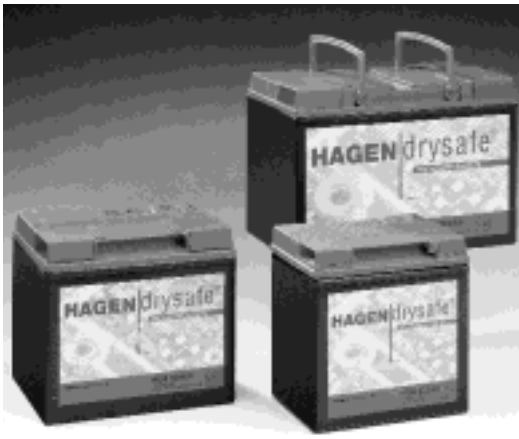
HAGEN Batterie AG

Maintenance-free sealed lead accumulators

HAGEN *drysafe*®



HAGEN *drysafe*®

HAGEN *drysafe*® batteries are rechargeable and maintenance-free sealed lead accumulators with flat pasted grid-plates and bonded electrolyte in glass-fibre mats (AGM-technology) to give a long maintenance-free life.

The special heavy duty lead alloy grids together with the latest advances in gas recombination technology give HAGEN *drysafe*® batteries excellent performance in both float and cyclic application.

HAGEN *drysafe*® batteries are an optimal solution for application in non system-connected DC equipment for electrical timer, signalling equipments, emergency lightning, failure proof DC control systems, fire protecting and burglar alarm systems, communication systems, luminous call systems, HAGEN power supply devices, UPS-systems, medical equipment, toys and hobbies and in small range traction application (par example invalid vehicles, golf-caddies, etc.)[1)]

HAGEN *drysafe*® batteries are distinguished by the advantages of a primary element and additionally by the high performance of a rechargeable lead-accumulator. New fields of application are arising from this positive features which up to now neither could be met by use of primary elements nor with rechargeable vented lead-accumulators.

[1)] For scale of small traction batteries of series HDSM should be used preferably.

HAGEN *drysafe*® batteries

- **rechargeable, fully maintenance-free**
- **independent operating position**
- **AGM technology**
- **deep discharge resistant up to 30 days**
- **low self-discharge <0.1%/24h at 20° C**
- **long service life at 20° C (acc. to EUROBAT guidlines up to 5 years)**
- **wide operating temperature range from –30° C to +50° C, prefered range –10° C to +30° C**
- **good high-current capacity**
- **suitable for cyclic operation**

VdS

All battery types required for installation in danger warning equipment are recognized by the Verband der Sachversicherer (Property Insurers Ássociation).

The VdS test numbers are printed on the front of the batteries.

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Capacities, voltages, main dimensions, design features

Type	Type of contact	Nominal voltage	Nominal capacity	Nominal discharge current	Dimensions / mm*			Weight / g approx.	Material-No.
		V	C_{20} / Ah	I_{20} / mA	Length	Width	Height**		
HPS-612	S	6	1.2	65	97	24	54	300	363 404
HPS-630	S	6	3.0	150	134	34	65	690	363 412
HDS-6100●	S	6	10.0	500	151	50	98	2100	596 452
HDS-6120●	S	6	12.0	600	151	50	98	2100	220 762
HPS-6200	G	6	20.0	1000	157	83	125	3700	351 141
HPS-1208	LM	12	0.8	40	96	25	62	350	348 350
HDS-1212●	S	12	1.2	60	97	48	54	580	200 605
HDS-1220●	S	12	2.0	100	178	34	65	890	200 613
HPS-1232	S	12	3.2	160	195	47	75	1430	365 266
HDS-1265●	S	12	6.5	325	151	65	98	2600	596 495
HDS-1272 S●	S	12	7.2	360	151	65	98	2600	220 789
HDS-1272 F	V	12	7.2	360	151	65	98	2600	395 584
HDS-12100●	S	12	10.0	500	151	98	98	4200	196 281
HDS-12120 F●	V	12	12.0	600	151	98	98	4200	596 372
HDS-12120 S●	S	12	12.0	600	151	98	98	4200	393 984
HDS-12150 NB●	G	12	15.0	750	181	76	167	6100	396 333
HDS-12180 NB	G	12	18.0	900	181	76	167	6200	491 901
HDSM-12250	G	12	25.0 ***	5000 ****	167	127	176	9700	326 601
HDS-12260 NB●	G	12	26.0	1300	167	127	176	9700	596 356
HDSM-12380	G	12	38.0 ***	7600 ****	196	166	175	14100	326 679
HDS-12400 NB●	G	12	40.0	2000	196	166	175	14100	596 399
HDSM-12600	G	12	60.0 ***	12000 ****	272	166	190	22600	682 686
HDS-12650 NB●	G	12	65.0	3250	272	166	190	22600	596 436
HDS-121100	T	12	110.0	5500	267	284	230	40300	916 052

* Tolerances ±1mm
** Measured over connection contact
*** Nominal capacity C_5 / Ah
**** Nominal discharge current I_5 / mA
● Approved by VDS

Connections:

S Flat contact for FASTON adaptor plug 4.8 mm

V Flat contact FASTON adaptor plug 6.3 mm

G Drilled flat contact made of lead with M5 screw connection

T Conical lead terminal: plus terminal 17.5 mm diam. minus terminal 16 mm diam.

LM Connection line approx. 22 cm with AMP Mate-N-Lock plug type 1-480318-0

O Further variations of voltage, capacity and dimensions are available on request

O Completion according to customer specifications

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Performance characteristics

Discharge characteristics curves

Figure 1 shows the voltage curve of a cell dependent on the discharge time. 20° C was selected as reference temperature and discharge currents of 1 x I_{20} to 40 x I_{20} as parameters.

The dashed boundary curve indicates the relevant final discharge voltages. Deep discharging starts beyond this region. The curves indicate that there is no advantage to be gained by discharging below this line.

HAGEN *drysafe*® batteries have up to one month´s protection against deep discharge. However, deep discharge and storage in this condition are damaging for any lead battery and should be avoided whenever possible.

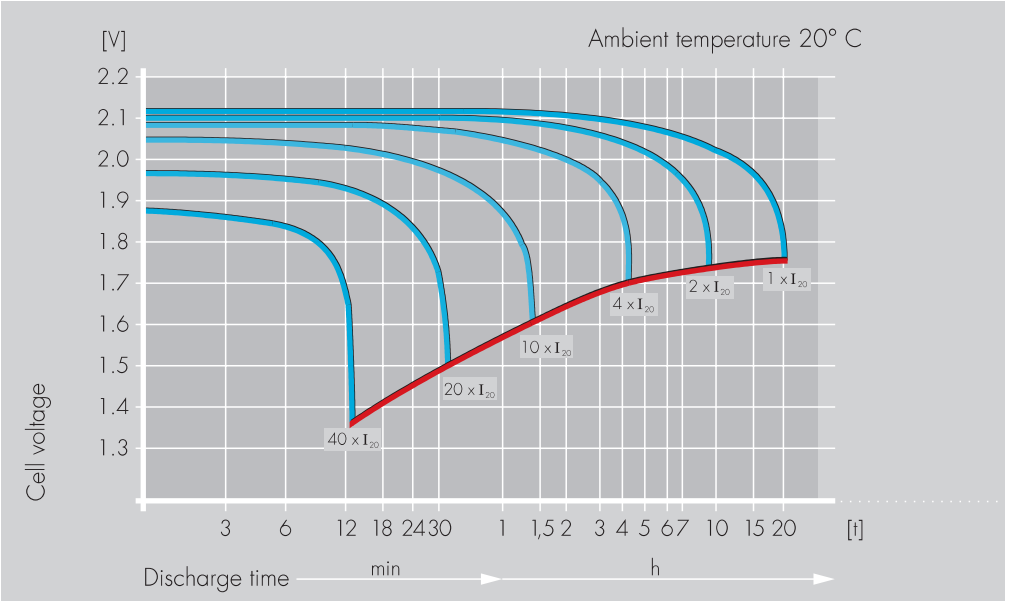

Figure 1

Effect of temperature on battery capacity

The available capacity of a battery varies with temperature and also load current. The effects are shown in Figure 2.

All nominal capacities are based on a battery temperature of 20° C and a 20 hour discharge load.

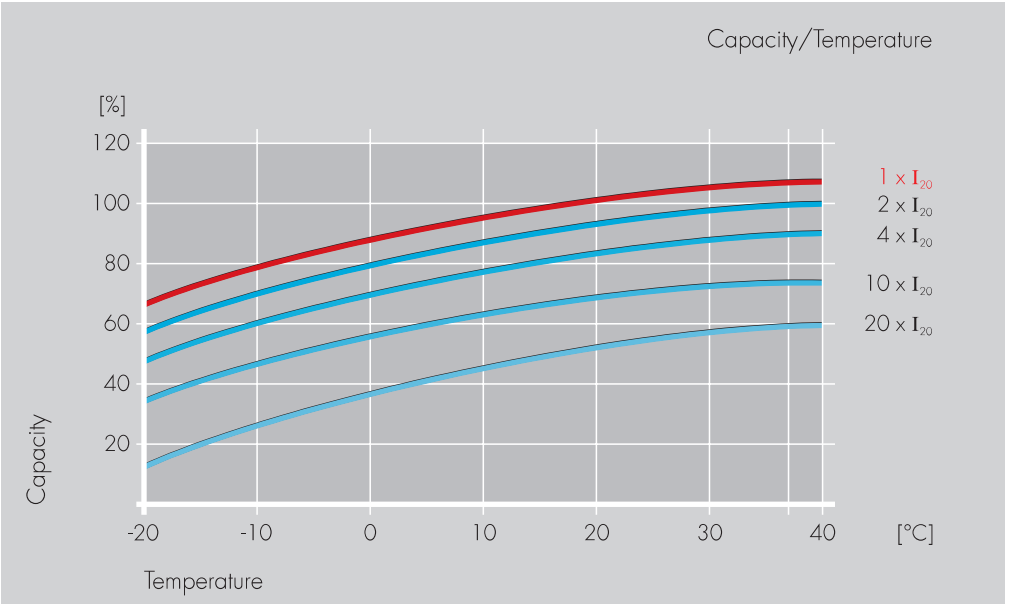

Figure 2

Charging

Sealed lead batteries require regulated battery chargers which limit the charging voltage according to the WU or IU charging characteristic for initial charging and trickle charging.

The optimum charging voltage as a function of the continuous ambient temperature (battery temperature) is indicated in Figure 3.

If wide variations of temperature are expected it is recommended to oporate with a temperature dependent voltage regulation as standard rather than to use a fixed charging voltage.

HAGEN generating sets with build-in drysafe batteries are equipped with this temperature dependent regulation as standard.

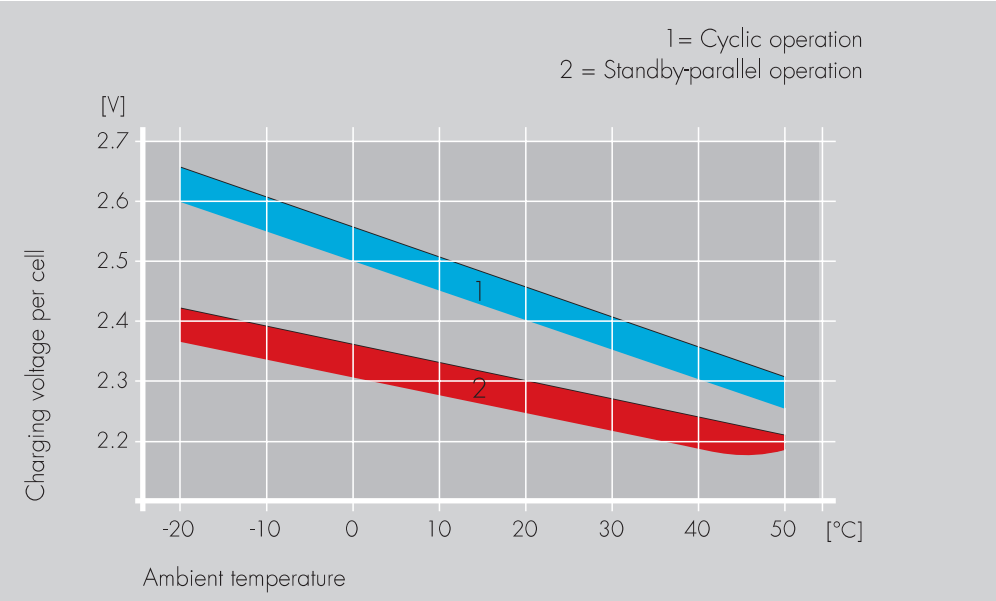

Figure 3

Storage

Batteries should be stored in a fully charged condition in a dry room Excess humidity can lead to surface conduction between terminals and as a result, self discharge will increase and sulphation may occur.

Figure 4 illustrates the relationship between the storage time and self-discharge at certain storage temperatures.

Batteries stored at 20° C should not be left for longer than 16 month before recharging.

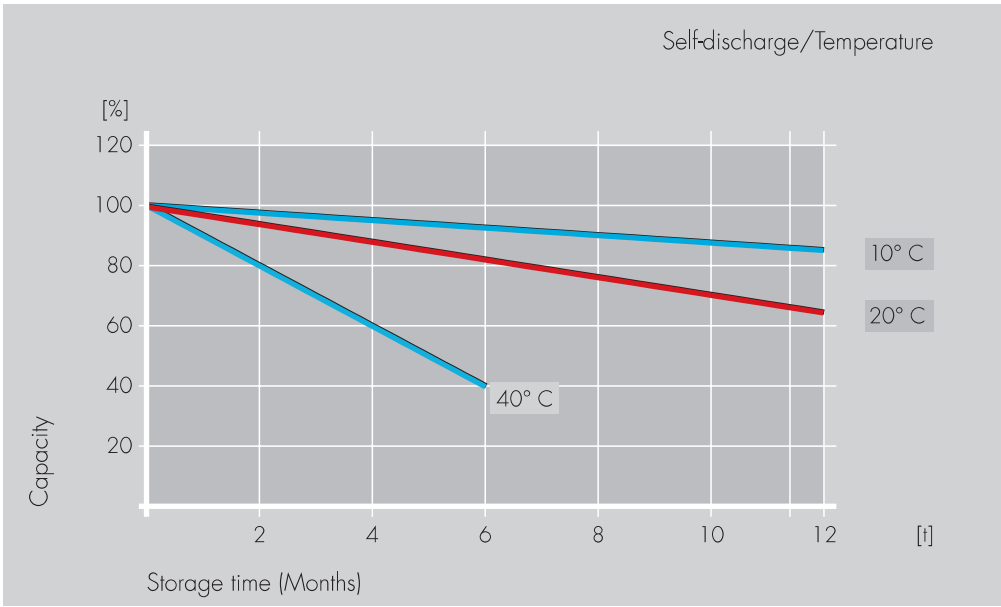

Figure 4

Installation

HAGEN *drysafe*® batteries can be operated independent of position and thus offer optimum possibilities for installation. However, sealed lead batteries must not be installed in hermetically sealed containers.