Our passion for clean energy

Electrical power distribution technology for photovoltaic plants

www.hensel.in

Main plant in Lennestadt

Hensel – A strong brand

With passion and energy, we ensure safe connections, so that low-voltage electrical power is meaningfully distributed. Particulary where high demands are placed on the electrical installation.

We win as a team, because every single one of us makes a substantial contribution with our commitment, actions and attitude: for our customers, suppliers and partners – worldwide.

We use our long-term solution competence to set new standards again and again.

And do so as a family-owned business - as HENSEL.

Philipp C. Hensel Frank Dubberke Michael Lehr

made in GERMANY since 1931

MORE THAN 80 YEARS OF EXPERIENCE

Electrical energy powers us

Hensel is a leading, internationally operating provider of electrical installation and distribution systems for the safe distribution of electrical energy in challenging environments.

Many installation challenges in commercial and industrial buildings, in outdoor applications, in transport infrastructure systems and in photovoltaic installations are reliably solved thanks to Hensel products.
Above all, it is the electrical industry and electrical plant construction companies that use Hensel branded products and value our company's technical competence.

CUTTING-EDGE PRODUCTION PROCESSES FOR MAXIMUM QUALITY

State-of-the-art plastics processing and advanced metal and surface coating production processes are a technical requisite for our high-quality electro-mechanical products.

made in GERMANY since 1931

INTERNATIONAL PRESENCE

Hensel guarantees local support and a high degree of availability thanks to its 4 locations in Germany, 9 subsidiaries and 60 international partners.

FAMILY COMPANY

FOUNDED IN 1931

12 SUBSIDIARIES NATIONALLY AND INTERNATIONALLY

MORE THAN 60 INTERNATIONAL PARTNERS

800 EMPLOYEES

ELECTRICAL INSTALLATION AND DISTRIBUTION SYSTEMS

SOLAR POWER

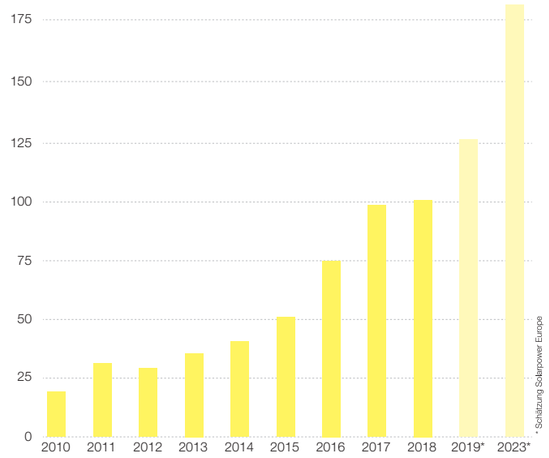
The energy of the future

Renewable energy is becoming increasingly important. Just in one single day, the sun provides the earth with 3,000 times more energy than we need, making it an inexhaustible source of energy.

The energy emitted from the sun accounts for 850 to 1,200 kWh/m² a year, depending on the location. The closer to the equator, the more energy is emitted.

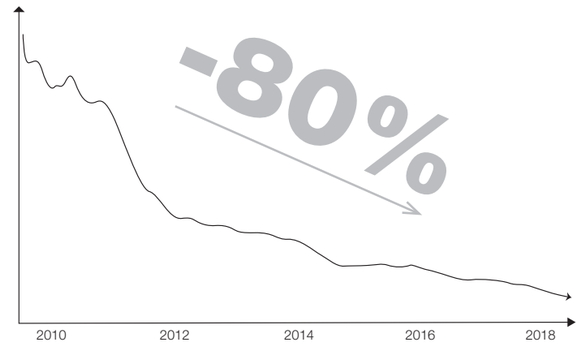
Safe, clean and environmentally friendly energy is required on all fronts. For more than 10 years, the production of solar power has risen globally, with the annual growth of new installations reaching more than 100 GW, with an upward trend.

GLOBAL PHOTOVOLTAIC GROWTH IN GIGAWATTS



COST DEVELOPMENT FOR PV MODULES (PER WATT)

Positive development: costs for PV modules have dropped by approximately 80% since 2010.



PHOTOVOLTAICS

Over 10,000 projects in more than 60 countries

HENSEL products are used globally in electrical installation and distribution technology, mostly in demanding environments.

To date, HENSEL technology has been used in more than **10,000 PV projects** with further projects underway. Over 10 years of experience in the area of photovoltaics and more than 85 years of expertise in the field of electrical installation and distribution systems ensure the successful and sustainable implementation of our projects.

Our product solutions for clean energy

BIOGAS PLANTS/SMALL WIND TURBINES

- Hensel products can also be used for energy production via biogas and small wind turbines

ROOF INSTALLATIONS

- Most popular type of installation
- Optimal alignment on flat roofs

OFF-GRID

- Energy production in areas with no power grid
- For village electrification and for water supply

PV GENERATOR JUNCTION BOX + PV POWER INVERTER COLLECTOR

- Connecting solar modules to the power inverter (ready for use)
- Connecting power inverters to isolation units (complete sets)
- Standardised solutions
- Individual solutions

OUTDOOR INSTALLATIONS

- Large PV systems
- Alignment towards the sun
- Solar trackers

DISCONNECTION UNIT + SWITCHGEAR ASSEMBLY

- Connecting generator plants to a low-voltage grid
- Standardised solutions (ready for use)
- Individual solutions

APPLICATIONS

Rooftop solar installations

Special challenges

- Interference in solar radiation resulting from roof slopes, roof aspects and shade from neighbouring buildings
- Limited roof surface, most components are installed outside
- Smaller PV installations

Our solution

- Quick and easy to install
- UV-resistant products suitable for installation in outdoor spaces
- A high IP protection class ensures protection against dust and humidity
- Protection Class II ensures safety of unskilled personnel
- Individual product solutions

To ensure maximum system availability, the total output is distributed between several power inverters.

Individual product solutions ensure a reliable distribution of electricity.

Furniture store in Herne, Germany

APPLICATIONS

Utility scale PV farms

Special challenges

- High solar radiation
- High temperature differences
- Different climatic conditions
- Large size of the plant makes on field maintenance a costly affair

Our solution

- Maintenance-free products thanks to high quality
- UV-resistant products suitable for installation in outdoor spaces
- The high IP protection class ensures protection against dust and humidity
- Ventilation inserts prevent water condensation

Numerous solar trackers in a solar park in Újszilvás (Hungary) generate 635,000 kWh a year. The power inverters were connected using individual Hensel product solutions.

Individual product solutions with integrated string monitoring for a large PV plant ensure the reliable distribution of electricity in Thailand.

Solar park in Újszilvás, Hungary

APPLICATIONS

Installations on carports

Special challenges

- The main difference between a PV carport and a typical unit in an outdoor space is that the PV generators are installed higher in order to make space for cars to park. The lightweight structure with PV modules forms the roof.
- Heat from car engines and dust from exhaust gases

Our solution

- Solutions with transparent covers allow you to see the installed components without having to open the cover
- Lightweight and easy to install
- Resistant against extreme temperatures
- Protection class II ensures the safety of employees on site

Numerous Hensel PV generator junction boxes ensure a reliable distribution of generated PV electricity.

Carports in Melaka, Malaysia

APPLICATIONS

PV + Architecture

Special challenges

- Photovoltaic systems can also be integrated into or onto modern and architecturally challenging buildings. The installation is integrated as part of the architecture thanks to individual solutions.
- The PV installations are exposed to all types of weather conditions.
- Access to the PV installation is restricted for regular maintenance cycles.

Our solution

- High level of customization possible
- Resistant against UV and extreme temperatures
- Maintenance-free products that are high in quality

Numerous PV generator junction boxes are installed on the roof of the Marina Bay Sands Hotel.

PV power inverter collectors are installed on the Supertrees in Singapore.

Marina Bay Sands and the Supertrees in Gardens by the Bay, Singapore

APPLICATIONS

Retrofit

Special challenges

- Already installed photovoltaic plants are to be expanded
- Limited space for the expansion

Our solution

- Simple expansion of the installation via the Mi system's modular function
  – ready for use or planned product solutions
  – individual product solutions
- Simple, hassle-free installation on site

PV distribution boards before the expansion of a plant in Chennai, India.

PV distribution boards after the expansion of a PV plant in Chennai, India.

Trade fair hall in Frankfurt, Germany

Floating PV

Special challenges

- Already installed photovoltaic plants are to be expanded
- Limited space for the expansion

Our solution

- Simple expansion of the installation via the Mi system's modular function
  – ready for use or planned product solutions
  – individual product solutions
- Simple, hassle-free installation on site

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APPLICATIONS

Off-grid/hybrid systems for village electrification

Special challenges

- Remote installations
- Shortage of qualified maintenance personnel
- Detailed individual system design and sizing for each project

Our solution

- High-quality, reliable and maintenance-free solutions
- Isolated products that guarantee the safety of untrained operators
- Individual product solutions

Electrification of a village in Liberia with PV generator junction boxes, PV power inverter collectors and battery distributors for protecting battery banks

Electrification of railways with a power supply in the Congo

Village electrification in Nepal

APPLICATIONS

Off-grid/hybrid systems for water pumping

Special challenges

- Remote installations
- Shortage of qualified maintenance personnel
- Detailed individual system design and sizing for each project

Our solution

- High-quality, reliable and maintenance-free solutions
- Isolated products that guarantee the safety of untrained operators
- Individual solutions for protection against dust and humidity

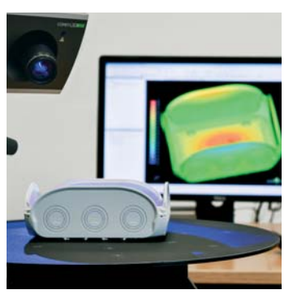
PV distribution boards close to a water source in the desert for a network-independent water pump system

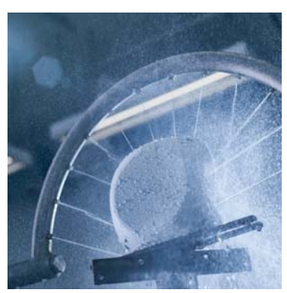
Solar park in Egypt

MODERN TEST METHODS

Hensel stands for certified quality

VDE-CERTIFIED TEST LABORATORY





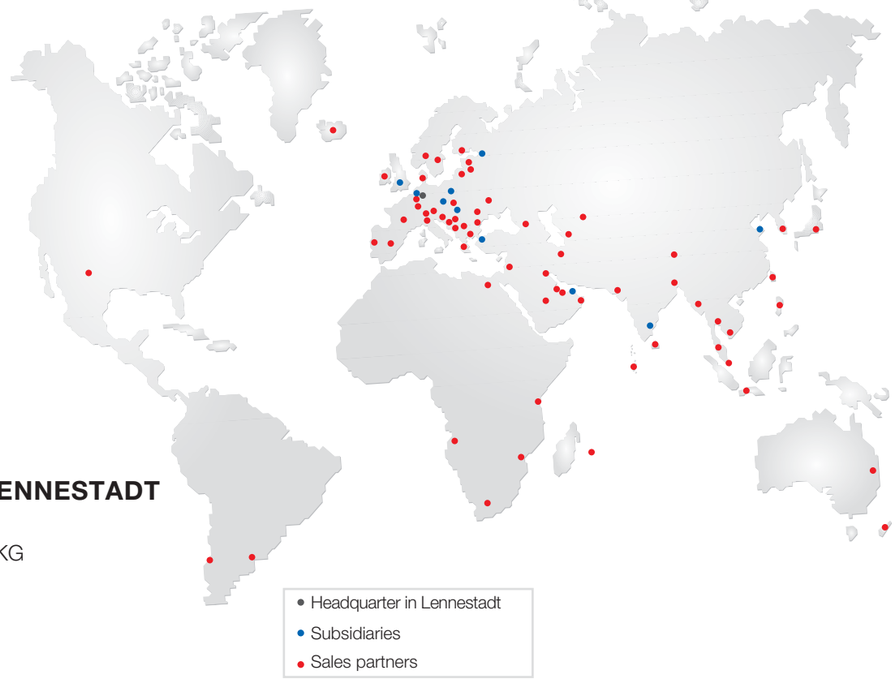
DMSZ
certified according to
ISO 9001+14001+
50001
Reg.-Nr. 00965

Places with dusty and humid environmental conditions that pose great challenges to electrical installation require products of the highest quality for the reliable distribution of electrical power in the low-voltage range.

- Durability of plastic materials
- Tests on electromagnetic susceptibility (EMC tests)
- Fire behaviour
- Limits of temperature rise
- Functional tests
- IP degree of protection (dust and water protection)
- Impact resistance
- Temperature resistance
- Corrosion resistance
- Dimensions check via structured light projection

High quality standards guarantee that our partners have the crucial competitive edge:

- Certified quality standard according to DIN EN ISO 9001:2015 for all production sites of the Hensel Group.
- Lean processes and efficiently positioned for the future. Continuous optimization:
  - Lean management / Hensel PEP system
- Safe manufacturing processes:
  - Occupational Health and Safety
  - Energy management according to DIN EN ISO 50001
  - Environmental management according to DIN EN ISO 14001



HEADQUARTER IN LENNESTADT

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Iran
Kuwait
Oman
Qatar
Saudi Arabia

Oceania
Australia
New Zealand

COMPANY

Hensel India

Hensel Electric India Private Limited (HEI) is a wholly owned subsidiary of Gustav Hensel GmbH & Co. KG., Germany.

Established in 2003 with its headquarters near the coastal city of Chennai in the south of India, HEI has provided innovative solutions to problems in "difficult environments".

The integrated competence center includes a complete information and exhibition area, design and development department and a qualified and skilled production and quality assurance team and is the centre of our activities in Asia Pacific.
With a marketing team in 40 cities backed by distribution partners in 165 industrial centres, we ensure that our products and technical support are available to customers in India. From our branch office in Singapore and resident sales managers in different parts of ASEAN, we ensure support to all partners and customers in Asia Pacific.

All facilities at HEI are certified to be in compliance with the requirements of ISO 9001:2015 and ISO 14001:2015 by the Bureau of Indian Standards.

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