Product Overview

QZ Cable supplies Self-Supporting Insulated (SIP) aerial cables designed for overhead power transmission and low-voltage electricity distribution networks.

SIP cables feature aluminium conductors with UV-resistant cross-linked polyethylene (XLPE) insulation. Depending on the cable type, the construction may include a supporting neutral conductor or consist of insulated conductors without a separate supporting neutral.

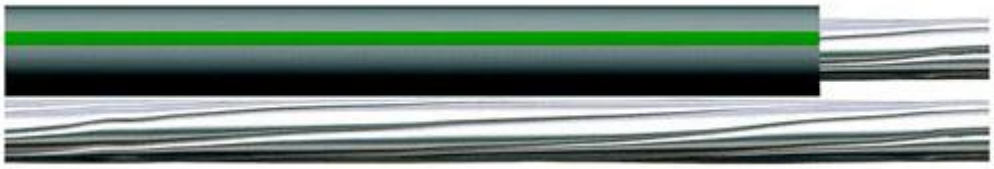
These cables are used for overhead distribution lines, service connections from main power lines to residential and utility buildings, and electrical installations along building walls and structural elements.

The product family includes SIP-1, SIPn-1, SIP-2, SIPn-2, SIP-4, SIPn-4, SIP-5 and SIP-5ng. Related designs such as AsXS and AsXSn are also referenced in the supplied technical documentation.

The standard low-voltage SIP configurations are designed for AC networks with a rated voltage of 0.6/1 kV (U_0/U). Medium-voltage SIP-3 is a separate product category for applications at 10–35 kV.

Types and Construction

1. SIP-1 – Aerial Cable with Bare Supporting Neutral



SIP-1 is a self-supporting insulated aerial cable with aluminium phase conductors and an uninsulated supporting neutral conductor.

Main construction:

- Phase conductors: Aluminium, concentrically stranded
- Supporting neutral: Aluminium-alloy conductor
- Phase insulation: UV-resistant cross-linked polyethylene (XLPE)
- Neutral insulation: Uninsulated

Typical applications:

- Low-voltage overhead transmission and distribution lines
- Overhead line reconstruction
- Service branches from main distribution lines
- Electrical connections to buildings and facilities

2. SIP-2 – Aerial Cable with Insulated Supporting Neutral

★ Address: West Industrial Park, Zhulin Town, Gongyi City, Henan Province, China. ★
★ Tel:+86-371-5502-1747 Mob:+86-173-3570-4553 www.qzcablegroup.com E-mail: info@qzcablegroup.com ★

SIP-2 features aluminium phase conductors and an insulated aluminium-alloy supporting neutral conductor.

Main construction:

- Phase conductors: Aluminium, concentrically stranded
- Supporting neutral: Aluminium-alloy conductor
- Insulation: UV-resistant cross-linked polyethylene (XLPE)
- Supporting neutral insulation: Insulated

Typical applications:

- Overhead distribution networks
- Coastal and industrial areas
- Areas exposed to saline or corrosive atmospheric conditions
- Overhead line reconstruction and service connections

3. SIP-4 – Self-Supporting Cable without a Separate Neutral Messenger



SIP-4 is an insulated aerial cable construction without a separate supporting neutral conductor.

Main construction:

- Conductors: Aluminium
- Conductor arrangement: Multiple insulated conductors
- Insulation: Light-stabilized polyethylene, according to the supplied product documentation
- Separate supporting neutral: Not provided

Typical applications:

- Branch connections from overhead power lines
- Electrical service connections to buildings
- Installation along building walls and engineering structures

4. SIP-5 – XLPE-Insulated Self-Supporting Aerial Cable

SIP-5 is a self-supporting insulated wire without a separate neutral supporting conductor. The supplied documentation identifies silanol-crosslinked, light-stabilized polyethylene as its insulation material.

Main construction:

- Conductor: Aluminium
- Insulation: Silanol-crosslinked, light-stabilized polyethylene
- Separate supporting neutral: Not provided

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The exact conductor arrangement and applicable voltage rating should be confirmed against the selected product specification.

5. SIP-5ng – Flame-Retardant Aerial Cable

SIP-5ng is listed as a flame-retardant version within the SIP-5 product family.

The exact flame-retardant insulation formulation, test requirements and applicable standard should be confirmed for the ordered design.

6. SIP-3 – Medium-Voltage Protected Aerial Wire

SIP-3 is a separate medium-voltage product type referenced in the supplied documentation.

It features a single aluminium conductor with XLPE insulation and is intended for overhead lines with nominal voltages of 10–35 kV.

Typical applications:

- Medium-voltage overhead transmission and distribution lines
- Coastal and industrial environments
- Areas requiring insulated overhead conductors

SIP-3 should be specified and quoted separately from the 0.6/1 kV SIP bundled cable range.

Applications

SIP aerial cables are designed for overhead electrical energy transmission and distribution.

Typical applications include:

- Low-voltage overhead power distribution networks
- Branch connections from main overhead lines
- Residential electricity service connections
- Connections to utility and industrial buildings
- Overhead power supply for lighting networks
- Reconstruction and modernization of existing distribution lines
- Installation along building walls and structural elements
- Medium-voltage overhead lines, using the appropriate SIP-3 design

Construction and Materials

1. Phase Conductors

- Material: Aluminium
- Shape: Round conductor
- Construction: Compacted stranded conductor

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- Stranding: Multi-wire concentric construction

2. Supporting Neutral Conductor

For SIP-1 and SIP-2 designs:

- Material: Aluminium alloy
- Shape: Round stranded conductor
- Construction: Compacted multi-wire design
- Function: Electrical neutral and mechanical support, according to the cable design

3. Insulation

- Material: Cross-linked polyethylene (XLPE)
- Type: Light-stabilized and UV-resistant XLPE
- Colour: Black or other specified identification colours, depending on the design
- SIP-1: Phase conductors insulated; supporting neutral uninsulated
- SIP-2: Phase conductors and supporting neutral insulated

SIP-4 and SIP-5 have different conductor arrangements and insulation specifications. Their detailed construction should be confirmed according to the applicable product standard.

4. Stranding Arrangement

For SIP-1 and SIP-2, insulated phase conductors are stranded around the supporting neutral conductor. The stranding direction is right-hand according to the supplied documentation.

An additional insulated auxiliary conductor with a nominal cross-section of 16 mm² or 25 mm² may be specified for lighting circuit connections, subject to product design confirmation.

Technical Specifications

Parameter	Specification
Product family	SIP Self-Supporting Insulated Aerial Cables
Conductor material	Aluminium
Supporting neutral	Aluminium alloy, where applicable
Conductor construction	Compacted, concentric stranded
Insulation	UV-resistant XLPE, according to cable type
Insulation colour	Black or specified identification colours
Low-voltage rated voltage	0.6/1 kV
SIP-3 voltage range	10–35 kV, depending on design
Applicable standards	GOST R 52373-2005; TU 16-705.500-2006
Additional references	GOST 15150-69 and applicable product requirements

Operating and Installation Conditions

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The supplied technical documentation specifies the following environmental and operating conditions:

- Climatic designation: UHL
- Placement categories: 1, 2 and 3 according to GOST 15150-69
- Solar radiation resistance: 1120 W/m² ±10%
- UV radiation component: 68 W/m² ±25%
- Bending resistance temperature: down to -40°C
- Minimum ambient temperature for cable laying and installation: -20°C
- Maximum permissible phase conductor temperature under normal operating conditions: +90°C
- Maximum permissible phase conductor temperature under short-circuit conditions: +250°C

The temperature limits and environmental conditions must be verified for the selected cable type and applicable standard before being used as guaranteed product values.

Key Features and Benefits

- **Aluminium conductors:** Provide electrical conductivity with a lightweight conductor design.
- **UV-resistant insulation:** Designed for outdoor exposure to solar radiation.
- **Self-supporting construction:** Selected designs use an aluminium-alloy neutral messenger for mechanical support.
- **Multiple cable configurations:** SIP-1, SIP-2, SIP-4 and SIP-5 offer different supporting conductor and insulation arrangements.
- **Environmental adaptability:** Specific configurations are intended for coastal, industrial and other demanding environments.
- **Residential service connections:** Suitable designs are available for branches from overhead distribution lines to buildings.

Applicable Standards

The supplied documentation references:

- GOST R 52373-2005
- TU 16-705.500-2006
- GOST 15150-69

TU 16-705.500-2006 is identified in the source documentation as replacing TU 16.K71-268-98 and TU 16.K71-272-98.

The exact standard edition and applicable requirements should be confirmed for each product type and project.

Why Choose QZ Cable?

QZ Cable is a cable and conductor manufacturer with a history dating back to 1969. We supply overhead conductors and insulated cable solutions for power transmission and distribution projects.

Our team can evaluate SIP cable requirements based on:

- SIP cable designation
- Rated voltage
- Phase conductor cross-section

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- Supporting neutral conductor material and cross-section
- Insulation type and thickness
- Environmental and installation conditions
- Applicable GOST or project-specific standards
- Required cable length and delivery destination

Contact QZ Cable with your technical specification or project drawings to discuss a suitable design and quotation.

Frequently Asked Questions

1. What is SIP cable?

SIP stands for Self-Supporting Insulated Wire. It is an insulated overhead conductor system designed for power distribution lines and service connections.

2. What is the difference between SIP-1 and SIP-2?

SIP-1 has an uninsulated supporting neutral conductor, while SIP-2 has an insulated supporting neutral conductor. Both designs use insulated aluminium phase conductors.

3. What is the difference between SIP-2 and SIP-4?

SIP-2 uses a supporting neutral conductor around which the insulated phase conductors are stranded. SIP-4 does not have a separate supporting neutral messenger.

4. What is the difference between SIP-4 and SIP-5?

The supplied documentation describes SIP-4 with light-stabilized polyethylene insulation and SIP-5 with silanol-crosslinked, light-stabilized polyethylene insulation. The exact material and standard requirements should be confirmed for each model.

5. What is the rated voltage of SIP cables?

The standard low-voltage SIP configurations in the supplied documentation are rated at 0.6/1 kV. SIP-3 is a separate medium-voltage design for 10–35 kV applications.

6. Are SIP cables suitable for coastal and industrial environments?

Selected SIP designs, particularly SIP-2, are specified for use in coastal and industrial environments. Final selection depends on the environmental conditions and applicable technical requirements.

7. Can SIP cables be supplied with different conductor cross-sections?

The supplied product range includes phase conductor cross-sections from 16 mm² to 240 mm². Supporting neutral sizes and conductor combinations depend on the selected cable type.

Specifications

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SIP-1 SIP-2 SIP-3 SIP-4 Aluminum Cable Specifications

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Mark and rated voltage wire	Number and nominal cross-phase and zero bearing veins sht.h mm2	Estimate the outer diameter of wire, mm	Estimated weight of 1 km of wire, kg
SIP-1 0,6 / 1 kV	1x16+1x25	15	135
	3x16+1x25	22	270
	3x25+1x35	26	390
	3x35+1x50	30	530
	3x50+1x50	32	685
	3x50+1x70	35	740
	3x70+1x70	37	930
	3x70+1x95	41	990
	3x95+1x70	41	1190
	3x95+1x95	43	1255
	3x120+1x95	46	1480
	3x150+1x95	48	1715
	3x185+1x95	52	2330
	3x240+1x95	56	2895
SIP-2 0,6 / 1 kV	3x16+1x25	24	308
	3x16+1x54,6*	28	427
	3x25+1x35	27	424
	3x25+1x54,6*	30	512
	3x35+1x50	31	571
	3x35+1x54,6*	32	606
	3x50+1x50	34	727
	3x50+1x54,5*	35	762
	3x50+1x70	36	798
	3x70+1x54,6*	39	973
	3x70+1x70	40	1010
	3x70+1x95	41	1087
	3x95+1x70	43	1240
	3x95+1x95	45	1319
	3x120+1x95	48	1553
	3x150x1x95	50	1787
	3x185+1x95	55	2403
	3x240+1x95	60	2968
SIP-3 20 kV	1x35	12	165
	1x50	13	215
	1x70	15	282
	1x95	16	364
	1x120	18	445

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	1x150	19	540
	1x185	24	722
	1x240	24	950
SIP-3 20 kV	1x35	14	209
	1x50	16	263
	1x70	17	334
	1x95	19	421
	1x120	20	518
	1x150	22	618
	1x185	24	808
	1x240	26	1045
SIP-4 0,6/1 kV	2x16	15	139
	4x16	18	278
	2x25	17	196
	4x25	21	392

SIP-1, SIPn-1 Parameter

Number of conductors and nominal cross-section, mm2	Nominal outer diameter, mm	Weight of 1 km of wire, kg
1 x 16 + 1 x 25	13,4	136
3 x 16 + 1 x 25	17,8	274
3 x 25 + 1 x 35	20,8	392
3 x 35 + 1 x 50	23,4	517
3 x 50 + 1 x 50	26,0	654
3 x 50 + 1 x 70	27,1	710
3 x 70 + 1 x 70	30,8	931
3 x 70 + 1 x 95	32,1	1002
3 x 95 + 1 x 70	33,7	1174
3 x 95 + 1 x 95	34,9	1246
3 x 120 + 1 x 95	38,2	1470
3 x 150 + 1 x 95	40,5	1697
3 x 185 + 1 x 95	45,0	2065
3 x 240 + 1 x 95	50,1	2521

SIP-2, SIPn-2 Parameter

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Number of conductors and nominal cross-section, mm2	Nominal outer diameter, mm	Weight of 1 km of wire, kg
3 x 16 + 1 x 25	20,6	306
3 x 25 + 1 x 35	21,8	428
3 x 25 + 1 x 54,6	23,2	489
3 x 35 + 1 x 50	24,6	566
3 x 35 + 1 x 54,6	25,0	581
3 x 50 + 1 x 50	27,1	703
3 x 50 + 1 x 54,6	27,7	718
3 x 50 + 1 x 70	28,6	777
3 x 70 + 1 x 54,6	32,1	939
3 x 70 + 1 x 70	32,1	997
3 x 70 + 1 x 95	33,5	1078
3 x 95 + 1 x 70	36,4	1241
3 x 95 + 1 x 95	36,4	1322
3 x 120 + 1 x 95	39,8	1546
3 x 150 + 1 x 95	43,8	1773
3 x 185 + 1 x 95	46,7	2141
3 x 240 + 1 x 95	50,1	2598

SIP-4, SIPn-4, SIP-5, SIP-5ng, AsXS, AsXSn Parameter

Number of conductors and nominal cross-section, mm2	Nominal outer diameter, mm	Weight of 1 km of wire, kg
1 x 10	6,2	47
1 x 16	7,4	68
1 x 25	8,6	98
1 x 35	9,7	129
1 x 50	11,3	174
1 x 70	13,3	246
1 x 95	15,1	327
1 x 120	16,5	401
1 x 150	18,2	475
1 x 185	20,2	596
1 x 240	22,5	747
2 x 10	12,4	94
2 x 16	14,8	138
2 x 25	17,2	199
2 x 35	19,4	260

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Number of conductors and nominal cross-section, mm2	Nominal outer diameter, mm	Weight of 1 km of wire, kg
2 x 50	22,5	351
2 x 70	26,6	499
2 x 95	30,2	661
2 x 120	33,1	811
2 x 150	36,3	962
2 x 185	40,4	1207
2 x 240	44,9	1512
3 x 10	13,4	142
3 x 16	15,9	207
3 x 25	18,5	298
3 x 35	20,8	391
3 x 50	24,2	527
3 x 70	28,6	748
3 x 95	32,4	991
3 x 120	35,5	1216
3 x 150	39,0	1443
3 x 185	43,4	1811
3 x 240	48,3	2267
4 x 10	15,0	189
4 x 16	17,8	276
4 x 25	20,8	397
4 x 35	23,4	521
4 x 50	27,1	703
4 x 70	32,1	997
4 x 95	36,4	1322
4 x 120	39,8	1621
4 x 150	43,8	1924
4 x 185	48,7	2415
4 x 240	54,2	3023

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