HENSEL

ENYFIT

Product information 06/2009

Combi climate glands

- cable entry and ventilation in one
- degree of protection IP 66 / IP 67
- for metric knockouts
- material: thermoplastic

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Industrial Electrical Power Distribution Systems

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Industrial Electrical Power Distribution Systems

How and when does condensed water occur in enclosures with high degree of protection and what states the safety standard IEC 60 364-5-52?

Condensation in enclosures particularly arises with outdoor installations. By large temperature fluctuations (day/night, chang-ing weather, intensive solar irradiation) or load change of the operational funds condensation can form in closed enclosures on the inner surfaces.

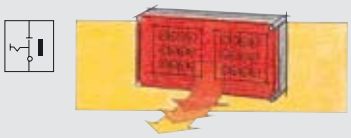
In order to prevent consequences such as corrosion, electrical short-circuits and possibly a complete equipment failure, purposeful measures are necessary.

1. HOW does condensed water forming occur?

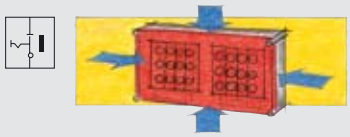
The degree of saturation of water in air (air humidity) is dependent on temperature.

In case of high temperature difference between exterior and interior air of the enclosure, condensation begins within the enclosure.

Example: Change of load in processing



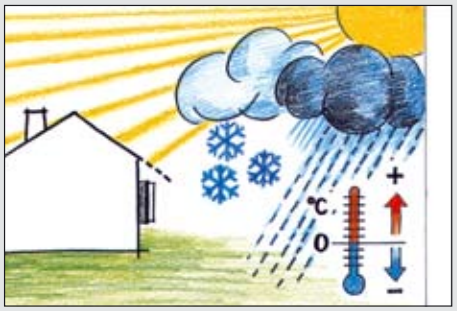
System switched on.
The internal temperature is usually higher than the external temperature due to the power dissipation of the built-in devices.



The warm air inside the enclosure attempts to accumulate moisture, which enters from outside through the seal as the enclosures are not gas-tight.

System switched off.
The internal temperature is reduced by cooling down the sysetm e.g. by switching off the loads. The cooler air emits moisture which is collected as condensed water on the cooling inner surfaces.

2. WHERE does condensed water forming occur?



Condensation forms particulary in areas where large temperature fluctuations are expected, (= 'sweating' enclosures): e.g. with protected outdoor installations or unprotected outdoor installations.
In the internal area e.g. in the proximity of large gates, in car washes, kitchens etc.

3. WHAT states the safety regulation IEC 60 364-5-52?

ÌEC 60 364-5-52 »Erection of low-voltage installations«,
chapter 52: wiring systems,
clause 522.3.2 stipulates:
”If water can accumulate or condensation of water can form within wiring systems, precautions for the water evacuation must be taken.“

The standard for cable junction boxes specifies a condensation hole in the size of ø 5 mm.

LES Cable entry systems
Combi climate glands

New product of Hensel: Ventilation and cable entry in one!

In general the formation of water in case of condensation in closed enclosures cannot be prevented in installation areas with high temperature differences!

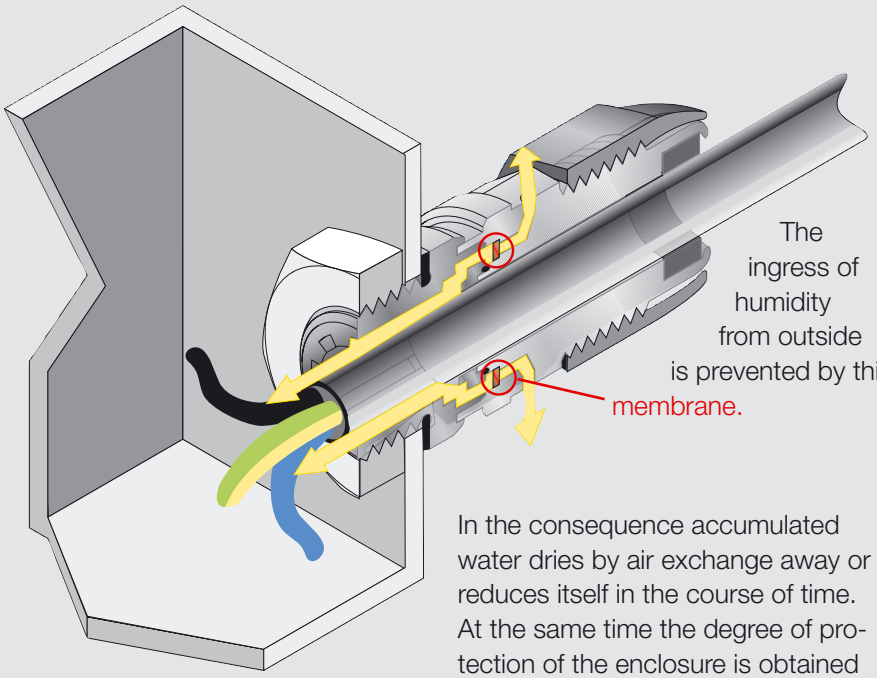
The new combi climate gland allows the cable entry and pressure compensation additionally.

Combi climate glands prevent accumulations of condensation, which can form among others by large temperature fluctuations, like changing weather, intensive solar irradiation etc., in enclosures with high degree of protection.

2 in 1

For adherence to the requested degree of protection the ventilation of the enclosure is effected via a special combi climate gland.

Via an inserted, breathable membrane combi climate glands ensure pressure compensation between enclosure interior and ambient air.



In the consequence accumulated water dries by air exchange away or reduces itself in the course of time. At the same time the degree of protection of the enclosure is obtained (up to IP 67)!

Your advantages with the new combi climate glands:

- Cable entry and ventilation in one!
- Degree of protection of enclosure is obtained
- Reliable avidance of damage to electrical and electronic operational funds by accumulation of condensed water

LES Cable entry systems

Combi climate glands for metric knockouts

- for indoor (normal environment and/or protected outdoor) and outdoor installation (harsh environment and/or outdoor)
- with strain relief and locknut
- material: thermoplastic
- **degree of protection: IP 66 / IP 67**
- **colour: grey, RAL 7032**

KBM 20	**Combi climate gland M20**

glow wire test IEC 60 695-2-11 960° C
ISO thread: M 20 x 1.5
sealing range: Ø 6-13 mm
bore-hole: Ø 20.5 mm
wall thickness: to 3.5 mm
In order not to exceed leakage limit of 0.07 bar with pressure compensation,
one combi climate gland M20 must be used per 6 litres (6000 cm³)
of enclosure volume.
Example: enclosure size 27 cm x 27 cm x 17 cm = 12393 cm³ = 12.393 litres.
Number of necessary combi climate glands M20 ≥ 3 pieces.

KBM 25	**Combi climate gland M25**

glow wire test IEC 60 695-2-11 960° C
ISO thread: M 25 x 1.5
sealing range: Ø 9-17 mm
bore-hole: Ø 25.5 mm
wall thickness: to 3.5 mm
In order not to exceed leakage limit of 0.07 bar with pressure compensation,
one combi climate gland M25 must be used per 11 litres (11000 cm³)
of enclosure volume.
Example: enclosure size 27 cm x 27 cm x 17 cm = 12393 cm³ = 12,393 litres.
Number of necessary combi climate glands M25 ≥ 2 pieces.

KBM 32	**Combi climate gland M32**

glow wire test IEC 60 695-2-11 960° C
ISO thread: M 32 x 1.5
sealing range: Ø 13-21 mm
bore-hole: Ø 32.5 mm
wall thickness: to 3.5 mm
In order not to exceed leakage limit of 0.07 bar with pressure compensation,
one combi climate gland M32 must be used per 13 litres (13000 cm³)
of enclosure volume.
Example: enclosure size 27 cm x 27 cm x 17 cm = 12393 cm³ = 12,393 litres.
Number of necessary combi climate glands M32 ≥ 1 piece.

VSB 13	**Sealing plug**

diameter: 13 mm
for sealing combi climate glands M20 or M25, which are not used for cable entry
material: thermoplastic
colour: RAL 3000 red

VSB 21	**Sealing plug**

diameter: 21 mm
for sealing combi climate glands M25 or M32, which are not used for cable entry
material: thermoplastic
colour: RAL 3000 red

When using different gland sizes the values for the enclosure volumes of the used combi climate glands can be added on. If the quantity of the necessary climate glands for pressure compensation is larger, than the number of necessary cable glands für cable entry, the unused climate glands can be sealed with sealing plugs.

LES Cable entry systems

Combi climate glands for metric knockouts

- for indoor (normal environment and/or protected outdoor) and outdoor installation (harsh environment and/or outdoor)
- with strain relief and locknut
- material: thermoplastic
- **degree of protection: IP 66 / IP 67**
- **colour: black, RAL 9005**

KBS 20	**Combi climate gland M20**

glow wire test IEC 60 695-2-11 960° C
ISO thread: M 20 x 1.5
sealing range: Ø 6-13 mm
bore-hole: Ø 20.5 mm
wall thickness: to 3.5 mm
In order not to exceed leakage limit of 0.07 bar with pressure compensation,
one combi climate gland M20 must be used per 6 litres (6000 cm³)
of enclosure volume.
Example: enclosure size 27 cm x 27 cm x 17 cm = 12393 cm³ = 12.393 litres.
Number of necessary combi climate glands M20 ≥ 3 pieces.

KBS 25	**Combi climate gland M25**

glow wire test IEC 60 695-2-11 960° C
ISO thread: M 25 x 1.5
sealing range: Ø 9-17 mm
bore-hole: Ø 25.5 mm
wall thickness: to 3.5 mm
In order not to exceed leakage limit of 0.07 bar with pressure compensation,
one combi climate gland M25 must be used per 11 litres (11000 cm³)
of enclosure volume.
Example: enclosure size 27 cm x 27 cm x 17 cm = 12393 cm³ = 12.393 litres.
Number of necessary combi climate glands M25 ≥ 2 pieces

KBS 32	**Combi climate gland M32**

glow wire test IEC 60 695-2-11 960° C
ISO thread: M 32 x 1.5
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one combi climate gland M32 must be used per 13 litres (13000 cm³)
of enclosure volume.
Example: enclosure size 27 cm x 27 cm x 17 cm = 12393 cm³ = 12.393 litres.
Number of necessary combi climate glands M32 ≥ 1 piece.

VSB 13	**Sealing plug**

diameter: 13 mm
For sealing combi climate glands M20 or M25, which are not used for cable entry
material: thermoplastic
colour: RAL 3000 red

VSB 21	**Sealing plug**

diameter: 21 mm
For sealing combi climate glands M25 or M32, which are not used for cable entry
material: thermoplastic
colour: RAL 3000 red

When using different gland sizes the values for the enclosure volumes of the used combi climate glands can be added on. If the quantity of the necessary climate glands for pressure compensation is larger, than the number of necessary cable glands für cable entry, the unused climate glands can be sealed with sealing plugs.

Combi climate glands for reduction of condensation by pressure compensation

LES Cable entry systems
Grommets
for metric knockouts

- for indoor - normal environment and (or) protected outdoor installation
- glow wire test IEC 60 695-2-11 750° C
- for knockouts M 16 - M 40
- bore-hole Ø 16.5 - 40.5 mm
- material: thermoplastic
- colour: grey, RAL 7035

Grommets
ESM
degree of protection: IP 55
sealing range: Ø 4.8 mm - 30 mm
wall thickness 1.5-3.5 mm

Stepped grommets
STM
degree of protection: IP 55
sealing range: Ø 3.5 mm - 34 mm
wall thickness: 1.5-4 mm

Grommets
EDK
degree of protection: IP 65
sealing range: Ø 5 mm - 30 mm
wall thickness: 1.5-3.5 mm

Grommets for conduits
EDR
degree of protection: IP 65
conduit connection: M 16 - M 40
wall thickness: 1.5-3.2 mm

LES Cable entry systems
Cable glands
for metric knockouts

- for indoor (normal environment and/or protected outdoor) and outdoor installation (harsh environment and/or outdoor)
- ISO thread: M 12 - M 63
- bore-hole: Ø 12.5 - 63.5 mm
- material: thermoplastic
- wall thickness: up to 3 mm

Cable glands
AKM
degree of protection: IP 65
sealing range: Ø 3 mm - 48 mm
colour: grey, RAL 7035
glow wire test IEC 60 695-2-11 750° C

Cable glands
ASM
degree of protection: IP 66
sealing range: Ø 3 mm - 48 mm
colour: grey, RAL 7035
glow wire test IEC 60 695-2-11 960° C

Cable glands
ASS
degree of protection: IP 66 / IP 67
sealing range: Ø 2 mm - 48 mm
colour: black, RAL 9005
glow wire test IEC 60 695-2-11 960° C

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