

Building & Industry Cables Phone: +41(0)32 843 5555 generalmarket.ch@nexans.com

# SIWO-KUL® B10 3.3/4.2 kV

SIWO-KUL B10 1x120 3,3/4,2kV RD

Nexans ref.: <u>10148753</u> EAN 13: 7611755007348

SIWO-KUL® B10 3.3/4.2 kV MV high temperature flexible cables designed with a PET braid, PUR varnished

### Description

SIWO-KUL® B10 cables are required when high flexibility and high temperature conditions are present; they are mainly used in medium-voltage motors and generators for connecting stator coils to the terminal box. They are also vital elements for wind converters, transformers, solar power inverters and other MV/LV cabinets. In drives, silicone decreases copper cross-section and gives flexibility for compactness.

SIWO-KUL® B10 13.3/4.2 kV cables are class 5 single core cables.

This product family is designed with a **PET braid, PUR varnished** providing our customers much flexibility according to their process (VPI...).

#### Construction

- Copper conductor tinned, flexible IEC 60228, class 5
- · Silicone rubber insulation
- Separator tape
- · Protective synthetic yarn braiding, PUR varnished

The use of silicone rubber, a high grade corona resistant insulation material, gives the cable excellent dielectric strength. The braided synthetic yarn covering, which is applied directly over the insulation, gives the cable, because of its short braiding pitch and high compactness, an excellent mechanical protection by maintaining good flexibility.

Operating temperature for continuous service extends from -55°C up to 180°C.

This product family is also part of our Windlink® offer for Wind turbines.

### **Approvals**

These cables are UL (Underwriters Laboratories inc.) approved for Appliance Wiring Material (AWM), following styles 3640, 3641, 3642 and 3643, CSA File No.: 036040-0-000.

**SIWO-KUL® B10** cables are in compliance with EU directives on the limits of certain metals and waste as defined on ROHS (Restriction of Hazardous Substances) and WEE (Waste from Electrical and Electronic Equipment).

SIWO-KUL® B10 is REACH conform substances benzene, C10-C13).





### Standards

International IEC 60092;IEC 60331;IEC 60332-1;IEC 60332-3;IEEE 383;LLOYDS Reg. 91/00126 (E1);UIC 895;VERITAS N°09555/A0 BV ACE1/723 PC 2502H

**National** BSS 6195-T5-C-D-E-F;DIN VDE 0472;NF F 16-101/BF1



Conductor Halogen free flexibility Flexible class 5



Ope. volt. 3.3 kV



Cable flexibility



static bending rad.



Operating temp. range -55 .. 180 °C



Chemical resistance Good



Maximum operating temperature 180 °C



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### Characteristics

Insulation         Special Sillicone           Halogen free         Yes           Outer sheath         Synthetic yar breiding           Construction type         558 x 0.5           Dimensional characteristics         Todouctor cross-section         120 mm²           Nominal outer diameter         21.15 mm           Approximate weight         15.45 mm           Conductor diameter         15.45 mm           Precision of diameter         +/- 0.3 mm           Electrical characteristics         Test voltage           Operating voltage         3.3 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         2.0 kV           Breakdown field strength (kV/mm)         > 2.0           Breakdown trelative value (indicative)         3.50           Loss factor tan d         3.50           Coble flexibility         Fiexible           Cable flexibility         Fiexible           Chemical resistance         Good           Minimum static operating bending radius	Construction characteristics	
Insulation         Special Sillicone           Halogen free         Yes           Outer sheath         Synthetic yar breiding           Construction type         558 x 0.5           Dimensional characteristics         Todouctor cross-section         120 mm²           Nominal outer diameter         21.15 mm           Approximate weight         15.45 mm           Conductor diameter         15.45 mm           Precision of diameter         +/- 0.3 mm           Electrical characteristics         Test voltage           Operating voltage         3.3 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         2.0 kV           Breakdown field strength (kV/mm)         > 2.0           Breakdown trelative value (indicative)         3.50           Loss factor tan d         3.50           Coble flexibility         Fiexible           Cable flexibility         Fiexible           Chemical resistance         Good           Minimum static operating bending radius	Conductor material	Tinned copper
Halogen free         Yes           Outer sheath         Synthetic yam braiding           Construction type         55x 0.5           Dimensional characteristics         Conductor cross-section         120 mm²           Nominal outer diameter         21.15 mm         Approximate weight         121.54 g/km         Conductor diameter         15.45 mm         Approximate weight         15.45 mm         Approximate weight	Conductor flexibility	Flexible class 5
Outer sheath         Synthetic yam braiding           Construction type         558 x 0.5           Dimensional characteristics         Conductor cross-section         120 mm²           Nominal outer diameter         21.15 mm           Approximate weight         1215 kg/km           Conductor diameter         1/5.45 mm           Precision of diameter         +/6.03 mm           Presidential diameter         10.00 mm           Max. DC resistance of the conductor at 20°C         0.16 Ohrn/km           Breakdown voltage         2.0 kV           Breakdown voltage         2.0 kV           Breakdown field strength (kV/mm)         > 20           Loss factor tan d         < 10.2 kV           Mechanical characteristics         Mechanical characteristics	Insulation	Special Silicone
Construction type         558 x 0.5           Dimensional characteristics         120 mm²           Conductor cross-section         120 mm²           Nominal outer diameter         21.15 mm           Approximate weight         1215 kg/km           Conductor diameter         15.45 mm           Precision of diameter         +c 0.3 mm           Precision of diameter         3.3 kV           Maximum peak voltage         3.3 kV           Maximum peak voltage         0.10 kV           Test voltage         3.1 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Loss factor tan d         < 10-2	Halogen free	Yes
Dimensional characteristics         120 mm²           Conductor cross-section         120 mm²           Nominal outer diameter         21.15 mm²           Approximate weight         1215 kg/km²           Conductor diameter         15.45 mm²           Precision of diameter         +/- 0.3 mm²           Electrical characteristics         83.3 kV²           Maximum peak voltage         3.8 kV²           Maximum peak voltage         010. kV²           Test voltage         10 kV²           Breakdown voltage         20 kV²           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Outer sheath	Synthetic yarn braiding
Conductor cross-section         120 mm²           Nominal outer diameter         21.15 mm           Approximate weight         1215 kg/km           Conductor diameter         †.4-0.3 mm           Precision of diameter         †.4-0.3 mm           Electrical characteristics         Waximum peak voltage         3.3 kV           Maximum peak voltage         010 kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Delectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Construction type	558 x 0.5
Nominal outer diameter         21.15 mm           Approximate weight         1215 kg/km           Conductor diameter         15.45 mm           Precision of diameter         +/-0.3 mm           Electrical characteristics         ***           Operating voltage         3.3 kV           Maximum peak voltage         010. kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Dimensional characteristics	
Approximate weight         1215 kg/km           Conductor diameter         15.45 mm           Precision of diameter         #-0.3 mm           Electrical characteristics         Sax kV           Operating voltage         3.3 kV           Maximum peak voltage         010. kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Conductor cross-section	120 mm²
Conductor diameter         15.45 mm           Precision of diameter         +/- 0.3 mm           Electrical characteristics         3.3 kV           Operating voltage         3.3 kV           Maximum peak voltage         10 kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Nominal outer diameter	21.15 mm
Electrical characteristics           Operating voltage         3.3 kV           Maximum peak voltage         010. kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tand         < 10-2	Approximate weight	1215 kg/km
Electrical characteristics         3.3 kV           Maximum peak voltage         3.3 kV           Maximum peak voltage         010 kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Conductor diameter	15.45 mm
Operating voltage         3.3 kV           Maximum peak voltage         010 kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Precision of diameter	+/- 0.3 mm
Maximum peak voltage         0 10 . kV           Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Electrical characteristics	
Test voltage         10 kV           Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Operating voltage	3.3 kV
Max. DC resistance of the conductor at 20°C         0.16 Ohm/km           Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Maximum peak voltage	0 10. kV
Breakdown voltage         20 kV           Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Test voltage	10 kV
Breakdown field strength (kV/mm)         > 20           Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Max. DC resistance of the conductor at 20°C	0.16 Ohm/km
Dielectric constant relative value (indicative)         3.50           Loss factor tan d         < 10-2	Breakdown voltage	20 kV
Loss factor tan d         < 10-2	Breakdown field strength (kV/mm)	> 20
Mechanical characteristicsMinimum Tensile Strength8.0 MPaCable flexibilityFlexibleElongation at break of insulation (%)> 250Usage characteristicsMinimum static operating bending radius109 mmOperating temperature, range-55 180 °CChemical resistanceGoodMaximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire retardantIEC 60332-3Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Dielectric constant relative value (indicative)	3.50
Minimum Tensile Strength8.0 MPaCable flexibilityFlexibleElongation at break of insulation (%)> 250Usage characteristicsMinimum static operating bending radius109 mmOperating temperature, range-55 180 °CChemical resistanceGoodMaximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire retardantIEC 60332-3Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Loss factor tan d	< 10-2
Cable flexibilityFlexibleElongation at break of insulation (%)> 250Usage characteristicsMinimum static operating bending radius109 mmOperating temperature, range-55 180 °CChemical resistanceGoodMaximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Mechanical characteristics	
Elongation at break of insulation (%)> 250Usage characteristics109 mmMinimum static operating bending radius109 mmOperating temperature, range-55 180 °CChemical resistanceGoodMaximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire retardantIEC 60332-3Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Minimum Tensile Strength	8.0 MPa
Usage characteristicsMinimum static operating bending radius109 mmOperating temperature, range-55 180 °CChemical resistanceGoodMaximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire retardantIEC 60332-3Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Cable flexibility	Flexible
Minimum static operating bending radius  Operating temperature, range  Chemical resistance  Good  Maximum operating temperature  Minimum operating temperature  Minimum operating temperature  Oil resistance  Flame retardant  Fire retardant  Fire resistant  Gases corrosivity  Smoke density  Packaging  Ozone resistance  109 mm  109 mm  109 mm  109 mm  100 mm	Elongation at break of insulation (%)	> 250
Operating temperature, range -55 180 °C Chemical resistance Good Maximum operating temperature 180 °C Minimum operating temperature -55 °C Oil resistance Yes Flame retardant IEC 60332-1 Fire retardant IEC 60332-3 Fire resistant IEC 60331 Gases corrosivity IEC 60754-1, IEC 60754-2 Smoke density IEC 61034 Packaging Cut to length Ozone resistance	Usage characteristics	
Chemical resistanceGoodMaximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire retardantIEC 60332-3Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Minimum static operating bending radius	109 mm
Maximum operating temperature180 °CMinimum operating temperature-55 °COil resistanceYesFlame retardantIEC 60332-1Fire retardantIEC 60332-3Fire resistantIEC 60331Gases corrosivityIEC 60754-1, IEC 60754-2Smoke densityIEC 61034PackagingCut to lengthOzone resistanceYes	Operating temperature, range	-55 180 °C
Minimum operating temperature  Oil resistance Flame retardant Fire retardant Fire resistant Fire resistant Gases corrosivity Smoke density Packaging Ozone resistance  -55 °C  Yes Fyes Flame retardant IEC 60332-1 IEC 60332-3 IEC 60332-3 IEC 60331 IEC 60754-1, IEC 60754-2 Smoke density Flame retardant IEC 60332-3 IEC 60331 IEC 60754-1, IEC 60754-2 Smoke density Flame retardant IEC 60332-3 IEC 60331 IEC 60754-1, IEC 60754-2 Smoke density Flame retardant IEC 60332-3 IEC 60331 IEC 60754-1, IEC 60754-2 Smoke density Flame retardant IEC 60332-3 IEC 60331 IEC 60754-1, IEC 60754-2 IEC 61034 IEC 610	Chemical resistance	Good
Oil resistance Flame retardant Fire retardant Fire resistant Gases corrosivity Smoke density Packaging Ozone resistance  Yes IEC 60332-1 IEC 60332-3 IEC 60332-3 IEC 60331 IEC 60754-1, IEC 60754-2 Smoke density Cut to length	Maximum operating temperature	180 °C
Flame retardant IEC 60332-1 Fire retardant IEC 60332-3 Fire resistant IEC 60331 Gases corrosivity IEC 60754-1, IEC 60754-2 Smoke density IEC 61034 Packaging Cut to length Ozone resistance	Minimum operating temperature	-55 °C
Fire retardant Fire resistant Gases corrosivity IEC 60331 Smoke density Packaging Ozone resistance IEC 60332-3 IEC 60331 IEC 60331 IEC 60754-1, IEC 60754-2 IEC 61034 IEC 61035 IEC 60351 IEC 60351 IEC 60754-1, IEC 60754-2 IEC 61034 IEC 61034 IEC 60754-1, IEC 60754-2 IEC 61034	Oil resistance	Yes
Fire resistant IEC 60331 Gases corrosivity IEC 60754-1, IEC 60754-2 Smoke density IEC 61034 Packaging Cut to length Ozone resistance	Flame retardant	IEC 60332-1
Gases corrosivity  Smoke density  Packaging  Ozone resistance  IEC 60754-1, IEC 60754-2  IEC 61034  Cut to length  Yes	Fire retardant	IEC 60332-3
Smoke density IEC 61034 Packaging Cut to length Ozone resistance Yes	Fire resistant	IEC 60331
Packaging Cut to length Ozone resistance Yes	Gases corrosivity	IEC 60754-1, IEC 60754-2
Ozone resistance Yes	Smoke density	IEC 61034
	Packaging	Cut to length
U.V resistance Yes	Ozone resistance	Yes
	U.V resistance	Yes



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### Permissible continuous current carrying capacity 3kV

Cables separated: 1D

The values determined from the diagram are based on the following assumptions:

a) Cables separated.

Space between adjacent cables ≥ 1 x d.

- b) Conductor temperature = See tables below
- c) Without additional cooling.

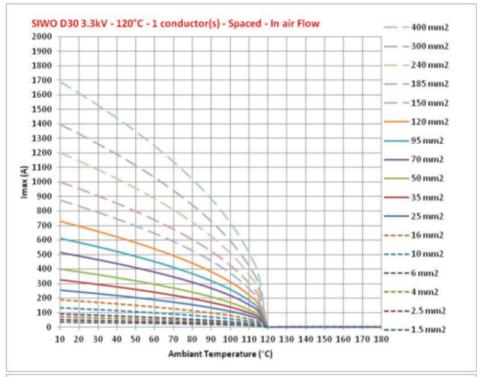
Suffcient natural air fow ensured.

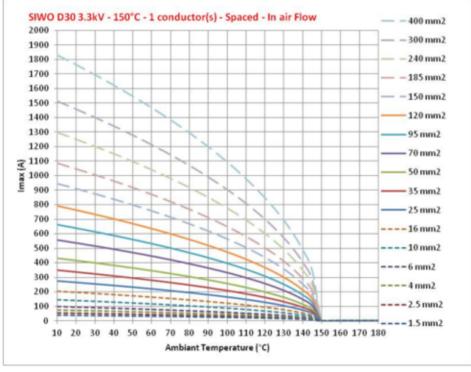


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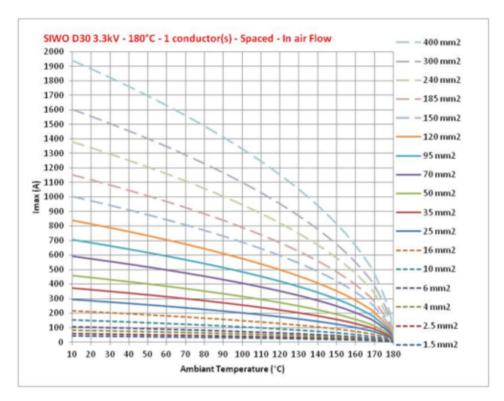




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## Selling information

### Marking

Our SIWO-KUL® B10 cables have been printed:

NEXANS SWITZERLAND SIWO-KUL® B10 + voltage in kV + section in mm² + Standards + Meter marks