

GAZ[®]

SOL G

*Ni-Cd Batteries for renewable
energy applications*

Made in Germany



EnerSys[®]
Power/Full Solutions

The GAZ® SOL G range has been specifically developed for renewable energy applications and in particular solar energy systems.

The long cycle life based on more than 100 years experiences with design and manufacturing of NiCd pocket plates and continuous improvement of this technology.

GAZ® SOL G provides good reliability with extremely long maintenance intervals and operates at variable state of charge (SoC) and depth of discharge (DoD).

Key Benefits

- capacity range (C_{120}) from 140 Ah to 1680 Ah
- long cycle life through improved mechanical & chemical components
- wide temperature range of operating from -20 °C to +50 °C
- long water topping-up intervals due to high internal gas recombination
- excellent charging efficiency at low temperatures
- great resistance to mechanical and electrical stresses



General Specifications

Type	Nominal Voltage V	Number of Terminals	Connector screw Hole	Nominal Capacity		Nominal Dimensions						Typical Weight kg lbs	Electrolyte Reserve ml	
				5 hr Rate @25°C	120 hr Rate @25°C	Length mm in l	Width mm in w	Height mm in h ₁						
SOL 140 G	1.2	2	M8	132	140	70	2.76	164	6.46	392	15.44	7.7	17.0	607
SOL 175 G	1.2	2	M8	165	175	70	2.76	164	6.46	392	15.44	7.8	17.2	607
SOL 210 G	1.2	2	M8	198	210	108	4.26	164	6.46	392	15.44	10.6	23.4	967
SOL 245 G	1.2	2	M8	231	245	108	4.26	164	6.46	392	15.44	10.9	24.0	967
SOL 275 G	1.2	2	M8	264	275	108	4.26	164	6.46	392	15.44	11.2	24.7	967
SOL 310 G	1.2	2	M8	297	310	108	4.26	164	6.46	392	15.44	11.6	25.6	967
SOL 345 G	1.2	2	M10	330	345	164	6.46	158	6.23	392	15.44	16.3	35.9	1441
SOL 380 G	1.2	2	M10	363	380	164	6.46	158	6.23	392	15.44	16.8	37.0	1441
SOL 415 G	1.2	2	M10	396	415	164	6.46	158	6.23	392	15.44	17.3	38.1	1441
SOL 450 G	1.2	2	M10	429	450	164	6.46	158	6.23	392	15.44	17.8	39.2	1441
SOL 485 G	1.2	2	M10	462	485	164	6.46	158	6.23	392	15.44	18.5	40.8	1441
SOL 555 G	1.2	4	M10	528	555	176	6.93	246	9.69	408	16.08	26.7	58.9	2351
SOL 625 G	1.2	4	M10	594	625	176	6.93	246	9.69	408	16.08	28.9	63.7	2351
SOL 693 G	1.2	4	M10	660	693	176	6.93	246	9.69	408	16.08	29.7	65.5	2351
SOL 730 G	1.2	6	M10	693	730	176	6.93	368	14.5	416	16.39	39.8	87.7	3567
SOL 830 G	1.2	6	M10	792	830	176	6.93	368	14.5	416	16.39	41.0	90.4	3567
SOL 935 G	1.2	6	M10	891	935	176	6.93	368	14.5	416	16.39	45.4	100.0	3567
SOL 1110 G	1.2	8	M10	1056	1110	176	6.93	448	17.65	416	16.39	52.5	116.0	4362
SOL 1245 G	1.2	8	M10	1188	1245	176	6.93	448	17.65	416	16.39	61.9	136.0	4362
SOL 1385 G	1.2	8	M10	1320	1385	176	6.93	558	21.99	416	16.39	64.4	142.0	5458
SOL 1525 G	1.2	8	M10	1452	1525	176	6.93	558	21.99	416	16.39	68.9	152.0	5458
SOL 1680 G	1.2	10	M10	1590	1680	176	6.93	558	21.99	416	16.39	70.7	156.0	5458

Notes

The electrical values shown in the table relate to performance from a fully charged condition at ambient temperature of +25°C rated capacity C₅ according IEC 62259, point 3.3



End voltage/cell

1.15 V

Type	Discharge Current [A]									
	48 h 2 d	72 h 3 d	96 h 4 d	120 h 5 d	144 h 6 d	168 h 7 d	192 h 8 d	216 h 9 d	240 h 10 d	
SOL 140 G	2,88	1,93	1,45	1,16	0,98	0,84	0,74	0,66	0,60	
SOL 175 G	3,60	2,41	1,81	1,45	1,22	1,05	0,93	0,83	0,75	
SOL 210 G	4,32	2,89	2,18	1,74	1,46	1,26	1,11	0,99	0,90	
SOL 245 G	5,04	3,37	2,54	2,04	1,71	1,47	1,30	1,16	1,05	
SOL 275 G	5,66	3,79	2,85	2,28	1,92	1,65	1,46	1,30	1,17	
SOL 310 G	6,37	4,27	3,21	2,58	2,16	1,87	1,64	1,47	1,32	
SOL 345 G	7,09	4,75	3,57	2,87	2,40	2,08	1,83	1,63	1,47	
SOL 380 G	7,81	5,23	3,94	3,16	2,65	2,29	2,01	1,80	1,62	
SOL 415 G	8,53	5,72	4,30	3,45	2,89	2,50	2,20	1,96	1,77	
SOL 450 G	9,25	6,20	4,66	3,74	3,14	2,71	2,38	2,13	1,92	
SOL 485 G	9,97	6,68	5,02	4,03	3,38	2,92	2,57	2,29	2,07	
SOL 555 G	11,41	7,64	5,75	4,61	3,87	3,34	2,94	2,62	2,37	
SOL 625 G	12,85	8,61	6,48	5,19	4,35	3,76	3,31	2,95	2,67	
SOL 693 G	14,25	9,55	7,18	5,76	4,83	4,17	3,67	3,28	2,96	
SOL 730 G	15,01	10,05	7,56	6,06	5,09	4,39	3,87	3,45	3,12	
SOL 830 G	17,07	11,43	8,60	6,89	5,78	4,99	4,39	3,92	3,54	
SOL 935 G	19,23	12,88	9,69	7,77	6,51	5,63	4,95	4,42	3,99	
SOL 1110 G	22,82	15,29	11,50	9,22	7,73	6,68	5,88	5,25	4,74	
SOL 1245 G	25,60	17,15	12,90	10,34	8,67	7,49	6,59	5,88	5,31	
SOL 1385 G	28,48	19,08	14,35	11,50	9,65	8,33	7,33	6,55	5,91	
SOL 1525 G	31,36	21,00	15,80	12,67	10,62	9,17	8,07	7,21	6,51	
SOL 1680 G	34,55	23,14	17,40	13,95	11,70	10,11	8,90	7,94	7,17	

End voltage/cell

1.16 V

Type	Discharge Current [A]									
	48 h 2 d	72 h 3 d	96 h 4 d	120 h 5 d	144 h 6 d	168 h 7 d	192 h 8 d	216 h 9 d	240 h 10 d	
SOL 140 G	2,86	1,92	1,44	1,16	0,97	0,84	0,74	0,66	0,60	
SOL 175 G	3,58	2,40	1,80	1,45	1,21	1,05	0,92	0,82	0,75	
SOL 210 G	4,29	2,88	2,17	1,74	1,46	1,26	1,11	0,99	0,89	
SOL 245 G	5,01	3,36	2,53	2,03	1,70	1,47	1,29	1,15	1,04	
SOL 275 G	5,62	3,77	2,84	2,27	1,91	1,65	1,45	1,30	1,17	
SOL 310 G	6,34	4,25	3,20	2,56	2,15	1,86	1,64	1,46	1,32	
SOL 345 G	7,05	4,73	3,56	2,85	2,39	2,07	1,82	1,63	1,47	
SOL 380 G	7,77	5,21	3,92	3,14	2,64	2,28	2,01	1,79	1,62	
SOL 415 G	8,49	5,69	4,28	3,43	2,88	2,49	2,19	1,96	1,77	
SOL 450 G	9,20	6,17	4,64	3,72	3,12	2,70	2,37	2,12	1,92	
SOL 485 G	9,92	6,65	5,00	4,01	3,37	2,91	2,56	2,28	2,06	
SOL 555 G	11,35	7,61	5,72	4,59	3,85	3,33	2,93	2,61	2,36	
SOL 625 G	12,78	8,57	6,44	5,17	4,34	3,75	3,30	2,94	2,66	
SOL 693 G	14,17	9,50	7,15	5,73	4,81	4,15	3,66	3,26	2,95	
SOL 730 G	14,93	10,00	7,53	6,04	5,07	4,38	3,85	3,44	3,11	
SOL 830 G	16,97	11,37	8,56	6,86	5,76	4,98	4,38	3,91	3,53	
SOL 935 G	19,12	12,81	9,64	7,73	6,49	5,61	4,93	4,40	3,98	
SOL 1110 G	22,70	15,21	11,44	9,18	7,70	6,65	5,86	5,23	4,72	
SOL 1245 G	25,46	17,06	12,84	10,29	8,64	7,46	6,57	5,86	5,30	
SOL 1385 G	28,32	18,98	14,28	11,45	9,61	8,30	7,31	6,52	5,89	
SOL 1525 G	31,18	20,90	15,72	12,61	10,58	9,14	8,05	7,18	6,49	
SOL 1680 G	34,35	23,02	17,32	13,89	11,66	10,07	8,86	7,91	7,15	

End voltage/cell

1.18 V

Type	Discharge Current [A]									
	48 h 2 d	72 h 3 d	96 h 4 d	120 h 5 d	144 h 6 d	168 h 7 d	192 h 8 d	216 h 9 d	240 h 10 d	
SOL 140 G	2,80	1,88	1,41	1,13	0,95	0,82	0,73	0,65	0,59	
SOL 175 G	3,50	2,34	1,76	1,42	1,19	1,03	0,91	0,81	0,73	
SOL 210 G	4,19	2,81	2,12	1,70	1,43	1,23	1,09	0,97	0,88	
SOL 245 G	4,89	3,28	2,47	1,98	1,67	1,44	1,27	1,13	1,02	
SOL 275 G	5,49	3,68	2,77	2,22	1,87	1,62	1,42	1,27	1,15	
SOL 310 G	6,19	4,15	3,13	2,51	2,11	1,82	1,61	1,43	1,30	
SOL 345 G	6,89	4,62	3,48	2,79	2,35	2,03	1,79	1,60	1,44	
SOL 380 G	7,59	5,09	3,83	3,07	2,58	2,23	1,97	1,76	1,59	
SOL 415 G	8,29	5,56	4,18	3,36	2,82	2,44	2,15	1,92	1,73	
SOL 450 G	8,99	6,03	4,54	3,64	3,06	2,65	2,33	2,08	1,88	
SOL 485 G	9,69	6,49	4,89	3,92	3,30	2,85	2,51	2,24	2,03	
SOL 555 G	11,08	7,43	5,59	4,49	3,77	3,26	2,87	2,57	2,32	
SOL 625 G	12,48	8,37	6,30	5,05	4,25	3,67	3,24	2,89	2,61	
SOL 693 G	13,84	9,28	6,99	5,60	4,71	4,07	3,59	3,20	2,90	
SOL 730 G	14,58	9,77	7,36	5,90	4,96	4,29	3,78	3,38	3,05	
SOL 830 G	16,58	11,11	8,37	6,71	5,64	4,88	4,30	3,84	3,47	
SOL 935 G	18,67	12,52	9,42	7,56	6,36	5,50	4,84	4,32	3,91	
SOL 1110 G	22,17	14,86	11,19	8,98	7,55	6,52	5,75	5,13	4,64	
SOL 1245 G	24,86	16,67	12,55	10,07	8,47	7,32	6,44	5,76	5,20	
SOL 1385 G	27,66	18,54	13,96	11,20	9,42	8,14	7,17	6,40	5,79	
SOL 1525 G	30,46	20,42	15,37	12,33	10,37	8,96	7,89	7,05	6,37	
SOL 1680 G	33,55	22,49	16,93	13,59	11,42	9,87	8,70	7,77	7,02	

End voltage/cell

1.20 V

Type	Discharge Current [A]									
	48 h 2 d	72 h 3 d	96 h 4 d	120 h 5 d	144 h 6 d	168 h 7 d	192 h 8 d	216 h 9 d	240 h 10 d	
SOL 140 G	2,59	1,75	1,32	1,06	0,90	0,78	0,68	0,61	0,55	
SOL 175 G	3,24	2,18	1,65	1,33	1,12	0,97	0,85	0,76	0,69	
SOL 210 G	3,89	2,62	1,98	1,59	1,34	1,16	1,02	0,92	0,83	
SOL 245 G	4,54	3,06	2,31	1,86	1,57	1,36	1,19	1,07	0,96	
SOL 275 G	5,09	3,43	2,59	2,09	1,76	1,52	1,34	1,20	1,08	
SOL 310 G	5,74	3,87	2,92	2,35	1,98	1,72	1,51	1,35	1,22	
SOL 345 G	6,39	4,30	3,25	2,62	2,21	1,91	1,68	1,50	1,36	
SOL 380 G	7,04	4,74	3,58	2,88	2,43	2,10	1,85	1,66	1,50	
SOL 415 G	7,68	5,17	3,91	3,15	2,66	2,30	2,02	1,81	1,63	
SOL 450 G	8,33	5,61	4,24	3,41	2,88	2,49	2,19	1,96	1,77	
SOL 485 G	8,98	6,05	4,57	3,68	3,10	2,68	2,36	2,11	1,91	
SOL 555 G	10,28	6,92	5,23	4,21	3,55	3,07	2,71	2,42	2,19	
SOL 625 G	11,57	7,79	5,89	4,74	4,00	3,46	3,05	2,72	2,46	
SOL 693 G	12,83	8,64	6,53	5,26	4,44	3,84	3,38	3,02	2,73	
SOL 730 G	13,52	9,10	6,88	5,54	4,67	4,04	3,56	3,18	2,87	
SOL 830 G	15,37	10,35	7,82	6,30	5,31	4,59	4,05	3,62	3,27	
SOL 935 G	17,31	11,66	8,81	7,09	5,98	5,17	4,56	4,07	3,68	
SOL 1110 G	20,55	13,84	10,46	8,42	7,10	6,14	5,41	4,83	4,37	
SOL 1245 G	23,05	15,52	11,73	9,45	7,97	6,89	6,07	5,42	4,90	
SOL 1385 G	25,64	17,27	13,05	10,51	8,86	7,66	6,75	6,03	5,45	
SOL 1525 G	28,23	19,01	14,37	11,57	9,76	8,44	7,43	6,64	6,00	
SOL 1680 G	31,10	20,95	15,83	12,75	10,75	9,30	8,19	7,32	6,61	

Installation and Operation

- Recommended temperature range: -20 °C to 50 °C
- Can be installed on steel or plastics racks

Standards

- Compliant with international standard IEC 61427:2005
- Compliant with international standard IEC 62259:2004
- The management systems governing the manufacture of GAZ NiCd batteries in Zwickau (Germany) are ISO 9001:2008 and ISO 14001:2004 certified.

Battery Sizing

Sizing at constant load:

Load x Temp. Derating x Design margin x Charge derating (90 %) = Current to be selected from the performance table

Sizing method at loads including peaks:

IEEE 1144-1996 for photovoltaic systems

Construction

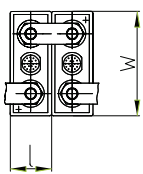
Improved Iomain™ battery concept with partial gas recombination for photovoltaic applications

- Positive electrode: Pocket plate – containing nickel hydroxid
- Negative electrode: Pocket plate – containing cadmium hydroxid
- Separators: Special fleece separator – low resistance microporous material
- Container: Moulded from translucent polystyrene or polypropylene
- Vent: Flame arresting vent
- Electrolyte: Solution of potassium hydroxide with special additives
- Terminals: Redundant leak protection minimizes carbonate formation
- Connectors: Nickel-plated copper with plastic covers according to EN 50272-2:2001

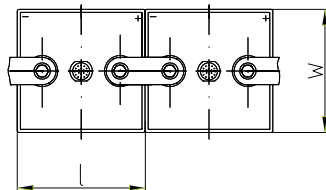
Battery system	Charging voltage per cell
5 – 10 % daily depth of discharge	1,5
10 – 15 % daily depth of discharge	1,55
15 – 25 % daily depth of discharge	1,6

Battery Layout

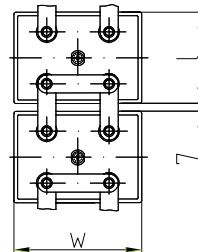
SOL 140 G – SOL 310 G
(Female thread M8)



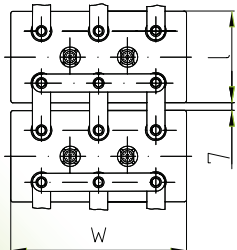
SOL 345 G - SOL 485 G
(Female thread M10)



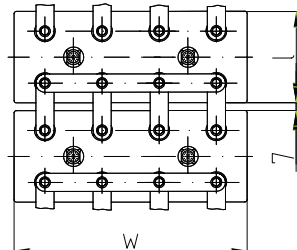
SOL 555 G – SOL 693 G
(Female thread M10)



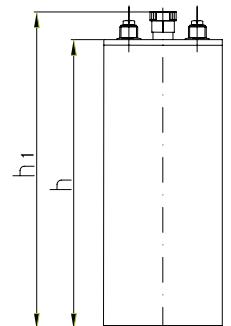
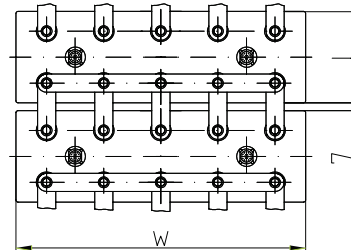
SOL 730 G – SOL 935 G
(Female thread M10)



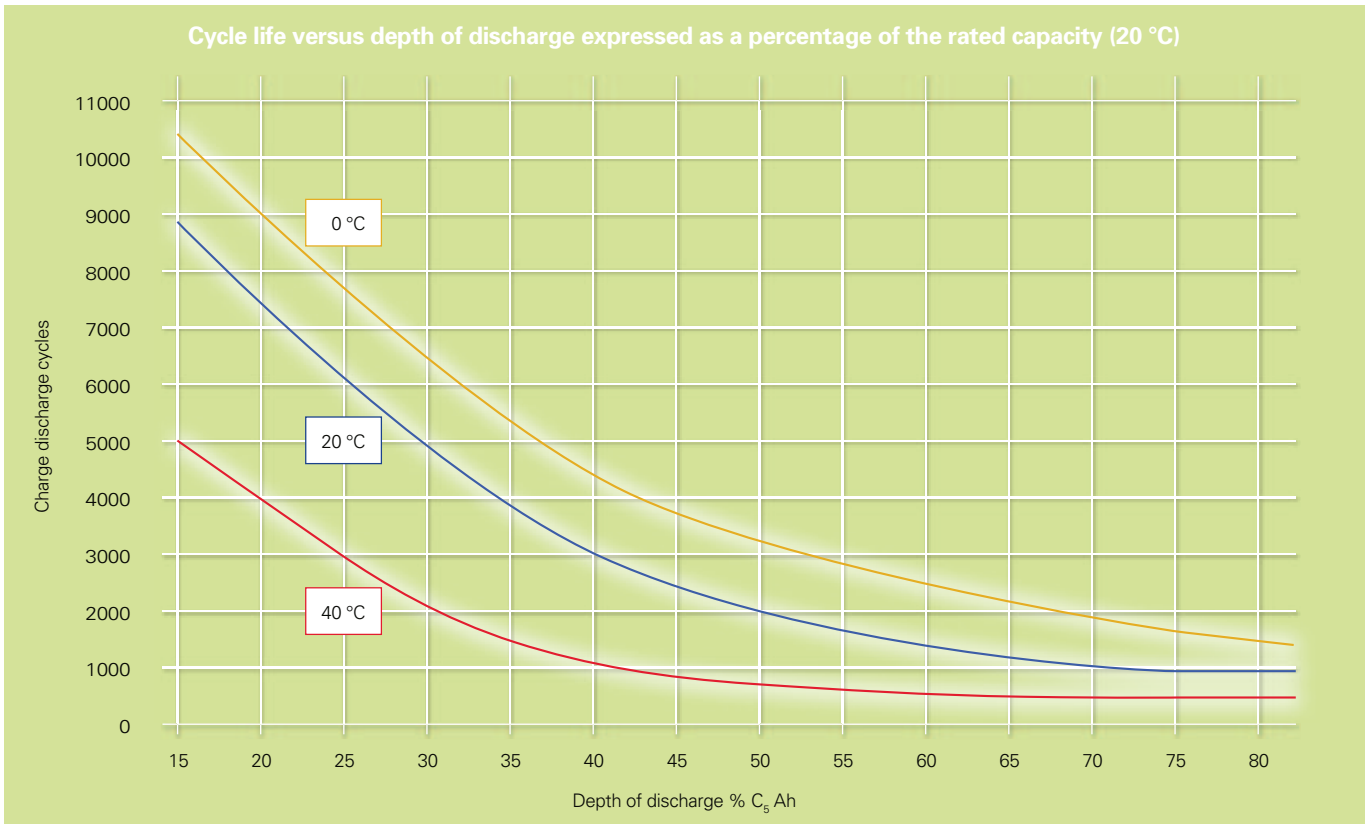
SOL 1110 G – SOL 1525 G
(Female thread M10)



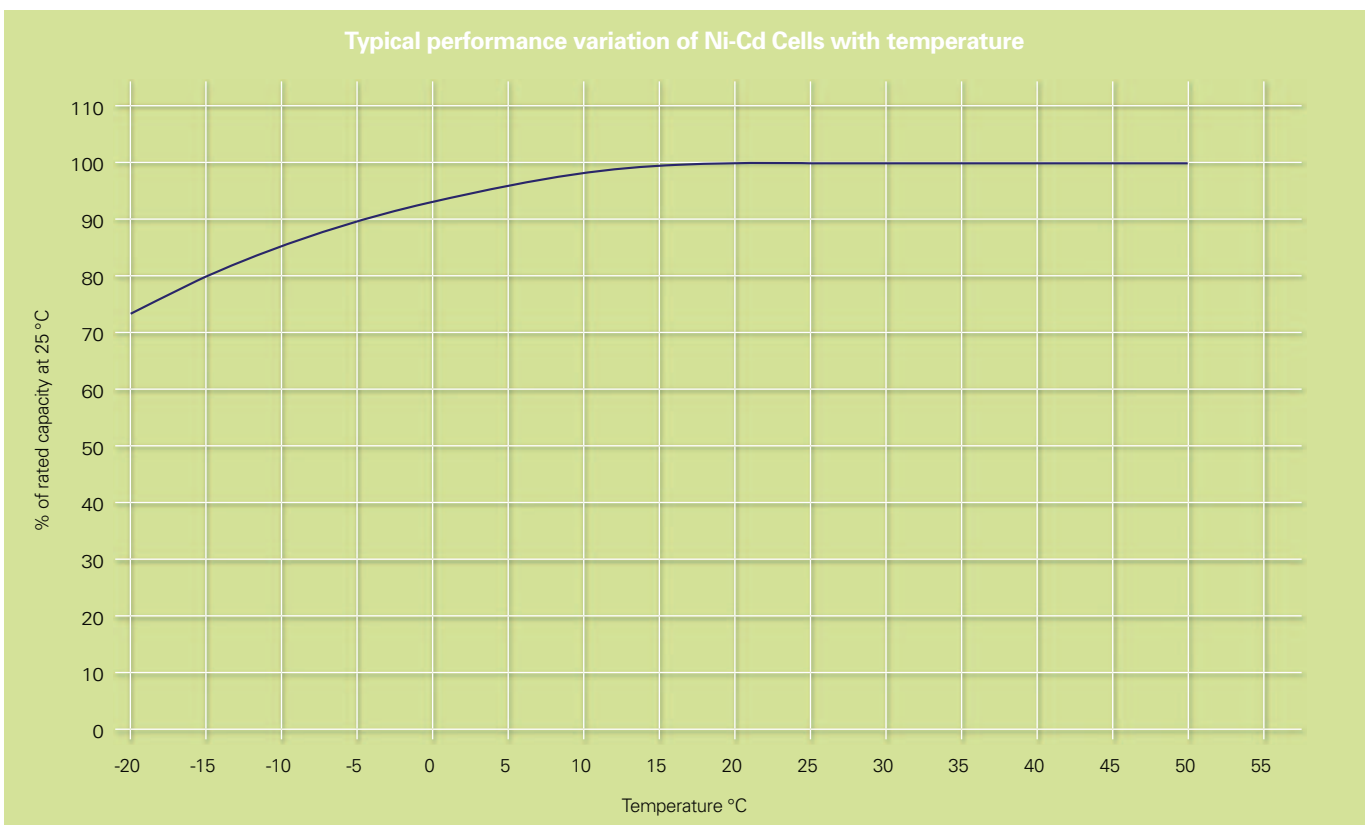
SOL 1680 G
(Female thread M10)



Number of Cycles vs. Depth of Discharge



Performance Variation of Ni-Cd Cells vs. Temperature



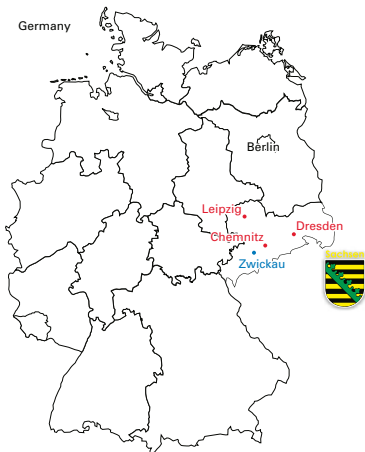
All dimensions and weights stated are subject to usual manufacturing tolerances. Electrical values are approximate. The right is reserved to make any alterations without prior notice.



...the opportunity to have the choice

An ENERSYS Company

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