protect line

NCPP
NICD POCKET PLATE BATTERIES FOR STATIONARY APPLICATIONS

KPH-KPM-KPL
Single Cell Catalogue

Product supplied by AEG Power Solutions

KPH-KPM-KPL CELLS

Introduction:

AEG Power Solutions is leader in power conversion and expert in systems integration, turnkey solutions and services worlwide.

Protect Line Nickel Cadmium Pocket Plate battery designs are based on the superior pocket plate technology.

A fully integrated modern factories, supported by strong process management and quality controls makes Protect Line the best choice when reliability is a must.

Protect Line Nickel Cadmium portfolio benefits from on-going innovations and improvements in design and productions techniques.

Protect Line single cell batteries are offered in 1,2 voltage per cell and in wide capacity range.

Proctec Line single cell batteries range is designed to comply with IEC 60623 and other International standards.

Construction:

The internal mechanical structure is made of nickel plated steel making it highly rugged and capable of withstanding mechanical abuses.

The active materials are encapsulated between specially designed folded steel strips, which are perforated on both sides.

This double perforated design increases the effective surface area by 30% which in turn results in effective utilization of active material and makes the battery more efficient.

Single cell batteries use special polypropylene separator system, which is chemically inert and highly immune to wear and tear.

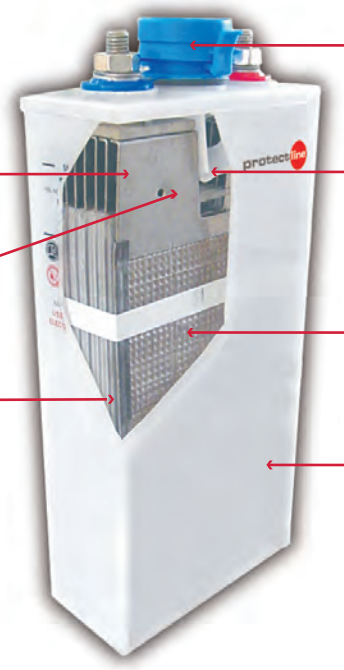
The strips are housed in a steel frame. The alkaline electrolyte filled-in does not react with the steel structure, therebay eliminating the chance of internal mechanical failure.

Batteries come in tough, shock resistant, fusion welded polypropylene containers and lids. A unique flame arresting flip type vent cap in the batteries prevents any unusual event and electrolyte contamination.

Single cell batteries are supplied either in filled condition (charged or discharged) or dry & discharged condition with inter-cell , connectors, cable connectors, associated hardware and accessories that are required for normal operation and maintenance.

Powder coated Mild Steel racks to house the batteries can be provided as an option.

Cut-view of cell:



Terminal Arrangement
Nickel-plated components (tab, stud, nut, post) provide excellent electrical conductivity

Plate Groups
Welded or bolted construction under controlled torque conditions to withstand severe vibrations

Polypropylene Grid Separator
Separates the plates and insulates the frames from each other and allows free electrolyte flow

Flame Arresting Vent Cap
Prevents propagation of external flame in to the cell & electrolyte contamination

Splash Guard
Prevents electrolyte splashing and possible short-circuit caused by external objects accidentally falling into the cell

Pocket Plate
Made of double perforated steel strips, encapsulating the active materials

Translucent Polypropylene Container
Fusion welded to lids, makes the cell mechanically sturdy and facilitates visual inspection of electrolyte level

Capacity Range

High Discharge - KPH:

- Thin plates with more plate surface area
- For high discharge applications with less than 1 hour backup time requirements
- 10 Ah to 265 Ah
- 33 standard cell models to choose from.

Medium Discharge - KPM:

- Optimized plate thickness
- For medium discharge applications, between 1 to 3 hours backup time requirements which involves high and long discharges
- 10 Ah to 395 Ah
- 42 standard cell models to choose from.

Long Discharge - KPL:

- Thick plates with more amount of active material
- For long discharge applications, with more than 3 hours backup time requirements
- 11 Ah to 480 Ah
- 41 standard cell models to choose from.

Benefits

- High reliability
- Long float life, 20 years+ at 20°C for standby applications
- Long shelf life, 5 years+ for the cells supplied in dry condition & 1 year in filled condition
- Quick charging - More than 90 % capacity available within 6 hours of charging
- Low internal resistance - For enhanced battery performance
- Resistant to mechanical & electrical abuses - Making it ideal for deployment in harsh environments
- Wide operating temperature range (-20°C to +50°C)
- Application specific designs (KPH, KPM & KPL)
- Easy installation & low maintenance
- Best TCO (Total Cost of Ownership) for demanding application needs
- No risk of sudden death failure

Applications

Single cell range is specially designed for industrial markets considering the reliability, cost-optimization and low-maintenance requirements for the following market segments and applications

- Oil & Gas
- General Industry
- Power Generation & Transmission
- Transport
- Telecom
- Data & IT

- Signaling and Telecommunications
- Solar Photovoltaic
- Instrumentation & Process control
- Switchgear protection
- Emergency lighting
- Switchyard
- UPS
- Genset starting
- Diesel Locomotive cranking
- Electromagnetic lifters (EOT crane)
- Fire alarm systems

Battery Charging

Following are recommended charge conditions:

Commissioning Charge:
Constant current charge of 10 hours at 0.2 C_5 A (20 amps for 100 Ah battery).

Quick Charging:
Constant current charge at 0.4 C_5 A for first 2.5 hours followed by 0.2 C_5 A for next 2.5 hours.

Charging in Operation:
The recommended charging voltages for continuous parallel operation, with occasional battery discharges:

Two Level Charging:

- Float level:

  1.40 V/cell for KPH & KPM

  1.42 V/cell for KPL

  Float charging current: 1 to 2 mA per Ah

- *Boost level:

  1.45 to 1.70 V/cell for KPH & KPM

  1.47 to 1.70 V/cell for KPL

  Current limit: 0.2 C_5 A

Single Level Charging:

- 1.43 – 1.50 V/cell
  (may increase water consumption)

  * Refer charge curves at page 11

  (A higher voltage will keep the battery at high state of charge)

KPH Range Cell dimensions and weigth details

CELL TYPE	CAPACITY AT (C_5 AH)	CELL DIMENSIONS (MM)			APROX. WEIGHT PER CELL IN KG	CELL CONNECTION BOLT (S) SIZE	CONT. SIZE REFERENCE	APPROX. RESERVE ELECTROLYTE CC/CELL
		HEIGHT (MM)	WIDTH (MM)	LENGTH (MM)				
KPH 10 P	10	229	86	46	1,45	M6	S1	100
KPH 12 P	12	229	86	46	1,50	M6	S1	100
KPH 16 P	16	229	86	61	1,90	M6	S2	130
KPH 20 P	20	239	134	44	2,15	M6	S3	140
KPH 24 P	24	289	134	59	3,20	M10	S4	200
KPH 30 P	30	289	134	59	3,55	M10	S4	200
KPH 35 P	35	289	134	59	3,70	M10	S4	200
KPH 40 P	40	374	134	59	4,50	M10	S4A	200
KPH 45 P	45	374	134	59	4,80	M10	S4A	200
KPH 50 P	50	374	134	59	5,00	M10	S4A	200
KPH 57 P	57	374	134	74	6,30	M10	S5	420
KPH 63 P	63	374	134	74	6,50	M10	S5	420
KPH 69 P	69	374	134	74	6,70	M10	S5	420
KPH KPH 76 P	76	374	134	74	6,80	M10	S5	420
KPH 80 P	80	374	134	74	6,85	M10	S5	420
KPH 85 P	85	391	134	101	9,40	2 x M10	S6	580
KPH KPH 94 P	94	391	134	101	9,70	2 x M10	S6	580
KPH 100 P	100	391	134	101	9,80	2 x M10	S6	580
KPH 110 P	110	391	134	101	10,2	2 x M10	S6	580
KPH 120 P	120	391	134	101	10,5	2 x M10	S6	580
KPH 130 P	130	417	159	106	12,5	2 x M10	S7	740
KPH 140 P	140	417	159	106	13,0	2 x M10	S7	740
KPH 145 P	145	417	159	106	13,2	2 x M10	S7	740
KPH 155 P	155	417	159	106	13,6	2 x M10	S7	740
KPH 160 P	160	417	159	138	14,2	2 x M10	S7A	960
KPH 170 P	170	417	159	138	14,5	2 x M10	S7A	960
KPH 180 P	180	417	159	138	14,9	2 x M10	S7A	960
KPH 190 P	190	417	159	138	15,2	2 x M10	S7A	960
KPH 210 P	210	443	163	166	20,0	2 x M10	S8	1210
KPH 230 P	230	443	163	166	20,8	2 x M10	S8	1210
KPH 240 P	240	443	163	166	21,6	2 x M10	S8	1210
KPH 255 P	255	443	163	166	22,0	2 x M10	S8	1210
KPH 265 P	265	443	163	166	22,4	2 x M10	S8	1210

KPM Range Cell dimensions and weigth details

CELL TYPE	CAPACITY AT (C_5 AH)	CELL DIMENSIONS (MM)			APROX. WEIGHT PER CELL IN KG	CELL CONNECTION BOLT (S) SIZE	CONT. SIZE REFERENCE	APPROX. RESERVE ELECTROLYTE CC/CELL
		HEIGHT (MM)	WIDTH (MM)	LENGTH (MM)				
KPM 10 P	10	229	86	46	1,3	M6	S1	100
KPM 13 P	13	229	86	61	1,5	M6	S2	130
KPM 19 P	19	239	134	44	1,9	M6	S3	140
KPM 25 P	25	289	134	59	2,4	M10	S4	200
KPM 32 P	32	289	134	59	2,7	M10	S4	200
KPM 38 P	38	289	134	59	3,2	M10	S4	200
KPM 43 P	43	289	134	59	3,8	M10	S4	200
KPM 50 P	50	289	134	59	4,0	M10	S4	200
KPM 54 P	54	289	134	59	4,2	M10	S4	200
KPM 60 P	60	374	134	59	4,7	M10	S4A	200
KPM 64 P	64	374	134	59	5,1	M10	S4A	200
KPM 70 P	70	374	134	59	5,6	M10	S4A	200
KPM 75 P	75	374	134	74	5,9	M10	S5	420
KPM 80 P	80	374	134	74	6,2	M10	S5	420
KPM 90 P	90	374	134	74	6,4	M10	S5	420
KPM 95 P	95	374	134	74	6,6	M10	S5	420
KPM 105 P	105	374	134	74	7,0	M10	S5	420
KPM 112 P	112	374	134	74	7,3	M10	S5	420
KPM 120 P	120	374	134	74	7,6	M10	S5	420
KPM 128 P	128	391	134	101	9,3	2 x M10	S6	580
KPM 136 P	136	391	134	101	9,6	2 x M10	S6	580
KPM 150 P	150	391	134	101	9,9	2 x M10	S6	580
KPM 158 P	158	391	134	101	10,3	2 x M10	S6	580
KPM 164 P	164	391	134	101	10,5	2 x M10	S6	580
KPM 170 P	170	417	159	106	10,8	2 x M10	S7	740
KPM 180 P	180	417	159	106	11,3	2 x M10	S7	740
KPM 188 P	188	417	159	106	11,7	2 x M10	S7	740
KPM 200 P	200	417	159	106	12,2	2 x M10	S7	740
KPM 212 P	212	417	159	106	12,6	2 x M10	S7	740
KPM 220 P	220	417	159	106	12,9	2 x M10	S7	740
KPM 235 P	235	417	159	106	13,2	2 x M10	S7	740
KPM 250 P	250	417	159	106	13,6	2 x M10	S7	740
KPM 260 P	260	417	159	138	14,5	2 x M10	S7A	960
KPM 270 P	270	417	159	138	14,9	2 x M10	S7A	960
KPM 280 P	280	417	159	138	15,4	2 x M10	S7A	960
KPM 300 P	300	417	159	138	16,0	2 x M10	S7A	960
KPM 320 P	320	443	163	166	20,0	2 X M10	S8	1210
KPM 330 P	330	443	163	166	20,2	2 X M10	S8	1210
KPM 345 P	345	443	163	166	20,6	2 X M10	S8	1210
KPM 354 P	354	443	163	166	21,0	2 X M10	S8	1210
KPM 370 P	370	443	163	166	21,5	2 X M10	S8	1210
KPM 395 P	395	443	163	166	22,0	2 X M10	S8	1210

KPL Range Cell dimensions and weigth details

CELL TYPE	CAPACITY AT (C_5 AH)	CELL DIMENSIONS (MM)			APROX. WEIGHT PER CELL IN KG	CELL CONNECTION BOLT (S) SIZE	CONT. SIZE REFERENCE	APPROX. RESERVE ELECTROLYTE CC/CELL
		HEIGHT (MM)	WIDTH (MM)	LENGTH (MM)				
KPL 11 P	11	229	86	46	1,40	M6	S1	100
KPL 17 P	17	229	86	46	1,60	M6	S1	100
KPL 23 P	23	229	86	61	1,90	M6	S2	130
KPL 27 P	27	289	134	59	3,20	M10	S4	200
KPL 32 P	32	289	134	59	3,50	M10	S4	200
KPL 36 P	36	289	134	59	3,80	M10	S4	200
KPL 41 P	41	289	134	59	4,20	M10	S4	200
KPL 45 P	45	289	134	59	4,30	M10	S4	200
KPL 55 P	55	289	134	59	4,50	M10	S4	200
KPL 60 P	60	374	134	59	5,00	M10	S4A	200
KPL 69 P	69	374	134	59	5,60	M10	S4A	200
KPL 75 P	75	374	134	74	5,90	M10	S5	420
KPL 80 P	80	374	134	74	6,10	M10	S5	420
KPL 88 P	88	374	134	74	6,20	M10	S5	420
KPL 92 P	92	374	134	74	6,30	M10	S5	420
KPL 100 P	100	374	134	74	6,40	M10	S5	420
KPL 115 P	115	374	134	74	6,60	M10	S5	420
KPL 120 P	120	374	134	74	6,80	M10	S5	420
KPL 135 P	135	391	134	101	9,50	2 x M10	S6	580
KPL 150 P	150	391	134	101	10,0	2 x M10	S6	580
KPL 160 P	160	391	134	101	10,4	2 x M10	S6	580
KPL 170 P	170	391	134	101	10,7	2 x M10	S6	580
KPL 180 P	180	391	134	101	11,0	2 x M10	S6	580
KPL 190 P	190	417	159	106	12,5	2 x M10	S7	740
KPL 210 P	210	417	159	106	12,8	2 x M10	S7	740
KPL 220 P	220	417	159	106	13,0	2 x M10	S7	740
KPL 235 P	235	417	159	106	13,5	2 x M10	S7	740
KPL 255 P	255	417	159	106	13,8	2 x M10	S7	740
KPL 270 P	270	417	159	106	14,0	2 x M10	S7	740
KPL 285 P	285	417	159	106	14,3	2 x M10	S7	740
KPL 300 P	300	417	159	138	18,0	2 x M10	S7A	960
KPL 310 P	310	417	159	138	18,4	2 x M10	S7A	960
KPL 335 P	335	417	159	138	18,8	2 x M10	S7A	960
KPL 355 P	355	417	159	138	19,2	2 x M10	S7A	960
KPL 370 P	370	443	163	166	21,5	2 X M10	S8	1210
KPL 390 P	390	443	163	166	22,0	2 X M10	S8	1210
KPL 410 P	410	443	163	166	22,4	2 X M10	S8	1210
KPL 425 P	425	443	163	166	22,6	2 X M10	S8	1210
KPL 445 P	445	443	163	166	22,9	2 X M10	S8	1210
KPL 460 P	460	443	163	166	23,2	2 X M10	S8	1210
KPL 480 P	480	443	163	166	23,5	2 X M10	S8	1210

Battery Arrangement as per Standard Rack Designs

(NORMAL ARRANGEMENT)																
CONTAINER SIZE REFERENCE	1TIER								2TIER							
	1STEP		2STEP		3STEP		4STEP		1STEP		2STEP		3STEP		4STEP	
	W	H	W	H	W	H	W	H	W	H	W	H	W	H	W	H
S1 & S2			222	668	323	783	424	898								
S3			318	678	467	793	616	908			318	1070	467	1300	616	1550
S4			318	728	467	843	616	958			318	1250	467	1450	616	1700
S4A			318	813	467	928	616	1043			318	1450	467	1670	616	1900
S5			318	813	467	928	616	1043			318	1450	467	1670	616	1900
S6			318	830	467	945	616	1060			318	1536	467	1786	616	2036
S7			376	856	554	971	732	1086			376	1624	554	1834	732	2074
S7A			376	856	554	971	732	1086			376	1624	554	1834	732	2074
S8			376	882	554	997	732	1112			376	1650	554	1860	732	2100

(All dimensions in mm. Height is including cells)

Evaluation of Rack Length

Normal Arrangement

Length of rack = (X + 1) x No. of cells in a row for S1 to S5 containers

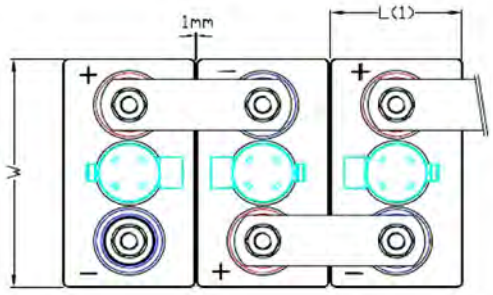
= (X + 2) x No. of cells in a row for S6 to S8 containers

Where, X = Length of cell

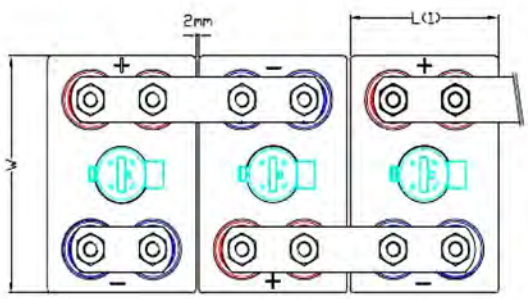
The value of length should be rounded-off to nearest to 100 mm and 5 mm should be added to arrive at the final length of rack.

Standard Arrangement of Cells

KPH 10 - KPH 80
KPM 10 - KPM 120
KPL 11 - KPL 120



KPH 85 - KPH 265
KPM 128 - KPM 395
KPL 135 - KPL 480



Certificates quality standards

Protect Line´s Ni-Cd batteries conform to IEC 60623 and other relevant international standards such as DIN, BS, KS, IS, etc.

Batteries are tested by third party, ETL SEMKO for IEC 60623 standards.

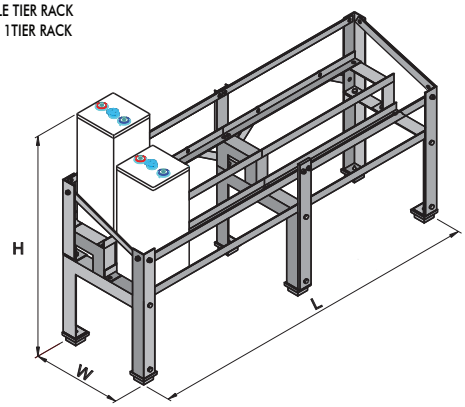
BUREAU VERITAS Certification — UKAS ENVIRONMENTAL MANAGEMENT
ISO 9001

BUREAU VERITAS Certification — UKAS ENVIRONMENTAL MANAGEMENT
ISO 14001

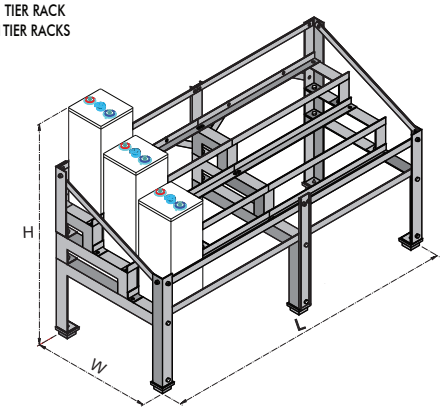
BUREAU VERITAS Certification — UKAS ENVIRONMENTAL MANAGEMENT
OHSAS 18001

Battery Rack Arrangement

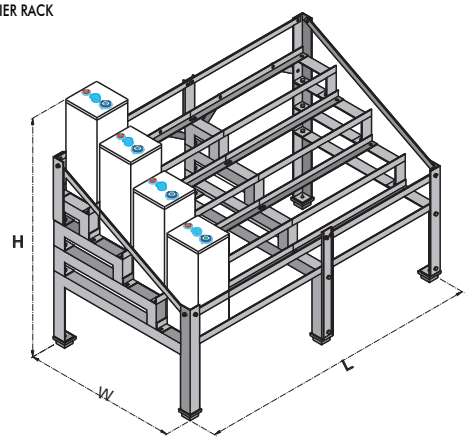
SINGLE TIER RACK
2STEP 1TIER RACK



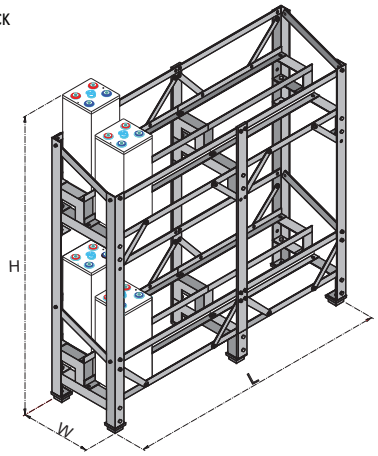
SINGLE TIER RACK
3STEP 1TIER RACKS



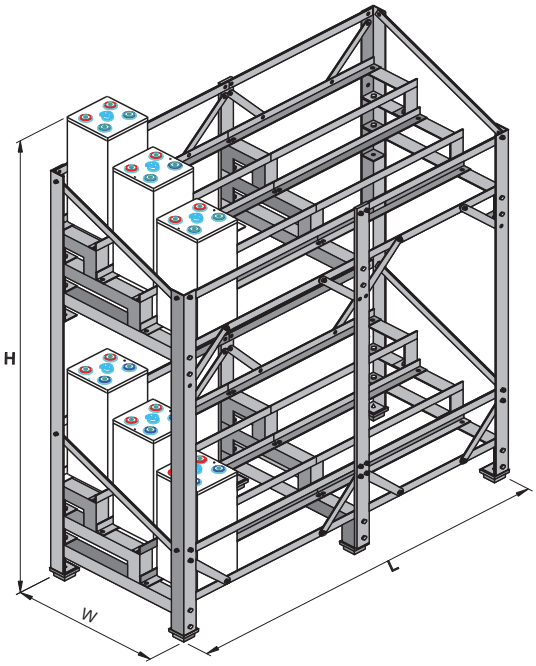
SINGLE TIER RACK
4STEP 1TIER RACK



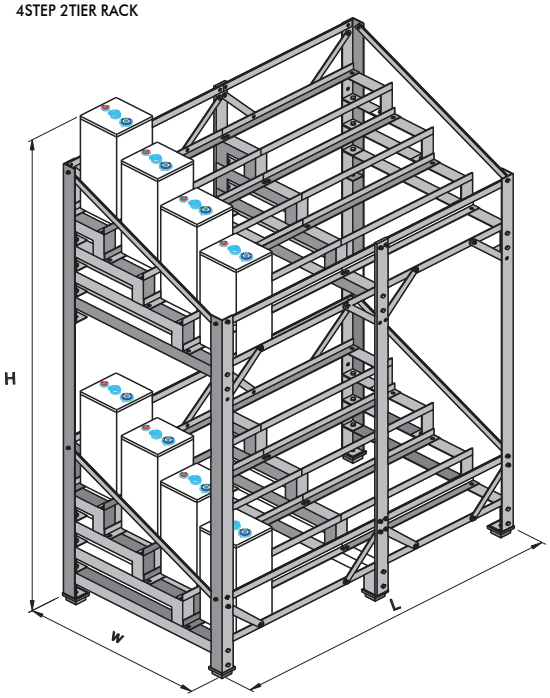
TWO TIER RACK
2STEP 2TIER RACK



TWO TIER RACK
3STEP 2TIER RACK

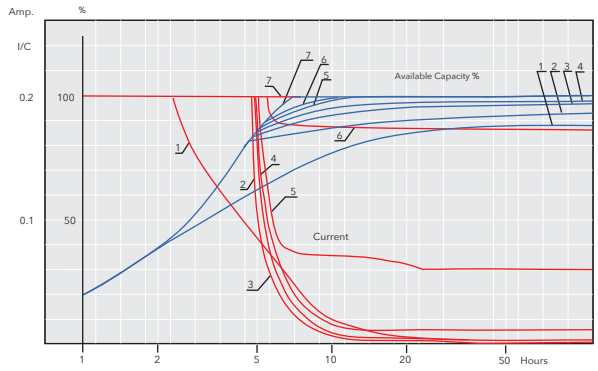


TWO TIER RACK
4STEP 2TIER RACK

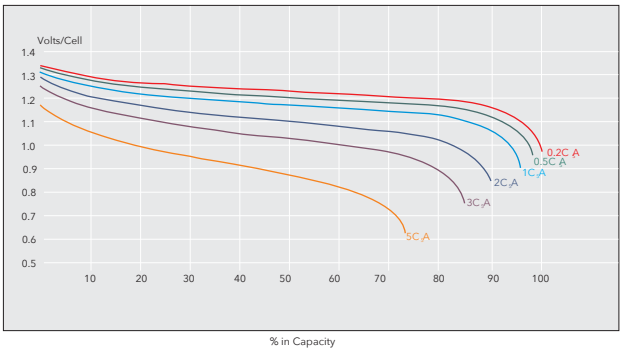


Typical Characteristics

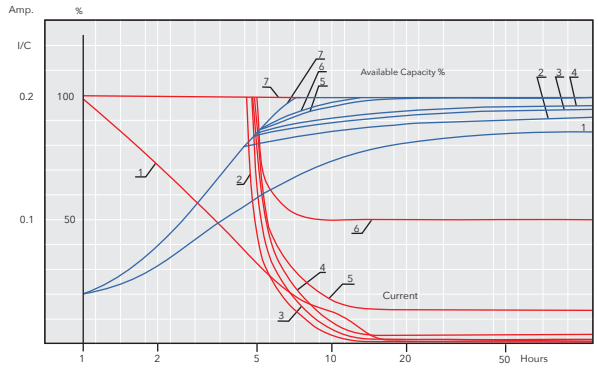
KPH Charge



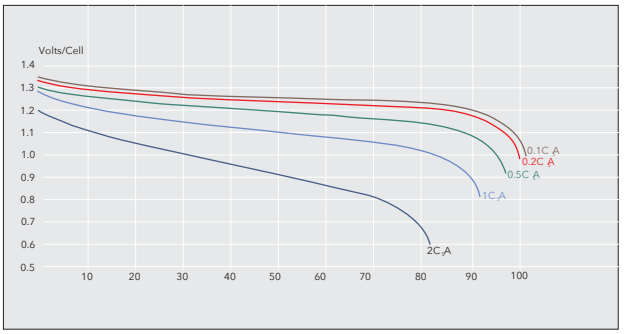
KPH Discharge



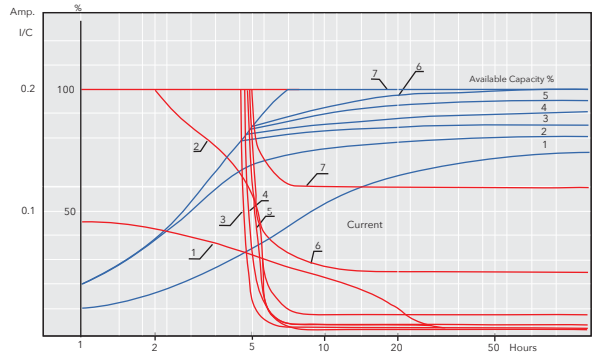
KPM Charge



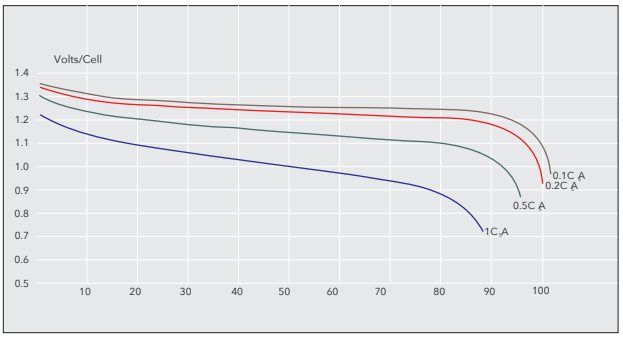
KPM Discharge



KPL Charge



KPL Discharge



Charging Voltage

1. 1.40 Volts / Cell
2. 1.45 Volts / Cell
3. 1.50 Volts / Cell
4. 1.55 Volts / Cell
5. 1.60 Volts / Cell
6. 1.65 Volts / Cell
7. 1.70 Volts / Cell

protect line

Protect Line
Products supplied by AEG Power Solutions. For further information and support: www.aegps.es / www.aegps.com

Protect Line Doc KP/ December 2019