HIS CONNECT®
solar wiring system

HIS SOLUTIONS.
YOUR ADVANTAGES.

2019/2020

SOLUTIONS FOR CONNECTING AND WIRING PV-SYSTEMS

HIS
we connect solar energy

OUR PRINCIPLES:
MORE. EFFICIENCY.

Solar energy is one of the sustainable energy sources known to man which, with the help of photovoltaic technology, we try to put to use. We at HIS have set ourselves the task to provide operators of photovoltaic plants with integrated cabling and switching solutions with which they can achieve their objectives and maintain their long-term position in the market.

SUSTAINABLE SOLUTIONS. FOR BETTER RESULTS.

As a leading international manufacturer of solar cables, string boxes, pluggable cable solutions and in-line fuses for the PV industry, we have worked hard since the company was founded, to improve the cabling and connecting of solar plants. This is better for the installer, better for the operator and better for the environment. The result of our work is installation-friendly and sustainable solutions which also set the benchmark with regard to cost effectiveness.

- **In-house test laboratory**
- **Reduced installation times**
- **Durable products**
- **Optimization concepts**
- **Greater profitability**

FACTS & FIGURES

Family business
with 20 years experience in the PV sector

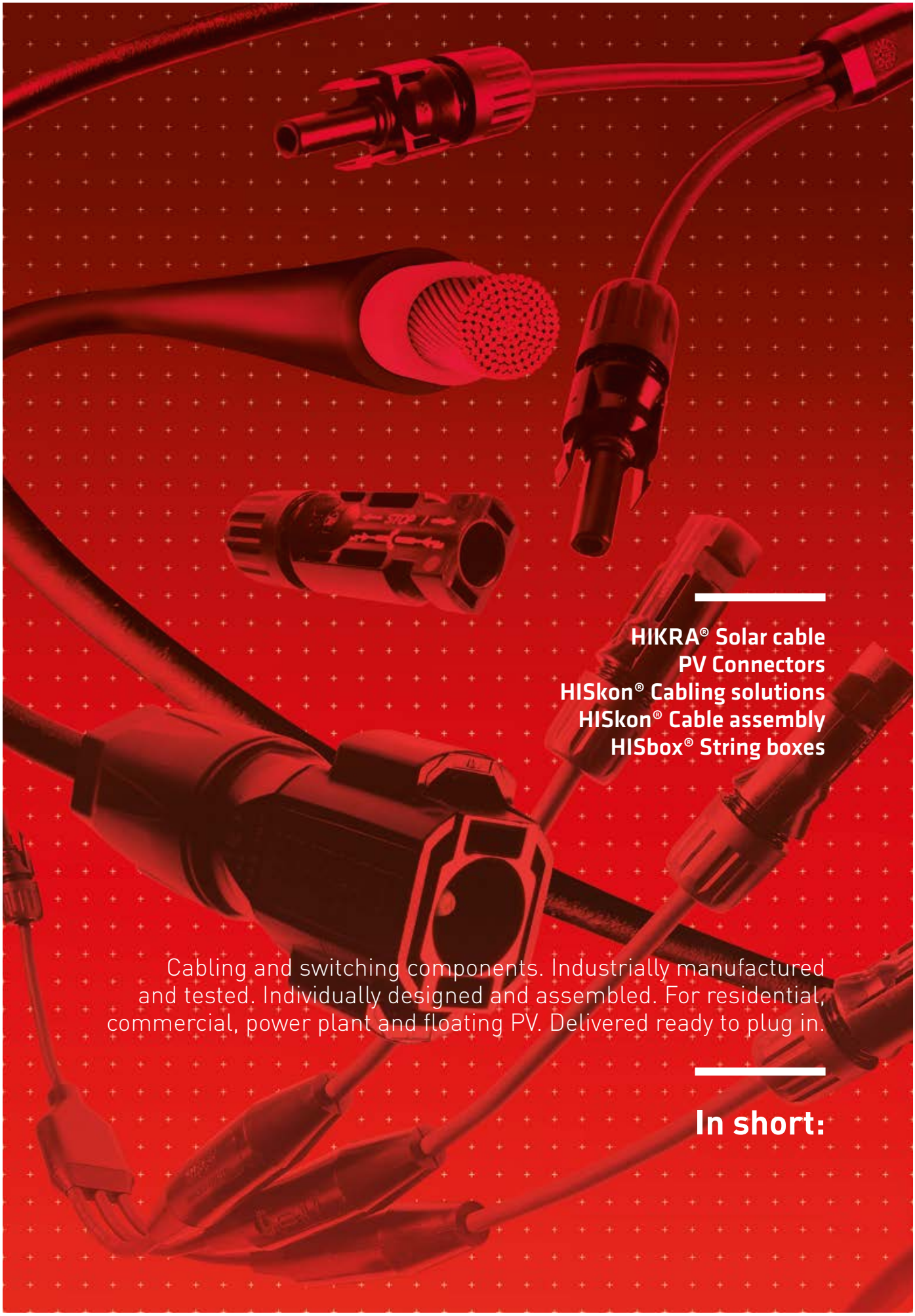
240 Employees
in development, production and sales

950 Customers
in 60 countries around the world

8.000 m²
production area in our Oberzent plant

COMPETENCE

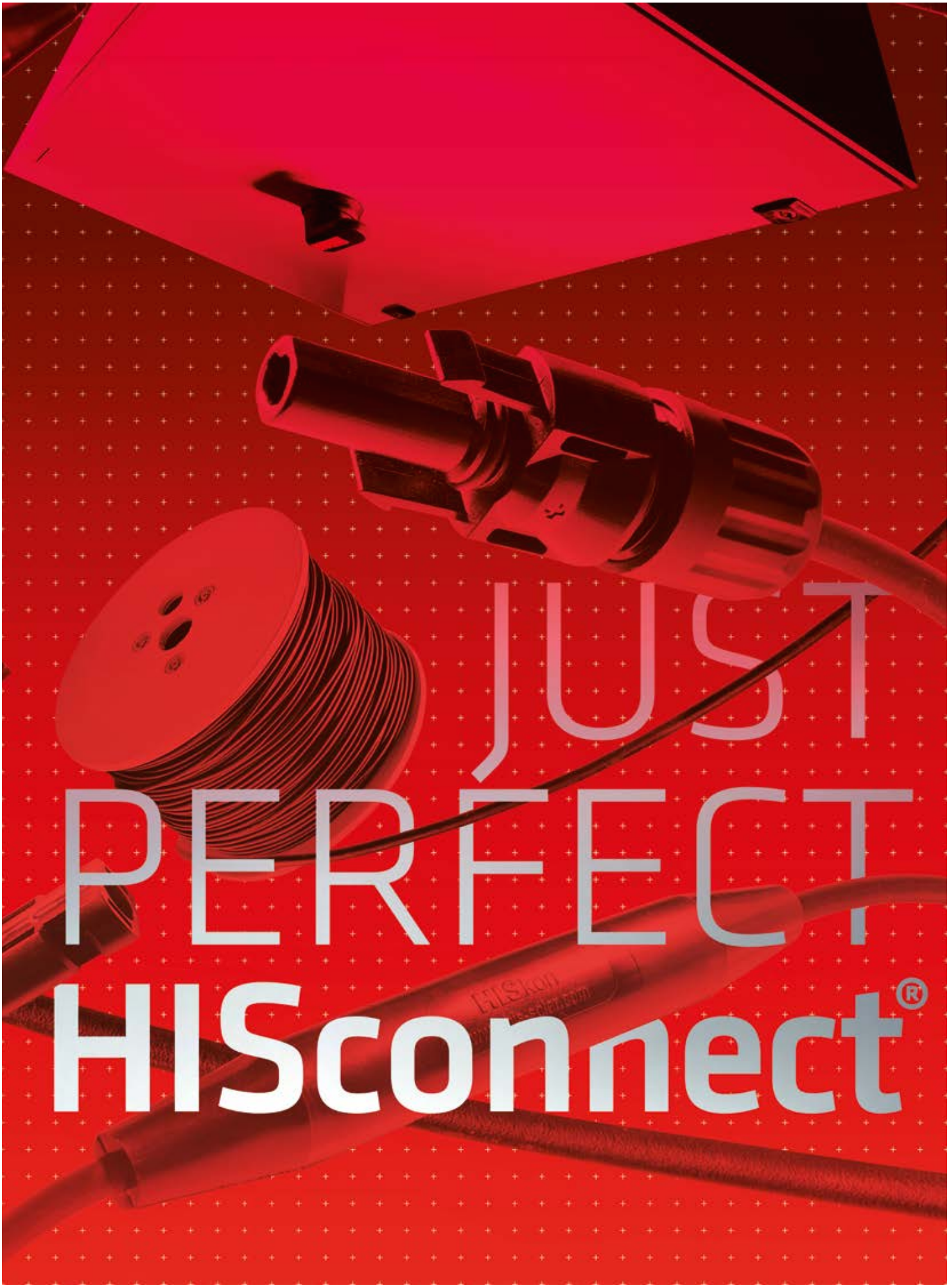
HIS components and solutions are designed by our experienced development team to best meet the particular on-site environmental conditions and then tested in our in-house laboratory. Worldwide, in 2018 our products have successfully connected **more than 2.8 GW PV** output.



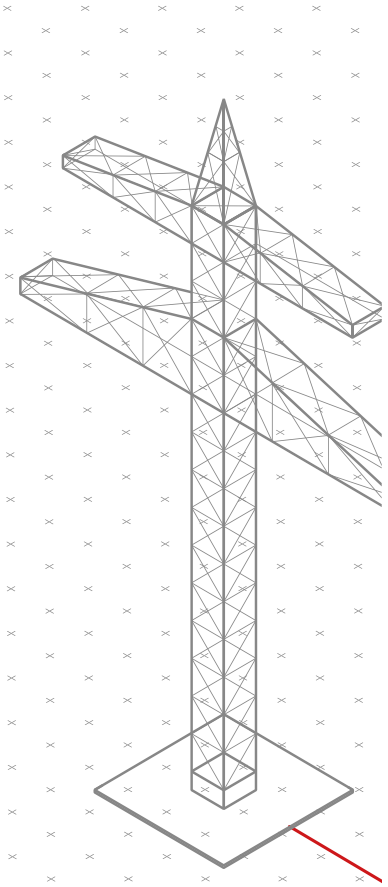
HIKRA® Solar cable
PV Connectors
HISkon® Cabling solutions
HISkon® Cable assembly
HISbox® String boxes

Cabling and switching components. Industrially manufactured and tested. Individually designed and assembled. For residential, commercial, power plant and floating PV. Delivered ready to plug in.

In short:


JUST
PERFECT
HISconnect®

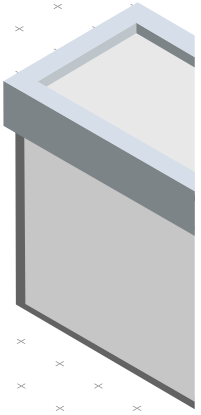
HIS CONNECT®
ALL-IN-ONE SYSTEM FOR PV-PROFESSIONALS



Whether high quality single components, pre-assembled solar cables or individually developed string boxes: the cabling and switch system HISconnect® has everything that plant operators, installers and service specialists need for cabling, switching and repairing of solar plants, including the safety you would wish for in your work.

REDUCE YOUR INSTALLATION COSTS AND BOOST THE LONGEVITY OF YOUR PV PLANT

The complete coverage of all cabling and switching tasks, simple installation and maintenance-free operation; the HISconnect® System has been designed to meet these requirements exactly. The basis of our system constitutes certified product brands which are tailor-made, professionally assembled and finally delivered ready to install. This means that from the beginning, installation errors are prevented and the foundations for a long life are laid.



HISkon® PV cabling components part of HIS CONNECT® + HISbox® DC/AC string boxes part of HIS CONNECT® = HIS CONNECT® solar wiring system

PV Cabling Components

High quality HIKRA® Solar cables, PV connectors for all major module manufacturers, In-line fuses, tools and accessories

Cable Assembly

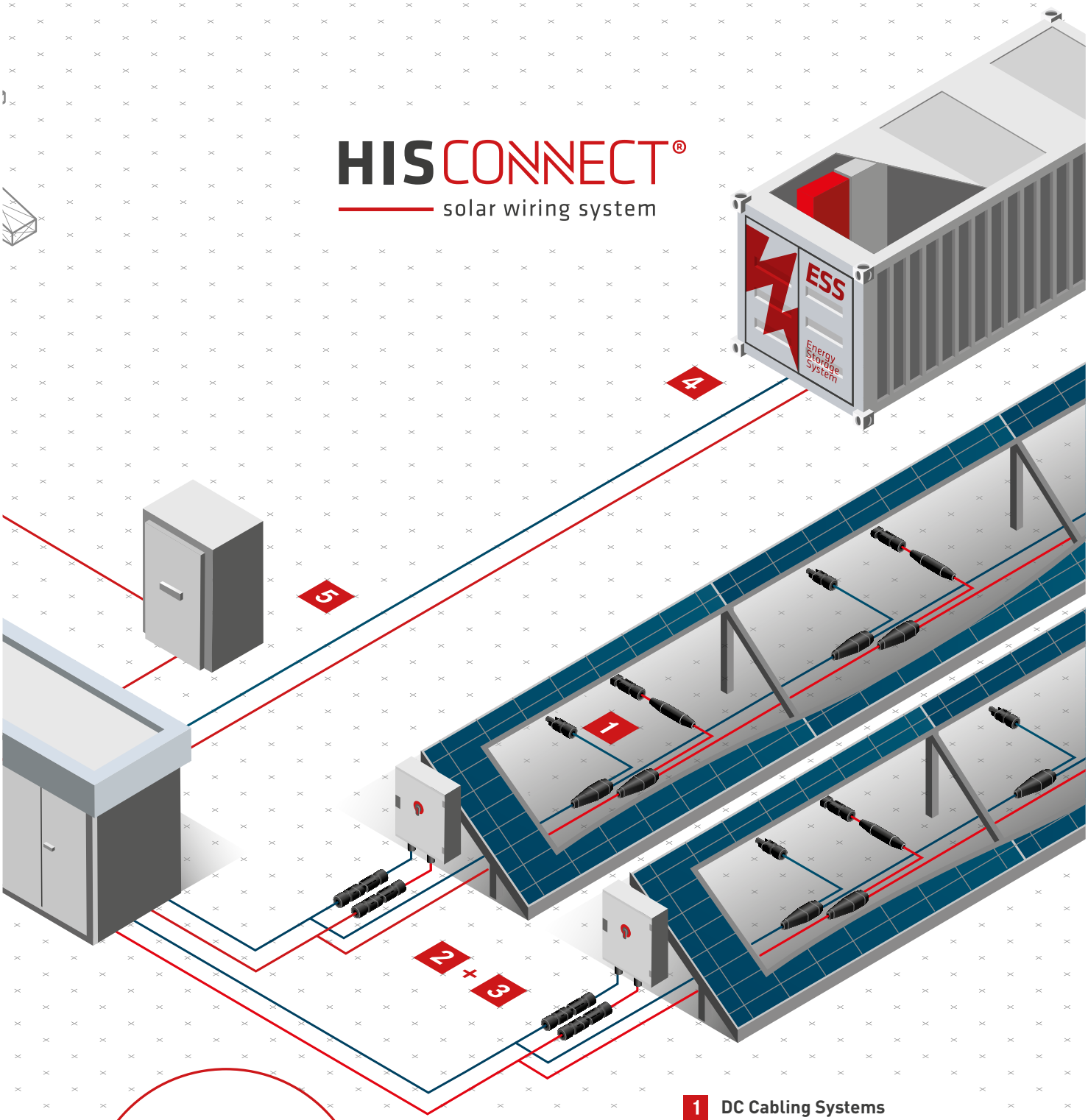
Design and assembly of individual Plug-and-Play cable solutions (splitters, harnesses and extensions)

DC/AC Stringboxes

Planning and manufacture of string combiner boxes, including all necessary switching and fuse components

HISCONNECT®

solar wiring system



ONE-STOP-SHOP SOLAR WIRING SOLUTION

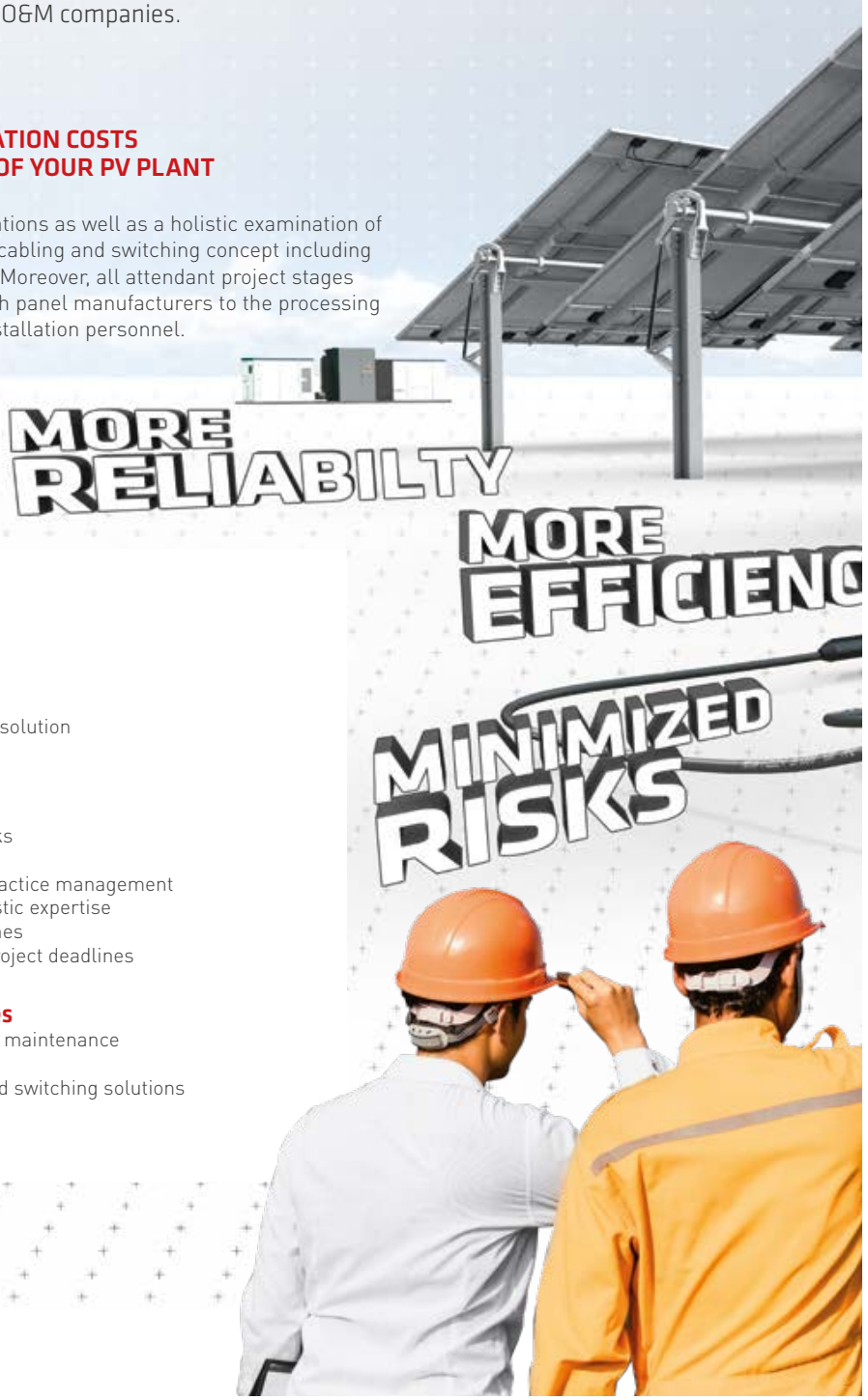
1. DC Cabling Systems
2. DC Combiner
3. Monitoring & Communication
4. ESS Combiner
5. Grid protect

HIS CONNECT® PLUS
SERVICE PLUS FOR YOUR PV PROJECT

HISconnect® PLUS stands for comprehensive service in the planning, design and co-ordination of PV projects, including the provision of the appropriate cabling and switching components. Everyone involved in the PV project benefits: investors, plant operators and developers as well as EPC and O&M companies.

REDUCE YOUR PLANNING AND CO-ORDINATION COSTS AND IMPROVE THE COST-EFFECTIVENESS OF YOUR PV PLANT

Based on complete coverage of all project specifications as well as a holistic examination of the plant, our employees will create a tailor-made cabling and switching concept including a comprehensive detailed plan of the components. Moreover, all attendant project stages will be conducted or co-ordinated: coordination with panel manufacturers to the processing of customs and to the provision of resources for installation personnel.



THE PLUS FOR ALL INVOLVED PARTIES

For investors
— High bankability for simpler project financing
— Better calculation security thanks to the all-in-one solution
— Continuing plant cost-effectiveness

For project developers and EPC companies
— Integrated system for all cabling and switching tasks
— Access to comprehensive HIS Product know-how
— Additional support from HIS PV experts and best practice management
— Much reduced supply chain and access to HIS Logistic expertise
— Pluggable components and reduced installation times
— Frictionless commissioning and compliance with project deadlines

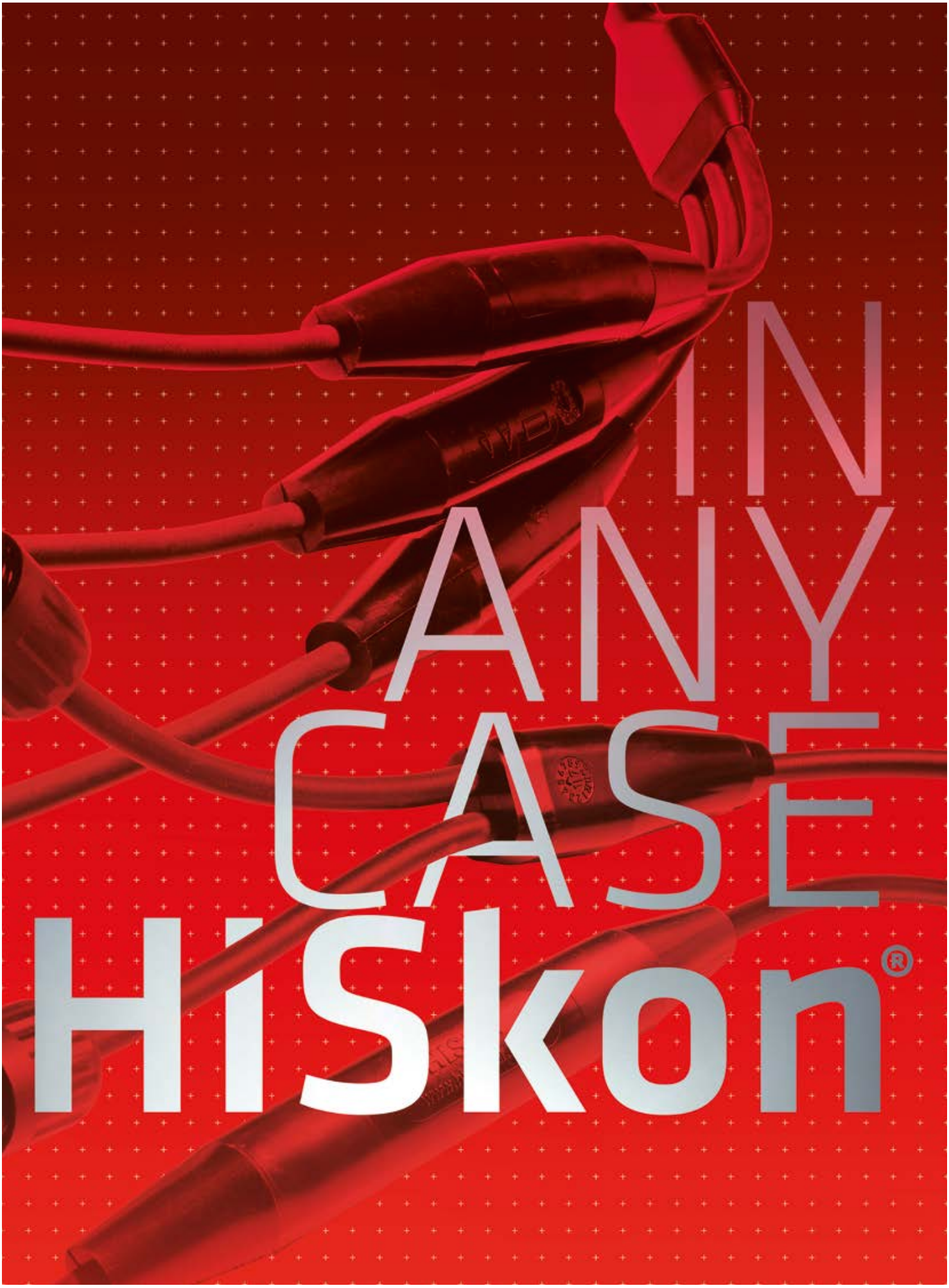
For plant operators, IPP and O&M companies
— Reduced costs in operational plants because of low maintenance
— Reliable energy supply
— Greater plant availability due to long-life cabling and switching solutions


HIS CONNECT PLUS®
wiring solution for solar business
LCOE
INCREASED
RoI
OPTIMIZED
OpEx
REDUCED
CapEx
PLUS
COST EFFECTIVE
AND SUSTAINABLE
COMPLETE SOLUTION
FOR PV PROJECTS

HIKRA® Solar cable
PV Connectors
HISkon® Splitter
HISkon® Extensions and Adaptors
HISkon® Inlinefuses and Fuse-connectors

Durable and robust cabling components from leading manufacturers. Individually tailored and pre-assembled for ready to plug in wiring solutions. In addition, internally quality tested with special adaptations on request.

In short:


IN
ANY
CASE
HiSkon®

HIKRA®
Solar cable

HIKRA® stands for more. More quality by testing which goes above and beyond the current product norms. More safety thanks to improved reaction to fire. More service thanks to varied designs and greater availability in our warehouses on three continents.
HIKRA®: the comprehensive cabling solution for international successful EPC and Installation companies which expect more from their suppliers.

IN FOCUS IS THE PLANT REVENUE. IN OPERATION OUR SOLAR CABLES.

HIKRA® stands for technically outstanding and integrated cabling solutions which have been developed taking into account all environmental, safety and cost aspects and even under the harshest conditions delivering a faultless performance.

A fine stranded wire of tinned electrolyte copper (IEC 60228/cl.5) as well as robust materials provide a low-loss transfer even after many years. When used in accordance with instructions, the expected life time of this product is at least 25 years. In addition, innovative insulating and sheath material designs provide greater resistance to abrasion and moisture. Versions with an additional nylon coating or stainless steel armour are also available at HIS.

NEW
according to IEC62930

HIKRA® SOL (H1Z2Z2-K) EN50618 + IEC62930

The double insulated, electronbeam cross-linked cable with special compound is certified to all current standards, meets all fire safety regulations and undergoes additional tests that go far beyond the standard. Durable and robust materials provide increased water-repellent properties: thus, it can be laid in the ground.

HIKRA® PLUS EN50618 (H1Z2Z2-K)

Robust materials defy the long-term influences of nature and offer a maximum quality and safety and conforms with fire protection guidlines. Thanks to its good resistance to atmospheric conditions, the cable has a specifically water repellency and can be laid underground.

INNOVATION

HIKRA® DUAL

The HIKRA® DUAL solar cable is TÜV (EN50618) and UL (UL 4703 PV Wire) certified and thus covers the whole bandwith required for global distribution. Ideal in combination with preassembled cables for manufacturers of junction boxes and modules. Also available as a pure UL version.

YOUR ADVANTAGES

Certification
EN50618, IEC62930, UL4703 (depending on type)

High availability
HIS warehouses on 3 continents

Part of the HISconnect® wiring system
Optimal compatibility with the plant configuration

Nominal voltage
1.5kV DC (up to 2kV DC max. operating voltage)

Suitable for laying in the ground
Optimized special compounds

High conductivity
Fine stranded wire of electrolyte copper

High short circuit current rating
250° C/5s

HIKRA® SOL (H1Z2Z2-K)

Your benefits:

— Certification: EN50618; **NEW: IEC62930**
— Nominal voltage 1,5kV DC and 1,0kV AC
Maximum permitted operating voltage: 1,8kV DC
(2,0 kV DC internal examination)
— Thanks to high-quality materials ready for direct burial
(acc. UL 44 cl. 5.4 & UL2566 cl. 6.4.4.2)
— Electron-beam cross-linked special compound; XLPO/XLPO
— CPR-classification of burning behavior acc. to 305/2011/EU: $B2_{ca}$, s1a, d0, a1
— Halogen free, flame retardant, UV and ozone resistant
— To aid installation: We ship this cable with meter-marking.
— Colour coding to seperate polarities
— Availabe in 100m coils, 500 m drums or in another kind upon request

TECHNICAL DATA

Nominal voltage	1.5kV DC and 1.0kV AC
Maximum permitted operating voltage	1,8kV DC (2,0 kV DC internal examination)
Test voltage	6.5kV AC / 15kV DC (5 minutes water bath, 20±5° C)
Strand construction	Tin-plated copper (electrolytic copper), fine wire acc. IEC 60228 Class 5
Short-circuit-temperature	250° C/5s
UV stability	Tensile strength and ultimate-elongation after 720 h (360 cycles) ≥ 70% of initial values; EN 50289-4-17 acc. Method A; EN ISO 4892-1 (2000) and EN ISO 4892-2 (2006)
Insulation resistance	Insulation resistance in water bath, each 2h at +90° C and 2h at 20° C (Limit values acc. EN 50618 Table 1)
Resistance against acid and alkaline solution	168h at 23° C in N-Oxal acid and N-Sodium hydroxide (EN 60811-404); ammoniac-resistant
Behaviour in case of fire	Flame-retardant acc. EN 60332-1-2 Annex A, low smoke emission (EN 61034,-2)
Halogen-free	EN 50525-1, Annex B
Minimum bending radius	10x cable diameter (flexible) I 4x cable diameter (fixed)
Range of temperature	Ambient temperature: -40° C to +90° C; Maximum conductor temperature: +120° C

Order No.		No. of cores in mm²	Construction n x max-Ø (mm)	Resistance of conductor (Ω/km)	External diameter approx (± 0.2 mm)	Copper index kg/km	Weight ~ kg/km
black	red						
73 90 65	73 90 66	1 x 1.5	29 x 0.25	13.7	4.6	14.0	32.0
73 86 09	73 86 10	1 x 2.5	47 x 0.25	8.21	5.0	24.0	42.0
73 86 13	73 86 14	1 x 4.0	52 x 0.3	5.09	5.4	38.4	57.0
73 86 15	73 86 16	1 x 6.0	78 x 0.3	3.39	6.0	57.6	76.0
73 86 17	73 86 18	1 x 10.0	77 x 0.4	1.95	7.2	96.0	119.0
73 86 19		1 x 16.0	126 x 0.4	1.24	9.3	153.6	196.0
73 90 61		1 x 25.0	190 x 0.4	0.795	11.3	240.0	291.0
73 90 63		1 x 35.0	266 x 0.4	0.565	12.9	336.0	394.0

HIKRA® DUAL 1500V/2000V

The HIKRA® DUAL solar cable is TÜV (EN50618) and UL (UL 4703 PV Wire) certified and thus covers the whole bandwith required for global distribution. Ideal in combination with preassembled cables for manufacturers of junction boxes and modules.

Order No.	No. of cores in mm²	Construction n x max-Ø (mm)	Resistance of conductor (Ω/km)	External diameter approx. (± 0.2 mm)	Copper quantity kg/km	Weight ~ kg/km
72 78 41	1 x 2.5 / AWG 14	47 x 0.25	8.21	5.94	24.0	49.0
74 06 74	1 x 4.0 / AWG 12	52 x 0.3	5.09	6.35	38.4	64.0
74 06 75	1 x 6.0 / AWG 10	78 x 0.3	3.39	6.97	57.6	84.0
74 11 97	1 x 10.0 / AWG 8	77 x 0.4	1.95	8.57	96.0	137.0

HIKRA® PLUS EN50618 (H1Z2Z2-K)

Your benefits:

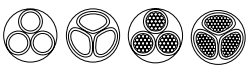
— Because of its excellent insulation material, the cable is particularly water repellent and can be laid directly underground. UL2566 (internal examination) Long-term insulation resistance test in water bath at 90° C >3GΩ*m (internal examination)
— Nominal voltage: 1.5kV DC and 1.0 kV AC
— Maximum permitted operating voltage: 1.8kV DC (Internal examination: 2.0kV DC)
— Short-circuit-temperature: 250° C/5s
— Reinforced cable sheath: Impact-Resistance UL 854.23 and Crushing-Resistance UL 854.24 (internal examination)
— UV stability: Tensile strength and ultimate-elongation after 720 h (360 cycles) ⩾ 70% of initial values; EN 50289-4-17 acc. method A; EN ISO 4892-1 (2000) and EN ISO 4892-2 (2006)
— CPR-classification of burning behavior: E_{ca} Declaration of Performance DoP 0743

Order No.			No. of cores in mm²	Construction n x max-Ø (mm)	Resistance of conductor (Ω/km)	External diameter approx (± 0.2 mm)	Copper index kg/km	Weight ~ kg/km
black	red	blue						
72 83 79	72 83 80	72 83 81	1 x 2.5	50 x 0.26	8.21	5.0	24.0	45.0
72 83 70	72 83 71	72 83 72	1 x 4.0	56 x 0.31	5.09	5.4	38.4	55.0
72 83 73	72 83 74	72 83 75	1 x 6.0	80 x 0.31	3.39	6.0	57.6	75.0
72 83 76	72 83 77	72 83 78	1 x 10.0	80 x 0.41	1.95	7.1	96.0	115.0
73 78 60			1 x 16.0	120 x 0.41	1.24	8.1	153.6	170.0
73 78 63			1 x 25.0	196 x 0.41	0.795	10.3	240.0	270.0
73 78 64			1 x 35.0	280 x 0.41	0.565	11.8	336.0	370.0

FURTHER HISKON® CABLES

HIKRA® Marten Resistant Cable
with a steel braid of V2A

HIKRA® AC Solar 3P
for use in systems with micro inverters



Underground Cable NYY / NAYY
for cabling the AC or DC side of your system

Data Cable Li2YCYv
for wiring data interfaces, e.g. standard protocols RS422 and RD485 in outdoor applications

HISkon® Cable configurator
Set up your own cabling quickly and in comfort with our online cable configurator

www.his-solar.com/kabelkonfigurator