

ENGLISH

# TAB STATIONARY BATTERIES



# TAB

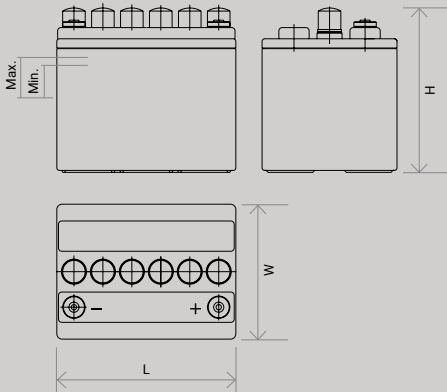
OPzS  
OGi  
UPS  
TOPzS  
OPzV

# TAB OPzS

## TECHNICAL DATA AND DIMENSIONS

### 6V 4 OPzS 200

↑ Rated voltage  
 ↑ Number of positive plate  
 ↑ Type of plates  
 ↑ Capacity at 10-hour discharging



## Low maintenance TAB OPzS vented stationary batteries



### TERMINAL POST BOLTED VERSION



### TERMINAL POST WELDED VERSION



LET US LEAD YOU INTO THE WORLD OF EVERLASTING ENERGY AND INTRODUCE YOU WITH OPzS STATIONARY BLOCKS AND CELLS PRODUCED IN THE CONVENTIONAL LEAD-ACID TECHNOLOGY.

#### The batteries are distinguished for:

- high capacity
- long life time
- reduced maintenance
- low self-discharging
- quick and simple acid level control
- economical water consumption
- appropriate dimensions and weight
- the lowest and constant maintenance current.

The individual cells (2V) and blocks (6V and 12V) are in translucent plastic containers made of styrenacrylnitril (SAN), a material which is extraordinary resistant to chemical influences and mechanical damage.

The stationary batteries of the type OPzS are manufactured according to the DIN 40736-1 and EN/IEC 60896-11 regulations.

#### APPLICATION

Stationary batteries of the OPzS type are intended for the supply of telecommunication facilities, computers, emergency lightning, alarm, control and monitoring systems in power plants and distribution stations, at railway stations, airports etc.

Due to their extremely low self-discharging they are suitable for plants supplied by solar cells.

#### OPERATION MAINTENANCE

IT IS RECOMMENDED THAT THE OPzS BATTERIES ARE INSTALLED IN THE SYSTEMS WHERE THEY ARE CONSTANTLY CONNECTED TO THE RECTIFIER.

The battery can be float-charged with voltage of 2.23 to 2.25 V/cell, or, in case of rapid charging after discharge, with voltage of 2.35 to 2.40 V/cell.

Rapid charging usually lasts another 3-5 hours after the voltage has already reached 2.35 to 2.40 V/cell. After that, an automatic switchover to the constant maintaining voltage of 2.23 to 2.25 V/cell takes place. Battery maintenance is reduced to a minimum and required only from time to time.

At normal operation, only some distilled water has to be added once in a 2-3 year period and, if necessary, the surface of cells has to be cleaned. All stated voltage values are valid for the temperature range from 15 to 25 degrees C. Out of this range, the corrections given by the battery producer are necessary.

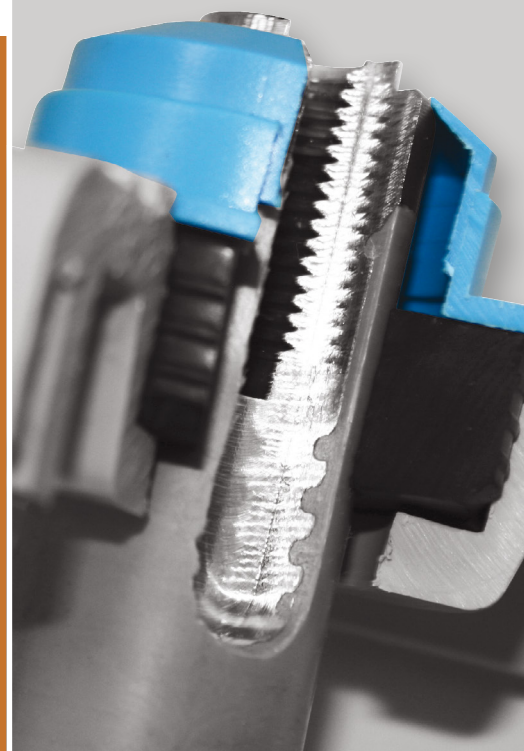
FOR DETAIL INFORMATION PLEASE CHECK OUR OPERATION MANUAL.

## ORDERS

IN ORDER THAT THE BATTERIES WOULD MEET ALL YOUR DEMANDS, WE KINDLY ASK YOU TO ENCLOSE THE FOLLOWING DATA WITH YOUR ORDER:

- **kind of consuming device** (telephone plant, DC-AC converter, emergency lightning etc.)
- **operating energy** of the consumer (kW, kVA,  $\cos \phi$ )
- minimum and maximum **allowable rated voltage** at consuming device (V)
- **time diagram** of a consumer load, and the required time autonomy (reserve)
- **expected voltage drop** in the supply lines
- **surrounding temperature** in the battery room (average, minimum, maximum)
- **type of rectifier**, its characteristics, regulating point I (A) or U (V), respectively, float voltage (V) (direct voltage of rapid-charging current I<sub>max</sub> (A), float charging voltage)
- **outline or dimensions** of a battery room
- **type of installation** (welded, bolted, on wooden or metal racks, in case, on earthquake-proof racks)
- **battery maintenance accessories** (areometers, thermometers, jug ...)
- **battery type**: filled up with electrolyte and electrically charged or dry-charge battery.

IN CASE OF PROBLEMS WITH ORDERING WE WILL BE GLAD TO ADVISE AND ASSIST YOU IN THE SELECTION OF THE SUITABLE TYPE OF BATTERY.



## CONSTRUCTION

The positive armored plate is of a tubular type, which means that the active substance (PbO<sub>2</sub>) is contained in special gauntlet made of polyester fibres and hardened by an impregnation compound. Such construction prevents escaping of an active substance during the operation and ensures a long life time. The grids of a positive and a negative plate are made of special low percentage (less than 2 %) antimony alloy with addition agents for improvement of crystalline structure of casting.

Negative plates are pasted-type plates with special alloys maintaining porosity of an active substance during the operation. As an electrolyte, a diluted sulphuric acid (H<sub>2</sub>SO<sub>4</sub>) with a density of  $1.24 \pm 0.01$  kg/l at 20 degrees C, and at a maximum permitted level is used. Separators separating the positive plates from the negative ones are made of microporous plastic material with a low electric resistance.

The cell containers are made of transparent SAN, while lid of nontransparent SAN or ABS material (SAN for blocks, ABS for 2V cells).

In a special process, the lids are tightly sealed to the container. The terminal plugs are sealed with rubber seals. This prevents any escape of electrolyte from the cells.

Due to the transparent containers the electrolyte level is clearly visible, the maximum and minimum levels are marked on a self-adhesive acid-proof label on a container side.



A cell plug seals well (ceramic filter), and prevents leakage of any sulphuric acid vapours, however, it lets through hydrogen and oxygen.

TWO VERSIONS OF BATTERIES ARE BEING MANUFACTURED:

- **DRY-CHARGE VERSION:** a battery has to be filled up with an electrolyte and supplementary charged before use. The plates are already formed and in a special process protected against oxidation. They can be stored without problems.
- **ELECTROLYTE-CHARGE:** battery can be installed immediately, because it is already filled up with electrolyte and electrically charged as well.

## IMPROVED DESIGN FOR BOLTED VERSION TERMINAL POST

NEW TYPE OF POLE FOR STATIONARY APPLICATIONS HAS A SPECIAL DESIGN WITH EMBRACED INJECTED PLASTIC AROUND PRE-MACHINED LEAD PART IN THE SEALING AREA.

PLANE AND CLEAN SURFACE OF PLASTIC PART IN COMBINATION WITH RUBBER SEALING RING ENSURES PERFECT SEAL. LONG PLASTIC INJECTED PART ALLOWS POLE GROWTH AND MOVING UPWARDS BY THE GROWTH OF POSITIVE PLATE. SUCH CONSTRUCTION ENSURES TIGHT POLE BUSHING WITHOUT ANY CORROSION OR DETERIORATION DURING BATTERY LIFE.

# TAB OPzS BLOCKS



TAB OPzS STATIONARY BLOCKS (CELLS) ARE PRODUCED IN THE CONVENTIONAL LEAD-ACID TECHNOLOGY.

Stationary batteries of the OPzS type are intended for the supply of telecommunication facilities, computers, emergency lightning, alarm, control and monitoring systems in power plants and distribution stations, at railway stations, airports etc.

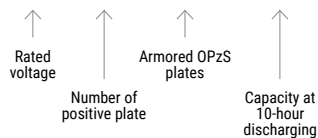


## DESIGN OPzS cells (block)\*

- POSITIVE ELECTRODE**
  - Tubular plate with low antimony alloy (<2 %)
- NEGATIVE ELECTRODE**
  - Flat with long life expander active material
- SEPARATION**
  - Microporous separator
- ELECTROLYTE**
  - Sulphuric acid of 1,24 kg/l at 20 °C
- CONTAINER**
  - High impact, transparent SAN LID
  - ABS (SAN)\* in grey color
- BLOCKS WITH BLIND CELLS**
  - 4V, 6V, 8V, 10V
- PLUGS**
  - Ceramic plugs according to DIN 40740
- POLE SEALING**
  - 100 % gas-and electrolyte-tight, sliding-pole
- CONNECTOR**
  - Flexible insulated copper cable with cross-section of 35, 50, 70, 95 or 120 mm<sup>2</sup> (35, 50 or 70 mm<sup>2</sup>)\*
- KIND OF PROTECTION**
  - IP 25 regarding DIN 40050, touch protected according VBG 4

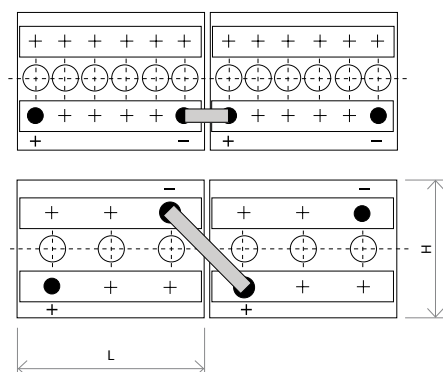
Uf (V/cell)	1,80				1,77				1,75				1,67				EN/IEC 60896-11		Dimensions			Weight	
	Discharging time (h)				10	5	3	1	Ri		Isc		L	W	H	Dry	Wet						
Type	Ah	Ah	Ah	Ah	mΩ	A	mm	mm	mm	kg	kg												
12V 1 OPzS 50	51	40,9	38,0	28,4	20,0	613	272	205	392	26	39												
12V 2 OPzS 100	103	81,8	75,7	56,7	9,3	1290	272	205	392	38	50												
12V 3 OPzS 150	154	122,6	113,7	85,1	6,9	1739	380	205	392	53	69												
6V 4 OPzS 200	204	167,0	149,3	115,2	2,2	2703	272	205	392	36	47												
6V 5 OPzS 250	255	208,6	186,6	143,6	1,9	3175	380	205	392	44	61												
6V 6 OPzS 300	307	250,5	223,7	172,0	1,6	3846	380	205	392	52	68												

## 12V 2 OPzS 100

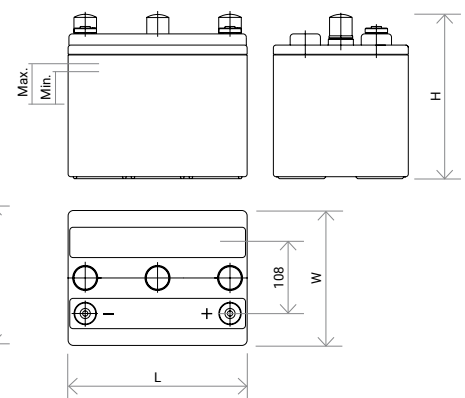


Electrolyte density:  
1,24 ± 0,01kg/l at 20 °C.

All measures and weights are within standard production tolerances.  
Weight tolerance is ± 5 %  
Electrical values are approximative.  
Technical modifications are reserved without prior notice.



CONNECTIONS



DIMENSIONS

# TAB OPzS CELLS

## CHARGING

### OPzS cells (block)\*

IU - CHARACTERISTIC  
 · I<sub>max</sub> without limitation

#### FLOAT CHARGE

- U = 2,23 V/cell ± 1 %, between 10 °C and 30 °C  
 $\Delta U/\Delta T = -0,004 \text{ V/K}$
- below 10 °C or above 30 °C in the monthly average

#### BOOST CHARGE

- U = 2,35 to 2,40 V/cell, time limited
- CHARGING TIME UP TO 92 %
- 6h with 1,5\*110 initial current, 2,23 V/cell, 50 % C10 discharged

## DISCHARGE CHARACTERISTICS

### OPzS cells (block)\*

#### REFERENCE TEMPERATURE

- 20 °C

#### INITIAL CAPACITY

- 100 %

#### DEPTH OF DISCHARGE

- Normally up to 80 %
- More than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

## MAINTENANCE

### OPzS cells (block)\*

#### EVERY 6 MONTH

- Check battery voltage, pilot block voltage, temperature

#### EVERY 12 MONTH

- Take down battery voltage, block voltage, temperature

## OPERATIONAL DATA

### OPzS cells (block)\*

#### DESIGN LIFE

- Up to 20 years (18 years)\* at 20 °C

#### WATER REFILLING INTERVAL

- More than 2 years at 20 °C

#### EN/IEC 60896-11 CYCLES

- 1500 (1200)\*

#### SELF-DISCHARGE

- Approx. 2 % per month at 20 °C

#### OPERATIONAL TEMPERATURE

- -20 °C to 55 °C, recommended 10 °C to 30 °C

#### VENTILATION REQUIREMENT

- according to EN/IEC 62485-2

#### MEASUREMENTS ACCORDING

- DIN 40736-1 AND DIN 40737-3

#### TESTS ACCORDING

- EN/IEC 60896-11

#### SAFETY STANDARDS

- EN/IEC 62485-2

#### TRANSPORT

- No dangerous goods during road transport

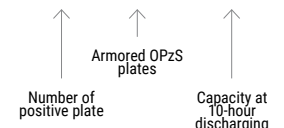


Uf (V/cell)	1,80				1,77		1,75		1,67		EN/IEC 60896-11		Dimensions			Weight		Poles
	Discharging time (h)		10	5	3	1	Ri	Isc	L	W	H	Dry	Wet					
Type	Ah	Ah	Ah	Ah	mΩ	A	mm	mm	mm	kg	kg	Nr.						
2 OPzS 100	111	97	85	62	1,48	1350	103	206	420	8,0	13,0	2						
3 OPzS 150	160	142	122	89	1,08	1845	103	206	420	10,0	15,0	2						
4 OPzS 200	215	187	163	119	0,84	2376	103	206	420	12,5	17,5	2						
5 OPzS 250	268	232	204	149	0,69	2887	124	206	420	15,5	21,5	2						
6 OPzS 300	321	277	242	177	0,58	3438	145	206	420	17,0	25,0	2						
5 OPzS 350	393	336	290	212	0,64	3137	124	206	536	20,0	29,0	2						
6 OPzS 420	470	403	348	254	0,55	3641	145	206	536	24,0	34,0	2						
7 OPzS 490	550	470	406	296	0,48	4169	166	206	536	27,0	38,0	2						
6 OPzS 600	685	582	510	372	0,45	4466	145	206	711	33,0	46,0	2						
7 OPzS 700	798	681	598	436	0,38	5280	210	191	711	41,0	61,0	4						
8 OPzS 800	912	778	683	499	0,33	6035	210	191	711	45,0	64,0	4						
9 OPzS 900	1025	875	767	560	0,29	6948	210	233	711	50,0	74,0	4						
10 OPzS 1000	1140	972	852	622	0,26	7720	210	233	711	55,0	77,0	4						
12 OPzS 1200	1365	1165	1020	745	0,23	8814	210	275	711	64,0	91,0	4						
12 OPzS 1500	1645	1410	1220	890	0,23	8605	210	275	861	80,0	111,0	4						
14 OPzS 1750	1910	1640	1420	1035	0,19	10536	212	397	837	98,0	145,0	6						
15 OPzS 1875	2050	1760	1520	1110	0,18	11289	212	397	837	104,0	150,0	6						
16 OPzS 2000	2185	1875	1625	1185	0,17	12042	212	397	837	109,0	154,0	6						
18 OPzS 2250	2455	2105	1825	1335	0,15	13506	212	487	837	126,0	184,0	8						
20 OPzS 2500	2730	2340	2030	1480	0,13	15007	212	487	837	137,0	192,0	8						
22 OPzS 2750	3000	2575	2230	1625	0,13	15941	212	576	837	149,0	222,0	8						
24 OPzS 3000	3270	2805	2430	1775	0,12	17390	212	576	837	160,0	230,0	8						

Electrolyte density:  
 1,24 ± 0,01kg/l at 20 °C.

All measures and weights are within standard production tolerances.  
 Weight tolerance is ± 5 %  
 Electrical values are approximative.  
 Technical modifications are reserved without prior notice.

## 3 OPzS 150



# TAB OGi BATTERIES



TAB OGi BLOCK BATTERIES ARE ROBUST VENTED LEAD-ACID BATTERIES DESIGNED FOR INDUSTRIAL APPLICATIONS IN POWER SUPPLY WITH HIGH SAFETY REQUIREMENTS.

TAB OGi block batteries can be used for both long duration discharge (10 hours) and short duration discharge (few minutes).

The main areas of application are DC power supply systems in power stations, UPS systems, industrial systems and emergency power supply systems. They can also be used for engine starting and PV power systems.



Uf (V/cell)	1,80 1,75 1,75 1,70 1,65 1,65 1,60							EN/IEC 60896-11		Dimensions			Weight	
	10	5	3	1	1/2	1/6	1/12	Ri	Isc	L	W	H	Dry	Wet
Type	Ah	Ah	Ah	Ah	Ah	Ah	Ah	mΩ	(kA)	mm	mm	mm	kg	kg
12V 1 OGi 25	29,0	25,5	22,5	16,8	14,3	9,2	6,7	16,79	0,72	272	205	375	23,4	35,0
12V 2 OGi 50	55,0	49,5	44,7	32,8	28,0	18,0	13,1	8,81	1,41	272	205	375	30,3	41,2
12V 3 OGi 75	80,0	74,5	67,5	49,6	42,2	27,3	19,8	5,94	2,11	272	205	375	36,6	47,0
12V 4 OGi 100	105,0	98,5	89,4	65,7	56,1	36,1	26,1	4,46	2,81	272	205	375	44,1	54,1
12V 5 OGi 125	135,0	123,0	111,3	81,6	69,0	44,3	31,7	3,57	3,52	380	205	375	55,0	68,9
12V 6 OGi 150	165,0	148,5	133,8	98,2	82,5	52,7	37,1	2,97	4,22	380	205	375	61,8	75,3
6V 7 OGi 175	193,0	172,5	156,0	114,1	91,2	56,9	39,6	1,27	4,93	272	205	375	35,9	46,6
6V 8 OGi 200	228,0	197,5	178,8	130,0	108,0	67,3	46,8	1,11	5,63	272	205	375	39,4	49,8
6V 9 OGi 225	254,0	221,5	200,7	145,8	121,5	75,5	52,6	0,99	6,36	380	205	375	48,0	63,2
6V 10 OGi 250	270,0	247,0	223,5	161,7	133,0	80,5	55,3	0,89	7,04	380	205	375	51,2	66,2
6V 11 OGi 275	304,0	271,5	245,1	177,6	146,0	88,5	60,7	0,81	7,78	380	205	375	53,5	68,3
6V 12 OGi 300	320,0	296,0	268,2	194,4	159,5	96,5	66,3	0,74	8,44	380	205	375	56,4	70,8
2V 3 OGi 75	80,0	74,5	67,5	49,6	42,2	27,3	19,8	0,99	1,92	103	206	420	6,5	9,9
2V 4 OGi 100	105,0	98,5	89,4	65,7	56,1	36,1	26,1	0,74	2,52	103	206	420	7,7	11,1
2V 5 OGi 125	135,0	123,0	111,3	81,6	69,0	44,3	31,7	0,60	3,24	103	206	420	9,0	12,6
2V 6 OGi 150	165,0	148,5	133,8	98,2	82,5	52,7	37,1	0,50	3,96	103	206	420	10,7	14,4
2V 7 OGi 175	193,0	172,5	156,0	114,1	91,2	56,9	39,6	0,42	4,49	103	206	420	11,7	15,3
2V 8 OGi 200	228,0	197,5	178,8	130,0	108,0	67,3	46,8	0,37	5,47	103	206	420	13,6	17,3
2V 9 OGi 225	254,0	221,5	200,7	145,8	121,5	75,5	52,6	0,33	6,10	103	206	420	15,4	19,2
2V 10 OGi 250	270,0	247,0	223,5	161,7	133,0	80,5	55,3	0,30	6,65	124	206	420	17,2	21,3
2V 11 OGi 275	304,0	271,5	245,1	177,6	146,0	88,5	60,7	0,27	7,55	145	206	420	19,0	22,8
2V 12 OGi 300	320,0	296,0	268,2	194,4	159,5	96,5	66,3	0,25	7,68	145	206	420	21,8	25,1
2V 13 OGi 325	346,7	320,7	290,6	210,6	172,8	104,5	71,8	0,23	8,32	145	206	420	23,8	27,6
2V 14 OGi 350	373,3	345,3	312,9	226,8	186,1	112,6	77,4	0,21	8,96	145	206	420	25,9	30,0
2V 24 OGi 600	684,0	592,5	536,4	390,0	324,0	201,9	140,4	0,13	16,42	205	272	392	39,4	49,8

## DESIGN

### POSITIVE ELECTRODE

- Robust-grid plate with circular bars in a corrosion-resistant PbSe alloy < 2 % Sb

### NEGATIVE ELECTRODE

- Flat plate with long life expander and low antimony alloy

### SEPARATION

- Microporous separator

### ELECTROLYTE

- Sulphuric acid of 1,24 kg/l,

### CONTAINER

- High impact, transparent SAN

### LID

- SAN in dark grey colour

### BLOCKS WITH BLIND CELLS

- 4V, 6V, 8V, 10V

### PLUGS

- Ceramic plugs or optional ceramic funnel plugs according to DIN 40740

### POLE SEALING

- 100 % gas-and electrolyte-tight, sliding-pole

### POLE

- M10, brass insert

### CONNECTOR

- Flexible insulated copper cable, with cross-section of 35, 50, 70, 95 or 120 mm<sup>2</sup>

### KIND OF PROTECTION

- IP 25 regarding DIN 40050, touch protected according VBG 4

## CHARGING

### IU - CHARACTERISTIC

- Imax without limitation

### FLOAT CHARGE

- U = 2,23 V/cell ± 1 %, between 10°C and 55°C
- dU/dT = -0,004 mV/K below 10 °C in the monthly average

### BOOST CHARGE

- U = 2,35 to 2,40V/cell, time limited

### CHARGING TIME UP TO 92 %

- 6h with 1,5\*I10 initial current, 2,23 V/cell, 50 % C10 discharged

## DISCHARGE CHARACTERISTICS

### REFERENCE TEMPERATURE

- 20 °C

### INITIAL CAPACITY

- 100 %

### DEPTH OF DISCHARGE

- Normally up to 80 %
- More than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

## MAINTENANCE

### EVERY 6 MONTH

- Check battery voltage, pilot block voltage, temperature

### EVERY 12 MONTH

- Take down battery voltage, block voltage, temperature

## OPERATIONAL LIFE

- Up to 15 years at 20 °C

- Up to 7,5 years at 30 °C

- Up to 4 years at 40 °C

### WATER REFILLING INTERVAL

- More than 3 years at 20 °C

### EN/IEC 60896-11 CYCLES

- 1000

### SELF-DISCHARGE

- Approx. 3 % per month at 20 °C

### OPERATIONAL TEMPERATURE

- -20 °C to 55 °C,

recommended 10 °C to 30 °C

### VENTILATION REQUIREMENT

- according to EN/IEC 62485-2

### MEASUREMENTS ACCORDING

- DIN 40 737 part 3

### TESTS ACCORDING

- EN/IEC 60896-11

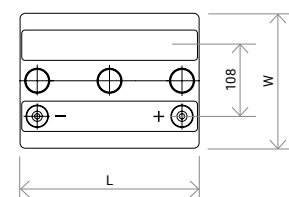
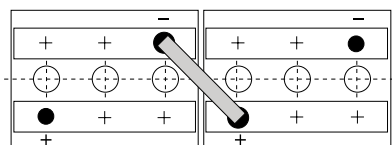
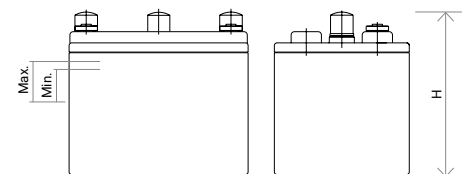
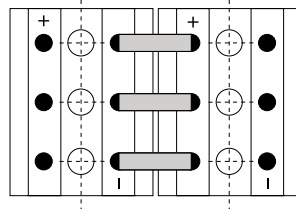
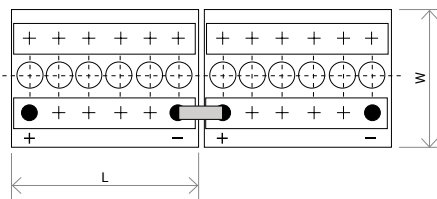
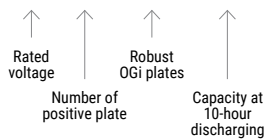
### APPLICABLE STANDARDS

- EN/IEC 62485-2

### TRANSPORT

- No dangerous goods during road transport

## 6V 7 OGi 175



Electrolyte density:  
1,24 ± 0,01kg/l at 20 °C.

All measures and weights are within standard production tolerances.  
Weight tolerance is ± 5 %  
Electrical values are approximative.  
Technical modifications are reserved without prior notice.

CONNECTIONS

DIMENSIONS

# TAB UPS BATTERIES



TAB UPS BATTERIES ARE ROBUST AND FOR HIGH DISCHARGE - PERFORMANCES OPTIMISED LEAD-ACID BATTERIES.

The main application for TAB UPS are Uninterruptable Power Supplies (UPS) in the size of 50 to 250 kVA. The battery is perfectly suited to start diesel engines for the auxiliary power supply.



Uf (V/cell)	1,80						1,75		1,70		1,65		1,63		1,60		EN/IEC 60896-11		Dimensions			Weight	
	Discharging time (min)						60		30		15		10		5		Ri	Isc	L	W	H	Dry	Wet
Type	C10 (Ah)	W/cell	W/cell	W/cell	W/cell	W/cell	mΩ	(kA)	mm	mm	mm	kg	kg										
12V 1 UPS 100	41	42	64	92	120	181	16,80	0,73	272	205	375	23,4	35,4										
12V 2 UPS 200	59	73	112	169	218	323	8,40	1,46	272	205	375	30,3	41,6										
12V 3 UPS 300	86	103	162	246	313	465	5,60	2,2	272	205	375	36,6	47,3										
12V 4 UPS 400	114	135	210	322	410	606	4,20	2,93	272	205	375	44,1	54,5										
12V 5 UPS 500	147	169	264	412	520	755	3,36	3,66	380	205	375	55,0	69,4										
12V 6 UPS 600	179	204	327	500	629	895	2,80	4,39	380	205	375	61,8	75,8										
6V 7 UPS 700	206	237	384	588	737	1040	1,20	5,13	272	205	375	35,9	47,0										
6V 8 UPS 800	247	272	440	676	848	1187	1,05	5,86	272	205	375	39,4	50,2										
6V 9 UPS 900	271	306	492	742	913	1294	0,93	6,59	380	205	375	48,0	63,8										
6V 10 UPS 1000	293	342	558	812	1014	1403	0,84	7,32	380	205	375	51,2	66,7										
6V 11 UPS 1100	325	381	592	879	1098	1509	0,76	8,05	380	205	375	53,5	68,8										
6V 12 UPS 1200	347	418	640	946	1178	1613	0,70	8,79	380	205	375	56,4	71,5										
2V 24 UPS 2400	742	816	1321	2027	2544	3562	0,13	17,58	205	272	375	39,4	50,2										
2V 30 UPS 3000	879	1027	1674	2437	3042	4209	0,10	21,9	205	380	375	51,2	66,7										
2V 36 UPS 3600	1041	1253	1920	2837	3535	4838	0,08	26,3	205	380	375	55,4	71,5										

100W is the averaged power per plate at the 10 min rate Uf = 1,63V/cell.

Electrolyte density: 1,28 ± 0,01 kg/l at 20 °C.

All measures and weights are within standard production tolerances.  
Weight tolerance is ± 5 %  
Electrical values are approximative.  
Technical modifications are reserved without prior notice.



## DESIGN

### POSITIVE ELECTRODE

- Robust-plate with circular bars in a corrosion-resistant PbSe alloy < 2 % Sb

### NEGATIVE ELECTRODE

- Flat plate with long life expander and low antimony alloy

### SEPARATION

- Microporous separator

### ELECTROLYTE

- Sulphuric acid of 1,28 kg/l

### CONTAINER

- High impact, transparent SAN

### LID

- SAN in dark grey colour

### BLOCKS WITH BLIND CELLS

- 4V, 6V, 8V, 10V

### PLUGS

- Ceramic plugs or optional ceramic funnel plugs according to DIN 40740

### POLE SEALING

- 100 % gas-and electrolyte-tight, sliding-pole

### POLE

- M10, brass insert

### CONNECTOR

- Flexible insulated copper cable, with cross-section of 35, 50, 70, 95 or 120 mm<sup>2</sup>

### KIND OF PROTECTION

- IP 25 regarding DIN 40050, touch protected according VBG 4

## CHARGING

### IU - CHARACTERISTIC

- Imax without limitation

### FLOAT CHARGE

- U = 2,25 to 2,27 V/cell ± 1 %, between 10 °C and 55 °C
- $dU/dT = -0,004 \text{ mV/}^\circ\text{K}$  below 10 °C in the monthly average

### BOOST CHARGE

- U = 2,35 to 2,40 V/cell, time limited

### CHARGING TIME UP TO 92 %

- 6h with 1,5\*110 initial current, 2,23 V/cell, 50 % C10 discharged

## DISCHARGE CHARACTERISTICS

### REFERENCE TEMPERATURE

- 20 °C

### INITIAL CAPACITY

- 100 %

### DEPTH OF DISCHARGE

- Normally up to 80 %
- More than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

## MAINTENANCE

### EVERY 6 MONTH

- Check battery voltage, pilot block voltage, temperature

### EVERY 12 MONTH

- Take down battery voltage, block voltage, temperature

## OPERATIONAL DATA

### OPERATIONAL LIFE

- Up to 12 years at 20 °C
- Up to 6 years at 30 °C
- Up to 3 years at 40 °C

### WATER REFILLING INTERVAL

- More than 3 years at 20 °C

### EN/IEC 60896-11 CYCLES

- 800

### SELF-DISCHARGE

- Approx. 3 % per month at 20 °C

### OPERATIONAL TEMPERATURE

- -20 °C to 55 °C, recommended 10 °C to 30 °C

### VENTILATION REQUIREMENT

- according to EN/IEC 62485-2

### MEASUREMENTS ACCORDING

- DIN 40 737 part 3

### TESTS ACCORDING

- EN/IEC 60896-11

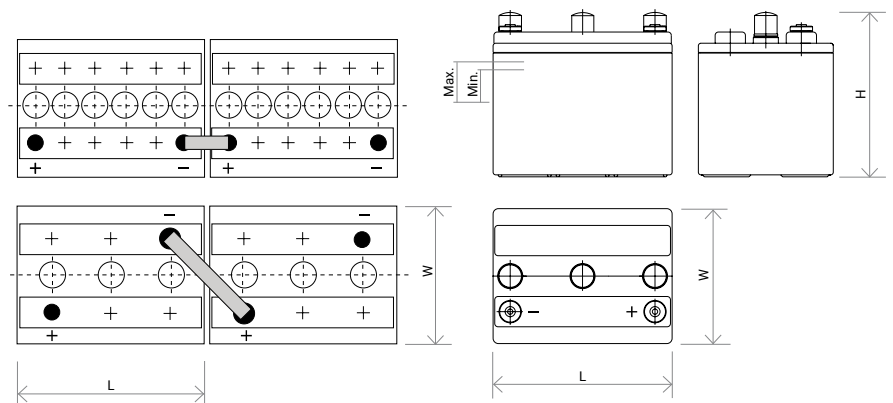
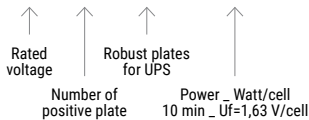
### APPLICABLE STANDARDS

- EN/IEC 62485-2

### TRANSPORT

- No dangerous goods during road transport

## 6V 7 UPS 700



CONNECTIONS

DIMENSIONS

# TAB TOPzS BATTERIES



## LOW MAINTENANCE TAB TOPzS VENTED STATIONARY BATTERIES



The batteries are distinguished for:

- HIGH CAPACITY
- LONG LIFE TIME
- REDUCED MAINTENANCE
- LOW SELF-DISCHARGING
- QUICK AND SIMPLE ACID LEVEL CONTROL
- ECONOMICAL WATER CONSUMPTION
- APPROPRIATE DIMENSIONS AND WEIGHT
- THE LOWEST AND CONSTANT MAINTENANCE CURRENT.

The stationary batteries of the type TOPzS are manufactured according to the EN/IEC 60896-11 regulations. Individual cells (2V) are made from translucent PP containers.

## APPLICATION

Stationary batteries of the TOPzS type are specially designed for solar systems. Due to their extremely low self-discharging and tubular positive plates they are suitable for off-grid solar systems.

## CONSTRUCTION

The positive armored plate is of a tubular type, which means that the active substance ( $PbO_2$ ) is contained in special gauntlet made of polyester fibres and hardened by an impregnation compound. Such construction prevents escaping of an active substance during the operation and ensures a long life time.

The grids of a positive and a negative plate are made of special low percentage (less than 2 %) antimony alloy with addition agents for improvement of crystalline structure of casting.

Negative plates are pasted-type plates with special alloys maintaining porosity of an active substance during the operation.

As an electrolyte, a diluted sulphuric acid ( $H_2SO_4$ ) with a density of  $1.24 \pm 0.01$  kg/l at 20 degrees C, and at a maximum permitted level is used.

Separators separating the positive plates from the negative ones are made of microporous plastic material with a low electric resistance.

In a special process, the lids are tightly sealed with thermo welding to the container. The terminal plugs are sealed with rubber seals. This prevents any escape of electrolyte from the cells.

Due to the transparent containers the electrolyte level is clearly visible, the maximum and minimum levels are marked on a self-adhesive acid-proof label on a container side.

## TWO VERSIONS OF BATTERIES ARE BEING MANUFACTURED:

- **DRY-CHARGE VERSION:**  
a battery has to be filled up with an electrolyte and supplementary charged before use. The plates are already formed and in a special process protected against oxidation. They can be stored without problems.
- **ELECTROLYTE-CHARGE:**  
battery can be installed immediately, because it is already filled up with electrolyte and electrically charged as well.

## DESIGN

### POSITIVE ELECTRODE

- Tubular positive plate with low antimony alloy (<2 %)

### NEGATIVE ELECTRODE

- Flat plate with long life expander

### SEPARATION

- Microporous separator

### ELECTROLYTE

- Sulphuric acid of 1,24 kg/l

### CONTAINER

- Transparent PP

### LID

- PP in green colour

### POLE SEALING

- 100 % gas-and electrolyte-tight, rubber seal

### POLE

- M10, brass insert

### CONNECTOR

- flexible insulated copper cable, with cross-section of 35, 50, or 70 mm<sup>2</sup>

### POLE SCREW

- M10, steel, insulated

## CHARGING

### IU - CHARACTERISTIC

- Imax without limitation

### FLOAT VOLTAGE

- U = 2,23 V/cell ± 1 %

### BOOST CHARGE

- U = 2,35 to 2,40 V/cell

## DISCHARGE CHARACTERISTICS

### REFERENCE TEMPERATURE

- 20 °C at C10 (1,80 V/cell) and 25 °C at C100 (1,85 V/cell)

### INITIAL CAPACITY

- 100 %

### DEPTH OF DISCHARGE

- Normally up to 80 %
- More than 80 % DOD or discharges beyond final discharge voltages (dependent on discharge current) have to be avoided

## MAINTENANCE

### EVERY 6 MONTH

- Check battery voltage pilot block voltage, temperature

### EVERY 12 MONTH

- Take down battery voltage block voltage, temperature

## OPERATIONAL DATA

### OPERATIONAL LIFE

- Up to 15 years
- EN/IEC 60896-11 CYCLES
- 1200

### SELF-DISCHARGE

- Approx. 3 % per month at 20 °C

### OPERATIONAL TEMPERATURE

- -20 °C to 55 °C, recommended 10 °C to 30 °C

### TESTS ACCORDING

- EN/IEC 60896-11 AND EN 61427
- SAFETY STANDARD, VENTILATION
- EN/IEC 62485-2

Uf (V/cell) Capacity	1,80			1,85		EN/IEC 60896-11		Dimensions			Weight	
	C10	C20	C100	Ri	Isc	L	W	H	Dry	Wet		
Type	Ah	Ah	Ah*	mΩ	A	mm	mm	mm	kg	kg		
3 TOPzS 265	265	289	345	0,56	3721	198	83	472	12,4	18,4		
4 TOPzS 353	353	384	460	0,46	4514	198	101	472	16,0	23,3		
5 TOPzS 442	442	481	575	0,38	5461	198	119	472	20,2	29,0		
4 TOPzS 500	499	545	650	0,35	6005	198	101	720	24,3	35,2		
5 TOPzS 625	624	681	815	0,28	7448	198	119	720	30,3	43,2		
6 TOPzS750	749	817	975	0,30	6991	198	137	720	38,0	53,5		
7 TOPzS 875	874	953	1140	0,26	7888	198	173	720	44,0	64,2		
8 TOPzS 1000	999	1089	1300	0,24	8848	198	191	720	50,2	72,5		

Electrolyte density: 1,24 ± 0,01kg/l at 20 °C.

\* Uf=1,85V/cell at 25 °C.

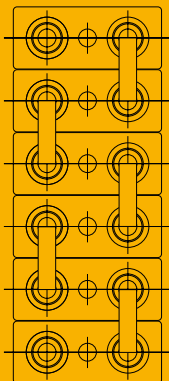
All measures and weights are within standard production tolerances.  
Weight tolerance is ± 5 %  
Electrical values are approximative.  
Technical modifications are reserved without prior notice.

## OPERATION-MAINTENANCE

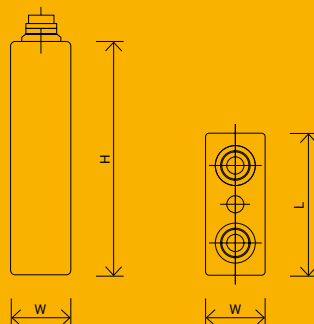
For more detail information please check our operation manual.

## TRANSPORT

Batteries are not subject to ADR (road transport).



CONNECTIONS



DIMENSIONS

# TAB OPzV BATTERIES

TAB OPzV range of valve regulated lead acid stationary batteries combine the benefits of recombination technology (i. e. virtually no maintenance due to very low gas emissions) plus the advantages of conventional vented batteries with positive tubular plates (i. e. long life and excellent cycling capability).

TAB OPzV VALVE REGULATED LEAD ACID BATTERIES ARE THE IDEAL ENERGY SOURCE FOR MANY DIFFERENT STANDBY APPLICATIONS.



## DESIGN

- TUBULAR POSITIVE PLATES**
- Special grid construction, pressure cast from antimony free alloy, with highly porous gauntlets that retain the active material
- PASTED NEGATIVE PLATES**
- Service lives consistent with the positive plates
- ELECTROLYTE**
- Gel structure
- SEPARATORS**
- Extremely high porosity and low internal resistance
- CONTAINERS AND LIDS**
- Made of plastic (ABS) material. Also available in ABS flame retardant material as an option (according to IEC 707 FV0)
- TERMINALS**
- Female treated terminal (M10) perfect contact and low resistance with flexible cable connectors
- POST SEALS**
- Prevents electrolyte leakage and terminal corrosion
- CONNECTORS**
- Flexible, fully insulated cable connectors screwed (with  $20 \pm 1$  Nm) to the terminal with an insulated screw having a probe hole on the top for electrical measurement
- ONE WAY RELIEF VALVE**
- Opens at low pressure

## INSTALLATION

CELLS ARE NORMALLY INSTALLED IN AN UPRIGHT POSITION ON STEEL STANDS

## CHARGING

- FLOAT VOLTAGE**
- Standby use 2.25 V/cell
- BOOST RECHARGE**
- Maximum voltage of 2.35 - 2.40 V/cell with a maximum current of 0.25 C10 (A)

## OPERATIONAL DATA

- OPERATIONAL LIFE**
- Up to 20 years
- EN/IEC 60896-11 CYCLES**
- 1200
- SELF-DISCHARGE**
- Approx. 2 % per month at 20 °C
- TESTS ACCORDING**
- EN/IEC 60896-21, EN 61427

Uf (V/cell)	1,8					1,8		1,77	1,75	1,67	EN/IEC 60896-21			Dimensions			Weight	
	Discharging time (h)	10	10	5	3	1	Ri	Isc	L	W	H1/H2	Wet	Poles					
Type	Nom. Cap. (Ah)	Capacity (Ah) at 20°C					mΩ	A	mm	mm	mm	kg	Nr.					
4 OPzV 200	200	204	172	150	110	1,22	1660	103	206	354/380	19	2						
5 OPzV 250	250	255	215	188	138	0,98	2080	124	206	354/380	23	2						
6 OPzV 300	300	306	258	225	166	0,85	2490	145	206	354/380	28	2						
5 OPzV 350	350	357	305	263	190	0,75	2770	124	206	471/496	31	2						
6 OPzV 420	420	429	365	315	226	0,61	3350	145	206	471/496	36	2						
7 OPzV 490	490	500	425	370	264	0,52	3900	166	206	471/496	41	2						
6 OPzV 600	600	612	520	450	322	0,51	4060	145	206	643/668	49	2						
8 OPzV 800	800	816	700	600	441	0,38	5390	210	191	643/668	65	4						
10 OPzV 1000	1000	1020	870	750	546	0,30	6760	210	233	643/668	80	4						
12 OPzV 1200	1200	1250	1045	900	653	0,26	8120	210	275	643/668	93	4						
12 OPzV 1500	1500	1530	1330	1116	774	0,23	8810	210	275	796/821	115	4						
16 OPzV 2000	2000	2040	1770	1488	1032	0,17	11510	214	399	771/796	155	6						
20 OPzV 2500	2500	2560	2160	1860	1289	0,14	14400	214	482	769/794	200	8						
24 OPzV 3000	3000	3060	2550	2232	1547	0,12	17260	214	576	771/796	235	8						

All measures and weights are within standard production tolerances.  
 Weight tolerance is  $\pm 5\%$   
 Electrical values are approximative.  
 Technical modifications are reserved without prior notice.

According to DIN 40742, EN/IEC 60896-21

## FEATURES

- SAFE
- VERSATILE
- RELIABLE
- MINIMAL GASSING
- DEEP DISCHARGE RESISTANCE

