

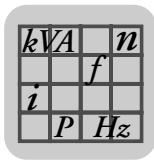
10 Hybrid Cables

10.1 Description of functions

SEW-EURODRIVE hybrid cables...

- Connect field distributors with AC motors or MOVIMOT®
- Connect MOVIFIT® units with AC motors or MOVIMOT®
- Connect MOVIMOT® or MOVI-SWITCH® 2S units mounted in close proximity to the motor with drives (in combination with option P2.A)
- Combine power transmission, control voltage and communication within one cable sheath
- Ensure optimum EMC shielding and cable impedances
- Are supplied as pre-fabricated cables with plug connectors

	NOTE
	For assignment of hybrid cables to the products, refer to the respective sections.

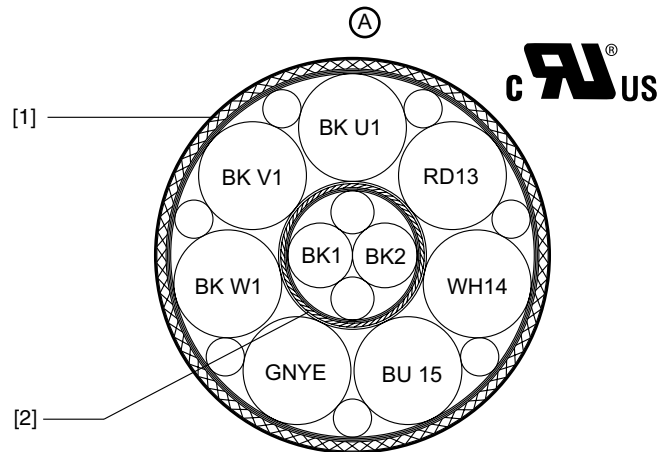


Hybrid Cables

"Cable type A" hybrid cables

10.2 "Cable type A" hybrid cables

10.2.1 Mechanical design



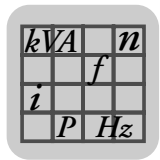
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[1] Overall shield
[2] Shielding

- SEW works standard W3251 (817 953 0)
- Supply cores: 7 x 1.5 mm²
- Control core pair: 2 x 0.75 mm²
- Insulation: TPE-U (polyurethane)
- Conductor: Bare E-Cu strand, extra fine wires with individual wire ≤ 0.1 mm
- Shield: Tinned E-Cu wire.
- Overall diameter: 13.2 ... 15.9 mm
- Color of outer cable sheath: Black

10.2.2 Electrical properties

- Conductor resistance for 1.5 mm² (at 20 °C): max. 13 Ω /km
- Conductor resistance for 0.75 mm² (at 20 °C): max. 26 Ω /km
- Operating voltage for 1.5 mm² core: max. 750 V (c RU US 600 V)
- Operating voltage for 0.75 mm² core: max. 350 V (c RU US 600 V)
- Insulation resistance at 20 °C: min. 20 M Ω x km



10.2.3 Mechanical properties

- Suitable for cable tracks
 - Bending cycles > 2.5 million
 - Travel speed ≤ 3 m/s
- Bending radius in the cable track: 10 x diameter
for fixed routing: 5 x diameter
- Torsional strength (e.g. rotary table applications)
 - Torsion ±180° for a cable length of > 1 m
 - Torsional cycles > 100.000

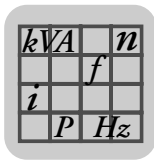
	NOTE
You will have to check the mechanical marginal conditions if you encounter reversed bending and high torsional load for a length of < 3 m. Please contact SEW-EURODRIVE in such cases.	

10.2.4 Thermal properties

- Processing and operation: -30 °C to +90 °C (c _{us}: -30 °C to +80 °C)
- Transport and storage: -40 °C up to +90 °C (c _{us}: -30 °C to +80 °C)
- Flame-retardant according to UL1581 Vertical Wiring Flame Test (VW1)
- Flame-retardant according to CSA C22.2 Vertical Wiring Flame Test

10.2.5 Chemical properties

- Oil-resistant according to VDE 0472 part 803 method B
- General fuel resistance (such as diesel, gasoline) according to ISO 6722 parts 1 and 2
- General resistance against acids, alkalis, cleaning agents
- General resistance against dusts (such as bauxite, magnesite)
- Insulation and cable jacket material is halogen free according to VDE 0472 part 815 as well as silicone free
- Within the specified temperature range, free from substances interfering with wetting agents

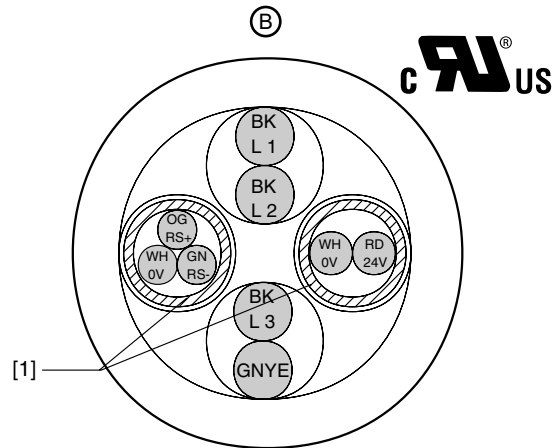


Hybrid Cables

"Cable type B" hybrid cables

10.3 "Cable type B" hybrid cables

10.3.1 Mechanical design



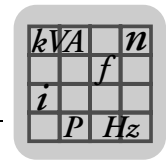
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[1] Shielding

- SEW works standard W3251 (814 517 2)
- Supply cores: 4 x 1.5 mm²
- Control core pair: 2 x 0.75 mm²
- Control core group: 3 x 0.75 mm²
 - Insulation: TPE-E (polyester)
 - Conductor: Bare E-Cu strand, extra fine wires with individual wire ≤ 0.1 mm
 - Shield: Tinned E-Cu wire.
- Overall diameter: 13.2 ... 13.8 mm
- Color of outer cable sheath: Black

10.3.2 Electrical properties

- Conductor resistance for 1.5 mm² (at 20 °C): max. 13 Ω /km
- Conductor resistance for 0.75 mm² (at 20 °C): max. 26 Ω /km
- Operating voltage for 1.5 mm² core: max. 750 V (c R US 600 V)
- Operating voltage for 0.75 mm² core: max. 350 V (c R US 600 V)
- Insulation resistance at 20 °C: min. 20 M Ω x km



10.3.3 Mechanical properties

- Suitable for cable tracks
 - Bending cycles > 2.5 million
 - Travel speed ≤ 3 m/s
- Bending radius in the cable track: 10 x diameter
for fixed routing: 5 x diameter
- Torsional strength (e.g. rotary table applications)
 - Torsion max. ±180° for a cable length of > 1 m
 - Torsional cycles > 100.000

	NOTE
	You will have to check the mechanical marginal conditions if you encounter reversed bending and high torsional load for a length of < 3 m. Please contact SEW-EURODRIVE in such cases.

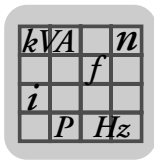
10.3.4 Thermal properties

- Processing and operation: -30 °C to +90 °C (cUL_{us}: -30 °C to +90 °C)¹⁾
- Transport and storage: -40 °C up to +90 °C (cUL_{us}: -40 °C to +90 °C)¹⁾
- Flame-retardant according to UL1581 Vertical Wiring Flame Test (VW1)
- Flame-retardant according to CSA C22.2 Vertical Wiring Flame Test

10.3.5 Chemical properties

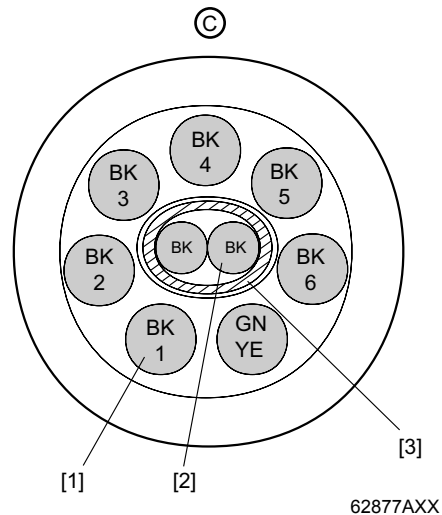
- Oil-resistant according to VDE 0472 part 803 method B
- General fuel resistance (such as diesel, gasoline) according to ISO 6722 parts 1 and 2
- General resistance against acids, alkalis, cleaning agents
- General resistance against dusts (such as bauxite, magnesite)
- Insulation and cable jacket material is halogen free according to VDE 0472 part 815 as well as silicone free
- Within the specified temperature range, free from substances interfering with wetting agents

1) Cable is certified according to UL style 2066990C 600 V and CSA AWM II A/B 90C 600 V



10.4 "Cable type C" hybrid cables

10.4.1 Mechanical design



- [1] Cores 2.5 mm²
- [2] Cores 0.75 mm²
- [3] Shielding

- SEW works standard W3251 (015 207 2)
- Supply cores: 7 x 2.5 mm²
- Control cores: 2 x 0.75 mm²
- Insulation: PVC / special PVC
- Conductor: Fine wires to VDE class 5, copper strand conductor
- Shield: Braided tinned copper shield
- Overall diameter: 15.2 mm

10.4.2 Electrical properties

- Conductor resistance for 2,5 mm²: 8.5 Ω/km
- Conductor resistance for 0,75 mm²: 26 Ω/km
- Operating voltage for 2,5 mm² cores: 600 V/1000 V
- Operating voltage for cores 0.75 mm²: AC 48 V
- Insulation resistance: 20 MΩ x km

10.4.3 Mechanical properties

- Bending radius in the cable track: 20 x diameter
for fixed routing: 6 x diameter

10.4.4 Thermal properties

- Processing and operation:
 - Flexible routing: -5 °C to +70 °C
 - Fixed routing: -30 °C to +80 °C
- Transport and storage: -30 °C up to +80 °C