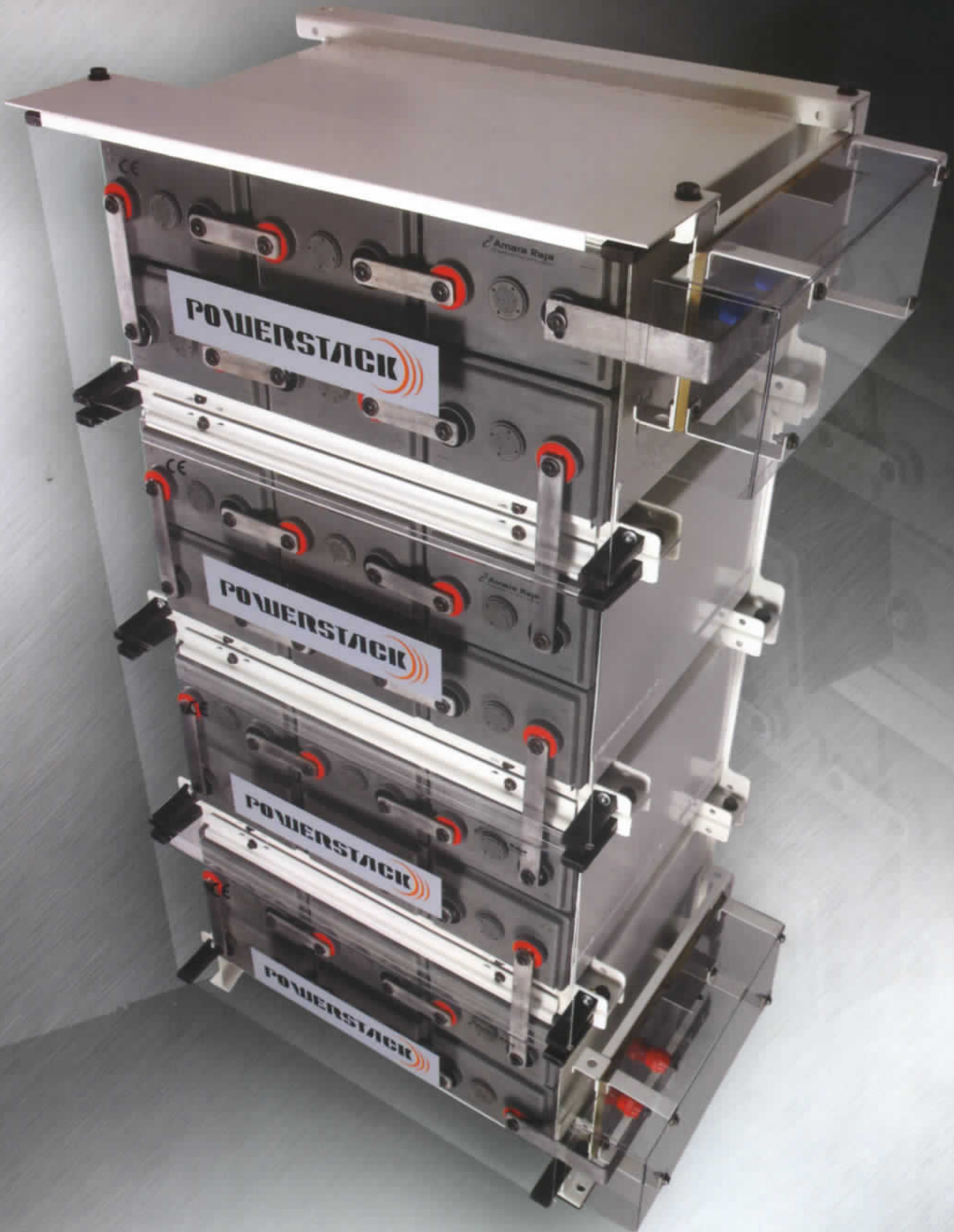
AMARA RAJA
Gotta be a better way

Johnson Controls



HI-PERFORMANCE
VRLA
BATTERIES

POWERSTACK

The future belongs to those who stake a claim for it here and now. This axiom has been our guiding principle at Amara Raja, helping us ceaselessly innovate and explore the new and never-before.

Amara Raja has put its vision into practice by striding forward in the power management industry and consolidating its position as one of the leading players in the Asia-Pacific region. With Johnson Controls Inc., a world leader, as an equity alliance partner (26%), Amara Raja Pioneered the next generation battery technology in India. This partnership facilitates sharing of knowledge and innovations to accelerate and expand development efforts in the global battery market. It also enables harnessing technology that acclimatized batteries to operate in harsh tropical conditions.

Working together with alliance partner Johnson Controls, Amara Raja set up India's finest battery plant, the first such facility for Johnson Controls in the last decade. This facility is backed by one of the finest Research & Development centers on site. A center that constantly and unceasingly thinks out-of-the-box and develops products and services that match world-class standards, and sets industry benchmarks.

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Amara Raja's Battery Excellence Center is another first for the region. Here, products are put through rigorous tests to ensure that they comply with international standards and design requirements. With the latest testing equipment, the center evaluates battery performance, design and longevity. Apart from this, there are facilities for application engineering, vehicle system study, simulations and computer-aided design, including a full calibration laboratory. Amara Raja's quality commitment has ensured that it conforms to International quality standards.

Amara Raja today has the distinction of being a prime player in the Johnson Controls led global alliance and is forging ahead in to new market - powered by innovation.

Amara Raja's Powerstack, a hi-performance battery is designed to meet the demands of a wide range of industrial applications. The Powerstack range, modular in structure, is capable of accommodating a wide spectrum of capacities depending on the application. Major application areas include Telecommunications, Power Utilities, Railways, Defence and other heavy industries.

POWERSTACK

POWERSTACK
The Reliable Powerhouse

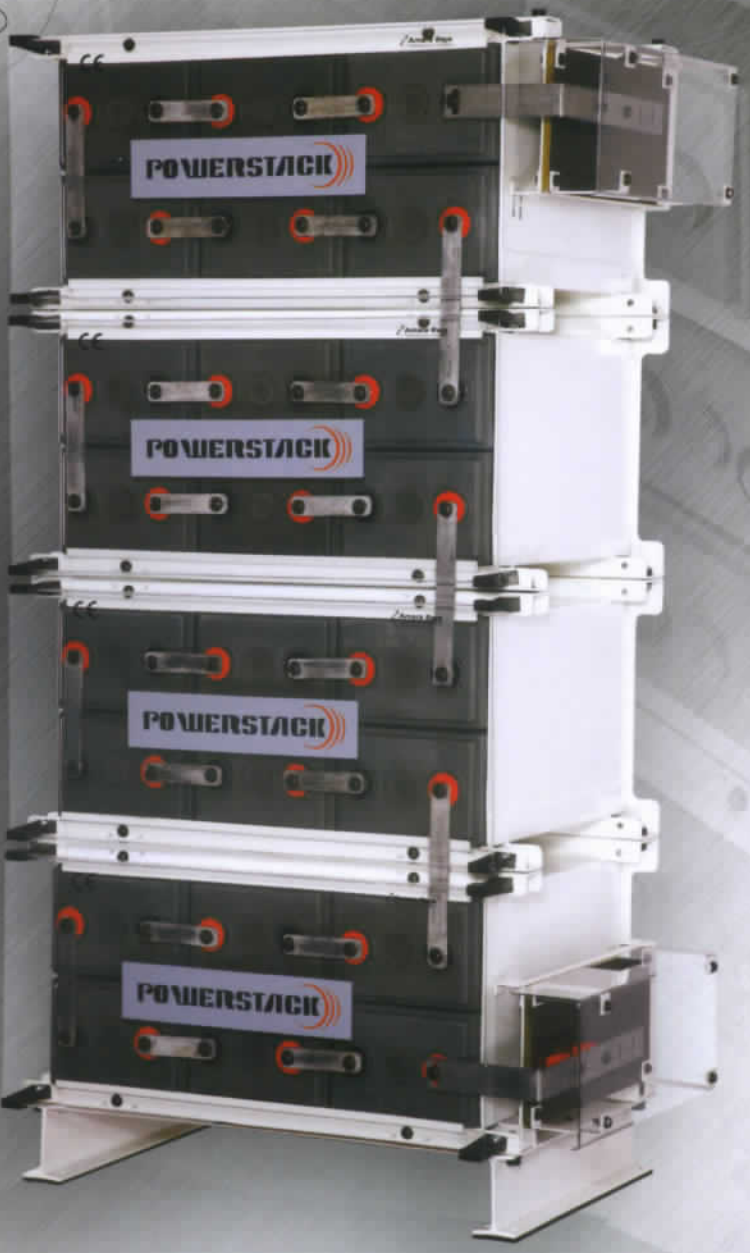
PERFORMANCE EDGE

- Design Float life of 20 years and cyclic life of 4000 cycles at 20% DOD
- Leadership bolstered by proven performance in harsh tropical conditions, since 1989
- Deep discharge capability
- Modular design for ease of installation and stacking flexibility
- Unique Ribbed Design Polypropylene container and cover offering enhanced strength and durability for safe operation
- Patented Lead Oxide Paste Recipe offering excellent charge acceptance and low self-discharge rate
- Innovative Plate Design offers low internal resistance and superior high rate discharge performance
- Advanced AGM separator offering a longer service life and enhanced high rate discharge performance
- 100% charged when shipped from factory

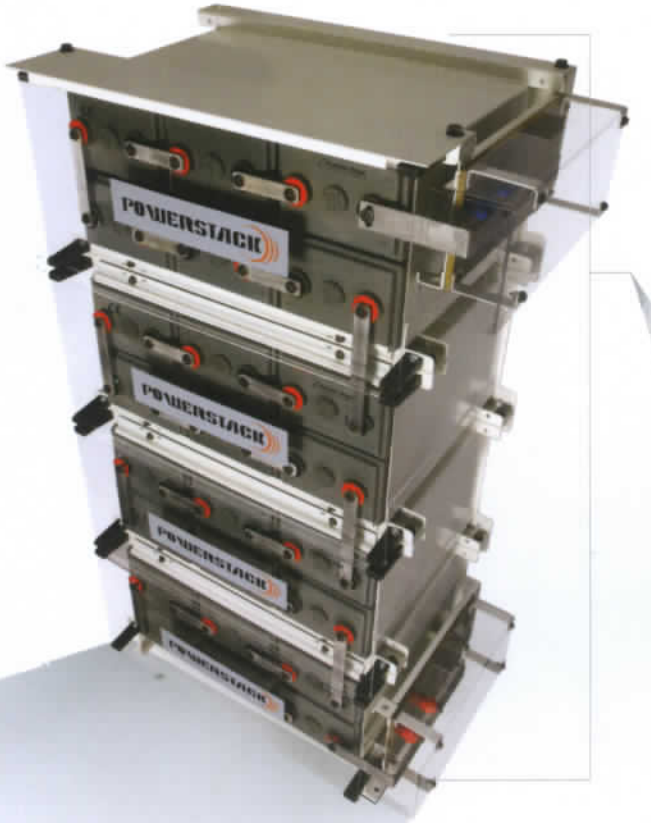
QUALITY EDGE

- Produced in state-of-the-art ISO 9001, ISO 14001 & TS 16949 certified facility
- OHSAS 18001 certified
- Continuous improvement through Internationally acclaimed tools like TQM, Kaizen, Six Sigma, 5S

Quality Systems certified to
ISO 9001 : 2008
ISO / TS16949 : 2009
and ISO 14001 : 2004 &
OHSAS 18001 : 2007
TÜV CERT





Backed by its unflinching commitment to offer the best of technology and quality, Amara Raja offers you Powerstack, the reliable power house.

APPLICATION SPECTRUM

Powerstack provides robust backup power solutions for varied applications.

MAJOR APPLICATION AREAS INCLUDE:

- ***Telecommunications*** - Basic Telephony, Cellular Telephony, Transmission, Last Mile Connectivity, Local Network Broadband, Microwave
- ***Uninterruptible Power Supply Systems*** - Data Processing, Process Instrumentation, Automated Banking
- ***Power Utilities*** - Switchgear & Instrumentation Controls, Transmission & Distribution
- ***Railways*** - Train lighting, Air-conditioning
- ***Solar Photo Voltaics (SPV)*** - Offshore Oil Exploration Platforms & Cathodic Protection
- ***Process & Service Industry***
- ***Defence, Signalling & Telecom***

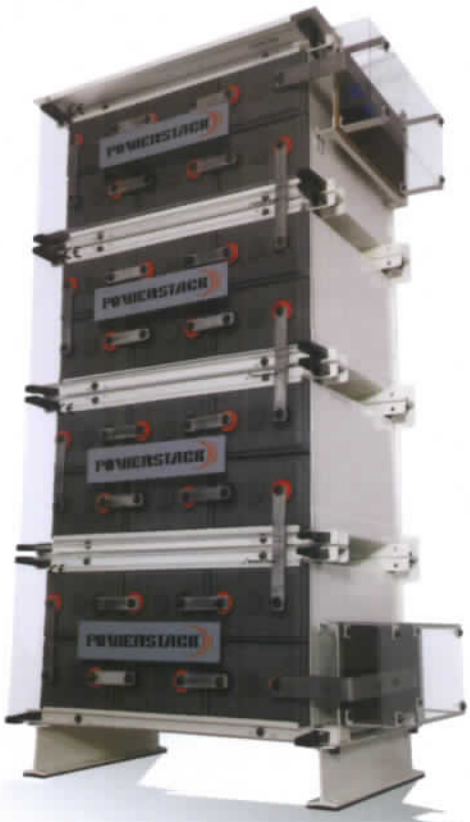
COMPLIANCE TO DOMESTIC & INTERNATIONAL

- ISO 9001:2008, ISO 14001:2008, TS 16949:2009, OHSAS 18001 : 2007 certified facilities
- CE Marking for Conformité Européene, ratified by Underwriters Laboratories
- Certified to IS 15549
- Certified to IEC 61427 & IEC 60896
- Classified as Non Hazardous Cargo and complies to requirements of IMDG (International Maritime Code for Dangerous Goods)
- Complies to Air Transport Requirement - IATA/ICAO special provision A67
- Complies to 1997 UBC Zone 4 Seismic Requirements
- Completely Recyclable - Lead, Plastic and Sulphuric acid can be recycled and reused
- UL, TEC, RDSO approved

TECHNICAL SPECIFICATIONS

PRODUCT:

- ***Container & Cover*** - Polypropylene Co-polymer (fire-retardant optional)
- ***AGM Separator*** - Spun glass micro-porous matrix with high compression.
- ***Positive Plate*** - SRS Grid Flat Pasted Type
- ***Positive Plate Alloy*** - Hybrid MFX Alloy with deep discharge and long life characteristics
- ***Negative Plate*** - SRS Grid Flat Pasted Type
- ***Negative Plate Alloy*** - Lead Calcium Alloy with Maintenance-Free characteristics
- ***Safety Valve*** - Self resealing, pressure regulated, explosion-proof
- ***Terminals*** - Lead terminals with copper inserts with a large surface area to provide maximum conductivity
- ***Connectors*** - Heavy-duty lead plated copper connectors
- ***Trays*** - Acid resistant MS trays, self-stackable type
- ***Color*** - Coded terminal polarity - Provides easy terminal identification



RANGE SPECIFICATIONS

Powerstack is available in varied ranges to meet customers' complex business needs. Powerstack is available in modular design, with 2V as the basic cell, with capacities ranging from 100Ah to 6000Ah, housed in self-stackable MS trays.

DISCHARGE DATASHEET ATTACHED

PERFORMANCE:

- **Self-discharge:** Less than 1% per week
- **Shelf life without re-charge:** Upto 6 months
- **Operating conditions:** - 40° C to + 60° C
- **Design Float Life:** 20 Years
- **Design Cycle Life:** 4000 @20% DOD; 2000 @50% DOD; 1200 @ 80% DOD
- **Recombination Efficiency:** > 98%

NOTE:

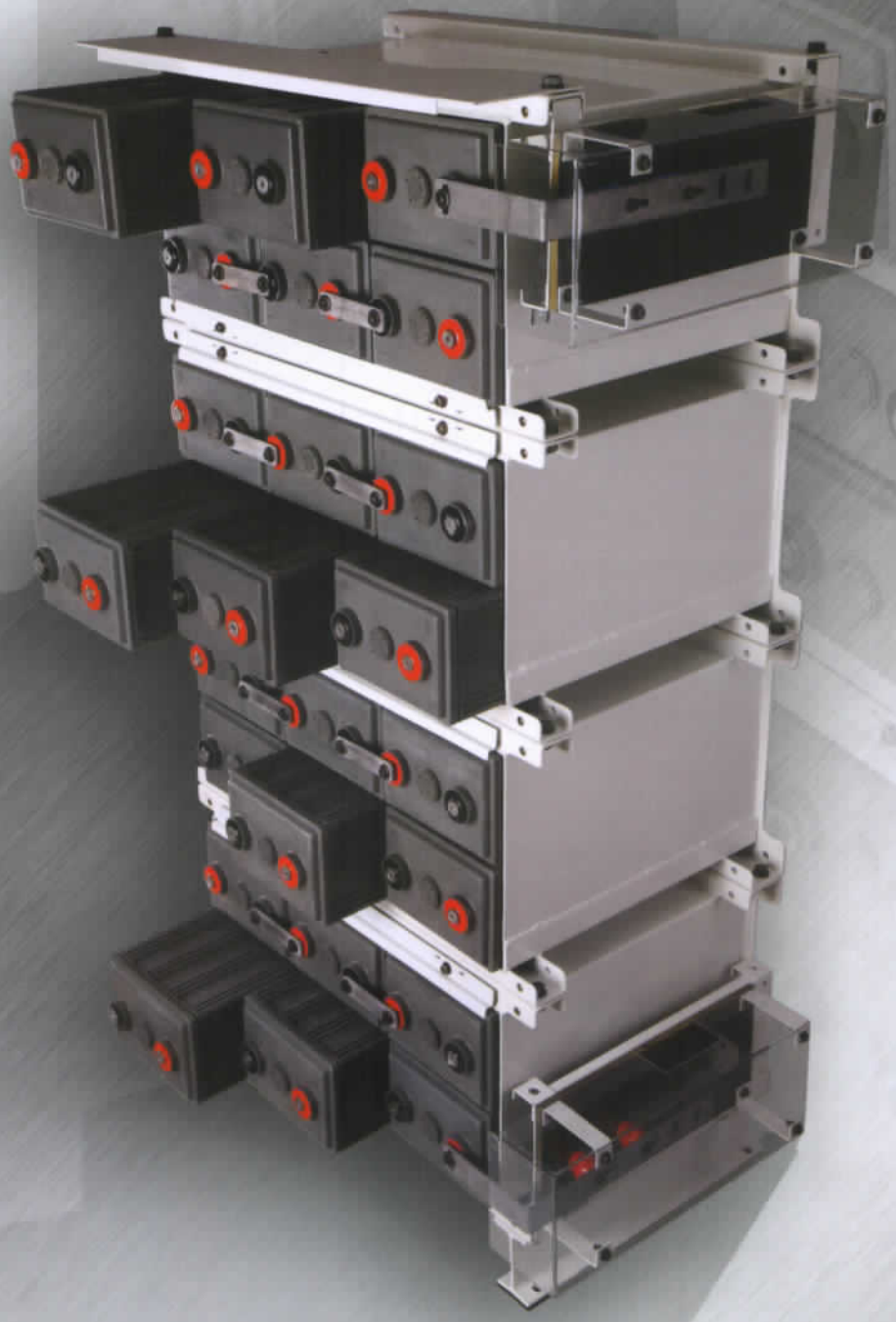
- All values are rated at 27°C.
- Charging parameters at 27°C.

Method: Constant Potential Current Limited

Charge Provision	Charging Voltage	Maximum Charging Current (Amps)
Float charge	2.23 - 2.25 VPC	0.2 C
Boost charge	2.30 - 2.32 VPC	0.2 C

C is the rated capacity @ 10 hour

**Please refer to operating manual for storage instructions*



POWERSTACK

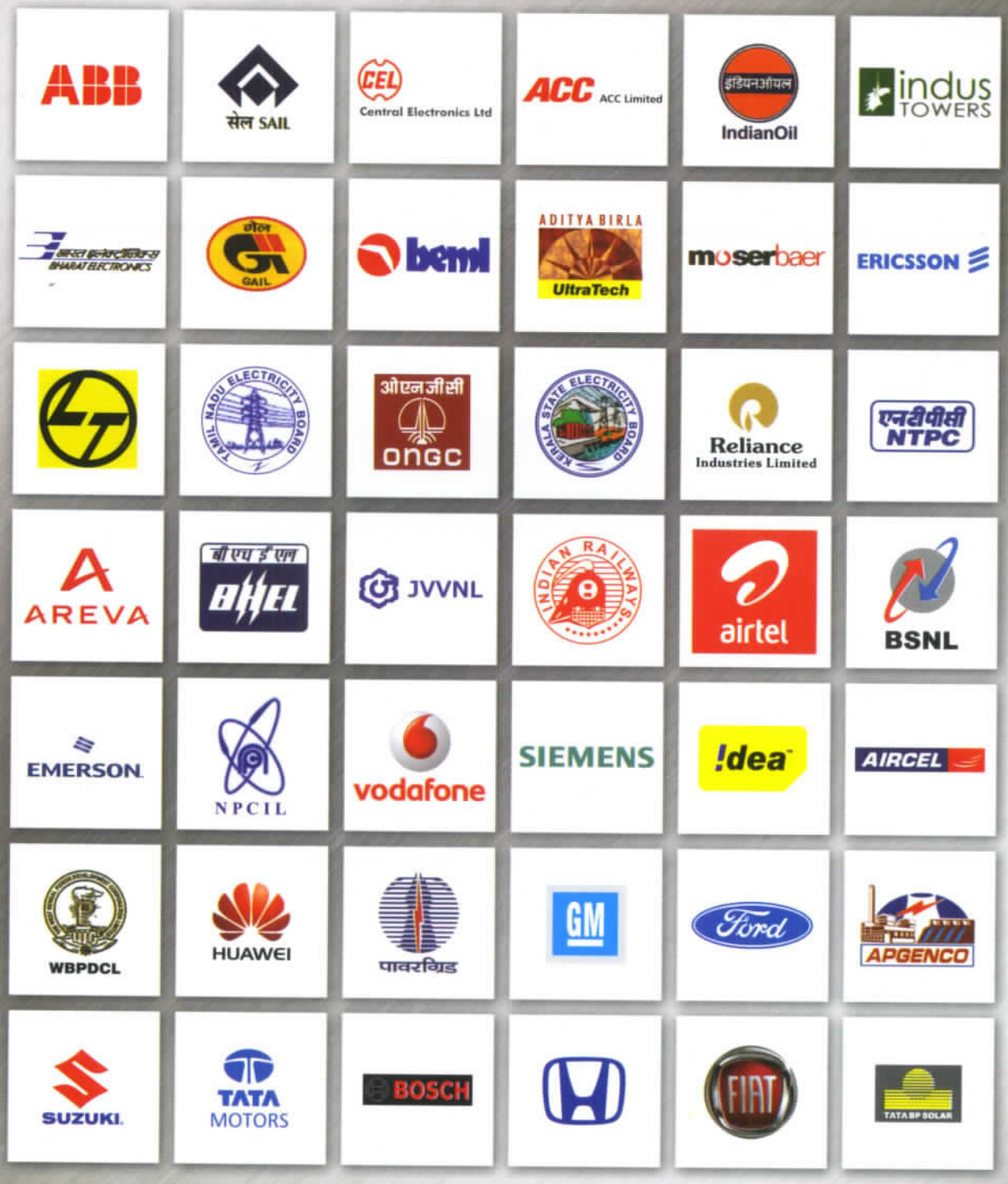
SPECIFICATIONS

POWERSTACK RANGE

MODULE SPECIFICATION AND PERFORMANCE DATA														
Sl. No.	Cell type	Nominal Ah Capacity @ C10 to 1.75 ECV at 27° C	System Module Voltage (V)	Stacking dimensions ± 5 mm			Moudle weight ± 5 KGS	Amperes to 1.75 VPC @ 27° C						
				W	D	H		30Min	1Hr	2Hr	3Hr	5Hr	8Hr	10Hr
1	IP6005	100	24	696	365	236	99	75	57	36	27	17	12.1	10.0
2	IP7005	120	24	696	390	236	110	90	69	43	32	21	14.5	12.0
3	IP6009	200	24	696	365	355	166	149	114	72	54	35	24.2	20.0
4	IP7009	240	24	696	390	355	187	179	137	86	65	42	29.0	24.0
5	IP7011	300	12	689	385	234	117	224	171	108	81	52	36.2	30.0
6	IP1011	375	12	706	500	232	152	280	214	134	101	66	45.3	37.5
7	IP1013	450	12	706	500	262	180	336	257	161	122	79	54.3	45.0
8	IP1017	600	12	689	500	320	232	448	343	215	162	105	72.5	60.0
9	IP1021	750	6	706	500	214	149	560	429	269	203	131	90.6	75.0
10	IP1025	900	6	706	500	244	175	672	514	323	243	157	108.7	90.0
11	IP1031	1125	6	706	500	289	213	840	643	403	304	197	135.9	112.5
12	IP1037	1350	6	706	500	333	254	1007	771	484	365	236	163.0	135.0
13	IP1051	1800	6	689	500	960	696	1343	1029	645	486	315	217.4	180.0
14	IP1063	2250	6	706	500	642	447	1679	1286	806	608	393	271.7	225.0
15	IP1075	2700	6	706	500	732	525	2015	1543	968	730	472	326.1	270.0
16	IP1093	3375	6	706	500	867	639	2519	1929	1210	912	590	407.6	337.5
17	IP1111	4050	6	706	500	999	762	3022	2314	1452	1095	708	489.1	405.0
18	IP1124	4500	6	706	500	1156	852	3358	2571	1613	1216	787	543.5	450.0
19	IP1148	5400	6	706	500	1332	1016	4030	3086	1935	1459	944	652.2	540.0
20	IP2009	340	12	706	555	200	141	254	194	122	92	59	41.1	34.0
21	IP2011	425	12	706	555	232	170	317	243	152	115	74	51.3	42.5
22	IP2013	510	12	706	555	262	201	381	291	183	138	89	61.6	51.0
23	IP2017	680	12	706	555	322	259	507	389	244	184	119	82.1	68.0
24	IP2021	850	6	706	555	214	167	634	486	305	230	149	102.7	85.0
25	IP2025	1020	6	706	555	244	195	761	583	366	276	178	123.2	102.0
26	IP2031	1275	6	706	555	289	238	951	729	457	345	223	154.0	127.5
27	IP2037	1530	6	706	555	333	283	1142	874	548	414	267	184.8	153.0
28	IP2051	2040	12	706	555	966	777	1522	1166	731	551	357	246.4	204.0
29	IP2063	2550	6	706	555	642	501	1903	1457	914	689	446	308.0	255.0
30	IP2075	3060	6	706	555	732	585	2284	1749	1097	827	535	369.6	306.0
31	IP2093	3825	6	706	555	867	714	2854	2186	1371	1034	669	462.0	382.5
32	IP2111	4590	6	706	555	999	849	3425	2623	1645	1241	802	554.3	459.0
33	IP2124	5100	6	706	555	1156	952	3806	2914	1828	1378	892	615.9	510.0
34	IP2148	6120	6	706	555	1332	1132	4567	3497	2194	1654	1070	39.1	612.0

Note: 1. "D" dimensions are without front cover
2. Installation drawing will supersedes the catalogue for dimensions.

Amara Raja has customers in over 40 countries around the world from 1 - person consultancies to Fortune 500 companies. Few of our select customers are ...



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AMARA RAJA BATTERIES LIMITED
(An Amara Raja Johnson Controls Company)

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TÜV NORD

DIN EN ISO 9001: 2008
ISO/TS 16949: 2009
ISO 14001: 2004
OHSAS 18001: 2007

ARB/IBD/PSS/3000/0414