ELEKTRO-TIPP

01 | 2025

42ST YEAR

CUSTOMER INFORMATION FOR ELECTRICAL SPECIALISTS

HENSEL

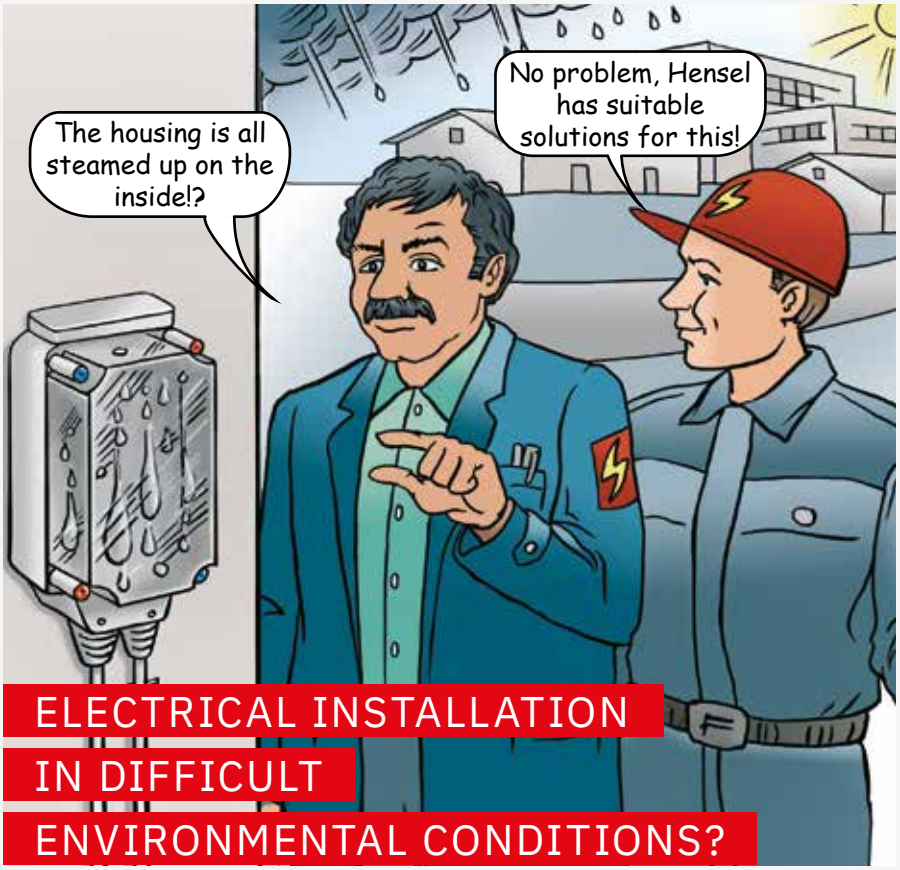
Dear Reader,

In humid and dusty environments, strong sunlight causes high temperature differences between day and night, resulting in higher demand for power distribution solutions. In such challenging environments, it is ever so important to maintain a suitable distribution system which is able to cope with the changes in temperature, especially if it is for a critical supply.

Significant & rapid change in temperature causes condensation within electrical enclosures resulting in short circuits and malfunctions of equipment. The prerequisite for overcoming such condition is to have high-quality solutions with a high degree of protection.

To prevent these problems occurring, we have developed special systems and accessories to ensure the inside of enclosures stays dry. This way, we guarantee permanent operational safety for yourselves and your customers.

Philipp C. Hensel, Managing Director,
Gustav Hensel GmbH & Co. KG



ELECTRICAL INSTALLATION IN DIFFICULT ENVIRONMENTAL CONDITIONS?

THE RIGHT MEASURES FOR HIGH TEMPERATURE DIFFERENCES: SO THAT CONDENSATION IS AVOIDED IN CLOSED HOUSINGS

Electrical installations must be set up in such a way that they can safely withstand the ambient conditions and stresses in their place of use. Temperature differences, e.g. due to climatic or operational influences, must also be taken into account. Temperature differences can occur in all protected and unprotected outdoor applications, but also indoors in special environmental conditions.
In all areas of the electrical installation, condensation can form in closed housings due to rapid temperature changes or major temperature fluctuations (day/night, change in weather, intensive sunlight, switching off the system). Particularly with a high degree of sealing, the risk of condensation accumulation increases, as excess air humidity cannot escape. In climates with particularly high humidity, the risk of condensation increases even more. Targeted measures are required to prevent consequences such as corrosion and malfunctions or even short-circuits or complete equipment/system failures.

OUR SOLUTION

Provisions for water drainage should be made where condensation can occur within cable and piping systems and condensate can collect. Systems and accessories specially developed for this purpose by Hensel, which keep the inside of the housing dry and thus ensure the smooth and safe functioning of the electrical installation, provide a remedy.

WHAT ARE THE REASONS FOR LARGE TEMPERATURE DIFFERENCES?

Climate/Weather

+ A cool night followed by a hot day Weather change
+ Monsoons in tropical and subtropical regions

Operating conditions

Different operating times of the installed units -> phases with a lot of power loss (waste heat) alternate with phases without operation (e.g. day/ night)

Place of use

Outdoor applications: e.g. in the field of photovoltaics, water and waste water management, waste management, petrol stations and pipelines, telecommunications, mining and the building materials industry, etc.

Indoor applications: e.g. near large gates, in car washes and laundry rooms, in agriculture, in cement, glass and ceramic factories, in power stations/power distribution, etc.

What are the consequences of large temperature differences?

Especially for housings with a high degree of protection and thus high impermeability and low airflow between inside and outside

Warm air can absorb more water or water vapour than cold air. **If the temperature in the housing** drops, humidity is released at the condensation point in the form of condensation, which collects on the colder inner walls or built-in devices. The greater the temperature difference inside and outside the housing, the greater the risk of condensation.

There is a pressure difference between the inside of the housing and the environment.

+ Due to the resulting negative pressure in housings with a high degree of protection, outside air with humidity is sucked in because housings are not gas-tight.
+ If the temperature in the housing drops or if the air in the housing is completely saturated with water vapor, the humidity condenses and forms condensation on the inner walls and/or the built-in devices.

In addition, the temperature changes can have an impact on the units and thus shorten their service life.

What do the product standards say?

The standard for cable junction boxes / small-type distribution boards specifies a hole for condensate drainage with a size of 5 mm (DIN EN IEC 60670-1, Chapter 12.3)
According to the standard for low-voltage switchgear, the relative humidity of 50 % of the ambient air must be taken into account, as well as occasional moderate condensation due to temperature fluctuations (IEC 61439, Chapter 7.1.1 (Table 15))

Effects of condensation are multi-faceted:

+ Corrosion on equipment
+ Malfunctions
+ Electrical short-circuits
+ Equipment / system failures
+ This results in: Power outages, costly downtime, safety risks, to name a few ...

HENSEL SOLUTIONS FOR OPERATIONAL SAFETY IN THE EVENT OF CONDENSATION

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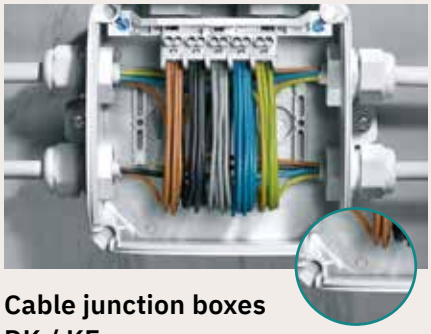
Opening condensation membrane on cable junction boxes



Cable junction boxes DK / KF

An openable condensation membrane is standard for cable junction boxes. It is located at a low point in the cable junction box and, when opened, reveals a hole for the condensation to drain (Ø 5 mm).

Protection class IP 55
(with open condensation membrane)

Ventilation

Ventilation flange Mi / FP

for ventilating ENYSTAR and Mi distributors at extremely high internal temperatures and where there is a risk of condensation.

Protection class IP 44

Pressure equalisation

LES pressure equalising element

to reduce condensation and accumulation by equalising pressure. Prevents humid air from being sucked in from outside due to negative pressure. For pre-embossing M40 / M20.

Protection class IP 54

Insert cable + ventilate by equalising pressure

Combination ventilation gland KBM / KBS

reduce condensation that can form due to rapid temperature changes or intense sunlight, among other things, via a climate membrane in housings with a high degree of protection.

Protection class IP 66 / IP 67

Protective roof Mi / FP

provides protection against rain, snow and ice as well as condensation.

Protection class IP 65

Sealing compound WP (“waterproof”) cable junction boxes

with supplied sealing compound are suitable for outdoor installation and use in extreme application areas with risk of condensation and water penetration, as well as for installation in the ground, without traffic load.

Protection class IP 66, IP 68, IP 69

HENSEL SOLUTIONS FOR OPERATIONAL SAFETY IN THE EVENT OF CONDENSATION

PRESSURE COMPENSATION

COMBINATION VENTILATION GLANDS

SEALING PLUG

VENTILATION FLANGES

PROTECTIVE CANOPY

MOUNTING FRAME

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