

## Technical Specification for Vented Lead-Acid Batteries (VLA)

### 1. Application

KOLFF SECURA PVS BLOCK solar batteries need only low maintenance and are used to store electrical energy in smaller solar photovoltaic installations. Due to the robust tubular plate design KOLFF PVS batteries are excellent suited for highest requirements regarding cycling ability and long lifetime.



### 2. Technical data (Reference temperature 20 °C)

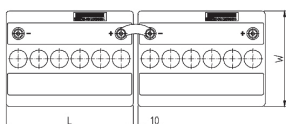
Type	$C_{1h}$ Ah	$C_{10h}$ Ah	$C_{20h}$ Ah	$C_{72h}$ Ah	$C_{100h}$ Ah	$C_{120h}$ Ah	$C_{240h}$ Ah	$R_i$ 1) mΩ	$I_k$ 2) kA	Length (L) mm	Width (W) mm	Height (H) mm	Weight dry kg	Weight filled kg
12 V 1 PVS 70	31	56	64	70	71	72	74	16.62	0.75	272	205	385	29.5	41.0
12 V 2 PVS 140	63	109	125	137	140	140	144	8.91	1.40	272	205	385	38.0	47.6
12 V 3 PVS 210	95	167	192	211	215	217	222	6.27	1.99	380	205	385	51.0	69.4
6 V 4 PVS 280	127	223	254	282	287	289	295	2.47	2.52	272	205	385	33.0	46.5
6 V 5 PVS 350	159	279	318	352	359	361	369	2.09	2.98	380	205	385	41.7	60.4
6 V 6 PVS 420	191	334	382	424	431	434	444	1.82	3.42	380	205	385	48.5	66.5

1, 2) Internal resistance  $R_i$  and short circuit current  $I_k$  according to IEC 60896-11

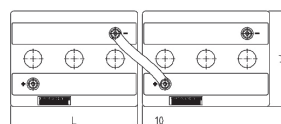
Height (H) is the maximum height between container bottom and top of the bolts in assembled condition.

KOLFF SECURA PVS BLOCK solar batteries are also available as dry pre-charged version. They are titled with additional "TG", e.g. 12 V 3 PVS 210 TG. All values given in the table correspond to 100 % DOD without voltage drop of connectors. Please consider item 7.

### 3. Terminal positions



12 V 1 PVS 70 to 12 V 3 PVS 210



6 V 4 PVS 280 to 6 V 6 PVS 420

Terminals are designed as female poles with brass inlay M10 for flexible insulated copper cables with cross-section 25, 35, 50, 70, 95 or 120 mm<sup>2</sup> or insulated solid copper connectors with cross-section 90, 150 or 300 mm<sup>2</sup>.

# Technical Specification for KOLFF *SECURA PVS BLOCK solar*



## 4. Design

Positive electrode	tubular-plate with woven polyester gauntlet and solid grids in a corrosion-resistant PbSbSnSe-low antimony alloy
Negative electrode	grid-plate in a low antimony alloy with long-life expander material
Separation	microporous separator
Electrolyte	sulphuric acid with a density of 1.24 kg/l at 20 °C (68 °F)
Container	high impact, transparent SAN (Styrol-Acrylic-Nitrile), UL-94 rating: HB
Lid	high impact, grey coloured SAN (colour may vary slightly from given image), UL-94 rating: HB
Plugs	labyrinth plugs for arresting aerosols, optional ceramic plugs or ceramic funnel plugs according to DIN 40740
Pole-bushing	100 % gas- and electrolyte-tight, sliding, plastic-coated "Panzerpol"
Kind of protection	IP 25 regarding EN 60529, touch protected according to VBG 4

## 5. Installation

KOLFF *SECURA PVS BLOCK solar* batteries are designed for indoor applications. For outdoor applications please contact KOLFF.

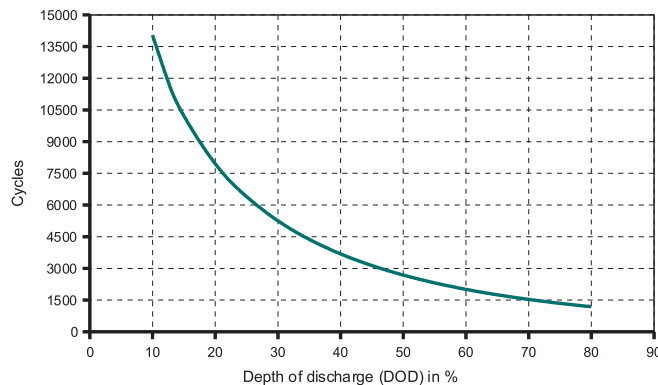
## 6. Maintenance

Every 6 months	check battery voltage, pilot block voltages, temperatures
Every 12 months	check connections, record battery voltage, block voltages and temperatures

## 7. Operational data

Depth of discharge (DOD)	max. 80 % ( $U_e = 1.91$ V/cell for discharge times >10 h; 1.80 V/cell for 1 h), deep discharges of more than 80 % DOD have to be avoided
Initial charge current (I or bulk phase)	unlimited, the minimal charge current has to be 5 A/100 Ah $C_{10}$
Charge voltage at cyclic operation	restricted from 2.30 V to 2.40 V per cell, operation instruction is to be observed
Floating voltage/non cycle voltage	2.23 V per cell
Adjustment of charge voltage	no adjustment necessary if battery temperature is between 10 °C and 30 °C (50 °F and 86 °F) in the monthly average, otherwise $DU/DT = -0.003$ V/cell per K
Recharge to 100 %	within a period of 1 up to 4 weeks
IEC 61427 cycles	2,700 (A+B) at 40 °C (104 °F)
Battery temperature	-20 °C to 55 °C (-4 °F to 131 °F), recommended temperature range 10 °C to 30 °C (50 °F to 86 °F)
Self-discharge	approx. 3 % per month at 20 °C (68 °F)

## 8. Number of cycles as function of Depth of discharge



## 9. Transport

Batteries are not subject to ADR (road transport), if the conditions of Special Provision 598 (Chapter 3.3) are observed.

These cells/batteries are dangerous goods on sea transport. Declaration and packaging must comply with the requirements of IMDG-Codes.

## 10. Standards

Test standards	IEC 60896-11, IEC 61427
Safety standard, ventilation	EN 50272-2



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