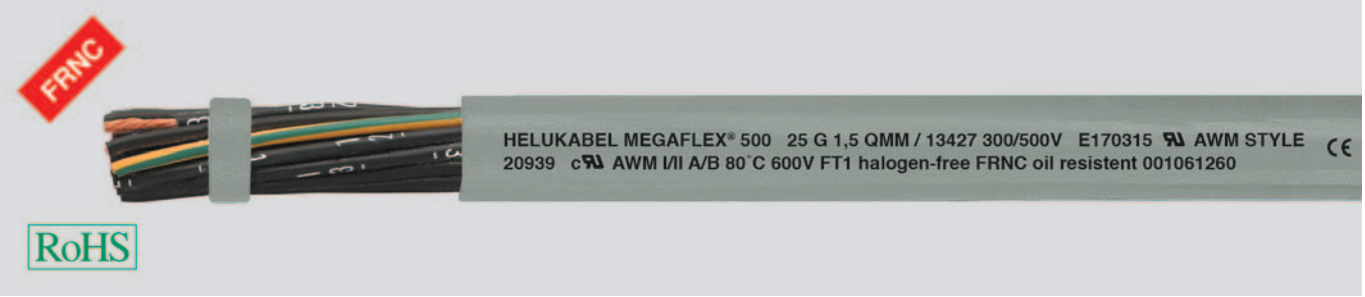
Dimensions and specifications may be changed without prior notice. (RN01)

Suitable accessories can be found in Chapter X.

• Cable Gland - HELUTOP® HT-E

UL/CSA HALOGEN-FREE CONTROL CABLES

MEGAFLEX® 500 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Technical data

- Halogen-free flexible control cable adapted to DIN VDE 0285-525-3-11/ DIN EN 50525-3-11, to UL-Style 20939, UL-Std.758
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 300/500 V UL/CSA 600 V
- **Test voltage** 3000 V
- **Minimum bending radius** flexing 10x cable Ø fixed installation 4x cable Ø
- **Flexibility** Alternate bending test acc. to DIN VDE 0473-396 / DIN EN 50396

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of halogen-free special polymer
- 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
- Outer sheath of halogen-free special polymer
- Sheath colour grey (RAL 7001)
- with meter marking
- **LS0H**= Low Smoke Zero Halogen

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- Also available as a 0,6/1 kV cable MEGAFLEX® 600
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **MEGAFLEX® 500-C**, confer page 398

Properties

- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Hydrolysis resistant
- Flexible, abrasion- and wear-resistant
- Ozone-resistant, recycleable
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test acc. to DIN VDE 0482-332-3-24, BS 4066 part 3, DIN EN 60332-3-24, IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2 / IEC 60332-1 (previously DIN VDE 0472 part 804 test method B), CSA FT1
- Corrosiveness of combustion gases acc. to NF X 10-702
- Halogen-free acc. to DIN VDE 0482 part 267 / DIN EN 50267-2-1 / IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density acc. to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2, IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN VDE 0473-811-404/ DIN EN 60811-404
- Hydrolysis-resistant to DIN EN 61234-1
- Ozone-resistant to DIN VDE 0473-811-403/DIN EN 60811-403

Application

For fixed installation or flexible application, with free movements without forcing which do not constantly recur and without tensile stress, for high mechanical strain. As a measuring and control cable primarily in machinery and plant construction, in air-conditoning systems, at the warehouse and conveyor systems, in ship-building and in the renewable energies such as in the construction of wind power stations.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13344	2 x 0,5	20	5,0	9,6	43,0
13345	3 G 0,5	20	5,3	14,4	50,0
13346	3 x 0,5	20	5,3	14,4	50,0
13347	4 G 0,5	20	5,7	19,0	60,0
13348	4 x 0,5	20	5,7	19,0	60,0
13349	5 G 0,5	20	6,2	24,0	71,0
13350	5 x 0,5	20	6,2	24,0	71,0
13351	7 G 0,5	20	7,4	33,6	84,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13352	8 G 0,5	20	8,0	38,0	101,0
13353	10 G 0,5	20	8,8	48,0	121,0
13354	12 G 0,5	20	9,1	58,0	142,0
13355	16 G 0,5	20	10,0	76,0	183,0
13356	18 G 0,5	20	10,7	86,0	204,0
13357	20 G 0,5	20	11,2	96,0	227,0
13359	25 G 0,5	20	12,7	120,0	283,0
13360	30 G 0,5	20	13,5	144,0	324,0

Continuation ▸

MEGAFLEX® 500 halogen-free, flame retardant, oil-resistant,

UV-resistant, flexible, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13361	34 G 0,5	20	14,5	163,0	367,0
13362	37 G 0,5	20	14,5	178,0	381,0
13363	41 G 0,5	20	15,8	197,0	417,0
13364	42 G 0,5	20	15,8	202,0	454,0
13365	50 G 0,5	20	17,3	240,0	519,0
13366	61 G 0,5	20	18,5	293,0	635,0
13367	65 G 0,5	20	19,4	312,0	694,0
13368	2 x 0,75	19	5,4	14,4	47,0
13369	3 G 0,75	19	5,7	21,6	56,0
13370	3 x 0,75	19	5,7	21,6	56,0
13371	4 G 0,75	19	6,2	29,0	69,0
13372	4 x 0,75	19	6,2	29,0	69,0
13373	5 G 0,75	19	6,8	36,0	83,0
13374	5 x 0,75	19	6,8	36,0	83,0
13375	7 G 0,75	19	8,1	50,0	114,0
13376	7 x 0,75	19	8,1	50,0	114,0
13377	8 G 0,75	19	8,9	58,0	136,0
13378	10 G 0,75	19	9,6	72,0	172,0
13379	12 G 0,75	19	9,9	86,0	183,0
13380	16 G 0,75	19	11,2	115,0	241,0
13381	18 G 0,75	19	11,9	130,0	266,0
13382	20 G 0,75	19	12,6	144,0	291,0
13383	25 G 0,75	19	14,1	180,0	374,0
13384	30 G 0,75	19	15,4	216,0	450,0
13385	34 G 0,75	19	16,4	245,0	517,0
13386	37 G 0,75	19	16,4	260,0	541,0
13387	41 G 0,75	19	17,6	296,0	611,0
13388	42 G 0,75	19	17,6	302,0	621,0
13389	50 G 0,75	19	19,8	360,0	742,0
13390	61 G 0,75	19	20,9	439,0	853,0
13392	65 G 0,75	19	21,8	468,0	909,0
13393	2 x 1	18	5,7	19,2	63,0
13394	3 G 1	18	6,0	29,0	74,0
13395	3 x 1	18	6,0	29,0	74,0
13396	4 G 1	18	6,6	38,4	90,0
13397	4 x 1	18	6,6	38,4	90,0
13398	5 G 1	18	7,2	48,0	109,0
13399	7 G 1	18	8,6	67,0	151,0
13400	8 G 1	18	9,4	77,0	184,0
13401	10 G 1	18	10,4	96,0	224,0
13402	12 G 1	18	10,7	115,0	243,0
13403	16 G 1	18	12,0	154,0	314,0
13404	18 G 1	18	12,7	173,0	361,0
13405	20 G 1	18	13,5	192,0	387,0
13406	25 G 1	18	15,2	240,0	496,0
13407	34 G 1	18	17,4	326,0	670,0
13408	37 G 1	18	17,4	355,0	713,0
13409	41 G 1	18	18,9	394,0	784,0
13410	42 G 1	18	18,9	403,0	824,0
13411	50 G 1	18	21,0	480,0	952,0
13412	61 G 1	18	22,2	586,0	1140,0
13413	65 G 1	18	23,2	628,0	1201,0
13414	2 x 1,5	16	6,3	29,0	70,0
13415	3 G 1,5	16	6,6	43,0	94,0
13416	3 x 1,5	16	6,6	43,0	94,0
13417	4 G 1,5	16	7,2	58,0	112,0
13418	5 G 1,5	16	7,9	72,0	141,0
13419	7 G 1,5	16	9,5	101,0	191,0
13420	8 G 1,5	16	10,4	115,0	224,0
13421	10 G 1,5	16	11,3	144,0	282,0
13422	12 G 1,5	16	11,7	173,0	311,0
13423	16 G 1,5	16	13,3	230,0	392,0
13425	18 G 1,5	16	14,0	259,0	450,0
13426	20 G 1,5	16	14,9	288,0	497,0
13427	25 G 1,5	16	16,8	360,0	630,0
13428	34 G 1,5	16	19,4	490,0	842,0
13429	37 G 1,5	16	19,4	533,0	897,0
13430	50 G 1,5	16	23,4	720,0	1277,0
13431	61 G 1,5	16	24,8	878,0	1460,0
13432	65 G 1,5	16	25,8	936,0	1612,0
13433	2 x 2,5	14	7,6	48,0	118,0
13434	3 G 2,5	14	8,3	72,0	151,0
13435	4 G 2,5	14	9,1	96,0	181,0
13436	5 G 2,5	14	10,2	120,0	224,0
13437	7 G 2,5	14	12,1	168,0	316,0
13438	8 G 2,5	14	13,2	192,0	370,0
13439	10 G 2,5	14	14,6	240,0	451,0
13440	12 G 2,5	14	15,2	288,0	499,0
13441	16 G 2,5	14	16,8	384,0	720,0
13442	18 G 2,5	14	18,1	432,0	769,0
13443	20 G 2,5	14	19,0	480,0	911,0
13444	25 G 2,5	14	22,2	600,0	1047,0
13445	30 G 2,5	14	22,9	720,0	1280,0
13446	2 x 4	12	9,2	77,0	199,0
13447	3 G 4	12	9,9	115,0	247,0
13448	4 G 4	12	11,0	154,0	299,0
13449	5 G 4	12	12,1	192,0	369,0
13450	7 G 4	12	13,3	269,0	463,0
13451	8 G 4	12	15,9	307,0	601,0
13452	10 G 4	12	17,3	384,0	698,0
13453	12 G 4	12	18,3	461,0	790,0
13454	16 G 4	12	20,2	614,0	1130,0
13455	18 G 4	12	21,8	691,0	1280,0
13456	2 x 6	10	10,8	115,0	266,0
13457	3 G 6	10	11,7	173,0	360,0
13458	4 G 6	10	13,0	230,0	429,0
13459	5 G 6	10	14,5	288,0	529,0
13460	7 G 6	10	16,0	403,0	631,0
13461	2 x 10	8	14,0	192,0	440,0
13462	3 G 10	8	15,0	288,0	550,0
13463	4 G 10	8	16,8	384,0	708,0
13464	5 G 10	8	18,7	480,0	862,0
13465	7 G 10	8	20,6	672,0	1124,0
13466	2 x 16	6	16,5	307,0	642,0
13467	3 G 16	6	17,6	461,0	830,0
13468	4 G 16	6	19,7	641,0	1060,0
13469	5 G 16	6	21,9	768,0	1270,0
13470	7 G 16	6	24,4	1075,0	1794,0
13471	3 G 25	4	22,5	720,0	1190,0
13472	4 G 25	4	25,2	960,0	1594,0
13473	5 G 25	4	27,9	1200,0	2014,0
13474	3 G 35	2	26,3	1008,0	1590,0
13475	4 G 35	2	28,5	1344,0	2200,0
13476	5 G 35	2	31,2	1680,0	2693,0
13477	3 G 50	1	30,2	1440,0	2571,0
13478	4 G 50	1	34,0	1920,0	3087,0
13479	5 G 50	1	37,8	2400,0	3980,0
13480	3 G 70	2/0	37,0	2016,0	3207,0
13481	4 G 70	2/0	41,5	2688,0	4077,0
13482	5 G 70	2/0	46,2	3360,0	5501,0
13483	3 G 95	3/0	41,4	2736,0	4708,0
13484	4 G 95	3/0	46,2	3648,0	5590,0
13485	5 G 95	3/0	51,5	4560,0	6972,0
13486	3 G 120	4/0	45,7	3456,0	5515,0
13487	4 G 120	4/0	51,2	4608,0	7100,0
13488	3 G 150	300 kcmil	52,8	4320,0	6279,0
13489	4 G 150	300 kcmil	58,3	5760,0	7781,0

Dimensions and specifications may be changed without prior notice. (RA03)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

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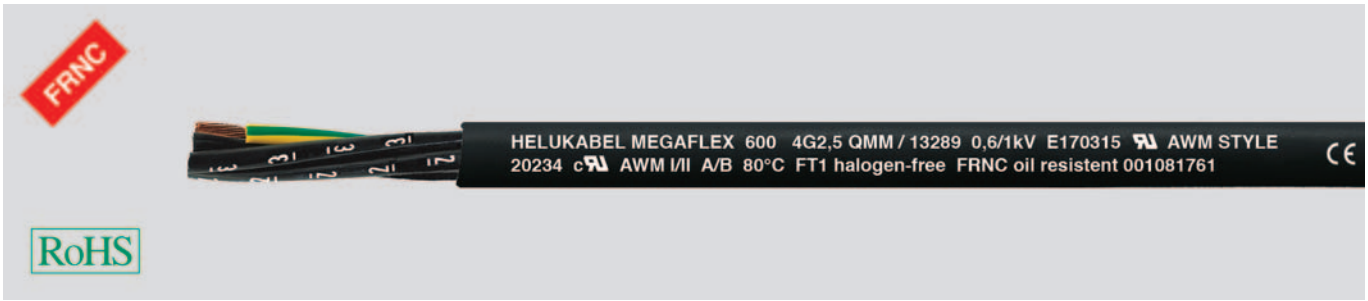
MEGAFLEX® 600 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking



Technical data

- Halogen-free flexible control cable to UL-Style 20234, UL-Std.758
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 600/1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 4x cable Ø
- **Flexibility**
  Alternate bending test acc. to DIN VDE 0473-396 / DIN EN 50396

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of halogen-free special polymer
- 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 layer with optimal lay-length
- Outer sheath, halogen-free special polymer
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Hydrolysis resistant
- Flexible, abrasion- and wear-resistant
- Ozone-resistantRecycleable

Tests

- Flame test acc. to DIN VDE 0482-332-3-24, BS 4066 part 3, DIN EN 60332-3-24, IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Corrosiveness of combustion gases acc. to NF X 10-702
- Halogen-free acc. to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density acc. to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN VDE 0473-811-404/ DIN EN 60811-404
- Hydrolysis-resistant to DIN EN 61234-1
- Ozone-resistant to DIN VDE 0473-811-403/DIN EN 60811-403

Note

- G = with green-yellow conductor
  x = without green-yellow conductor
- screened analogue type:
  MEGAFLEX® 600-C, confer page 400

Application

For fixed installation or flexible application, with occasional not permanently recurring free movement without forced motion and without tensile stress, for high mechanical strain. As a measuring and control cable in tool machinery, conveyor belts and production lines, plant engineering, climate engineering, in foundries and steel mills. Especially suited for wind power plant and computer equipment.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13200	2 x 0,5	20	6,4	9,6	56,0
13201	3 G 0,5	20	6,8	14,4	68,0
13202	3 x 0,5	20	6,8	14,4	68,0
13203	4 G 0,5	20	7,6	19,0	100,0
13204	4 x 0,5	20	7,6	19,0	100,0
13205	5 G 0,5	20	8,2	24,0	117,0
13206	5 x 0,5	20	8,2	24,0	117,0
13207	7 G 0,5	20	9,8	33,6	138,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13208	8 G 0,5	20	10,7	38,0	150,0
13209	10 G 0,5	20	11,6	48,0	176,0
13210	12 G 0,5	20	12,2	58,0	200,0
13211	16 G 0,5	20	13,7	76,0	250,0
13212	18 G 0,5	20	14,4	86,0	276,0
13213	20 G 0,5	20	15,3	96,0	293,0
13214	25 G 0,5	20	17,2	120,0	335,0
13215	30 G 0,5	20	18,0	144,0	348,0

Continuation ▸

MEGAFLEX® 600 halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13216	34 G 0,5	20	19,8	163,0	520,0
13217	37 G 0,5	20	15,0	178,0	561,0
13218	41 G 0,5	20	21,3	197,0	590,0
13219	42 G 0,5	20	21,2	202,0	595,0
13220	50 G 0,5	20	23,4	240,0	715,0
13221	61 G 0,5	20	26,0	293,0	840,0
13222	65 G 0,5	20	26,8	312,0	880,0
13223	2 x 0,75	19	6,8	14,4	66,0
13224	3 G 0,75	19	7,2	21,6	74,0
13225	3 x 0,75	19	7,2	21,6	74,0
13226	4 G 0,75	19	8,0	29,0	126,0
13227	4 x 0,75	19	8,0	29,0	126,0
13228	5 G 0,75	19	8,8	36,0	140,0
13229	5 x 0,75	19	8,8	36,0	140,0
13230	7 G 0,75	19	10,7	50,0	190,0
13231	7 x 0,75	19	10,7	50,0	190,0
13232	8 G 0,75	19	11,5	58,0	212,0
13233	10 G 0,75	19	12,7	72,0	238,0
13234	12 G 0,75	19	13,1	86,0	257,0
13235	16 G 0,75	19	14,6	115,0	304,0
13236	18 G 0,75	19	15,6	130,0	362,0
13237	20 G 0,75	19	16,6	144,0	394,0
13238	25 G 0,75	19	18,9	180,0	486,0
13239	30 G 0,75	19	15,4	216,0	450,0
13241	34 G 0,75	19	21,5	245,0	638,0
13242	37 G 0,75	19	21,5	260,0	696,0
13243	41 G 0,75	19	23,2	296,0	750,0
13244	42 G 0,75	19	23,2	302,0	770,0
13245	50 G 0,75	19	25,6	360,0	895,0
13246	61 G 0,75	19	28,2	439,0	1070,0
13247	65 G 0,75	19	29,0	468,0	1110,0
13248	2 x 1	18	7,4	19,2	80,0
13249	3 G 1	18	8,0	29,0	96,0
13250	3 x 1	18	8,0	29,0	96,0
13251	4 G 1	18	8,8	38,4	100,0
13252	4 x 1	18	8,8	38,4	100,0
13253	5 G 1	18	9,8	48,0	130,0
13254	7 G 1	18	11,7	67,0	170,0
13255	8 G 1	18	12,8	77,0	230,0
13256	10 G 1	18	14,3	96,0	270,0
13257	12 G 1	18	14,5	115,0	290,0
13258	16 G 1	18	16,5	154,0	360,0
13259	18 G 1	18	17,3	173,0	405,0
13260	20 G 1	18	18,4	192,0	450,0
13261	25 G 1	18	21,1	240,0	570,0
13262	34 G 1	18	24,0	326,0	750,0
13263	37 G 1	18	24,3	355,0	790,0
13264	41 G 1	18	25,9	394,0	890,0
13265	42 G 1	18	25,9	403,0	900,0
13266	50 G 1	18	28,5	480,0	1100,0
13267	61 G 1	18	31,4	586,0	1266,0
13268	65 G 1	18	32,5	628,0	1560,0
13269	2 x 1,5	16	8,4	29,0	95,0
13270	3 G 1,5	16	9,1	43,0	112,0
13271	3 x 1,5	16	9,1	43,0	112,0
13272	4 G 1,5	16	9,9	58,0	139,0
13273	5 G 1,5	16	11,0	72,0	170,0
13274	7 G 1,5	16	13,3	101,0	225,0
13275	8 G 1,5	16	14,5	115,0	250,0
13276	10 G 1,5	16	16,1	144,0	300,0
13277	12 G 1,5	16	16,6	173,0	370,0
13278	16 G 1,5	16	18,5	230,0	450,0
13279	18 G 1,5	16	19,7	259,0	520,0
13280	20 G 1,5	16	20,9	288,0	600,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13281	25 G 1,5	16	23,9	360,0	730,0
13282	34 G 1,5	16	27,2	490,0	950,0
13283	37 G 1,5	16	29,4	533,0	1094,0
13284	50 G 1,5	16	32,5	720,0	1400,0
13285	61 G 1,5	16	35,7	878,0	1700,0
13286	65 G 1,5	16	36,8	936,0	1900,0
13287	2 x 2,5	14	9,4	48,0	160,0
13288	3 G 2,5	14	9,9	72,0	175,0
13289	4 G 2,5	14	11,1	96,0	203,0
13290	5 G 2,5	14	12,4	120,0	251,0
13291	7 G 2,5	14	15,0	168,0	330,0
13292	8 G 2,5	14	16,1	192,0	400,0
13293	10 G 2,5	14	17,0	240,0	461,0
13294	12 G 2,5	14	18,4	288,0	553,0
13295	16 G 2,5	14	19,4	384,0	742,0
13296	18 G 2,5	14	22,0	432,0	795,0
13297	20 G 2,5	14	32,2	480,0	924,0
13298	25 G 2,5	14	26,9	600,0	1110,0
13299	30 G 2,5	14	28,1	720,0	1370,0
13300	2 x 4	12	11,4	77,0	180,0
13301	3 G 4	12	12,3	115,0	230,0
13302	4 G 4	12	13,8	154,0	310,0
13303	5 G 4	12	15,3	192,0	410,0
13304	7 G 4	12	16,8	269,0	540,0
13305	8 G 4	12	20,0	307,0	710,0
13306	10 G 4	12	21,6	384,0	760,0
13307	12 G 4	12	22,9	461,0	860,0
13308	16 G 4	12	23,6	614,0	910,0
13309	18 G 4	12	24,2	691,0	980,0
13310	2 x 6	10	13,1	115,0	205,0
13311	3 G 6	10	14,1	173,0	370,0
13312	4 G 6	10	15,6	230,0	430,0
13313	5 G 6	10	17,3	288,0	650,0
13314	7 G 6	10	19,3	403,0	860,0
13315	2 x 10	8	15,4	192,0	330,0
13316	3 G 10	8	16,5	288,0	660,0
13317	4 G 10	8	18,1	384,0	790,0
13318	5 G 10	8	20,5	480,0	960,0
13319	7 G 10	8	22,5	672,0	1300,0
13320	2 x 16	6	18,3	307,0	580,0
13321	3 G 16	6	19,6	461,0	700,0
13322	4 G 16	6	21,7	641,0	1100,0
13323	5 G 16	6	24,2	768,0	1600,0
13324	7 G 16	6	25,7	1075,0	1890,0
13325	3 G 25	4	24,0	720,0	1450,0
13326	4 G 25	4	26,9	960,0	1600,0
13327	5 G 25	4	29,4	1200,0	2050,0
13328	3 G 35	2	26,2	1008,0	1900,0
13329	4 G 35	2	29,4	1344,0	2400,0
13330	5 G 35	2	32,8	1680,0	2900,0
13331	3 G 50	1	31,6	1440,0	2700,0
13332	4 G 50	1	35,5	1920,0	3400,0
13333	5 G 50	1	40,0	2400,0	4361,0
13334	3 G 70	2/0	36,7	2016,0	3300,0
13335	4 G 70	2/0	40,7	2688,0	4400,0
13336	5 G 70	2/0	45,7	3360,0	5807,0
13337	3 G 95	3/0	41,2	2736,0	5050,0
13338	4 G 95	3/0	46,2	3648,0	6010,0
13339	5 G 95	3/0	50,7	4560,0	7752,0
13340	3 G 120	4/0	45,9	3456,0	5620,0
13341	4 G 120	4/0	50,3	4608,0	7500,0
13342	3 G 150	300 kcmil	52,7	4320,0	6390,0
13343	4 G 150	300 kcmil	58,8	5760,0	6840,0

Dimensions and specifications may be changed without prior notice. (RA03)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

N

MEGAFLEX® 500-C halogen-free, flame retardant, oil-resistant,

UV-resistant, flexible, screened, EMC-preferred types, meter marking

Technical data

- Halogen-free flexible control cable adapted to DIN VDE 0285-525-3-11 / DIN EN 50525-3-11, to UL-Style 20939, UL-Std.758
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 300/500 V UL/CSA 600 V
- **Test voltage** 3000 V
- **Coupling resistance** max. 250 Ohm/km
- **Minimum bending radius** flexing 10x cable Ø fixed installation 4x cable Ø
- **Flexibility** Alternate bending test acc. to DIN VDE 0473-396 / DIN EN 50396

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of halogen-free special polymer
- 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
- Separating foil
- Tinned copper braided screen, approx. 85% coverage
- Outer sheath of halogen-free special polymer
- Sheath colour grey (RAL 7001)
- with meter marking
- **LS0H**= Low Smoke Zero Halogen

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **MEGAFLEX® 500**, confer page 394

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recycleable
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Flame test acc. to DIN VDE 0482-332-3-24, BS 4066 part 3, DIN EN 60332-3-24, IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (previously DIN VDE 0472 part 804 test method B) CSA FT1
- Corrosiveness of combustion gases acc. to NF X 10-702
- Halogen-free acc. to DIN VDE 0482 part 267, DIN EN 50267-2-1, IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density acc. to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2, IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN VDE 0473-811-404 / DIN EN 60811-404
- Hydrolysis resistant to DIN EN 61234-1
- Ozone-resistant to DIN VDE 0473-811-403/ DIN EN 60811-403

Application

For fixed installation or flexible application that does not permanently recurring free movement without forced motion and without tensile stress, for high mechanical strain. As a measuring and control cable e. g. in machine and plant engineering, air conditioning in the warehouse and materials handling, shipbuilding and in the newable energies such as wind power stations.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13500	2 x 0,5	20	5,7	35,0	46,0
13501	3 G 0,5	20	6,0	42,0	56,0
13502	3 x 0,5	20	6,0	42,0	56,0
13503	4 G 0,5	20	6,5	47,0	62,0
13504	4 x 0,5	20	6,5	47,0	62,0
13505	5 G 0,5	20	7,0	56,0	75,0
13506	5 x 0,5	20	7,0	56,0	75,0
13507	7 G 0,5	20	7,9	69,0	98,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13508	8 G 0,5	20	8,5	80,0	116,0
13509	10 G 0,5	20	9,3	94,0	135,0
13510	12 G 0,5	20	9,6	108,0	158,0
13511	16 G 0,5	20	10,7	129,0	210,0
13512	18 G 0,5	20	11,2	145,0	216,0
13514	20 G 0,5	20	11,9	172,0	240,0
13515	25 G 0,5	20	13,4	240,0	315,0

Continuation ▸

MEGAFLEX® 500-C halogen-free, flame retardant, oil-resistant,

UV-resistant, flexible, screened, EMC-preferred types, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
13516	2 x 0,75	19	6,1	40,0	60,0
13517	3 G 0,75	19	6,4	52,0	68,0
13518	3 x 0,75	19	6,4	52,0	68,0
13519	4 G 0,75	19	6,9	60,0	78,0
13520	4 x 0,75	19	6,9	60,0	78,0
13521	5 G 0,75	19	7,4	71,0	95,0
13522	5 x 0,75	19	7,4	71,0	95,0
13523	7 G 0,75	19	8,6	91,0	130,0
13524	7 x 0,75	19	8,6	91,0	130,0
13525	8 G 0,75	19	9,4	110,0	145,0
13526	10 G 0,75	19	10,2	137,0	180,0
13527	12 G 0,75	19	10,4	142,0	203,0
13528	16 G 0,75	19	11,6	200,0	275,0
13529	18 G 0,75	19	12,4	212,0	290,0
13530	20 G 0,75	19	12,9	238,0	320,0
13531	25 G 0,75	19	14,8	281,0	413,0
13532	2 x 1	18	6,4	50,0	66,0
13533	3 G 1	18	6,7	60,0	80,0
13534	3 x 1	18	6,7	60,0	80,0
13535	4 G 1	18	7,3	71,0	100,0
13536	4 x 1	18	7,3	71,0	100,0
13537	5 G 1	18	7,8	88,0	130,0
13538	7 G 1	18	9,1	111,0	160,0
13539	8 G 1	18	9,9	127,0	197,0
13540	10 G 1	18	10,8	150,0	232,0
13541	12 G 1	18	11,2	184,0	260,0
13542	16 G 1	18	12,3	209,0	346,0
13543	18 G 1	18	13,2	260,0	382,0
13544	20 G 1	18	13,8	317,0	440,0
13545	25 G 1	18	15,8	349,0	540,0
13546	2 x 1,5	16	7,0	63,0	88,0
13547	3 G 1,5	16	7,3	80,0	100,0
13548	3 x 1,5	16	7,3	80,0	100,0
13549	4 G 1,5	16	7,9	97,0	125,0
13550	5 G 1,5	16	8,6	119,0	158,0
13552	7 G 1,5	16	10,2	147,0	210,0
13554	8 G 1,5	16	11,1	170,0	244,0
13556	10 G 1,5	16	12,0	193,0	315,0
13557	12 G 1,5	16	12,5	267,0	340,0
13558	16 G 1,5	16	13,8	315,0	424,0
13559	18 G 1,5	16	15,0	374,0	480,0
13560	20 G 1,5	16	15,7	396,0	545,0
13561	25 G 1,5	16	18,0	526,0	702,0
13562	2 x 2,5	14	8,3	96,0	132,0
13563	3 G 2,5	14	9,0	144,0	168,0
13565	4 G 2,5	14	9,8	148,0	195,0
13566	5 G 2,5	14	10,9	181,0	256,0
13567	7 G 2,5	14	12,9	255,0	345,0
13568	8 G 2,5	17	13,8	285,0	390,0
13569	10 G 2,5	14	15,8	340,0	482,0
13570	12 G 2,5	14	15,9	441,0	572,0
13571	2 x 4	12	9,8	120,0	220,0
13572	3 G 4	12	10,6	174,0	251,0
13573	4 G 4	12	11,5	230,0	305,0
13574	5 G 4	12	12,7	273,0	388,0
13575	7 G 4	12	13,9	316,0	504,0
13576	2 x 6	10	11,5	173,0	270,0
13577	3 G 6	10	12,4	240,0	351,0
13578	4 G 6	10	13,8	305,0	464,0
13579	5 G 6	10	15,7	439,0	546,0
13580	7 G 6	10	16,6	505,0	670,0
13581	2 x 10	8	14,9	255,0	461,0
13582	3 G 10	8	15,9	350,0	574,0
13583	4 G 10	8	17,8	535,0	785,0
13584	5 G 10	8	19,6	592,0	914,0
13585	7 G 10	8	21,6	810,0	1308,0
13586	2 x 16	6	17,3	422,0	670,0
13587	3 G 16	6	18,5	585,0	911,0
13588	4 G 16	6	20,8	740,0	1105,0
13589	5 G 16	6	22,9	895,0	1293,0
13590	7 G 16	6	25,0	1282,0	2149,0
13591	4 G 25	4	26,2	1140,0	1911,0
13592	4 x 35	2	30,4	1576,0	2542,0
13593	4 G 50	1	34,6	2155,0	3550,0
13594	4 G 70	2/0	41,3	3120,0	4939,0
13595	4 G 95	3/0	46,2	4043,0	6690,0
13596	4 G 120	4/0	51,0	5069,0	8453,0
13597	4 G 150	300 kcmil	59,0	5792,0	9104,0

Dimensions and specifications may be changed without prior notice. (RA03)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

N

MEGAFLEX® 600-C halogen-free, flame retardant, oil-resistant, UV-resistant, flexible, meter marking

Technical data

- Halogen-free flexible control cable to UL-Style 20234, UL-Std.758
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 600/1000 V
- **Test voltage** 4000 V
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 4x cable Ø
- **Flexibility**
  Alternate bending test acc. to DIN VDE 0473-396 / DIN EN 50396
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of halogen-free special polymer
- 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 layer with optimal lay-length
- Separating foil
- Tinned copper braided screening, coverage approx. 85%
- Outer sheath, halogen-free special polymer
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Halogen-free
- Highly flame-retardant
- Resistant to oils and greases
- Resistant to UV and weathering
- Flexible, abrasion- and wear-resistant
- Ozone-resistant
- Recycleable

Tests

- Flame test acc. to DIN VDE 0482-332-3-24, BS 4066 part 3, DIN EN 60332-3-24, IEC 60332-3-24 (previously DIN VDE 0472 part 804 test method C)
- Self-extinguishing and flame retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (previously DIN VDE 0472 part 804 test method B)
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Corrosiveness of combustion gases acc. to NF X 10-702
- Halogen-free according to DIN VDE 0482 part 267/ EN 50267-2-1/ IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density acc. to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2/ IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)
- Oil-resistant to DIN VDE 0473-811-404/DIN EN 60811-404
- hydrolysebeständig nach DIN EN 61234-1
- Ozone-resistant to DIN VDE 0473-811-403/DIN EN 60811-403

Note

- G = with green-yellow conductor
  x = without green-yellow conductor
- unscreened analogue type:
  MEGAFLEX® 600, confer page 396

Application

For fixed installation or flexible application, with occasional not permanently recurring free movement without forced motionand without tensile stress, for high mechanical strain. As a measuring and control cable in tool machinery, conveyor belts and production lines, plant engineering, climate engineering,in foundries and steel mills. Especially suited for wind power plant and computer equipment.
EMC = Electromagnetic compatibillity
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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
15217	2 x 0,5	20	6,9	35,0	46,0
15218	3 G 0,5	20	7,3	42,0	56,0
15219	3 x 0,5	20	7,3	42,0	56,0
15220	4 G 0,5	20	8,1	47,0	62,0
15221	4 x 0,5	20	8,1	47,0	62,0
15222	5 G 0,5	20	8,7	56,0	75,0
15223	5 x 0,5	20	8,7	56,0	75,0
15224	7 G 0,5	20	10,3	69,0	98,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
15225	10 G 0,5	20	12,1	94,0	135,0
15226	12 G 0,5	20	12,7	108,0	158,0
15227	18 G 0,5	20	14,9	145,0	216,0
15228	20 G 0,5	20	15,8	172,0	240,0
15229	25 G 0,5	20	17,7	240,0	315,0
15230	2 x 0,75	18	7,3	40,0	60,0
15231	3 G 0,75	18	7,7	52,0	68,0
15232	3 x 0,75	18	7,7	52,0	68,0

Continuation ▸

MEGAFLEX® 600-C halogen-free, flame retardant, oil-resistant,

UV-resistant, flexible, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
15233	4 G 0,75	18	8,5	60,0	78,0
15234	4 x 0,75	18	8,5	60,0	78,0
15235	5 G 0,75	18	9,3	71,0	95,0
15236	5 x 0,75	18	9,3	71,0	95,0
15237	7 G 0,75	18	10,7	91,0	130,0
15238	7 x 0,75	18	10,7	91,0	130,0
15239	12 G 0,75	18	13,1	142,0	203,0
15240	18 G 0,75	18	16,2	212,0	290,0
15241	20 G 0,75	18	17,2	238,0	320,0
15242	25 G 0,75	18	19,5	281,0	413,0
15243	2 x 1	17	8,0	50,0	66,0
15244	3 G 1	17	8,6	60,0	80,0
15245	3 x 1	17	8,6	60,0	80,0
15246	4 G 1	17	9,4	71,0	100,0
15247	4 G 1	17	9,4	71,0	100,0
15248	5 G 1	17	10,4	88,0	130,0
15249	10 G 1	17	14,9	150,0	232,0
15250	12 G 1	17	14,5	184,0	260,0
15251	18 G 1	17	17,9	260,0	382,0
15252	20 G 1	17	19,0	317,0	440,0
15253	25 G 1	17	21,7	349,0	540,0
15254	2 x 1,5	16	9,0	63,0	88,0
15255	3 G 1,5	16	9,7	80,0	100,0
15256	3 x 1,5	16	9,7	80,0	100,0
15257	4 G 1,5	16	10,5	97,0	125,0
15258	5 G 1,5	16	11,6	119,0	158,0
15259	7 G 1,5	16	13,9	147,0	210,0
15260	10 G 1,5	16	16,7	193,0	315,0
15261	12 G 1,5	16	17,2	267,0	340,0
15262	18 G 1,5	16	20,5	374,0	480,0
15263	20 G 1,5	16	21,7	396,0	545,0
15264	25 G 1,5	16	24,7	526,0	702,0
15265	2 x 2,5	14	10,2	96,0	132,0
15266	3 G 2,5	14	10,7	144,0	168,0
15267	4 G 2,5	14	11,9	148,0	195,0
15268	5 x 2,5	14	13,2	181,0	256,0
15269	7 G 2,5	14	15,8	255,0	345,0
15270	10 G 2,5	14	17,0	340,0	482,0
15271	12 G 2,5	14	19,2	441,0	572,0
15272	3 G 4	12	13,1	174,0	251,0
15273	4 G 4	12	14,6	230,0	305,0
15274	5 G 4	12	16,1	273,0	388,0
15275	7 G 4	12	17,6	316,0	504,0
15276	3 G 6	10	14,9	240,0	351,0
15277	4 G 6	10	16,4	305,0	464,0
15278	5 G 6	10	18,1	439,0	546,0
15279	7 G 6	10	20,1	505,0	670,0
15280	3 G 10	8	16,6	350,0	574,0
15281	4 G 10	8	18,1	535,0	785,0
15282	5 G 10	8	20,6	592,0	914,0
15283	7 G 10	8	22,6	810,0	1308,0

Dimensions and specifications may be changed without prior notice. (RA03)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-E

N

UL/CSA DATA CABLES

Command Cable UL (LiYY) Style 2464/300 V, (80°C)

Technical data

- Special PVC command cable, approved to UL-Style 2464, cores acc. to AWG 26-20 to UL-Style 1061/1729 AWG 18-16 to UL-Style 1007/1569
- **Temperature range**
  flexing -10°C to +80°C
  fixed installation -20°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Minimum bending radius**
  fixed 7,5x cable Ø
  flexing 15x cable Ø

Cable structure

- Tinned copper, fine wire conductors AWG 26-20, ASTM-B 174-95 class J-M, AWG 18-16 ASTM-B 286
  Conductor make-up to:
  0,14 mm² = 7x0,162 mm
  0,23 mm² = 7x0,202 mm
  0,34 mm² = 7x0,254 mm
  0,56 mm² = 7x0,32 mm
  0,82 mm² = 19x0,235 mm
  1,30 mm² = 19x0,31 mm
- Core insulation of special PVC class 43 respectively semirigid acc. to UL-Std.1581 tab.50.182 and 50.183
- Core identification to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Outer sheath of special PVC class 43 acc. to UL-Std.1581 tab.50.182
- Sheath colour
  black (international colour code)
  grey (DIN 47100 / preferred type for stock)

Properties

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

Tests

- PVC flame retardant according to UL VW-1, CSA FT1
- **Conditionally resistant to**
  Oil
  Solvents
  Acids
  Lyes

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **command cable UL (LiYCY)**, confer page 413

Application

As a flexible connector and connecting cable, as control, signal and measuring line of machine tools, conveyor belts and plant construction, air conditioning systems, in foundries and steel mills.

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

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83137	83045	2 x 0,14	26	3,6	3,6	13,0
83138	83046	3 x 0,14	26	3,8	4,0	15,0
83139	83047	4 x 0,14	26	4,0	5,4	18,0
83140	83048	6 x 0,14	26	4,6	8,1	25,0
83141	83049	10 x 0,14	26	5,6	13,4	38,0
83142	83050	12 x 0,14	26	5,8	16,2	46,0
83143	83055	16 x 0,14	26	6,3	21,5	56,0
83144	83056	18 x 0,14	26	6,6	34,4	62,0
83145	83057	24 x 0,14	26	7,5	32,4	82,0
83146	83058	27 x 0,14	26	7,6	36,3	97,0
83147	83059	30 x 0,14	26	8,0	40,4	110,0
83153	83130	2 x 0,23	24	3,8	4,6	16,0
83154	83131	3 x 0,23	24	4,0	7,1	19,0
83155	83132	4 x 0,23	24	4,3	9,4	23,0
83156	83133	6 x 0,23	24	4,9	14,2	32,0
83157	83134	10 x 0,23	24	6,0	23,8	55,0
83158	83135	12 x 0,23	24	6,2	28,5	60,0
83159	83136	16 x 0,23	24	6,8	38,1	75,0
83160	83371	18 x 0,23	24	7,1	43,1	82,0
83161	83372	24 x 0,23	24	8,1	59,7	116,0
83162	83373	27 x 0,23	24	8,4	64,7	140,0
83163	83374	30 x 0,23	24	8,9	71,9	150,0
83169	83375	2 x 0,34	22	4,1	6,5	25,0
83170	83376	3 x 0,34	22	4,3	9,8	30,0
83171	83377	4 x 0,34	22	4,6	13,0	45,0
83172	83378	6 x 0,34	22	5,4	19,6	60,0
83173	83379	10 x 0,34	22	6,6	32,5	80,0
83174	83380	12 x 0,34	22	6,8	39,1	105,0
83175	83381	16 x 0,34	22	7,5	52,0	130,0
83176	83382	18 x 0,34	22	8,1	59,0	140,0
83177	83383	24 x 0,34	22	9,4	79,0	190,0
83178	83384	27 x 0,34	22	9,7	88,0	207,0
83179	83385	30 x 0,34	22	10,2	97,8	225,0
83185	83386	2 x 0,56	20	4,6	9,8	30,0
83186	83387	3 x 0,56	20	4,8	14,6	33,0
83187	83388	4 x 0,56	20	5,2	19,4	41,0

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83188	83389	6 x 0,56	20	6,1	29,0	65,0
83189	83390	10 x 0,56	20	7,6	48,2	102,0
83190	83391	12 x 0,56	20	7,8	58,2	120,0
83191	83392	16 x 0,56	20	8,7	77,3	152,0
83192	83393	18 x 0,56	20	9,3	87,0	168,0
83193	83394	24 x 0,56	20	10,9	116,3	224,0
83194	83395	27 x 0,56	20	11,2	129,8	260,0
83195	83396	30 x 0,56	20	11,8	144,6	300,0
83201	83397	2 x 0,82	18	6,1	15,2	50,0
83202	83398	3 x 0,82	18	6,4	23,2	62,0
83203	83399	4 x 0,82	18	6,9	31,3	72,0
83204	83474	6 x 0,82	18	8,1	47,0	100,0
83205	83475	10 x 0,82	18	10,4	78,2	180,0
83206	83476	12 x 0,82	18	10,9	94,0	182,0
83207	83477	16 x 0,82	18	12,2	125,1	240,0
83208	83478	18 x 0,82	18	13,0	141,1	270,0
83209	83479	24 x 0,82	18	15,2	188,2	370,0
83210	83480	27 x 0,82	18	15,8	212,0	400,0
83211	83481	30 x 0,82	18	16,3	235,6	470,0
83217	83482	2 x 1,3	16	6,6	24,4	70,0
83218	83483	3 x 1,3	16	7,0	37,1	90,0
83219	83484	4 x 1,3	16	7,6	49,4	110,0
83220	83491	6 x 1,3	16	9,2	74,2	160,0
83221	83492	10 x 1,3	16	11,8	124,0	250,0
83222	83493	12 x 1,3	16	12,2	149,0	300,0
83223	83494	16 x 1,3	16	13,7	198,7	400,0
83224	83495	18 x 1,3	16	14,6	224,0	450,0
83225	83496	24 x 1,3	16	17,0	298,4	650,0
83226	83497	27 x 1,3	16	17,6	336,0	680,0
83227	83498	30 x 1,3	16	18,6	373,6	750,0

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

Command Cable UL (LiYY) Style 2516, 600 V, 105°C

Technical data

- Special PVC command cable, approved to UL-Style 2516
- **Temperature range**
  flexing -10°C to +105°C
  fixed installation -20°C to +105°C
- **Nominal voltage** 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 4000 V
- **Minimum bending radius**
  fixed 7,5x cable Ø
  flexing 15x cable Ø

Cable structure

- Tinned copper, fine wire conductors acc. to ASTM-B 174, class J-K
  Conductor make-up to:
  2,08 mm² = 41x0,254 mm
  3,20 mm² = 65x0,254 mm
- Core insulation of special PVC class 43 acc. to UL-Std.1581 tab.50.182 (105°C)
- Core identification to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Outer sheath of special PVC class 43 acc. to UL-Std.1581 tab.50.182 (105°C)
- Sheath colour
  black (international colour code)
  grey (DIN 47100 / preferred type from stock)

Properties

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

Tests

- PVC flame retardant acc. to UL VW-1, CSA FT1
- **Conditionally resistant to**
  Oil
  Solvents
  Acids
  Lyes

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type:
  command cable UL (LiYCY),
  confer page 415

Application

As a flexible connector and connecting cable, as control, signal and measuring line of machine tools, conveyor belts and plant construction, air conditioning systems, in foundries and steel mills.

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

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83233	83624	2 x 2,08	14	8,4	39,6	120,0
83234	83625	3 x 2,08	14	8,9	59,6	150,0
83235	83626	4 x 2,08	14	9,6	79,2	190,0
83236	83627	6 x 2,08	14	11,4	119,0	300,0
83237	83628	10 x 2,08	14	15,1	198,4	450,0
83238	83629	12 x 2,08	14	15,6	238,7	500,0
83239	83630	16 x 2,08	14	17,2	319,0	700,0
83240	83631	18 x 2,08	14	18,3	358,4	750,0
83241	83632	24 x 2,08	14	21,5	478,4	900,0
83242	83633	27 x 2,08	14	22,7	538,1	1100,0
83243	83634	30 x 2,08	14	23,5	598,4	1150,0
83244	83635	36 x 2,08	14	25,4	717,2	1800,0

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83245	83636	2 x 3,2	12	9,3	61,0	150,0
83246	83637	3 x 3,2	12	9,8	91,4	210,0
83247	83638	4 x 3,2	12	10,8	121,6	300,0
83248	83639	6 x 3,2	12	12,8	183,7	430,0
83249	83640	10 x 3,2	12	17,0	305,9	500,0
83250	83641	12 x 3,2	12	17,5	367,6	700,0
83251	83642	16 x 3,2	12	19,8	490,9	810,0
83252	83643	18 x 3,2	12	21,0	551,7	970,0
83253	83644	24 x 3,2	12	24,8	736,4	1200,0

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

Suitable accessories can be found in Chapter X.

• Cable tie

TRAYCONTROL® 300 flexible, oil-resistant, NFPA 79 Edition 2012

Technical data

- Flexible PVC data and control cable
- **Temperature range** -25°C to +105°C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius** flexing 6x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Tinned copper conductor, fine wire with AWG dimensions
- Outer sheath of special PVC (AWG 22 -AWG 16 with transparent nylon skin)
- Core identification to international colour code
- Cores stranded in layers with optimal lay-lengths
- Separator
- Outer sheath of special PVC
- Sheath colour grey (RAL 7001)
- With length marking in feet

Properties

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

Tests

- self-extinguishing and flame retardant acc. to CSA FT4
- **UL (AWG 22 - AWG 16):** PLTC-ER, ITC-ER, Type CM, NFPA 79 2012, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2517
- **UL (AWG 24 - AWG 28):** CM, AWM 2464, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2012
- **CSA**: CSA CMG FT4, AWM I/II A/B FT4

Note

Advantages

- highly-flexible easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirements

Application

HELUKABEL® TRAYCONTROL® 300 is a multi-core PVC data and control cable. Cross-sections with PLTC-ER and ITC-ER approval suitable for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets. Applications: tool machines, control panels, control and instrumentation technology, production automation, cable ducts, renewable energies.

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

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Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62625	0,093	2 x 28	3,9	1,8	12,0
62626	0,093	3 x 28	4,2	2,7	18,0
62627	0,093	4 x 28	4,4	3,6	21,0
62628	0,093	6 x 28	4,9	5,4	27,0
62629	0,093	8 x 28	5,2	7,2	30,0
62630	0,093	10 x 28	5,8	8,9	30,0
62631	0,093	15 x 28	6,4	13,4	43,0
62632	0,093	20 x 28	7,0	17,9	54,0
62633	0,093	25 x 28	8,0	22,3	63,0
62634	0,093	30 x 28	8,4	26,8	73,0
62635	0,093	40 x 28	9,1	35,7	89,0
62636	0,093	50 x 28	10,1	44,7	109,0
62637	0,154	2 x 26	4,2	3,0	18,0
62638	0,154	3 x 26	4,3	4,4	21,0
62639	0,154	4 x 26	4,5	5,9	24,0
62640	0,154	6 x 26	5,2	8,9	30,0
62641	0,154	8 x 26	5,5	11,8	34,0
62642	0,154	10 x 26	6,2	14,8	42,0
62643	0,154	15 x 26	6,8	22,2	52,0
62644	0,154	20 x 26	7,7	29,6	67,0
62645	0,154	25 x 26	8,5	37,0	80,0
62646	0,154	30 x 26	8,8	44,4	92,0
62647	0,154	40 x 26	9,6	59,1	116,0
62648	0,154	50 x 26	10,8	73,9	145,0
62649	0,241	2 x 24	4,4	4,7	19,0
62650	0,241	3 x 24	4,6	7,0	22,0
62651	0,241	4 x 24	4,9	9,3	27,0
62652	0,241	6 x 24	5,6	13,9	33,0
62653	0,241	8 x 24	5,9	18,5	42,0
62654	0,241	10 x 24	6,6	23,2	49,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62655	0,241	15 x 24	7,4	34,7	69,0
62656	0,241	20 x 24	8,4	46,3	86,0
62657	0,241	25 x 24	9,3	57,9	103,0
62658	0,241	30 x 24	9,6	69,4	131,0
62659	0,241	40 x 24	11,2	92,6	173,0
62660	0,241	50 x 24	12,4	115,7	219,0
62661	0,382	2 x 22	6,1	7,4	22,0
62662	0,382	3 x 22	6,7	11,0	28,0
62663	0,382	4 x 22	7,2	14,7	32,0
62664	0,382	6 x 22	7,8	22,0	46,0
62665	0,382	8 x 22	8,8	29,4	54,0
62666	0,382	10 x 22	9,1	36,7	66,0
62667	0,382	15 x 22	9,7	55,0	90,0
62668	0,382	20 x 22	10,5	73,4	115,0
62669	0,382	25 x 22	11,9	91,7	141,0
62670	0,382	30 x 22	12,3	110,0	176,0
62671	0,382	40 x 22	13,5	146,7	234,0
62672	0,382	50 x 22	14,9	183,4	293,0
62673	0,616	2 x 20	6,9	11,9	57,0
62674	0,616	3 x 20	7,2	17,8	60,0
62675	0,616	4 x 20	7,8	23,7	73,0
62676	0,616	6 x 20	9,0	35,5	97,0
62677	0,616	8 x 20	9,6	47,4	133,0
62678	0,616	10 x 20	10,8	59,2	143,0
62679	0,616	15 x 20	12,4	88,8	177,0
62680	0,616	20 x 20	14,5	118,3	261,0
62681	0,616	25 x 20	15,3	147,9	353,0
62682	0,616	30 x 20	15,9	177,5	419,0
62683	0,616	40 x 20	18,1	236,6	562,0
62684	0,616	50 x 20	20,1	295,7	699,0

Continuation ▸

TRAYCONTROL® 300 flexible, oil-resistant, NFPA 79 Edition 2012

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62685	0,963	2 x 18	7,4	18,5	61,0
62686	0,963	3 x 18	7,6	27,8	64,0
62687	0,963	4 x 18	8,3	37,0	77,0
62688	0,963	6 x 18	9,5	55,5	101,0
62689	0,963	8 x 18	10,1	74,0	142,0
62690	0,963	10 x 18	12,1	92,5	195,0
62691	0,963	15 x 18	13,6	138,7	247,0
62692	0,963	20 x 18	14,9	184,9	328,0
62693	0,963	25 x 18	17,6	231,2	407,0
62694	0,963	30 x 18	17,7	277,4	539,0
62695	0,963	40 x 18	19,5	369,8	717,0
62696	0,963	50 x 18	21,8	462,3	894,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62697	1,31	2 x 16	7,5	25,2	83,0
62698	1,31	3 x 16	8,4	37,8	91,0
62699	1,31	4 x 16	8,8	50,3	109,0
62700	1,31	6 x 16	10,1	75,5	162,0
62702	1,31	8 x 16	11,4	100,7	243,0
62703	1,31	10 x 16	13,0	125,8	267,0
62704	1,31	15 x 16	14,7	188,7	364,0
62705	1,31	20 x 16	16,1	251,6	493,0
62706	1,31	25 x 16	18,3	314,5	608,0
62707	1,31	30 x 16	19,2	377,3	729,0
62708	1,31	40 x 16	21,3	503,1	967,0
62709	1,31	50 x 16	23,9	628,8	1214,0

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

Suitable accessories can be found in Chapter X.

- Cable tie

Command Cable UL (LiYY-TP) Style 2464, 300 V, 80°C

Technical data

- Special PVC command cable, approved to UL-Style 2464, cores acc. to UL-Style 1061/1729
- **Temperature range** flexing -10°C to +80°C fixed installation -20°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** fixed 7,5x cable Ø flexing 15x cable Ø

Cable structure

- Tinned copper, fine wire conductors acc. to ASTM-B 174-95 class J-M
- conductor make-up to
- 0,14 mm² = 7x0,162 mm
- 0,23 mm² = 7x0,202 mm
- 0,34 mm² = 7x0,254 mm
- 0,56 mm² = 7x0,32 mm
- Core insulation of special PVC class 43 respectively semirigid acc. to UL-Std.1581 tab.50.182 and 50183
- Core identification (pair) to DIN 47100, with colour repetition from pair no. 23 or international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Seperator-foil
- Outer sheath of special PVC class 43 acc. to UL-Std.1581 tab.50.182
- Sheath colour black (international colour code) grey (DIN 47100 - preferred type)

Properties

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

Tests

- PVC flame retardant acc. to UL VW-1, CSA FT1
- **Conditionally resistant to** Oil Solvents Acids Lyes

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **command cable UL (LiYCY-TP)**, confer page 418

Application

Twisted pair control cable for use in tool making machinery conveyor system and production lines, in industrial plants and in air conditioning as well as in the steel producing industries.

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

Part no. Sheath colour grey	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83904	1 x 2 x 0,14	26	3,6	2,7	20,0
83905	2 x 2 x 0,14	26	5,1	5,4	24,0
83906	3 x 2 x 0,14	26	5,3	8,1	30,0
83907	4 x 2 x 0,14	26	5,8	10,8	38,0
83908	5 x 2 x 0,14	26	6,2	13,6	44,0
83909	6 x 2 x 0,14	26	6,8	16,2	51,0
83910	7 x 2 x 0,14	26	6,8	19,0	57,0
83911	8 x 2 x 0,14	26	7,3	21,7	64,0
83912	10 x 2 x 0,14	26	7,4	26,7	76,0
83913	12 x 2 x 0,14	26	9,1	32,6	93,0
83914	14 x 2 x 0,14	26	9,8	37,4	103,0
83915	15 x 2 x 0,14	26	10,6	40,7	109,0
83916	16 x 2 x 0,14	26	10,6	43,4	112,0
83917	18 x 2 x 0,14	26	11,1	48,5	119,0
83918	20 x 2 x 0,14	26	11,9	54,2	130,0
83919	22 x 2 x 0,14	26	12,4	59,3	150,0
83920	24 x 2 x 0,14	26	13,1	64,7	169,0
83921	25 x 2 x 0,14	26	13,4	67,2	178,0
83922	1 x 2 x 0,23	24	3,8	4,8	32,0
83923	2 x 2 x 0,23	24	5,3	9,7	36,0
83924	3 x 2 x 0,23	24	5,7	14,7	48,0
83925	4 x 2 x 0,23	24	6,2	19,6	56,0
83926	5 x 2 x 0,23	24	6,6	24,6	71,0
83927	6 x 2 x 0,23	24	7,2	29,3	80,0
83928	7 x 2 x 0,23	24	7,2	34,1	89,0
83929	8 x 2 x 0,23	24	7,8	39,1	98,0
83930	10 x 2 x 0,23	24	9,2	48,9	111,0
83931	12 x 2 x 0,23	24	9,7	59,4	135,0
83932	14 x 2 x 0,23	24	10,2	68,7	160,0

Part no. Sheath colour black	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
65214	1 x 2 x 0,14	26	3,6	2,7	20,0
65215	2 x 2 x 0,14	26	5,1	5,4	24,0
65216	3 x 2 x 0,14	26	5,3	8,1	30,0
65217	4 x 2 x 0,14	26	5,8	10,8	38,0
65218	5 x 2 x 0,14	26	6,2	13,6	44,0
65219	6 x 2 x 0,14	26	6,8	16,2	51,0
65220	7 x 2 x 0,14	26	6,8	19,0	57,0
65221	8 x 2 x 0,14	26	7,3	21,7	64,0
65222	10 x 2 x 0,14	26	7,4	26,7	76,0
65223	12 x 2 x 0,14	26	9,1	32,6	93,0
65224	14 x 2 x 0,14	26	9,8	37,4	103,0
65225	15 x 2 x 0,14	26	10,6	40,7	109,0
65226	16 x 2 x 0,14	26	10,6	43,4	112,0
65227	18 x 2 x 0,14	26	11,1	48,5	119,0
65228	20 x 2 x 0,14	26	11,9	54,2	130,0
65229	22 x 2 x 0,14	26	12,4	59,3	150,0
65230	24 x 2 x 0,14	26	13,1	64,7	169,0
65231	25 x 2 x 0,14	26	13,4	67,2	178,0
65232	1 x 2 x 0,23	24	3,8	4,8	32,0
65233	2 x 2 x 0,23	24	5,3	9,7	36,0
65234	3 x 2 x 0,23	24	5,7	14,7	48,0
65235	4 x 2 x 0,23	24	2,0	19,6	56,0
65236	5 x 2 x 0,23	24	6,0	24,6	56,0
65237	6 x 2 x 0,23	24	7,2	29,3	80,0
65238	7 x 2 x 0,23	24	7,2	34,1	89,0
65239	8 x 2 x 0,23	24	7,8	39,1	98,0
65240	10 x 2 x 0,23	24	9,2	48,9	111,0
65241	12 x 2 x 0,23	24	9,7	59,4	135,0
65242	14 x 2 x 0,23	24	10,2	68,7	160,0

Continuation ▸

Command Cable UL (LiYY-TP) Style 2464, 300 V, 80°C

Part no. Sheath colour grey	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83933	15 x 2 x 0,23	24	10,9	73,7	171,0
83934	16 x 2 x 0,23	24	10,9	79,1	185,0
83935	18 x 2 x 0,23	24	11,5	88,9	209,0
83936	20 x 2 x 0,23	24	12,2	98,4	230,0
83937	22 x 2 x 0,23	24	13,0	108,6	248,0
83938	24 x 2 x 0,23	24	13,7	117,9	279,0
83939	25 x 2 x 0,23	24	14,2	123,5	292,0
83940	1 x 2 x 0,34	22	4,2	6,5	38,0
83941	2 x 2 x 0,34	22	5,9	13,0	44,0
83942	3 x 2 x 0,34	22	6,3	19,5	60,0
83943	4 x 2 x 0,34	22	7,0	26,1	79,0
83944	5 x 2 x 0,34	22	7,6	32,6	92,0
83945	6 x 2 x 0,34	22	8,2	39,2	119,0
83946	7 x 2 x 0,34	22	8,2	45,7	128,0
83947	8 x 2 x 0,34	22	9,0	52,3	139,0
83948	10 x 2 x 0,34	22	10,7	65,3	171,0
83949	12 x 2 x 0,34	22	11,3	78,4	194,0
83950	14 x 2 x 0,34	22	12,1	91,5	222,0
83951	15 x 2 x 0,34	22	12,7	97,8	231,0
83952	16 x 2 x 0,34	22	12,7	104,6	240,0
83953	18 x 2 x 0,34	22	13,6	117,8	264,0
83954	20 x 2 x 0,34	22	14,4	130,7	291,0
83955	22 x 2 x 0,34	22	15,1	143,6	300,0
83956	24 x 2 x 0,34	22	16,2	156,8	359,0
83957	25 x 2 x 0,34	22	16,7	163,3	381,0
83958	1 x 2 x 0,56	20	4,6	10,8	60,0
83959	2 x 2 x 0,56	20	6,5	21,5	80,0
83960	3 x 2 x 0,56	20	7,1	32,3	94,0
83961	4 x 2 x 0,56	20	7,8	43,1	104,0
83962	5 x 2 x 0,56	20	8,6	53,8	130,0
83963	6 x 2 x 0,56	20	9,6	64,6	151,0
83964	7 x 2 x 0,56	20	9,6	75,3	174,0
83965	8 x 2 x 0,56	20	12,2	86,1	262,0
83966	10 x 2 x 0,56	20	12,5	107,7	298,0
83967	12 x 2 x 0,56	20	13,1	129,1	302,0
83968	14 x 2 x 0,56	20	13,8	150,6	327,0
83969	15 x 2 x 0,56	20	14,7	161,3	370,0
83970	16 x 2 x 0,56	20	14,7	172,1	402,0
83971	18 x 2 x 0,56	20	15,7	193,6	480,0
83972	20 x 2 x 0,56	20	16,7	215,1	551,0
83973	22 x 2 x 0,56	20	17,2	236,6	621,0
83974	24 x 2 x 0,56	20	18,6	258,0	703,0
83975	25 x 2 x 0,56	20	19,2	268,9	721,0

Part no. Sheath colour black	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
65243	15 x 2 x 0,23	24	10,9	73,7	171,0
65244	16 x 2 x 0,23	24	10,9	79,1	185,0
65245	18 x 2 x 0,23	24	11,5	88,9	209,0
65246	20 x 2 x 0,23	24	12,2	98,4	230,0
65247	22 x 2 x 0,23	24	13,0	108,6	248,0
65248	24 x 2 x 0,23	24	13,7	117,9	279,0
65249	25 x 2 x 0,23	24	14,2	123,5	292,0
65250	1 x 2 x 0,34	22	4,2	6,5	38,0
65251	2 x 2 x 0,34	22	5,9	13,0	44,0
65252	3 x 2 x 0,34	22	6,3	19,5	60,0
65253	4 x 2 x 0,34	22	7,0	26,1	79,0
65254	5 x 2 x 0,34	22	7,6	32,6	92,0
65255	6 x 2 x 0,34	22	8,2	39,2	119,0
65256	7 x 2 x 0,34	22	8,2	45,7	128,0
65257	8 x 2 x 0,34	22	9,0	52,3	139,0
65258	10 x 2 x 0,34	22	10,7	65,3	171,0
65259	12 x 2 x 0,34	22	11,3	78,4	194,0
65260	14 x 2 x 0,34	22	12,1	91,5	222,0
65261	15 x 2 x 0,34	22	12,7	97,8	231,0
65262	16 x 2 x 0,34	22	12,7	104,6	240,0
65263	18 x 2 x 0,34	22	13,6	117,8	264,0
65264	20 x 2 x 0,34	22	14,4	130,7	291,0
65265	22 x 2 x 0,34	22	15,1	143,6	300,0
65266	24 x 2 x 0,34	22	16,2	156,8	359,0
65267	25 x 2 x 0,34	22	16,7	163,3	381,0
65268	1 x 2 x 0,56	20	4,6	10,8	60,0
65269	2 x 2 x 0,56	20	6,5	21,5	80,0
65270	3 x 2 x 0,56	20	7,1	32,3	94,0
65271	4 x 2 x 0,56	20	7,8	43,1	104,0
65272	5 x 2 x 0,56	20	8,6	53,8	130,0
65273	6 x 2 x 0,56	20	9,6	64,6	151,0
65274	7 x 2 x 0,56	20	9,6	75,3	174,0
65275	8 x 2 x 0,56	20	12,1	86,1	262,0
65276	10 x 2 x 0,56	20	12,5	107,7	298,0
65277	12 x 2 x 0,56	20	13,1	129,1	302,0
65278	14 x 2 x 0,56	20	13,8	150,6	327,0
65279	15 x 2 x 0,56	20	14,7	161,3	370,0
65280	16 x 2 x 0,56	20	14,7	172,1	402,0
65281	18 x 2 x 0,56	20	15,7	193,6	480,0
65282	20 x 2 x 0,56	20	16,7	215,1	551,0
65283	22 x 2 x 0,56	20	17,2	236,6	621,0
65284	24 x 2 x 0,56	20	18,6	258,0	703,0
65285	25 x 2 x 0,56	20	19,2	268,9	721,0

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

Suitable accessories can be found in Chapter X.

- Cable tie

TRAYCONTROL® 300 TP twisted pair, flexible, oil-resistant,

NFPA 79 Edition 2012

Technical data

- Flexible PVC data and control cable
- **Temperature range** -25°C to +105°C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius** flexing 6x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Core insulation of special PVC (AWG 22 - AWG 18 with transparent nylon skin)
- Core identification (pair) acc. to international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- Separator
- Outer sheath of special PVC
- Sheath colour - grey (RAL 7001)
- with length marking in feet

Properties

- Self-extinguishing and flame retardant in acc. to CSA FT4
- The materials used in manufacture are free of silicone, cadmium and substances that impair paint wetting

Tests

- **UL (AWG 22 - AWG 18)**: PLTC-ER, ITC-ER, Type CM, NFPA 79 2012, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2517
- **UL (AWG 24 - AWG 26)**: CM, AWM 2464, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2012
- **CSA**: CSA CMG FT4, AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirement

Application

HELUKABEL® TRAYCONTROL® 300 TP is a twisteded pair data and control cable. Cross-sections with PLTC-ER and ITC-ER approval for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets. Applications: tool machines, control panels, measuring devices, production automation, cable ducts, renewable energies.

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

N

Part no.	Cross-section mm²	No.pairs x No.cores x AWG-no.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62794	0,154	1 x 2 x 26	3,6	3,0	20,0
62795	0,154	2 x 2 x 26	5,1	5,0	24,0
62796	0,154	3 x 2 x 26	5,3	8,0	30,0
62797	0,154	4 x 2 x 26	5,8	11,0	38,0
62798	0,154	5 x 2 x 26	6,2	14,0	44,0
62799	0,154	6 x 2 x 26	6,8	16,0	51,0
62800	0,154	7 x 2 x 26	6,9	19,0	57,0
61928	0,154	8 x 2 x 26	7,3	22,0	64,0
61929	0,154	10 x 2 x 26	7,4	27,0	76,0
61930	0,154	12 x 2 x 26	9,1	33,0	93,0
61931	0,154	14 x 2 x 26	9,8	38,0	103,0
61932	0,154	15 x 2 x 26	10,6	41,0	109,0
61933	0,154	16 x 2 x 26	10,7	43,0	112,0
61934	0,154	18 x 2 x 26	11,1	49,0	119,0
61935	0,154	20 x 2 x 26	11,9	54,0	130,0
61936	0,154	22 x 2 x 26	12,4	59,0	150,0
61937	0,154	24 x 2 x 26	13,1	65,0	169,0
61938	0,154	25 x 2 x 26	13,4	67,0	178,0
61939	0,241	1 x 2 x 24	3,9	5,0	32,0
61940	0,241	2 x 2 x 24	5,9	10,0	36,0
61941	0,241	3 x 2 x 24	6,2	15,0	48,0
61942	0,241	4 x 2 x 24	6,5	20,0	56,0
61943	0,241	5 x 2 x 24	7,2	25,0	71,0
61944	0,241	6 x 2 x 24	8,1	29,0	80,0
61945	0,241	7 x 2 x 24	8,2	34,0	89,0
61946	0,241	8 x 2 x 24	8,9	39,0	98,0
61947	0,241	10 x 2 x 24	10,5	49,0	111,0
61948	0,241	12 x 2 x 26	11,0	59,0	135,0
61949	0,241	14 x 2 x 24	11,6	69,0	160,0
61950	0,241	15 x 2 x 24	12,0	74,0	171,0

Part no.	Cross-section mm²	No.pairs x No.cores x AWG-no.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61951	0,241	16 x 2 x 24	12,1	79,0	185,0
61952	0,241	18 x 2 x 24	13,5	89,0	209,0
61953	0,241	20 x 2 x 24	14,4	98,0	230,0
61954	0,241	22 x 2 x 24	15,3	109,0	248,0
61955	0,241	24 x 2 x 24	16,1	118,0	279,0
61956	0,241	25 x 2 x 24	16,7	124,0	292,0
61957	0,382	1 x 2 x 22	4,2	7,0	38,0
61958	0,382	2 x 2 x 22	6,4	13,0	44,0
61959	0,382	3 x 2 x 22	6,8	20,0	60,0
61960	0,382	4 x 2 x 22	9,2	29,3	79,0
61961	0,382	5 x 2 x 22	8,2	33,0	92,0
61962	0,382	6 x 2 x 22	8,9	39,0	119,0
61963	0,382	7 x 2 x 22	9,0	46,0	128,0
61964	0,382	8 x 2 x 22	9,9	52,0	139,0
61965	0,382	10 x 2 x 22	11,7	65,0	171,0
61966	0,382	12 x 2 x 22	12,4	78,0	194,0
61967	0,382	14 x 2 x 22	13,0	92,0	222,0
61968	0,382	15 x 2 x 22	13,2	98,0	231,0
61969	0,382	16 x 2 x 22	13,3	105,0	240,0
61970	0,382	18 x 2 x 22	14,2	118,0	264,0
61971	0,382	20 x 2 x 22	15,1	131,0	291,0
61972	0,382	22 x 2 x 22	15,8	144,0	300,0
61973	0,382	24 x 2 x 22	17,0	157,0	359,0
61974	0,382	25 x 2 x 22	17,5	163,0	381,0
61975	0,616	1 x 2 x 20	5,2	11,0	60,0
61976	0,616	2 x 2 x 20	8,8	22,0	80,0
61977	0,616	3 x 2 x 20	9,3	32,0	94,0
61978	0,616	4 x 2 x 20	10,2	43,0	104,0
61979	0,616	5 x 2 x 20	11,3	54,0	130,0
61980	0,616	6 x 2 x 20	12,5	65,0	151,0

Continuation ▸

TRAYCONTROL® 300 TP twisted pair, flexible, oil-resistant,

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Part no.	Cross-section mm²	No.pairs x No.cores x AWG-no.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61981	0,616	7 x 2 x 20	12,6	75,0	174,0
61982	0,616	8 x 2 x 20	15,9	86,0	262,0
61983	0,616	10 x 2 x 20	16,4	108,0	298,0
61984	0,616	12 x 2 x 20	17,2	129,0	302,0
61985	0,616	14 x 2 x 20	18,1	151,0	327,0
61986	0,616	15 x 2 x 20	18,5	161,0	370,0
61987	0,616	16 x 2 x 20	18,6	172,0	402,0
61988	0,616	18 x 2 x 20	19,9	194,0	480,0
61989	0,616	20 x 2 x 20	21,1	215,0	551,0
61990	0,616	22 x 2 x 20	21,8	237,0	621,0
61991	0,616	24 x 2 x 20	23,5	258,0	703,0
61992	0,616	25 x 2 x 20	24,3	269,0	721,0
61993	0,963	1 x 2 x 18	5,6	18,0	61,0
61994	0,963	2 x 2 x 18	9,6	36,0	77,0
61995	0,963	3 x 2 x 18	10,6	54,0	103,0
61996	0,963	6 x 2 x 18	13,7	107,0	216,0
61997	0,963	9 x 2 x 18	16,4	162,0	328,0
61998	0,963	15 x 2 x 18	20,4	271,0	542,0

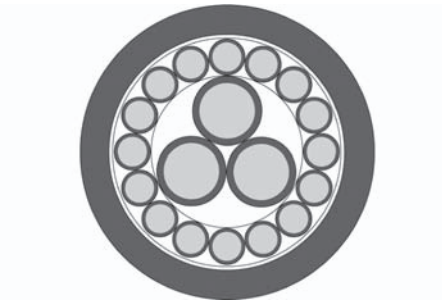
Dimensions and specifications may be changed without prior notice. (RN02)

Suitable accessories can be found in Chapter X.

- Cable tie

SENSORFLEX® / VERTEILERFLEX two-approvals

sensor actuator and distributor cables PVC, PUR, PVC/PUR



Technical data

- Special PVC or PUR sheath acc. to
  - UL-Style 2464 for PVC
  - UL-Style 20233 for PUR
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -30°C to +80°C
- **Nominal voltage** U_0/U 300/500 V
- **Test voltage**
  up to 0,25 mm² 1200 V
  from 0,34 mm² 2000 V
- **Minimum bending radius**
  SENSORFLEX® two-approvals PVC
  15x cable Ø
  SENSORFLEX® two-approvals PUR
  7,5x cable Ø

Cable structure

PVC cables

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of PVC
- Core identification see table below
- Outer sheath of special PVC

PUR cables

- Bare copper-conductor, to DIN VDE 0295 cl.6, extra fine-wire, BS 6360 cl.6, IEC 60228 cl.6
- Core insulation of PVC
- Core identification see table below
- Outer sheath of PUR

Part no. 79907, 75642, 79850

- Construction as per SENSORFLEX® two-approvals
- Core insulation of polypropylene

Properties

PVC cables

- Extensively oil resistant; Chemical Resistance (see table Technical Informations)
- PVC self-extinguishing and flame retardant 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)

PUR cables

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

Special feature

- The cables with the highly flexible stranded conductor cl.6, are **suitable for drag chain applications**
- The types with **PVC/PUR** sheath material have a PVC inner sheath, with a PUR sheath applied over it by means of coextrusion

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For decentralised installation and control technology. These cables are used in connector systems for sensors and actuators. In combination with injected circular connectors and installed actuator-sensor boxes, they constitute an important connecting element between the periphery and the PLC in production systems. The assembled cables offer attractive opportunities for reducing costs, not only in the field of automation technology, but also in the entire manufacturing industry. While previously it was necessary to carry out time-consuming wiring of switchgear cabinets and machines, now field bus technology has made it possible to move the periphery interfaces from the switchgear cabinets to the machines and systems. Moving the I/O points to the system periphery enables significant reductions in installation costs.

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

SENSORFLEX® 2-APPROVALS

Part no.	Sheath colour	Cable structure No.cores x cross-sec. mm²	Sheath material	Core colours	Fine wire	High flex **	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
78284	GY RAL 7001	3 x 0,25	PUR	BN, BU, BK		X	4,4	7,2	18,0	24
79907	GY RAL 7001	4 x 0,25	PUR	BN, BU, BK, WH		X	4,7	9,6	18,0	24
78286	GY RAL 7001	6 x 0,25	PVC	BN, BU, BK, WH, GY, PK	X		5,2	14,4	36,0	24
76345	GY RAL 7001	3 x 0,34	PVC	BN, BU, BK	X		4,9	9,8	30,0	22
76347	GY RAL 7001	4 x 0,34	PVC	BN, BU, BK, WH		X	5,2	13,1	43,0	22
76348	GY RAL 7001	5 G 0,34	PVC/PUR	BN, BU, BK, WH, GN-YE	X		5,9	16,4	54,0	22
76349	GY RAL 7001	5 G 0,34	PVC/PUR	BN, BU, BK, WH, GN-YE		X	5,9	16,4	54,0	22
78287	GY RAL 7001	5 G 0,34	PVC/PUR	BK with number, GN-YE		X	5,9	16,4	54,0	22
79850	GY RAL 7001	5 G 0,34	PUR	BN, BU, BK, WH, GN-YE		X	5,9	16,4	54,0	22
73571	GY RAL 7001	3 G 0,75	PVC	BK with number, GN-YE	X		6,7	21,6	58,0	18
75642	BK RAL 9005	3 G 0,75	PUR	BK with number, GN-YE		X	5,9	21,6	58,0	18
76351	GY RAL 7001	3 G 0,75	PVC	BN, BU, GN-YE	X		6,7	28,8	88,0	18
78288	GY RAL 7001	3 G 0,75	PUR	BK with number, GN-YE		X	5,9	21,6	58,0	18

Continuation ▸

SENSORFLEX® / VERTEILERFLEX

two-approvals sensor actuator and distributor cables PVC, PUR, PVC/PUR

SENSORFLEX® 2-APPROVALS

Part no.	Sheath colour	Cable structure No.cores x cross-sec. mm²	Sheath material	Core colours	Fine wire	High flex **	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
74551	GY RAL 7001	4 G 0,75	PUR	BK with number, GN-YE		X	6,9	29,0	66,0	18
78289	GY RAL 7001	4 G 0,75	PVC/PUR	BK with number, GN-YE	X		7,0	29,0	66,0	18
77352	BK RAL 9005	2 x 1	PVC	SW mit Ziffer 1-2	X		7,2	19,2	56,0	17
78290	GY RAL 7001	2 x 1	PVC	SW mit Ziffer 1-2	X		7,2	19,2	56,0	17
76350	GY RAL 7001	11 G 1	PVC/PUR	BK with number 1-8, BN, BU, GN-YE	X		12,0	105,6	225,0	17
78291	GY RAL 7001	2 x 1,5	PVC	BN, BU	X		6,8	29,0	75,0	16
73587	GY RAL 7001	3 G 1,5	PVC	BN, BU, GN-YE	X		6,9	44,0	94,0	16

Dimensions and specifications may be changed without prior notice.

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-MS-EP4

Command Cable UL (LiYCY) Style 2464, 300 V, 80°C,

EMC-preferred type

Technical data

- Special PVC command cable, approved to UL-Style 2464, cores acc. to UL-Style 1061/1729 for AWG 26-20, UL-Style 1007/1569 for AWG 18-16
- **Temperature range**
  flexing -10°C to +80°C
  fixed installation -20°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Minimum bending radius**
  fixed 7,5x cable Ø
  flexing 15x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Tinned copper, fine wire conductors AWG 26-20 gem. ASTM-B 174-95 class J-M, AWG 18-16 gem. ASTM-B 286 conductor make-up to
  0,14 mm² = 7x0,162 mm
  0,23 mm² = 7x0,202 mm
  0,34 mm² = 7x0,254 mm
  0,56 mm² = 7x0,32 mm
  0,82 mm² = 19x0,235 mm
  1,30 mm² = 19x0,31 mm
- Core insulation of special PVC class 43 respectively semirigid acc. to UL-Std. 1581 tab.50.182 and 50.183
- Colour coded to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Seperator-foil
- Drain wire
- Tinned copper wire braiding, approx. 85% coverage
- Outer sheath of PVC class 43 acc. to UL-Std.1581 tab.50.182
- Sheath colour
  black (international colour code)
  grey (DIN 47100 - preferred type from stock)

Properties

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

Tests

- PVC flame retardant acc. to UL VW-1, CSA FT1
- **Conditionally resistant to**
  Oil
  Solvents
  Acids
  Lyes

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- non-screened analogue types: **command cable UL (LiYY)**, confer page 403

Application

As a flexible interconnecting cable for electronics, control and command technology, as well as in measurement, signal, and pulse technology. Fast and inexpensive contacting by cutting and clamping technology.
EMC = Electromagnetic compatibillity
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. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83254	83976	2 x 0,14	26	3,9	12,6	20,0
83255	83977	3 x 0,14	26	4,2	13,7	25,0
83256	83978	4 x 0,14	26	4,4	14,9	28,0
83257	83979	6 x 0,14	26	5,0	18,9	30,0
83258	83980	10 x 0,14	26	6,1	29,5	50,0
83259	83981	12 x 0,14	26	6,3	31,4	53,0
83260	83982	16 x 0,14	26	6,8	43,9	60,0
83261	83983	18 x 0,14	26	7,1	52,1	70,0
83262	83984	24 x 0,14	26	8,0	62,8	100,0
83263	83985	27 x 0,14	26	8,4	66,3	105,0
83264	83986	30 x 0,14	26	8,6	70,4	110,0

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83270	83987	2 x 0,23	24	4,3	16,1	20,0
83271	83988	3 x 0,23	24	4,5	18,9	25,0
83272	83989	4 x 0,23	24	4,8	23,0	30,0
83273	83990	6 x 0,23	24	5,4	32,8	40,0
83274	83991	10 x 0,23	24	6,5	50,9	60,0
83275	83992	12 x 0,23	24	6,7	59,1	70,0
83276	83993	16 x 0,23	24	7,4	68,4	90,0
83277	83994	18 x 0,23	24	7,7	79,5	123,0
83278	83995	24 x 0,23	24	8,8	97,3	131,0
83279	83996	27 x 0,23	24	9,0	122,0	160,0
83280	83997	30 x 0,23	24	9,3	132,0	170,0

Continuation ▸

Command Cable UL (LiYCY) Style 2464, 300 V, 80°C,

EMC-preferred type

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83286	65044	2 x 0,34	22	4,6	18,1	40,0
83287	65045	3 x 0,34	22	4,8	22,2	50,0
83288	65046	4 x 0,34	22	5,1	28,7	60,0
83289	65047	6 x 0,34	22	6,0	45,4	80,0
83290	65048	10 x 0,34	22	7,3	66,1	130,0
83291	65049	12 x 0,34	22	7,5	70,8	140,0
83292	65050	16 x 0,34	22	8,2	88,4	160,0
83293	65051	18 x 0,34	22	8,7	104,1	170,0
83294	65052	24 x 0,34	22	9,9	129,0	220,0
83295	65053	27 x 0,34	22	10,4	138,4	250,0
83296	65054	30 x 0,34	22	10,9	159,0	280,0
83302	65055	2 x 0,56	20	5,1	29,4	50,0
83303	65056	3 x 0,56	20	5,3	39,7	55,0
83304	65057	4 x 0,56	20	5,6	46,1	61,0
83305	65058	6 x 0,56	20	6,6	66,8	90,0
83306	65059	10 x 0,56	20	8,1	93,1	133,0
83307	65060	12 x 0,56	20	8,4	117,4	151,0
83308	65061	16 x 0,56	20	9,5	130,4	190,0
83309	65062	18 x 0,56	20	9,9	151,4	216,0
83310	65063	24 x 0,56	20	11,5	237,0	339,0
83311	65064	27 x 0,56	20	12,0	257,4	374,0
83312	65065	30 x 0,56	20	12,4	297,0	397,0

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83318	65066	2 x 0,82	18	6,5	39,1	60,0
83319	65067	3 x 0,82	18	6,8	50,0	75,0
83320	65068	4 x 0,82	18	7,4	59,1	90,0
83321	65069	6 x 0,82	18	8,8	89,1	125,0
83322	65070	10 x 0,82	18	10,9	141,4	180,0
83323	65071	12 x 0,82	18	11,2	152,8	220,0
83324	65072	16 x 0,82	18	12,9	184,1	290,0
83325	65073	18 x 0,82	18	13,5	207,2	300,0
83326	65074	24 x 0,82	18	15,6	272,6	450,0
83327	65075	27 x 0,82	18	15,9	289,1	470,0
83328	65076	30 x 0,82	18	16,6	317,4	490,0
83334	65077	2 x 1,3	16	6,9	59,1	90,0
83335	65078	3 x 1,3	16	7,3	74,1	160,0
83336	65079	4 x 1,3	16	7,9	96,4	200,0
83337	65080	6 x 1,3	16	9,6	137,4	290,0
83338	65081	10 x 1,3	16	12,4	191,7	450,0
83339	65082	12 x 1,3	16	12,8	251,7	600,0
83340	65083	16 x 1,3	16	12,8	276,1	650,0
83341	65084	18 x 1,3	16	15,5	364,1	680,0
83342	65085	24 x 1,3	16	18,1	442,4	900,0
83343	65086	27 x 1,3	16	18,7	494,7	990,0
83344	65087	30 x 1,3	16	19,5	521,4	1050,0

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

Suitable accessories can be found in Chapter X.

- Cable tie

Command Cable UL (LiYCY) Style 2516/600 V, 105°C,

EMC-preferred type

Technical data

- Special PVC command cable, approved to UL-Style 2516 cores acc. UL-Style 10012
- **Temperature range**
  flexing -10°C to +105°C
  fixed installation -20°C to +105°C
- **Nominal voltage** 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 4000 V
- **Minimum bending radius**
  fixed 7,5x cable Ø
  flexing 15x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Tinned copper, fine wire conductors acc. to ASTM-B 174, class J-K
  conductor make-up to
  2,08 mm² = 41x0,254 mm
  3,20 mm² = 65x0,254 mm
- Core insulation of special PVC class 43 acc. to UL-Std.1581 tabl.50.182 (105°C)
- Core identification to DIN 47100 or international colour code
- Cores stranded in layers with optimal lay-length
- Seperator-foil
- Drain wire
- Tinned copper wire braiding, approx. 85% coverage
- Outer sheath of PVC class 43 acc. to UL-Std.1581 tab.50.182 (105°C)
- Sheath colour
  black (international colour code)
  grey (DIN 47100/preferred type from stock)

Properties

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

Tests

- PVC flame retardant according to UL VW-1, CSA FT1
- **Conditionally resistant to**
  Oil
  Solvents
  Acids
  Lyes

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- non-screened analogue types: **command cable UL (LiYY)**, confer page 404

Application

As a flexible interconnecting cable for electronics, control and command technology, as well as in measurement, signal, and pulse technology. Fast and inexpensive contacting by cutting and clamping technology.
EMC = Electromagnetic compatibillity
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.

N

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83350	65114	2 x 2,08	14	9,1	92,1	180,0
83351	65115	3 x 2,08	14	9,6	140,6	220,0
83352	65116	4 x 2,08	14	10,4	162,4	270,0
83353	65117	6 x 2,08	14	12,1	200,0	380,0
83354	65118	10 x 2,08	14	16,0	313,1	600,0
83355	65119	12 x 2,08	14	16,5	417,6	770,0
83356	65120	16 x 2,08	14	18,1	510,3	870,0
83357	65121	18 x 2,08	14	19,4	540,4	990,0
83358	65122	24 x 2,08	14	23,4	0,0	1300,0
83359	65123	27 x 2,08	14	23,9	604,2	1400,0
83360	65124	30 x 2,08	14	24,6	660,1	1610,0

Part no. Sheath colour grey	Part no. Sheath colour black	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83362	65125	2 x 3,2	12	10,0	131,4	200,0
83363	65126	3 x 3,2	12	10,6	162,6	240,0
83364	65127	4 x 3,2	12	11,4	221,7	300,0
83365	65128	6 x 3,2	12	14,4	328,1	400,0
83366	65129	10 x 3,2	12	17,8	401,8	580,0
83367	65130	12 x 3,2	12	18,4	460,2	800,0
83368	65131	16 x 3,2	12	20,6	532,3	900,0
83369	65132	18 x 3,2	12	22,7	573,4	1000,0
83370	65133	24 x 3,2	12	26,1	626,8	1300,0

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

Suitable accessories can be found in Chapter X.

• Cable tie

TRAYCONTROL® 300-C flexible, oil-resistant, screened,

EMC-preferred type, NFPA 79 Edition 2012

Technical data

- Flexible screened PVC data and control cable
- **Temperature range** -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 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Tinned copper conductor, fine wire with AWG dimensions
- Core insulation of special PVC (AWG 22 - AWG 16 with transparent nylon skin)
- Core identification to international colour code
- Cores stranded in layers with optimal lay-length
- 1. Screen with special aluminium film
- 2.Tinned copper braided screen, approx. 85%
- Separator
- Outer sheath of special PVC
- Sheath colour grey (RAL 7001)
- with length marking in feet

Properties

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

Tests

- self-extinguishing and flame retardant acc. to CSA FT4
- **UL (AWG 22 - AWG 16)**: PLTC-ER, ITC-ER, Type CM, NFPA 79 2012, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2517
- **UL (AWG 24 - AWG 28)**: CM, AWM 2464, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2012
- **CSA**: CSA CMG FT4, AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirement

Application

HELUKABEL® TRAYCONTROL® 300 is a screened, multi-core PVC data and control cable. Cross-sections with PLTC-ER and ITC-ER approval suitable for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets. The double-screening with aluminium foil (100% coverage) and copper braid (approx. 85% coverage) guarantee superior EMC protection. Applications: tool machines, control panels, measuring devices, production automation, cable ducts, renewable energies.

EMC = Electromagnetic compatibillity

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.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62710	0,093	2 x 28	4,5	6,0	16,0
62711	0,093	3 x 28	4,7	7,0	22,0
62712	0,093	4 x 28	5,0	9,0	27,0
62713	0,093	6 x 28	5,5	12,0	34,0
62714	0,093	8 x 28	5,8	15,0	37,0
62715	0,093	10 x 28	6,4	18,0	43,0
62716	0,093	15 x 28	7,0	24,0	52,0
62717	0,093	20 x 28	7,6	30,0	67,0
62718	0,093	25 x 28	8,6	37,0	79,0
62719	0,093	30 x 28	8,9	43,0	88,0
62720	0,093	40 x 28	9,7	54,0	112,0
62721	0,093	50 x 28	11,4	67,0	131,0
62722	0,154	2 x 26	4,7	9,0	24,0
62723	0,154	3 x 26	4,9	10,0	27,0
62724	0,154	4 x 26	5,1	12,0	31,0
62725	0,154	6 x 26	5,8	16,0	39,0
62726	0,154	8 x 26	6,1	19,0	43,0
62727	0,154	10 x 26	6,8	24,0	51,0
62728	0,154	15 x 26	7,5	31,0	66,0
62729	0,154	20 x 26	8,3	40,0	79,0
62730	0,154	25 x 26	9,2	49,0	92,0
62731	0,154	30 x 26	9,5	57,0	110,0
62732	0,154	40 x 26	10,4	72,0	136,0
62733	0,154	50 x 26	12,1	88,0	165,0
62734	0,241	2 x 24	4,9	15,0	30,0
62735	0,241	3 x 24	5,1	16,0	33,0
62736	0,241	4 x 24	5,3	19,0	37,0
62737	0,241	6 x 24	6,1	27,0	48,0

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62738	0,241	8 x 24	6,4	31,0	57,0
62739	0,241	10 x 24	7,3	39,0	67,0
62740	0,241	15 x 24	8,2	51,0	85,0
62741	0,241	20 x 24	9,0	64,0	106,0
62742	0,241	25 x 24	9,9	77,0	128,0
62743	0,241	30 x 24	10,3	92,0	155,0
62744	0,241	40 x 24	11,4	118,0	206,0
62745	0,241	50 x 24	13,2	148,0	249,0
62746	0,382	2 x 22	6,6	19,0	34,0
62747	0,382	3 x 22	5,5	22,0	40,0
62748	0,382	4 x 22	5,8	27,0	46,0
62749	0,382	6 x 22	6,5	34,0	60,0
62750	0,382	8 x 22	9,3	45,0	72,0
62751	0,382	10 x 22	9,8	69,0	85,0
62752	0,382	15 x 22	9,7	77,0	115,0
62753	0,382	20 x 22	11,1	92,0	140,0
62754	0,382	25 x 22	12,6	121,0	176,0
62755	0,382	30 x 22	13,0	139,0	210,0
62756	0,382	40 x 22	14,1	177,0	273,0
62757	0,382	50 x 22	15,5	215,0	331,0
62758	0,616	2 x 20	7,4	28,0	73,0
62759	0,616	3 x 20	7,7	34,0	77,0
62760	0,616	4 x 20	8,3	40,0	91,0
62761	0,616	6 x 20	8,6	54,0	118,0
62762	0,616	8 x 20	9,1	70,0	158,0
62763	0,616	10 x 20	10,4	83,0	173,0
62764	0,616	15 x 20	12,9	119,0	218,0
62765	0,616	20 x 20	14,8	130,0	298,0

Continuation ▸

TRAYCONTROL® 300-C flexible, oil-resistant, screened,

EMC-preferred type, NFPA 79 Edition 2012

Part no.	Cross-section mm²	No.cores x AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62766	0,616	25 x 20	16,0	186,0	401,0
62767	0,616	30 x 20	16,5	224,0	477,0
62768	0,616	40 x 20	18,7	288,0	623,0
62769	0,616	50 x 20	20,7	337,0	752,0
62770	0,963	2 x 18	7,8	37,0	80,0
62771	0,963	3 x 18	8,1	49,0	86,0
62772	0,963	4 x 18	8,8	58,0	101,0
62773	0,963	6 x 18	10,0	82,0	130,0
62774	0,963	8 x 18	10,6	100,0	168,0
62775	0,963	10 x 18	12,8	124,0	226,0
62776	0,963	15 x 18	14,3	180,0	295,0
62777	0,963	20 x 18	15,5	234,0	386,0
62778	0,963	25 x 18	17,7	277,0	462,0
62779	0,963	30 x 18	18,4	323,0	590,0
62780	0,963	40 x 18	20,2	416,0	773,0
62781	0,963	50 x 18	22,4	508,0	958,0
62782	1,31	2 x 16	8,2	51,0	110,0
62783	1,31	3 x 16	8,9	63,0	116,0
62784	1,31	4 x 16	9,5	76,0	139,0
62785	1,31	6 x 16	10,8	104,0	195,0
62786	1,31	8 x 16	12,0	134,0	283,0
62787	1,31	10 x 16	13,9	168,0	316,0
62788	1,31	15 x 16	15,3	234,0	410,0
62789	1,31	20 x 16	17,0	301,0	551,0
62790	1,31	25 x 16	19,4	367,0	675,0
62791	1,31	30 x 16	20,1	428,0	794,0
62792	1,31	40 x 16	22,3	550,0	1033,0
62793	1,31	50 x 16	25,1	669,0	1274,0

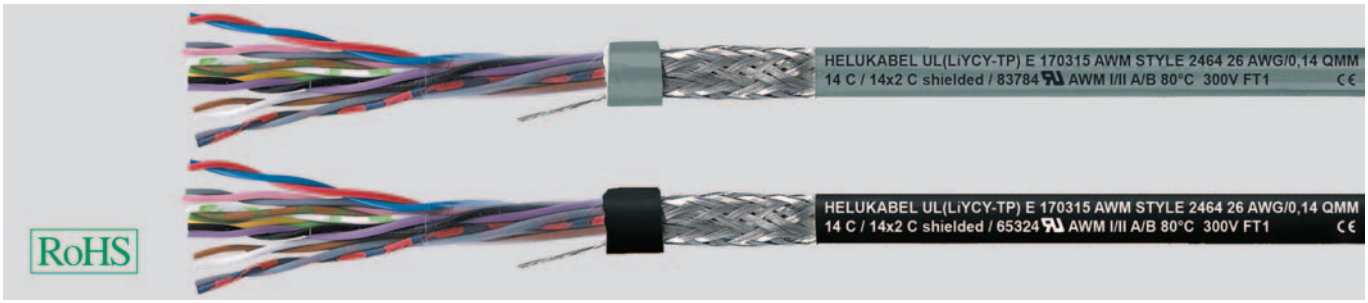
Dimensions and specifications may be changed without prior notice. (RN02)

Suitable accessories can be found in Chapter X.

- Cable tie

Command Cable UL (LiYCY-TP) Style 2464/300 V, 80°C,

EMC-preferred type



Technical data

- Special PVC command cable, approved to UL-Style 2464, cores acc. to UL-Style 1061/1729
- **Temperature range** flexing -10°C to +80°C fixed installation -20°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** fixed 7,5x cable Ø flexing 15x cable Ø
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Tinned copper, fine wire conductors acc. to ASTM-B 174-95 class J-M Conductor make-up to 0,14 mm² = 7x0,162 mm 0,23 mm² = 7x0,202 mm 0,34 mm² = 7x0,254 mm 0,56 mm² = 7x0,32 mm
- Core insulation of special PVC class 43 respectively semirigid acc. to UL-Std.1581 tab.50.182 and 50183
- Core identification (pair) to DIN 47100 with colour repetition from pair no. 23 and above or international colour code
- Cores stranded in pairs to optimal lay-length
- Pairs stranded with optimal lay-length in layers
- Seperator-foil
- Drain wire
- Tinned copper wire braiding, approx. 85% coverage
- Outer sheath of special PVC class 43 acc. to UL-Std.1581 tab.50.182
- Sheath colour black (international colour code) grey (DIN 47100 - preferred type from stock)

Properties

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

Tests

- PVC flame retardant acc. to UL VW-1, CSA FT1
- **Conditionally resistant to** Oil Solvents Acids Lyes

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- non-screened analogue type: **command cable UL (LiYY-TP)**, confer page 407

Application

Flexiblescreenedpaircableconnection,as control,signaland measuring cablesin tool machinery,conveyor belts and,inplant construction,air conditioning,in foundries and steel mills.

EMC = Electromagnetic compatibillity

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. Sheath colour grey	Sheath colour black	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83774	65314	1 x 2 x 0,14	26	4,0	15,7	32,0
83775	65315	2 x 2 x 0,14	26	5,6	19,5	39,0
83776	65316	3 x 2 x 0,14	26	5,8	23,7	47,0
83777	65317	4 x 2 x 0,14	26	6,3	26,9	55,0
83778	65318	5 x 2 x 0,14	26	6,7	31,2	68,0
83779	65319	6 x 2 x 0,14	26	7,3	49,7	86,0
83780	65320	7 x 2 x 0,14	26	7,3	52,0	92,0
83781	65321	8 x 2 x 0,14	26	7,8	53,9	97,0
83782	65322	10 x 2 x 0,14	26	9,1	59,6	111,0
83783	65323	12 x 2 x 0,14	26	9,8	67,1	141,0
83784	65324	14 x 2 x 0,14	26	10,5	75,2	150,0
83785	65325	15 x 2 x 0,14	26	11,1	77,3	154,0
83786	65326	16 x 2 x 0,14	26	11,1	80,4	155,0
83787	65327	18 x 2 x 0,14	26	11,8	84,2	170,0
83788	65328	20 x 2 x 0,14	26	12,4	98,2	183,0
83789	65329	22 x 2 x 0,14	26	13,1	104,1	207,0
83790	65330	24 x 2 x 0,14	26	13,6	112,0	228,0
83791	65331	25 x 2 x 0,14	26	15,1	114,4	239,0

Part no. Sheath colour grey	Sheath colour black	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83792	65332	1 x 2 x 0,23	24	4,2	16,4	46,0
83793	65333	2 x 2 x 0,23	24	5,9	27,4	53,0
83794	65334	3 x 2 x 0,23	24	6,2	31,7	65,0
83795	65335	4 x 2 x 0,23	24	6,7	37,4	79,0
83796	65336	5 x 2 x 0,23	24	7,2	54,7	98,0
83797	65337	6 x 2 x 0,23	24	7,7	65,6	114,0
83798	65338	7 x 2 x 0,23	24	7,7	60,2	121,0
83799	65339	8 x 2 x 0,23	24	8,4	74,1	129,0
83800	65340	10 x 2 x 0,23	24	9,9	109,3	152,0
83801	65341	12 x 2 x 0,23	24	10,2	115,8	189,0
83802	65342	14 x 2 x 0,23	24	10,9	120,7	213,0
83803	65343	15 x 2 x 0,23	24	11,4	132,4	225,0
83804	65344	16 x 2 x 0,23	24	11,4	141,6	227,0
83805	65345	18 x 2 x 0,23	24	12,2	146,6	238,0
83806	65346	20 x 2 x 0,23	24	12,7	160,6	270,0
83807	65347	22 x 2 x 0,23	24	13,5	170,8	300,0
83808	65348	24 x 2 x 0,23	24	14,5	229,7	321,0
83809	65349	25 x 2 x 0,23	24	14,8	231,4	340,0

Continuation ▸

Command Cable UL (LiYCY-TP) Style 2464/300 V, 80°C,

EMC-preferred type

Part no. Sheath colour grey	Sheath colour black	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83810	65350	1 x 2 x 0,34	22	4,6	17,0	58,0
83811	65351	2 x 2 x 0,34	22	6,4	36,7	65,0
83812	65352	3 x 2 x 0,34	22	6,9	44,6	78,0
83813	65353	4 x 2 x 0,34	22	7,5	54,1	88,0
83814	65354	5 x 2 x 0,34	22	8,1	63,4	110,0
83815	65355	6 x 2 x 0,34	22	8,8	73,4	126,0
83816	65356	7 x 2 x 0,34	22	8,8	79,4	140,0
83817	65357	8 x 2 x 0,34	22	9,7	88,4	148,0
83818	65358	10 x 2 x 0,34	22	11,5	107,0	184,0
83819	65359	12 x 2 x 0,34	22	12,0	122,4	210,0
83820	65360	14 x 2 x 0,34	22	12,6	138,2	241,0
83821	65361	15 x 2 x 0,34	22	13,4	154,3	245,0
83822	65362	16 x 2 x 0,34	22	13,4	161,4	251,0
83823	65363	18 x 2 x 0,34	22	14,4	197,9	275,0
83824	65364	20 x 2 x 0,34	22	15,0	211,4	300,0
83825	65365	22 x 2 x 0,34	22	15,9	217,6	320,0
83826	65366	24 x 2 x 0,34	22	17,0	230,4	371,0
83827	65367	25 x 2 x 0,34	22	17,3	138,5	402,0

Part no. Sheath colour grey	Sheath colour black	No.pairs x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
83828	65368	1 x 2 x 0,56	20	5,0	26,0	70,0
83829	65369	2 x 2 x 0,56	20	7,0	56,1	89,0
83830	65370	3 x 2 x 0,56	20	7,6	71,7	102,0
83831	65371	4 x 2 x 0,56	20	8,3	92,4	119,0
83832	65372	5 x 2 x 0,56	20	9,1	107,4	140,0
83833	65373	6 x 2 x 0,56	20	10,1	122,4	162,0
83834	65374	7 x 2 x 0,56	20	10,1	131,7	198,0
83835	65375	8 x 2 x 0,56	20	12,7	144,3	272,0
83836	65376	10 x 2 x 0,56	20	13,2	179,6	307,0
83837	65377	12 x 2 x 0,56	20	13,6	201,7	318,0
83838	65378	14 x 2 x 0,56	20	14,4	221,4	342,0
83839	65379	15 x 2 x 0,56	20	15,5	231,6	381,0
83840	65380	16 x 2 x 0,56	20	15,5	257,1	417,0
83841	65381	18 x 2 x 0,56	20	16,3	282,4	494,0
83842	65382	20 x 2 x 0,56	20	17,1	306,7	570,0
83843	65383	22 x 2 x 0,56	20	18,0	321,8	643,0
83844	65384	24 x 2 x 0,56	20	19,4	342,4	724,0
83845	65385	25 x 2 x 0,56	20	19,8	361,2	740,0

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

Suitable accessories can be found in Chapter X.

- Cable tie

N

TRAYCONTROL® 300-C TP twisted pair, flexible, screened, oil-resistant, EMC-preferred type, NFPA 79 Edition 2012

Technical data

- Flexible screened PVC data and control cable
- **Temperature range** -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 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Tinned copper conductor, fine wire stranded, with AWG measures
- Core insulation of special PVC (AWG 22 - AWG 18 with transparent nylon skin)
- Core identification (pair) acc. to international colour code
- Cores stranded in pairs with optimal lay-length
- Pairs stranded in layers with optimal lay-length
- 1. Screening with special aluminium foil 2. Tinned copper braided screen, approx. 85% coverage
- Separator
- Outer sheath of special PVC
- Sheath colour grey (RAL 7001)
- with length marking in feet

Properties

- Self-extinguishing and flame retardant in acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- **UL (AWG 22 - AWG 18)**: PLTC-ER, ITC-ER, CM, NFPA 79 2012, OIL RES I & II, Class I Div. 2, NEC Art. 501, 725, 760 & 800, AWM 2517
- **UL (AWG 24 - AWG 26)**: CM, AWM 2517, rated OIL RES I & II, NEC Art. 725, 760 & 800, NFPA 79 2012
- **CSA**: CSA CMG FT4, AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, easy to install
- Oil-resistant to OIL RES I & II

Available on request

- PUR or TPE outer sheath
- Sheath colour to suit customer requirement

Application

HELUKABEL® TRAYCONTROL® 300 is a screened, twisted pair data and control cable. Cross-sections with PLTC-ER and ITC-ER approval suitable for open, unprotected installation in cable trays to the machine; their outstanding oil resistance (OIL RES I & II) makes them ideally suited as connecting and joining cables and also for control, signal and measuring systems in industrial plants. The flexible cable structure facilitates installation inside and outside of machines and switch cabinets. The double-screening with aluminium foil (100% coverage) and copper braid (approx. 85% coverage) guarantee superior EMC protection. Applications: tool machines, control panels, measuring devices, production automation, cable ducts, renewable energies.

EMC = Electromagnetic compatibillity

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.	Cross-section mm²	No.pairs x No.cores x AWG-no.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
61999	0,154	1 x 2 x 26	4,7	16,0	32,0
59760	0,154	2 x 2 x 26	5,7	20,0	39,0
59761	0,154	3 x 2 x 26	5,9	24,0	47,0
59762	0,154	4 x 2 x 26	6,4	27,0	55,0
59763	0,154	5 x 2 x 26	6,8	31,0	68,0
59764	0,154	6 x 2 x 26	7,4	50,0	86,0
59765	0,154	7 x 2 x 26	7,5	52,0	92,0
59766	0,154	8 x 2 x 26	7,9	54,0	97,0
59767	0,154	10 x 2 x 26	9,2	60,0	111,0
59768	0,154	12 x 2 x 26	9,8	67,0	141,0
59769	0,154	14 x 2 x 26	10,4	75,0	150,0
59770	0,154	15 x 2 x 26	10,8	77,0	154,0
59771	0,154	16 x 2 x 26	11,2	80,0	155,0
59772	0,154	18 x 2 x 26	11,8	84,0	170,0
59773	0,154	20 x 2 x 26	12,4	98,0	183,0
59774	0,154	22 x 2 x 26	13,1	104,0	207,0
59775	0,154	24 x 2 x 26	13,6	112,0	228,0
59776	0,154	25 x 2 x 26	15,1	114,0	239,0
59777	0,241	1 x 2 x 24	4,9	16,0	46,0
59778	0,241	2 x 2 x 24	6,6	27,0	53,0
59779	0,241	3 x 2 x 24	6,9	32,0	65,0
59780	0,241	4 x 2 x 26	7,8	37,0	79,0
59781	0,241	5 x 2 x 24	8,0	55,0	98,0
59782	0,241	6 x 2 x 24	8,4	66,0	114,0
59783	0,241	7 x 2 x 24	8,8	60,0	121,0
59784	0,241	8 x 2 x 24	9,5	74,0	129,0

Part no.	Cross-section mm²	No.pairs x No.cores x AWG-no.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59785	0,241	10 x 2 x 24	10,5	109,0	152,0
59786	0,241	12 x 2 x 24	10,8	116,0	189,0
59787	0,241	14 x 2 x 24	12,6	121,0	213,0
59788	0,241	15 x 2 x 24	12,4	132,0	225,0
59789	0,241	16 x 2 x 24	12,9	142,0	227,0
59790	0,241	18 x 2 x 24	13,8	147,0	238,0
59791	0,241	20 x 2 x 24	14,4	161,0	270,0
59792	0,241	22 x 2 x 24	15,3	171,0	300,0
59793	0,241	24 x 2 x 24	16,4	230,0	321,0
59794	0,241	25 x 2 x 24	16,7	231,0	340,0
59795	0,382	1 x 2 x 22	6,9	17,0	58,0
59796	0,382	2 x 2 x 22	9,3	37,0	65,0
59797	0,382	3 x 2 x 22	9,7	45,0	79,0
59798	0,382	4 x 2 x 22	10,5	54,0	88,0
59799	0,382	5 x 2 x 22	11,4	63,0	110,0
59800	0,382	6 x 2 x 22	12,1	73,0	126,0
59801	0,382	7 x 2 x 22	12,3	79,0	140,0
59802	0,382	8 x 2 x 22	13,2	88,0	148,0
59803	0,382	10 x 2 x 22	15,7	107,0	184,0
59804	0,382	12 x 2 x 22	16,0	122,0	210,0
59805	0,382	14 x 2 x 22	16,3	138,0	241,0
59806	0,382	15 x 2 x 22	16,6	154,0	245,0
59807	0,382	16 x 2 x 22	16,8	161,0	251,0
59808	0,382	18 x 2 x 22	17,8	198,0	275,0
59809	0,382	20 x 2 x 22	18,4	211,0	300,0
59810	0,382	22 x 2 x 22	19,3	218,0	320,0

Continuation ▸

TRAYCONTROL® 300-C TP twisted pair, flexible, screened, oil-resistant, EMC-preferred type, NFPA 79 Edition 2012

Part no.	Cross-section mm²	No.pairs x No.cores x AWG-no.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59811	0,382	24 x 2 x 22	20,5	230,0	371,0
59812	0,382	25 x 2 x 22	20,8	239,0	402,0
59813	0,616	1 x 2 x 20	7,4	26,0	70,0
59814	0,616	2 x 2 x 20	10,0	56,0	89,0
59815	0,616	3 x 2 x 20	10,8	72,0	102,0
59816	0,616	4 x 2 x 20	11,5	92,0	119,0
59817	0,616	5 x 2 x 20	12,6	107,0	140,0
59818	0,616	6 x 2 x 20	13,4	122,0	162,0
59819	0,616	7 x 2 x 20	13,5	132,0	198,0
59820	0,616	8 x 2 x 20	16,9	144,0	272,0
59821	0,616	10 x 2 x 20	17,6	180,0	307,0
59822	0,616	12 x 2 x 20	18,1	202,0	318,0
59823	0,616	14 x 2 x 20	19,2	221,0	342,0
59824	0,616	15 x 2 x 20	19,5	232,0	381,0
59825	0,616	16 x 2 x 20	19,6	257,0	417,0
59826	0,616	18 x 2 x 20	20,6	282,0	494,0
59827	0,616	20 x 2 x 20	21,6	307,0	570,0
59828	0,616	22 x 2 x 20	22,7	322,0	643,0
59829	0,616	24 x 2 x 20	24,5	342,0	724,0
59830	0,616	25 x 2 x 20	24,9	361,0	740,0
59831	0,963	1 x 2 x 18	7,8	28,0	104,0
59832	0,963	2 x 2 x 18	10,3	57,0	121,0
59833	0,963	3 x 2 x 18	11,6	75,0	150,0
59834	0,963	6 x 2 x 18	14,7	139,0	328,0
59835	0,963	9 x 2 x 18	17,3	212,0	490,0
59836	0,963	15 x 2 x 18	21,4	358,0	811,0

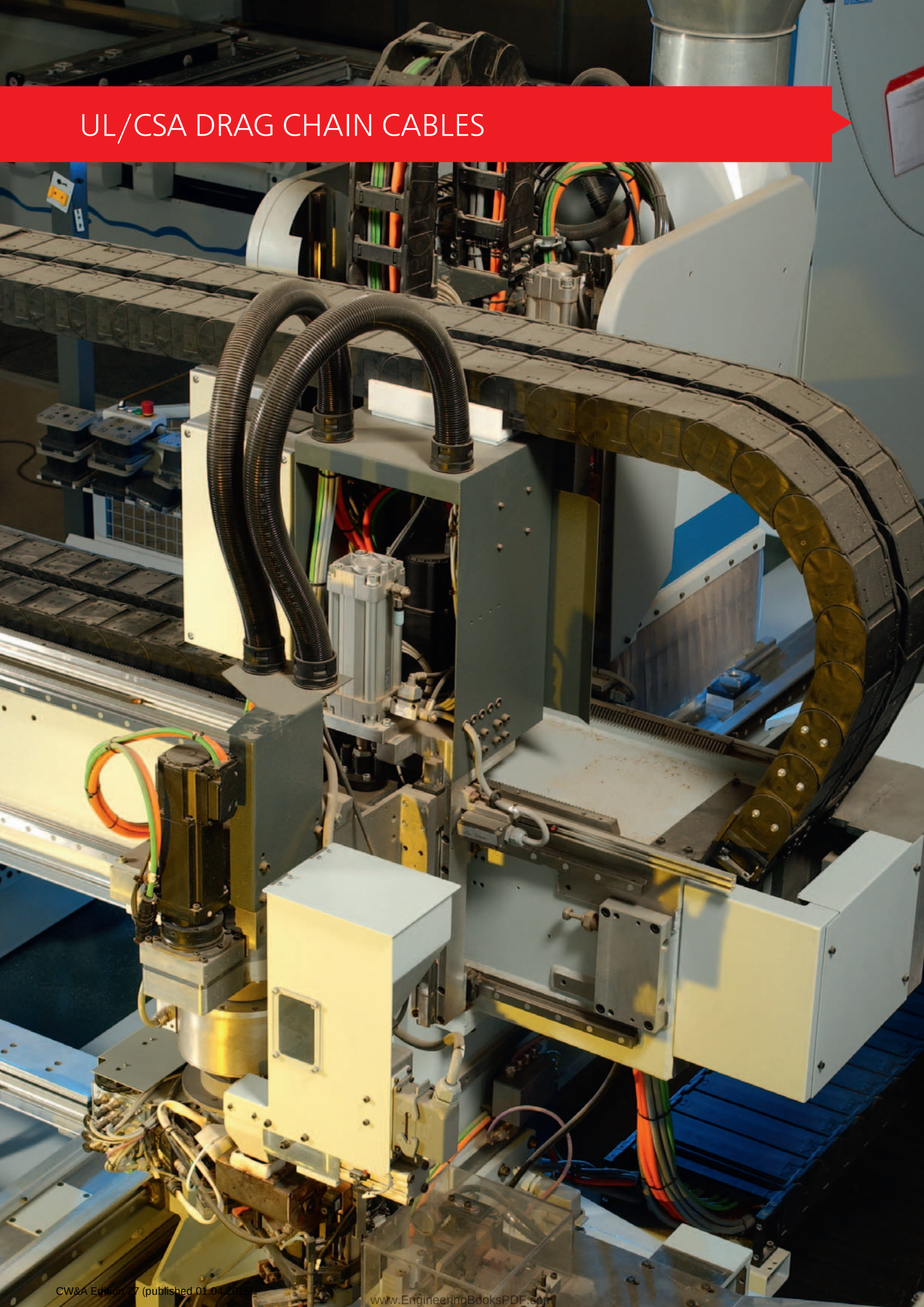
Dimensions and specifications may be changed without prior notice. (RN02)

Suitable accessories can be found in Chapter X.

- Cable tie

N

UL/CSA DRAG CHAIN CABLES



JZ-602 RC cable for drag chains, 90°C, 600 V, two approval control cable, meter marking

Technical data

- Control cable of special-PVC to UL AWM Style 10012 (core insulation) 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** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl.6 col. 4, BS 6360 cl.6 and IEC 60228 cl.6
- Core insulation special PVC compound type YI8 to DIN VDE 0207 part 4 and class 43 acc. to UL-Std.1581
- Core identification to DIN VDE 0293 red cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded in layers with optimal lay-length
- Wrapping with fleece over each layer
- Outer sheath of special PVC compound type YM5 to DIN VDE 0207 part 5, UL-Style 2587 and CSA C22.2 No 210
- Sheath colour black (RAL 9005)
- with meter marking

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- UV-resistant

Note

- G = with green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **JZ-602 RC -CY**, confer page 427

Application

For use in dry, damp and wet rooms with free movement without tensile stress or forced movements as highly flexible PVC control cable suitable for frequent lifting and bending stress in the machinery and tooling, robot technology and permanently moving machine parts. Convincingly proved in the standard use of drag chains. Interesting for the export-oriented machinery plant. For applications that go beyond standard solutions (e. g. composting facilities or high shelf conveyors with extremely high speed, etc.) we recommend you to our specially developed inquiry sheet for energy guiding systems, further technical details see selection table: Conductors for cable drag chains in the opening credits. For use in cable drag chains please note installation instruction.

RC = Robotics Cable

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

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
89900	3 G 0,5	20	6,0	14,0	58,0
89901	4 G 0,5	20	6,5	19,0	69,0
89902	5 G 0,5	20	7,1	24,0	84,0
89903	7 G 0,5	20	8,2	34,0	123,0
89904	9 G 0,5	20	10,0	43,2	177,0
89905	12 G 0,5	20	10,5	58,2	192,0
89906	18 G 0,5	20	12,5	86,0	256,0
89907	25 G 0,5	20	15,2	120,0	358,0
89908	34 G 0,5	20	17,1	163,0	487,0
89909	3 G 1	18	6,6	23,8	88,0
89910	4 G 1	18	7,1	31,7	101,0
89911	5 G 1	18	7,8	39,6	126,0
89912	7 G 1	18	9,2	55,4	145,0
89913	9 G 1	18	11,0	71,2	168,0
89914	12 G 1	18	11,5	95,0	260,0
89915	15 G 1	18	13,2	119,0	300,0
89916	18 G 1	18	14,0	142,4	360,0
89917	25 G 1	18	17,2	197,8	640,0
89918	34 G 1	18	19,1	269,0	730,0
89919	3 G 1,5	16	7,4	44,0	94,0
89920	4 G 1,5	16	8,0	58,0	117,0
89921	5 G 1,5	16	8,8	72,0	140,0
89922	7 G 1,5	16	10,8	101,0	186,0
89923	9 G 1,5	16	12,8	129,7	244,0
89924	12 G 1,5	16	13,5	173,0	319,0
89925	18 G 1,5	16	16,0	260,0	451,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
89926	25 G 1,5	16	19,8	360,0	625,0
89927	34 G 1,5	16	22,4	490,0	840,0
89932	3 G 2,5	14	8,9	72,0	150,0
89928	4 G 2,5	14	10,1	96,0	185,0
89933	5 G 2,5	14	11,3	120,0	242,0
89929	7 G 2,5	14	13,6	168,0	293,0
89934	12 G 2,5	14	16,8	288,0	498,0
89935	3 G 4	12	10,9	115,0	231,0
89930	4 G 4	12	12,4	154,0	298,0
89936	5 G 4	12	13,8	192,0	370,0
89931	7 G 4	12	16,6	269,0	460,0
89937	4 G 6	10	14,6	231,0	430,0
89938	4 G 10	8	18,2	384,0	720,0
89939	4 G 16	6	22,6	615,0	1060,0
89940	4 G 25	4	26,5	960,0	1590,0
89941	4 G 35	2	30,8	1344,0	2105,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTIFLEX 600 highly flexible, oil-resistant, open installation

TC-ER, PLTC-ER, NFPA 79 Edition 2012

Technical data

- Highly-flexible PVC control cable according to UL-Std.1277
- **Temperature range**
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  TC Wind Turbine (WTTC) 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 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, extra-fine wire stranded, with AWG measures
- Core insulation of special PVC with transparent nylon skin
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and abovein the outer layer
- Cores stranded in layers with optimal lay-lengths
- Separator
- Outer sheath of special PVC
- Sheath colour black (RAL 9005)
- with length marking in feet

Properties

- Self-extinguishing and flame retardant in acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- **UL**:
  TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2012, WTTC 1000 V, DP-1, OIL RES I&II, 90°C dry / 75°C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
- **CSA**:
  c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, simple installation

Available on request

- with blue cores (DC)
- with red cores (AC)
- Grey or TPE outer sheath

Application

HELUKABEL® MULTIFLEX 600 is a highly-flexible, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 edition 2012. 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: production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry. Please observe applicable installation regulations for use in energy supply chains.

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

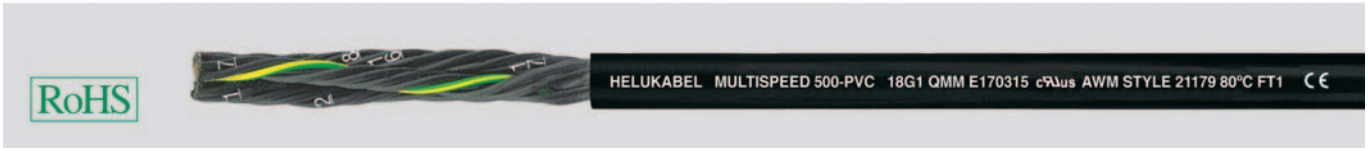
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62502	2 x 0,5	20	6,9	10,0	53,0
62503	3 G 0,5	20	7,3	14,0	61,0
62504	4 G 0,5	20	8,0	19,0	72,0
62505	5 G 0,5	20	8,6	24,0	85,0
62506	7 G 0,5	20	9,9	34,0	110,0
62507	12 G 0,5	20	11,4	58,0	158,0
62508	18 G 0,5	20	14,2	86,0	241,0
62509	25 G 0,5	20	17,0	120,0	316,0
62510	34 G 0,5	20	18,9	163,0	439,0
62511	3 G 0,75	18	7,8	22,0	75,0
62512	4 G 0,75	18	8,6	29,0	91,0
62513	5 G 0,75	18	9,3	36,0	103,0
62514	7 G 0,75	18	10,8	50,0	136,0
62515	12 G 0,75	18	12,4	86,0	228,0
62516	15 G 0,75	18	13,8	108,0	273,0
62517	18 G 0,75	18	15,4	130,0	311,0
62518	25 G 0,75	18	18,5	180,0	498,0
62519	34 G 0,75	18	20,5	245,0	550,0
62520	36 G 0,75	18	20,6	259,0	570,0
62521	42 G 0,75	18	22,3	302,0	600,0
62522	3 G 1,5	16	8,6	43,0	100,0
62523	4 G 1,5	16	9,5	58,0	122,0
62524	5 G 1,5	16	10,3	72,0	148,0
62525	7 G 1,5	16	12,0	101,0	197,0
62526	9 G 1,5	16	14,2	130,0	244,0
62527	12 G 1,5	16	14,7	173,0	328,0
62528	18 G 1,5	16	17,2	259,0	459,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62529	25 G 1,5	16	20,8	360,0	665,0
62530	34 G 1,5	16	23,0	490,0	1084,0
62531	41 G 1,5	16	25,1	590,0	1260,0
62532	50 G 1,5	16	27,7	720,0	1521,0
62533	60 G 1,5	16	29,5	864,0	1885,0
62534	3 G 2,5	14	9,8	72,0	160,0
63136	4 G 2,5	14	10,6	96,0	173,0
62535	5 G 2,5	14	11,9	120,0	268,0
62536	7 G 2,5	14	13,6	168,0	307,0
62537	9 G 2,5	14	16,1	216,0	437,0
62538	12 G 2,5	14	16,9	288,0	572,0
62539	18 G 2,5	14	20,1	432,0	800,0
62540	25 G 2,5	14	25,1	600,0	1100,0
62541	3 G 4	12	11,3	115,0	221,0
62542	4 G 4	12	12,4	154,0	247,0
62543	5 G 4	12	13,8	192,0	318,0
62544	7 G 4	12	16,9	269,0	438,0
62545	4 G 6	10	15,3	230,0	383,0
62546	5 G 6	10	16,6	288,0	481,0
62547	7 G 6	10	18,2	403,0	800,0
62548	4 G 10	8	19,7	384,0	671,0
62549	5 G 10	8	22,0	480,0	990,0
62550	4 G 16	6	23,7	614,0	951,0
62551	5 G 16	6	26,1	768,0	1500,0
62552	4 G 25	4	34,0	960,0	1700,0
62554	4 G 35	2	37,0	1344,0	2300,0

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

MULTISPEED® 500-PVC UL/CSA high flexible, safety

against high bending in drag chain systems, oil-resistant, low torsion, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51 to UL-Std.758 AWM Style 21179
- **Temperature range** flexing -5°C to +80°C fixed installation -30°C to +80°C
- **Nominal voltage** VDE U_0/U 300/500 V UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above
- Stranding: <7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Outer sheath special PVC, especially resistant against fatigue strength, extruded as filler with pressure
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers0

Tests

- PVC outer sheath self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- Low-adhesion
- Ozon and UV resistant
- High property of alternating bending strength
- longer service life due to low frictional resistance
- Better chemical resistance
- Oil resistance to DIN VDE 0473-811-404/ DIN EN 60811-404
- Reduced Ø, therefore low moving masses

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **MULTISPEED® 500-C-PVC UL/CSA**, confer page 429

N

Application

UL/CSA approved HELUKABEL® MULTISPEED® 500-PVC are installed there, where extreme requirements for the cables are necessary. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada. Matched materials and stranding technique permit continuous use as a highly flexible cable for drag chains with long travel and high or slow speeds. For use in dry, damp rooms, and outdoors, with free movement without tensile stress or forced movements as a highly flexible PVC control cable suitable for frequent lifting and bending stress in engineering and tool manufacturing.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24295	2 x 0,5	20	4,8	9,6	40,0
24296	3 G 0,5	20	5,1	14,4	45,0
24297	4 G 0,5	20	5,5	19,0	57,0
24298	5 G 0,5	20	6,0	24,0	66,0
24299	7 G 0,5	20	9,1	33,6	81,0
24300	12 G 0,5	20	10,0	58,0	133,0
24301	18 G 0,5	20	12,2	86,0	194,0
24302	25 G 0,5	20	14,3	120,0	274,0
24303	4 G 0,75	19	6,1	29,0	63,0
24304	5 G 0,75	19	6,6	36,0	79,0
24305	7 G 0,75	19	10,5	50,0	107,0
24306	12 G 0,75	19	11,4	86,0	169,0
24307	18 G 0,75	19	14,2	130,0	247,0
24308	25 G 0,75	19	16,3	180,0	366,0
24309	36 G 0,75	19	20,1	259,0	540,0
24310	42 G 0,75	19	22,2	302,0	630,0
24311	3 G 1	18	5,9	29,0	69,0
24312	4 G 1	18	6,4	38,4	86,0
24313	5 G 1	18	7,0	48,0	101,0
24314	7 G 1	18	11,2	67,0	140,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24315	12 G 1	18	12,3	115,0	227,0
24316	18 G 1	18	15,1	173,0	351,0
24317	25 G 1	18	17,6	240,0	489,0
24318	3 G 1,5	16	6,7	43,0	88,0
24319	4 G 1,5	16	7,3	58,0	110,0
24320	5 G 1,5	16	8,0	72,0	130,0
24321	7 G 1,5	16	13,2	101,0	182,0
24322	12 G 1,5	16	14,4	173,0	319,0
24323	18 G 1,5	16	17,7	259,0	420,0
24324	25 G 1,5	16	20,5	360,0	604,0
24325	4 G 2,5	14	8,9	96,0	172,0
24326	5 G 2,5	14	9,9	120,0	219,0
24327	7 G 2,5	14	16,1	168,0	303,0
24328	12 G 2,5	14	17,8	288,0	504,0
24329	18 G 2,5	14	21,8	432,0	754,0
24330	25 G 2,5	14	24,4	600,0	940,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-HF-FCY high flexible, cable for drag chains, oil resistant, EMC-preferred type, meter marking

NEW

Technical data

- Special PVC drag chain cable, extreme flexibility acc. to UL/CSA AWM I/II A/B Style 2570
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  VDE U_0/U 300/500 V
  UL/CSA 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 5x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC acc. to UL-Std.1581
- 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 selected lay-length
- Separating foil over each layer
- construction with Cu-screening, tinned, approx. 85%
- Minimum coverage 85%
- Outer sheath of special PVC compound type TM5 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- low adhesion
- oil resistant to DIN VDE 0473-811-404 / DIN EN 60811-404

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type:
  JZ-602 RC, confer page 423
  MULTISPEED® 500-PVC UL/CSA, confer page 425

Application

UL/CSA approved, highly flexible, screened PVC drag-chain cable for laying in dry, damp and wet rooms, with free movement and without tensile load or forced movements, suitable for frequent lifting and bending stresses in the sector of machine manufacture and tool making. Thanks to the high level of shielding density, a fault-free transmission of signals or impulses is ensured. The ideal control line, offering protection against interference, for the above applications. Of interest for those machinery manufacturers, who are export orientated. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12908	2 x 0,5	20	6,0	35,0	46,0
12909	3 G 0,5	20	6,3	42,0	56,0
12910	4 G 0,5	20	6,8	47,0	64,0
12911	5 G 0,5	20	7,4	56,0	77,0
12912	7 G 0,5	20	8,5	69,0	104,0
12913	12 G 0,5	20	10,1	108,0	158,0
12914	18 G 0,5	20	11,7	145,0	229,0
12915	25 G 0,5	20	14,0	240,0	320,0
12916	2 x 0,75	19	6,4	40,0	59,0
12917	3 G 0,75	19	6,8	52,0	68,0
12918	4 G 0,75	19	7,3	60,0	82,0
12919	5 G 0,75	19	7,9	71,0	101,0
12920	7 G 0,75	19	9,2	91,0	150,0
12921	12 G 0,75	19	11,0	142,0	212,0
12922	18 G 0,75	19	13,0	212,0	305,0
12923	25 G 0,75	19	15,8	281,0	430,0
12924	2 x 1	18	6,8	50,0	71,0
12925	3 G 1	18	7,2	60,0	90,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12926	4 G 1	18	7,8	71,0	114,0
12927	5 G 1	18	8,4	88,0	136,0
12928	7 G 1	18	9,8	111,0	169,0
12929	12 G 1	18	12,0	184,0	270,0
12930	18 G 1	18	14,2	260,0	385,0
12931	25 G 1	18	16,8	349,0	530,0
12932	2 x 1,5	16	7,3	63,0	88,0
12933	3 G 1,5	16	7,7	80,0	104,0
12934	4 G 1,5	16	8,4	97,0	136,0
12935	5 G 1,5	16	9,1	119,0	170,0
12936	7 G 1,5	16	10,7	147,0	221,0
12937	12 G 1,5	16	13,0	267,0	348,0
12938	18 G 1,5	16	15,5	374,0	489,0
12939	25 G 1,5	16	18,7	526,0	710,0
12940	3 G 2,5	14	9,1	144,0	177,0
12941	4 G 2,5	14	9,9	148,0	204,0
12942	7 G 2,5	14	13,0	255,0	340,0
12943	4 G 4	12	11,2	230,0	310,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-602 RC-CY special cable for drag chains, 90°C, 600 V, two approval control cable, EMC-preferred type, meter marking

Technical data

- Control cable of special-PVC to UL CSA AWM I/II A/B Style 2587 (sheath insulation) and CSA
- **Temperature range** flexing -5°C to +90°C fixed installation -40°C to +90°C (up to +105°C for short time)
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min 20 MOhm x km
- **Minimum bending radius** flexing 10x cable Ø fixed installation 5x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl.6 col. 4, BS 6360 cl.5 and IEC 60228 cl.6
- Core insulation of special PVC compound type YI8 to DIN VDE 0207 part 4 and class 43 acc. to UL-Std.1581
- Core identification to DIN VDE 0293 red cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded with optimal lay-length
- Core wrapping with fleece over each layer
- PVC-inner sheath
- Screening: braid coverage ca. 85% up to 17 mm Ø - layer of tinned copper wires >17 mm Ø - tinned copper wire
- Outer sheath of special PVC compound type YM5 to DIN VDE 0207 part 5, UL-Style 2587 and CSA C22.2 No 210
- Outer sheath black (RAL 9005)
- with meter marking

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- UV-resistant

Note

- G = with green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-602 RC**, confer page 423

Application

These cable are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. These cables have shown excellent performance in combination with standard cable trays. The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above applications. Interesting for the export-oriented machines and machinery plants. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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

RC = Robotics Cable

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
89950	3 G 0,5	20	8,5	45,0	124,0
89951	4 G 0,5	20	9,0	52,0	135,0
89952	5 G 0,5	20	9,7	68,0	153,0
89953	7 G 0,5	20	11,0	93,0	191,0
89954	9 G 0,5	20	12,4	134,0	243,0
89955	12 G 0,5	20	13,5	163,0	322,0
89956	15 G 0,5	20	14,8	174,0	350,0
89957	18 G 0,5	20	16,0	191,0	374,0
89958	25 G 0,5	20	19,0	223,0	436,0
89959	3 G 1	18	8,9	56,0	130,0
89960	4 G 1	18	9,7	81,0	155,0
89961	5 G 1	18	10,4	90,0	181,0
89962	7 G 1	18	12,0	106,0	208,0
89963	9 G 1	18	14,1	161,0	321,0
89964	12 G 1	18	15,2	175,0	341,0
89965	15 G 1	18	16,7	204,0	396,0
89966	18 G 1	18	17,6	241,0	473,0
89967	25 G 1	18	20,7	342,0	650,0
89968	34 G 1	18	24,3	434,0	781,0
89969	3 G 1,5	16	10,2	89,0	165,0
89970	4 G 1,5	16	11,0	97,0	192,0
89971	5 G 1,5	16	11,8	111,0	224,0
89972	7 G 1,5	16	14,0	147,0	274,0
89973	9 G 1,5	16	16,4	193,0	340,0
89974	12 G 1,5	16	17,1	256,0	461,0
89975	18 G 1,5	16	20,2	360,0	674,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
89976	25 G 1,5	16	25,2	544,0	950,0
89977	34 G 1,5	16	28,1	674,0	1203,0
89984	3 G 2,5	14	11,8	141,0	220,0
89978	4 G 2,5	14	13,2	170,0	270,0
89985	5 G 2,5	14	14,2	195,0	350,0
89979	7 G 2,5	14	17,4	251,0	428,0
89986	12 G 2,5	14	21,0	368,0	730,0
89980	18 G 2,5	14	25,4	639,0	1140,0
89987	3 G 4	12	14,0	180,0	296,0
89981	4 G 4	12	15,9	232,0	456,0
89988	5 G 4	12	17,7	330,0	450,0
89982	7 G 4	12	20,9	395,0	737,0
89983	4 G 6	10	18,3	316,0	572,0
89989	4 G 10	8	23,2	490,0	1012,0
89990	4 G 16	6	27,6	850,0	1400,0
89991	4 G 25	4	33,1	1450,0	2100,0
89992	4 G 35	2	37,8	1890,0	2550,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTIFLEX 600-C highly-flexible, oil-resistant, screened,

EMC-preferred type, control cable for open installation TC-ER, PLTC-ER, NFPA 79 Edition 2012

Technical data

- Highly-flexible PVC control cable acc. to UL-Std.1277
- **Temperature range**
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  TC 600 V
  TC Wind Turbine (WTTC) 1000 V
- **Test voltage** 3000 V
- **Coupling resistance**
  max. 250 Ohm/km
- **Minimum bending radius**
  flexing 10x cable Ø
- **Insulation resistance**
  min. 20 MOhm x km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, extra-fine wire stranded, with AWG measures
- Core insulation of special PVC with transparent nylon skin
- 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-lengths
- Separating foil
- Braided screening of tinned copper wires, coverage approx. 85%
- Separator
- Outer sheath of special PVC
- Sheath colour black (RAL 9005)
- with length marking in feet

Properties

- Self-extinguishing and flame retardant in acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- **UL**:
  TC-ER, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12), MTW, NFPA 79 2012, WTTC 1000 V, DP-1, OIL RES I&II, 90°C dry / 75°C wet, Class 1 Div. 2 per NEC Art 336, 392, 501, crush impact test in accordance with UL 1277
- **CSA**:
  c(UL) CIC-TC FT4, CSA AWM I/II A/B FT4

Note

Advantages

- Highly-flexible, simple installation

Available on request

- with blue cores (DC)
- with red cores (AC)
- Grey or TPE outer sheath

Application

HELUKABEL® MULTIFLEX 600-C is a highly-flexible, oil-resistant control cable. The special combination of TC-ER, PLTC-ER and ITC-ER allows this cable to be used as a connecting cable for industrial plant and machinery in accordance with NFPA 79 edition 2012. 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: Production lines, bottling plants, machine construction, switch cabinets, conveyor systems, packaging machines, automotive industry. For the use in energy drag chains please note the installation guidelines.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62556	2 x 0,5	20	7,7	30,0	80,0
62557	3 G 0,5	20	8,0	37,0	85,0
62558	4 G 0,5	20	8,7	46,0	100,0
62559	5 G 0,5	20	9,3	54,0	113,0
62560	7 G 0,5	20	10,7	70,0	152,0
62561	12 G 0,5	20	12,3	112,0	210,0
62562	18 G 0,5	20	15,1	153,0	304,0
62563	25 G 0,5	20	18,1	225,0	408,0
62564	34 G 0,5	20	19,8	267,0	530,0
62565	3 G 0,75	18	8,5	55,0	101,0
62566	4 G 0,75	18	9,3	69,0	127,0
62567	5 G 0,75	18	10,0	82,0	148,0
62568	7 G 0,75	18	11,6	119,0	186,0
62569	12 G 0,75	18	14,1	178,0	286,0
62570	15 G 0,75	18	15,2	175,0	455,0
62571	18 G 0,75	18	16,3	252,0	383,0
62572	25 G 0,75	18	19,6	362,0	514,0
62573	34 G 0,75	18	21,9	473,0	685,0
62574	3 G 1,5	16	9,3	75,0	131,0
62575	4 G 1,5	16	10,2	93,0	165,0
62576	5 G 1,5	16	11,0	113,0	195,0
62577	7 G 1,5	16	12,9	162,0	250,0
62578	9 G 1,5	16	15,2	193,0	340,0
62579	12 G 1,5	16	15,6	249,0	393,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62580	18 G 1,5	16	18,4	376,0	559,0
62581	25 G 1,5	16	23,1	510,0	788,0
62582	34 G 1,5	16	25,8	674,0	1203,0
62583	3 G 2,5	14	10,3	141,0	218,0
62584	4 G 2,5	14	11,5	149,0	222,0
62585	5 G 2,5	14	12,4	195,0	350,0
62586	7 G 2,5	14	15,4	243,0	373,0
62587	9 G 2,5	14	16,8	312,0	479,0
62588	12 G 2,5	14	18,5	368,0	730,0
62589	18 G 2,5	14	22,4	639,0	1140,0
62590	25 G 2,5	14	25,5	796,0	1530,0
62591	3 G 4	12	11,7	180,0	296,0
62592	4 G 4	12	13,3	221,0	305,0
62593	5 G 4	12	14,7	330,0	450,0
62594	7 G 4	12	17,8	363,0	536,0
62595	4 G 6	10	16,1	314,0	469,0
62596	5 G 6	10	17,5	441,0	772,0
62597	7 G 6	10	20,6	505,0	1028,0
62598	4 G 10	8	21,9	526,0	790,0
62599	5 G 10	8	24,1	610,0	1096,0
62600	4 G 16	6	24,8	730,0	1621,0
62602	5 G 16	6	27,2	1050,0	1759,0
62603	4 G 25	4	33,1	1450,0	2100,0
62605	4 G 35	2	37,8	1840,0	2550,0

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

MULTISPEED® 500-C-PVC UL/CSA oil resistant, high flexible, safety against high bending in drag chain systems, low torsion, screened, EMC-preferred type, meter marking

Technical data

- Special drag chain cables for high mechanical stress in accordance to DIN VDE 0285-525-2-51/DIN EN 50525-2-51 and UL-Std.758 AWM Style 21179
- **Temperature range** flexing -5°C to +80°C fixed installation -30°C to +80°C
- **Nominal voltage** VDE U_0/U 300/500 V UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Coupling resistance** max. 250 Ohm x km
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Core insulation of Special PP
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above
- Stranding: <7 cores: with optimal lay length, construction due to a filling element, in a stranded position ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special PVC inner sheath YM2 gusset-filling extruded, grey (RAL 7001)
- Braid of tinned copper wires, minimum coverage 85% max. with optimal braiding pitch
- Outer sheath of special PVC especially fatigue resistant
- sheath colour black (RAL 9005)
- with meter marking

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- Low adhesion
- Ozon and UV resistant
- High property of alternating bending strength
- longer service life due to low friction resistance
- Better chemical resistance
- Oil resistance to DIN VDE 0473-811-404/ DIN EN 60811-404
- Higher stability
- Higher economical solution
- Reduced Ø, therefore less moving masses

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **MULTISPEED® 500-PVC UL/CSA**, confer page 425

N

Application

For permanently use on long distances, and high or low speeds. These high flexible PVC control cables are suitable for shift- and bending stresses in machines and machine tool constructions. These are installed in dry, moist rooms and in open air with free movement without tensile stress or forced movements. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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

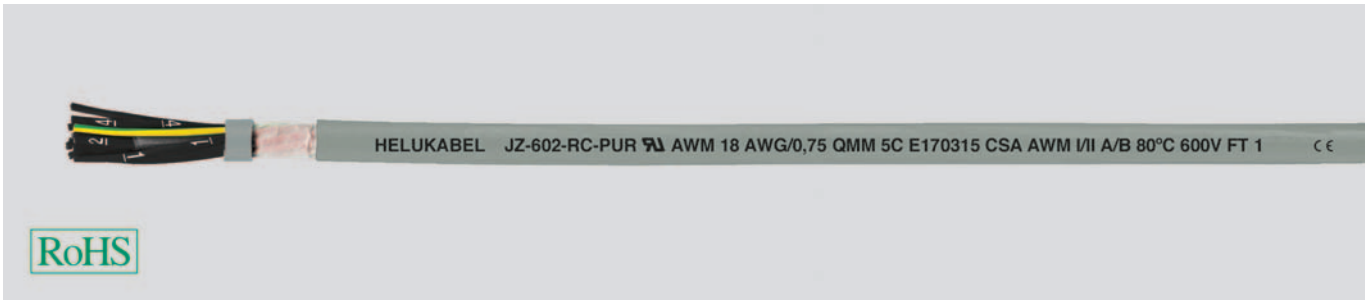
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24335	2 x 0,5	20	6,6	30,0	88,0
24336	3 G 0,5	20	6,9	36,0	101,0
24337	4 G 0,5	20	7,3	42,0	116,0
24338	5 G 0,5	20	7,8	48,0	146,0
24339	7 G 0,5	20	11,3	64,0	181,0
24340	9 G 0,5	20	11,4	80,0	219,0
24341	12 G 0,5	20	12,6	105,0	271,0
24342	18 G 0,5	20	15,0	137,0	374,0
24343	25 G 0,5	20	17,1	210,0	542,0
24344	2 x 0,75	19	6,8	40,0	96,0
24345	3 G 0,75	19	7,4	48,0	111,0
24346	4 G 0,75	19	8,0	55,0	140,0
24347	5 G 0,75	19	8,5	66,0	161,0
24348	7 G 0,75	19	12,9	85,0	227,0
24349	12 G 0,75	19	14,4	135,0	317,0
24350	18 G 0,75	19	17,5	190,0	486,0
24351	25 G 0,75	19	19,9	275,0	651,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24352	3 G 1	18	7,7	59,0	131,0
24353	4 G 1	18	8,3	70,0	164,0
24354	5 G 1	18	9,1	84,0	198,0
24355	7 G 1	18	14,0	106,0	252,0
24356	12 G 1	18	15,0	174,0	410,0
24357	18 G 1	18	18,7	240,0	550,0
24358	25 G 1	18	21,2	332,0	756,0
24359	3 G 1,5	16	8,6	75,0	166,0
24360	4 G 1,5	16	9,4	90,0	199,0
24361	5 G 1,5	16	10,4	108,0	229,0
24362	7 G 1,5	16	16,0	157,0	304,0
24363	12 G 1,5	16	17,6	240,0	502,0
24364	18 G 1,5	16	21,3	355,0	709,0
24365	25 G 1,5	16	24,8	448,0	939,0
24366	4 G 2,5	14	11,3	134,0	270,0
24367	5 G 2,5	14	12,3	175,0	335,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-602 RC-PUR special cable for drag chains, 80°C, 600 V, two approval control cable, meter marking



Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (sheath insulation) and CSA
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 100x10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.6, extra fine-wire, BS 6360 cl.6, IEC 60228 cl.6
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 to UL-Std.1581
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded in layers with optimal selected lay-lenght
- Core wrapping with fleece over each layer
- Outer sheath of special **full-polyurethane**
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils and coolant, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **JZ-602 RC -C-PUR**, confer page 436

Application

These cables are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist, wet rooms and outdoor. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

RC = Robotics Cable

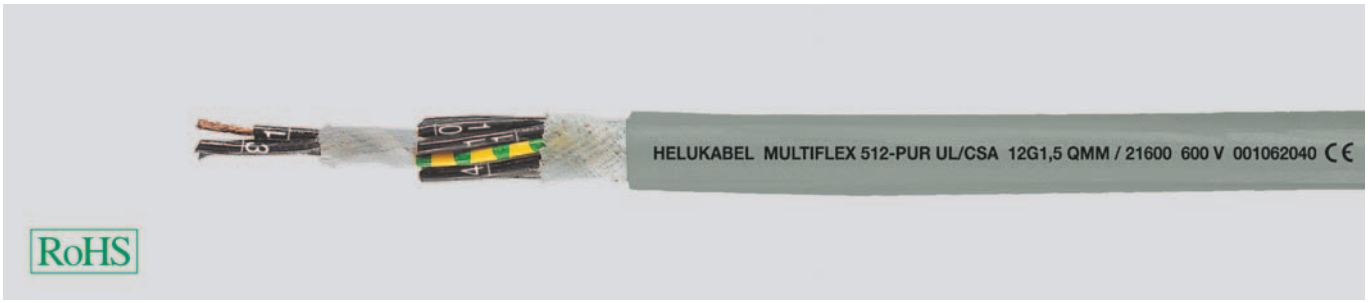
CE = The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12630	3 G 0,5	20	6,0	14,0	58,0
12631	4 G 0,5	20	6,5	19,0	69,0
12632	5 G 0,5	20	7,1	24,0	84,0
12633	7 G 0,5	20	8,2	34,0	123,0
12634	9 G 0,5	20	10,0	43,2	177,0
12635	12 G 0,5	20	10,5	58,2	192,0
12636	18 G 0,5	20	12,5	86,0	256,0
12637	25 G 0,5	20	15,2	120,0	358,0
12638	34 G 0,5	20	17,1	163,0	487,0
12639	3 G 0,75	18	6,6	23,8	88,0
12640	4 G 0,75	18	7,1	31,7	101,0
12641	5 G 0,75	18	7,8	39,6	126,0
12642	7 G 0,75	18	9,2	55,4	145,0
12643	9 G 0,75	18	11,0	86,4	168,0
12644	12 G 0,75	18	11,5	95,0	260,0
12645	15 G 0,75	18	13,2	119,0	300,0
12646	18 G 0,75	18	14,0	142,4	360,0
12647	25 G 0,75	18	17,2	197,8	640,0
12648	34 G 0,75	18	19,1	269,0	730,0
12649	3 G 1,5	16	7,4	44,0	94,0
12650	4 G 1,5	16	8,0	58,0	117,0
12651	5 G 1,5	16	8,8	72,0	140,0
12652	7 G 1,5	16	10,8	101,0	186,0
12653	9 G 1,5	16	12,8	129,7	244,0
12654	12 G 1,5	16	13,5	173,0	319,0
12655	18 G 1,5	16	16,0	260,0	451,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12656	25 G 1,5	16	19,8	360,0	625,0
12657	34 G 1,5	16	22,4	490,0	840,0
12658	3 G 2,5	14	8,9	72,0	150,0
12659	4 G 2,5	14	10,1	96,0	185,0
12660	5 G 2,5	14	11,3	120,0	242,0
12661	7 G 2,5	14	13,6	168,0	293,0
12662	12 G 2,5	14	16,8	288,0	498,0
12663	3 G 4	12	10,9	115,0	231,0
12664	4 G 4	12	12,4	154,0	298,0
12665	5 G 4	12	13,8	192,0	370,0
12666	7 G 4	12	16,6	269,0	460,0
12667	4 G 6	10	14,6	231,0	430,0
12668	4 G 10	8	18,2	384,0	720,0
12669	4 G 16	6	22,6	615,0	1060,0
12670	4 G 25	4	26,5	960,0	1590,0
12671	4 G 35	2	30,8	1344,0	2105,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTIFLEX 512®-PUR UL/CSA special cable for drag chains, 80°C, 600 V, two approval control cable, halogen-free



Technical data

- Special drag chain cables for high mechanical stress, acc. to UL Style 20939
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 5x cable Ø fixed installation 3x cable Ø
- **Alternating bending test** tested with approx. **10 million bending cycles**
- **Radiation resistance** up to 50x10⁶ cJ/kg (up to 50 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6 and IEC 60228 cl.6
- Core insulation of special PP
- 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 selected lay-length
- Special core wrapping over each layer (up to 4 mm² without core wrapping over the outer layer)
- Outer sheath of special **full-polyurethane** TMPU, to DIN VDE 0207-363-10-2/ DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Very good oil resistant
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- Adhesion-low
- High resistance to mechanical strain
- High property of alternating bending strength
- Long life durabilities through low friction-resistance by using the TP insulation
- High tensile strength-, abrasion- and impact resistant at öpw temperature
- Resistant to weather, ozone and UV-radiation, solvents, acids and alkalis, and hydrolysis
- PUR outer sheath self-extinguishing and flame retardant 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) UL VW-1, CSA FT1

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cleanroom qualification tested with analog type. Please note "cleanroom qualified" when ordering.
- screened analogue type: **MULTIFLEX 512® -C-PUR UL/CSA**, confer page 437

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Application

These special UL/CSA cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift operation. Those cables are developed according to the newest state of technology improvement. These high flexible control cables with sliding abilities guaranteed an optimum service life durabilities and also very economic by using the PP-core insulation and the PUR-outer sheath. The PUR material is adhesion-low and cut-resistant. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21559	2 x 0,5	20	5,5	9,6	38,0
21560	3 G 0,5	20	5,8	14,4	46,0
21561	4 G 0,5	20	6,4	19,0	59,0
21562	5 G 0,5	20	7,0	24,0	68,0
21563	7 G 0,5	20	8,1	33,6	88,0
21564	12 G 0,5	20	9,9	58,0	131,0
21565	18 G 0,5	20	11,5	86,0	197,0
21566	20 G 0,5	20	12,0	96,0	260,0
21567	25 G 0,5	20	13,7	120,0	282,0
21568	30 G 0,5	20	14,3	144,0	315,0
21569	36 G 0,5	20	15,3	172,0	374,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21570	2 x 0,75	19	6,2	14,4	47,0
21571	3 G 0,75	19	6,5	21,6	58,0
21572	4 G 0,75	19	7,0	29,0	69,0
21573	5 G 0,75	19	7,8	36,0	85,0
21574	7 G 0,75	19	9,0	50,0	118,0
21575	12 G 0,75	19	11,0	86,0	183,0
21576	18 G 0,75	19	13,0	130,0	270,0
21577	20 G 0,75	19	13,5	144,0	290,0
21578	25 G 0,75	19	15,4	180,0	374,0
21579	30 G 0,75	19	16,2	216,0	420,0
21580	36 G 0,75	19	17,6	259,0	498,0

Continuation ▸

MULTIFLEX 512®-PUR UL/CSA special cable for drag chains, 80°C, 600 V, two approval control cable, halogen-free

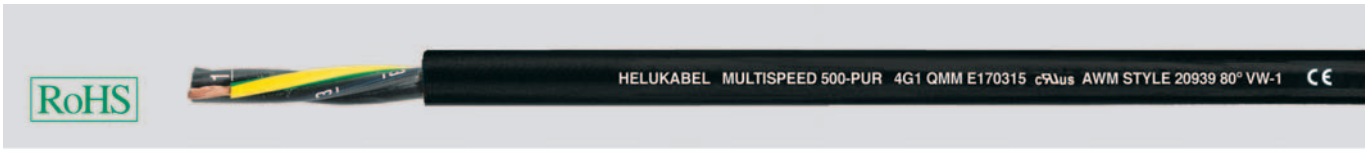
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21581	2 x 1	18	6,9	19,2	55,0
21582	3 G 1	18	7,4	29,0	70,0
21583	4 G 1	18	8,0	38,0	86,0
21584	5 G 1	18	8,7	48,0	102,0
21585	7 G 1	18	10,2	67,0	143,0
21586	12 G 1	18	12,6	115,0	225,0
21587	18 G 1	18	14,8	173,0	334,0
21588	20 G 1	18	15,8	192,0	370,0
21589	25 G 1	18	18,1	240,0	460,0
21590	30 G 1	18	18,5	288,0	530,0
21591	36 G 1	18	20,1	346,0	625,0
21592	41 G 1	18	22,0	410,0	779,0
21593	50 G 1	18	24,0	498,0	953,0
21594	65 G 1	18	27,2	650,0	1205,0
21595	2 x 1,5	16	7,6	29,0	70,0
21596	3 G 1,5	16	8,1	43,0	90,0
21597	4 G 1,5	16	8,7	58,0	106,0
21598	5 G 1,5	16	9,7	72,0	145,0
21599	7 G 1,5	16	11,3	101,0	205,0
21600	12 G 1,5	16	13,8	173,0	320,0
21601	18 G 1,5	16	16,3	259,0	465,0
21602	20 G 1,5	16	17,3	288,0	510,0
21603	25 G 1,5	16	19,8	360,0	650,0
21604	30 G 1,5	16	20,3	432,0	750,0
21605	36 G 1,5	16	22,2	518,0	880,0
21606	42 G 1,5	16	24,0	628,0	1209,0
21607	50 G 1,5	16	26,2	749,0	1449,0
21608	61 G 1,5	16	28,9	912,0	1712,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21609	2 x 2,5	14	9,2	48,0	115,0
21610	3 G 2,5	14	9,7	72,0	162,0
21611	4 G 2,5	14	10,5	96,0	196,0
21612	5 G 2,5	14	11,6	120,0	230,0
21613	7 G 2,5	14	13,8	168,0	312,0
21614	12 G 2,5	14	16,9	288,0	532,0
21615	18 G 2,5	14	20,0	432,0	762,0
21616	20 G 2,5	14	21,2	480,0	858,0
21617	25 G 2,5	14	24,4	600,0	998,0
21618	4 G 4	12	13,2	154,0	283,0
21619	5 G 4	12	14,6	192,0	349,0
21620	7 G 4	12	17,6	79,0	498,0
21621	4 G 6	10	14,4	230,0	432,0
21622	5 G 6	10	15,9	288,0	529,0
21623	7 G 6	10	19,2	403,0	782,0
21624	4 G 10	8	18,4	384,0	685,0
21625	5 G 10	8	20,7	480,0	817,0
21626	7 G 10	8	24,7	672,0	1023,0
21627	4 G 16	6	21,3	614,0	1042,0
21628	5 G 16	6	23,8	768,0	1292,0
21629	7 G 16	6	28,6	1075,0	1709,0

Dimensions and specifications may be changed without prior notice. (RN05)

Suitable Cable drag chains can be found in our Cable Accessories catalogue.

MULTISPEED® 500-PUR UL/CSA safety against high bending in drag chain systems, low torsion, halogen-free, meter marking



Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, DIN VDE 0285-525-2-21/ DIN EN 50525-2-21 and UL-Std.758 AWM Style 20939
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
  Nominal voltage
  DIN VDE U_0/U 300/500 V
  UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
- **Radiation resistance**
  up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above
- Stranding:
  <7 cores: cores stranded in a layer with optimal lay-length around a filler as per contruction
- ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Outer sheath of special-PUR
- extruded as filler with pressure
- Sheath colour black (RAL 9005)
- with meter marking

Properties

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

Tests

- PUR-sheath flame retardant 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), UL VW-1, CSA FT1
- low adhesion
- halogen-free
- Higher economical solution
- High resistant to mechanical strain
- Long life durabilitys due to low friction-resistance
- High tensile strenght, abrasion- and impact resistance at low temperature
- Tear resistance
- Hight stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Increased economic efficiency
- Reduced Ø, therefore less moving masses

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type:
  MULTISPEED® 500-C-PUR UL/CSA,
  confer page 439

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Application

UL/CSA approved HELUKABEL® MULTISPEED® 500-PUR are installed there, where the extreme requirements for the cables are necessary. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high an slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e. g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24370	2 x 0,5	20	4,8	9,6	41,0
24371	3 G 0,5	20	5,1	14,4	48,0
24372	4 G 0,5	20	5,5	19,0	62,0
24373	5 G 0,5	20	6,0	24,0	70,0
24374	7 G 0,5	20	9,1	33,6	88,0
24375	12 G 0,5	20	10,0	58,0	131,0
24376	18 G 0,5	20	12,2	86,0	204,0
24377	25 G 0,5	20	14,3	120,0	266,0
24378	3 G 0,75	19	5,2	21,6	51,0
24379	4 G 0,75	19	6,1	29,0	68,0
24380	5 G 0,75	19	6,6	36,0	73,0
24381	7 G 0,75	19	10,5	50,0	92,0
24382	12 G 0,75	19	11,4	86,0	170,0
24383	18 G 0,75	19	14,2	130,0	257,0
24384	25 G 0,75	19	16,3	180,0	280,0
24385	36 G 0,75	19	20,1	260,0	411,0
24386	42 G 0,75	19	22,2	302,0	608,0

Continuation ▸

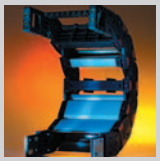
MULTISPEED® 500-PUR UL/CSA safety against high

bending in drag chain systems, low torsion, halogen-free, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24387	3 G 1	18	5,9	29,0	59,0
24388	4 G 1	18	6,4	38,0	71,0
24389	5 G 1	18	7,0	48,0	84,0
24390	7 G 1	18	11,2	67,0	111,0
24391	12 G 1	18	12,3	115,0	200,0
24392	18 G 1	18	15,1	173,0	286,0
24393	25 G 1	18	17,6	240,0	370,0
24331	36 G 1	18	21,6	346,0	485,0
24394	3 G 1,5	16	6,7	43,0	81,0
24395	4 G 1,5	16	7,3	58,0	102,0
24396	5 G 1,5	16	8,0	72,0	121,0
24397	7 G 1,5	16	13,2	101,0	164,0
24398	12 G 1,5	16	15,0	173,0	293,0
24399	18 G 1,5	16	17,7	259,0	450,0
24400	25 G 1,5	16	20,5	360,0	631,0
24332	36 G 1,5	16	25,6	518,0	779,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24401	4 G 2,5	14	8,9	86,0	173,0
24402	5 G 2,5	14	9,8	120,0	220,0
24403	7 G 2,5	14	16,1	168,0	290,0
24404	12 G 2,5	14	17,8	288,0	504,0
24405	18 G 2,5	14	21,8	432,0	719,0
24406	25 G 2,5	14	24,4	600,0	940,0

Dimensions and specifications may be changed without prior notice. (RN05)



Suitable Cable drag chains can be found in our Cable Accessories catalogue.

PURö-JZ-HF-FCP high flexible, cable for drag chains, oil resistant,

EMC-preferred type, meter marking

NEW

Technical data

- Special PUR drag chain cable, extreme flexibility acc. to UL/CSA AWM I/II A/B Style 21223
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  VDE U_0/U 300/500 V
  UL/CSA 1000 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 5x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC acc. to UL-Std.1581
- 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 selected lay-length
- Separating foil over each layer
- construction with Cu-screening, tinned, approx. 85%
- Minimum coverage 85%
- Outer sheath of special full-polyurethane to DIN VDE 0207-363-10-2/ DIN EN 50363-10-12 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- Suitable for outdoor lying
- resistant to UV-radiation,oxygen, Ozone,Hydrolyzeandmicrobes
- low adhesion
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- oil resistant to DIN VDE 0473-811-404 / DIN EN 60811-404

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- analouge type:
  JZ-602 RC-PUR

Application

UL/CSA approved, highly flexible, screened PUR drag-chain cable for laying in dry, damp, wet rooms and outside, with free movement and without tensile load or forced movements, suitable for frequent lifting and bending stresses in the sector of machine manufacture and tool making. Thanks to the high level of shielding density, a fault-free transmission of signals or impulses is ensured. The ideal control line, offering protection against interference, for the above applications. Of interest for those machinery manufacturers, who are export orientated. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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.

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12944	2 x 0,5	20	6,0	35,0	46,0
12945	3 G 0,5	20	6,3	42,0	56,0
12946	4 G 0,5	20	6,8	47,0	64,0
12947	5 G 0,5	20	7,4	56,0	77,0
12948	7 G 0,5	20	8,5	69,0	104,0
12949	12 G 0,5	20	10,1	108,0	158,0
12950	18 G 0,5	20	11,7	145,0	229,0
12951	25 G 0,5	20	14,0	240,0	320,0
12952	2 x 0,75	19	6,4	40,0	59,0
12953	3 G 0,75	19	6,8	52,0	68,0
12954	4 G 0,75	19	7,3	60,0	82,0
12955	5 G 0,75	19	7,9	71,0	101,0
12956	7 G 0,75	19	9,2	91,0	150,0
12957	12 G 0,75	19	11,0	142,0	212,0
12958	18 G 0,75	19	13,0	212,0	305,0
12959	25 G 0,75	19	15,8	281,0	430,0
12960	2 x 1	18	6,8	50,0	71,0
12961	3 G 1	18	7,2	60,0	90,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12962	4 G 1	18	7,8	71,0	114,0
12963	5 G 1	18	8,4	88,0	136,0
12964	7 G 1	18	9,8	111,0	169,0
12965	12 G 1	18	12,0	184,0	270,0
12966	18 G 1	18	14,2	260,0	385,0
12967	25 G 1	18	16,8	349,0	530,0
12968	2 x 1,5	16	7,3	63,0	88,0
12969	3 G 1,5	16	7,7	80,0	104,0
12970	4 G 1,5	16	8,4	97,0	136,0
12971	5 G 1,5	16	9,1	119,0	170,0
12972	7 G 1,5	16	10,7	147,0	221,0
12973	12 G 1,5	16	13,0	267,0	348,0
12974	18 G 1,5	16	15,5	374,0	489,0
12975	25 G 1,5	16	18,7	526,0	710,0
12976	3 G 2,5	14	9,1	144,0	177,0
12977	4 G 2,5	14	9,9	148,0	204,0
12978	7 G 2,5	14	13,0	255,0	340,0
12979	4 G 4	12	11,2	230,0	310,0

Dimensions and specifications may be changed without prior notice. (RN05)

JZ-602 RC-C-PUR special cable for drag chains, 80°C, 600 V, two approval control cable, EMC-preferred type, meter marking

Technical data

- Control cable of special-PUR to UL CSA AWM I/II A/B Style 20939 (sheath insulation) and CSA
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min 20 MOhm x km
- **Minimum bending radius** flexing 10x cable Ø fixed installation 5x cable Ø
- **Coupling resistance** max. 250 Ohm/km
- **Radiation resistance** up 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl.6, BS 6360 cl.6 and IEC 60228 cl.6
- Core insulation of special PVC compound type TI2 to DIN VDE 0207-363-3/ DIN EN 50363-3 and class 43 acc. to UL-Std.1581
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded with optimal lay-length
- Wrapped of fleece over each layer
- PVC-inner sheath
- Screening: up to 17 mm Ø - layer of tinned copper wires >17 mm Ø - tinned copper wire braid coverage ca. 85%
- Outer sheath of special **Full-polyurethane**
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Resistant to mineral oils, synthetic oils and coolant, UV-radiation, oxygene, ozon and hydrolysis. Conditionally resistant to microbes.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **JZ-602 RC PUR**, confer page 430

Application

These cable are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist, wet rooms and outdoor. These special cables for drag chains are used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. The dense screening assures disturbance-free transmission of all signals and impulses. An ideal disturbance-free control cable for the above applications. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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

RC = Robotics Cable

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

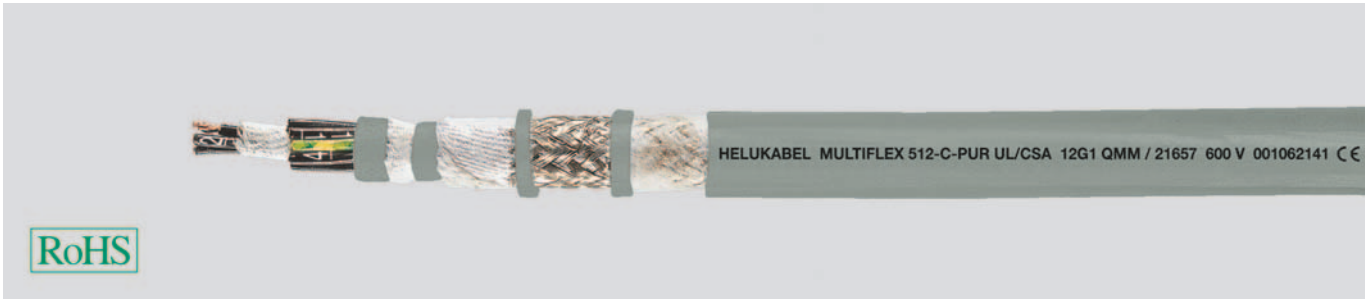
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12680	3 G 0,5	20	8,5	45,0	124,0
12681	4 G 0,5	20	9,0	52,0	135,0
12682	5 G 0,5	20	9,7	68,0	153,0
12683	7 G 0,5	20	11,0	93,0	191,0
12684	9 G 0,5	20	12,4	134,0	243,0
12685	12 G 0,5	20	13,5	163,0	322,0
12686	15 G 0,5	20	14,8	174,0	350,0
12687	18 G 0,5	20	16,0	191,0	374,0
12688	25 G 0,5	20	19,0	223,0	436,0
12689	3 G 0,75	18	8,9	56,0	130,0
12690	4 G 0,75	18	9,7	81,0	155,0
12691	5 G 0,75	18	10,4	90,0	181,0
12692	7 G 0,75	18	12,0	106,0	208,0
12693	9 G 0,75	18	14,1	161,0	321,0
12694	12 G 0,75	18	15,2	175,0	341,0
12695	15 G 0,75	18	16,7	204,0	396,0
12696	18 G 0,75	18	17,6	241,0	473,0
12697	25 G 0,75	18	20,7	342,0	650,0
12698	34 G 0,75	18	24,3	434,0	781,0
12699	3 G 1,5	16	10,2	89,0	165,0
12700	4 G 1,5	16	11,0	97,0	192,0
12701	5 G 1,5	16	11,8	111,0	224,0
12702	7 G 1,5	16	14,0	147,0	274,0
12703	9 G 1,5	16	16,4	193,0	340,0
12704	12 G 1,5	16	17,1	256,0	461,0
12705	18 G 1,5	16	20,2	360,0	674,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
12706	25 G 1,5	16	25,2	544,0	950,0
12707	34 G 1,5	16	28,1	674,0	1203,0
12708	3 G 2,5	14	11,8	141,0	220,0
12709	4 G 2,5	14	13,2	170,0	270,0
12710	5 G 2,5	14	14,2	195,0	350,0
12711	7 G 2,5	14	17,4	251,0	428,0
12712	12 G 2,5	14	21,0	368,0	730,0
12713	18 G 2,5	14	25,4	639,0	1140,0
12714	3 G 4	12	14,0	180,0	296,0
12715	4 G 4	12	15,9	232,0	456,0
12716	5 G 4	12	17,7	330,0	450,0
12717	7 G 4	12	20,9	395,0	737,0
12718	4 G 6	10	18,3	316,0	572,0
12719	4 G 10	8	23,2	490,0	1012,0
12720	4 G 16	6	27,6	850,0	1400,0
12721	4 G 25	4	33,1	1450,0	2100,0
12722	4 G 35	2	37,8	1890,0	2550,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTIFLEX 512®-C-PUR UL/CSA special cable for

drag chains, 80°C, 600 V, two approval control cable, EMC-preferred type, halogen-free, meter marking



Technical data

- Special drag chain cables for extreme mechanical stress to UL-Style 20939
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage** UL/CSA 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
- **Alternating bending test**
  tested with approx. **10 million bending cycles**
- **Radiation resistance**
  up to 50x10⁶ cJ/kg (up to 50 Mrad)
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Bare copper, extra fine wire conductors, bunch stranded to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6 and IEC 60228 cl.6
- Core insulation of special PP
- 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 selected lay-length
- Special core wrapping over each layers and an additional fleece over outer layer
- **TPE-inner sheath**, halogen-free
- Wrapping with special tapes
- Tinned copper braided screening, approx. 85% coverage
- Special core wrapping of fleece (up to 4 mm² without core wrapping over the outer layer)
- Outer sheath of special **full-polyurethane** TMPU, to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Very good oil resistant
- Guaranteed permanent application in multi-shift operation under extreme high bending stress
- Adhesion-low
- High resistant to mechanical strain
- High property of alternating bending strength
- Long lifedurabilities through low fiction-resistance by using the TPE insulation
- High tensile strength-, abrasion and impact resistant at low temperature
- Resistant to Weather, Ozone, UV-radiation, Solvents, Acids and Alkalis, Hydraulic liquidity and Hydrolysis
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PUR-sheath flame retardant 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), UL VW-1, CSA FT1

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- unscreened analogue type: **MULTIFLEX 512® PUR UL/CSA**, confer page 431

N

Application

The special screened UL/CSA cables for drag chains are mainly applied for impulse transmission to prevent external interference effects and used for permanent flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts and multi-shift operation. Those cables are developed according to the newest state of technology improvement. These high flexible control cables with sliding abilities guaranteed an optimum service life durabilities and also very economic by using the PP-core insulation and the PUR-outer sheath which is adhesive-free and cut-resistant.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21630	2 x 0,5	20	8,3	30,0	90,0
21631	3 G 0,5	20	8,5	38,0	105,0
21632	4 G 0,5	20	9,0	50,0	124,0
21633	5 G 0,5	20	9,7	65,0	132,0
21634	7 G 0,5	20	11,1	70,0	175,0
21635	12 G 0,5	20	12,7	100,0	250,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21636	18 G 0,5	20	14,7	157,0	325,0
21637	20 G 0,5	20	15,4	167,0	350,0
21638	25 G 0,5	20	17,1	240,0	450,0
21639	30 G 0,5	20	17,9	273,0	510,0
21640	36 G 0,5	20	19,2	306,0	580,0

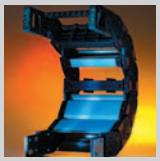
Continuation ▸

MULTIFLEX 512®-C-PUR UL/CSA special cable for

drag chains, 80°C, 600 V, two approval control cable, EMC-preferred type, halogen-free, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
21641	2 x 0,75	19	8,8	39,0	110,0
21642	3 G 0,75	19	9,3	49,0	120,0
21643	4 G 0,75	19	9,7	60,0	148,0
21644	5 G 0,75	19	10,5	70,0	160,0
21645	7 G 0,75	19	11,9	95,0	205,0
21646	12 G 0,75	19	14,2	140,0	308,0
21647	18 G 0,75	19	16,3	220,0	420,0
21648	20 G 0,75	19	16,9	249,0	450,0
21649	25 G 0,75	19	19,2	313,0	579,0
21650	30 G 0,75	19	19,7	470,0	630,0
21651	36 G 0,75	19	21,2	500,0	745,0
21652	2 x 1	18	9,7	50,0	120,0
21653	3 G 1	18	10,0	60,0	135,0
21654	4 G 1	18	10,8	73,0	173,0
21655	5 G 1	18	11,7	81,0	187,0
21656	7 G 1	18	13,4	114,0	240,0
21657	12 G 1	18	16,0	186,0	360,0
21658	18 G 1	18	18,5	254,0	498,0
21659	20 G 1	18	19,4	322,0	568,0
21660	25 G 1	18	21,7	377,0	670,0
21661	30 G 1	18	22,5	429,0	774,0
21662	36 G 1	18	24,3	516,0	895,0
21663	41 G 1	18	26,1	610,0	1032,0
21664	50 G 1	18	28,4	690,0	1160,0
21665	65 G 1	18	32,2	852,0	1660,0
21666	2 x 1,5	16	10,2	64,0	145,0
21667	3 G 1,5	16	11,0	84,0	168,0
21668	4 G 1,5	16	11,6	99,0	217,0
21669	5 G 1,5	16	12,6	129,0	235,0
21670	7 G 1,5	16	14,5	148,0	325,0
21671	12 G 1,5	16	17,4	279,0	481,0
21672	18 G 1,5	16	19,9	393,0	675,0
21673	25 G 1,5	16	23,7	584,0	927,0
21674	30 G 1,5	16	24,6	607,0	1025,0
21675	36 G 1,5	16	26,4	702,0	1210,0
21676	42 G 1,5	16	28,4	829,0	1441,0
21677	50 G 1,5	16	31,2	1025,0	1709,0
21678	61 G 1,5	16	34,2	1190,0	2025,0
21679	2 x 2,5	14	11,9	104,0	198,0
21680	3 G 2,5	14	12,6	140,0	284,0
21681	4 G 2,5	14	13,6	164,0	378,0
21682	5 G 2,5	14	14,7	190,0	423,0
21683	7 G 2,5	14	17,4	236,0	486,0
21684	12 G 2,5	14	20,9	390,0	756,0
21685	18 G 2,5	14	24,2	607,0	1127,0
21686	20 G 2,5	14	25,6	661,0	1210,0
21687	25 G 2,5	14	29,1	796,0	1530,0
21688	4 G 4	12	16,8	222,0	448,0
21689	5 G 4	12	18,4	328,0	533,0
21690	7 G 4	12	21,6	360,0	678,0
21691	4 G 6	10	18,1	305,0	636,0
21692	5 G 6	10	19,6	441,0	772,0
21693	7 G 6	10	23,2	505,0	1028,0
21694	4 G 10	8	22,5	485,0	1052,0
21695	5 G 10	8	24,7	610,0	1096,0
21696	7 G 10	8	29,3	820,0	1530,0
21697	4 G 16	6	25,7	840,0	1386,0
21698	5 G 16	6	28,2	1050,0	1759,0
21699	7 G 16	6	33,6	1510,0	2087,0

Dimensions and specifications may be changed without prior notice. (RN05)



Suitable Cable drag chains can be found in our Cable Accessories catalogue.

MULTISPEED® 500-C-PUR UL/CSA safety against

high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking

Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, DIN VDE 0285-525-2-21/ DIN EN 50525-2-21 and UL-Std.758 AWM Style 20939
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
  Nominal voltage
  VDE U_0/U 300/500 V
  UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
- **Coupling resistant**
  max. 250 Ohm/km
- **Radiation resistance**
  up to 100x10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above
- Stranding:
  <7 cores: cores stranded in a layer with optimal lay-length around a filler as pe construction
  ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE-O inner sheath, extruded as filler with pressure, grey RAL 7001
- Tinned copper braided screen, coverage 85% max., with optimal pitch
- Outer sheath of special PUR
- Sheath colour black (RAL 9005)
- with meter marking

Properties

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

Tests

- PUR-sheath flame retardant 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), UL VW-1, CSA FT1
- Low adhesion
- High property of alternating bending strength
- Longer service life due to low frictional resistance
- High tensile, abrasion and impact resistance even at low temperatures
- Higher notch toughness
- Higher stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced Ø, therefore less moving masses

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type:
  MULTISPEED® 500-PUR UL/CSA,
  confer page 433

N

Application

UL/CSA approved HELUKABEL® MULTISPEED® 500-C-PUR is used in applications where extreme requirements placed on the line. Designed for the export-orientated machinery manufacturer, specifically for USA and Canada. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high an slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e. g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24410	2 x 0,5	20	6,6	30,0	90,0
24411	3 G 0,5	20	6,9	36,0	104,0
24412	4 G 0,5	20	7,3	42,0	118,0
24413	5 G 0,5	20	7,8	48,0	148,0
24414	7 G 0,5	20	11,3	64,0	184,0
24415	9 G 0,5	20	11,4	80,0	219,0
24416	12 G 0,5	20	12,6	105,0	276,0
24417	18 G 0,5	20	15,0	137,0	378,0
24418	25 G 0,5	20	17,5	210,0	547,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24419	2 x 0,75	19	6,8	40,0	100,0
24420	3 G 0,75	19	7,4	48,0	117,0
24421	4 G 0,75	19	8,0	55,0	143,0
24422	5 G 0,75	19	8,5	66,0	167,0
24423	7 G 0,75	19	12,9	85,0	229,0
24424	12 G 0,75	19	14,4	135,0	319,0
24425	18 G 0,75	19	17,5	190,0	492,0
24426	25 G 0,75	19	19,9	275,0	659,0

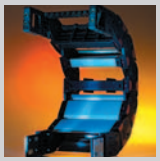
Continuation ▸

MULTISPEED® 500-C-PUR UL/CSA safety against

high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24427	2 x 1	18	7,1	50,0	120,0
24428	3 G 1	18	7,7	59,0	140,0
24429	4 G 1	18	8,3	70,0	167,0
24430	5 G 1	18	9,1	84,0	201,0
24431	7 G 1	18	14,0	106,0	256,0
24432	12 G 1	18	15,0	174,0	417,0
24433	18 G 1	18	18,7	240,0	557,0
24434	25 G 1	18	21,4	332,0	766,0
24333	36 G 1	18	26,1	436,0	840,0
24435	3 G 1,5	16	8,6	75,0	170,0
24436	4 G 1,5	16	9,4	90,0	204,0
24437	5 G 1,5	16	10,4	108,0	236,0
24438	7 G 1,5	16	16,0	157,0	309,0
24439	12 G 1,5	16	17,6	240,0	509,0
24440	18 G 1,5	16	21,3	355,0	718,0
24441	25 G 1,5	16	24,8	448,0	944,0
24334	36 G 1,5	16	30,3	592,0	1070,0
24442	4 G 2,5	14	11,3	134,0	280,0
24443	5 G 2,5	14	12,3	175,0	346,0
24444	7 G 2,5	14	19,9	229,0	410,0

Dimensions and specifications may be changed without prior notice. (RN05)



Suitable Cable drag chains can be found in our Cable Accessories catalogue.

MULTISPEED® 500-TPE UL/CSA high flexible,

safety against high bending in drag chain systems, low torsion, halogen-free, meter marking

Technical data

- Special drag chain cables for high mechanical stress in acc. to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51 and UL-Std.758 AWM Style 20841 and 21184
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** VDE U_0/U 300/500 V UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 5x cable Ø fixed installation 3x cable Ø
- **Radiation resistance** up to 100x10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors Unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above
- Stranding: <7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Outer sheath of special-TPE-O, extruded as filler with pressure
- Sheath colour ocean blue (RAL 5020)
- with meter marking
- **TPE**: The selected tinned copper wire conductor permits the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide

Properties

- Microbe-resistance - TPE
- High property of alternating bending strength
- Long life durabilitys due to low friction-resistance
- High tensile strength, abrasion and impact resistance at low temperature
- Extremely high bending loads
- Low adhesion
- Halogen-free
- Higher notch toughness
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced Ø, therefore less moving masses
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Cleanroom qualification tested with analog
- type. Please note "cleanroom qualified" when ordering.
- screened analogue type: **MULTISPEED® 500-C-TPE UL/CSA**, confer page 443

N

Application

The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high an slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e. g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24450	2 x 0,5	20	4,7	9,6	42,0
24451	3 G 0,5	20	5,0	14,4	49,0
24452	4 G 0,5	20	5,4	19,0	63,0
24453	5 G 0,5	20	5,8	24,0	70,0
24454	7 G 0,5	20	8,9	33,6	90,0
24455	12 G 0,5	20	9,8	58,0	134,0
24456	18 G 0,5	20	11,9	86,0	209,0
24457	25 G 0,5	20	13,9	120,0	270,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24458	2 x 0,75	19	5,0	14,4	47,0
24459	3 G 0,75	19	5,2	21,6	55,0
24460	4 G 0,75	19	6,1	29,0	70,0
24461	5 G 0,75	19	6,6	36,0	74,0
24462	7 G 0,75	19	10,5	50,0	95,0
24463	12 G 0,75	19	11,4	86,0	174,0
24464	18 G 0,75	19	14,2	130,0	261,0
24465	25 G 0,75	19	16,3	180,0	290,0
24466	36 G 0,75	19	19,5	260,0	419,0
24467	42 G 0,75	19	21,3	302,0	614,0

Continuation ▸

MULTISPEED® 500-TPE UL/CSA high flexible,

safety against high bending in drag chain systems, low torsion, halogen-free, meter marking

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24468	2 x 1	18	5,2	19,2	50,0
24469	3 G 1	18	5,9	29,0	60,0
24470	4 G 1	18	6,4	38,0	74,0
24471	5 G 1	18	7,0	48,0	86,0
24472	7 G 1	18	11,2	67,0	114,0
24473	12 G 1	18	12,3	115,0	210,0
24474	18 G 1	18	15,1	173,0	291,0
24475	25 G 1	18	17,6	240,0	380,0
24476	3 G 1,5	16	6,7	43,0	84,0
24477	4 G 1,5	16	7,3	58,0	108,0
24478	5 G 1,5	16	8,0	72,0	126,0
24479	7 G 1,5	16	13,2	101,0	169,0
24480	12 G 1,5	16	14,4	173,0	299,0
24481	18 G 1,5	16	17,7	259,0	460,0
24482	25 G 1,5	16	19,8	360,0	640,0
24483	4 G 2,5	14	8,9	96,0	179,0
24484	5 G 2,5	14	9,8	120,0	230,0
24485	7 G 2,5	14	16,1	168,0	294,0
24486	12 G 2,5	14	17,8	288,0	510,0
24487	18 G 2,5	14	21,8	432,0	722,0
24488	25 G 2,5	14	24,4	600,0	950,0

Dimensions and specifications may be changed without prior notice. (RN05)

Suitable Cable drag chains can be found in our Cable Accessories catalogue.

MULTISPEED® 500-C-TPE UL/CSA safety against

high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking

Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51 and UL-Std.758 AWM Style 21184
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 300/500 V UL 600 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 5x cable Ø fixed installation 3x cable Ø
- **Coupling resistance** max. 250 Ohm x km
- **Radiation resistance** up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Tinned copper, fine wire conductors, Unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN VDE 0293 black cores with continuous white numbering
- GN-YE conductor, 3 cores and above
- Stranding: <7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE-O inner sheath, extruded as filler with pressure, natural colour
- Screen of Cu braid tinned, coverage 85% max., with optimal pitch
- Outer sheath of speciall-TPE-O extruded as filler with pressure
- Sheath colour ocean blue (RAL 5020)
- with meter marking
- **TPE**: The selected tinned copper wire conductor and tinned copper wire braid permit the installation in aggressive environments as well as hydrogen sulfide, ammonia and sulfur dioxide.

Properties

- Microbe-resistance - TPE
- High property of alternating bending strength
- Longer service life due to low friction resistance
- High tensile, abrasion and impact resistance even at low temperatures
- Extremely high bending loads
- Low adhesion
- Higher notch toughness
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced Ø, therefore less moving masses
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- Please note the cleanroom qualification when ordering.
- unscreened analogue type: **MULTISPEED® 500-TPE UL/CSA**, confer page 441

N

Application

The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and slow speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e. g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23914	2 x 0,5	20	6,4	30,0	85,0
23915	3 G 0,5	20	6,7	36,0	99,0
23916	4 G 0,5	20	7,3	42,0	107,0
23917	5 G 0,5	20	7,7	48,0	140,0
23918	7 G 0,5	20	11,3	64,0	176,0
23919	10 G 0,5	20	10,1	80,0	204,0
23920	12 G 0,5	20	12,4	105,0	261,0
23921	18 G 0,5	20	14,7	137,0	360,0
23922	25 G 0,5	20	17,1	320,0	530,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23923	2 x 0,75	19	7,0	40,0	97,0
23924	3 G 0,75	19	7,4	48,0	110,0
23925	4 G 0,75	19	8,0	55,0	139,0
23926	5 G 0,75	19	8,5	66,0	160,0
23927	7 G 0,75	19	12,9	85,0	219,0
23928	12 G 0,75	19	14,4	135,0	307,0
23929	18 G 0,75	19	17,2	190,0	490,0
23930	25 G 0,75	19	19,9	275,0	640,0

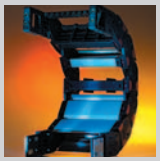
Continuation ▸

MULTISPEED® 500-C-TPE UL/CSA safety against

high bending in drag chain systems, low torsion, halogen-free, EMC-preferred type, meter marking

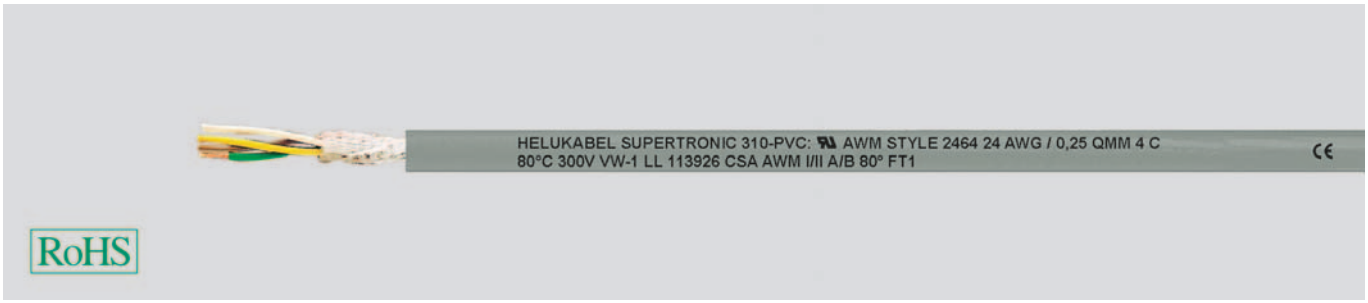
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23931	2 x 1	18	7,4	50,0	115,0
23932	3 G 1	18	7,7	59,0	131,0
23933	4 G 1	18	8,3	70,0	160,0
23934	5 G 1	18	9,1	84,0	195,0
23935	7 G 1	18	14,0	106,0	247,0
23936	12 G 1	18	15,0	174,0	411,0
23937	18 G 1	18	18,5	240,0	547,0
23938	25 G 1	18	21,4	332,0	754,0
23939	3 G 1,5	16	8,6	75,0	160,0
23940	4 G 1,5	16	9,4	90,0	194,0
23941	5 G 1,5	16	10,4	108,0	220,0
23942	7 G 1,5	16	16,0	157,0	294,0
23943	12 G 1,5	16	17,6	240,0	490,0
23944	18 G 1,5	16	21,3	355,0	704,0
23945	25 G 1,5	16	24,8	448,0	930,0
23946	4 G 2,5	14	11,3	134,0	260,0
23947	5 G 2,5	14	12,3	175,0	330,0
23948	7 G 2,5	14	14,8	229,0	406,0
23949	12 G 2,5	14	21,5	390,0	990,0

Dimensions and specifications may be changed without prior notice. (RN05)



Suitable Cable drag chains can be found in our Cable Accessories catalogue.

SUPERTRONIC®-310-PVC special cable for drag chains, meter marking



Technical data

- Special PVC drag chain cable acc. to UL-Style 2464
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage** 1500 V
- **Breakdown voltage** min. 3000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 5x cable Ø fixed installation 3x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper conductor, fine wire Unilay with short lay-lengths
- Core insulation of PVC class 43 acc. to UL-Std.1581
- Core identification to DIN 47100 coloured
- Cores stranded in layers with optimal lay-length
- Wrapping of fleece between the layers of stranding
- Outer sheath of special PVC, oil resistant compound type TM5 to DIN VDE 0207-363-4-1/DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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)
- Low-adhesion

Note

- Please observe applicable installation regulations for use in energy supply chains.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

A highly-flexible PVC control cable suitable for frequent and fast lifting and bending stresses in machines and tool building, robot systems and on constantly moving machine components. Long service lives guarantee reliable function and good cost efficiency. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text. Designed for machines intended for export, specifically USA and Canada.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49885	2 x 0,14	26	3,7	2,8	24,0
49886	3 x 0,14	26	3,9	4,1	26,0
49887	4 x 0,14	26	4,1	5,6	31,0
49888	5 x 0,14	26	4,5	7,0	36,0
49889	7 x 0,14	26	5,1	9,8	50,0
49890	10 x 0,14	26	5,8	14,0	65,0
49891	12 x 0,14	26	6,0	16,8	72,0
49892	14 x 0,14	26	6,2	19,6	78,0
49893	18 x 0,14	26	6,9	25,2	91,0
49894	24 x 0,14	26	7,8	33,6	120,0
49895	25 x 0,14	26	8,3	35,0	125,0
49896	2 x 0,25	24	4,0	5,0	29,0
49897	3 x 0,25	24	4,2	7,5	34,0
49898	4 x 0,25	24	4,5	10,0	40,0
49899	5 x 0,25	24	4,9	12,5	51,0
49900	7 x 0,25	24	5,6	17,5	65,0
49901	10 x 0,25	24	6,4	25,0	85,0
49902	12 x 0,25	24	6,6	30,1	97,0

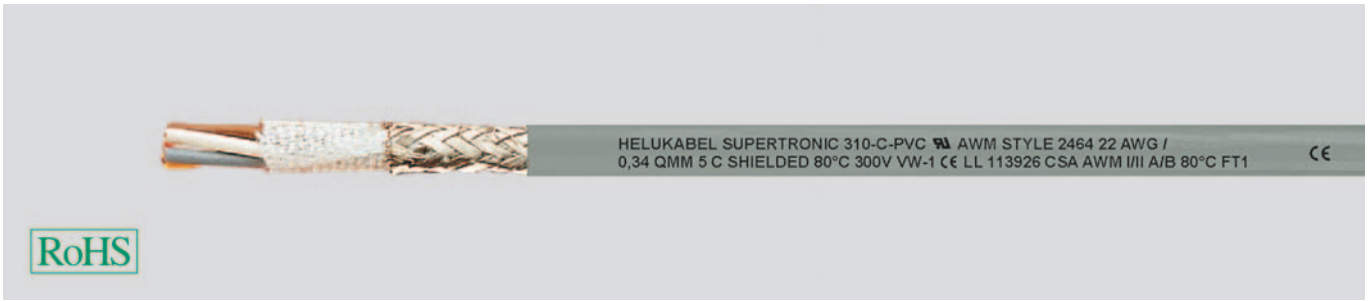
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49903	14 x 0,25	24	6,9	35,0	109,0
49904	18 x 0,25	24	7,6	45,0	132,0
49905	24 x 0,25	24	8,8	60,0	171,0
49906	25 x 0,25	24	9,4	62,5	178,0
49907	2 x 0,34	22	4,2	6,8	34,0
49908	3 x 0,34	22	4,4	10,2	43,0
49909	4 x 0,34	22	4,8	13,6	58,0
49910	5 x 0,34	22	5,1	17,0	65,0
49911	7 x 0,34	22	5,9	23,8	85,0
49912	10 x 0,34	22	6,8	34,0	117,0
49913	12 x 0,34	22	7,0	40,8	134,0
49914	14 x 0,34	22	7,4	47,6	152,0
49915	18 x 0,34	22	8,1	61,2	184,0
49916	24 x 0,34	22	9,6	81,5	242,0
49917	25 x 0,34	22	10,0	85,0	252,0

Dimensions and specifications may be changed without prior notice. (RN05)

Suitable Cable drag chains can be found in our Cable Accessories catalogue.

SUPERTRONIC®-310-C-PVC special cable for drag chains,

EMC-preferred type, meter marking



Technical data

- Special PVC drag chain cable approved to UL-Style 2464
- **Temperature range** flexing -5°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage** core/core 1500 V core/screen 1000 V
- **Breakdown voltage** min. 3000 V
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Insulation resistance** min. 20 MOhm x km
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper conductor, fine wire Unilay with short lay-lengths
- Core insulation of PVC class 43 acc. to UL-Std.1581
- Core identification to DIN 47100 coloured
- Cores stranded in layers with optimal lay-length
- Wrapping of fleece between the layers of stranding
- Wrapping over the outer layer
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- Outer sheath of oil resistant special PVC, compound type TM5 to DIN VDE 0281 Part 1 or class 43 acc. to UL-Std.1581
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

- Low-adhesion
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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)

Note

- Please observe applicable installation regulations for use in energy supply chains.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

A highly-flexible PVC control cable suitable for frequent and fast lifting and bending stresses in machines and tool building, robot systems and on constantly moving machine components. Long service lives guarantee reliable function and good cost efficiency. The copper screen effectively protects against internal and external interference. Designed for machines intended for export, specifically USA and Canada. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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.

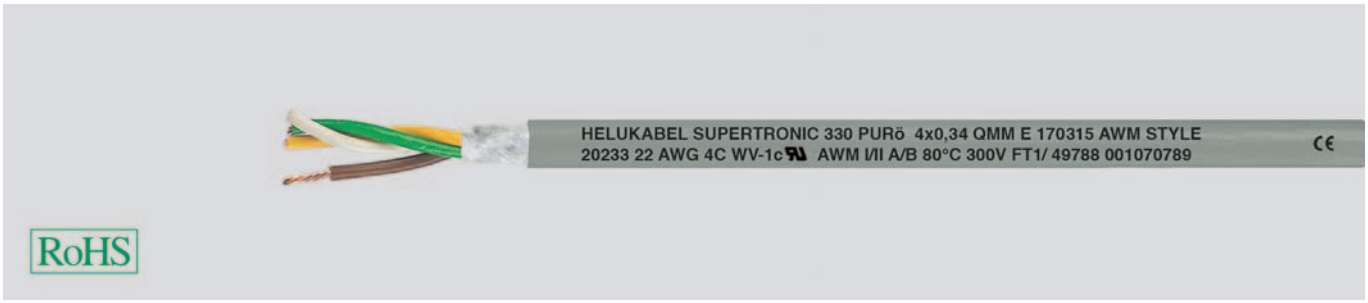
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49920	2 x 0,14	26	4,3	11,3	33,0
49921	3 x 0,14	26	4,5	14,2	36,0
49922	4 x 0,14	26	4,7	15,5	41,0
49923	5 x 0,14	26	5,0	18,4	46,0
49924	7 x 0,14	26	5,7	27,9	70,0
49925	10 x 0,14	26	6,4	39,1	88,0
49926	12 x 0,14	26	6,7	42,2	97,0
49927	14 x 0,14	26	6,9	45,4	105,0
49928	18 x 0,14	26	7,6	54,2	116,0
49929	24 x 0,14	26	8,6	66,5	150,0
49930	25 x 0,14	26	9,0	68,5	157,0
49931	2 x 0,25	24	4,6	14,8	39,0
49932	3 x 0,25	24	4,8	18,9	45,0
49933	4 x 0,25	24	5,1	21,4	52,0
49934	5 x 0,25	24	5,5	31,2	70,0
49935	7 x 0,25	24	6,2	39,8	80,0
49936	10 x 0,25	24	7,1	53,9	114,0
49937	12 x 0,25	24	7,3	59,2	123,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49938	14 x 0,25	24	7,6	64,3	138,0
49939	18 x 0,25	24	8,3	78,6	165,0
49940	24 x 0,25	24	9,7	89,8	200,0
49941	25 x 0,25	24	10,1	101,2	204,0
49942	2 x 0,34	22	4,8	18,2	44,0
49943	3 x 0,34	22	5,0	28,8	60,0
49944	4 x 0,34	22	5,4	35,8	76,0
49945	5 x 0,34	22	5,7	39,2	80,0
49946	7 x 0,34	22	6,6	52,8	104,0
49947	10 x 0,34	22	7,5	67,5	150,0
49948	12 x 0,34	22	7,7	76,5	160,0
49949	14 x 0,34	22	8,1	85,9	180,0
49950	18 x 0,34	22	8,9	99,9	211,0
49951	24 x 0,34	22	10,3	147,0	290,0
49952	25 x 0,34	22	10,9	155,0	304,0

Dimensions and specifications may be changed without prior notice. (RN05)

Suitable Cable drag chains can be found in our Cable Accessories catalogue.

SUPERTRONIC®-330 PURö cable for drag chains, halogen-free, meter marking



Technical data

- Special PUR sheathed cable
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage**
  core/core 1500 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Capacitance**
  core/core 60 nF/km
- **Minimum bending radius**
  flexing 5x cable Ø
  fixed 3x cable Ø
- **Radiation resistance**
  up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, extra fine-wire to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6
- Core insulation of PP
- Cores stranded in layers with optimally lay-lengths
- Core identification to DIN 47100 coloured
- Wrapping over the outer layer
- Outer sheath of special **full-polyurethane** compound type TMPU to DIN VDE 0282 Part 10, Annex A and acc. to UL-Std.1581 Tab.50227
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

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

Tests

- PUR outer sheath, flame retardant 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)
- Low adhesion
- High flexibility at low temperatures
- High abrasion resistance
- Tear and cut-resistant
- Notch resistant
- **Resistant to**
  UV-radiation, Oxygen, Ozone, Hydrolysis, Oil
- **Partially resistant to**
  Microbial attack, Hydraulic fluids, Coolant emulsion, Alkalis

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

For installation in dry, moist and wet rooms and outdoors with free movement without tensile stress or forced movements, impressively proven in drag chain application. A highly flexible PUR control cable, suitable for frequent and quick lifting and bending stresses in machine engineering and construction, in robot technology and on permanently moving machine components. Long service life guarantees reliable function and high cost-efficiency. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text. Attractive for export-oriented mechanical engineering.

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

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49764	2 x 0,14	26	3,9	2,8	22,0
49765	3 x 0,14	26	4,0	4,1	24,0
49766	4 x 0,14	26	4,3	5,6	29,0
49767	5 x 0,14	26	4,7	7,0	33,0
49768	7 x 0,14	26	5,3	9,8	47,0
49769	10 x 0,14	26	6,1	14,0	57,0
49770	12 x 0,14	26	6,2	16,8	63,0
49771	14 x 0,14	26	6,5	19,6	72,0
49772	18 x 0,14	26	7,2	25,2	80,0
49773	24 x 0,14	26	8,2	33,6	110,0
49774	25 x 0,14	26	8,6	35,0	115,0
49775	2 x 0,25	24	4,3	5,0	26,0
49776	3 x 0,25	24	4,5	7,5	30,0
49777	4 x 0,25	24	4,8	10,0	39,0
49778	5 x 0,25	24	5,2	12,5	44,0
49779	7 x 0,25	24	6,0	17,5	52,0
49780	10 x 0,25	24	6,9	25,0	70,0
49781	12 x 0,25	24	7,1	30,1	84,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49782	14 x 0,25	24	7,4	35,0	97,0
49783	18 x 0,25	24	8,2	45,0	114,0
49784	24 x 0,25	24	9,6	60,0	157,0
49785	25 x 0,25	24	10,1	62,5	160,0
49786	2 x 0,34	22	4,6	6,8	31,0
49787	3 x 0,34	22	4,8	10,2	38,0
49788	4 x 0,34	22	5,2	13,6	51,0
49789	5 x 0,34	22	5,6	17,0	54,0
49790	7 x 0,34	22	6,5	23,8	77,0
49791	10 x 0,34	22	7,5	34,0	104,0
49792	12 x 0,34	22	7,7	40,8	122,0
49793	14 x 0,34	22	8,1	47,6	140,0
49794	18 x 0,34	22	9,2	61,2	162,0
49795	24 x 0,34	22	10,7	81,5	204,0
49796	25 x 0,34	22	11,2	85,0	229,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED®-TRONIC-PUR safety against high bending

in drag chain systems, halogen-free, meter marking

Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, DIN VDE 0285-525-2-21/ DIN EN 50525-2-21 and acc. to UL-Std.758 AWM, Style 20233
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 300/300 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN 47100
- <7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
  ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Outer sheath of special PUR extruded extruded as filler with pressurea
- Sheath colour black (RAL 9005)
- with meter marking

Properties

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

Tests

- PUR outer sheath, flame retardant 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) UL VW-1, CSA FT1
- Low-adhesion
- Halogen-free
- High property of alternating bending strength
- High tensile strength, abrasion- and impact resistance at low temperature
- Use in multi-shift operations under extremely high continuous bending loads
- Abrasion resistance
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced diameter, therefore lower moving masses

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **MULTISPEED®-TRONIC-C-PUR**, confer page 450

Application

Application HELUKABEL® MULTISPEED®-TRONIC-PUR installed there, where the extreme requirements for the cables are necessary. The selected materials and lay-up technique permit these high flexible cables for permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses e. g. in energy drag chains, industry robotics, production lines, automatic control systems and permanent movable machinery parts for multi-shift operation. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

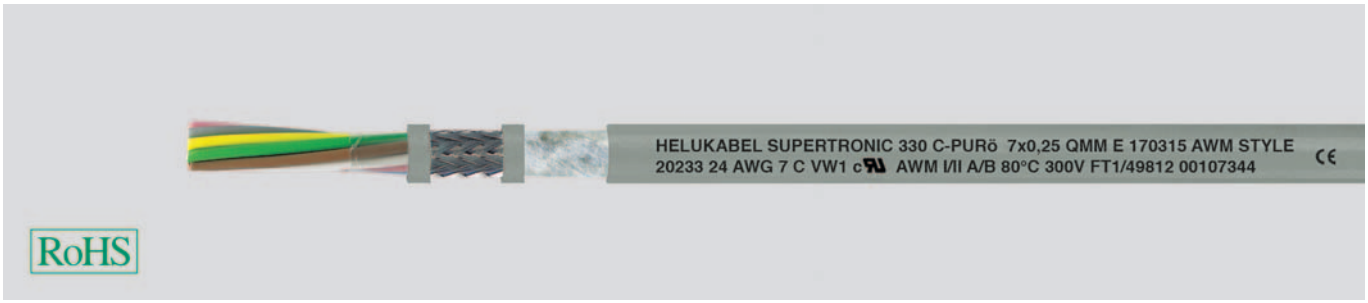
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24567	2 x 0,25	24	3,9	5,0	27,0
24568	3 x 0,25	24	4,1	7,5	33,0
24569	4 x 0,25	24	4,4	10,0	40,0
24570	5 x 0,25	24	4,7	12,5	48,0
24571	7 x 0,25	24	6,9	17,5	60,0
24572	12 x 0,25	24	7,4	30,1	91,0
24573	18 x 0,25	24	8,9	45,0	125,0
24574	25 x 0,25	24	10,2	62,5	170,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24575	2 x 0,34	22	4,1	6,8	32,0
24576	3 x 0,34	22	4,3	10,2	40,0
24577	4 x 0,34	22	4,6	13,6	55,0
24578	5 x 0,34	22	5,0	17,0	60,0
24579	7 x 0,34	22	7,3	23,8	80,0
24580	12 x 0,34	22	7,9	40,8	127,0
24581	18 x 0,34	22	9,7	61,2	175,0
24582	25 x 0,34	22	10,0	85,0	238,0

Dimensions and specifications may be changed without prior notice. (RN05)

SUPERTRONIC®-330 C-PURö cable for drag chains, halogen-free, EMC-preferred type, meter marking



Technical data

- Special PUR sheathed cable, screened
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage**
  core/core 1500 V
  core/screen 1000 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Capacitance**
  core/core 60 nF/km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed 4x cable Ø
- **Radiation resistance**
  up to 100x10⁶ cJ/kg (up to 100 Mrad)
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Bare copper conductor, extra fine wire to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6
- Core insulation of PP
- Core identification to DIN 47100 coloured
- Cores stranded in layers with optimal lay-length
- Wrapping over the outer layer
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- Outer sheath of special **full polyurethane** compound type TMPU to DIN VDE 0207-363-10-2/ DIN EN 50363-10-2 and acc. to UL-Std.1581 tab.50227
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

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

Tests

- PUR outer sheath, flame retardant 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)
- Low-adhesion
- High flexibility at low temperatures
- High abrasion resistance
- Tear and cut-resistant
- Notch resistant
- **Resistant to**
  UV-radiation, Oxygen, Ozone, Hydrolysis, Oil
- **Partially resistant to**
  Microbial attack, Hydraulic fluid, Coolant emulsion, Alkalis

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Especially suited for drag chain installation in dry, moist and wet environments and outdoors with flexible movement and without tensile stress or forced movements. A highly-flexible PVC control cable suitable for frequent and fast lifting and bending stresses in machines and tool building, robot systems and on constantly moving machine components. Long service lives guarantee reliable function and good cost efficiency. The dense screening assures interference-free transmission of all signals and impulses. An ideal interference-free control cable for the above applications. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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.

N

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49797	2 x 0,14	26	4,4	11,2	32,0
49798	3 x 0,14	26	4,5	14,1	35,0
49799	4 x 0,14	26	4,8	15,5	40,0
49800	5 x 0,14	26	5,0	18,3	45,0
49801	7 x 0,14	26	5,8	27,8	66,0
49802	10 x 0,14	26	6,7	39,3	86,0
49803	12 x 0,14	26	6,8	42,1	94,0
49804	14 x 0,14	26	7,1	45,3	102,0
49805	18 x 0,14	26	7,8	54,1	118,0
49806	24 x 0,14	26	8,8	66,3	149,0
49807	25 x 0,14	26	9,2	68,4	156,0
49808	2 x 0,25	24	4,8	14,9	38,0
49809	3 x 0,25	24	5,0	18,8	44,0
49810	4 x 0,25	24	5,3	21,3	51,0
49811	5 x 0,25	24	5,7	31,0	68,0
49812	7 x 0,25	24	6,6	39,6	82,0
49813	10 x 0,25	24	7,5	53,9	110,0
49814	12 x 0,25	24	7,7	59,1	124,0
49815	14 x 0,25	24	8,0	64,2	135,0
49816	18 x 0,25	24	8,8	78,4	150,0
49817	24 x 0,25	24	10,2	89,9	194,0
49818	25 x 0,25	24	10,7	101,0	204,0
49819	2 x 0,34	22	5,1	18,1	45,0
49820	3 x 0,34	22	5,3	28,7	60,0
49821	4 x 0,34	22	5,7	35,7	76,0
49822	5 x 0,34	22	6,1	39,1	82,0
49823	7 x 0,34	22	7,1	52,7	110,0
49824	10 x 0,34	22	8,1	67,4	148,0
49825	12 x 0,34	22	8,3	76,4	166,0
49826	14 x 0,34	22	8,7	85,5	185,0
49827	18 x 0,34	22	9,8	99,7	216,0
49828	24 x 0,34	22	11,3	147,1	291,0
49829	25 x 0,34	22	11,8	155,0	305,0

Dimensions and specifications may be changed without prior notice. (RN05)

MULTISPEED®-TRONIC-C-PUR safety against high

bending in drag chain systems, high flexible, halogen-free, screened, EMC-preferred type, meter marking

Technical data

- Special drag chain cables for high mechanical stress in adapted to DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, DIN VDE 0285-525-2-21/ DIN EN 50525-2-21 and acc. to UL-Std.758 AWM Style 20233
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** U_0/U 300/300 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Coupling resistance** max. 250 Ohm/km
- **Radiation resistance** up to 100x10^6 cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper, fine wire conductors, Unilay with short pitch length
- Core insulation of special PP
- Core identification to DIN 47100
- <7 cores: cores stranded in a layer with optimal lay-length around a filler as per construction
  ≥7 cores: cores stranded with optimal lay-length to bunch-construction with low torsion strength, optimal selected short lay-length around a filler
- Special-TPE extruded as filler with pressure, grey (RAL 7001)
- Screen of Cu braid bare, coverage 85% max., with optimal pitch
- Outer sheath of special-PUR
- Sheath colour black (RAL 9005)
- with meter marking

Properties

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

Tests

- PUR outer sheath, flame retardant 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) UL VW-1, CSA FT1
- Low-Adhesion
- Halogen-free
- High property of alternating bending strength
- High tensile strength, abrasion- and impact resistance at low temperature
- Use in multi-shift operations under extremely high continuous bending loads
- Abrasion resistance
- Tear resistance
- High stability
- Oil resistance
- Better chemical resistance
- UV and ozone resistance
- Higher economical solution
- Reduced Ø, results low weight of moving materials

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- non screened analogue type: **MULTISPEED®-TRONIC-PUR**, confer page 448

Application

For permanent application in drag chains for long distances, high and low speed of movements. These cables are installed in dry, moist and wet rooms and in open air with free movement without tensile stress or forced movements. These robust and abrasion resistant special control cables are installed there, where the problems appear for the application in permanent stresses. These cables are installed everywhere, where high requirements for the flexibility, abrasion, oxygen and chemical resistance are necessary. These screened cables are particularly suitable for the interference-free transmission in instrumentation and control engineering applications. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24614	2 x 0,25	24	5,4	74,0	39,0
24615	3 x 0,25	24	5,6	19,0	45,0
24616	4 x 0,25	24	5,9	22,0	51,0
24617	5 x 0,25	24	6,2	26,0	68,0
24618	7 x 0,25	24	8,7	35,0	83,0
24619	12 x 0,25	24	9,4	58,0	122,0
24620	18 x 0,25	24	11,5	79,0	160,0
24621	25 x 0,25	24	13,0	99,0	210,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
24622	2 x 0,34	22	5,6	18,0	45,0
24623	3 x 0,34	22	5,8	22,0	60,0
24624	4 x 0,34	22	6,1	28,0	76,0
24625	5 x 0,34	22	6,8	31,0	82,0
24626	7 x 0,34	22	9,3	51,0	110,0
24627	12 x 0,34	22	9,9	70,0	166,0
24628	18 x 0,34	22	12,3	103,0	216,0
24629	25 x 0,34	22	13,6	130,0	312,0

Dimensions and specifications may be changed without prior notice. (RN05)

SUPER-PAAR-TRONIC 340-C-PUR cable for drag chains, halogen-free, EMC-preferred type, meter marking

Technical data

- Special drag chain cable, stranded in pairs
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage** 300 V
- **Test voltage**
  core/core 1500 V
  core/screen 1000 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Mutual capacitance**
  core/core approx. 60 nF/km
- **Minimum bending radius**
  for permanent bending at 0,25 mm²
  flexing 7,5x cable Ø
  fixed 4x cable Ø
  at 0,5-1,0 mm²
  flexing 10x cable Ø
  fixed 5x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km
- **Radiation resistance**
  up to 100x10⁶ cJ/kg (up to 100 Mrad)

Cable structure

- Bare copper conductor, extra fine wire to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6 and IEC 60228 cl.6
- Core insulation of PP
- Core identification to DIN 47100
- Cores stranded in pairs, pairs stranded torsion-free in layers with optimal lay-length
- Wrapping over the outer layer
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- Outer sheath of **full polyurethane** compound type TMPU to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2 and acc. to UL-Std.1581 tab.50.227
- Sheath colour grey (RAL 7001)
- with meter marking

Properties

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

Tests

- PUR outer sheath, flame retardant 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)
- Oil resistance acc. to DIN VDE 0473-811-404/ DIN EN 60811-404
- Halogen free
- Weather, ozone and UV-resistant
- Chemical resistance to solvents, acids, alkalis and hydraulic fluids

Advantages

- Very high resistance to mechanical stresses
- Very good alternating bending strength
- High tear, abrasion and impact resistance, even at low temperatures

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Stranded in pairs, these fully-screened special drag chain cables can also be used where external, high-frequency interference influences pulse transfer. They are used for permanently flexible stresses in machine and tool building, in robot technology, on constantly moving machine components and for extended use in multi-shift operations. Developed to state-of-the-art technology, these highly-flexible data cable, with a cut resistant and low-adhesion PUR outer sheath guaranteeing optimal service life and extremely good cost efficiency. This two-approvals single-core cable is preferred for use in export-oriented mechanical engineering, in machine tools, production lines and systems engineering. Guaranteed extended use in multi-shift operations with extremely high bending stresses. For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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.

N

Part no.	No.pairs x no.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49830	1 x 2 x 0,25	24	4,8	14,0	26,0
49831	2 x 2 x 0,25	24	6,7	32,0	61,0
49832	3 x 2 x 0,25	24	7,1	38,4	70,0
49833	4 x 2 x 0,25	24	7,6	43,2	82,0
49834	5 x 2 x 0,25	24	8,3	51,5	99,0
49835	6 x 2 x 0,25	24	9,0	71,8	126,0
49836	8 x 2 x 0,25	24	10,5	74,4	147,0
49837	10 x 2 x 0,25	24	11,9	90,0	179,0
49838	14 x 2 x 0,25	24	12,7	111,2	210,0
49839	1 x 2 x 0,34	22	5,1	20,0	35,0
49840	2 x 2 x 0,34	22	7,2	41,0	80,0
49841	3 x 2 x 0,34	22	7,6	52,2	100,0
49842	4 x 2 x 0,34	22	8,3	59,1	118,0
49843	5 x 2 x 0,34	22	9,0	67,0	134,0
49844	6 x 2 x 0,34	22	9,9	86,4	162,0
49845	8 x 2 x 0,34	22	11,9	107,5	214,0
49846	10 x 2 x 0,34	22	13,9	131,0	270,0
49847	14 x 2 x 0,34	22	14,1	150,0	304,0
49848	1 x 2 x 0,5	20	5,8	22,5	47,0
49849	2 x 2 x 0,5	20	8,4	53,0	100,0
49850	3 x 2 x 0,5	20	9,0	72,8	131,0
49851	4 x 2 x 0,5	20	10,0	75,6	149,0
49852	5 x 2 x 0,5	20	11,0	85,7	169,0

Part no.	No.pairs x no.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
49853	6 x 2 x 0,5	20	11,8	103,0	181,0
49854	8 x 2 x 0,5	20	14,2	148,4	274,0
49855	10 x 2 x 0,5	20	16,5	180,0	332,0
49856	14 x 2 x 0,5	20	16,9	218,3	390,0
49857	1 x 2 x 0,75	19	6,2	35,2	56,0
49858	2 x 2 x 0,75	19	9,2	61,4	102,0
49859	3 x 2 x 0,75	19	9,8	87,1	144,0
49860	4 x 2 x 0,75	19	11,2	95,2	160,0
49861	5 x 2 x 0,75	19	12,2	115,0	193,0
49862	6 x 2 x 0,75	19	13,2	137,1	216,0
49863	8 x 2 x 0,75	19	15,6	184,4	327,0
49864	10 x 2 x 0,75	19	18,4	259,8	451,0
49865	14 x 2 x 0,75	19	18,9	318,4	521,0
49866	1 x 2 x 1	18	6,7	42,0	64,0
49867	2 x 2 x 1	18	10,0	73,0	120,0
49868	3 x 2 x 1	18	10,8	93,6	160,0
49869	4 x 2 x 1	18	11,7	117,8	184,0
49870	5 x 2 x 1	18	13,2	139,0	217,0

Dimensions and specifications may be changed without prior notice. (RN05)

UL/CSA MOTOR, SERVO & FEEDBACK CABLES

CW&A Edition 27 (published 01.04.2015)

TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA Motorsupply

cable 1000 V, for power supply connections to frequency converters, double screened, meter marking.

Technical data

- Special motor power supply cable for frequency converters to Style 2570
- **Temperature range**
  flexing -5°C bis +80°C
  fixed installation -40°C bis +80°C
- **Nominal voltage**
  UL 1000 V
- **Test voltage** 4000 V
- **Insulation resistance**
  min. 200 MOhm x km
- **Coupling resistance**
  acc. to different cross-section
  max. 250 Ohm/km
- **Minimum bending radius**
  fixed installation for outer Ø:
  up to 12 mm: 5x cable Ø
  > 12-20 mm: 7,5x cable Ø
  > 20 mm: 10x cable Ø
  free-movement for outer Ø:
  up to 12 mm: 10x cable Ø
  > 12-20 mm: 15x cable Ø
  > 20 mm: 20x cable Ø
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of polyethylene (PE)
- Core indentification BN, BK, GY
- GN-YE conductor
- Cores stranded in concentric layers
- 1. Screen with special aluminium film
  2. Tinned copper braided screen, approx. 85% coverage
- Outer sheath of special PVC
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Low mutual capacitance
- Meets EMC requirements acc. to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- UV-resistant
- Outdoor application
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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)

Note

- **) The current carrying capacity for permanent operation at ambient temperature of 30°C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA motor connection cable for the frequency converters secures the EMC in systems and buildings, equipment with devices and machineries, which can emit electromagnetic interference fields that can impact the environment in an illegal manner. It is used as a connection and connecting cable under average mechanical stress for fixed installations and sometimes for free movement in dry, moist and wet rooms and outside. It is used in the automotive industry, food processing industry, transfer streets, packaging industry, machine tools, handling equipment, in the industry it is used for pumps, fans, transport belts, etc. Used in explosion proof areas.

EMC = Electromagnetic compatibillity

The screen 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.

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

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Mutual capacitance Core / Core app.nF / km	Core / Screen app.nF / km	Coupling resistance at 1 MHz Ohm/km	at 30 MHz Ohm/km	Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight app. kg / km	AWG-No.
22320	4 G 1,5	10,4					0	95,0	140,0	16
22321	4 G 2,5	12,5	80	130	18	210	26	150,0	300,0	14
22322	4 G 4	14,2	90	150	11	210	34	235,0	485,0	12
22323	4 G 6	15,2	90	150	6	150	44	320,0	630,0	10
22324	4 G 10	19,5	120	200	7	180	61	533,0	860,0	8
22325	4 G 16	22,9	140	230	9	190	82	789,0	1290,0	6
22326	4 G 25	27,1	120	210	4	95	108	1236,0	1860,0	4
22327	4 G 35	29,6	150	260	3	85	135	1662,0	2610,0	2

Continuation ▸

TOPFLEX®-EMV-UV-2YSLCYK-J UL/CSA Motorsupply

cable 1000 V, for power supply connections to frequency converters, double screened, meter marking.

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Mutual capacitance Core / Core app.nF / km	Core / Screen app.nF / km	Coupling resistance at 1 MHz Ohm/km	at 30 MHz Ohm/km	Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight app. kg / km	AWG-No.
22328	4 G 50	35,2	190	320	2	40	168	2345,0	2950,0	1
22329	4 G 70	41,4	190	320	2	45	207	3196,0	3950,0	2/0
22330	4 G 95	46,0	250	410	1	50	250	4316,0	5300,0	3/0
22331	4 G 120	50,8					292	5435,0	6600,0	4/0
22332	4 G 150	58,3					335	6394,0	7040,0	300 kcmil
22333	4 G 185	65,5					382	7639,0	8380,0	350 kcmil

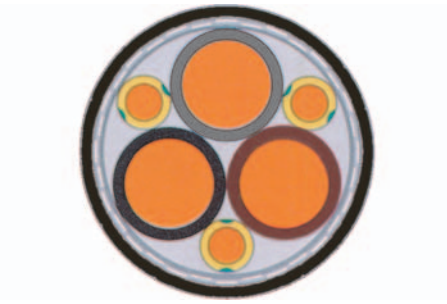
Dimensions and specifications may be changed without prior notice. (RN07)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-MS-EP4

TOPFLEX®-EMV-UV-3 PLUS 2YSLCYK-J UL/CSA

Motor supply cable 1000 V, for power supply connections to frequency converters, double screened, meter marking.



Technical data

- Special motor power supply cable for frequency converters to Style 2570
- **Temperature range**
  flexing -5°C bis +80°C
  fixed installation -40°C bis +80°C
- **Nominal voltage**
  UL 1000 V
- **Test voltage** 4000 V
- **Insulation resistance**
  min. 200 MOhm x km
- **Coupling resistance**
  acc. to different cross-section
  max. 250 Ohm/km
- **Minimum bending radius**
  fixed installation for outer Ø:
  up to 12 mm: 5x cable Ø
  > 12-20 mm: 7,5x cable Ø
  > 20 mm: 10x cable Ø
  free-movement for outer Ø:
  up to 12 mm: 10x cable Ø
  > 12-20 mm: 15x cable Ø
  > 20 mm: 20x cable Ø
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of polyethylene (PE)
- Core identification BK, BN, GY
- GN-YE conductor (divided into 3)
- Cores stranded in concentric layers
- 3+3 core design
- 1. Screen with special aluminium film
  2. Tinned copper braided screen, approx. 85% coverage
- Outer sheath of special PVC
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Low mutual capacitance
- Meets EMC requirements acc. to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The 3 Plus-construction of motor power supply cables features a symmetrical 3-core design, improved in terms of EMC characteristics comparing favorably with a 4-core version. The protective conductor PE, divided into 3 is uniformly stranded in the interstices. This enables an extremely concentric structure
- The minimum cross-section of 0,75^2 meets the requirements of DIN EN 60204 part 1
- uv-resistant
- Outdoor application
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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)

Note

- **) The current carrying capacity for permanent operation at ambient temperature of 30°C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

It is used as a connection and connecting cable under average mechanical stress for fixed installation and sometimes for free movement in dry, moist and wet rooms and outside. It is used in the automotive industry, food processing industry, transfer streets, packaging industry, machine tools, handling equipment, in the industry it is used for pumps, fans, transport belts and in air condition systems, etc. Used in explosion proof areas.

EMC = Electromagnetic compatibillity

The screen 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.

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

Continuation ▸

TOPFLEX®-EMV-UV-3 PLUS 2YSLCYK-J UL/CSA

Motor supply cable 1000 V, for power supply connections to frequency converters, double screened, meter marking.

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Coupling resistance at 1 MHz Ohm/km	at 30 MHz Ohm/km	Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight app. kg / km	AWG-No.
22193	3 x 1,5 + 3 G 0,25	10,0			18	86,0	140,0	16
22194	3 x 2,5 + 3 G 0,5	11,4	18	210	26	144,0	220,0	14
22195	3 x 4 + 3 G 0,75	13,0	11	210	34	224,0	323,0	12
22196	3 x 6 + 3 G 1,0	15,0	6	150	44	298,0	420,0	10
22197	3 x 10 + 3 G 1,5	18,4	7	180	61	491,0	615,0	8
22198	3 x 16 + 3 G 2,5	21,0	9	190	82	723,0	819,0	6
22199	3 x 25 + 3 G 4,0	25,3	4	95	108	1138,0	1325,0	4
22223	3 x 35 + 3 G 6,0	27,8	3	85	135	1535,0	1718,0	2
22224	3 x 50 + 3 G 10,0	32,6	2	40	168	2208,0	2399,0	1
22225	3 x 70 + 3 G 10,0	38,1	2	45	207	2871,0	3056,0	2/0
22226	3 x 95 + 3 G 16,0	41,0	1	50	250	3953,0	4162,0	3/0
22227	3 x 120 + 3 G 16,0	46,4			292	4836,0	5075,0	4/0
22228	3 x 150 + 3 G 25,0	53,5			335	5412,0	6128,0	300 kcmil
22229	3 x 185 + 3 G 35,0	59,5			382	6969,0	7189,0	350 kcmil
22230	3 x 240 + 3 G 42,5	65,1				8540,0	9540,0	500 kcmil

Dimensions and specifications may be changed without prior notice. (RN07)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-MS-EP4

TOPFLEX®-MOTOR-EMV 103 low capacitance power supply cable 1000 V, increased ampacity, meter marking

Technical data

- Special motor power supply cable for frequency converters acc. to UL-AWM style 21179
- **Temperature range** flexing -5°C to +70°C fixed installation -40°C to +80°C
- Permissible **operating temperature** at conductor +90°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL 1000 V
- **Test voltage** 2500 V
- **Insulation resistance** min. 200 MOhm x km
- **Coupling resistance** acc. to different cross-sections max. 250 Ohm/km
- **Mutual capacitance** acc. to different cross-sections core/core 70 to 250 nF/km core/screen 110 to 410 nF/km
- **Minimum bending radius** fixed installation for outer Ø: up to 12 mm: 5x cable Ø > 12-20 mm: 7,5x cable Ø > 20 mm: 10x cable Ø free-movement for outer Ø: up to 12 mm: 10x cable Ø > 12-20 mm: 15x cable Ø > 20 mm: 20x cable Ø
- **Radiation-resistance** up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl.5, BS 6360 cl.5 or IEC 60228 cl.5
- Core insulation of special-polymer
- Core identification to DIN VDE 0293-308 - up to 5 cores coloured - from 7 cores, black with continuous white numbering
- GN-YE conductor
- Cores stranded in concentric layers
- 1. Screen with special aluminium film 2. Tinned copper braided screen, coverage approx. 80%
- Outer sheath of special PVC
- Sheath colour orange (RAL 2003)
- with meter marking

Properties

Tests

- PVC self-extinguishing and flame retardant 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)
- Features Special-Polymer-insulation secures a lower dielectric loss, double potential strength, high longevity and low screen-interference currents to include increased current carrying capacity
- Meets EMC requirements according to EN 55011 and DIN VDE 0875 part 11
- Low coupling resistance for high electromagnetic compatibility
- This screened motor supply cable with low mutual capacitance of the single cores because of the special Polymer core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- Design acc. to the requirements of VdS 3501:2006-04
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This UL/CSA motor power supply cable for the frequency converters assures electromagnetic compatibillity in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments. Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications. Installation in hazardous areas.

EMC = Electromagnetic compatibillity

The screen 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.

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

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
22689	3 G 1,5	9,4	72,0	200,0	16
22690	4 G 1,5	10,4	95,0	230,0	16
22691	5 G 1,5	11,2	117,0	258,0	16
22692	7 G 1,5	13,2	148,0	281,0	16
22693	3 G 2,5	11,2	137,0	270,0	14
22694	4 G 2,5	12,5	150,0	300,0	14
22695	5 G 2,5	13,5	200,0	352,0	14
22696	7 G 2,5	16,0	230,0	473,0	14
22697	4 G 4	14,2	235,0	485,0	12

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
22698	5 G 4	15,4	321,0	567,0	12
22699	7 G 4	18,2	352,0	603,0	12
22700	4 G 6	15,2	320,0	633,0	10
22701	5 G 6	16,8	439,0	679,0	10
22702	7 G 6	20,0	501,0	771,0	10
22703	4 G 10	19,5	533,0	860,0	8
22704	5 G 10	21,6	711,0	1029,0	8
22705	4 G 16	23,1	789,0	1290,0	6
22706	4 G 25	27,1	1236,0	1862,0	4

Dimensions and specifications may be changed without prior notice. (RN07)

TOPFLEX® 600 VFD EMC-preferred type, flexible motor power supply cable, oil-resistant, NFPA 79 Edition 2012

Technical data

- PVC motor supply cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range** -25°C to +90°C
- **Nominal voltage** TC 600 V WTTC 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius** flexing 6x cable Ø
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire with AWG dimensions
- Core insualtion of special PVC with transparent nylon skin
- Black cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded in layers with optimal lay-length
- Fleece
- 1. Screening with special aluminium foil 2. Screening with braid of tinned copper wires, optimal coverage approx. 85%
- Separator
- Outer sheath of special PVC
- Sheath colour black (RAL 9005) or orange (RAL 2003)
- with length marking in feet

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- **UL:** TC-ER, WTTC 1000 V, MTW, NFPA 79 2012, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90°C dry / 75°C wet, Cold Bend Test -40°C Class 1 Div. 2 per NEC Art. 336, 392, 501
  CSA: c (UL) CIC-TC FT4 AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Flexible, extremly oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 edition 2012 for open, unprotected installation on cable trays and from cable trays to the machine. The special PVC sheath is extremly resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.

EMC = Electromagnetic compatibillity

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.

Sheath colour black

Part no.	No.cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63139	4 x 18	0,963	9,9	52,0	164,0
63140	4 x 16	1,31	11,4	72,0	183,0
63137	4 x 14	2,08	12,5	118,0	197,0
63141	4 x 12	3,31	14,0	182,0	267,0
63142	4 x 10	5,26	17,1	256,0	402,0
63143	4 x 8	8,37	22,3	417,0	668,0
63144	4 x 6	13,31	25,4	651,0	918,0
63145	4 x 4	21,21	30,1	910,0	1363,0
63146	4 x 2	33,6	35,3	1411,0	1994,0

Sheath colour orange

Part no.	No.cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63147	4 x 18	0,963	9,9	52,0	164,0
63148	4 x 16	1,31	11,4	72,0	183,0
63149	4 x 14	2,08	12,5	118,0	197,0
63150	4 x 12	3,31	14,0	182,0	267,0
63151	4 x 10	5,26	17,1	182,0	267,0
63152	4 x 8	8,37	22,3	417,0	668,0
63153	4 x 6	13,31	25,4	651,0	918,0
63154	4 x 4	21,21	30,1	910,0	1363,0
63155	4 x 2	33,6	35,3	1411,0	1994,0

Dimensions and specifications may be changed without prior notice. (RN07)

Suitable accessories can be found in Chapter X.

• Cable Gland - HELUTOP® HT-MS-EP4

TOPFLEX® 650 VFD EMC-preferred type, flexible motor power supply cable with control cores, oil-resistant, NFPA 79 Edition 2012

Technical data

- TPE motor supply cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range**
  flexing -25°C to +105°C
- **Nominal voltage**
  TC 600 V
  WTTC 1000 V
- **Test voltage**
  power supply cores 4000 V
  control cores 2000 V
- **Minimum bending radius**
  flexing 6x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Tinned copper conductor, fine wire with AWG measures
- Core insualtion of special PVC with transparent nylon skin
- Black supply cores with continuous white numbering
- 2 black control cores withnumber 5+6
- GN-YE conductor in the outer layer
- Control cores screened in pairs with plastic-coated aluminium foil, tinned drain wire
- Control cores stranded in pairs and laid up in layers with optimal lay-length with the power supply cores
- 1. Screening with plastic-coated aluminium foil
  2. Screening from tinned Cu-braid, optimal coverage approx. 85%
- Separator
- Outer sheath of special TPE
- Sheath colour black (RAL 9005) or orange (RAL 2003)
- with length marking in feet

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- **UL:**
  TC-ER, WTTC 1000 V, MTW, NFPA 79 2012, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90°C dry / 75°C wet, Cold Bend Test -40°C Class 1 Div. 2 per NEC Art. 336, 392, 501
  CSA:
  c (UL) CIC-TC FT4
  AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Flexible, extremly oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 edition 2012 for open, unprotected installation on cable trays and from cable trays to the machine. The special TPE sheath is extremly resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.
EMC = Electromagnetic compatibillity
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.

N

Sheath colour black

Part no.	No. cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63156	4x AWG 16 +2x AWG 18	1,31/ 0,963	13,0	88,0	259,0
63157	4x AWG 14 +2x AWG 18	2,08/ 0,963	14,0	133,0	370,0
63138	4x AWG 14 +2x AWG 14	2,08/ 2,08	14,0	159,0	399,0
63158	4x AWG 12 +2x AWG 18	3,31/ 0,963	15,3	197,0	435,0
63159	4x AWG 12 +2x AWG 14	3,31/ 2,08	15,7	224,0	466,0
63160	4x AWG 10 +2x AWG 14	5,26/ 2,08	18,2	301,0	703,0
63161	4x AWG 8 +2x AWG 14	8,37/ 2,08	24,1	457,0	901,0
63162	4x AWG 6 +2x AWG 14	13,31/ 2,08	27,4	615,0	1275,0
63163	4x AWG 4 +2x AWG 14	21,21/ 2,08	33,4	1450,0	1861,0

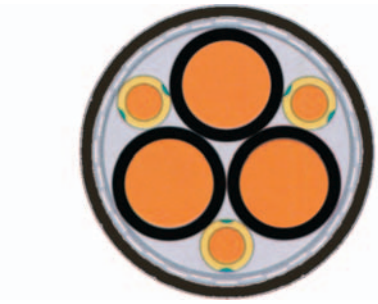
Sheath colour orange

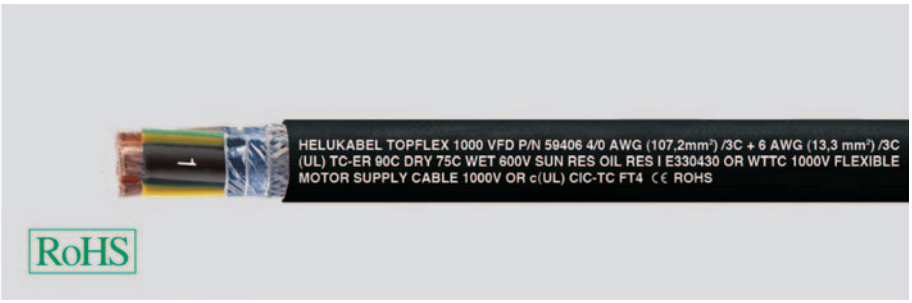
Part no.	No. cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62876	4x AWG 16 +2x AWG 18	1,31/ 0,963	13,0	88,0	259,0
62877	4x AWG 14 +2x AWG 18	2,08/ 0,963	14,0	133,0	370,0
62878	4x AWG 14 +2x AWG 14	2,08/ 2,08	14,0	159,0	399,0
62879	4x AWG 12 +2x AWG 18	3,31/ 0,963	15,3	197,0	435,0
62880	4x AWG 12 +2x AWG 14	3,31/ 2,08	15,7	224,0	466,0
62881	4x AWG 10 +2x AWG 14	5,26/ 2,08	18,2	301,0	703,0
62882	4x AWG 8 +2x AWG 14	8,37/ 2,08	24,1	457,0	901,0
62883	4x AWG 6 +2x AWG 14	13,31/ 2,08	27,4	615,0	1275,0
62884	4x AWG 4 +2x AWG 14	21,21/ 2,08	33,4	1450,0	1861,0

Dimensions and specifications may be changed without prior notice. (RN07)

TOPFLEX® 1000 VFD EMC-preferred type, flexible motor power supply cable with control cores, oil-resistant, NFPA79 Edition 2012

NEW





Technical data

- Motor power supply cable for VFDs acc. to UL-Std. 83, 1277 and 2277
- **Temperature range** flexing -25°C to +90°C
- **Nominal voltage** UL 1277 - TC 600 V UL 2277 - WTTC 1000 V
- **Test voltage** 2500 V
- **Minimum bending radius** flexing 15x cable Ø fixed installation 7,5x cable Ø
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Bare copper-conductor, fine-wire with AWG dimensions
- Core insualtion of special PVC with clear nylon coating
- Core identification black cores with continuous white numbering
- GN-YE conductor (divided into 3)
- Cores stranded in concentric layers
- 3 power + 3 ground conductor design
- 1. Screen with special aluminium film 2. Tinned copper braided screen, coverage approx. 80%
- Outer sheath of special TPE
- Sheath colour black (RAL 9005)
- with length marking in feet

Properties

- Resistant to oil and sunlight
- Due the optimal screening an interference-free operation of frequency container is obtained
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- Behavior in fire acc. to CIC FT4
- **UL** UL Type TC-ER, UL 83, 1277, 2277, WTTC, Oil Res I, NFPA 2012
- **CSA** c(UL) Type CIC FT4, CSA C22.2 No. 230, CSA C22.2 No. 239

Note

- VFD = Variable Frequency Drive

Application

It is used as a power supply cable under average mechanical stress for fixed installation and sometimes for free movement in dry, moist wet rooms and outside. It is used 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. Used in explosion proof areas.

EMC = Electromagnetic compatibillity

The screen 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.

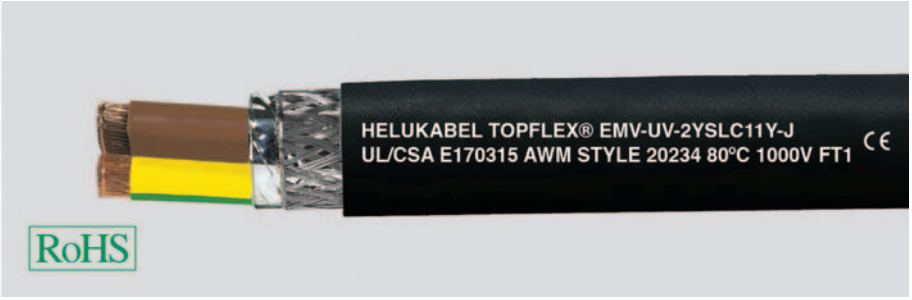
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No. power cores x AWG-No.	No. ground cores x AWG-No.	No. cores x cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59398	3x AWG 8 +	3x AWG 16	(3x 8,37 + 3x 1,31)	17,1	372,0	573,0
59399	3x AWG 6 +	3x AWG 14	(3x 13,3 + 3x 2,08)	19,3	554,0	735,0
59400	3x AWG 4 +	3x AWG 12	(3x 21,2 + 3x 3,3)	24,5	831,0	1225,0
59401	3x AWG 2 +	3x AWG 10	(3x 33,6 + 3x 5,26)	27,8	1258,0	1737,0
59402	3x AWG 1 +	3x AWG 8	(3x 42,4 + 3x 8,37)	31,1	1615,0	2225,0
59403	3x AWG 1/0 +	3x AWG 8	(3x 53,4 + 3x 8,37)	33,1	1938,0	2604,0
59404	3x AWG 2/0 +	3x AWG 8	(3x 67,5 + 3x 8,37)	35,8	2344,0	3089,0
59405	3x AWG 3/0 +	3x AWG 6	(3x 85 + 3x 13,3)	38,6	2994,0	3823,0
59406	3x AWG 4/0 +	3x AWG 6	(3x 107,2 + 3x 13,3)	44,5	3590,0	4700,0
59407	3x AWG 250 kcmil +	3x AWG 6	(3x 127 + 3x 13,3)	48,4	4177,0	5487,0
59408	3x AWG 300 kcmil +	3x AWG 4	(3x 152 + 3x 21,2)	50,9	5104,0	6530,0
59409	3x AWG 350 kcmil +	3x AWG 2	(3x 178 + 3x 33,6)	54,0	6218,0	7768,0
59410	3x AWG 400 kcmil +	3x AWG 2	(3x 203 + 3x 33,6)	55,5	6875,0	8492,0
59411	3x AWG 500 kcmil +	3x AWG 2	(3x 254 + 3x 33,6)	60,5	8303,0	10130,0

Dimensions and specifications may be changed without prior notice. (RN07)

TOPFLEX®-EMV-UV 2YSLC11Y-J UL/CSA Motor

supply cable 1000 V, for power supply connections to frequency converters, double screened, meter marking.



Technical data

- Special PUR motor power supply cable for frequency converters to UL AWM style 20234 and CSA AWM adapted to DIN VDE 0250
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  UL 1000 V
- **Test voltage** 4000 V
- **Insulation resistance**
  min. 200 MOhm x km
- **Minimum bending radius**
  fixed installation for outer Ø:
  up to 12 mm: 5x cable Ø
  > 12-20 mm: 7,5x cable Ø
  > 20 mm: 10x cable Ø
  free-movement for outer Ø:
  up to 12 mm: 10x cable Ø
  > 12-20 mm: 15x cable Ø
  > 20 mm: 20x cable Ø
- **Coupling resistance**
  acc. to different cross-section
  max. 250 Ohm/km
- **Radiation-resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductor to DIN VDE 0295 cl.5, BS 6360 cl.5 or IEC 60228 cl.5
- Core insulation of polyethylen (PE)
- Core indentification BK, BN, GY
- GN-YE conductor
- Cores stranded in concentric layers
- 1. Screen with special aluminium film
  2. Tinned copper braided screen, approx. 85% coverage
- Outer sheath of PUR
- Sheath colour black (RAL 9005)
- with meter marking

Note

- **) The current carrying capacity for permanent operation at ambient temperature of 30°C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Properties

- Meets EMC requirements acc. to EN 55011 and DIN VDE 0875 part 11
- PUR outer sheath: low adhesion, flame retardant, extremely abradion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- Low mutual capacitance
- Low coupling resistance for high electromagnetic compatibility
- UV-resitant
- Outdoor application
- This screened motor supply cable with low mutual capacitance of the single cores because of the special PE core insulation and low screen capacitance enable a low-loss transmission of the power compared to PVC-sheathed connecting cables
- Due to the optimal screening an interference-free operation of frequency converters is obtained
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PUR outer sheath self-extinguishing and flame retardant to DIN VDE 0482-332-1-2, DIN EN 60332-1-2/IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

N

Application

This TOPFLEX®-EMV-UV-2YSLC11Y-J UL/CSA motor power supply cable with PUR outher sheath for the frequency converters assures electromagnetic compatibillity in plants and buildings, facilities with units and operating equipment where the fields of electromagnetic interference might cause adverse effects on the surroundings. As a supply and connecting cable for medium mechanical stresses in fixed installations and forced movements in dry, moist and wet environments and for outdoor applications. Used in the automotive and food industries, environmental technology, packaging industry, machine tools. Handling equipment, for SIMOVERT drives, they are particularly suitable for use with industrial pumps, ventilators, conveyor belts and air-conditioning installations and similar applications. Installation in hazardous areas.

EMC = Electromagnetic compatibillity

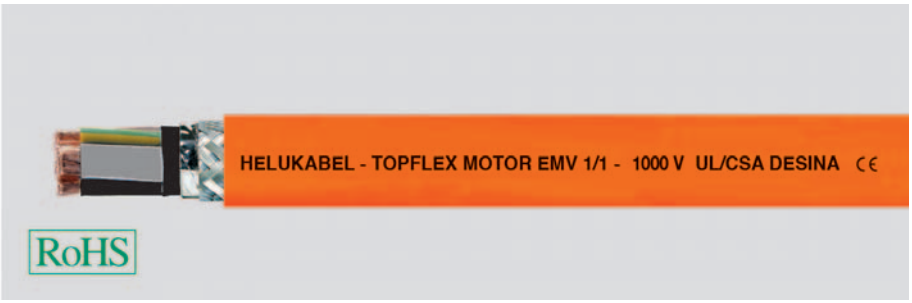
The screen must be connected at both ends and ensure large-area contact over the entire cable circumference for compliance with the functional interference requirements of EN 55011.

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

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Mutual capacitance Core / Core app.nF / km	Core / Screen app.nF / km	Coupling resistance at 1 MHz Ohm/km	at 30 MHz Ohm/km	Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight app. kg / km	AWG-No.
22389	4 G 1,5	10,3					18	95,0	230,0	16
22390	4 G 2,5	12,3	80	130	18	210	26	150,0	300,0	14
22391	4 G 4	13,9	90	150	11	210	34	235,0	485,0	12
22392	4 G 6	15,3	90	150	6	150	44	320,0	630,0	10
22393	4 G 10	19,5	120	200	7	180	61	533,0	860,0	8
22394	4 G 16	23,3	140	230	9	190	82	789,0	1290,0	6
22395	4 G 25	27,4	120	211	4	95	108	1180,0	1800,0	4
22396	4 G 35	30,3	150	260	3	85	135	1662,0	2610,0	2
22397	4 G 50	35,5	190	320	2	40	168	2345,0	2950,0	1
22398	4 G 70	40,2	190	320	2	45	207	3196,0	3950,0	2/0
22399	4 G 95	44,5	250	410	1	50	250	4316,0	5300,0	3/0
22566	4 G 120	50,3					292	5435,0	6600,0	4/0
22567	4 G 150	56,1					335	6394,0	7040,0	300 kcmil
22568	4 G 185	58,0					382	7639,0	8380,0	350 kcmil

Dimensions and specifications may be changed without prior notice. (RN07)

TOPFLEX® MOTOR EMV 1/1 triple-screened, low capacitance, 80°C, 1000 V, high flexible motor supply cable, meter marking



Technical data

- Special PUR motor power supply cable for frequency converter to UL AWM Style 20234 and CSA AWM adapted to DIN VDE 0250
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- Permissible **operating temperature** at conductor +90°C
- **Nominal voltage**
  VDE U_0/U 600/1000 V
  UL 1000 V
- **Test voltage** 3000 V
- **Mutual capacitance** at 4 kHz
  acc. to different cross-section
  core/core 70-250 nF/km
  core/screen 110-410 nF/km
- **Insulation resistance**
  min. 200 MOhm x km
- **Minimum bending radius**
  fixed installation, for outside Ø:
  up to 12 mm: 5x cable Ø
  > 12-20 mm: 7,5x cable Ø
  > 20 mm: 10x cable Ø
  free-movement, for outside Ø:
  up to 12 mm: 10x cable Ø
  > 12-20 mm: 15x cable Ø
  > 20 mm: 20x cable Ø
- **Coupling resistance**
  acc. to different cross-section
  max. 250 Ohm/km
- **Radiation resistance**
  up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, IEC 60228 cl.5
- Core insulation of special polyethylene (PE)
- Core identification BK, BN, GY
- GN-YE conductor
- Cores stranded in layers
- 1. Screen of semi-conductive fleece
  2. Aluminium-coated polyester film
  3. Tinned copper braided screen, coverage approx. 85%
- Outer sheath of PUR
- Sheath colour orange (RAL 2003) acc. to DESINA®
- with meter marking

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- This screened motor power supply cable, with low mutual capacitance because of the special PE core insulation, enable low-loss transmission of power compared to PVC-sheathed power supply cables
- The optimal triple screening enables interference-free operation of frequency converters
- Optimum compliance with requirements for electromagnetic compatibility (EMC) due to the triple screening
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PUR outer sheath self-extinguishing and flame retardant to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- **) The current carrying capacity for permanent operation at ambient temperature of 30°C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This TOPFLEX® MOTOR EMV 1/1 two-approvals, triple-screened motor power supply cable for frequency converters provides outstanding EMC in machines and systems. Suitable as a supply and connecting cable for high mechanical stresses, in fixed installations and occasional free movements in dry, moist and wet environments, as well as outdoors. Areas of application include machine tools, processing and manufacturing machinery, machining centres, industrial robots, transfer lines, handling equipment, etc.

EMC = Electromagnetic compatibillity

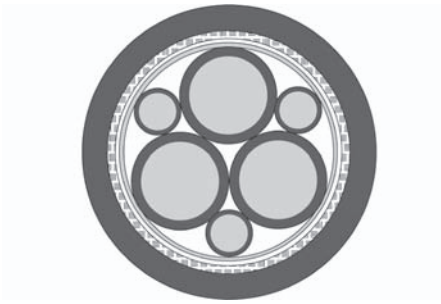
To optimize the EMC features we recommend a large round contact of the copper braiding on both ends.

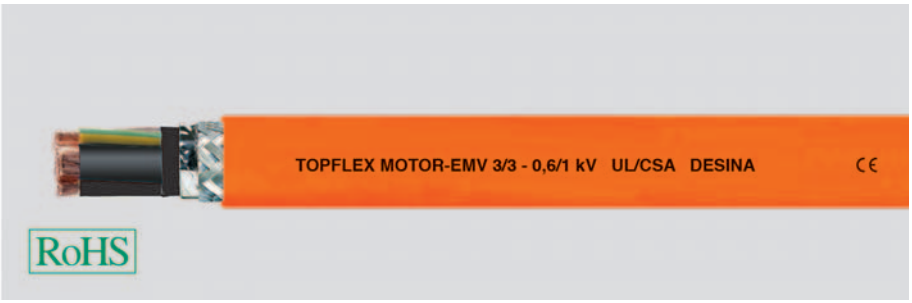
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Mutual capacitance Core / Core app.nF / km	Core / Screen app.nF / km	Coupling resistance at 1 MHz Ohm/km	at 30 MHz Ohm/km	Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight app. kg / km	AWG-No.
78377	4 G 1,5	11,5	70	110			18	95,0	230,0	16
78378	4 G 2,5	13,5	80	130	18	210	26	150,0	300,0	14
78379	4 G 4	15,8	90	150	11	210	34	235,0	485,0	12
78380	4 G 6	17,8	90	150	6	150	44	320,0	630,0	10
708609	4 G 10	21,6	120	200	7	180	61	533,0	860,0	8
708610	4 G 16	25,4	120	210	9	190	82	789,0	1290,0	6
708611	4 G 25	31,0	140	230	4	95	108	1180,0	1800,0	4
708612	4 G 35	33,0	150	260	3	85	135	1662,0	2610,0	2
78384	4 G 50	39,0	190	320	2	40	168	2345,0	2950,0	1
78385	4 G 70	45,0	190	320	2	45	207	3196,0	3950,0	2/0
78386	4 G 95	50,1	250	410	1	50	250	4316,0	5300,0	3/0
78387	4 G 120	54,2					292	5435,0	6600,0	4/0
78388	4 G 150	61,3					335	6394,0	7040,0	300 kcmil
78479	4 G 185	64,2					382	7639,0	8380,0	350 kcmil

Dimensions and specifications may be changed without prior notice.

TOPFLEX®-MOTOR-EMV 3/3 triple-screened, low capacitance, 80°C, 1000 V, PUR flexible motor supply cable, meter marking





Technical data

- Special PUR motor power supply cable for frequency converter to UL AWM Style 20234 and CSA AWM adapted to DIN VDE 0250
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- Permissible **operating temperature** at conductor +90°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL 1000 V
- **Test voltage** 3000 V
- **Mutual capacitance** at 4 kHz acc. to different cross-section core/core 70-250 nF/km core/screen 110-410 nF/km
- **Insulation resistance** min. 200 MOhm x km
- **Minimum bending radius** fixed installation for outside Ø: up to 12 mm: 5x cable Ø > 12-20 mm: 7,5x cable Ø > 20 mm: 10x cable Ø free-movement for outside Ø: up to 12 mm: 10x cable Ø > 12-20 mm: 15x cable Ø > 20 mm: 20x cable Ø
- **Coupling resistance** acc. to different cross-section max. 250 Ohm/km
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.5, fine-wire, BS 6360 cl.5, IEC 60228 cl.5
- Core insulation of special polyethylene (PE)
- Core identification black cores with imprint U1, V1, W3
- GN-YE conductor (divided into 3)
- Cores stranded in layers
- 1. Screen of semi-conductive fleece 2. Aluminium-coated polyester film 3. Tinned copper braided screen, coverage approx. 80%
- Outer sheath of PUR
- Sheath colour orange (RAL 2003) acc. to DESINA®
- with meter marking

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- This screened motor power supply cable, with low mutual capacitance because of the special PE core insulation, enables low-loss transmission of power compared to PVC-sheathed power supply cables
- The optimal triple screening enables interference-free operation of frequency converters
- Optimum compliance with requirements for electromagnetic compatibility (EMC) due to the triple screening
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Special features

Here the earth core cross-section is divided into thirds, which lie in the interstices between the power supply cores. Due to this symmetrical construction, the PE insulation and the triple screening, very low capacitance and inductance are achieved. EMC compatibility is considerably enhanced.

Tests

- PUR outer sheath self-extinguishing and flame retardant to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- All cables are also available in JB with coloured cores acc. to DIN VDE 0295
- **) The current carrying capacity for permanent operation at ambient temperature of 30°C. For deviating ambient temperatures the conversion factors should be used and for further see the indication in DIN VDE 0298 part 4.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

This TOPFLEX® MOTOR EMV 3/3 two-approvals, triple-screened motor power supply cable for frequency converters provides outstanding EMC in machines and systems. Suitable as a supply and connecting cable for high mechanical stresses, in fixed installations and occasional free movements in dry, moist and wet environments, as well as outdoors. Areas of application include machine tools, processing and manufacturing machinery, machining centres, industrial robots, transfer lines, handling equipment, etc. By dividing the earth core into thirds and dividing it evenly in the interstices between the power supply cores, a symmetrical structure has been achieved. This results in improved EMC, capacitance and inductance compared to the 4-core version.

EMC = Electromagnetic compatibillity

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.

Continuation ▸

TOPFLEX®-MOTOR-EMV 3/3 triple-screened, low capacitance, 80°C, 1000 V, PUR flexible motor supply cable, meter marking

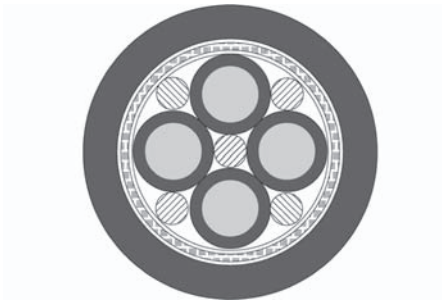
Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Coupling resistance at 1 MHz Ohm/km	Coupling resistance at 30 MHz Ohm/km	Power ratings **) with 3 loaded cores in Amperes	Cop. weight kg / km	Weight app. kg / km	AWG-No.
78614	3 x 1,5 + 3 G 0,25	10,4			18	86,0	150,0	16
78615	3 x 2,5 + 3 G 0,5	12,1	18	210	26	144,0	240,0	14
78616	3 x 4 + 3 G 0,75	13,9	11	210	34	224,0	345,0	12
78617	3 x 6 + 3 G 1,0	15,5	6	150	44	298,0	460,0	10
78618	3 x 10 + 3 G 1,5	19,5	7	180	61	491,0	840,0	8
78619	3 x 16 + 3 G 2,5	22,5	9	190	82	723,0	930,0	6
78620	3 x 25 + 3 G 4,0	28,6	4	95	108	1138,0	1425,0	4
78621	3 x 35 + 3 G 6,0	29,6	3	85	135	1535,0	1900,0	2
708613	3 x 50 + 3 G 10,0	35,7	2	40	168	2208,0	2812,0	1
708371	3 x 70 + 3 G 10,0	43,0	2	45	207	2871,0	3370,0	2/0
708372	3 x 95 + 3 G 16,0	47,0	1	50	250	3953,0	4320,0	3/0
708373	3 x 120 + 3 G 25,0	52,0			292	4836,0	6160,0	4/0
78626	3 x 150 + 3 G 25,0	58,0			335	5412,0	7200,0	300 kcmil

Dimensions and specifications may be changed without prior notice.

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUTOP® HT-MS-EP4

TOPSERV® PVC Motor and servo cables for fixed or not constantly movements 0,6/1 kV, according to Siemens 6FX5008, Lenze, Bosch Rexroth



Technical data

- Special PVC Motorcable acc. to UL AWM Style 2570 CSA AWM VDE-recognized
- **Temperature range**
  flexing -0°C to +60°C
  fixed installation -20°C to +80°C
- **Nominal voltage**
  VDE U_0/U 600/1000 V
  UL/CSA 1000 V
- **A.c. test voltage**, 50 Hz
  4000 V
- **Minimum bending radius**
  flexing 15x cable Ø
  fixed installation 5x cable Ø
  min. 100.000 cycles

Cable structure

- Bare copper-conductor, acc. to DIN EN 60228
  class 5: fine-wire
  class 6: extra fine-wire
- Core insulation
  to 6 mm² of halogen-free PP
  from 10 mm² of PVC
- Core identification
  power supply cores
  core 1: black with imprint U/L1/C/L+
  core 2: black with imprint V/L2
  core 3: black with imprint W/L3/D/L-
  control cores
  TOPSERV® 108 PVC without control cores
  TOPSERV® 112 PVC with **1** control cores
  acc. to Siemens
  core 1: black with imprint BR1
  core 2: white with imprint BR2
  acc. to Lenze
  core 1: brown with imprint BR1
  core 2: white with imprint BR2
  TOPSERV®119 PVC with **2** control cores
  pair 1: black with number no. 5+6
  pair 2: black with number no. 7+8
- GN-YE conductor
- Screening of the control cores in pairs wrapped with tinned copper braid
- Power supply cores laid up with optimal lay length and stabilising filler
- Fleece wrapping facilitates sliding
- Overall screening from tinned copper braid, optimal coverage approx. 85%
- Outer sheath of PVC
- Sheath colour orange (RAL 2003)

Properties

- low capacitance until 6mm² (included)
- oilresistant PVC outer sheath
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC sheath flame retardant acc. to DIN EN 60332-1-1 to -1-3 (VDE 0482-332-1-1 to -1-3)

Note

- For a corresponding encoder cables please check chapter **TOPGEBER 511 PVC**
- For highly flexible, drag chain capable servo cables please check chapter **TOPSERV® PUR**
- Brackets ( ) indicate screen
- DESINA® explanation see introduction
- SIEMENS product designations 6FX 5008-plus are registered trademarks of Siemens AG and are to be used only for purposes of comparison
- Lenze product designations are registered trademarks of Lenze AG and are to be used only for purposes of comparison
- Bosch Rexroth product designations INK are registered trademarks of Bosch Rexroth AG and are to be used only for purposes of comparison

Application

The combination of supply cores with the control cores for the braking function and the thermal protection in these cables is ideal. Precision servomotors, as used today in many areas of highly-automated manufacturing processes, call for high-quality, reliable and long-lasting cables. These requirements are met to a high degree by these cables. The cables have an additional overall screen to ensure EMC compatibility, i.e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards.
Applications include machine, plant and robot construction, automation, drive, control and production engineering.
Attractive for export-oriented mechanical and system engineering.
EMC = Electromagnetic compatibillity
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.

Continuation ▸

TOPSERV® PVC Motor and servo cables for fixed or not constantly movements 0,6/1 kV, according to Siemens 6FX5008, Lenze, Bosch Rexroth

TOPSERV® 108 PVC, acc.to Siemens 6FX5008

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
707250	(4 G 1,5)	Siemens	6FX5008-1BB11	Orange RAL 2003	8,0	78,0	118,0	16
707251	(4 G 2,5)	Siemens	6FX5008-1BB21	Orange RAL 2003	9,6	130,0	180,0	14
707252	(4 G 4)	Siemens	6FX5008-1BB31	Orange RAL 2003	11,0	198,0	264,0	12
707253	(4 G 6)	Siemens	6FX5008-1BB41	Orange RAL 2003	13,1	288,0	382,0	10
707254	(4 G 10)	Siemens	6FX5008-1BB51	Orange RAL 2003	19,3	463,0	764,0	8
707255	(4 G 16)	Siemens	6FX5008-1BB61	Orange RAL 2003	23,3	701,0	1218,0	6
707256	(4 G 25)	Siemens	6FX5008-1BB25	Orange RAL 2003	26,9	1068,0	1670,0	4
707257	(4 G 35)	Siemens	6FX5008-1BB35	Orange RAL 2003	30,3	1449,0	2139,0	2
707258	(4 G 50)	Siemens	6FX5008-1BB50	Orange RAL 2003	34,5	2096,0	2991,0	1

TOPSERV® 112 PVC, acc.to Siemens 6FX5008

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
707280	(4 G 1,5 + (2 x 1,5))	Siemens	6FX5008-1BA11	Orange RAL 2003	10,4	140,0	206,0	16
707281	(4 G 2,5 + (2 x 1,5))	Siemens	6FX5008-1BA21	Orange RAL 2003	12,0	185,0	269,0	14
707282	(4 G 4 + (2 x 1,5))	Siemens	6FX5008-1BA31	Orange RAL 2003	13,6	257,0	377,0	12
707283	(4 G 6 + (2 x 1,5))	Siemens	6FX5008-1BA41	Orange RAL 2003	15,6	348,0	485,0	10
707284	(4 G 10 + (2 x 1,5))	Siemens	6FX5008-1BA51	Orange RAL 2003	21,0	502,0	887,0	8
707285	(4 G 16 + (2 x 1,5))	Siemens	6FX5008-1BA61	Orange RAL 2003	24,1	741,0	1276,0	6
707286	(4 G 25 + (2 x 1,5))	Siemens	6FX5008-1BA25	Orange RAL 2003	28,3	1100,0	1716,0	4
707287	(4 G 35 + (2 x 1,5))	Siemens	6FX5008-1BA35	Orange RAL 2003	31,4	1498,0	2290,0	2
707288	(4 G 50 + (2 x 1,5))	Siemens	6FX5008-1BA50	Orange RAL 2003	34,5	2500,0	2934,0	1

TOPSERV® 112 PVC, acc.to Lenze

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
707221	(4 G 1 + (2 x 0,5))	Lenze	-	Orange RAL 2003	9,5	88,0	143,0	17
707222	(4 G 1,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	11,0	106,0	187,0	16
707223	(4 G 2,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	12,3	152,0	233,0	14
707224	(4 G 4 + (2 x 1,0))	Lenze	-	Orange RAL 2003	14,6	229,0	382,0	12
707225	(4 G 6 + (2 x 1,0))	Lenze	-	Orange RAL 2003	16,7	312,0	491,0	10
710054	(4 G 10 + (2 x 1,0))	Lenze	-	Orange RAL 2003	19,8	484,0	731,0	8
710055	(4 G 16 + (2 x 1,0))	Lenze	-	Orange RAL 2003	23,3	729,0	1033,0	6

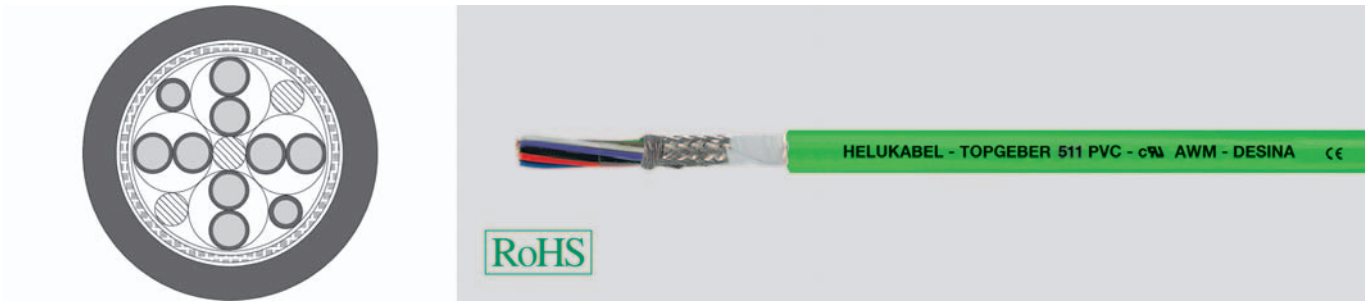
TOPSERV® 119 PVC, acc.to Bosch Rexroth

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
707290	(4 G 1 + 2 x (2 x 0,75))	Bosch Rexroth	INK-0653	Orange RAL 2003	11,2	130,0	208,0	-
707291	(4 G 1,5 + 2 x (2 x 0,75))	Bosch Rexroth	INK-0650	Orange RAL 2003	11,5	155,0	229,0	-
707292	(4 G 2,5 + 2 x (2 x 1,0))	Bosch Rexroth	INK-0602	Orange RAL 2003	13,5	216,0	321,0	-
707293	(4 G 4 + (2 x 1,0) + (2 x 1,5))	Bosch Rexroth	INK-0603	Orange RAL 2003	15,5	297,0	432,0	-
707294	(4 G 6 + (2 x 1,0) + (2 x 1,5))	Bosch Rexroth	INK-0604	Orange RAL 2003	17,3	374,0	587,0	-
707295	(4 G 10 + (2 x 1,0) + (2 x 1,5))	Bosch Rexroth	INK-0605	Orange RAL 2003	21,2	545,0	910,0	-
707296	(4 G 16 + 2 x (2 x 1,5))	Bosch Rexroth	INK-0606	Orange RAL 2003	25,0	804,0	1334,0	-

Dimensions and specifications may be changed without prior notice. (RN07)

Suitable HELUTEC® Signal and power connectors can be found in our Cable Accessories catalogue.

TOPGEBER 511 PVC Feedback cables according to Siemens-, Lenze- or Bosch Rexroth Standard with PVC-sheath for fixed or not constantly movements



Technical data

- Special PVC feedback cable acc. to UL AWM style 20233 and CSA
- **Temperature range**
  flexing -0°C to +60°C
  fixed installation -20°C to +80°C
- **Nominal voltage**
  acc. to Siemens 30 V
  acc. to Bosch Rexroth and Lenze 300 V
- **A.c. test voltage**, 50 Hz
  core/core 1500 V
  core/screen 1000 V
- **Minimum bending radius**
  flexing 15x cable Ø
  fixed installation 6x cable Ø
  min. 100.000 cycles

Cable structure

- Copper-conductor bare or tinned to DIN VDE 0295 cl.6, extra fine-wire, IEC 60228 cl.6
- Core insulation of special polypropylene
- Core colours on request
- Overall screening of tinned copper wire braid with tinned drain wire, coverage approx. 85%
- Polyester foil
- Outer sheath of PVC
- Sheath colour green (RAL 6018) acc. to DESINA® or orange

Properties

- Outer sheath of PVC, oilresistant
- Optimum compliance with requirements for elect romagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA®-standard
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC sheath flame retardant acc. to DIN EN 60332-1-1 bis -1-3 (VDE 0482-332-1-1 bis -1-3)

Note

- For a corresponding motor- and servocables please check chapter **TOPSERV® PVC**
- For drag chain capable encoder cables please check chapter **TOPGEBER 512 PUR**
- Brackets ( ) indicate screen.
- SIEMENS product designations 6FX 5008-... are registered trademarks of Siemens AG and are to be used only for purposes of comparison.
- INDRAMAT product designations INK- are registered trademarks of Bosch-Rexroth AG and are to be used only for purposes of comparison.
- LENZE product designations are registered trademarks of LENZE AG, and are to be used only for purposes of comparison.
- DESINA®: Explanation: see introduction.

Application

Low cost alternativ to Motorcables with PUR Sheath for fix instalation or occasional moving applications. These low-capacitance incremental encoder cables or position feedback cables transmit the control pulses for positioning and operating characteristics of servomotors. These cables are used as connecting cables for tachos, brakes and pulse generators in industrial equipment, machine tools, control and automation equipment.

EMC = Electromagnetic compatibillity

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. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
707417	(4 x 2 x 0,34 + 4 x 0,5)	Siemens	6FX 5008-1BD21	Green	8,9	70,3	117,8	-
707389	(3 x (2 x 0,14) + 4 x 0,14 + 2 x 0,5)	Siemens	6FX 5008-1BD41	Green	8,8	58,0	118,9	-
707390	(3 x (2 x 0,14) + 4 x 0,14 + 4 x 0,25 + 2 x 0,5)	Siemens	6FX 5008-1BD51	Green	9,6	70,7	137,7	-
803672	(2 x 2 x 0,22 + 1 x 2 x 0,34)	Siemens	6FX 5008-2DC00	Green	6,9	38,0	61,0	-
802471	(2 x 2 x 0,22)	Siemens	6FX 5008-1DC00	Green	6,9	35,0	71,0	-
705461	(4 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0448	Orange	8,4	50,0	99,0	-
707392	(4 x 2 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0209	Orange	8,8	64,0	119,0	-
707394	(4 x 2 x 0,14 + 4 x 1,0 + (4 x 0,14))	Bosch Rexroth	INK-0532	Orange	9,7	86,0	149,0	-
707077	3 x (2 x 0,14) + (2 x 0,5)	Lenze	-	Green	9,3	54,0	95,0	-
707397	4 x (2 x 0,14) + (2 x 1,0)	Lenze	-	Green	11,0	70,0	145,0	-
707398	3 x (2 x 0,14) + (3 x 0,14)	Lenze	-	Green	9,2	41,0	102,0	-

Dimensions and specifications may be changed without prior notice. (RN07)

Suitable HELUTEC® Signal and power connectors can be found in our Cable Accessories catalogue.

TOPSERV® PUR high flexible motor and servo cable for drag chain 0,6/1 kV, for example according to Siemens 6FX8008PLUS, Lenze, Bosch Rexroth

Technical data

- Special PUR drag chain cable acc. to UL AWM Style 21223 or 20234 CSA AWM VDE-recognized
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +90°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 1000 V
- **A.c. test voltage**, 50 Hz 4000 V
- **Insulation resistance** min. 20 MOhm x km
- **Coupling resistance** max. 250 Ohm/km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.6, extra fine-wire, IEC 60228 cl.6
- Core insulation halogen-free PP
- Core identification
  power supply cores
  core 1: black with imprint U/L1/C/L+
  core 2: black with imprint V/L2
  core 3: black with imprint W/L3/D/L-
  control cores
  TOPSERV® 109 PUR without control cores
  TOPSERV® 113 PUR with **1** control cores
  acc. to Siemens
  core 1: black with imprint BR1
  core 2: white with imprint BR2
  acc. to Lenze
  core 1: brown with imprint BR1
  core 2: white with imprint BR2
  TOPSERV®121 PUR with **2** control cores
  pair 1: black with number no. 5+6
  pair 2: black with number no. 7+8
- GN-YE conductor
- Screening of the control cores in pairs wrapped with tinned copper braid
- Power supply cores laid up with optimal lay length and stabilising filler
- Fleece wrapping facilitates sliding
- Overall screening from tinned copper braid, optimal coverage approx. 85%
- Outer sheath of PUR
- Sheath colour orange (RAL 2003)

Properties

- Low adhesion, flame retardant, extremely abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack PUR sheath
- Optimized insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents.
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA® standard.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Resistant to cleaning and disinfecting agents acc. to ECOLAB®

Tests

- PUR outer sheath self-extinguishing and flame retardant to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- For a corresponding encoder cables please check chapter **TOPGEBER 512 PUR**
- For servo cables with non or only slight drag chain application please check chapter **TOPSERV® PVC**
- Brackets ( ) indicate screen
- DESINA® explanation see introduction
- SIEMENS product designations 6FX 5008-plus are registered trademarks of Siemens AG and are to be used only for purposes of comparison
- Lenze product designations are registered trademarks of Lenze AG and are to be used only for purposes of comparison
- Bosch Rexroth product designations INK are registered trademarks of Bosch Rexroth AG and are to be used only for purposes of comparison

Application

The combination of supply cores with the control cores for the braking function and the thermal protection in these cables is ideal. Precision servomotors, as used today in many areas of highly-automated manufacturing processes, call for high-quality, reliable and long-lasting cables. These requirements are met to a high degree by these cables. The cables have an additional overall screen to ensure EMC compatibillity, i. e. for protection against electromagnetic interference. Production is based on the specifications of established manufacturers of servo-drives and controls, as well as on various VDE, UL and CSA standards. Applications include machine, plant and robot construction, automation, drive, control and production engineering. Attractive for export-oriented mechanical and system engineering. Please observe applicable installation regulations for use in energy supply chains.
EMC = Electromagnetic compatibillity
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.

Continuation ▸

TOPSERV® PUR high flexible motor and servo cable for drag chain 0,6/1 kV, for example according to Siemens 6FX8008PLUS, Lenze, Bosch Rexroth

TOPSERV® 109 PUR, acc.to Siemens 6FX8008PLUS

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
75943	(4 G 1,5)	Siemens	6FX8008-1BB11	Orange RAL 2003	8,9	90,0	142,0	16
75944	(4 G 2,5)	Siemens	6FX8008-1BB21	Orange RAL 2003	10,7	132,0	206,0	14
75945	(4 G 4)	Siemens	6FX8008-1BB31	Orange RAL 2003	12,2	204,0	290,0	12
75946	(4 G 6)	Siemens	6FX8008-1BB41	Orange RAL 2003	14,5	315,0	423,0	10
75947	(4 G 10)	Siemens	6FX8008-1BB51	Orange RAL 2003	17,5	488,0	672,0	8
75948	(4 G 16)	Siemens	6FX8008-1BB61	Orange RAL 2003	21,6	769,0	1038,0	6
75949	(4 G 25)	Siemens	6FX8008-1BB25	Orange RAL 2003	25,2	1100,0	1495,0	4
75950	(4 G 35)	Siemens	6FX8008-1BB35	Orange RAL 2003	28,6	1510,0	1936,0	2
75951	(4 G 50)	Siemens	6FX8008-1BB50	Orange RAL 2003	33,4	2133,0	2774,0	1
700437	(4 G 70)	Siemens	6FX8008-1BB70	Orange RAL 2003	39,9	3029,0	3803,0	2/0
700897	(4 G 95)	Siemens	-	Orange RAL 2003	49,5	4606,0	5102,0	3/0

TOPSERV® 113 PUR, acc.to Siemens 6FX8008PLUS

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
78948	(4 G 1,5 + (2 x 1,5))	Siemens	6FX8008-1BA11	Orange RAL 2003	11,6	148,0	233,0	16
78949	(4 G 2,5 + (2 x 1,5))	Siemens	6FX8008-1BA21	Orange RAL 2003	13,2	187,0	315,0	14
78950	(4 G 4 + (2 x 1,5))	Siemens	6FX8008-1BA31	Orange RAL 2003	14,8	268,0	403,0	12
78951	(4 G 6 + (2 x 1,5))	Siemens	6FX8008-1BA41	Orange RAL 2003	16,3	358,0	555,0	10
78952	(4 G 10 + (2 x 1,5))	Siemens	6FX8008-1BA51	Orange RAL 2003	19,5	584,0	769,0	8
75956	(4 G 16 + (2 x 1,5))	Siemens	6FX8008-1BA61	Orange RAL 2003	23,1	825,0	1207,0	6
75957	(4 G 25 + (2 x 1,5))	Siemens	6FX8008-1BA25	Orange RAL 2003	26,8	1283,0	1642,0	4
75958	(4 G 35 + (2 x 1,5))	Siemens	6FX8008-1BA35	Orange RAL 2003	30,9	1850,0	2120,0	2
75959	(4 G 50 + (2 x 1,5))	Siemens	6FX8008-1BA50	Orange RAL 2003	34,2	2540,0	2918,0	1

TOPSERV® 113 PUR, acc.to Lenze

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
707228	(4 G 1 + (2 x 0,5))	Lenze	-	Orange RAL 2003	10,5	88,0	166,0	16
707229	(4 G 1,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	11,5	106,0	206,0	16
707230	(4 G 2,5 + (2 x 0,5))	Lenze	-	Orange RAL 2003	13,2	152,0	268,0	14
707231	(4 G 4 + (2 x 1,0))	Lenze	-	Orange RAL 2003	14,6	229,0	387,0	12
707232	(4 G 6 + (2 x 1,0))	Lenze	-	Orange RAL 2003	17,6	333,0	523,0	10
707746	(4 G 10 + (2 x 1,0))	Lenze	-	Orange RAL 2003	20,1	508,0	766,0	8
707747	(4 G 16 + (2 x 1,0))	Lenze	-	Orange RAL 2003	23,8	751,0	1174,0	6

TOPSERV® 113 PUR

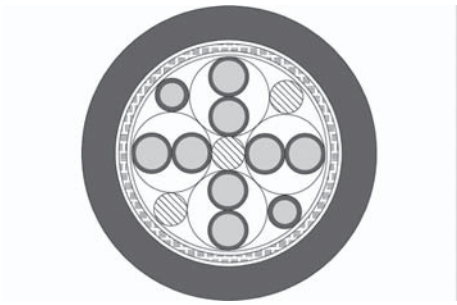
Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
77376	(4 G 1 + (2 x 0,75))	-	-	Orange RAL 2003	11,5	134,0	250,0	17
700199	(4 G 1,5 + (2 x 0,5))	-	-	Orange RAL 2003	11,5	127,0	240,0	16
74506	(4 G 1,5 + (2 x 1,0))	-	-	Orange RAL 2003	11,1	138,0	212,0	16
74507	(4 G 2,5 + (2 x 1,0))	-	-	Orange RAL 2003	12,5	177,0	274,0	14
74508	(4 G 4 + (2 x 1,0))	-	-	Orange RAL 2003	14,3	258,0	378,0	12
74514	(4 G 6 + (2 x 1,0))	-	-	Orange RAL 2003	16,2	348,0	493,0	10
74509	(4 G 10 + (2 x 1,0))	-	-	Orange RAL 2003	19,0	574,0	736,0	8
74510	(4 G 16 + (2 x 1,0))	-	-	Orange RAL 2003	22,2	815,0	1071,0	6
74511	(4 G 25 + (2 x 1,0))	-	-	Orange RAL 2003	26,2	1273,0	1616,0	4
74512	(4 G 35 + (2 x 1,0))	-	-	Orange RAL 2003	29,8	1840,0	2080,0	2
74513	(4 G 50 + (2 x 1,0))	-	-	Orange RAL 2003	33,7	2530,0	2854,0	1

TOPSERV® 121 PUR, acc.to Bosch Rexroth

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
706003	(4 G 0,75 + (2 x 0,5))	Bosch Rexroth	INK-0670	Orange RAL 2003	9,2	77,0	138,0	17
73774	(4 G 1 + 2 x (2 x 0,75))	Bosch Rexroth	INK-0653	Orange RAL 2003	11,5	148,0	254,0	17
76103	(4 G 1,5 + 2 x (2 x 0,5))	-	-	Orange RAL 2003	12,4	145,0	250,0	17
73579	(4 G 1,5 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	12,6	182,0	262,0	16
700561	(4 G 1,5 + 2 x (2 x 0,75))	Bosch Rexroth	INK-0650	Orange RAL 2003	12,2	170,0	290,0	16
73580	(4 G 2,5 + 2 x (2 x 1,0))	Bosch Rexroth	INK-0602	Orange RAL 2003	14,6	229,0	336,0	14
78955	(4 G 2,5 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	15,6	241,0	350,0	14
74094	(4 G 4 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	16,2	312,0	475,0	12
700562	(4 G 4 + (2 x 1,0) + (2 x 1,5))	Bosch Rexroth	INK-0603	Orange RAL 2003	16,0	318,0	485,0	12
78956	(4 G 4 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	16,7	324,0	490,0	12
74095	(4 G 6 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	18,2	376,0	606,0	10
700563	(4 G 6 + (2 x 1,0) + (2 x 1,5))	Bosch Rexroth	INK-0604	Orange RAL 2003	18,8	398,0	615,0	10
78957	(4 G 6 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	19,0	450,0	621,0	10
74096	(4 G 10 + 2 x (2 x 1,0))	-	-	Orange RAL 2003	21,5	609,0	905,0	8
700564	(4 G 10 + (2 x 1,0) + (2 x 1,5))	Bosch Rexroth	INK-0605	Orange RAL 2003	22,4	610,0	915,0	8
78958	(4 G 10 + 2 x (2 x 1,5))	-	-	Orange RAL 2003	22,4	625,0	925,0	8
75978	(4 G 16 + 2 x (2 x 1,5))	Bosch Rexroth	INK-0606	Orange RAL 2003	26,9	904,0	1226,0	6
75979	(4 G 25 + 2 x (2 x 1,5))	Bosch Rexroth	INK-0607	Orange RAL 2003	28,0	1323,0	1595,0	4
75980	(4 G 35 + 2 x (2 x 1,5))	Bosch Rexroth	INK-0667	Orange RAL 2003	32,5	1621,0	2196,0	2
700565	(4 G 50 + 2 x (2 x 2,5))	Bosch Rexroth	INK-0668	Orange RAL 2003	37,0	2600,0	3000,0	1

Dimensions and specifications may be changed without prior notice. (RN07)

TOPGEBER 512 PUR high flexible Feedback cable for drag chain according to Siemens, Bosch Rexroth, Lenze and other Standards



Technical data

- Special PUR drag chain feedback cable acc. to UL AWM style 20233 and 20236 and CSA
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  acc. to Siemens 30 V
  acc. to Bosch Rexroth and Lenze 300 V
  further details on request
- **A.c. test voltage**, 50 Hz
  core/core 2000 V
  core/screen 1000 V
- **Mutual capacitance** at 800 Hz
  core/core approx. 70 nF/km
  core/screen approx. 110 nF/km
- **Insulation resistance**
  min. 20 MOhm x km
- **Coupling resistance**
  max. 250 Ohm
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 6x cable Ø

Cable structure

- tinned copper, to DIN VDE 0295 cl.6, extra fine-wire, BS 6360 cl.6, IEC 60228 cl.6
- Core insulation of special polypropylene
- Core colours on demand
- Fleece wrapping facilitates sliding
- Overall screening of tinned copper wire braid with tinned drain wire, coverage approx. 85%
- Polyester foil
- Outer sheath of PUR
- Sheath colour green (RAL 6018) acc. to DESINA® or orange

Properties

- PUR outer sheath, low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- Special feature: These cables are produced to high quality specifications and conform to the DESINA®-standard
- Due to the high grade special core insulation, the PUR sheath and the highly flexible conductor, these cables are ideally suitable for use in drag chains and provide high functional reliability
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- Particularly attractive for export-oriented markets due to UL/CSA approval
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- Resistant to cleaning and disinfecting agents acc. to ECOLAB

Note

- For a corresponding motor- and servocables please check chapter **TOPSERV® PUR**
- Encoder cables for static application please check chapter **TOPGEBER 511 PVC**
- Brackets ( ) indicate screen.
- SIEMENS product designations 6FX 8008-... are registered trademarks of Siemens AG and are to be used only for purposes of comparison.
- Bosch Rexroth product designations INK- are registered trademarks of Bosch-Rexroth AG and are to be used only for purposes of comparison.
- DESINA®: Explanation: see introduction.

Application

These low-capacitance incremental encoder cables or position feedback cables transmit the control pulses for positioning and operating characteristics of servomotors. These cables are used as connecting cables for tachos, brakes and pulse generators in applications subjected to heavy mechanical stresses in industrial equipment, machine tools, control and automation equipment. Please observe applicable installation regulations for use in energy supply chains.

EMC = Electromagnetic compatibillity

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.

Continuation ▸

TOPGEBER 512 PUR high flexible Feedback cable for drag chain according to Siemens, Bosch Rexroth, Lenze and other Standards

Part no.	No.cores x cross-sec. mm²	for system	OEM Part no.	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
700655	(8 x 2 x 0,18)	Siemens	6FX 8008-1BD11	Green	7,8	54,0	79,0	24
78081	(4 x 2 x 0,34 + 4 x 0,5)	Siemens	6FX 8008-1BD21	Green	9,8	83,0	135,0	21
707400	(3 x (2 x 0,14) + 2 x 0,5)	Siemens	6FX 8008-1BD31	Green	9,0	74,0	119,0	21
700657	(3 x (2 x 0,14) + 4 x 0,14 + 2 x 0,5)	Siemens	6FX 8008-1BD41	Green	8,9	66,0	120,0	26
700540	(3 x (2 x 0,14) + 4 x 0,14 + 4 x 0,25 + 2 x 0,5)	Siemens	6FX 8008-1BD51	Green	9,6	75,0	138,0	-
700654	(4 x 2 x 0,18)	Siemens	6FX 8008-1BD61	Green	6,4	35,0	57,0	-
700653	(2 x 2 x 0,18)	Siemens	6FX 8008-1BD71	Green	5,0	24,0	42,0	-
78079	(12 x 0,22)	Siemens	6FX 8008-1BD81	Green	7,5	65,0	74,0	24
804767	(2 x 2 x 0,2 + 2 x 0,38)	Siemens	6FX 8008-2DC00	Green	7,0	40,0	74,0	-
706333	(5 x 2 x 0,25 + 2 x 0,5)	Berger Lahr	-	Green	8,8	69,0	127,0	24
705413	(3 x 2 x 0,25 + 2 x 0,5)	Elau	-	Green	7,4	43,0	82,0	24
707403	(3 x 2 x 0,25)	B+R	-	Green	6,5	31,0	60,0	24
707404	(5 x 2 x 0,14 + 2 x 0,5)	B+R	-	Green	8,7	48,0	98,0	24
707405	3 x (2 x 0,14) + (2 x 0,5)	Lenze	-	Green	9,8	42,0	98,0	24
707406	4 x (2 x 0,14) + (2 x 1,0)	Lenze	-	Green	11,3	66,0	144,0	24
707407	3 x (2 x 0,14) + (3 x 0,14)	Lenze	-	Green	10,3	41,0	127,0	24
702050	(4 x 2 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0209 grün	Green	8,8	64,0	99,0	24
78080	(4 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0448 grün	Green	8,5	51,0	106,0	24
77741	(9 x 0,5)	Bosch Rexroth	INK-0208 grün	Green	8,8	69,0	124,0	20
707738	(4 x 2 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0209	Orange	8,8	64,0	99,0	20
707739	(4 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0448	Orange	8,5	51,0	106,0	20
707740	(9 x 0,5)	Bosch Rexroth	INK-0208	Orange	8,8	69,0	124,0	20
707408	(4 x 2 x 0,14 + 4 x 1,0 + (4 x 0,14))	Bosch Rexroth	INK-0532	Orange	9,7	81,0	142,0	20
707418	(3 x (2 x 0,25) + 3 x 0,25 + 2 x 1,0)	Bosch Rexroth	INK-0280	Orange	9,0	84,0	134,7	20
707409	(2 x 2 x 0,25 + 2 x 0,5)	Bosch Rexroth	INK-0750	Orange	7,2	38,0	79,0	20
77743	(3 x (2 x 0,14) + 2 x (1 x 0,5))	Heidenhain	-	Green	8,4	81,0	109,0	-
79513	(4 x 2 x 0,14 + 4 x 0,5)	Heidenhain	-	Green	8,5	52,0	100,0	26
707410	(3 x 2 x 0,14 + 2 x 1,0)	Heidenhain	-	Green	9,1	72,0	132,0	26
700560	(4 x 2 x 0,14 + (4 x 0,14) + 4 x 0,5)	Heidenhain	-	Green	8,3	67,0	104,0	-
77753	(10 x 0,14 + 2 x 0,5)	Heidenhain	-	Green	7,2	43,0	83,0	26
78963	(5 x 2 x 0,14 + 2 x 0,5)	Baumüller	-	Green	9,0	72,0	98,0	26
78828	(3 x 2 x 0,25)	-	-	Green	7,2	55,0	83,0	24
79613	(5 x 2 x 0,38 + 2 x 0,5)	-	-	Green	8,6	69,0	130,0	21
77744	(3 x (2 x 0,14) + 2 x 1,0)	-	-	Green	8,2	71,0	107,0	26
78372	(3 x 2 x 0,14 + 2 x 0,5)	-	-	Green	7,2	35,0	67,0	26
77750	(4 x (2 x 0,25) + 2 x 1,0)	-	-	Green	10,5	93,0	175,0	24
705221	(4 x 2 x 0,25)	-	-	Green	7,5	39,0	88,0	24

Dimensions and specifications may be changed without prior notice. (RN07)

Suitable HELUTEC® Signal and power connectors can be found in our Cable Accessories catalogue.

N

TOPSERV® 600 VFD EMC-preferred type, high flexible motor power supply cable, oil-resistant, NFPA 79 Edition 2012

Technical data

- TPE motor supply cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range** -25°C to +90°C
- **Nominal voltage** TC 600 V WTTC 1000 V
- **Test voltage** 4000 V
- **Minimum bending radius** flexing 5x cable Ø permanently flexing 7,5 cable Ø
- **Coupling resistance** max. 250 Ohm/km

Cable structure

- Tinned copper conductor, extra fine wire with AWG dimensions
- Core insualtion of special PVC with transparent nylon skin
- Black cores with continuous white numbering
- GN-YE conductor in the outer layer
- Cores stranded in layers with optimal lay-length
- Fleece
- 1. Screening with special aluminium foil 2. Screening with braid of tinned copper wires, optimal coverage approx. 85%
- Separator
- Outer sheath of special TPE
- Sheath colour black (RAL 9005) or orange (RAL 2003)
- with length marking in feet

Properties

- self-extinguishing and flame retardant acc. to CSA FT4
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- **UL:** TC-ER, WTTC 1000 V, MTW, NFPA 79 2012, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90°C dry / 75°C wet, Cold Bend Test -40°C Class 1 Div. 2 per NEC Art. 336, 392, 501
  CSA: c (UL) CIC-TC FT4 AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Highly-flexible, extremly oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 edition 2012 for open, unprotected installation on cable trays and from cable trays to the machine. The special TPE sheath is extremly resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.
EMC = Electromagnetic compatibillity
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.

Sheath colour black

Part no.	No.cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62607	4 x 18	0,963	9,9	38,0	163,0
62608	4 x 16	1,31	11,4	51,0	184,0
62609	4 x 14	2,08	12,5	80,0	197,0
62610	4 x 12	3,31	14,0	127,0	266,0
62611	4 x 10	5,26	17,1	230,0	401,0
62612	4 x 8	8,37	22,3	384,0	669,0
62613	4 x 6	13,31	25,4	614,0	917,0
62614	4 x 4	21,21	30,1	960,0	1364,0
62615	4 x 2	33,6	35,3	1344,0	1990,0

Sheath colour orange

Part no.	No.cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
62616	4 x 18	0,963	9,9	38,0	163,0
62617	4 x 16	1,31	11,4	51,0	184,0
62618	4 x 14	2,08	12,5	80,0	197,0
62619	4 x 12	3,31	14,0	127,0	266,0
62620	4 x 10	5,26	17,1	230,0	401,0
62621	4 x 8	8,37	22,3	384,0	669,0
62622	4 x 6	13,31	25,4	614,0	917,0
62623	4 x 4	21,21	30,1	960,0	1364,0
62624	4 x 2	33,6	35,3	1344,0	1990,0

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

Suitable accessories can be found in Chapter X.

• Cable Gland - HELUTOP® HT-MS-EP4

TOPSERV® 650 VFD EMC-preferred type, high flexible motor power supply cable with control cores, oil-resistant, NFPA 79 Edition 2012

Technical data

- TPE motor supply cable acc. to UL-Std.1277 and UL-Std.2277
- **Temperature range**
  flexing -25°C to +105°C
- **Nominal voltage**
  TC 600 V
  WTTC 1000 V
- **Test voltage**
  power supply cores 4000 V
  control cores 2000 V
- **Minimum bending radius**
  flexing 5x cable Ø
  permanently flexing 7,5x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km

Cable structure

- Tinned copper-conductor, extra fine-wire with AWG dimensions
- Core insualtion of special PVC with transparent nylon skin
- Core identification black cores with continuous white numbering
  - power supply cores no. 1-4
  - control cores no. 5+6
- GN-YE conductor in the outer layer
- Control cores screened in pairs with plastic-coated aluminium foil, tinned drain wire
- Control cores stranded in pairs and laid up in layers with optimal lay-length with the power supply cores
- 1. Screen with plastic-coated aluminium foil
  2. Tinned copper braided screen, approx. 85% coverage
- Separator
- Outer sheath of special TPE
- Sheath colour black (RAL 9005) or orange (RAL 2003)
- with length marking in feet

Properties

- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers
- UV-resistant

Tests

- self-extinguishing and flame retardant acc. to CSA FT4
- **UL:**
  TC-ER, WTTC 1000 V, MTW, NFPA 79 2012, PLTC-ER (AWG 18 - AWG 12), ITC-ER (AWG 18 - AWG 12) OIL RES I & II, 90°C dry / 75°C wet, Cold Bend Test -40°C Class 1 Div. 2 per NEC Art. 336, 392, 501
  CSA:
  c (UL) CIC-TC FT4
  AWM I/II A/B FT4

Note

- VFD = Variable Frequency Drive

Application

Highly flexible, extremly oil-resistant motor supply cable for modern servomotors; the double-screening with special aluminium foil (100% coverage) and tinned copper braid (approx. 85% coverage) provides effective protection against electrical disturbance and the resultant failures. Approved to NFPA 79 edition 2012 for open, unprotected installation on cable trays and from cable trays to the machine. The special TPE sheath is extremly resistant to oil, coolants and solvents and hence the perfect solution for industrial applications with open installation, installation in pipes and in the earth.
EMC = Electromagnetic compatibillity
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.

N

Sheath colour black

Part no.	No. cores x AWG-No.	Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
59837	4x AWG 16 +2x AWG 18	1,31/ 0,824	13,0	88,0	259,0
59838	4x AWG 14 +2x AWG 18	2,08/ 0,824	14,0	133,0	370,0
59839	4x AWG 14 +2x AWG 14	2,08/ 2,08	14,6	159,0	399,0
59840	4x AWG 12 +2x AWG 18	3,31/ 0,824	15,3	197,0	435,0
59841	4x AWG 12 +2x AWG 14	3,31/ 2,08	15,7	224,0	466,0
59842	4x AWG 10 +2x AWG 14	5,26/ 2,08	18,2	301,0	703,0
59843	4x AWG 8 +2x AWG 14	8,37/ 2,08	24,1	457,0	901,0
59844	4x AWG 6 +2x AWG 14	13,31/ 2,08	27,4	615,0	1275,0
59845	4x AWG 4 +2x AWG 14	21,21/ 2,08	33,4	1450,0	1861,0

Sheath colour orange

Part no.	No. cores 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	13,0	88,0	259,0
59847	4x AWG 14 +2x AWG 18	2,08/ 0,824	14,0	133,0	370,0
59848	4x AWG 14 +2x AWG 14	2,08/ 2,08	14,6	159,0	399,0
59849	4x AWG 12 +2x AWG 18	3,31/ 0,824	15,3	197,0	435,0
59850	4x AWG 12 +2x AWG 14	3,31/ 2,08	15,7	224,0	466,0
59851	4x AWG 10 +2x AWG 14	5,26/ 2,08	18,2	301,0	703,0
59852	4x AWG 8 +2x AWG 14	8,37/ 2,08	24,1	457,0	901,0
59853	4x AWG 6 +2x AWG 14	13,31/ 2,08	27,4	615,0	1275,0
59854	4x AWG 4 +2x AWG 14	21,21/ 2,08	33,4	1450,0	1861,0

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

TOPSERV® Hybrid hybrid cable for SICK Hiperface DSL® motor feedback systems

NEW

Technical data

- **TOPSERV ® PUR**
- Special PUR drag chain cable acc. to UL AWM Style 21223 CSA AWM
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +90°C
- **Nominal voltage**
  VDE
  power supply cores U_0/U 600/1000 V
  control cores U_0/U 300/500 V
  UL/CSA 1000 V
- **A.c. test voltage**, 50 Hz
  power supply cores 4000 V
  control cores 1000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Coupling resistance**
  max. 250 Ohm/km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
  min. 5 mio. cycles

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.6, extra fine-wire, IEC 60228 cl.6
- Core insulation halogen-free PP
- Core identification
  power supply cores
  core 1: black with imprint U/L1/C/L+
  core 2: black with imprint V/L2
  core 3: black with imprint W/L3/D/L-
  control cores
  pair 1: black with number no. 5+6
  pair 2: white and blue
- GN-YE conductor
- Screening of the control cores in pairs wrapped with tinned copper braid
- Power supply cores laid up with optimal lay length and stabilising filler
- Overall screening from tinned copper braid, optimal coverage approx. 85%
- Outer sheath of PVC or PUR
- Sheath colour orange (RAL 2003) acc. to DESINA®

Properties

- low capacitance
- PUR outer sheath: low adhesion, extremely abrasion resistant, halogen-free, resistant to UV-, oil-, hydrolysis and microbial attack
- Optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
- These cables are produced to high quality specifications and conform to the DESINA® standard.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PUR outer sheath self-extinguishing and flame retardant to DIN VDE 0482-332-1-2, DIN EN 60332-1-2, IEC 60332-1 (equivalent DIN VDE 0472 part 804 test method B)

Note

- The technical data for **TOPSERV® Hybrid PVC** cables are available on request.

Application

The supply conductors for these cables are ideally combined with the control conductors for the brake function and the transmission of the Sick Hiperface DSL protocols. Applications include machine, plant and robot construction. Please observe applicable installation regulations for use in energy supply chains.

EMC = Electromagnetic compatibillity

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.

TOPSERV® Hybrid PVC for fixed or not constantly movements

Part no.	No.cores x cross-sec. mm²	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
709930	(4G0,5 + (2x0,34) C + (2x26 AWG)) C	Orange RAL 2003	9,3	72,0	123,0	26
709932	(4G1 + (2x0,75) C + (2x22 AWG)) C	Orange RAL 2003	11,6	130,0	208,0	22
709933	(4G1,5 + (2x0,75) C + (2x22 AWG)) C	Orange RAL 2003	12,2	152,0	248,0	22
709934	(4G2,5 + (2x1) C + (2x22 AWG)) C	Orange RAL 2003	13,8	207,0	326,0	22
709935	(4G4 + (2x1) C + (2x22 AWG)) C	Orange RAL 2003	15,3	273,0	415,0	22
709936	(4G6 + (2x1) C + (2x22 AWG)) C	Orange RAL 2003	17,2	357,0	538,0	22
709937	(4G10 + (2x1,5) C + (2x22 AWG)) C	Orange RAL 2003	20,3	530,0	752,0	22
709938	(4G16 + (2x1,5) C + (2x22 AWG)) C	Orange RAL 2003	22,6	768,0	1005,0	22

TOPSERV® Hybrid PUR, high flexible for drag chain

Part no.	No.cores x cross-sec. mm²	Sheath colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
709703	(4G0,5 + (2x0,34) C + (2x26 AWG)) C	Orange RAL 2003	9,3	76,0	127,0	26
708543	(4G1 + (2x0,75) C + (2x22 AWG)) C	Orange RAL 2003	11,6	133,0	212,0	22
710081	(4G1,5 + (2x0,75) C + (2x24 AWG)) C	Orange RAL 2003	11,7	146,0	229,0	24
708544	(4G1,5 + (2x0,75) C + (2x22 AWG)) C	Orange RAL 2003	12,7	155,0	269,0	22
708545	(4G2,5 + (2x1) C + (2x22 AWG)) C	Orange RAL 2003	13,9	205,0	310,0	22
708546	(4G4 + (2x1) C + (2x22 AWG)) C	Orange RAL 2003	15,7	280,0	420,0	22
708547	(4G6 + (2x1) C + (2x22 AWG)) C	Orange RAL 2003	18,0	363,0	540,0	22
708548	(4G10 + (2x1,5) C + (2x22 AWG)) C	Orange RAL 2003	21,0	538,0	760,0	22
709705	(4G16 + (2x1,5) C + (2x22 AWG)) C	Orange RAL 2003	23,4	775,0	1020,0	22

Dimensions and specifications may be changed without prior notice.

UL/CSA HEAT-RESISTANT CABLES

SiHF UL/CSA halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable

Technical data

- Special silicone multicore cable with higher heat-resistance range to UL Style 4476 and CSA AWM II A/B
- **Temperature range**
  VDE -60°C to +180°C
  (up to +220°C for short time)
  UL/CSA -50°C to +150°C
- **Nominal voltage**
  VDE U_0/U 300/500 V
  UL/CSA 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
  min. 200 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 4x cable Ø
- **Radiation resistance**
  up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper conductors to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of silicone
- Core identification to DIN VDE 0293-308 colour coded or black cores with continuous white numbering
- For 2-cores brown, blue
- Cores stranded in layers with optimal lay-length
- GN-YE conductor, 3 cores and above
- Outer sheath of silicone
- Sheath colour black

Properties

- **Advantages**
  Hardly changes of dielectric strength and the insulation resistance also at high temperatures, high ignition or flash point, in case of fire, forms an insulating layer of SiO_2
- **Resistant to**
  High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen and UV
- Halogen-free
  acc. to DIN VDE 0482 part 267/ DIN EN 50267-2-1/IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Behaviour in fire no flame propagation
  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), CSA FT1
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90°C.

Note

- G = with green-yellow conductor
  x = without green-yellow conductor
- screened analogue type:
  SiHF-C-Si UL/CSA , confer page 478

Application

UL-CSA approved Silicone cables were evolved for use wherever insulation is subjected to extreme temperature changes. They are heat-resistant for permanent temperature up to +180°C, for short time operation up to +220°C. 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. Due to elastical characteristic of core insulations, these are used as flexible connection cable.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23214	2 x 0,5	20	7,7	9,6	73,0
23215	3 G 0,5	20	8,1	14,4	82,0
23216	4 G 0,5	20	8,8	19,2	98,0
23217	5 G 0,5	20	9,4	24,0	120,0
23218	6 G 0,5	20	10,4	28,8	131,0
23219	7 G 0,5	20	10,4	33,6	140,0
23220	8 G 0,5	20	10,8	38,4	183,0
23221	10 G 0,5	20	12,8	48,0	201,0
23222	12 G 0,5	20	13,4	57,6	241,0
23223	16 G 0,5	20	13,9	76,8	269,0
23224	18 G 0,5	20	14,4	86,4	311,0
23225	25 G 0,5	20	16,8	120,0	401,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23226	2 x 1	18	8,2	19,2	88,0
23227	3 G 1	18	9,0	28,2	111,0
23228	4 G 1	18	10,0	38,4	130,0
23229	5 G 1	18	10,6	48,0	161,0
23230	6 G 1	18	11,4	57,6	182,0
23231	7 G 1	18	11,4	67,2	198,0
23232	8 G 1	18	12,4	76,8	251,0
24010	9 G 1	18	13,2	86,0	277,0
23233	10 G 1	18	13,2	96,0	304,0
23234	12 G 1	18	14,4	115,2	343,0
23235	16 G 1	18	15,7	153,6	441,0
23236	18 G 1	18	16,6	172,8	492,0
23237	25 G 1	18	19,1	240,0	617,0

Continuation ▸

SiHF UL/CSA halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23238	2 x 1,5	16	9,1	28,8	117,0
23239	3 G 1,5	16	9,6	43,2	131,0
23240	4 G 1,5	16	10,6	57,6	166,0
23241	5 G 1,5	16	11,4	72,0	198,0
23242	6 G 1,5	16	12,4	86,4	240,0
23243	7 G 1,5	16	12,4	100,8	261,0
23244	8 G 1,5	16	13,9	115,2	298,0
23245	10 G 1,5	16	16,1	144,0	359,0
23246	12 G 1,5	16	16,6	172,6	431,0
23247	14 G 1,5	16	18,0	201,6	520,0
23248	16 G 1,5	16	20,0	230,4	569,0
23249	18 G 1,5	16	20,9	259,2	652,0
23250	20 G 1,5	16	21,8	288,0	724,0
23251	25 G 1,5	16	24,0	345,6	925,0
23252	41 G 1,5	16	29,2	590,4	1440,0
23253	2 x 2,5	14	9,8	48,0	141,0
23254	3 G 2,5	14	10,4	72,0	174,0
23255	4 G 2,5	14	11,6	96,0	217,0
23256	5 G 2,5	14	12,4	120,0	271,0
23257	6 G 2,5	14	13,6	144,0	314,0
23258	7 G 2,5	14	13,6	168,0	331,0
23259	8 G 2,5	14	14,9	192,0	404,0
23260	10 G 2,5	14	17,2	240,0	495,0
23261	12 G 2,5	14	21,0	288,0	554,0
23262	16 G 2,5	14	22,6	384,0	725,0
23263	18 G 2,5	14	24,0	432,0	838,0
23264	25 G 2,5	14	28,8	600,0	1108,0
23265	2 x 4	12	10,9	76,8	190,0
23266	3 G 4	12	11,8	115,2	241,0
23267	4 G 4	12	12,9	153,6	304,0
23268	5 G 4	12	14,5	192,0	384,0
23269	7 G 4	12	17,8	268,8	527,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
23270	2 x 6	10	14,4	115,2	284,0
23271	3 G 6	10	15,1	172,8	392,0
23272	4 G 6	10	16,4	230,4	492,0
23273	5 G 6	10	18,2	288,0	610,0
23274	7 G 6	10	21,1	403,2	681,0
23275	2 x 10	8	18,0	192,0	405,0
23276	3 G 10	8	18,9	288,0	620,0
23277	4 G 10	8	20,0	384,0	741,0
23278	5 G 10	8	22,1	480,0	914,0
23279	7 G 10	8	24,9	672,0	1164,0
23280	2 x 16	6	20,9	307,2	441,0
23281	3 G 16	6	22,8	460,8	501,0
23282	4 G 16	6	24,9	614,4	623,0
23283	5 G 16	6	26,9	768,0	971,0
23284	7 G 16	6	28,1	1075,3	1690,0
23285	2 x 25	4	25,1	480,0	711,0
23286	3 G 25	4	27,0	720,0	1210,0
23287	4 G 25	4	32,1	960,0	1524,0
23288	2 x 35	2	28,7	672,0	1140,0
23289	3 G 35	2	30,6	1008,0	1523,0
23290	4 G 35	2	32,9	1344,0	2217,0

Dimensions and specifications may be changed without prior notice. (RN03)

Suitable accessories can be found in Chapter X.

- Cable protection tube - HTP

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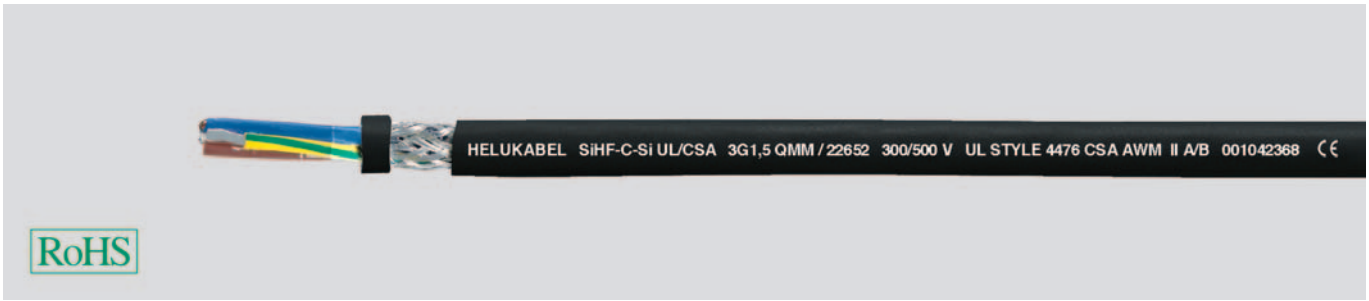
SiHF-C-Si UL/CSA halogen-free, 150°C/ 600 V, two-approvals silicon multicore cable, Cu-screened, EMC-preferred type



Technical data

- Special silicone multicore cable with higher heat-resistance range to UL Style 4476 and CSA AWM II A/B
- **Temperature range**
  VDE -60°C to +180°C
  (up to +220°C for short time)
  UL/CSA -50°C to +150°C
- **Nominal voltage**
  VDE U_0/U 300/500 V
  UL/CSA 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Insulation resistance**
  min. 200 MOhm x km
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 5x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km
- **Radiation resistance**
  up to 20x10⁶ cJ/kg (up to 20 Mrad)

Cable structure

- Tinned copper conductors to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of silicone
- Core identification to DIN VDE 0293-308 colour coded or black cores with continuous white numbers
- For 2-cores brown, blue
- Cores stranded in layers with optimal lay-length
- GN-YE conductor, 3 cores and above
- Foil separator
- Tinned copper braided screening, approx. 85% coverage
- Outer sheath of silicone
- Sheath colour black

Tests

- Halogen-free
  acc. to DIN VDE 0482 part 267, DIN EN 50267-2-1, IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Behaviour in fire
  no flame propagation 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), CSA FT1.

Properties

Advantages

- Hardly changes of dielectric strength and the insulation resistance, also at high temperatures high ignition or flash point, in case of fire, forms an insulating layer of SiO_2

Resistant to

- High molecular oils, fats from vegetables and animals, alcohols, plasticizers and clophenes, diluted acids, lyes and salt dissolution, oxidation substances, tropical influences and weather, lake water, oxygen and UV
- For laying as a fixed installation only in open or ventilated pipe systems as well as in ducts. Otherwise the mechanical properties of the silicon are reduced by the enclosed air at temperatures exceeding 90°C.

Note

- G = with green-yellow conductor
  x = without green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- non-screened analogue type:
  SiHF UL/CSA, confer page 476

Application

UL-CSA approved Silicone cables were evolved for use wherever 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. Due to elastical characteristic of core insulations, these are used as flexible connection cable. An interference-free transmission of signals and pulse is assured by the high screening density. The ideal interference-protected silicone multicore flexible cable for such applications as given above.

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
22637	2 x 0,5	20	9,0	55,5	94,0
22638	3 G 0,5	20	9,3	60,8	104,0
22639	4 G 0,5	20	9,7	66,5	125,0
22640	5 G 0,5	18	10,1	81,6	149,0
22641	7 G 0,5	20	10,5	92,2	168,0
22642	10 G 0,5	20	13,2	124,0	237,0
22643	12 G 0,5	20	13,4	134,4	260,0
22644	2 x 1	18	9,5	66,7	130,0
22645	3 G 1	18	9,6	86,2	151,0
22646	4 G 1	18	10,6	96,8	169,0
22647	5 G 1	18	11,6	108,3	198,0
22648	7 G 1	18	12,1	141,2	236,0
22649	10 G 1	18	14,7	190,0	248,0
22650	12 G 1	18	15,1	209,8	364,0
22651	2 x 1,5	16	10,6	87,7	169,0
22652	3 G 1,5	16	11,0	103,5	191,0
22653	4 G 1,5	16	11,6	131,7	230,0
22654	5 G 1,5	16	13,1	148,5	272,0
22655	7 G 1,5	16	14,1	193,4	341,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
22656	10 G 1,5	16	17,3	268,5	478,0
22657	12 G 1,5	16	17,9	298,4	521,0
22658	2 x 2,5	14	12,0	122,3	226,0
22659	3 G 2,5	14	12,7	147,7	271,0
22660	4 G 2,5	14	14,0	188,6	332,0
22661	5 G 2,5	14	15,1	214,9	384,0
22662	7 G 2,5	14	16,9	265,7	478,0
22663	4 G 4	12	17,0	294,0	516,0
22664	5 G 4	12	19,1	374,0	641,0
22665	4 G 6	10	18,6	449,0	773,0
22666	5 G 6	10	21,3	563,0	980,0
22667	4 G 10	8	25,5	759,0	1284,0

Dimensions and specifications may be changed without prior notice. (RN03)

UL/CSA ALLWEATHER CABLES & RUBBER CABLES

Rubber / Neoprene Control Cable type SJO and SO

Technical data

- UL+CSA approved rubber/neoprene flexible cables
- **Temperature range**
  -40°C to +90°C
- **Nominal voltage**
  SJO 300 V
  SO 600 V
- **Approvals**
  UL-Std.62
  CSA C22.2-49

Cable structure

- Bare copper conductor to ASTM B-174
- Core insulation of synthetic rubber, EPDM
- Core identification coloured
- **Colour code**
  2 cores black, white
  3 cores black, white, green
  4 cores black, white, green, red
- Cores stranded in layers with optimal lay-length
- Hemp or cotton filler
- Outer sheath of neoprene (oil resistant)
- Sheath colour black

Properties

- **Resistant**
  Oil
  Wetness
  UV-radiation

Note

- **Note**: SJO-**18/2**
  18 = AWG 18
  2 = No. of cores
- Supply lengths are on original reels of 76 m or 152 m or on drums of 305 m lengths.
- Further Types also available: PVC control cables SJT, SJTO, ST, STO.

Application

As a flexible cord for mobile equipment for use in rougher conditions in the engines and mechanical engineering, dockyards, in agriculture, in cabins and steel rolling mills and for export overseas.

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

Nominal voltage 300 Volt, type SJO (90°C)

Part no.	No.cores x AWG-No.	Current carrying capacity in Amp.	Cond. make-up n x wire Ø	Outer Ø app. mm	Weight app. kg / km
63010	2 x 18	7	16 x 0,3	7,8	65,0
63011	3 x 18	7	16 x 0,3	8,4	80,0
63012	4 x 18	7	16 x 0,3	9,2	95,0
63013	2 x 16	10	26 x 0,3	8,3	130,0
63014	3 x 16	10	26 x 0,3	9,0	148,0
63015	4 x 16	10	26 x 0,3	10,0	180,0
63016	2 x 14	15	41 x 0,3	9,4	195,0
63017	3 x 14	15	41 x 0,3	10,0	225,0
63018	4 x 14	15	41 x 0,3	10,7	288,0

Nominal voltage 600 Volt, type SO (90°C)

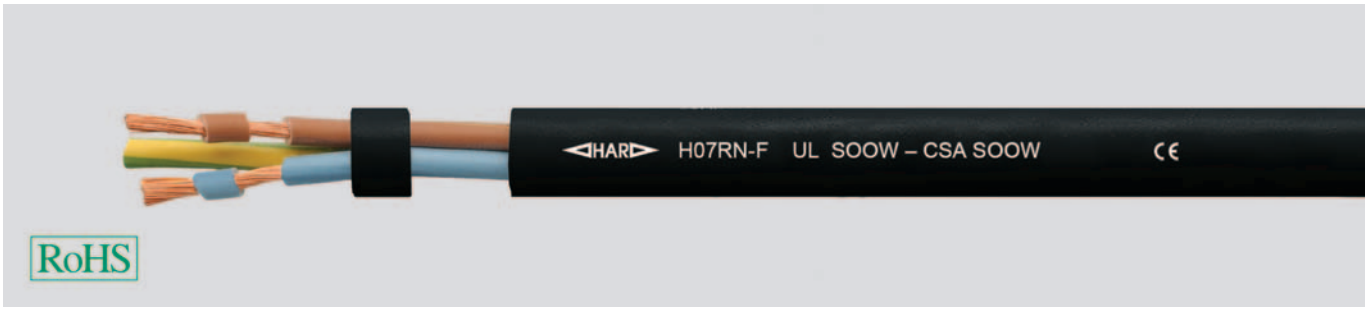
Part no.	No.cores x AWG-No.	Current carrying capacity in Amp.	Cond. make-up n x wire Ø	Outer Ø app. mm	Weight app. kg / km
63034	2 x 18	7	16 x 0,3	10,0	70,0
63035	3 x 18	7	16 x 0,3	10,4	86,0
63036	4 x 18	7	16 x 0,3	11,0	110,0
63037	2 x 16	10	26 x 0,3	10,4	140,0
63038	3 x 16	10	26 x 0,3	11,0	155,0
63039	4 x 16	10	26 x 0,3	12,3	200,0
63040	2 x 14	15	41 x 0,3	13,5	200,0
63041	3 x 14	15	41 x 0,3	14,3	235,0
63042	4 x 14	15	41 x 0,3	15,3	300,0
63043	2 x 12	20	65 x 0,3	15,3	280,0
63044	3 x 12	20	65 x 0,3	16,2	310,0
63045	4 x 12	20	65 x 0,3	18,9	330,0
63046	2 x 10	25	105 x 0,3	16,4	305,0
63047	3 x 10	25	105 x 0,3	17,5	325,0
63048	4 x 10	25	105 x 0,3	19,0	365,0

Dimensions and specifications may be changed without prior notice. (RN04)

Suitable accessories can be found in Chapter X.

• Cable tie - T-WS

H07RN-F/SOOW rubber-sheathed cable, harmonizised type



Technical data

- Rubber-sheated cable H07RN-F acc. to DIN VDE 0285-525-2-21 / DIN EN 50525-2-21 and UL-Std.62
- UL - SOOW
  CSA - SOOW
- **Temperature rang**
  HAR -25°C to +60°C
  UL/CSA -40°C to +90°C
- Permissible **operating temperature** at the conductor +60°C
- **Nominal voltage**
  HAR U_0/U 450/750 V
  UL/CSA 600 V
- **Test voltage** 2500 V
- **Minimum bending radius**
  flexing 10x cable Ø
  fixed installation 7,5x cable Ø

Cable structure

- Bare copper conductor, fine wire with AWG dimensions
- Core insulation of rubber (EPR)
- Core identification
  3 cores: BU, BN
  4 cores: BN, BK, GY
  5 cores: BU, BN, BK, GY
- Cores stranded in layers with optimal lay-length
- GN-YE conductor
- Outer sheath of rubber (CPE)
- Sheath colour black

Properties

- Ozone-resistant
- Weather and UV-resistant
- Resistant to oils and greases

Application

Highly-standardised, heavy-duty rubber-sheated cable for use in practically all machines destined for export markets, in dry, damp, wet environments and outdoors. As a feeder to transportable motors or machines, cranes, hoists, hand lamps and drilling machines.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	Cross-section mm²	No.cores x AWG-No.	Current carrying capacity in ampere at 30°C ambient temperature	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
39025	1	3 x 17	10	9,6	29,0	130,0
39026	1,5	3 x 15	13	10,2	43,0	165,0
39027	1,5	4 x 15	10	11,4	58,0	200,0
39028	1,5	5 x 15	8	13,1	72,0	240,0
39029	2,5	3 x 13	18	14,0	72,0	235,0
39030	2,5	4 x 13	15	15,1	96,0	290,0
39031	2,5	5 x 13	12	16,9	120,0	345,0
39032	4	3 x 11	25	16,0	115,0	320,0
39033	4	4 x 11	20	17,3	154,0	395,0
39034	4	5 x 11	16	18,7	192,0	485,0
39035	6	3 x 9	30	17,1	173,0	420,0
39036	6	4 x 9	25	18,4	230,0	540,0
39037	6	5 x 9	24	20,1	288,0	650,0
39038	10	3 x 7	40	22,9	288,0	810,0
39039	10	4 x 7	35	25,0	384,0	950,0

Dimensions and specifications may be changed without prior notice. (RF01)

Suitable accessories can be found in Chapter X.

• Cable tie - T-WS

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UL/CSA REELING CABLES

TROMMPUR®-H trailing, halogen-free

Technical data

- Trailing cable acc. to UL AWM Style 20235 CSA/AWM
- **Temperature range** flexing -40°C to +80°C fixed installation -50°C to +80°C
- **Nominal voltage** DIN VDE 600/1000 V UL 1000 V
- **A.c. test voltage**, 50 Hz core/core 4000 V
- **Insulation resistance** min. 20 MOhm x km
- **Speed of motion** up to 250 m/min
- **Minimum bending radius** 6x cable Ø

Cable structure

- Bare copper-conductor, to DIN VDE 0295 cl.6, extra fine-wire, BS 6360 cl.6, IEC 60228 cl.6
- Core insulation of TPE
- Core identification to DIN VDE 0293
  - up to 5 cores coloured
  - from 6 cores, black with continuous white numbering
- GN-YE conductor
- Cores stranded around support element
- Polyester fleece wrapping
- Outer sheath of PUR with integrated support braiding
- Sheath colour yellow

Properties

- PUR outer sheath, low adhesion, abrasion resistant, halogen-free, resistant to UV, oil, hydrolysis and microbial attack
- Due to the PUR outer sheath, the cable is resistant against ozone and radiation, as well as oils, greases and petrol

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

Application

Significantly smaller external diameters, smaller bending radii and reduced weights compared to NSHTÖU cables enable the use of smaller drive motors and drums, thus providing significant cost savings. Trailing cables are used for high mechanical stress, especially for applications with frequent winding and unwinding with simultaneous tensile and torsional stress, for building machinery, conveyors and lifting systems, and cranes. They are used as robust and all-weather resistant cables in the harshest operating environments in mining and in flexible handling equipment and railway motors. The cables are suitable for installation in dry, damp and wet environments, as well as outdoors.

Notes

- During installation and operation the tensile stress on the cable must not exceed 25 N/mm²
- Acceleration must not exceed 0,4 m/s²
- 1 to 2 turns should remain on the drum during operation

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

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
77144	4 G 1,5	10,2	58,0	157,0	16
77145	5 G 1,5	10,8	72,0	176,0	16
77146	7 G 1,5	12,9	101,0	245,0	16
77147	12 G 1,5	18,4	173,0	337,0	16
77148	18 G 1,5	18,6	259,0	526,0	16
77149	24 G 1,5	21,3	345,6	662,0	16
77150	30 G 1,5	24,6	432,0	901,0	16
77151	42 G 1,5	26,5	604,8	1056,0	16
77152	4 G 2,5	11,7	96,0	208,0	14
77153	5 G 2,5	12,7	120,0	263,0	14
77154	7 G 2,5	14,8	168,0	327,0	14
77155	12 G 2,5	20,4	288,0	533,0	14
77156	18 G 2,5	21,1	432,0	725,0	14
77157	24 G 2,5	24,8	576,0	988,0	14
77158	30 G 2,5	27,6	720,0	1242,0	14
77159	40 G 2,5	30,0	960,0	1500,0	14
77160	50 G 2,5	34,3	1200,0	1800,0	14

Part no.	No.cores x cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	AWG-No.
77161	4 G 4	12,5	154,0	270,0	12
77172	5 G 4	14,3	192,0	362,0	12
77162	4 G 6	16,9	230,0	409,0	10
77173	5 G 6	17,8	288,0	511,0	10
77163	4 G 10	19,6	384,0	633,0	8
77174	5 G 10	20,9	480,0	766,0	8
77164	4 G 16	23,8	614,0	936,0	6
77175	5 G 16	25,3	768,0	1170,0	6
77165	4 G 25	27,7	960,0	1485,0	4
77166	4 G 35	30,1	1344,0	2115,0	2
77167	4 G 50	35,2	1920,0	2600,0	1
77168	4 G 70	40,3	2688,0	3700,0	2/0
77169	4 G 95	50,6	3648,0	4800,0	3/0
77170	4 G 120	53,0	4608,0	5900,0	4/0
77171	4 G 150	56,0	5760,0	7100,0	300 kcmil

Dimensions and specifications may be changed without prior notice.

UL/CSA SINGLE CORES

UL-Style 1007, CSA TR 64 PVC single cores, 80°C, 300 V

Technical data

- PVC-single core to UL-Style and CSA-AWM UL-Style 1007
  CSA-AWM I A/B or TR 64
- **Temperature range**
  flexible -5°C bis +80°C
  fixed installation -30°C bis +80°C
  CSA-AWM I A/B or TR 64 +90°C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Test voltage** (Spark test)
  AWG 26-20 = 4 kV
  AWG 10-18 = 5 kV
- **Minimum bending radius**
  fixed installation 5x core Ø
  flexible 10x core Ø

Cable structure

- Stranded copper conductor, tinned to UL-Std.758 with AWG dimensions
- Core insulation of PVC
  heat and damp resistant acc. to class 43 tab.50.182 acc. to UL-Std.1581

Properties

- **Conditionally resistant to**
  Oils
  Solvents
  Acids
  Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant, test method to UL VW-1, CSA FT1

Note

- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
  00 = green
  01 = black
  02 = blue
  03 = brown
  04 = red
  05 = white
  06 = grey
  07 = violet
  08 = yellow
  09 = orange
  10 = transparent
  11 = pink
  12 = beige
  13 = green-yellow
- Due to design the constructional alternations may the possible.
- AWG 14 - AWG 10 to UL-Style 1569

Application

For the internal wiring of switchbords, electrical equipment, e. g. households, radio or televisions and control desks. Connecting wires in machines laid in protective tubes and flexible pipes and also for motors and transformators.
AWM = **A**ppliance **W**iring **M**aterial
For internal wirings for electrical equipment and control apparatus e. g. electronic assembly components.
UL = Underwriters Laboratories Inc. (USA)
CSA = **C**anadian **S**tandards **A**ssociation (Canada)
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
635xx	1 x 0,13	26	1,4	1,6	3,2
620xx	1 x 0,21	24	1,5	2,3	4,3
621xx	1 x 0,33	22	1,6	3,4	6,0
622xx	1 x 0,52	20	1,8	5,3	8,5
623xx	1 x 0,82	18	2,1	8,2	12,5

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
624xx	1 x 1,32	16	2,4	13,0	18,5
636xx	1 x 2,08	14	3,0	20,0	29,0
637xx	1 x 3,31	12	3,9	33,0	40,0
638xx	1 x 5,26	10	4,1	51,6	61,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

UL-Style 1569, CSA TR 64 PVC single cores, 105°C, 300 V

Technical data

- PVC-single core to UL-Style and CSA-AWM UL-Style 1569
  CSA-AWM I A/B or TR 64
- **Temperature range**
  flexible -5°C bis +105°C
  fixed installation -30°C bis +105°C
  CSA-AWM I A/B or TR 64 +90°C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Test voltage** (Spark test)
  AWG 26-20 = 4 kV
  AWG 10-18 = 5 kV
- **Minimum bending radius**
  fixed installation 5x core Ø
  flexing 10x core Ø

Cable structure

- Stranded copper conductor, tinned to UL-Std.758 with AWG dimensions
- Core insulation of special PVC heat and damp resistant class 43 tab.50.182 acc. to UL-Std.1581

Properties

- **Conditionally resistant to**
  Oils
  Solvents
  Acids
  Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant, test method to UL VW-1, CSA FT1

Note

- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
  00 = green
  01 = black
  02 = blue
  03 = brown
  04 = red
  05 = white
  06 = grey
  07 = violet
  08 = yellow
  09 = orange
  10 = transparent
  11 = pink
  12 = beige
  13 = green-yellow
- Due to design the constructional alternations may the possible.

Application

For the internal wiring of switchbords, electrical equipment, e. g. households, radio or televisions and control desks. Connecting wires in machines laid in protective tubes and flexible pipes and also for motors and transformators.
AWM = **A**ppliance **W**iring **M**aterial
For internal wirings for electrical equipment and control apparatus e. g. electronic assembly components.
UL = Underwriters Laboratories Inc. (USA)
CSA = **C**anadian **S**tandards **A**ssociation (Canada)
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
660xx	1 x 0,13	26	1,4	1,6	3,2
661xx	1 x 0,21	24	1,5	2,3	4,3
662xx	1 x 0,33	22	1,6	3,4	6,0
663xx	1 x 0,52	20	1,8	5,3	8,5
664xx	1 x 0,82	18	2,1	8,2	12,5

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
665xx	1 x 1,32	16	2,4	13,0	18,5
666xx	1 x 2,08	14	2,9	20,0	29,0
667xx	1 x 3,31	12	3,6	33,0	40,0
668xx	1 x 5,26	10	4,3	51,6	61,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

UL-Style 1015 PVC single core, 600 V

Technical data

- PVC-single core as per UL AWM Style 1015/ MTW and CSA-AWM/TEW
- **Temperature range**
  flexible -5°C to +105°C
  fixed installation -30°C to +105°C
- **Temperature at conductor**
  UL/CSA max. +105°C
- **Nominal voltage** 600 V
- **Test voltage** (Spark test)
  AWG 24 = 4 kV
  AWG 22 and 20 = 5 kV
  AWG 18 and 10 = 6 kV
  AWG 8 = 7,5 kV
- UL-type **AWM+MTW** 105°C 600 V
- CSA-type **AWM+TEW** 105°C 600 V
- **Minimum bending radius**
  fixed installation 5x core Ø
  flexible 10x core Ø

Cable structure

- Stranded copper conductor, tinned to UL-Std.758 with AWG dimensions
- AWG-sizes as per table below
- Core insulation of PVC
  heat and damp resistant to class 43 and CSA-C22.2 No. 210 UL VW-1 and CSA FT1, acc. to UL-Std.1581
- For structural reasons, constructive changes are possible

Properties

- **Conditionally resistant to**
  Oils
  Solvents
  Acids
  Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant, test method to UL VW-1, CSA FT1

Note

- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
  00 = green, 01 = black, 02 = blue,
  03 = brown, 04 = red, 05 = white,
  06 = grey, 07 = violet, 08 = yellow,
  09 = orange, 10 = transparent, 11 = pink,
  12 = beige, 13 = green-yellow,
  14 = blue/white, 15 = dark blue,
  27 = white/blue
  (supply up to AWG 8)

Application

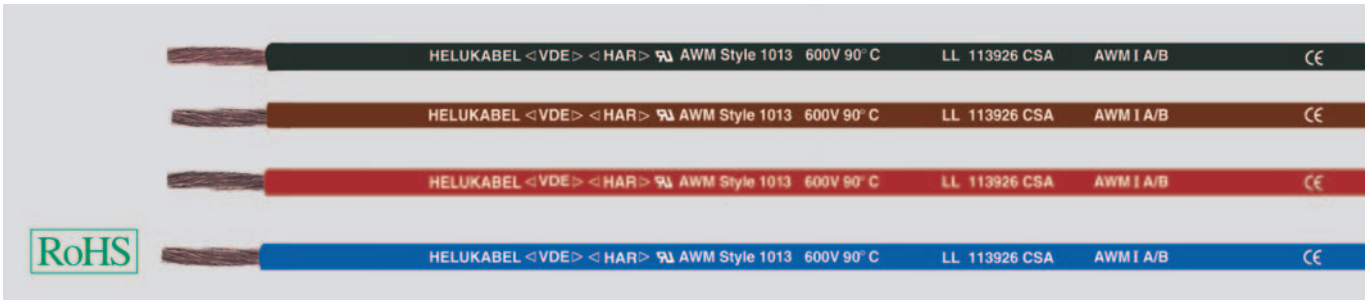
For the internal wiring of switchbords, electrical equipment, e. g. households, radio or televisions and control desks. Connecting wires in machines laid in predective tubes and flexible pipes and also for motors and transformators. UL bzw. CSA:
AWM = **A**ppliance **W**iring **M**aterial
For internal wirings for electrical equipment and control apparatus e. g. electronic assembly components.
UL-MTW: Machine Tool Wires
CSA-TEW: Equipment Lead Wires
MTW = **M**achine **T**ool **W**ire
For the electronical installation of machine tools and the relative control.
UL = **U**nderwriters **L**aboratories Inc. (USA)
CSA = **C**anadian **S**tandards **A**ssociation (Canada)
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
601xx	1 x 0,21	24	2,2	2,3	8,0
602xx	1 x 0,33	22	2,4	3,2	10,0
603xx	1 x 0,52	20	2,5	5,0	12,0
604xx	1 x 0,81	18	2,8	7,9	16,0
605xx	1 x 1,31	16	3,1	12,6	22,0
606xx	1 x 2,08	14	3,5	20,7	31,0
607xx	1 x 3,32	12	4,0	33,0	45,0
608xx	1 x 5,26	10	4,6	51,6	65,0
609xx	1 x 8,35	8	6,5	80,6	110,0
610xx	1 x 13,29	6	8,0	125,0	175,0
611xx	1 x 21,14	4	9,5	201,0	260,0
612xx	1 x 26,65	3	10,4	253,0	340,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
613xx	1 x 33,61	2	11,3	317,0	380,0
614xx	1 x 42,38	1	13,3	399,0	500,0
615xx	1 x 53,47	1/0	13,6	500,0	615,0
616xx	1 x 67,4	2/0	15,5	631,0	750,0
617xx	1 x 84,97	3/0	17,5	792,0	900,0
618xx	1 x 107,17	4/0	19,0	996,0	1070,0
62501	1 x 127	250 kcmil	21,2	1178,0	1280,0
62601	1 x 152	300 kcmil	22,4	1410,0	1518,0
62701	1 x 178	350 kcmil	25,3	1645,0	1756,0
62801	1 x 203	400 kcmil	26,0	1902,0	2002,0
62901	1 x 254	500 kcmil	28,0	2345,0	2475,0

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

THREENORM PVC single core, UL-Style 1013 and CSA 600 V



Technical data

- PVC-single cores acc. to DIN VDE 0285-525-2-31, DIN EN 50525-2-31, UL-Style 1013 and CSA, CSA-AWM I/A/B
- **Temperature range**
  H05V-K/H07V-K
  flexing +5°C to +70°C
  fixed installation -10°C to +70°C
  UL/CSA +90°C
- **Nominal voltage**
  up to 1 mm² H05V-K: U_0/U 300/500 V
  from 1,5 mm² H07V-K: U_0/U 450/750 V
  UL/CSA 600 V AC
- **Test voltage**
  H05V-K/H07V-K 2000 V
- **Test voltage** (Spark Test)
  AWG 20 = 5 kV
  > AWG 20 = 6 kV
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  fixed installation for core Ø:
  ⩽ 8 mm: 4x core Ø
  > 8-12 mm: 5x core Ø
  > 12 mm: 6x core Ø

Cable structure

- Bare copper fine wire stranded to DIN VDE 0295 cl.5, BS 6360 cl.5, IEC 60228 cl.5, acc. to UL-Std.758 resp. ASTM B 174
- Core insulation of PVC compound type TI1 to DIN VDE 0207-363-3/ DIN EN 50363-3 acc. to UL-Std.1581, class 43, CSA-C 22.2 No. 210 tab.12 class H
- Core identification to DIN VDE 0293 coloured

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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) UL-VW-1, CSA FT1

Note

- Tinned conductor on request.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- The cross-sections 0,5 mm², 0,75 mm² and 1,0 mm² are acc. to H05 V-K, the cross-sections 1,5 up to 120 mm² acc. to H07 V-K.
- **Type H05 V:**
  approved one-colour mark:
  black, blue, brown, grey, orange, pink, red, turquoise, violet, white, green and yellow.
  Two-coloured mark in any combination of the above individual colours.
- **Type H07 V:**
  approved mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white and green-yellow.
  Other marks are available as (H).

Application

Three norms approved connecting jumper wire primarily designed for exportes, used in machine tools. This wire is used for internal wiring of switchboards and electrical equipment. The approbation of HAR-UL-CSA AWM make possible an economical storekeeping and simplification of parts list.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

H05V-K

Cross-sec. mm² / 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 / 20	2,5	4,8	63815	63816	63817	63818	63819	63820	63821	63822	63823	63824	63825	63826	63827	63828	63829	63830
Part no. 0,75 / 19	2,65	7,2	63831	63832	63833	63834	63835	63836	63837	63838	63839	63840	63841	63842	63843	63844	63845	63846
Part no. 1 / 18	2,8	9,6	63847	63848	63849	63850	63851	63852	63853	63854	63855	63856	63857	63858	63859	63860	63861	63862

Continuation ▸

THREENORM PVC single core, UL-Style 1013 and CSA 600 V

H07V-K

Cross-sec. mm² / 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. 1,5 / 16	3,05	14,4	63863	63864	63865	63866	63867	63868	63869	63870	63871	63872	63873	63874	63875	63876	63877	63878
Part no. 2,5 / 14	3,6	24,0	63879	63880	63881	63882	63883	63884	63885	63886	63887	63888	63889	63890	63891	63892	63893	63894
Part no. 4 / 12	4,1	38,0	63895	63896	63897	63898	63899	63900	63901	63902	63903	63904	63905	63906	63907	63908	63909	63910
Part no. 6 / 10	4,8	58,0	63911	63912	63913	63914	63915	63916	63917	63918	63919	63920	63921	63922	63923	63924	63925	63926
Part no. 10 / 8	6,4	96,0	63927	63928	63929	63930	63931	63932	63933	63934	63935	63936	63937	63938	63939	63940	63941	63942
Part no. 16 / 6	8,1	154,0	63943	63944	63945	63946	63947	63948	63949	63950	63951	63952	63953	63954	63955	63956	63957	63958
Part no. 25 / 4	9,6	240,0	63959	63960	63961	63962	63963	63964	63965	63966	63967	63968	63969	63970	63971	63972	63973	63974
Part no. 35 / 2	10,8	336,0	63975	63976	63977	63978	63979	63980	63981	63982	63983	63984	63985	63986	63987	63988	63989	63990
Part no. 50 / 1	13,6	480,0	63991	63992	63993	63994	63995	63996	63997	63998	63999	64000	64001	64002	64003	64004	64005	64006
Part no. 70 / 2/0	15,2	672,0	64007	64008	64009	64010	64011	64012	64013	64014	64015	64016	64017	64018	64019	64020	64021	64022
Part no. 95 / 3/0	16,8	912,0	64023	64024	64025	64026	64027	64028	64029	64030	64031	64032	64033	64034	64035	64036	64037	64038
Part no. 120 / 4/0	19,5	1152,0	64039	64040	64041	64042	64043	64044	64045	64046	64047	64048	64049	64050	64051	64052	64053	64054
Part no. 150 / 300 kcmil	22,2	1440,0	64055	64056	64057	64058	64059	64060	64061	64062	64063	64064	64065	64066	64067	64068	64069	64070

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

N

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

Technical data

- PVC-single cores acc. to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31, UL-Std.1063, UL-Style 10269 and CSA-AWM I/A/B
- **Temperature range**
  H05V2-K / H07V2-K
  flexing +5°C to +90°C
  fixed installation -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 1 mm² H05V2-K: U_0/U 300/500 V
  from 1,5 mm² H07V2-K: U_0/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 MOhm x km
- **Minimum bending radius**
  fixed installation for core Ø:
  ⩽ 8 mm: 4x core Ø
  > 8-12 mm: 5x core Ø
  > 12 mm: 6x core Ø

Cable structure

- Bare copper fine wire stranded to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5, acc. to UL-Std.758
- Core insulation of PVC compound type TI3 to DIN VDE 0207-363-3/DIN EN 50363-3 CSA-C 22.2 No. 210 tab.12 class H and class 43 acc. to UL-Std.1581
- Core identification to DIN VDE 0293

Properties

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

Tests

- PVC self-extinguishing and flame retardant 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 conductor on request.
- up to = 1,0 mm² = H05V2-K, from 1,5 mm² up to 35 mm² = H07V2-K. Cross-sections up to 35 mm² is acc. to DIN VDE 0285-525-2-31. Due to this cross-section >35 mm² is the type H07V-K but with an increased heat-resistant PVC-compound TI3.
- **Type H05V:**
  approved one-colour mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white, green and yellow.
  Two-coloured mark in any combination of the above individual colours.
- **Type H07V:**
  approved mark: black, blue, brown, grey, orange, pink, red, turquoise, violet, white and green-yellow.
  Other marks are available as (H).

Application

Five norms approved connecting jumper wire primarily designed for exportes, used in machine tools. The approbation of HAR, UL-AWM, UL-MTW, CSA-AWM, CSA-Equipment-wire make possible an economical storekeeping and simplification of parts list.

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

H05V2-K

Cross-sec. mm² / 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 core, UL-Style

10269/UL-Standard 1063, 600 V, 105°C

H07V2-K

Cross-sec. mm² / 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. 1,5 / 16	3,0	14,4	64123	64124	64125	64126	64127	64128	64129	64130	64131	64132	64133	64134	64135	64136	64137	64138
Part no. 2,5 / 14	3,6	24,0	64139	64140	64141	64142	64143	64144	64145	64146	64147	64148	64149	64150	64151	64152	64153	64154
Part no. 4 / 12	4,1	38,0	64155	64156	64157	64158	64159	64160	64161	64162	64163	64164	64165	64166	64167	64168	64169	64170
Part no. 6 / 10	4,8	58,0	64171	64172	64173	64174	64175	64176	64177	64178	64179	64180	64181	64182	64183	64184	64185	64186
Part no. 10 / 8	6,4	96,0	64187	64188	64189	64190	64191	64192	64193	64194	64195	64196	64197	64198	64199	64200	64201	64202
Part no. 16 / 6	8,1	154,0	64203	64204	64205	64206	64207	64208	64209	64210	64211	64212	64213	64214	64215	64216	64217	64218
Part no. 25 / 4	9,6	240,0	64219	64220	64221	64222	64223	64224	64225	64226	64227	64228	64229	64230	64231	64232	64233	64234
Part no. 35 / 2	10,8	336,0	64235	64236	64237	64238	64239	64240	64241	64242	64243	64244	64245	64246	64247	64248	64249	64250
Part no. 50 / 1	13,6	480,0	64251	64252	64253	64254	64255	64256	64257	64258	64259	64260	64261	64262	64263	64264	64265	64266
Part no. 70 / 2/0	15,2	672,0	64267	64268	64269	64270	64271	64272	64273	64274	64275	64276	64277	64278	64279	64280	64281	64282
Part no. 95 / 3/0	16,8	912,0	64283	64284	64285	64286	64287	64288	64289	64290	64291	64292	64293	64294	64295	64296	64297	64298
Part no. 120 / 4/0	19,5	1152,0	64299	64300	64301	64302	64303	64304	64305	64306	64307	64308	64309	64310	64311	64312	64313	64314
Part no. 150 / 300 kcmil	22,2	1440,0	64315	64316	64317	64318	64319	64320	64321	64322	64323	64324	64325	64326	64327	64328	64329	64330

H05V2-K, barrel (with various capacity)

Cross-sec. mm² / 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	2,5	5,2	65402	65403	65404	65405	65406	65407	65408	65409	65413	65410	65412		65414	65411		
Part no. 0,75 / 20	2,65	7,2	65415	65416	65417	65418	65419	65420	65421	65422	65426	65423	65425		65427	65424		
Part no. 1 / 18	2,8	9,6	65428	65429	65430	65431	65432	65433	65434	65435	65439	65436	65438		65440	65437		

H07V2-K, barrel (with various capacity)

Cross-sec. mm² / 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. 1,5 / 16	3,05	14,4	65441	65442	65443	65444	65445	65446	65447	65448	65452	65449	65451		65453	65450		
Part no. 2,5 / 14	3,6	24,0	65454	65455	65456	65457	65458	65459	65460	65461	65465	65462	65464		65466	65463		
Part no. 4 / 12	4,1	38,0	65467	65468	65469	65470	65471	65472	65473	65474	65478	65475	65477		65549	65476		

H05V2-K two colour

Cross-sec. mm² / 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
app. RAL			-	-	-	-	-	-	-	-	-	-	-
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 colour

Cross-sec. mm² / 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
app. RAL			-	-	-	-	-	-	-	-	-
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 ▸

N

FIVENORM HAR-UL-CSA-AWM-MTW, PVC single core, UL-Style

10269/UL-Standard 1063, 600 V, 105°C

(H)07V2-K two colour

Cross-sec. mm² / 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
app. RAL			-	-	-	-	-	-	-	-	-	-	-
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 colour

Cross-sec. mm² / 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
app. RAL			-	-	-	-	-	-	-	-	-
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 colour, barrel (with various capacity)

Cross-sec. mm² / 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
app. RAL			-	-	-	-	-	-	-	-	-	-	-
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 colour, barrel (with various capacity)

Cross-sec. mm² / 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
app. RAL			-	-	-	-	-	-	-	-	-	-	-
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)

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

THHN/THWN 90°C, 600 V, UL listed, PVC + nylon single core

Technical data

- PVC + Nylon insulated single cores as per UL-Styles and NEC standard
- **Temperature range** as per Styles
  THHN: 90°C dry - NEC standard
  THWN: 75°C wet - NEC standard
  AWM: UL-Styles 1316 to 1321
  105°C dry
  80°C in oil
  AWM: UL-Styles 1452, 1453
  90°C dry
  80°C in oil 1000 V
  MTW: UL-Styles 1408 to 1414
  90°C dry
  80°C in oil 600 V
- **Nominal voltage** 600 V
- **Minimum bending radius**
  8x core Ø
- **Test voltage** (Spark test)
  AWG 14 to AWG 10 = 7,5 kV
  AWG 8 to AWG 2/0 = 10 kV
  AWG 3/0 to AWG 4/0 = 12,5 kV
  kcmil 250 to kcmil 500 = 15 kV
  kcmil 600 to kcmil 1000 = 17,5 kV

Cable structure

- Bare copper conductor, AWG-sizes as per given table below and ASTM B-3 and ASTM B-8
- Core insulation of PVC and Nylon-outer-sheath
- Cores colour coded, colour identification see below
- Surface of sheath printed with markings:
  14 to 1000 MCM THHN (stranded) - (size) AWG Type MTW OR THHN OR THWN 600 V OR GASOLINE AND OIL RESTSTANT II (UL) OR AWM W-51554
  14 to 10 AWG THHN (solid) - (size) AWG TYPE THHN OR THWN 600 V OR GASOLINE AND OIL RESISTANT II (UL) OR AWM

Properties

Resistant against

- Oils
- Gasoline
- Water
- Acids
- Ozone
- Lyes
- Sunlight
- Abrasion

Note

- 1 kcmil = 1000 circ mils = 0,5067 mm².
- Please complete the part number for these cables by adding the suffix for the colour required as per the list:
  0 = green
  1 = black
  2 = blue
  3 = brown
  4 = red
  5 = white
  6 = grey
  7 = yellow
  8 = orange
  9 = pink

Application

As flexible connecting cable in machines, switch and distribution cabinets, cable assemblies and for fixed indoor installation, in tubes and in cable conduits.
AWM = **A**ppliance **W**iring **M**aterial
For internal wrings for electrical equipment and control apparatus e. g. radio and televisions, electronic assembly component.
MTW = **M**achine **T**ool **W**ire
For the electronical installation of machine tools and the relative control. THW = Thermoplastic PVC-insulated building wire, Heat resistant 75°C, for Wet and dry locations, flame retardant. THHN = Thermoplastic PVC-insulated building wire, Nylon sheathed, 90°C 600 V, for dry and damp locations.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

N

Part no.	Cross-section mm²	AWG-No.	Cond. make-up n x wire Ø	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
6320x	2,08	14	19 x 0,38	3,0	20,7	25,0
6321x	3,32	12	19 x 0,48	3,4	33,0	37,0
6322x	5,26	10	19 x 0,6	4,3	51,6	60,0
6323x	8,35	8	19 x 0,75	5,5	80,6	95,0
6324x	13,39	6	19 x 0,96	6,6	125,0	143,0
6325x	21,14	4	19 x 1,19	8,4	201,0	229,0
6326x	26,65	3	19 x 1,336	9,1	253,0	282,0
6327x	33,61	2	19 x 1,5	10,0	317,0	349,0
6328x	42,38	1	19 x 1,686	11,4	399,0	449,0
6329x	53,47	1/0	19 x 1,89	12,4	500,0	557,0
6330x	67,4	2/0	19 x 2,126	13,7	631,0	691,0
6331x	84,97	3/0	19 x 2,387	15,0	792,0	861,0
6332x	107,17	4/0	19 x 2,68	16,5	996,0	1069,0

Part no.	Cross-section mm²	AWG-No.	Cond. make-up n x wire Ø	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
63331	127	250 kcmil	37 x 2,088	18,29	1178,0	1277,0
63341	152	300 kcmil	37 x 2,286	19,56	1410,0	1515,0
63351	178	350 kcmil	37 x 2,47	21,08	1645,0	1753,0
63361	203	400 kcmil	37 x 2,7	22,35	1902,0	1998,0
63371	254	500 kcmil	37 x 2,95	24,13	2345,0	2466,0
63381	304	600 kcmil	61 x 2,52	26,75	2920,0	3000,0
63391	380	750 kcmil	61 x 2,82	29,36	3658,0	3713,0
63401	507	1000 kcmil	61 x 3,25	33,27	4858,0	4796,0

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

PVC single cores according to CEI-20-22 II

Technical data

- PVC-Single Cores as per Italian standard CEI 20-22 II
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -30°C to +80°C
- **Nominal voltage**
  up to 0,35 mm² U_0/U 300/300 V
  0,5 and 0,75 mm² U_0/U 300/500 V
  from 1 mm² U_0/U 450/750 V
- **Test voltage** 2500 V
- **Minimum bending radius**
  fixed installation for core Ø:
  ⩽ 8 mm: 4x core Ø
  > 8-12 mm: 5x core Ø
  > 12 mm: 6x core Ø

Cable structure

- Bare fine wire stranded copper conductor to CEI 20-29 cl.5
- Core insulation of PVC
  R 2 up to CEI 20 II, cap. VI cl. 3

Properties

- Low smoke
- **Resistant to**
  Oil
  Solvents
  Acids
  Lyes
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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)

Note

- AWG sizes are approximate equivalent values. The actual cross-section is in mm².

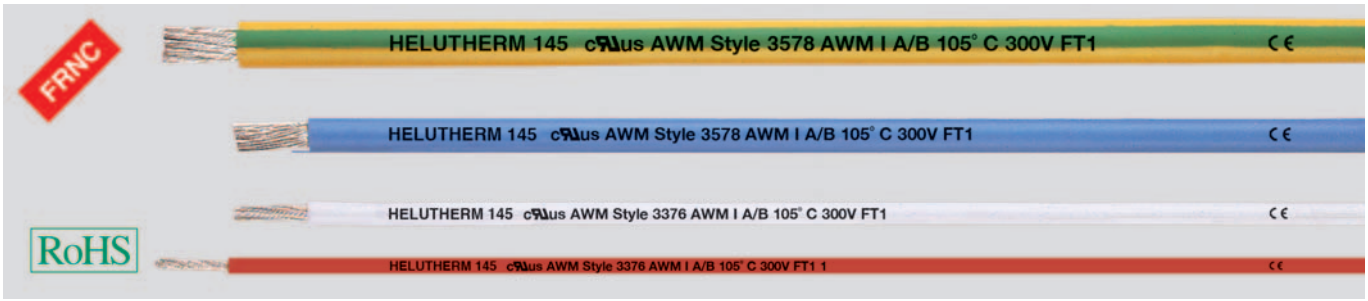
Application

As hook up wire, control cabinet building, in cable assembly manufacturing as well as in electronic applications.
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

Cross-section mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	BK	GN-YE	BU	BN	RD	WH	D-BU	o.col.
app. RAL				9005	-	5015	8003	3000	1013	5010	-
Part no.				29600	29601	29602	29603	29604	29605	29606	29607
0,35	1,5	2,5	3,6	-	-	-	-	-	-	-	-
Part no.				29608	29609	29610	29611	29612	29613	29614	29615
0,5	2,6	4,8	6,0	20	20	20	20	20	20	20	20
Part no.				29616	29617	29618	29619	29620	29621	29622	29623
0,75	2,8	7,2	10,0	18	18	18	18	18	18	18	18
Part no.				29624	29625	29626	29627	29628	29629	29630	29631
1	3,2	9,6	16,0	17	17	17	17	17	17	17	17
Part no.				29632	29633	29634	29635	29636	29637	29638	29639
1,5	3,5	14,4	21,0	16	16	16	16	16	16	16	16
Part no.				29640	29641	29642	29643	29644	29645	29646	29647
2,5	4,2	24,0	32,0	14	14	14	14	14	14	14	14
Part no.				29648	29649	29650	29651	29652	29653	29654	29655
4	4,6	38,0	48,0	12	12	12	12	12	12	12	12
Part no.				29656	29657	29658	29659	29660	29661	29662	29663
6	6,3	58,0	69,0	10	10	10	10	10	10	10	10
Part no.				29664	29665	29666	29667	29668	29669	29670	29671
10	7,6	96,0	117,0	8	8	8	8	8	8	8	8
Part no.				29672	29673	29674	29675	29676	29677	29678	29679
16	8,8	154,0	180,0	6	6	6	6	6	6	6	6
Part no.				29680	29681	29682	29683	29684	29685	29686	29687
25	11,0	240,0	266,0	4	4	4	4	4	4	4	4
Part no.				29688	29689	29690	29691	29692	29693	29694	29695
35	12,5	336,0	366,0	2	2	2	2	2	2	2	2
Part no.				29696	29697	29698	29699	29700	29701	29702	29703
50	14,5	480,0	515,0	1	1	1	1	1	1	1	1
Part no.				29704	29705	29706	29707	29708	29709	29710	29711
70	16,5	672,0	741,0	2/0	2/0	2/0	2/0	2/0	2/0	2/0	2/0
Part no.				29712	29713	29714	29715	29716	29717	29718	29719
95	18,5	912,0	950,0	3/0	3/0	3/0	3/0	3/0	3/0	3/0	3/0
Part no.				29720	29721	29722	29723	29724	29725	29726	29727
120	21,0	1152,0	1230,0	4/0	4/0	4/0	4/0	4/0	4/0	4/0	4/0
Part no.				29728	29729	29730	29731	29732	29733	29734	29735
150	23,0	1440,0	1500,0	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil	300 kcmil

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

HELUTHERM® 145 300 V, flexible single core, cross-linked, halogen-free



Technical data

- Halogen-free single cores with increased heat resistance acc. to
  UL-Style 3376 (AWG 24 - AWG 16)
  UL-Style 3578 (AWG 14 - AWG 10)
  CSA C22.2 No. 210
- **Temperature range**
  flexing -35°C to +120°C
  fixed installation -55°C to +145°C
  UL/CSA
  flexing -35°C to +105°C
  fixed installation - 55°C to +105°C
- **Nominal voltage** 300 V
- **Test voltage** 2000 V
- **Minimum bending radius**
  flexing 12,5x core Ø
  fixed installation 4x core Ø
- **Caloric load values**
  see Technical Informations
- **Power ratings table**
  see Technical Informations
- **Approval**
  Germanischer Lloyd

Cable structure

- Tinned Cu wires, acc. to AWG-sizes
  Conductor make-up:
  AWG 24 to AWG 14 = 19-wires
  AWG 12 = 65-wires
  AWG 10 = 105-wires
- Core insulation of polyolefin-copolymer, cross-linked
- Core colours see table below

Tests

- Flame test acc. to
  DIN VDE 0482-332-3, BS 4066 part 3,
  DIN EN 60332-3, IEC 60332-3 (previously DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases acc. to DIN VDE 0482 part 267,
  DIN EN 50267-2-2, IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free acc. to
  DIN VDE 0482 part 267,
  DIN EN 50267-2-1, IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density acc. to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2, IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)

Properties

- Halogen-free
- Lower propagation of fire
- Low development of smoke and fumes
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Thermal class B
- These single-core cables are resistant to melting, even when in contact with a soldering iron at temperatures of between 300°C and 380°C, because of the electron-beam cross-linking for the insulation material
- Due to the high temperature profile the cross-section of conductor can under certain circumstances be reduced, hereby enabling a saving in space requirement and weight
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

These temperature resistant single-core cables are used for the internal wiring of lighting fixtures, heaters, electrical machinery, switching systems and distributors in equipment and plant and machinery, suitable for installation on, in and beneath plaster, in closed installation ducts, as well as for traffic systems and outdoor applications. These cables are not approved for direct routing on racks, gutters or tanks. These halogen-free single core cables are characterised by their amazingly hight long-time resistance to temperature and feature among the leading halogen-free. Flame resistant products in the world.

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

N

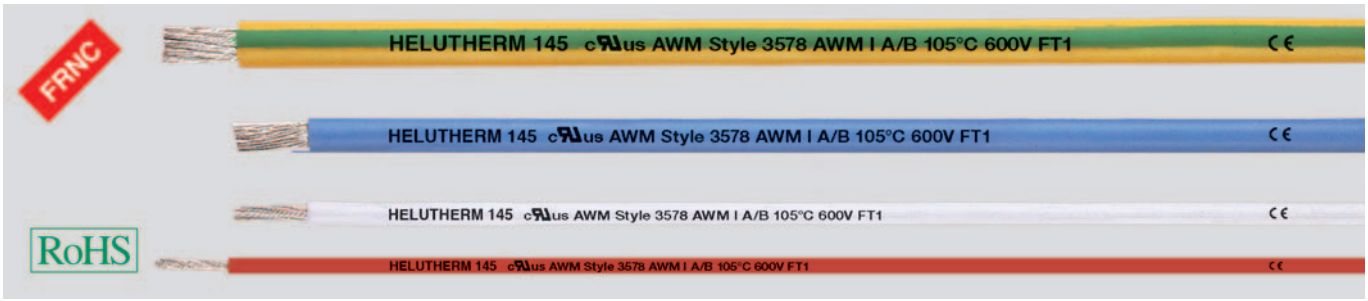
AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	BK	GN-YE	BU	BN	RD	WH	GY	VT	YE	PK	GN	OG	BEIGE	2-col.
Part no. 24	1,5	2,3	4,0	61817	61816	61818	61819	61820	61821	61822	61823	61824	59339	61826	61825	61828	61829
Part no. 22	1,6	3,2	6,0	61831	61830	61832	61833	61834	61835	61836	61837	61838	61841	61840	61839	61842	61843
Part no. 20	1,9	5,0	9,0	61845	61844	61846	61847	61848	61849	61850	61851	61852	61855	61854	61853	61856	61857
Part no. 18	2,1	7,9	12,0	61859	61858	61860	61861	61862	61863	61864	61865	61866	61869	61868	61867	61870	61871
Part no. 16	2,4	12,6	16,0	61873	61872	61874	61875	61876	61877	61878	61879	61880	61883	61882	61881	61884	61885
Part no. 14	3,5	20,7	27,0	61887	61886	61888	61889	61890	61891	61892	61893	61894	61897	61896	61895	61898	61899
Part no. 12	4,2	33,0	36,0	61901	61900	61902	61903	61904	61905	61906	61907	61908	61911	61910	61909	61912	61913
Part no. 10	4,8	51,6	58,0	61915	61914	61916	61917	61918	61919	61920	61921	61922	61925	61924	61923	61926	61927

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

HELUTHERM® 145 600 V, flexible single core, cross-linked, halogen-free



Technical data

- Halogen-free single cores with increased heat resistance acc. to **UL Style 3578 CSA C22.2 No. 210**
- **Temperature range**
  flexing -35°C to +120°C
  fixed installation -55°C to +145°C
  UL/CSA
  flexing -35°C to +105°C
  fixed installation -55°C to +105°C
- **Nominal voltage** 600 V
- **Test voltage** 3000 V
- **Minimum bending radius**
  flexing 12,5x core Ø
  fixed installation 4x core Ø
- **Caloric load values**
  see Technical Informations
- **Power ratings table**
  see Technical Informations
- **Approval**
  Germanischer Lloyd

Cable structure

- Tinned Cu wires, acc. to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of cross-linked polyolefin-copolymer
- Core colours see table below

Tests

- Flame test acc. to DIN VDE 0482-332-3-22, BS 4066 part 3, DIN EN 60332-3-22, IEC 60332-3-22 (previously DIN VDE 0472 part 804 test method C)
- Corrosiveness of combustion gases acc. to DIN VDE 0482 part 267, DIN EN 50267-2-2, IEC 60754-2 (equivalent DIN VDE 0472 part 813)
- Halogen-free acc. to DIN VDE 0482 part 267, DIN EN 50267-2-1, IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- Smoke density acc. to DIN VDE 0482 part 1034-1+2, DIN EN 61034-1+2, IEC 61034-1+2, BS 7622 part 1+2 (previously DIN VDE 0472 part 816)

Properties

- Halogen-free
- Lower propagation of fire
- Low development of smoke and fumes
- Good abrasion and notch resistance
- Good resistance to oils and weathering
- Resistant to UV radiation and ozone
- Resistant to soldering temperatures
- Resistant to melting, even when in contact with a soldering iron at temperatures of between 300°C and 380°C, because of the cross-linking for the insulation material
- Due to the high temperature profile the cross-section of conductor can under certain circumstances be reduced, hereby enabling a saving in space requirement and weight
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Application

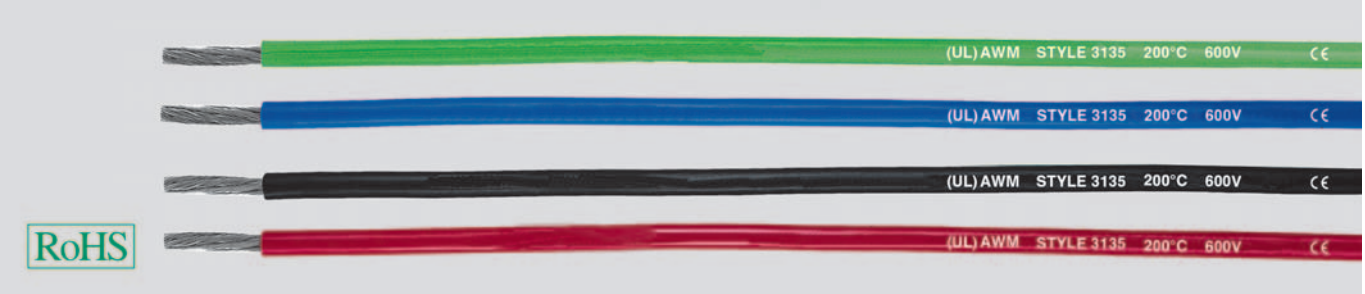
These temperature resistant single-core cables are used for the internal wiring of lighting fixtures, heaters, electrical machinery, switching systems and distributors in equipment and plant and machinery, suitable for installation on, in and beneath plaster, in closed installation ducts, as well as for traffic systems and outdoor applications. These cables are not approved for direct routing on racks, gutters or tanks. These halogen-free single core cables are characterised by their amazingly high long-time resistance to temperature and feature among the leading halogen-free, flame resistant products in the world.

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

Cross-sec. mm²	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	BK	GN-YE	BU	BN	RD	WH	GY	VT	YE	PK	GN	OG	BEIGE	2-col.
Part no. 0,25	2,3	2,4	7,0	59473	59472	59474	59475	59476	59477	59478	59479	59480	59483	59482	59481	59484	59485
Part no. 0,5	2,6	4,8	11,0	59487	59486	59488	59489	59490	59491	59492	59493	59494	59497	59496	59495	59498	59499
Part no. 0,75	2,8	7,2	14,0	59501	59500	59502	59503	59504	59505	59506	59507	59508	59511	59510	59509	59512	59513
Part no. 1	2,9	9,6	17,0	59515	59514	59516	59517	59518	59519	59520	59521	59522	59525	59524	59523	59526	59527
Part no. 1,5	3,2	14,4	22,0	59529	59528	59530	59531	59532	59533	59534	59535	59536	59539	59538	59537	59540	59541
Part no. 2,5	3,7	24,0	33,0	59543	59542	59544	59545	59546	59547	59548	59549	59550	59553	59552	59551	59554	59555
Part no. 4	4,2	38,4	53,0	59557	59556	59558	59559	59560	59561	59562	59563	59564	59567	59566	59565	59568	59569
Part no. 6	5,0	57,6	78,0	59571	59570	59572	59573	59574	59575	59576	59577	59578	59581	59580	59579	59582	59583
Part no. 10	6,4	96,0	136,0	59585	59584	59586	59587	59588	59589	59590	59591	59592	59595	59594	59593	59596	59597
Part no. 16	8,5	154,0	203,0	59599	59598	59600	59601	59602	59603	59604	59605	59606	59609	59608	59607	59610	59611
Part no. 25	10,4	240,0	300,0	59613	59612	59614	59615	59616	59617	59618	59619	59620	59623	59622	59621	59624	59625
Part no. 35	11,5	336,0	405,0	59627	59626	59628	59629	59630	59631	59632	59633	59634	59637	59636	59635	59638	59639
Part no. 50	14,4	480,0	580,0	59641	59640	59642	59643	59644	59645	59646	59647	59648	59651	59650	59649	59652	59653

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

UL-Style 3135 silicone single core, 600 V / 200°C, halogen-free



Technical data

- Silicon single cores acc. to UL-Std.758 Style 3135
- **Temperature range** -60°C to +200°C
- **Nominal voltage** 600 V
- **Test voltage** 2000 V
- **Breakdown voltage** min. 5000 V
- **Minimum bending radius** 15x core Ø

Cable structure

- Tinned copper conductors
- Stranded see table below
- Core insulation of Silicon
- Core colours see below

Properties

- Halogen-free acc. to VDE 0482 part 267/ DIN EN 50267-2-1/IEC 60754-1 (equivalent DIN VDE 0472 part 815)
- **Resistant to**
  High molecular oils
  fats from vegetables and animals
  alcohols
  plasticizers and clophenes
  diluted acids
  lyes and salt dissolution
  oxidation substances
  tropical influences and weather
  lake water
  oxygen
  ozone

Note

- Additional sizes on request.

Application

UL-approved single cores for use in high, temperature areas. They are used mainly in the steel producing industries, in aviation industries as well as in ship building, cement, glas and ceramic factories
AWM = **A**ppliance **W**iring **M**aterial
For internal wirings for electrical equipment and control apparatus e. g. electronic assembly components
CE= The product is conformed with the EC Low-Voltage Directive 2006/95/EC.

AWG-No.	Conductor construction	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km	BK	BU	BN	RD	WH	GY	VT	GN
Part no. 24	1 x 0,5	2,1	1,9	6,3	47021 o. r.	47022 o. r.	47023 o. r.	47024 o. r.	47025 o. r.	47026 o. r.	47027 o. r.	47076 o. r.
Part no. 22	3 x 0,4	2,4	3,6	9,2	47028 o. r.	47029 o. r.	47030 o. r.	47031 o. r.	47032 o. r.	47033 o. r.	47034 o. r.	47071 o. r.
Part no. 20	5 x 0,4	2,6	6,0	12,3	47035 o. r.	47036 o. r.	47037 o. r.	47038 o. r.	47039 o. r.	47040 o. r.	47041 o. r.	47072 o. r.
Part no. 18	7 x 0,4	2,8	8,6	15,5	47042 o. r.	47043 o. r.	47044 o. r.	47045 o. r.	47046 o. r.	47047 o. r.	47048 o. r.	47073 o. r.
Part no. 16	11 x 0,4	3,0	13,3	21,0	47049 o. r.	47050 o. r.	47051 o. r.	47052 o. r.	47053 o. r.	47054 o. r.	47055 o. r.	47074 o. r.
Part no. 14	17 x 0,4	3,4	20,5	29,7	47056 o. r.	47057 o. r.	47058 o. r.	47059 o. r.	47060 o. r.	47061 o. r.	47062 o. r.	47075 o. r.
Part no. 12	27 x 0,4	3,8	32,6	43,2	47063 o. r.	47064 o. r.	47065 o. r.	47066 o. r.	47067 o. r.	47068 o. r.	47069 o. r.	47070 o. r.

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

Single 600-J/-O special single core cable, 600 V, meter marking

Technical data

- Special PVC single core acc. to UL-Style 10107 and CSA AWM I/II A/B, adapted to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31, DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, acc. to UL-Std.758
- **Temperature range** flexing -5°C bis +90°C fixed installation -40°C bis +90°C
- **Permissible operating temperature** max. +90°C at conductor
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core insulation of special PVC compound type TM2 to DIN VDE 0207-363-3/ DIN EN 50363-3 and class 43 acc. to UL-Std.1581 colour black or green-yellow
- Outer sheath of special PVC compound type TM2 to DIN VDE 0207-363-4-1/ DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Chemical Resistance - see table Technical informations

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- UV-resistant

Note

- G = with green-yellow conductor x = without green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **Single 600-CY -J/-O**, confer page 499
- also as 1000 V Style 10678 deliverable

Application

PVC Single cores suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation). Is not suitable to be used as direct burrial- or as underwater cable. These two norms approved single cores designed for exportorientated machinery manufacturer for machine tools, conveyor belts and production lines.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Core colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
10881	1 G 6	10	green-yellow	7,8	58,0	118,0
10882	1 x 6	10	black	7,8	58,0	118,0
10883	1 G 10	8	green-yellow	9,0	96,0	180,0
10884	1 x 10	8	black	9,0	96,0	180,0
10885	1 G 16	6	green-yellow	10,0	154,0	250,0
10886	1 x 16	6	black	10,0	154,0	250,0
10887	1 G 25	4	green-yellow	11,5	240,0	370,0
10888	1 x 25	4	black	11,5	240,0	370,0
10889	1 G 35	2	green-yellow	13,0	336,0	490,0
10890	1 x 35	2	black	13,0	336,0	490,0
10891	1 G 50	1	green-yellow	15,6	480,0	665,0
10892	1 x 50	1	black	15,6	480,0	665,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Core colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
10893	1 G 70	2/0	green-yellow	17,9	672,0	910,0
10894	1 x 70	2/0	black	17,9	672,0	910,0
10895	1 G 95	3/0	green-yellow	19,5	912,0	1195,0
10896	1 x 95	3/0	black	19,5	912,0	1195,0
10897	1 G 120	4/0	green-yellow	22,3	1152,0	1545,0
10898	1 x 120	4/0	black	22,3	1152,0	1545,0
10899	1 G 150	250 kcmil	green-yellow	25,0	1440,0	1750,0
10900	1 x 150	250 kcmil	black	25,0	1440,0	1750,0
10901	1 G 185	350 kcmil	green-yellow	28,6	1776,0	2320,0
10902	1 x 185	350 kcmil	black	28,6	1776,0	2320,0
10903	1 G 240	450 kcmil	green-yellow	31,4	2304,0	2960,0
10904	1 x 240	450 kcmil	black	31,4	2304,0	2960,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

Single 600-CY -J/-O special single core cable, 600 V, Cu-screened, EMC-preferred type, meter marking

Technical data

- Special PVC single cores acc. to UL-Style 10107 and CSA AWM I/II A/B, adapted to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31, DIN VDE 0285-525-2-51/ DIN EN 50525-2-51, acc. to UL-Std.758
- **Temperature range** flexing -5°C bis +90°C fixed installation -40°C bis +90°C
- **Permissible operating temperature** max. +90°C at conductor
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 4x cable Ø
- **Coupling resistance** max. 250 Ohm/km
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, fine wire conductors, to DIN VDE 0295 cl.5, BS 6360 cl.5 and IEC 60228 cl.5
- Core isulation of special PVC compound type TI2 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43 acc. to UL-Std.1581 colour black or green-yellow
- Tinned copper braided screening, coverage approx. 85%
- Outer sheath special PVC compound type TM2 to DIN VDE 0207-363-4-1 / DIN EN 50363-4-1 and class 43 acc. to UL-Std.1581
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Chemical Resistance - see table Technical Informations
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- UV-resistant

Note

- G = with green-yellow conductor x = without green-yellow conductor
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **Single 600-J/-O**, confer page 498
- also as 1000 V Style 10678 deliverable

Application

PVC single cores suitable for installation for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms as well as outside (fixed installation). Is not suitable to be used as direct burrial-or as underwater cable. These two norms approved single cores designed for exportorientated machinery manufacturer for machine tools, conveyor belts and production lines. These screened cables are particulary suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibillity).

EMC = Electromagnetic compatibillity

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. mm²	AWG-No.	Core colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
10910	1 G 6	10	green-yellow	7,6	72,0	140,0
10911	1 x 6	10	black	7,6	72,0	140,0
10912	1 G 10	8	green-yellow	9,4	130,0	230,0
10913	1 x 10	8	black	9,4	130,0	230,0
10914	1 G 16	6	green-yellow	10,4	190,0	300,0
10915	1 x 16	6	black	10,4	190,0	300,0
10916	1 G 25	4	green-yellow	12,0	260,0	420,0
10917	1 x 25	4	black	12,0	260,0	420,0
10918	1 G 35	2	green-yellow	14,4	405,0	615,0
10919	1 x 35	2	black	14,4	405,0	615,0
10920	1 G 50	1	green-yellow	16,4	560,0	825,0
10921	1 x 50	1	black	16,4	560,0	825,0

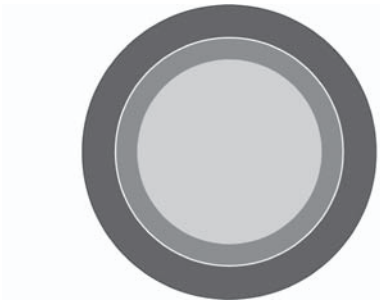
Part no.	No.cores x cross-sec. mm²	AWG-No.	Core colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
10922	1 G 70	2/0	green-yellow	17,4	780,0	1090,0
10923	1 x 70	2/0	black	17,4	780,0	1090,0
10924	1 G 95	3/0	green-yellow	20,1	1030,0	1395,0
10925	1 x 95	3/0	black	20,1	1030,0	1395,0
10926	1 G 120	4/0	green-yellow	23,0	1285,0	1770,0
10927	1 x 120	4/0	black	23,0	1285,0	1770,0
10928	1 G 150	250 kcmil	green-yellow	26,1	1570,0	1930,0
10929	1 x 150	250 kcmil	black	26,1	1570,0	1930,0
10930	1 G 185	350 kcmil	green-yellow	29,3	1940,0	2635,0
10931	1 x 185	350 kcmil	black	29,3	1940,0	2635,0
10932	1 G 240	450 kcmil	green-yellow	32,2	2530,0	3380,0
10933	1 x 240	450 kcmil	black	32,2	2530,0	3380,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

TOPFLEX® 302 / 302-UL very high flexible PVC single core double insulated 0,6/1kV



Technical data

TOPFLEX® 302

- Special PVC single-core cable with double insulation flexible at low temperatures
- **Temperature range**
  flexing -15°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  U_0/U 600/1000 V
- **A.C. test voltage**, 50 Hz
  3000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  for flexible installation
  5x cable Ø

TOPFLEX® 302-UL

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

Cable structure

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl.6 and IEC 60228 cl.6
- PVC insulation flexible at low temperatures, natural colour
- PVC sheath compound TM2 flexible at low temperatures
- Sheath colour black

Properties

- Sheath UV-resistant
- PVC self-extinguishing and flame retardant 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 table Technical Information
- The cable is permissible for overvoltage category II

Application

These cables are specially designed for use as connecting cables on sliding contacts for current collectors, and also for use in energy supply chains, automatic handling devices, robots, machine tools, machining and processing equipment, and nearly any area requiring flexible used and free motion.

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

TOPFLEX® 302 without UL-approval

Part no.	No.cores x cross-sec. mm²	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.cores x cross-sec. mm²	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.

Single 602-RC -J/O special single core cable for drag chains, 90°C, 600 V, meter marking

Technical data

- Special PVC single core acc. to UL-Style 10107 and CSA AWM I/II AB, core acc. to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31 (except 300 mm²)
- **Temperature range** flexing -5°C to +90°C fixed installation -40°C to +90°C
- **Permissible operating temperature** max. +90°C at conductor
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** flexing 7,5x cable Ø fixed installation 3x cable Ø
- **Radiation resistance** up to 80x10⁶ cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6 and IEC 60228 cl.6, however by 185 mm² up to 300 mm² with reduced single wire-Ø, max. 0,30 mm
- Core insulation of special PVC compound type TI3 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43, 90°C acc. to UL-Std.1581 colour black or green-yellow
- Outer sheath special PVC compound type YM5 to DIN VDE 0207 part 5 and class 43, 90°C acc. to UL-Std.1581
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Chemical Resistance - see table Technical Informations
- Resistant to mineral oils, synthetic oils and lubricating coolants.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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) UL VW-1, CSA FT1
- Acc.to UL-Style 10107/ UL-Std.1581, CSA C22.2 No 210

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- 300 mm² in adaption
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type: **Single 602-RC-CY-J/O**, confer page 502

Application

High flexible special single core cable for drag chains are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These two-norm cables primarily designed for exportorientated machinery manufacturer for flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. For applications which go beyond standard solutions (for example for composting appliances or high shelf conveyors with extremely high processing speeds etc.) we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

RC = Robotics Cable

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Core colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69601	1 G 10	8	green-yellow	9,4	96,0	180,0
69602	1 x 10	8	black	9,4	96,0	180,0
69603	1 G 16	6	green-yellow	10,5	154,0	250,0
69604	1 x 16	6	black	10,5	154,0	250,0
69605	1 G 25	4	green-yellow	11,6	240,0	370,0
69606	1 x 25	4	black	11,6	240,0	370,0
69607	1 G 35	2	green-yellow	14,5	336,0	490,0
69608	1 x 35	2	black	14,5	336,0	490,0
69609	1 G 50	1	green-yellow	16,6	480,0	665,0
69610	1 x 50	1	black	16,6	480,0	665,0
69611	1 G 70	2/0	green-yellow	18,4	672,0	910,0
69612	1 x 70	2/0	black	18,4	672,0	910,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Core colour	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69613	1 G 95	3/0	green-yellow	20,5	912,0	1195,0
69614	1 x 95	3/0	black	20,5	912,0	1195,0
69615	1 G 120	4/0	green-yellow	23,0	1152,0	1545,0
69616	1 x 120	4/0	black	23,0	1152,0	1545,0
69617	1 G 150	250 kcmil	green-yellow	25,2	1440,0	1750,0
69618	1 x 150	250 kcmil	black	25,2	1440,0	1750,0
69619	1 G 185	350 kcmil	green-yellow	29,0	1776,0	2320,0
69620	1 x 185	350 kcmil	black	29,0	1776,0	2320,0
69621	1 G 240	450 kcmil	green-yellow	32,5	2304,0	2960,0
69622	1 x 240	450 kcmil	black	32,5	2304,0	2960,0
69623	1 G 300	550 kcmil	green-yellow	35,4	2880,0	3550,0
69624	1 x 300	550 kcmil	black	35,4	2880,0	3550,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

Single 602-RC -CY -J/O special single core cable

for drag chains, 90°C, 600 V, EMC-preferred type, meter marking

Technical data

- Special PVC single core cable acc. to UL-Style 10107 and CSA AWM I/II A/B, core acc. to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31 (except 300 mm²)
- **Temperature range**
  flexing -5°C to +90°C
  fixed installation -40°C to +90°C
- **Permissible operating temperature**
  max. +90°C at conductor
- **Nominal voltage**
  VDE U_0/U 600/1000 V
  UL/CSA 600 V
- **Test voltage** 4000 V
- **Breakdown voltage** min. 8000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  flexing 7,5x cable Ø
  fixed installation 3x cable Ø
- **Coupling resistance**
  max. 250 Ohm/km
- **Radiation resistance**
  up to 80x10^6 cJ/kg (up to 80 Mrad)

Cable structure

- Bare copper, extra fine wire conductors, to DIN VDE 0295 cl.6, col. 4, BS 6360 cl.6 and IEC 60228 cl.6, however by 185 mm² up to 300 mm² with reduced single wire-Ø, max. 0,30 mm
- Core insulation of special PVC compound type TI3 to DIN VDE 0207-363-3 / DIN EN 50363-3 and class 43, 90°C acc. to UL-Std.1581 colour black or green-yellow
- Tinned copper braided screening, coverage approx. 80%
- Outer sheath special PVC compound type YM5 to DIN VDE 0207 part 5 and class 43, 90°C acc. to UL-Std.1581
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Chemical Resistance - see table Technical Informations
- Resistant to mineral oils, synthetic oils and lubricating coolants.
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Tests

- PVC self-extinguishing and flame retardant 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), UL VW-1, CSA FT1
- Acc.to UL-Style 10107/ UL-Std.1581, CSA C22.2 No 210

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- 300 mm² in adaption
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- non screened analogue type:
  Single 602-RC-J/O, confer page 501

Application

High flexible special single core screened cables for drag chains are used for flexible use for medium mechanical stresses with free movement without tensile stress or forced movements in dry, moist and wet rooms. These two-norm cables primarily designed for exportorientated machinery manufacturer for flexible applications in machineries, machine tools, robot technics, for movable automated machinery parts. These screened cables are particulary suitable for the interference-free transmission in instrumentation and control engineering applications (electromagnetic compatibillity). For applications which go beyond standard solutions we recommend for our especially developed enquiry sheet for energy guiding systems. Before installation in cable trays please read the instructions. Further technical details see selection table for drag chain cables, see lead text.

EMC = Electromagnetic compatibillity

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

RC = Robotics Cable

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69631	1 G 10	8	10,0	130,0	230,0
69632	1 x 10	8	10,0	130,0	230,0
69633	1 G 16	6	11,1	190,0	300,0
69634	1 x 16	6	11,1	190,0	300,0
69635	1 G 25	4	12,3	260,0	420,0
69636	1 x 25	4	12,3	260,0	420,0
69637	1 G 35	2	15,1	405,0	615,0
69638	1 x 35	2	15,1	405,0	615,0
69639	1 G 50	1	17,2	560,0	825,0
69640	1 x 50	1	17,2	560,0	825,0
69641	1 G 70	2/0	19,0	780,0	1090,0
69642	1 x 70	2/0	19,0	780,0	1090,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
69643	1 G 95	3/0	22,0	1030,0	1395,0
69644	1 x 95	3/0	22,0	1030,0	1395,0
69645	1 G 120	4/0	23,6	1285,0	1770,0
69646	1 x 120	4/0	23,6	1285,0	1770,0
69647	1 G 150	250 kcmil	25,8	1570,0	1930,0
69648	1 x 150	250 kcmil	25,8	1570,0	1930,0
69649	1 G 185	350 kcmil	29,8	1940,0	2635,0
69650	1 x 185	350 kcmil	29,8	1940,0	2635,0
69651	1 G 240	450 kcmil	33,5	2530,0	3380,0
69652	1 x 240	450 kcmil	33,5	2530,0	3380,0
69653	1 G 300	550 kcmil	36,2	3140,0	4120,0
69654	1 x 300	550 kcmil	36,2	3140,0	4120,0

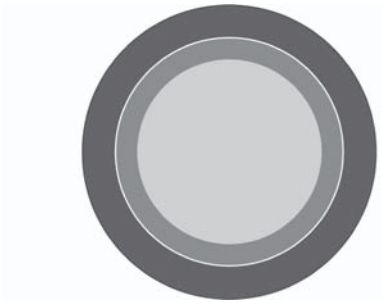
Dimensions and specifications may be changed without prior notice. (RN06)

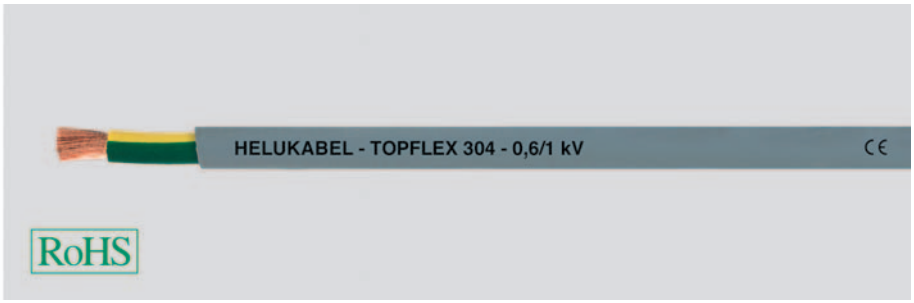
Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

TOPFLEX® 304 / 304-C unscreened (double insulated)/ screened

high flexible PVC single core 0,6/1kV for drag chain application





Technical data

- Special PVC single-core cable
- **Temperature range**
  flexing -5°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  U_0/U 600/1000 V
- **A.c. test voltage**, 50 Hz
  3000 V
- **Insulation resistance**
  min. 20 MOhm x km
- **Minimum bending radius**
  for flexible installation
  5x cable Ø

Cable structure

TOPFLEX® 304

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl.6 and IEC 60228 cl.6
- PVC insulation, green-yellow
- PVC sheath compound TM2
- Sheath colour grey

TOPFLEX® 304-C

- Construction as above, but
- Tinned copper braid, coverage approx. 85%

Properties

- PVC self-extinguishing and flame retardant 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 table Technical Information

Application

Thanks to their outstanding alternating bending stress characteristics, these cables are ideally suited for use in drag chains, and also for use in handling devices, robots, and nearly any area requiring flexible used and free motion.

TOPFLEX® 304-C Optimum compliance with requirements for electromagnetic compatibillity (EMC) by approx. 85% coverage from the braided screen.

EMC = Electromagnetic compatibillity

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.

TOPFLEX® 304

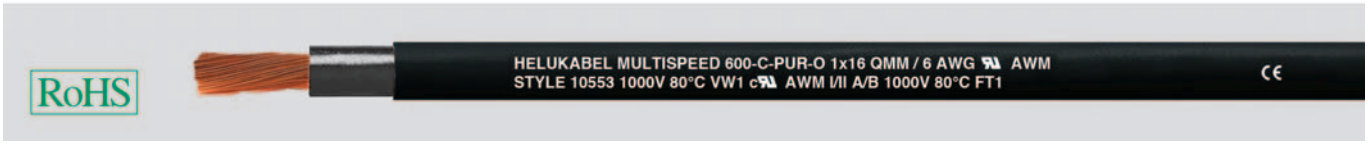
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
79639	1 G 2,5	14	4,5	24,0	42,0
79640	1 G 4	12	5,6	38,4	58,0
79641	1 G 6	10	6,1	57,6	85,0
71544	1 G 10	8	8,0	96,0	130,0
79642	1 G 16	6	9,8	154,0	190,0
79643	1 G 25	4	11,8	240,0	280,0
79644	1 G 35	2	12,9	336,0	400,0
79645	1 G 50	1	14,6	480,0	520,0
79646	1 G 70	2/0	17,5	672,0	720,0
79647	1 G 95	3/0	20,0	912,0	1050,0
79648	1 G 120	4/0	21,6	1152,0	1220,0
79649	1 G 150	300 kcmil	23,5	1440,0	1500,0
79650	1 G 185	350 kcmil	25,7	1776,0	1940,0
79651	1 G 240	500 kcmil	29,5	2304,0	2675,0
79652	1 G 300	600 kcmil	32,5	2880,0	3300,0

TOPFLEX® 304C

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
79653	1 G 2,5	14	5,9	40,0	55,0
79654	1 G 4	12	6,5	50,0	75,0
79655	1 G 6	10	8,3	88,0	125,0
79656	1 G 10	8	8,7	124,0	170,0
79657	1 G 16	6	10,3	190,0	300,0
79658	1 G 25	4	12,4	260,0	420,0
79659	1 G 35	2	13,7	405,0	620,0
79660	1 G 50	1	15,4	560,0	825,0
79661	1 G 70	2/0	17,5	780,0	1090,0
79662	1 G 95	3/0	21,0	1030,0	1395,0
79685	1 G 120	4/0	22,4	1311,0	1770,0
79663	1 G 150	300 kcmil	24,3	1527,0	1930,0
79664	1 G 185	350 kcmil	26,5	1940,0	2635,0
79665	1 G 240	500 kcmil	30,3	2530,0	3380,0
79666	1 G 300	600 kcmil	35,0	3050,0	3500,0

Dimensions and specifications may be changed without prior notice.

MULTISPEED® 600-PUR -J/-O special single cores for drag chains, 1000 V, halogen-free, meter marking



Technical data

- Special drag chain core line for extreme mechanical stresses adapted to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31 and UL style 10553
- **Temperature range**
  flexing -30°C to +80°C
  fixed installation -40°C to +80°C
- **Nominal voltage**
  VDE U_0/U 600/1000 V
  UL/CSA 1000 V
  Test voltage 3000 V
- **Insulation resistance**
  min. 100 MOhm x km
- **Minimum bending radius**
  flexing 5x core Ø
  fixed installation 3x core Ø

Cable structure

- Bare copper conductor, ultra-fine wire to DIN VDE 0295 cl.6, column 4, BS 6360 cl.6 and/or IEC 60228 cl.6
- Core insulation of thermoplastic polymer in either black or green/yellow
- Outer sheath of special polyurethane, TMPU adapted to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Flame retardant, UL VW-1, CSA FT1
- Halogen-free
- Abrasion resistant
- Very good oil resistance
- Very good alternating bending strength
- Very high resistance to mechanical stresses
- Higher notch resistance
- Ozone and UV-resistant
- Coolant resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor
  x = without green-yellow conductor (OZ)
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- screened analogue type:
  MULTISPEED® 600-C-PUR-J/O,
  confer page 505

Application

These special drag chain core cables permit extended use with extreme requirements, with free movement, without tensile stresses or forced movements. Suitable for installation in long traverse paths and high speeds in dry, high temperature influence in dry, moist and wet environments and in the open air. These cables can be used for all applications demanding the highest requirements in flexibility, abrasion resistance, ozone and chemical resistance. For applications extending beyond standard solutions (e. g. composting plants or high-lift conveyor systems working at extremely low speeds), we recommend that you request our questionnaire, which has been especially designed for energy supply systems. Before installation in cable trays please read the instructions.

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

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
25888	1 G 6	10	7,2	58,0	80,0
25269	1 x 6	10	7,2	58,0	80,0
25889	1 G 10	8	8,4	96,0	130,0
25270	1 x 10	8	8,4	96,0	130,0
25890	1 G 16	6	9,5	154,0	181,0
25271	1 x 16	6	9,5	154,0	181,0
25891	1 G 25	4	11,0	240,0	274,0
25272	1 x 25	4	11,0	240,0	274,0
25892	1 G 35	2	13,0	336,0	398,0
25273	1 x 35	2	13,0	336,0	398,0
25893	1 G 50	1	15,4	480,0	529,0
25274	1 x 50	1	15,4	480,0	529,0
25894	1 G 70	2/0	17,2	672,0	717,0
25275	1 x 70	2/0	17,2	672,0	717,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
25895	1 G 95	3/0	20,0	912,0	1050,0
25276	1 x 95	3/0	20,0	912,0	1050,0
25896	1 G 120	4/0	21,0	1152,0	1240,0
25277	1 x 120	4/0	21,0	1152,0	1240,0
25897	1 G 150	250 kcmil	23,8	1440,0	1524,0
25278	1 x 150	250 kcmil	23,8	1440,0	1524,0
25898	1 G 185	350 kcmil	26,2	1776,0	1932,0
25279	1 x 185	350 kcmil	26,2	1776,0	1932,0
25899	1 G 240	450 kcmil	29,8	2304,0	2467,0
25280	1 x 240	450 kcmil	29,8	2304,0	2467,0
25900	1 G 300	550 kcmil	33,1	2880,0	3140,0
25281	1 x 300	550 kcmil	33,1	2880,0	3140,0

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

Suitable accessories can be found in Chapter X.

- Cable Gland - HELUcond PA6-L
- Cable Gland - HELUcond PA6-UL

MULTISPEED® 600-C-PUR -J/-O special cable for drag chains, 1000 V, screened, halogen-free, EMC-preferred type, meter marking

Technical data

- Special drag chain core cable for mechanical stresses adapted to DIN VDE 0285-525-2-31/ DIN EN 50525-2-31 and UL-Style 10553
- **Temperature range** flexing -30°C to +80°C fixed installation -40°C to +80°C
- **Nominal voltage** VDE U_0/U 600/1000 V UL/CSA 1000 V
- **Test voltage** 3000 V
- **Insulation resistance** min. 100 MOhm x km
- **Minimum bending radius** flexing 5x core Ø fixed installation 3x core Ø

Cable structure

- Bare copper conductor, ultra-fine wire to DIN VDE 0295 cl.6, column 4, BS 6360 cl.6 and/or IEC 60228 cl.6
- Core insulation of thermoplastic polymer in either black or green/yellow
- Braided screen of tinned Cu wires, coverage approx. 85%
- Core wrapping with fleece
- Outer sheath of special polyurethane TMPU adapted to DIN VDE 0207-363-10-2 / DIN EN 50363-10-2
- Sheath colour black (RAL 9005)
- with meter marking

Properties

- Flame retardant, UL VW-1, CSA FT1
- Halogen-free
- Abrasion resistant
- Very good oil resistance
- Very good alternating bending strength
- Very high resistance to mechanical stresses
- Improved notch resistance
- Ozone and UV-resistant
- Coolant-resistant
- The materials used in manufacture are cadmium-free and contain no silicone and free from substances harmful to the wetting properties of lacquers

Note

- G = with green-yellow conductor x = without green-yellow conductor (OZ)
- Please observe applicable installation regulations for use in energy supply chains.
- AWG sizes are approximate equivalent values. The actual cross-section is in mm².
- unscreened analogue type: **MULTISPEED® 600-PUR -J/-0**, confer page 504

Application

These special drag chain core cables permit extended use with extreme requirements, with free movement, without tensile stresses or forced movements. Suitable for installation in long traverse paths and high speeds in dry, high temperature influence in dry, moist and wet environments and in the open air. These cables can be used for all applications demanding the highest requirements in flexibility, abrasion resistance, ozone and chemical resistance. The copper screening assures a disturbance-free data and signal transmission for measuring and control systems. For applications extending beyond standard solutions (e. g. composting plants or high-lift conveyor systems working at extremely low speeds), we recommend that you request our questionnaire, which has been especially designed for energy supply systems. Before installation in cable trays please read the instructions.

EMC = Electromagnetic compatibillity

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.

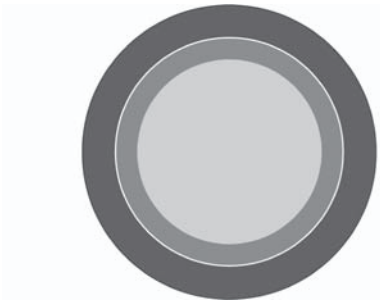
Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
25901	1 G 6	10	7,8	71,0	101,0
25282	1 x 6	10	7,8	71,0	101,0
25902	1 G 10	8	9,7	122,0	168,0
25283	1 x 10	8	9,7	122,0	168,0
25903	1 G 16	6	11,7	180,0	217,0
25284	1 x 16	6	11,7	180,0	217,0
25904	1 G 25	4	13,2	282,0	342,0
25285	1 x 25	4	13,2	282,0	342,0
25905	1 G 35	2	15,2	386,0	468,0
25286	1 x 35	2	15,2	386,0	468,0
25906	1 G 50	1	18,7	535,0	584,0
25287	1 x 50	1	18,7	535,0	584,0
25907	1 G 70	2/0	21,2	750,0	822,0
25288	1 x 70	2/0	21,2	750,0	822,0

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
25908	1 G 95	3/0	23,4	1004,0	1190,0
25289	1 x 95	3/0	23,4	1004,0	1190,0
25909	1 G 120	4/0	24,5	1260,0	1400,0
25290	1 x 120	4/0	24,5	1260,0	1400,0
25910	1 G 150	250 kcmil	27,8	1570,0	1710,0
25291	1 x 150	250 kcmil	27,8	1570,0	1710,0
25911	1 G 185	350 kcmil	29,4	1911,0	2021,0
25292	1 x 185	350 kcmil	29,4	1911,0	2021,0
25912	1 G 240	450 kcmil	34,2	2451,0	2601,0
25293	1 x 240	450 kcmil	34,2	2451,0	2601,0
25913	1 G 300	550 kcmil	37,4	2997,0	3257,0
25294	1 x 300	550 kcmil	37,4	2997,0	3257,0

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

TOPFLEX® 301 / 301-C unscreened (double insulated)/ screened

high flexible PUR single core 0,6/1kV for drag chain application



Technical data

TOPFLEX® 301 (unscreened)

- Special PUR single-core cable acc. to UL AWM Style 10553
- **Temperature range** flexing -15°C to +80°C
- **Nominal voltage** acc. to VDE U_0/U 600/1000 V acc. to UL 1000 V
- **A.C. test voltage** 3000 V
- **Insulation resistance** min. 20 MOhm x km
- **Minimum bending radius** 7,5 cable Ø

TOPFLEX® 301-C (screened)

- Tech. data as per TOPFLEX® 301
- **Coupling resistance** max. 250 Ohm/km

Cable structure

TOPFLEX® 301 (unscreened)

- Bare copper, extra fine wire conductor to DIN VDE 0295 cl.6 and IEC 60228 cl.6
- Cold resistant PVC core insulation, grey
- PUR outer sheath
- Sheath colour black or green yellow

TOPFLEX® 301-C (screened)

- Structure as per TOPFLEX 301, but additionally
- Fleece wrapping between screen and sheath
- Tinned copper braided screening, approx. 85% coverage
- Sheath colour black

Properties

- PUR outer sheath: low adhesion, flame retardant, extremely abrasion resistant, resistant to UV, oil, hydrolysis and microbial attack
- Optimised insulation materials ensure resistance to oils (including mineral oils), greases, coolants, hydraulic fluids as well as many alkalis and solvents
- The optimised external diameter and the reduced weight facilitate use in multi-shift operation with extreme alternating bending stress cycles
- Thanks to its excellent mechanical characteristics, the wear-resistant, notch-resistant, flame-retardant PUR sheath provides high functional reliability over long periods

Application

TOPFLEX® 301 (unscreened) These cables are specially designed for use in energy supply chains, automated handling equipment, robots, machine tools, processing and manufacturing machinery.

TOPFLEX® 301-C (screened) Applications as described above, additionally optimal compliance with electromagnetic compatibillity (EMC) requirements on account of the approx. 85% coverage by the braided screening.

EMC = Electromagnetic compatibillity

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.

TOPFLEX® 301 double insulated, black unscreened

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
75375	1 x 6	10	7,1	58,0	85,0
75376	1 x 10	8	8,8	96,0	130,0
75377	1 x 16	6	10,5	154,0	190,0
75378	1 x 25	4	11,2	240,0	280,0
75379	1 x 35	2	13,5	336,0	400,0
75380	1 x 50	1	15,8	480,0	520,0
75381	1 x 70	2/0	18,0	672,0	720,0
75382	1 x 95	3/0	20,4	912,0	1050,0
75383	1 x 120	4/0	22,2	1152,0	1220,0
75384	1 x 150	300 kcmil	25,0	1440,0	1500,0
75385	1 x 185	350 kcmil	28,0	1776,0	1940,0
75386	1 x 240	500 kcmil	32,5	2304,0	2645,0

TOPFLEX® 301 double insulated, green-yellow unscreened

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
75387	1 G 6	10	7,1	58,0	85,0
75388	1 G 10	8	8,8	96,0	130,0
75389	1 G 16	6	10,5	154,0	190,0
75390	1 G 25	4	11,2	240,0	280,0
75391	1 G 35	2	13,5	336,0	400,0
75392	1 G 50	1	15,8	480,0	520,0
75393	1 G 70	2/0	18,0	672,0	720,0
75394	1 G 95	3/0	20,4	912,0	1050,0
75395	1 G 120	4/0	22,2	1152,0	1220,0
75396	1 G 150	300 kcmil	25,0	1440,0	1500,0
75397	1 G 185	350 kcmil	28,0	1776,0	1940,0
75398	1 G 240	500 kcmil	32,5	2304,0	2645,0

TOPFLEX® 301-C black screened EMC

Part no.	No.cores x cross-sec. mm²	AWG-No.	Outer Ø app. mm	Cop. weight kg / km	Weight app. kg / km
75399	1 x 6	10	7,8	95,0	144,0
75400	1 x 10	8	9,5	124,0	170,0
75401	1 x 16	6	10,8	186,0	220,0
75402	1 x 25	4	12,2	278,0	340,0
75403	1 x 35	2	13,7	384,0	460,0
75404	1 x 50	1	15,4	530,0	580,0
75405	1 x 70	2/0	17,6	753,0	820,0
75406	1 x 95	3/0	21,7	1006,0	1200,0
75407	1 x 120	4/0	22,4	1257,0	1350,0
75408	1 x 150	300 kcmil	24,3	1562,0	1680,0
75409	1 x 185	350 kcmil	26,5	1895,0	2100,0
75410	1 x 240	500 kcmil	30,3	2704,0	3100,0

Dimensions and specifications may be changed without prior notice.

BRITISH STANDARD CABLES

CW&A Edition 27 (published 01.04.2015)

HELUKABEL® BS 5308 Part 1 Instruments cable, core insulation PE or XLPE

Technical data

- Instrument cable acc. to British Standard 5308 Part 1
- **Temperature range**
  fixed installation -20°C to +65°C
- **Nominal voltage**
  U_0/U 300/500 V
- **Minimum bending radius**
  fixed installation
  5x outer Ø (type 1)
  6x outer Ø (type 2+3)

Cable structure

- Copper conductor, single-, multiple-, or fine-wire acc. to BS 6360
  Conductor cross-sections from 0,5 mm² to 1,5 mm²
- Core insulation
  - Polyethylene acc. to BS 6234 Type 03 or
  - XLPE (cross-linked polyethylene for LSZH cable)
- Cores stranded in pairs with optimal lay-length,
  Lay-length smaller than 100 mm
  Number of pairs: 1,2,5,10,15,20,30,50
- Pairs individually not screened or screened
- Pairs stranded in layers
- Wrapping with aluminium/polyester foil, on request
- **Type 1**
  Flame retardant PVC outer sheath or LSZH
- **Type 2**
  Extruded polyethylene inner sheath,
  steel wire armouring,
  Flame retardant PVC outer sheath or LSZH
- **Type 3**
  PVC inner sheath,
  steel wire armouring,
  PVC outer sheath
- Sheath colour black or blue

Note

As a result of a wide range of cables and wires acc. to British Standard, you can find following only a small selection of types.
For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
E-Mail: spezialkabel@helukabel.de

Application

As measurement and control cables in power plants and industrial plants, and in the petrochemical industry. **Example** BS 5308 P1 T1 CU / PE / CAM / PVC = Overall screening, sheath PVC BS 5308 P1 T2 CU / XLPE / IAM / CAM / LSZH / SWA / LSZH = Pair screened, Overall screening, galvanic round steel wire, halogen free

Dimensions and specifications may be changed without prior notice.

HELUKABEL® BS 5308 Part 2 Instruments cable, core insulation PVC

Technical data

- Instrument cable acc. to British Standard 5308 Part 2
- **Temperature range**
  fixed installation -20°C to +65°C
- **Nominal voltage**
  U_0/U 300/500 V
- **Minimum bending radius**
  fixed installation
  5x outer Ø (type 1)
  6x outer Ø (type 2)

Cable structure

- Copper conductor, single-, multiple-, or fine-wire acc. to BS 6360
- Conductor cross-sections from 0,5 mm² to 1,5 mm²
- Core insulation PVC acc. to BS 6746
- Cores stranded in pairs with optimal lay-length
  Lay-length smaller than 100 mm
- Number of pairs: 1,2,5,10,20,30,50
- Pairs individually screened with aluminium-foil or unscreened
- Pairs stranded in layers
- Wrapping with aluminium/polyester foil, on request
- **Type 1**
  Flame retardant PVC outer sheath
- **Type 2**
  Extruded PVC inner sheath,
  steel wire armouring,
  Flame retardant PVC outer sheath
- Sheath colour black or blue

Note

As a result of a wide range of cables and wires acc. to British Standard, you can find following only a small selection of types.
For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
E-Mail: spezialkabel@helukabel.de

Application

As measurement and control cables in power plants and industrial plants, and in the petrochemical industry. **Example** BS 5308 P2 T2 CU / PVC / CAM / PVC / SWA / PVC = Overall screening, steel wire armouring

Dimensions and specifications may be changed without prior notice.

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HELUKABEL® BS 5467 High voltage cable 0,6/1kV, armoured, sheath PVC

Technical data

- Special power cable acc. to British Standard 5467
- **Temperature range**
  flexing 0°C to +90°C
  fixed installation -15°C to +90°C
- **Nominal voltage**
  U_0/U 600/1000 V
- **Minimum bending radius**
  fixed installation
  up to 16 mm² 6x outer Ø
  > 25 mm² 8x outer Ø

Cable structure

- Bare copper conductor acc. to BS 6360 cl.2
- Core insulation of cross-linked polyethylene
- Core identification
  1-core - brown
  2-core - brown, blue
  3-core - brown, blue, grey
  4-core - brown, black, grey, blue
  5-core and up with numbering
- Cores stranded layers
- PVC-Inner sheath
- Amouring of galvanized steel wire
- PVC-Outer sheath
- Sheath colour black

Properties

- Reaction to fire tested acc. to IEC 60332-1, BS 4066-1

Note

As a result of a wide range of cables and wires acc. to British Standard, you can find following only a small selection of types.
For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
E-Mail: spezialkabel@helukabel.de

Application

As a control and power cable in industrial enviroments. Thanks to the amouring of galvanized steel wire, can be used anywhere that a high level of mechanical protection is required. Suitable for use outdoors and in the earth.

Example
BS 5467 CU / XLPE / PVC / AWA / PVC = Singlecore
BS 5467 CU / XLPE / PVC / SWA / PVC = Multicore

Dimensions and specifications may be changed without prior notice.

HELUKABEL® BS 6724 High voltage cable 0,6/1kV, armoured, halogen-free

Technical data

- Special power cable acc. to British Standard 6724
- **Temperature range**
  flexing 0°C to +90°C
  fixed installation -20°C to +90°C
- Permissible **operating temperature**
  at conductor +90°C
- **Nominal voltage**
  U_0/U 600/1000 V
- **Minimum bending radius**
  fixed installation
  up to 16 mm² 6x outer Ø
  > 25 mm² 8x outer Ø

Cable structure

- Bare copper conductor acc. to BS 6360 cl.2
- Core insulation of cross-linked polyethylene
- Core identification
  1-core - brown
  2-core - brown, blue
  3-core - brown, black, grey
  4-core - brown, black, grey, blue
  5-core and up with numbering
- Cores stranded layers
- Inner sheath LSHF mix
- Amouring of galvanized steel wire
- Outer sheath LSHF mix
- Sheath colour black

Properties

- Reaction to fire tested acc. to IEC 60332-3, BS 4066-1

Note

As a result of a wide range of cables and wires acc. to British Standard, you can find following only a small selection of types.
For request about British Standard cables please contact us under
Ph. 0049 7150 9209-786
E-Mail: spezialkabel@helukabel.de

Application

Unlike power cables acc. to BS 5467, these are LSHF (Low Smoke Halogen Free). Used anywhere where in case of fire damage to human life and material assets must be prevented, e.g. in industrial plants, airports, underground railways and tunnels.

Example

BS 6724 CU / XLPE / LSZH / AWA / LSZH = Singelcore
BS 6724 CU / XLPE / LSZH / SWA / LSZH = Multicore

Dimensions and specifications may be changed without prior notice.

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