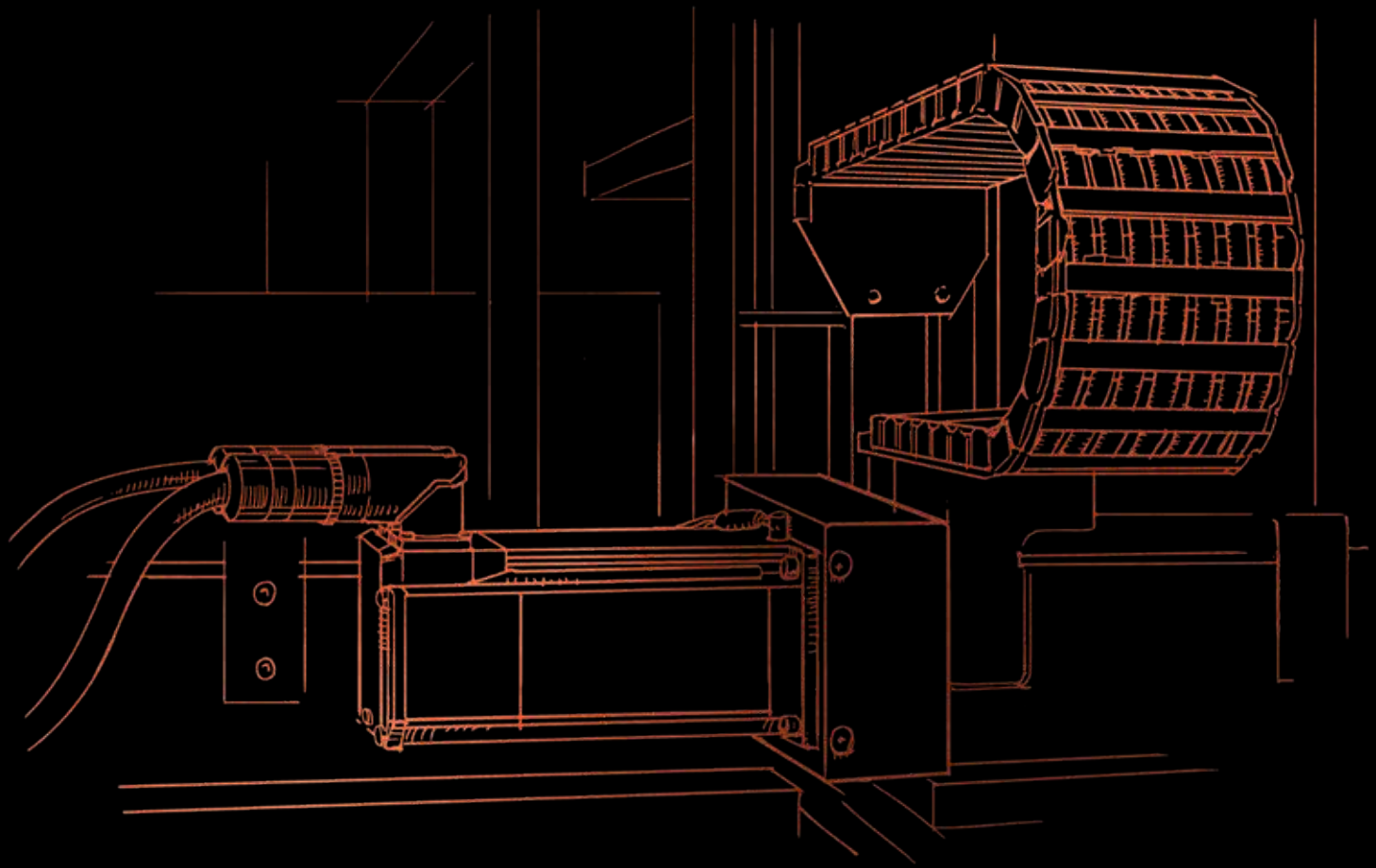
HELUKABEL®

Servo, Feedback & Hybrid Cables

DRIVE TECHNOLOGY

Ed. 1.1 // GB



Channeling POWER

Icons

Approvals / Standards


UL


CSA


HAR

VDE REG Number


SPAIN


EAC


CCC


CE


DNV-GL

IPA


DESINA

Properties /Applications

Halogen-Free

UV Radiation


Robust


Drag Chain


Torsion


Wind-Offshore

Meter Marking

In Feet

Explanation of the icons used in the brochure:

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

Content

TOPSERV® Hybrid PVC

Hybrid cables for single-cable solutions in drive technology.
For static and occasionally flexible applications acc. to Siemens 6FX5008, SICK HIPERFACE DSL and other standards

TECHNICAL DATA

Special PVC hybrid cable acc. to UL AWM Style 2570 CSA AWM

Temperature range	flexible 0°C to +60°C fixed -20°C to +80°C
AC Test voltage	50 Hz 2000 V
Minimum bending radius	flexible 15 x outer Ø fixed 5 x outer Ø

STRUCTURE

- Copper wire bare, tinned
  finely stranded acc. to DIN VDE 0295 cl. 5 / IEC 60228 cl. 5
  extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: halogen-free special-PP
- Core identification: on request
- Protective conductor: GN-YE
- Core screening: control cores in pairs, tinned copper wires
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Sliding movement supporting fleece wrapping
- Outer sheath: PVC
- Sheath colour: orange (RAL 2003) acc. to DESINA®

PROPERTIES

- low capacitance
- resistant to: oil
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers
- optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen
  Designed for min. 100,000 bending cycles
- these cables are produced to high quality specifications and conform to the DESINA® standard

TESTS

- flame retardant acc. to DIN VDE 60332-1-1 to -1-3 / DIN EN 60332-1-2 / IEC 60332-1-1 to -1-3

NOTES

- Brackets ( ) mean screen
- DESINA®, trademark SIEMENS and SICK see notes p. 19

APPLICATION

With these low-capacitance hybrid cables, motor-servo and feedback cables are combined in one cable. This reduces installation times and space requirements in the systems. For EMC compatibility, i.e. interference immunity, the cables have an additional overall shield. The cables are manufactured according to the specifications of well-known servo drive and control manufacturers as well as to various VDE, UL and CSA standards. They are used, for example, in machine, plant and robot construction as well as in automation, drive, control and production technology. Interesting for export-oriented machine and plant construction. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

Part no: HELUKABEL	Part no: OEM	Number of cores	Structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
Acc. to SICK HIPERFACE DSL						
709930	Li9YCY	8	4 G 0,5 + (2 x 0,34) C + (2 x 26 AWG) C	9,3	72	123
709931	Li9YCY	8	4 G 0,75 + (2 x 0,34) C + (2 x 26 AWG) C	11,0	85	138
709932	Li9YCY	8	4 G 1,0 + (2 x 0,75) C + (2 x 22 AWG) C	11,6	130	208
709933	Li9YCY	8	4 G 1,5 + (2 x 0,75) C + (2 x 22 AWG) C	12,2	152	248
709934	Li9YCY	8	4 G 2,5 + (2 x 1,0) C + (2 x 22 AWG) C	13,8	207	326
709935	Li9YCY	8	4 G 4 + (2 x 1,0) C + (2 x 22 AWG) C	15,3	273	415
Acc. to SIEMENS OCC						
17001155	6FX5008-1BE04	10	4 x 0,38 + (2 x 0,38) C + (4 x 0,20) C	9,4	79	135
17001156	6FX5008-1BE08	10	4 x 0,75 + (2 x 0,50) C + (4 x 0,20) C	10,2	100	161
17001851	6FX5008-1BE11	10	4 x 1,5 + (2 x 1,5) C + (4 x 0,20) C	12,3	157	237
17001849	6FX5008-1BE21	10	4 x 2,5 + (2 x 1,5) C + (4 x 0,20) C	13,3	199	291


HELUKABEL TOPSERV HYBRID 4 G 1,0 + (2x0,75)C
4 G 1,5 + (2x0,75)C
TOPSERV HYBRID 4 G 1,0 +

TOPSERV® PVC

Motor-servo cables for static or occasionally flexible applications
0.6/1 kV, acc. to Siemens 6FX5008, Lenze, Bosch Rexroth and other standards

TECHNICAL DATA

Special PVC motor cable acc. to UL AWM Style 2570 CSA AWM, VDE registered

Temperature range	flexible 0°C to +60°C fixed -20°C to +80°C
Nominal voltage	acc. to VDE U_0/U 600/1000 V acc. to UL/CSA 1000 V
AC Test voltage	50 Hz 2000 V
Minimum bending radius	flexible 15 x outer Ø fixed 5 x outer Ø

STRUCTURE

- Copper wire bare, tinned
  finely stranded acc. to DIN VDE 0295 cl.5 / IEC 60228 cl. 5
  extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: to 6 mm² halogen-free PP, from 10 mm² 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 core
  Core 1: black (Siemens) / brown (Lenze) with imprint BR1
  Core 2: white (Siemens) / white (Lenze) with imprint BR2
  TOPSERV® 119 PVC mit **2** control pairs
  Pair 1: black with imprint no. 5+6
  Pair 2: black with imprint no. 7+8
- Protective conductor: GN-YE
- Screened cores: control cores in pairs, with tinned copper wires
- Power supply cores laid up with optimal lay length and stabilising filler
- Sliding movement supporting fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PVC
- Sheath colour: orange (RAL 2003) acc. to DESINA®

PROPERTIES

- low capacitance
- resistant to: oil
- optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen Designed for min. 100,000 bending cycles
- these cables are produced to high quality specifications and conform to the DESINA® standard
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame retardant acc. to DIN VDE 60332-1-1 to -1-3 / DIN EN 60332-1-2 / IEC 60332-1-1 to -1-3

NOTES

- Brackets ( ) mean screen
- DESINA®, trademark SIEMENS, SICK, Lenze and Bosch Rexroth see notes p. 19

APPLICATION

In these cables, the power cores are ideally combined with the control cores for the brake function and thermal protection. For EMC compatibility, i.e. interference immunity, the cables have an additional overall shield. Production is based on the specifications of well-known servo drive and control manufacturers as well as on various VDE, UL and CSA standards. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

Part no: HELUKABEL	Part no: OEM	Cable Structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
Without pair - TOPSERV® 108 PVC					
707250	6FX5008-1BB11	4 G 1,5	8.0	78	119
707251	6FX5008-1BB21	4 G 2,5	9.6	130	174
707252	6FX5008-1BB31	4 G 4	11.0	198	252
707253	6FX5008-1BB41	4 G 6	13.3	288	365
707254	6FX5008-1BB51	4 G 10	19.3	463	705
707255	6FX5008-1BB61	4 G 16	23.7	701	1053
707256	6FX5008-1BB25	4 G 25	27.1	1068	1504
707257	6FX5008-1BB35	4 G 35	29.9	1449	1973
707258	6FX5008-1BB50	4 G 50	35.8	2096	2671

TOPSERV® PVC

Part no: HELUKABEL	Part no: OEM	Structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
With 1 pair - TOPSERV® 112 PVC					
707221	LENZE	4 G 1,0 + (2 x 0,5) C	9.5	88	136
707222	LENZE	4 G 1,5 + (2 x 0,5) C	11.0	106	175
707280	6FX5008-1BA11	4 G 1,5 + (2 x 1,5) C	10.4	140	194
707223	LENZE	4 G 2,5 + (2 x 0,5) C	12.3	152	224
707281	6FX5008-1BA21	4 G 2,5 + (2 x 1,5) C	12.0	185	258
707224	LENZE	4 G 4 + (2 x 1,0) C	14.3	229	360
707282	6FX5008-1BA31	4 G 4 + (2 x 1,5) C	13.6	257	347
707225	LENZE	4 G 6 + (2 x 1,0) C	16.0	312	463
707283	6FX5008-1BA41	4 G 6 + (2 x 1,5) C	15.9	348	457
710054	LENZE	4 G 10 + (2 x 1,0) C	19.8	484	791
707284	6FX5008-1BA51	4 G 10 + (2 x 1,5) C	21.0	502	791
710055	LENZE	4 G 16 + (2 x 1,0) C	23.3	729	1199
707285	6FX5008-1BA61	4 G 16 + (2 x 1,5) C	24.7	741	1110
707286	6FX5008-1BA25	4 G 25 + (2 x 1,5) C	27.8	1100	1550
707287	6FX5008-1BA35	4 G 35 + (2 x 1,5) C	30.9	1498	2030
707288	6FX5008-1BA50	4 G 50 + (2 x 1,5) C	34.5	2450	2934
With 2 pairs - TOPSERV® 119 PVC					
707290	INK0653 / REL0105	4 G 1,0 + 2 x (2 x 0,75) C	11.2	130	196
707291	INK0650 / REL0106	4 G 1,5 + 2 x (2 x 0,75) C	11.5	155	218
707292	INK0602 / REL0107	4 G 2,5 + 2 x (2 x 1,0) C	13.5	216	304
707293	INK0603 / REL0108	4 G 4 + (2 x 1,0) C + (2 x 1,5) C	15.5	297	404
707294	INK0604 / REL0109	4 G 6 + (2 x 1,0) C + (2 x 1,5) C	17.3	374	527
707295	INK0605 / REL0110	4 G 10 + (2 x 1,0) C + (2 x 1,5) C	21.2	545	820
707296	INK0606 / REL0111	4 G 16 + 2 x (2 x 1,5) C	25.0	804	1168

TOPGEBER® 511 PVC

Feedback cables with PVC outer sheath for static and occasionally flexible installations acc. to Siemens 6FX5008, Lenze, Bosch Rexroth and other standards

TECHNICAL DATA

Special-PVC feedback cable acc. to UL/CSA

Temperature range	flexible 0°C to +60°C fixed -20°C to +80°C
Nominal voltage	acc. to Siemens 30 V acc. to Bosch Rexroth / Lenze 300 V
AC test voltage	50 Hz Core/Core 1500 V Core/Screen 1000 V
Minimum bending radius	flexible 15 x outer Ø fixed 5 x outer Ø

STRUCTURE

- Copper wire bare or tinned, extra finely stranded acc. to DIN VDE 0295 cl.6 / IEC 60228 cl.6
- Core insulation: special-PP
- Core identification: see table
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Polyester foil
- Outer sheath: PVC
- Sheath colour: see table

PROPERTIES

- low capacitance
- resistant to: oil
- optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen Designed for min. 100,000 bending cycles
- these cables are produced to high quality specifications and conform to the DESINA® standard
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- flame retardant acc. to DIN VDE 60332-1-1 to -1-3 / DIN EN 60332-1-2 / IEC 60332-1-1 to -1-3

NOTES

- Brackets ( ) mean screen
- DESINA®, trademark SIEMENS, SICK, Lenze and Bosch Rexroth see notes p. 19

APPLICATION

Cost-efficient alternative to PUR feedback cables for use in fixed or occasionally flexible applications. These low-capacitance incremental feedback cables or position indicator cables transmit control pulses for positioning and process characteristics of servo motors and are used as connection cables for tachometers, brakes and pulse generators in plant engineering, mechanical engineering and in control and automation technology. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

Part no: HELUKABEL	Part no: OEM	Number of cores	Sheath colour	Structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
Acc. to Siemens 30V							
707417	6FX5008-1BD21	12	green	(4 x 2 x 0,34 + 4 x 0,5) C	8.9	70	116
707389	6FX5008-1BD41	12	green	(3 x (2 x 0,14) D + 4 x 0,14 + 2 x 0,5) C	8.9	66	114
707390	6FX5008-1BD51	16	green	(3 x (2 x 0,14) D + 4 x 0,14 + 4 x 0,25 + 2 x 0,5) C	9.4	75	129
803672	6FX5008-2DC00	6	green	(2 x 2 x 0,22 + 1 x 2 x 0,34)	6.9	38	68
802471	6FX2008-1DC00	4	green	(2 x 2 x 0,22)	6.9	35	63
Acc. to Lenze 300V							
707077	Lenze	8	green	(4 x 2 x 0,25 + 2 x 0,5) C	9.2	54	110
707397	Lenze	10	green	(4 x 2 x 0,25 + 2 x 1,0) C	11.0	70	156
707398	Lenze	9	green	(4 x 1 + 4 x 2 x 0,14 + (4 x 0,14) D) C	9.2	41	106
Acc. to Bosch Rexroth 300V							
705461	INK448 / REG0013	10	orange	3 x (2 x 0,14) C + (2 x 0,5) C	8.4	61	95
707392	INK209	10	orange	4 x (2 x 0,14) C + (2 x 1,0) C	8.8	64	119
707394	INK532	16	orange	3 x (2 x 0,14) C + (3 x 0,14) C	9.7	84	145
Various							
705615	LI9YC11Y	16	green	(7 x 2 x 0,14 + 2 x 0,5) C	7.6	46	86

HELUTEC®

Online Configurator

Configure connectors easily online.
With our HELUTEC® online configurator, you can access our complete range of signal, power and hybrid connectors.

helutec.de

Part no: HELUKABEL	Core identification
707417	bn+bk; rd+og; bu+vt; gy+ye (0.34qmm pairs) • bu/wh; bk/wh; rd/wh; ye/wh (0.5qmm)
707389	gn+ye; bk+bn; rd+og (0.14qmm pairs) • bn/rd+bn/bu (0.5qmm) • gy+bu+wh/ye+wh/bk (0.14qmm quad)
707390	gn+ye; bk+bn; rd+og (0.14qmm pairs) • bn/rd+bn/bu (0.5qmm) • gy+bu+wh/ye+wh/bk (0.14qmm quad) • bn/ye+bn/gy+gn/bk+gn/rd (0.25qmm quad)
803672	gn+ye; pk+bu (0.22qmm) • rd+bk (0.34qmm)
802471	gn+ye; pk+bu (0.22qmm)
707077	bk+ye; bk+gn; bk+rd (0.14qmm pairs) • bk+wh (0.5qmm)
707397	bk+ye; bk+gn; bk+rd; bk+bu (0.14qmm pairs) • bk+wh (1.0qmm)
707398	ye/bk+bu/bk+gn/bk+rd/bk (0,14qmm quad) • wh+br/gn+wh/gn+bu (1,0qmm) • rd+bk; br+gn; ye+vi; gr+pk (0,14qmm pairs)
705461	bk+ye; bk+gn; bk+rd (0,14qmm pairs) • bk+wh (0,5qmm)
707392	bk+ye; bk+gn; bk+rd; bk+bu (0,14qmm pairs) • bk+wh (1,0qmm)
707394	bk+ye; bk+gn; bk+rd (0,14qmm pairs) • bk+gr+pk (0,14qmm)
705615	wh, br (0,5qmm cores); wh+br; gn+ye; gr+pk; bu+rd; bk+vi; gr/pk+rd/bu; wh/gn+br/gn (0,14qmm pairs)

TOPSERV® Hybrid PUR

Highly flexible, drag chain suitable hybrid cables for single-cable solutions in drive technology acc. to Siemens 6FX8008PLUS, SICK HIPERFACE DSL, HEIDENHAIN EnDat and other standards

TECHNICAL DATA

Special-PUR drag chain cable acc. to UL AWM Style 21223 or rather 21209 CSA AWM

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
AC Test voltage	50 Hz 2000 V
Minimum bending radius	flexible 8 x outer Ø fixed 5 x outer Ø

STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: halogen-free special-PP
- Core identification: on request
- Protective conductor: GN-YE
- Sliding movement supporting fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PUR
- Sheath colour: orange (RAL 2003) acc. to DESINA®

PROPERTIES

- low adhesion, extremely abrasion resistant
- resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as cleaning agents and disinfectants according to ECOLAB®
- 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 during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- self-extinguishing and flame-retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2 / IEC 60332-1 (corresponds to DIN VDE 0472 Part 804 test type B)
- Approvals: ECOLAB®

NOTES

- Brackets ( ) mean screen
- DESINA®, trademark SICK, HEIDENHAIN, HENGSTLER and SIEMENS see notes p. 19

APPLICATION

With these low-capacitance hybrid cables, motor servo and feedback cables are combined in one cable. This reduces installation times and space requirements in systems and drag chains. For EMC compatibility, i.e. interference immunity, the cables have an additional overall screen. The cables are manufactured according to the specifications of well-known servo drive and control manufacturers as well as in accordance with various VDE, UL and CSA standards. They are used, for example, in machine and robot construction as well as in automation, drive, control and production technology. Interesting for export-oriented machine and plant construction. For use in drag chains, please refer to the respective assembly instructions.

Part no: HELUKABEL	Part no: OEM	Number of cores	Cable structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
Acc. to SICK HIPERFACE DSL						
709703	Li9YC11Y	8	4 G 0,5 + (2 x 0,34) C + (2 x 26 AWG) C	9.3	76	127
709704	Li9YC11Y	8	4 G 0,75 + (2 x 0,34) C + (2 x 26 AWG) C	9.9	88	142
708543	Li9YC11Y	8	4 G 1,0 + (2 x 0,75) C + (2 x 22 AWG) C	11.6	133	212
710081	Li9YC11Y	8	4 G 1,5 + (2 x 0,75) C + (2 x 24 AWG) C	11.7	146	230
708544	Li9YC11Y	8	4 G 1,5 + (2 x 0,75) C + (2 x 22 AWG) C	12.7	155	269
708545	Li9YC11Y	8	4 G 2,5 + (2 x 1,0) C + (2 x 22 AWG) C	13.9	205	310
708546	Li9YC11Y	8	4 G 4,0 + (2 x 1,0) C + (2 x 22 AWG) C	15.9	280	420
Acc. to HEIDENHAIN HMC6 or EnDat 2.2						
709722	Li9YC11Y	12	4 G 1,5 + (2 x 0,75) C + (2 x 0,24 + 2 x 2 x 0,09) C	12.8	159	265
709724	Li9YC11Y	12	4 G 4,0 + (2 x 1,0) C + (2 x 0,24 +2 x 2 x 0,09) C	16.2	261	453
Acc. to HENGSTLER Acuro Link						
17001151	Li9YC11Y	10	4 G 0,75 + (2 x 0,5) C + (4 x 24 AWG) C	11.8	121	230
17000505	Li9YC11Y	10	4 G 1,5 + (2 x 0,75) C + (4 x 24 AWG) C	13.0	155	273
17001152	Li9YC11Y	10	4 G 2,5 + (2 x 1,0) C + (4 x 24 AWG) C	15.8	215	371
Acc. to SIEMENS OCC						
17001157	6FX8008-1BE04	10	4 x 0,38 + (2 x 0,38) C + (4 x 0,20) C	9.4	79	135
17001158	6FX8008-1BE08	10	4 x 0,75 + (2 x 0,50) C + (4 x 0,20) C	10.2	102	161
17001850	6FX8008-1BE11	10	4 x 1,5 + (2 x 1,5) C + (4 x 0,20) C	12.3	163	237
17001848	6FX8008-1BE21	10	4 x 2,5 + (2 x 1,5) C + (4 x 0,20) C	13.3	203	291

TOPSERV® PUR

Highly flexible, drag chain motor-servo cables
0.6/1 kV acc. to Siemens 6FX8008PLUS, Lenze, Bosch Rexroth and other standards

TECHNICAL DATA

Special-PUR drag chain cable acc. to UL AWM Style 21223 or rather 21209 CSA AWM VDE-registered

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	acc. to VDE U_0/U 600/1000 V acc. to UL/CSA 1000 V
AC Test voltage	50 Hz 4000 V
Minimum bending radius	flexible 7.5 x outer Ø fixed 4 x outer Ø

STRUCTURE

- Copper wire bare, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: halogen-free special-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® 108 PVC without control cores
  TOPSERV® 112 PVC with **1** control core
  Core 1: black (Siemens) / brown (Lenze) with imprint BR1
  Core 2: white (Siemens) / white (Lenze) with imprint BR2
  TOPSERV® 121 PUR with **2** control cores
  Pair 1: black with imprint no. 5+6
  Pair 2: black with imprint no. 7+8
- Protective conductor: GN-YE
- Screened cores: control cores in pairs, with tinned copper wires
- Power supply cores laid up with optimal lay length and stabilising filler
- Sliding movement supporting fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Outer sheath: PUR
- Sheath colour: see table

PROPERTIES

- low adhesion, extremely abrasion resistant
- resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as cleaning agents and disinfectants according to ECOLAB®
- 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 during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- self-extinguishing and flame-retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2 / IEC 60332-1 (corresponds to DIN VDE 0472 Part 804 test type B)
- Approvals: ECOLAB®

NOTES

- Brackets ( ) mean screen
- DESINA®, trademark SIEMENS, SICK, Lenze and Bosch Rexroth see notes p. 19

APPLICATION

With these cables, the power cores are ideally combined with the control cores for the brake function and thermal protection. For EMC compatibility, i.e. interference immunity, the cables have an additional overall shield. The production is in accordance with the specifications of well-known servo drive and control manufacturers as well as in accordance with various VDE, UL and CSA standards. They are used, for example, in machine, plant and robot construction as well as in automation, drive, control and production technology. Interesting for export-oriented machine and plant construction. For use in drag chains, please observe the respective assembly instructions. EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

Part no: HELUKABEL	Part no: OEM	Sheath colour	Cable structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
Without pair - TOPSERV® 109 PUR						
75943	6FX8008-1BB11	orange	4 G 1,5	8.9	90	90
75944	6FX8008-1BB21	orange	4 G 2,5	10.7	132	132
75945	6FX8008-1BB31	orange	4 G 4	12.2	204	204
75946	6FX8008-1BB41	orange	4 G 6	14.5	315	315
75947	6FX8008-1BB51	orange	4 G 10	17.5	488	488
75948	6FX8008-1BB61	orange	4 G 16	21.6	769	769
75949	6FX8008-1BB25	orange	4 G 25	25.2	1100	1100
75950	6FX8008-1BB35	orange	4 G 35	28.6	1510	1510
75951	6FX8008-1BB50	orange	4 G 50	33.4	2133	2133
700437	6FX8008-1BB70	orange	4 G 70	39.9	3029	3029
700897	6FX8008-1BB95	orange	4 G 95	47.6	4606	4606

TOPSERV® PUR

Part no: HELUKABEL	Part no: OEM	Sheath colour	Cable structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
With 1 pair - TOPSERV® 113 PUR						
706003	INK0670	orange	4 G 0,75 + (2 x 0,5) C	9.2	77	132
77376	Li9YC11Y	orange	4 G 1,0 + (2 x 0,75) C	11.5	134	163
707228	Lenze	orange	4 G 1,0 + (2 x 0,5) C	10.5	88	155
707229	Lenze	orange	4 G 1,5 + (2 x 0,5) C	11.5	106	195
74506	Li9YC11Y	orange	4 G 1,5 + (2 x 1,0) C	11.1	138	200
78948	6FX8008-1BA11	orange	4 G 1,5 + (2 x 1,5) C	11.6	148	221
707230	Lenze	orange	4 G 2,5 + (2 x 0,5) C	13.2	152	251
74507	Li9YC11Y	orange	4 G 2,5 + (2 x 1,0) C	12.5	177	275
78949	6FX8008-1BA21	orange	4 G 2,5 + (2 x 1,5) C	13.2	187	285
707231	Lenze	orange	4 G 4 + (2 x 1,0) C	14.6	250	375
74508	Li9YC11Y	orange	4 G 4 + (2 x 1,0) C	14.3	258	356
78950	6FX8008-1BA31	orange	4 G 4 + (2 x 1,5) C	14.8	268	381
707232	Lenze	orange	4 G 6 + (2 x 1,0) C	17.6	344	495
74514	Li9YC11Y	orange	4 G 6 + (2 x 1,0) C	16.2	348	492
78951	6FX8008-1BA41	orange	4 G 6 + (2 x 1,5) C	16.8	358	495
707746	Lenze	orange	4 G 10 + (2 x 1,0) C	20.1	508	706
74509	Li9YC11Y	orange	4 G 10 + (2 x 1,0) C	19.0	510	690
78952	6FX8008-1BA51	orange	4 G 10 + (2 x 1,5) C	19.5	584	712
707747	Lenze	orange	4 G 16 + (2 x 1,0) C	23.8	751	1008
74510	Li9YC11Y	orange	4 G 16 + (2 x 1,0) C	22.2	798	981
75956	6FX8008-1BA61	orange	4 G 16 + (2 x 1,5) C	23.1	825	1041
74511	Li9YC11Y	orange	4 G 25 + (2 x 1,0) C	26.2	1273	1436
75957	6FX8008-1BA25	orange	4 G 25 + (2 x 1,5) C	26.8	1283	1476
74512	Li9YC11Y	orange	4 G 35 + (2 x 1,0) C	29.8	1490	1914
75958	6FX8008-1BA35	orange	4 G 35 + (2 x 1,5) C	30.9	1550	1954
74513	Li9YC11Y	orange	4 G 50 + (2 x 1,0) C	33.7	2110	2594
75959	6FX8008-1BA50	orange	4 G 50 + (2 x 1,5) C	34.2	2140	2598
With 2 pairs - TOPSERV® 121 PUR						
708499	Li9YC11Y	orange	4 G 0,75 + 2 x (2 x 0,34) C	10.4	103	177
73774	INK0653	orange	4 G 1,0 + 2 x (2 x 0,75) C	11.2	148	208
17001159	REL0105	orange	4 G 1,0 + 2 x (2 x 0,75) C	11.2	148	208
76103	Li9YC11Y	orange	4 G 1,5 + 2 x (2 x 0,5) C	11.6	145	250
700561	INK0650 / REL0106	orange	4 G 1,5 + 2 x (2 x 0,75) C	12.2	170	276
707775	Schneider Electric	green	4 G 1,5 + 2 x (2 x 0,75) C	12.2	170	276
73579	Li9YC11Y	orange	4 G 1,5 + 2 x (2 x 1,0) C	12.4	182	290
73580	INK0602 / REL0107	orange	4 G 2,5 + 2 x (2 x 1,0) C	14.0	229	346
703103	Schneider Electric	green	4 G 2,5 + 2 x (2 x 1,0) C	14.0	229	346
78955	Li9YC11Y	orange	4 G 2,5 + 2 x (2 x 1,5) C	15.4	241	350
74094	Li9YC11Y	orange	4 G 4 + 2 x (2 x 1,0) C	15.5	312	475
700562	INK0603 / REL0108	orange	4 G 4 + (2 x 1,0) C + (2 x 1,5) C	15.8	318	473
78956	Li9YC11Y	orange	4 G 4 + 2 x (2 x 1,5) C	16.2	324	490
74095	Li9YC11Y	orange	4 G 6 + 2 x (2 x 1,0) C	17.3	376	606
700563	INK0604 / REL0109	orange	4 G 6 + (2 x 1,0) C + (2 x 1,5) C	17.6	398	609
78957	Li9YC11Y	orange	4 G 6 + 2 x (2 x 1,5) C	18.0	412	621
700564	INK0605 / REL0110	orange	4 G 10 + (2 x 1,0) C + (2 x 1,5) C	20.5	610	852
74096	Li9YC11Y	orange	4 G 10 + 2 x (2 x 1,0) C	21.5	609	905
78958	Li9YC11Y	orange	4 G 10 + 2 x (2 x 1,5) C	20.9	625	925
75978	INK0606 / REL0111	orange	4 G 16 + 2 x (2 x 1,5) C	23.6	904	1290
75979	INK0607 / REL0112	orange	4 G 25 + 2 x (2 x 1,5) C	27.0	1323	1700
75980	INK0667 / REL0113	orange	4 G 35 + 2 x (2 x 1,5) C	30.5	1621	2155
700565	INK0668	orange	4 G 50 + 2 x (2 x 2,5) C	35.5	2600	3100

TOPGEBER® 512 PUR

Highly flexible, drag chain feedback cables acc. to Siemens 6FX8008PLUS, Lenze, Bosch Rexroth and other standards

TECHNICAL DATA

Special-PUR drag chain cable acc. to UL AWM Style 20233 and 20236 and CSA

Temperature range	flexible -30°C to +80°C fixed -40°C to +80°C
Nominal voltage	acc. to Siemens 30 V acc. to Bosch Rexroth / Lenze 300 V
AC Test voltage	50 Hz Core/Core 2000 V Core/Screen 1000 V
Minimum bending radius	flexible 10 x outer Ø fixed 6 x outer Ø

STRUCTURE

- Copper wire bare or tinned, extra finely stranded acc. to DIN VDE 0295 cl. 6 / IEC 60228 cl. 6
- Core insulation: halogen-free special-PP
- Core identification: see table
- Sliding movement supporting fleece wrapping
- Screen: braided screen of tinned copper wires, approx. coverage 85%
- Polyester foil
- Outer sheath: PUR
- Sheath colour: see table

PROPERTIES

- low adhesion, extremely abrasion resistant
- resistant to: UV radiation, oil, grease, coolants, hydraulic fluids, microbes, numerous alkalis and solvents, as well as cleaning agents and disinfectants according to ECOLAB®
- optimum compliance with requirements for electromagnetic compatibility (EMC) by approx. 85% coverage from the braided screen Designed for min. 100,000 bending cycles
- these cables are produced to high quality specifications and conform to the DESINA® standard
- the materials used during manufacturing are cadmium-free, contain no silicone and are free from substances harmful to the wetting properties of lacquers

TESTS

- self-extinguishing and flame-retardant acc. to DIN VDE 0482-332-1-2, DIN EN 60332-1-2 / IEC 60332-1 (corresponds to DIN VDE 0472 Part 804 test type B)
- Approvals: ECOLAB®

NOTES

- Brackets () mean screen
- DESINA®, trademark SIEMENS, SICK, Lenze and Bosch Rexroth see notes p. 19

APPLICATION

These low-capacitance incremental feedback cables or position indicator cables transmit control pulses for the positioning and travel characteristics of servo motors and are used as connection cables for tachometers, brakes and pulse generators in plant engineering, mechanical engineering and in control and automation technology. For use in drag chains, please observe the respective assembly instructions.EMC= Electromagnetic Compatibility; in order to optimise EMC properties, we recommend a double-sided and all-round large contact area of the copper braiding.

TOPGEBER® 512 PUR

Part no: HELUKABEL	Part no: OEM	Number of cores	Sheath colour	Cable structure	Outer-Ø approx. mm	Copper no. approx. kg / km	Weight approx. kg / km
Acc. to Siemens 30V							
700655	6FX8008-1BD11	16	green	(8 x 2 x 0,18) C	7.8	54	85
78081	6FX8008-1BD21	12	green	(4 x 2 x 0,34 + 4 x 0,5) C	8.9	74	115
707400	6FX8008-1BD31	8	green	(3 x (2 x 0,14) D + 2 x (0,5) D) C	9.0	70	126
700657	6FX8008-1BD41	12	green	(3 x (2 x 0,14) D + 4 x 0,14 + 2 x 0,5) C	8.9	66	120
700540	6FX8008-1BD51	16	green	(3 x (2 x 0,14) D + 4 x 0,14 + 4 x 0,25 + 2 x 0,5) C	9.6	75	135
700654	6FX8008-1BD61	8	green	(4 x 2 x 0,18) C	6.4	35	61
700653	6FX8008-1BD71	4	green	(2 x 2 x 0,18) C	5.0	24	39
78079	6FX8008-1BD81	12	green	(12 x 0,22) C	6.9	49	77
804767	6FX8008-2DC00	6	green	(2 x 2 x 0,20 + 1 x 2 x 0,38)	7.0	41	72
Acc. to Schneider Electric							
705413	Schneider Electric	8	green	(3 x 2 x 0,25 + 2 x 0,5) C	7.4	43	82
706333	Schneider Electric	12	green	(5 x 2 x 0,25 + 2 x 0,5) C	8.8	69	110
708489	Schneider Electric	8	green	(3 x 2 x 0,14 + 2 x 0,34) C	6.8	29	65
Acc. to B&R							
707403	B&R	6	green	(3 x 2 x AWG24) C	6.5	31	57
707404	B&R	12	green	(5 x 2 x 0,14 + 2 x 0,5) C	7.8	48	79
Acc. to Lenze							
707405	Lenze	8	green	3 x (2 x 0,14) C + (2 x 0,5) C	9.9	54	114
707406	Lenze	10	green	4 x (2 x 0,14) C + (2 x 1,0) C	10.8	70	142
707407	Lenze	9	green	3 x (2 x 0,14) C + (3 x 0,14) C	9.2	41	98
Acc. to Bosch Rexroth 300 V							
702050	INK209 grün	10	green	(4 x 2 x 0,25 + 2 x 1,0) C	8.8	64	120
78080	INK448 / REG0013 gr.	10	green	(4 x 2 x 0,25 + 2 x 0,5) C	8.5	51	108
77741	INK208 gr.	9	green	(9 x 0,5) C	8.8	69	124
707738	INK209	10	orange	(4 x 2 x 0,25 + 2 x 1,0) C	8.8	64	120
707739	INK448 / REG0013	10	orange	(4 x 2 x 0,25 + 2 x 0,5) C	8.5	51	108
707740	INK208	9	orange	(9 x 0,5) C	8.8	69	124
707408	INK532	16	orange	(4 x 1 + 4 x 2 x 0,14 + (4 x 0,14) D) C	9.5	84	139
707418	INK280	11	orange	(3 x (2 x 0,25) D + 3 x 0,25 + 2 x 1,0) C	9.0	74	130
707409	INK750	6	orange	(2 x 2 x 0,25 + 2 x 0,5) C	7.2	38	76
713070	REG0011	14	green	5 x (2 x 0,14) Stc + 4 x 0,5	10.0	104	172.2
17000504	REG0012	6	orange	(2 x 2 x 0,2 + 2 x 0,5)	7.2	34	80
Acc. to Heidenhain							
710106	Heidenhain EnDat 2.0	8	black	(1 x 4 x 0,14 + 4 x 0,34) C	6.0	36	61
77753	Heidenhain	12	green	(10 x 0,14 + 2 x 0,5) C	7.2	43	79
77743	Heidenhain	8	green	(3 x (2 x 0,14) D + 2 x (1 x 0,5) D) C	8.4	81	103
709693	Heidenhain	8	black	(3 x (2 x 0,14) D + 2 x (1 x 0,5) D) C	8.4	81	103
79513	Heidenhain	12	green	(4 x 2 x 0,14 + 4 x 0,5) C	8.5	52	103
709691	Heidenhain	12	black	(4 x 2 x 0,14 + 4 x 0,5) C	8.5	52	103
707410	Heidenhain	8	green	(3 x (2 x 0,14) D + 2 x (1,0) D) C	9.1	72	132
700560	Heidenhain	16	green	(4 x 2 x 0,14 + (4 x 0,14) C + 4 x 0,5) C	9.0	81	123
709692	Heidenhain	16	black	(4 x 2 x 0,14 + (4 x 0,14) C + 4 x 0,5) C	9.0	81	123
Acc. to Baumüller							
78963	Baumüller	12	green	(5 x 2 x 0,14 + 2 x 0,5) C	8.8	72	91
Acc. to Fanuc							
707761	LI9YC11Y	16	green	(5 x 2 x 0,18 + 6 x 0,5) C	8.7	74	120
707762	LI9YC11Y	12	green	(3 x 2 x 0,18 + 6 x 1,0) C	8.7	93	130
707116	LI9YC11Y	12	green	(3 x 2 x 0,18 + 6 x 0,5) C	8.7	66	108
707763	LI9YC11Y	9	green	(2 x 2 x 0,18 + 5 x 0,5) C	7.8	55	90
707115	LI9YC11Y	7	green	(1 x 2 x 0,18 + 5 x 0,5) C	7.4	49	86
707764	LI9YC11Y	10	green	(4 x 2 x 0,22 + 2 x 0,5) C	7.8	54	87
Various							
78828	LI9YC11Y	6	green	(3 x (2 x 0,25) D) C	7.2	55	79
709613	LI9YC11Y	12	green	(5 x 2 x 0,38 + 2 x 0,5) C	9.2	69	124
77744	LI9YC11Y	8	green	(3 x (2 x 0,14) D + 2 x 1,0) C	8.2	71	131
78372	LI9YC11Y	8	green	(3 x 2 x 0,14 + 2 x 0,5) C	7.2	35	73
705647	LI9YC11Y	16	green	(7 x 2 x 0,14 + 2 x 0,5) C	7.6	46	89
707748	LI9YC11Y	10	green	(4 x (2 x 0,14) C + (2 x 1,0)) C	11.4	90	185
77750	LI9YC11Y	10	green	(4 x (2 x 0,25) C + 2 x 1,0) C	10.5	89	162
705221	LI9YC11Y	8	green	(4 x 2 x 0,25) C	7.5	41.2	82
74418	LI9YC11Y	6	green	(3 x 2 x 0,25) C	7	38.4	65
74419	LI9YC11Y	8	green	(4 x 2 x 0,25) C	7.1	39.2	72
74420	LI9YC11Y	10	green	(5 x 2 x 0.25) C	8.8	51.5	102
700662	LI9YC11Y	8	green	4 x 2 x 0,18	6.4	35	68
78649	LI9YC11Y	16	green	8 x 2 x 0,25	8.8	67	114.4
700241	LI9YC11Y	8	green	4 x 2 x 0,22	7.8	41	110
708490	LI9YC11Y	10	green	4 x (2 x 0,14)D2Y + 2 x (1 x 0,5)D2Y	9.5	69.6	131.2

Part no: HELUKABEL	Core identification
700655	wh/ye+wh/gn; wh/rd+wh/or; wh/bk+wh/br; gr+wh; bu+vi; ye+gn; rd+or; bk+br
78081	br+bk; rd+or; bu+vi;gn+ye (0,34qmm pairs) • bu/wh; bk/wh; rd/wh; ye/wh (0,5qmm)
707400	gn+ye; bk+br; rd+or (0,14qmm pairs) • bk+rd (0,5qmm)
700657	gn+ye; bk+br; rd+or (0,14qmm pairs) • br/rd+br/bu (0,5qmm) • gr+bu+wh/ye+wh/bk (0,14qmm quad)
700540	gn+ye; bk+br; rd+or (0,14qmm pairs) • br/rd+br/bu (0,5qmm) • gr+bu+wh/ye+wh/bk (0,14qmm quad) • br/ye+br/gr+gn/bk+gn/rd (0,25qmm quad)
700654	bk+br; rd+or; gn+ye; bu+vi
700653	rd+or; bk+br
78079	bk;br;rd (fipkt layer) • or; ye; gn; bu; vi; gr; wh; wh/bk; wh/br (second layer)
804767	bu+pk; gn+ye (0,2qmm) • rd+bk (0,38qmm)
705413	wh+br; gn+ye; gr+pk (0,25qmm pairs) • bu; rd (0,5qmm)
706333	wh+br; gn+ye; gr+pk; bk+vi; gr/pk+rd/bu (0,25qmm pairs) • bu; rd (0,5qmm)
708489	wh+br; gn+ye; gr+pk (0,14qmm pairs) • bu; rd (0,34qmm)
707403	wh+br; gn+ye; gr+pk
707404	wh+vi; br+gn; ye+gr; pk+bu; rd+bk (0,14qmm pairs) rd+wh; bk+gn (0,5qmm)
707405	gn+ye; bu+rd; gr+pk (0,14qmm pairs) • br+wh (0,5qmm)
707406	bk+ye; bk+gn; bk+rd; bk+bu (0,14qmm pairs) • wh+br (1,0qmm)
707407	bk+ye; bk+gn; bk+rd (0,14qmm pairs) • bk+gr+pk (0,5qmm)
702050	gn+br; bk+rd; gr+pk; bu+vi (0,25qmm pairs) • wh; br (1,0qmm)
78080	gn+br; bk+rd; gr+pk; bu+vi (0,25qmm pairs) • wh; br (0,5qmm)
77741	bu+wh+rd+pk+gn+ye+br+bk+gr
707738	gn+br; bk+rd; gr+pk ;bu+vi (0,25qmm pairs) • wh; br (1,0qmm)
707739	gn+br; bk+rd; gr+pk;bu+vi (0,25qmm pairs) • wh; br (0,5qmm)
707740	bu+wh+rd+pk+gn+ye+br+bk+gr
707408	ye/bk+bu/bk+gn/bk+rd/bk (0,14qmm quad) • wh+br/gn+wh/gn+bu (1,0qmm) • rd+bk;br+gn;ye+vi;gr+pk (0,14qmm pairs)
707418	gn+br, gr+pk, bk+rd (0,25qmm pairs) • ye+bu+vi (0,25qmm Drilling) • br; wh (1,0qmm)
707409	rd+bk; gr+pk (0,25qmm pairs) • wh; br (0,5qmm)
713070	wh+ye; bk+rd; bu+vio; gn+br; gr+pk (0,14qmm pairs)• bk; br; wh; rd (0,5qmm)
17000504	ye+gn; bu+or (0,2qmm pairs) • wh; br (0,5qmm)
710106	gr; ye; pk; vi (0,14qmm) • bu; wh; br/gn; wh/gn (0,34qmm)
77753	wh; br; gn; ye; gr; pk; bu; rd; bk; vi (0,14qmm) • gr/pk; rd/bu (0,5qmm)
77743	gn+ye; gr+pk; bu+rd (0,14qmm pairs) • wh; br(0,5qmm)
709693	gn+ye; gr+pk; bu+rd (0,14qmm pairs) • wh; br(0,5qmm)
79513	gn+br; ye+vi; pk+gr; rd+bk (0,14qmm) • wh; bu; wh/gn; br/gn (0,5qmm)
709691	gn+br; ye+vi; pk+gr; rd+bk (0,14qmm) • wh; bu; wh/gn; br/gn (0,5qmm)
707410	gn+ye; gr+pk; bu+rd (0,14qmm) • wh; br (1,0qmm)
700560	ye+vi; fr+pk; bk+rd; br+gn (0,14qmm) • ye/bk; bu/bk; gn/bk; rd/bk (0,14qmm quad) • wh; bu; wh/gn; br/gn (0,5qmm)
709692	ye+vi; fr+pk; bk+rd; br+gn (0,14qmm) • ye/bk; bu/bk; gn/bk; rd/bk (0,14qmm quad) • wh; bu; wh/gn; br/gn (0,5qmm)
78963	wh; br (0,5qmm) • gn+ye; gr+pk; bu+rd; bk+vi; gr/pk+rd/bu (0,14qmm pairs)
707761	bk+or; bk+gr; wh+ye; wh+gr; wh+br (0,18 qmm) • 3x rd num. 4-6; 3x bk num. 1-3 (0,5qmm)
707762	rd+wh; rd+bk ;bk+wh (0,18 qmm) • 3x rd num. 4-6; 3x bk num. 1-3 (1,0qmm)
707116	rd+wh; rd+bk; bk+wh (0,18 qmm) • 3x rd num. 4-6; 3x bk num. 1-3 (0,5qmm)
707763	bk+vi;wh+br (0,18 qmm) • gn;ye;gr;pk;bu (0,5 qmm)
707115	br+wh (0,18qmm) • bu;pk;gr;ye;gr (0,5qmm)
707764	br/bk+br/rd; ye/bk+ye/rd; gn/bk+gn/rd; gr/bk+gr/rd (0,22qmm pairs) • br, ye (0,5qmm)
78828	wh+br; gn+ye; gr+pk
709613	wh+br; gn+ye; gr+pk; bu+rd; bk+vi (0,38qmm pairs) • wh; br (0,5qmm)
77744	gn+ye; gr+pk; bu+rd (0,14qmm) • wh; br (1,0qmm)
78372	gn+ye; gr+pk; bu+rd (0,14qmm pairs) • wh; br (0,5qmm)
705647	wh+br; gn+ye; gr+pk; bu+rd; bk+vi; gr/pk+rd/bu; wh/gn+br/gn (0,14qmm pairs) • wh; br (0,5qmm)
707748	wh+br; gn+ye; gr+pk; bu+rd (0,14qmm pairs) • wh+br (1,0qmm pairs)
77750	gn+br; bk+rot; gr+pk; bu+vi (0,25qmm pairs) • wh+br (1,0qmm)
705221	wh+br; gn+ye; gr+pk; bu+rd
74418	wh+br; gn+ye; gr+pk
74419	wh+br; gn+ye; gr+pk; bu+rd
74420	wh+br; gn+ye; gr+pk; bu+rd; bk+vi
700662	wh+br; gn+ye; gr+pk; bu+rd
78649	wh+br; gn+ye; gr+pk; bu+rd; bk+vi; gr/pk+ rd/bu; wh/gn+br/gn; wh/ye+ye/br
700241	wh+br; gn+ye; gr+pk; bu+rd
708490	wh; br; gn+ye; gr+pk; bu+rd; bk+vi

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Technical modifications

Safety notice

The cables and wires described in the catalogue are produced in accordance with national and international standards, as well as plant standards; application safety, as stipulated in the safety directives, standards, and statutory regulations, as amended, are provided. Following proper installation and usage guidelines, the possibility of product-specific dangers can be excluded. This catalogue describes general information for each product's use. Independent of the above, the applicable DIN VDE specifications apply. Installation and processing must only be executed by qualified electricians.

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