

Ventilation Plugs (Pressure Balance Elements)

In order to choose the right ventilation plug unit (pressure balance elements) for a specific application, the working principles of the unit must be known first.

Ventilation plugs are permeable to "gases and vapours, e.g. air" but impermeable to "liquids and dust, e.g. water". The permeability resistance to liquids depends on the pore size and structure of the membrane inside these devices.

If the working conditions of water (the most common liquid) are studied, it is possible to say that the water intrusion pressure goes down as air permeability increases. The relevant specifications are collected in tabulated data.

Of the relevant parameters, the "Pressure Balance" function depends on the differential pressure between the inner and the outer environments of the enclosure. As a reference pressure, 70 mBar (70mBar = 1 Psi) value is chosen to present data. Under normal conditions, air circulation exists for all differential pressure levels. But the volume flow rate is very low for smaller values and obviously increases with increasing pressure values. Of course the air flow rate also depends on the properties of the membrane (classified as standard, medium, high and ultra high permeability types).

If there is no water pressure danger (if the device is not immersed in the water), it is always better to choose highly permeable elements for good circulation even for low differential pressure levels.

In essence, there is air circulation in the enclosure from the inside to the outside when the device is heating up due to its operation. Similarly, a circulation in reverse direction occurs during the cooling period. It should also be noted that there is always a level of humidity in air, hence some water in the form of vapour is also circulated with air. However condensed water is blocked by the water repellent membrane unless the differential pressure exceeds the intrusion pressure threshold.

After this technical overview, the utility of the "Ventilation Plugs" can be listed as follows;

Prevention of pressure increase inside the enclosure. The pressure sensitive elements are not threatened.

Limiting of temperature increase by the air circulation. The temperature sensitive elements are not threatened.

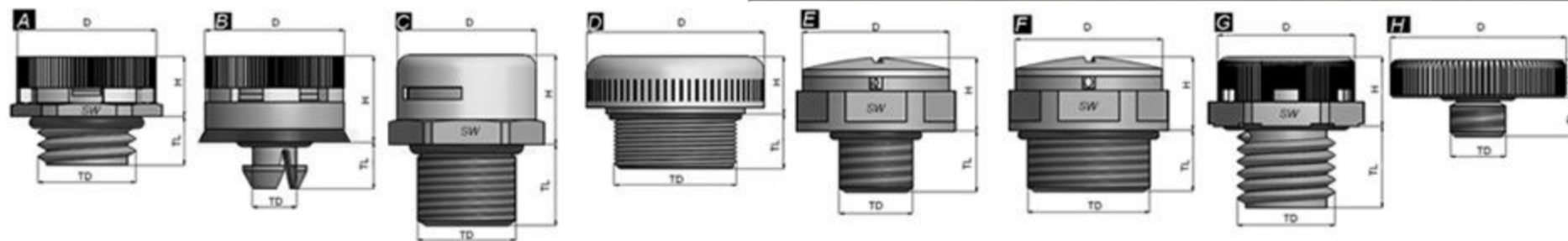
Added flexibility for maintenance. In traditional units, when the enclosures are heated, generally the dilated air goes out from the seals but can not return back when the device is colder. Because of the vacuum formed inside the enclosure, the gaskets are exposed to large pressure levels. In result, it is very difficult to open the covers for maintenance. Especially in "luminaires" it is obligatory to change the bulbs when the device is cold. The ventilation plugs in our system prevent these kind of limitations.

Prevention of accidental water suction into the system. During the cooling period, we know that there is air circulation from the outside to the inside. Hence, if the enclosure is wet from rain or due to other reasons, some water may be sucked inside the enclosure if there is no ventilation plug.

Prevention of exposure to hot, humid, compressed gases. There is always a level of humidity in the enclosure due to atmospheric conditions. Hence when the device is hot, all the components will be exposed to a hot, humid and compressed environment without the ventilation plug.

To conclude, the ventilation plug can reduce and even fully eliminate the adverse effects of humidity in the environment. Water drops on the bottom of the enclosure are normal, but the inherent damage becomes insignificant due to the existence of a ventilation plug.

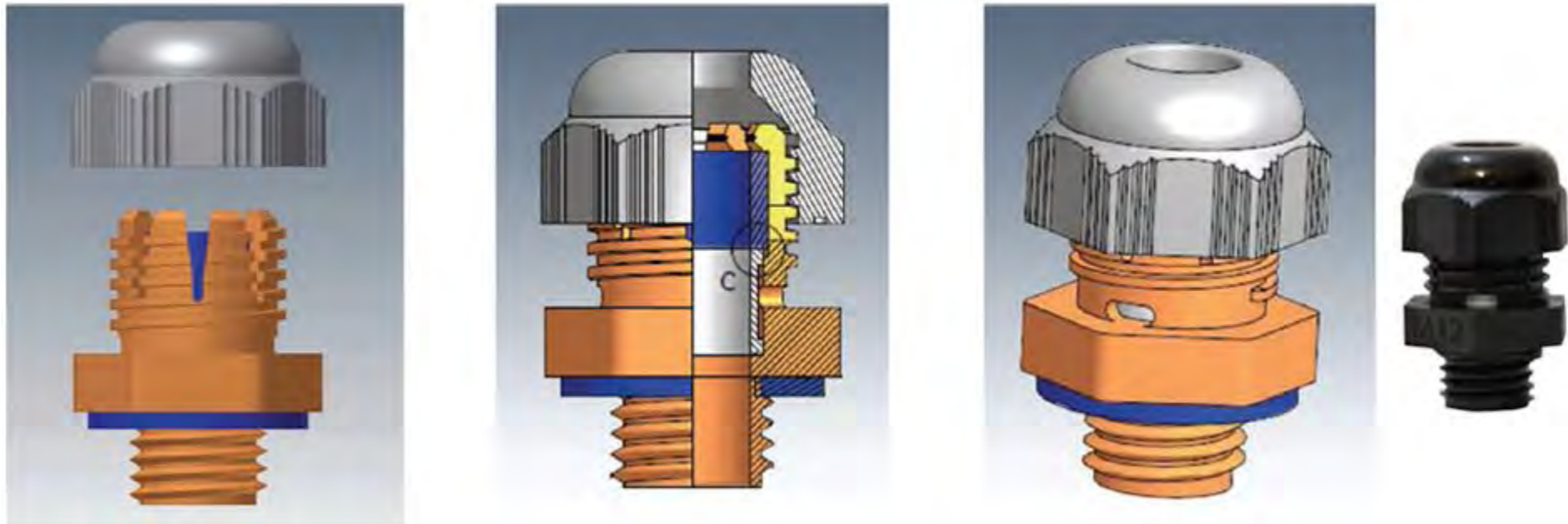
- Housing Material : PA6 - V2 or Stainless Steel
- Membrane Material : Acrylic co-polymer on nylon support
- Membrane Feature : Hydrophobic - Oleophobic
- Protection Degree : IP68 (Refer to the chart for pressure)
- Protection against water jet : IP69K
- Air Flow Rates : Refer to the chart
- Working Temperatures : -40°C to +105°C
- Available Membrane permeabilities : S (standard) M (medium) H (high) UH (ultra high)
- O-rings : Nitril Rubber



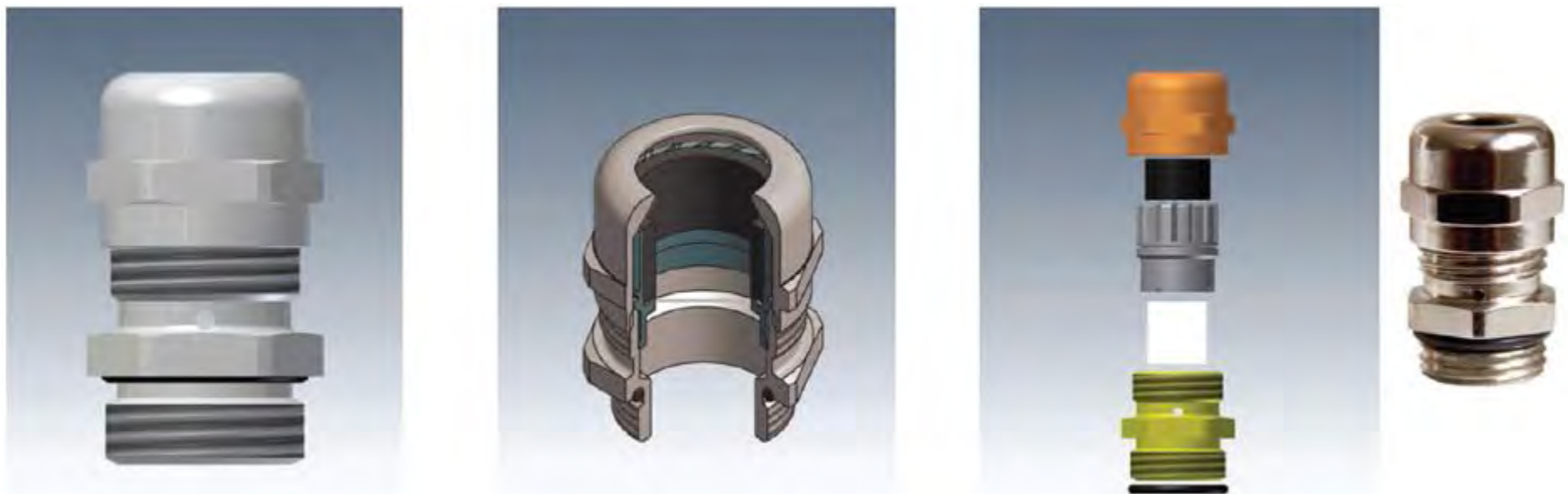
Permeab. Code	Code			Thread Size	Dimensions (mm)					ΔP = 1 Psi = 70 m Bar Average Air Permeability in lt/hour				Water Intrusion pressure in Bar				Plug Type	Recom. Hole Diam. (mm)
	RAL 7001	RAL 7035	RAL 9005		TD	TL	H	D	SW	S	M	H	UH	S	M	H	UH		
Poliamide 6																			
BVPA-01	BVPA-11	BVPA-21	M12X1,0	12,0	6,6	7,5	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	A	12,5	
BVPB-01	BVPB-11	BVPB-21	M12X1,5	12,0	6,0	7,5	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	A	12,5	
BVPB-01L	BVPB-11L	BVPB-21L	M12X1,5	12,0	10,0	7,5	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	A-G	12,5	
BVQ-M01	BVQ-M11	BVQ-M21	QUICK FIT	5,5	7,5	9,2	17,0	-	16	25	120	300	0,9	0,5	0,2	0,1	B	6,4	
BVPC-01	BVPC-11	BVPC-21	M12X1,5	12,0	7,5	12,5	22,0	22	20	35	180	450	0,9	0,5	0,2	0,1	E	12,5	
BVPG-01	BVPG-11	BVPG-21	M16X1,5	16,0	7,5	12,5	22,0	22	20	35	180	450	0,9	0,5	0,2	0,1	F	16,5	
BVPH-01	BVPH-11	BVPH-21	M20X1,5	20,0	7,5	12,5	22,0	22	20	35	180	450	0,9	0,5	0,2	0,1	F	20,5	
BVPD-01	BVPD-11	BVPD-21	M12X1,5	12,0	10,0	12,5	24,0	24	42	120	450	750	0,9	0,5	0,2	0,1	E	12,5	
BVPH-01	BVPH-11	BVPH-21	M16X1,5	16,0	10,0	12,5	24,0	24	42	120	450	750	0,9	0,5	0,2	0,1	F	16,5	
BVPE-01	BVPE-11	BVPE-21	M20X1,5	20,0	10,0	12,5	24,0	24	42	120	450	750	0,9	0,5	0,2	0,1	F	20,5	
BVPX-08	BVPX-18	BVPX-28	M40X1,5	40,0	18,0	19,0	60,0	-	120	375	1.350	2.200	0,9	0,5	0,2	0,1	D	40,5	
Stainless Steel																			
BAVP-01			M4X0,7	4,0	7,0	3,1	12,3	-	4	7	35	100	0,9	0,5	0,2	0,1	H	4,3	
BBVP-0S			Pg7	12,5	10,5	11,0	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	C	13,2	
BBVP-01S			M12X1,0	12,0	10,0	11,0	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	C	12,5	
BBVP-01L			M12X1,5	12,0	10,0	11,0	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	C	12,5	
BBVP-01			M12X1,5	12,0	6,0	15,2	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	C	12,5	
BBVP-02			M16X1,5	16,0	6,0	12,4	17,0	17	16	25	120	300	0,9	0,5	0,2	0,1	C	16,5	
BBVP-02L			M16X1,5	16,0	6,0	16,5	17,0	18	16	25	120	300	0,9	0,5	0,2	0,1	C	16,5	
BBVP-03			M20X1,5	20,0	6,0	13,5	17,0	22	16	25	120	300	0,9	0,5	0,2	0,1	C	20,5	
BBVP-03L			M20X1,5	20,0	6,0	17,0	17,0	22	16	25	120	300	0,9	0,5	0,2	0,1	C	20,5	
BBVPX-05			M40X1,5	40,0	10,0	20,4	58,5	-	120	375	1.350	2.200	0,9	0,5	0,2	0,1	D	40,5	

According to the chosen air permeability
One of the letters (S-M-H-UH)
Have to be added before the code number

Ventilation Glands



Polyamide Cable Gland with Integrated Ventilation
 Mos cable glands with integrated ventilation combine cable glands with pressure balance elements or ventilation plugs.
 They are made of polyamide PA 6 (above) or brass, nickel plated (below).
Brass Cable Gland with Integrated Ventilation



Benefits of Mos Cable Glands with Integrated Ventilation.

- Advantages of cable gland and pressure balance device combined in one product.
- Heat generated by electrical and electronic components in an enclosure, as well as fluctuating outside temperature, result in pressure differences. A semipermeable membrane inside the device allows air and humidity to leave the enclosure, however, doesn't allow dirt and water to enter from the outside.
- Properties of the membrane stay the same independent of cable diameter and torque.
- These polyamide cable glands have higher strain and torsion relief at lower cap nut tightening torque compared with same size standard cable glands.
- Heights of PA 6 cable glands with integrated ventilation are significantly less and have smaller volumes than same size standard cable glands. Suitable for smaller spaces.
- Comply with EN 50262 and EN 60335.
- IP 66 and IP 68
- Custom specifications are available on request.

• Air permeability of cable glands with integrated ventilation: Indicative Air Permeability for Pg 13,5 Brass ventilation gland

ΔP 50 mbar 30 l/h
 ΔP 100 mbar 66 l/h
 ΔP 150 mbar 102 l/h
 ΔP 200 mbar 138 l/h
 ΔP 250 mbar 174 l/h
 ΔP 300 mbar 216 l/h

(ΔP is the difference between interior/exterior enclosure pressure)

Ventilation Glands (PA6)

Technical Details

Material : Polyamide 6
Protection Class : IP 68
Temp. Range : -30°C to +100°C
Washer : Chloroprene
O-ring (acc. requirements) : NBR
Vent Element : PTFE
 Manufactured according to the requirements of EN 50262



Codes	Thread Type	Body SW (mm)	Cap SW (mm)	TD (mm)	TL (mm)	For Cable (mm)		Average Air Flow For ΔP = 70 mB UH (l/h)	Water Intrusion Pressure UH (Bar)	Water Immersion Depth UH (m)	
						Min. Ø	Max. Ø				
Ral 7001	BMVG-0S	M12x1,5	19	19	12,0	8,0	4,0	8,0	25	0,1	1,0
	BMVG-01	M16x1,5	19	19	16,0	10,0	4,0	8,0	25	0,1	1,0
	BMVG-02	M20x1,5	24	24	20,0	10,0	6,0	12,0	40	0,1	1,0
	BSVG-04	Pg 13,5	24	24	20,4	10,0	6,0	12,0	40	0,1	1,0
Ral 7035	BMVG-1S	M12x1,5	19	19	12,0	8,0	4,0	8,0	25	0,1	1,0
	BMVG-11	M16x1,5	19	19	16,0	10,0	4,0	8,0	25	0,1	1,0
	BMVG-12	M20x1,5	24	24	20,0	10,0	6,0	12,0	40	0,1	1,0
	BSVG-14	Pg 13,5	24	24	20,4	10,0	6,0	12,0	40	0,1	1,0
Ral 9005	BMVG-2S	M12x1,5	19	19	12,0	8,0	4,0	8,0	25	0,1	1,0
	BMVG-21	M16x1,5	19	19	16,0	10,0	4,0	8,0	25	0,1	1,0
	BMVG-22	M20x1,5	24	24	20,0	10,0	6,0	12,0	40	0,1	1,0
	BSVG-24	Pg 13,5	24	24	20,4	10,0	6,0	12,0	40	0,1	1,0

Ventilation Glands (Brass)

Technical Details

Material : Brass Nickel Plated
Clamping Insert : Polyamide 6
Sealing : Chloroprene
O-Ring : NBR
Protection Class : IP 68
Temp. Range : -40°C to +100°C
Vent Element : PTFE
 Manufactured according to the requirements of EN 50262



Codes	Thread Type	Body SW (mm)	Cap SW (mm)	TD (mm)	TL (mm)	For Cable (mm)		Average Air Flow For ΔP = 70 mB UH (l/h)	Water Intrusion Pressure UH (Bar)	Water Immersion Depth UH (m)
						Min. Ø	Max. Ø			
BMBCVG-0S	M12x1,5	15	17	12,0	8,0	4,0	8,0	25	0,1	1,0
BMBCVG-01	M16x1,5	17	17	16,0	8,0	4,0	8,0	25	0,1	1,0
BMBCVG-01L	M16x1,5	20	20	16,0	7,0	5,0	10,0	35	0,1	1,0
BMBCVG-02	M20x1,5	22	22	20,0	6,5	6,0	12,0	50	0,1	1,0
BSBCVG-02	Pg 9	17	17	15,2	6,0	4,0	8,0	25	0,1	1,0
BSBCVG-04	Pg 13,5	22	22	20,4	6,5	6,0	12,0	50	0,1	1,0

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