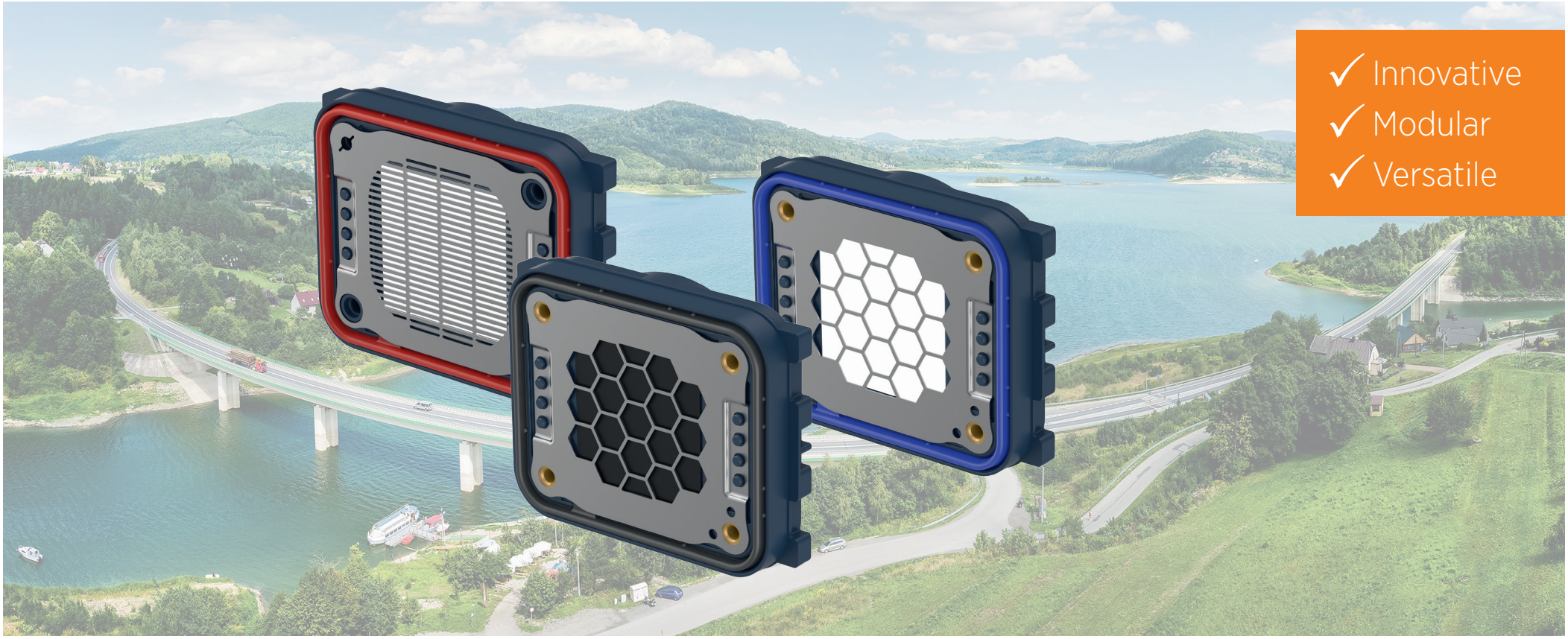
VentPlus
Venting units for high-voltage battery systems



Leadership in Filtration

MANN+HUMMEL

MANN+HUMMEL VentPlus
Venting units for high-voltage battery systems

Several years mass production experience for
battery electric and hybrid vehicles

Open the website for more information about products for electrified powertrains from MANN+HUMMEL.

Watch the video of the venting units for high-voltage battery systems.

Visit our E-Mobility Onlineshop to check our offerings and buy directly.

MANN+HUMMEL memberships and partnerships in e-mobility and fuel cells:

Hydrogen Council

EUROPEAN BATTERY ALLIANCE | EBA250

elektromobilität süd-west

brennstoffzelle BW

Science for a moving society

European Clean Hydrogen Alliance

USHA United States Hydrogen Alliance

VDMA Arbeitsgemeinschaft Brennstoffzellen (Fuel Cell Working Group)

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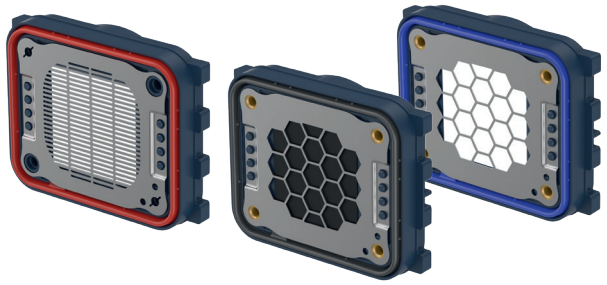
Venting units for high-voltage battery systems

Premium quality with over six years mass production experience for battery electric and hybrid vehicles

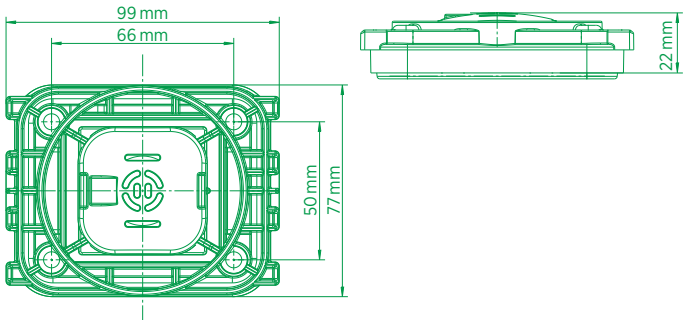


Functional description

- **Permanent pressure compensation** due to temperature differences or varying altitude (e.g. mountainous terrain or air freight)
- **Dust & water tightness** to protect the battery system in case of water wading and high-pressure or steam-jet cleaning
- **Automatic emergency degassing** in case of a malfunction of the battery (e.g. degassing of cells)
- **Prevention of access** to the high-voltage components even after a fire (intrinsic safety)

Large variety of possibilities for you to combine our modular kit to fit your specific application.

Dimensions



Technical specification

Plastic material	PP GF30 (FR)
Flammability	flame retardant (UL94-V0)
Dimensions	99 x 77 x 22 mm
Hole pattern	66 x 50 mm
Protection class	IP6K7 / IP6K9K
Min. permanent water tightness	100 mbar @ 48 h (IP6K8)
Operating temperature	T_{min} = -40 °C; T_{max} = +90 °C

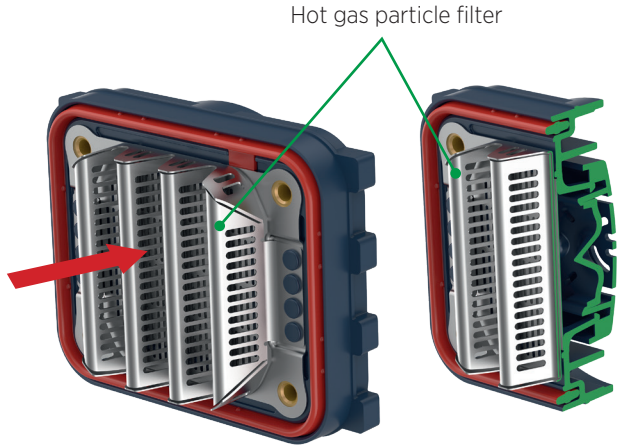
Membrane characteristics

Material	porous polytetrafluoroethylene (PTFE), hydrophobic on both sides
Chemical stability	virtually universal
Flammability	flame retardant (UL94-V0)

Optional hot gas particle filter

Status: in Development

- To increase safety, new legislation will enforce OEMs to assure a time period of five minutes in which passengers can safely exit their vehicle before a fire or explosion occurs
- The hot gas particle filter is a method for keeping particles created in thermal runaway events from being ejected from the pack by filtration
- Through this, the risk of igniting the vent gas outside the pack by metallic sparks can be reduced



➡ Direction of the emergency degassing gas stream

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Membrane

	Airflow [l/min]* with slot grid	Airflow [l/min]* with honeycomb grid	Emergency degassing [mbar]
Narrow white	1.2	1.8	400 +/- 150
Open black	4.5	6.8	200 +/- 100

**Air flow [l/min] measured @ 25 mbar*

Membrane grid

	Protection class	Description
Honeycomb, metal	IPxx-B	Protection against access with finger diameter 12 mm
Slot, metal	IPxx-D	Protection against access with wire diameter 1 mm

Sealing material – Chemical resistance

	Flame retardance	Fuel	Oil	Ozone	Coolant	Water	IP Code IP6K9K
FKM (blue)	✓	✓	✓	✓	✓	✓	✓
VMQ (red)	✓	limited	limited	✓	✓	✓	✓
EPDM (black)	✓	-	-	✓	✓	✓	✓

Fixation

	Intrinsic safety	Description
Metal insert	✓	Use of M5 metal thread and screws
Direct screwing	limited	Direct screwing into plastic Ø 5 mm

Your VentPlus matrix code

Example: VentPlus venting unit with open black membrane, membrane grid with slots, VMQ sealing and fixation with metal inserts.

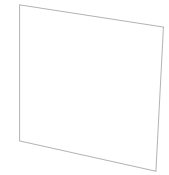
VP	**3**	**2**	**2**	**1**

Your VentPlus matrix code:

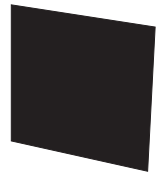
VP				

Matrix code

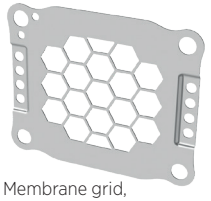
Membrane	Membrane grid	Sealing material	Fixation
1	1	1	1
3	2	2	2
		3	



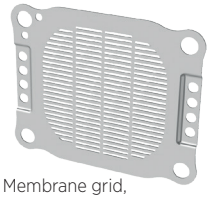
White membrane with standard permeability



Black membrane with high permeability

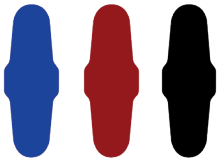


Membrane grid, honeycomb design

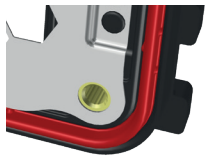


Membrane grid, slot design

Sealing, with check flag (Poka Yoke)



Sealing materials: FKM (blue), VMQ (red), EPDM (black)



M5 metal insert

Direct screwing (screw not scope of delivery)

Flame retardance according to DIN EN 60695-11-10 and protection classes according to ISO 20653:2013

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