



OPzS Batteries

Solutions for the toughest requirements

*T*radition & *I*nnovation

The FXM battery series with positive tubular plates (compliant with DIN: OPzS) is manufactured with unique know-how at our FXM Batterie Manufaktur production plant. Unique technologies for batteries with positive tubular plates were introduced with the plant and machinery which is partially self-built and optimised at the production site. These sophisticated production processes were developed by Franz Xaver Mittermaier*, a pioneer in the battery industry.

The FXM series uses the highest quality materials which are processed at the plant in Isen / Bavaria. Each individual step is carefully controlled to ensure excellent and consistent quality.

Above all, production at the battery factory mainly means innovation and craftsmanship. This uses technology which permanently improves the performance of batteries and cells and turns the products to the best of their kind.

The manufacturing technology

By means of a self-developed, partly patented manufacturing method, the finest, equally sized and completely uniformly distributed pores are formed in the active material of the positive electrode. The weight tolerance of the positive plates is thus <0.3 %. Due to the homogeneity of the mass, the density of the sulphuric acid over the entire plate length is almost identical. The internal resistance and the load factor are thereby reduced, and heat is considerably reduced even at high charge and discharge currents.

This special manufacturing technology makes the products highly durable and ensures an extremely high cycle stability.

* **Franz Xaver Mittermaier** stands for over 100 years of experience in the research and development of battery technology. His grandfather, father and uncle also worked with electricity. In 1897, his grandfather founded the first Bavarian accumulator factory in Isen, and car batteries have been manufactured since 1925. Time and again, FXM has improved the manufacturing technology and products with many milestones. Numerous patents, such as the wet-filling procedure of the positive plate or the production process for negative electrode grids, were applied for and granted.



Selection of patents:

No. 42 18 465
No. 43 21 248.4-45
No. 19 537 128.3-09
No. 197 02 865.9-45
No. 10 2004 039 689
No. 10 2007 033 921
No. 10 2007 005 816.2-45

Density measurement analogue
Forming
Closure
Mixing electrolytes
Tube electrode grid
Separator for lead accumulator
Negative electrodes / pressing



OPzS Batteries Blocks and Cells

The product range of series OPzS

Proven energy source with long life, maximum reliability, also for critical applications and cycle operation.

OpzS batteries are sealed lead acid batteries with liquid electrolyte. They consist of positive tubular plates and negative grids. They are ideally suited to applications with high cyclic and capacitive load, such as energy supply systems, emergency power supplies according to VDE 0100-710 and VDE 0100-718, telecommunications facilities or as storage for renewable energy.

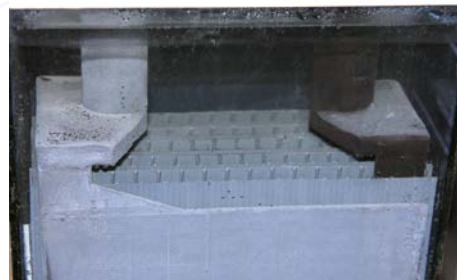
Applications

Today, FXM OPzS batteries are used by well-known clients in many areas, and are made in Germany.



Quality features

- ✓ Maximum operational reliability
- ✓ Very low maintenance, but serviceable
- ✓ Very low self-discharge thanks to special alloy
- ✓ Deep discharge resistant
- ✓ Up to 50 % increased cycle stability
- ✓ Significantly reduced short circuit tendency inside the cell
- ✓ High voltage stability during discharge
- ✓ High efficiency (up to 30 % above the norm)
- ✓ Very low internal resistance
- ✓ Capable of carrying high current
- ✓ Short effective recovery feature
- ✓ Reduced stable floating voltage
- ✓ Easy control of operating performance and the operating state
- ✓ Backfire-proof closure
- ✓ Easy to install yourself
- ✓ Manufactured in accordance with numerous self-developed, globally recognised and applied patents

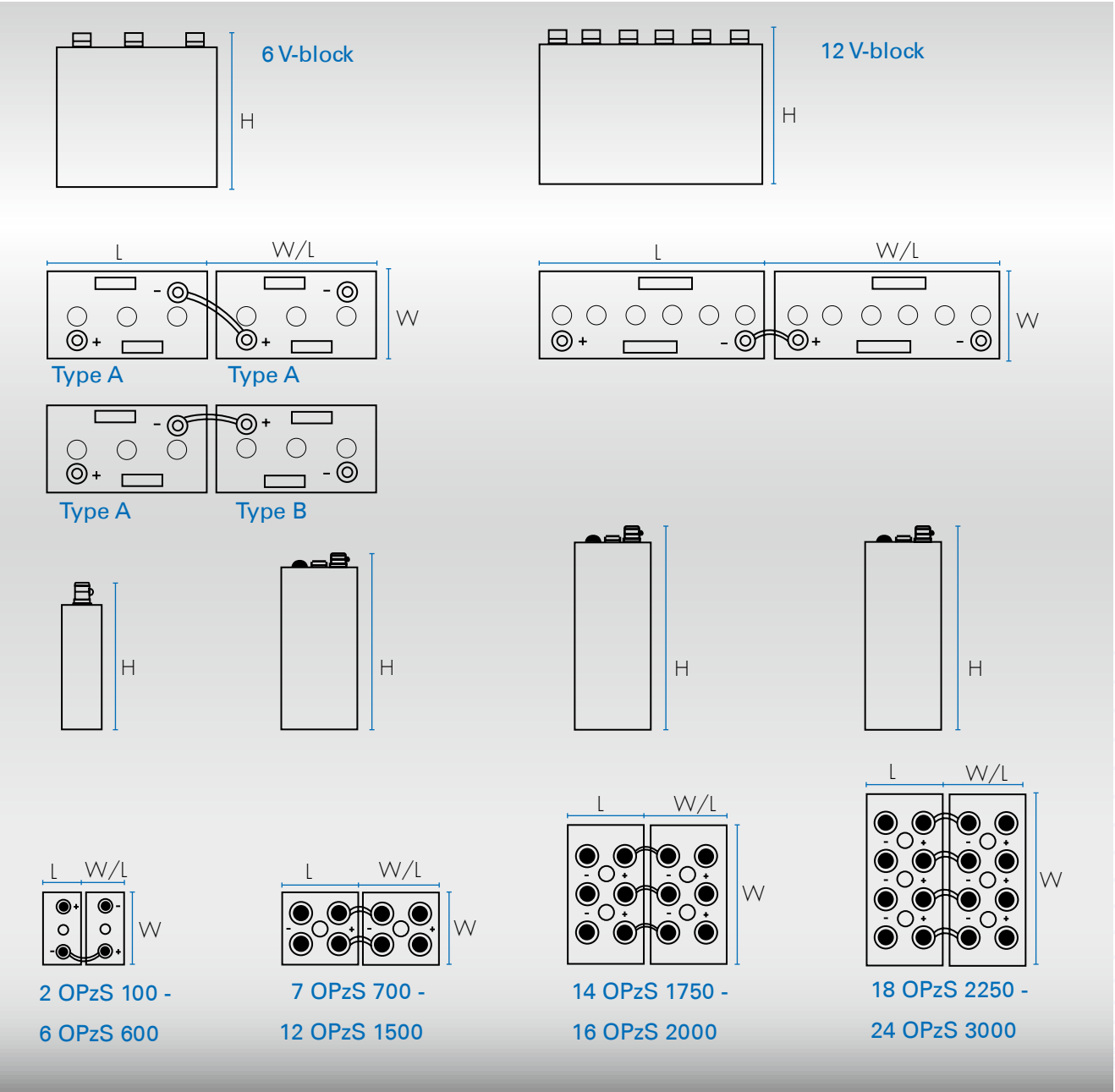


OPzS Batteries Blocks and Cells

Technical details

OPzS cells + blocks

Drawings



OPzS

Technical details Overview

Type description according to DIN	Rated voltage	Rated capacity C ₁₀ according to DIN Ah	Actual capacity C₁₀ 1.80 V/Z 20°C	Length (L)	Width (W)	Height (H)	Installed length (W/L)	Weight dry	Weight gug	Internal resist- ance	Short circuit current	Con- nection	Pole pairs
Blocks: 40 737-3 Cells: 40 736-1	V		Ah	max. mm	max. mm	max. mm	mm	kg	kg	mOhm	A		
OPzS block batteries													
6V 3 OPzS 150*	6	150	172	272	205	400	282	29,0	36,5	3,23	1884	M10	1
6V 4 OPzS 200*	6	200	230	272	205	400	282	35,2	47,1	2,80	2150	M10	1
6V 5 OPzS 250*	6	250	285	380	205	400	390	43,5	60,9	2,50	2620	M10	1
6V 6 OPzS 300*	6	300	345	380	205	400	390	50,5	67,1	2,10	2960	M10	1
12V 1 OPzS 50	12	50	58	272	205	400	282	24,4	37,7	18,20	670	M10	1
12V 2 OPzS 100	12	100	115	272	205	400	282	37,7	49,4	9,40	1220	M10	1
12V 3 OPzS 150	12	150	172	380	205	400	390	53,0	69,8	6,60	1800	M10	1
OPzS single cells 200-490 Ah													
2 OPzS 100	2	100	115	103	206	430	113	8,0	13,8	1,50	1335	M10	1
3 OPzS 150	2	150	172	103	206	430	113	10	15	1,07	1884	M10	1
4 OPzS 200	2	200	230	103	206	430	113	12,5	16,8	0,86	2332	M10	1
5 OPzS 250	2	250	285	124	206	430	134	15,0	20,8	0,74	2688	M10	1
6 OPzS 300	2	300	345	145	206	430	155	18,5	25,7	0,65	3072	M10	1
5 OPzS 350	2	350	400	124	206	546	134	19,5	26,6	0,65	3180	M10	1
6 OPzS 420	2	420	480	145	206	546	155	24,5	33,2	0,58	3578	M10	1
7 OPzS 490	2	490	560	165	206	546	175	27,2	39,4	0,52	4007	M10	1
OPzS single cells 600-3000 Ah													
6 OPzS 600	2	600	690	145	206	721	155	34,0	46,4	0,50	4088	M10	1
7 OPzS 700	2	700	805	210	191	721	220	38,4	54,0	0,45	4413	M10	2
8 OPzS 800	2	800	920	210	191	721	220	51,0	67,7	0,32	6405	M10	2
9 OPzS 900	2	900	1035	210	235	721	220	54,2	72,1	0,30	6812	M10	2
10 OPzS 1000	2	1000	1150	210	235	721	220	58,9	80,0	0,28	7390	M10	2
12 OPzS 1200	2	1200	1380	210	275	721	220	68,0	94,0	0,24	8354	M10	2
12 OPzS 1500	2	1500	1725	210	275	871	220	84,5	116,0	0,28	7048	M10	2
14 OPzS 1750	2	1750	2010	214	399	847	224	91,1	123,0	0,26	7800	M10	3
16 OPzS 2000	2	2000	2300	214	399	847	224	126,0	170,0	0,19	11053	M10	3
18 OPzS 2250	2	2250	2585	212	487	847	224	135,1	179,3	0,17	11724	M10	4
20 OPzS 2500	2	2500	2875	212	487	847	222	148,0	200,0	0,14	15000	M10	4
22 OPzS 2750	2	2750	3160	212	576	847	222	154,8	209,5	0,13	15482	M10	4
24 OPzS 3000	2	3000	3450	212	576	847	222	167,0	223,0	0,13	16154	M10	4

* 6V block batteries are manufactured in both type A and type B versions; see diagram on page 6

** Height incl. standard ceramic plugs

OPzS Batteries Blocks and Cells

OPzS

Technical details constant current discharge

1,80V / Cell								
Type description	5 min	10 min	30 min	1 hour	3 hours	5 hours	10 hours	100 hours
OPzS block batteries								
6V 3 OPzS 150*	233	128	99	74	41	28	18	3
6V 4 OPzS 200*	312	172	134	100	54	38	24	3
6V 5 OPzS 250*	393	218	169	127	69	49	31	4
6V 6 OPzS 300*	472	262	204	153	83	59	37	5
12V 1 OPzS 50	79	47	34	25	14	10	6	1
12V 2 OPzS 100	153	84	65	49	26	19	12	2
12V 3 OPzS 150	233	128	99	74	41	28	18	3
OPzS single cells 200 - 490 Ah								
2 OPzS 100	160	90	70	53	29	21	12	2
3 OPzS 150	240	134	105	79	44	31	19	3
4 OPzS 200	320	179	140	105	58	41	25	3
5 OPzS 250	400	224	175	132	73	52	31	4
6 OPzS 300	480	269	210	158	87	62	37	5
5 OPzS 350	389	299	233	176	97	69	43	6
6 OPzS 420	467	358	280	211	116	82	52	7
7 OPzS 490	545	418	327	246	136	96	60	8
OPzS single cells 600 - 3000 Ah								
6 OPzS 600	480	385	343	281	176	130	72	10
7 OPzS 700	516	413	369	303	189	140	78	11
8 OPzS 800	638	511	457	374	234	173	96	14
9 OPzS 900	686	550	491	402	252	186	103	15
10 OPzS 1000	797	638	570	467	292	216	120	17
12 OPzS 1200	960	769	687	563	352	261	145	20
12 OPzS 1500	1.043	833	744	610	381	282	171	22
14 OPzS 1750	1.122	896	800	656	410	304	184	24
16 OPzS 2000	1.388	1.108	990	811	507	375	227	29
18 OPzS 2250	1.492	1.191	1.064	872	545	404	245	31
20 OPzS 2500	1.743	1.392	1.242	1.018	637	471	286	37
22 OPzS 2750	1.873	1.496	1.336	1.095	684	507	307	39
24 OPzS 3000	2.056	1.642	1.466	1.201	751	556	337	43

Deviation about +/- 1.5 % possible

* 6V block batteries are manufactured in both type A and type B versions; see diagram on page 6



OPzS

Technical details constant current discharge

1,75V / Cell								
Type description	5 min	10 min	30 min	1 hour	3 hours	5 hours	10 hours	100 hours
OPzS block batteries								
6V 3 OPzS 150 *	283	160	117	83	47	30	18	3
6V 4 OPzS 200*	379	215	158	113	62	40	24	4
6V 5 OPzS 250*	476	272	199	143	79	52	31	4
6V 6 OPzS 300*	572	326	240	172	95	63	38	5
12V 1 OPzS 50	95	54	38	28	15	10	6	1
12V 2 OPzS 100	187	105	77	55	30	20	12	2
12V 3 OPzS 150	283	160	117	83	47	30	18	3
OPzS single cells 200 - 490 Ah								
2 OPzS 100	193	111	82	59	33	22	12	2
3 OPzS 150	290	167	123	89	49	33	19	3
4 OPzS 200	387	222	164	118	66	44	25	4
5 OPzS 250	483	278	205	148	82	54	32	4
6 OPzS 300	580	333	246	177	99	65	38	5
5 OPzS 350	466	351	270	194	102	73	44	6
6 OPzS 420	559	421	324	233	122	87	52	7
7 OPzS 490	653	491	378	272	143	102	61	8
OPzS single cells 600 - 3000 Ah								
6 OPzS 600	580	464	398	318	187	136	75	11
7 OPzS 700	624	499	428	342	201	146	80	11
8 OPzS 800	771	617	529	423	249	181	100	14
9 OPzS 900	829	663	569	455	267	194	107	15
10 OPzS 1000	963	770	661	528	310	226	124	18
12 OPzS 1200	1.160	928	796	636	374	272	150	21
12 OPzS 1500	1.261	1.020	896	727	393	292	180	23
14 OPzS 1750	1.355	1.097	963	782	423	314	194	25
16 OPzS 2000	1.677	1.357	1.192	967	523	388	239	30
18 OPzS 2250	1.803	1.458	1.281	1.039	562	417	257	33
20 OPzS 2500	2.106	1.703	1.496	1.214	657	488	301	38
22 OPzS 2750	2.264	1.831	1.609	1.305	706	524	323	41
24 OPzS 3000	2.522	2.040	1.792	1.454	786	584	360	46

Deviation about +/- 1.5 % possible

* 6V block batteries are manufactured in both type A and type B versions; see diagram on page 6

OPzS Batteries Blocks and Cells

OPzS

Technical details constant current discharge

1,70V / Cell								
Type description	5 min	10 min	30 min	1 hour	3 hours	5 hours	10 hours	100 hours
OPzS block batteries								
6V 3 OPzS 150*	333	187	130	89	48	31	19	3
6V 4 OPzS 200*	445	251	176	121	63	42	25	4
6V 5 OPzS 250*	560	317	221	153	80	54	31	4
6V 6 OPzS 300*	672	380	267	184	96	65	39	5
12V 1 OPzS 50	112	63	44	30	16	11	6	1
12V 2 OPzS 100	220	123	86	59	30	21	12	2
12V 3 OPzS 150	333	187	130	89	48	31	19	3
OPzS single cells 200 - 490 Ah								
2 OPzS 100	227	129	91	63	34	23	13	2
3 OPzS 150	340	194	137	95	50	34	19	3
4 OPzS 200	453	258	182	126	67	45	25	4
5 OPzS 250	567	323	228	158	84	56	31,8	4
6 OPzS 300	680	387	273	189	101	68	39	5
5 OPzS 350	543	398	305	210	106	75	44	6
6 OPzS 420	652	478	366	252	127	90	53	7
7 OPzS 490	760	557	427	294	148	105	62	8
OPzS single cells 600 - 3000 Ah								
6 OPzS 600	680	542	451	351	192	139	76	11
7 OPzS 700	731	583	485	377	206	149	82	12
8 OPzS 800	904	721	600	467	255	185	102	14
9 OPzS 900	972	775	645	502	275	199	109	15
10 OPzS 1000	1.129	900	749	583	319	231	127	18
12 OPzS 1200	1.360	1.084	902	702	384	278	153	22
12 OPzS 1500	1.478	1.199	1.041	838	400	298	185	23
14 OPzS 1750	1.589	1.289	1.119	901	430	320	199	25
16 OPzS 2000	1.966	1.595	1.385	1.115	532	396	246	31
18 OPzS 2250	2.114	1.714	1.488	1.198	572	426	265	33
20 OPzS 2500	2.469	2.002	1.738	1.399	668	498	309	39
22 OPzS 2750	2.654	2.153	1.869	1.504	719	535	332	42
24 OPzS 3000	2.957	2.398	2.082	1.676	801	596	370	47

Deviation about +/- 1.5 % possible

* 6V block batteries are manufactured in both type A and type B versions; see diagram on page 6

OPzS

Technical details constant current discharge

1,65 V / Cell								
Type description	5 min	10 min	30 min	1 hour	3 hours	5 hours	10 hours	100 hours
OPzS block batteries								
6V 3 OPzS 150 *	383	211	139	94	49	32	19	3
6V 4 OPzS 200*	512	283	188	127	64	43	25	4
6V 5 OPzS 250*	643	357	236	160	82	55	32	5
6V 6 OPzS 300*	772	428	285	193	98	66	39	5
12V 1 OPzS 50	128	71	47	32	16	11	6	1
12V 2 OPzS 100	253	139	92	62	31	21	12	2
12V 3 OPzS 150	383	211	139	94	49	32	19	3
OPzS single cells 200 - 490 Ah								
2 OPzS 100	260	145	97	66	34	23	13	2
3 OPzS 150	390	218	146	99	51	35	19	3
4 OPzS 200	520	290	194	132	68	46	26	4
5 OPzS 250	650	363	243	165	85	58	32	5
6 OPzS 300	780	435	291	198	102	69	39	5
5 OPzS 350	620	442	337	223	109	77	45	6
6 OPzS 420	744	530	404	268	131	92	54	7
7 OPzS 490	868	619	472	312	153	107	63	9
OPzS single cells 600 - 3000 Ah								
6 OPzS 600	780	617	502	379	196	141	78	11
7 OPzS 700	839	663	540	407	211	152	84	12
8 OPzS 800	1.037	821	668	504	261	188	103	15
9 OPzS 900	1.115	882	718	542	280	202	111	16
10 OPzS 1000	1.295	1.024	833	629	325	234	129	18
12 OPzS 1200	1.560	1.234	1.004	758	392	282	156	22
12 OPzS 1500	1.696	1.374	1.179	945	406	302	188	24
14 OPzS 1750	1.823	1.477	1.267	1.016	436	325	202	26
16 OPzS 2000	2.255	1.827	1.568	1.257	540	402	250	32
18 OPzS 2250	2.424	1.964	1.686	1.351	580	432	269	34
20 OPzS 2500	2.832	2.295	1.969	1.578	678	504	314	40
22 OPzS 2750	3.044	2.467	2.117	1.697	729	542	338	43
24 OPzS 3000	3.391	2.748	2.358	1.890	812	604	376	48

Deviation about +/- 1.5 % possible

* 6V block batteries are manufactured in both type A and type B versions; see diagram on page 6

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