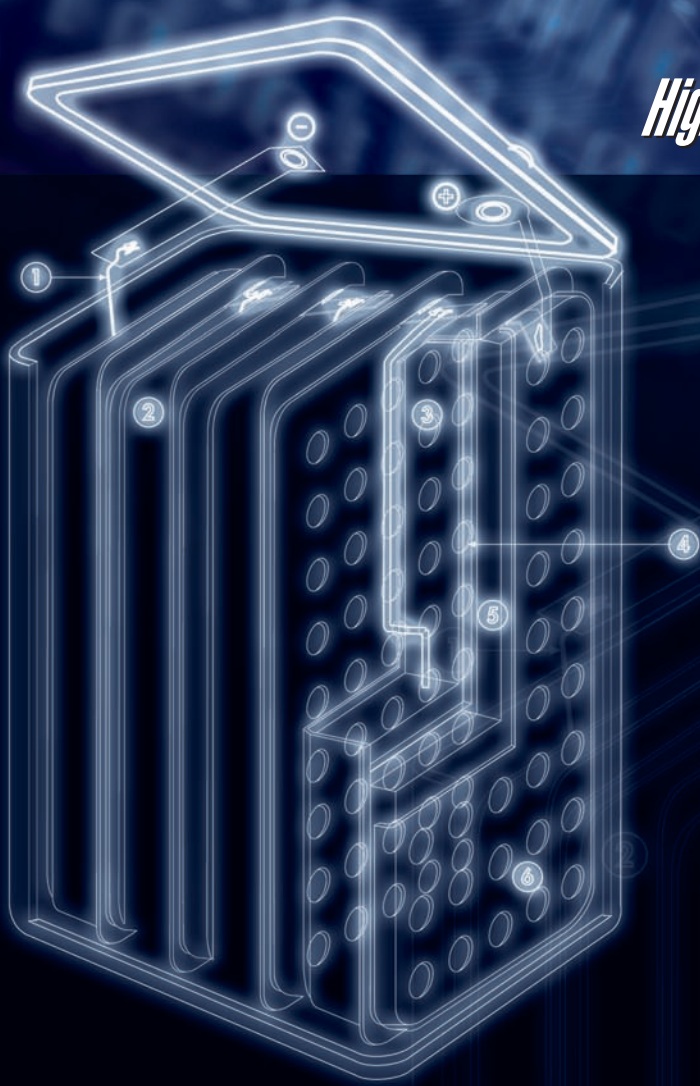




Industrial Primary Batteries

High Performance Portable Power




CEGASA
INTERNATIONAL

High and constant output voltage

The CEGASA AIR ALKALINE BATTERIES discharge at a high and constant output voltage of 1,35 V per cell throughout the entire life of the battery. That means extremely low reduction of voltage during the cell discharge. (see figure 2)

The output voltage is 20% higher than other battery systems.

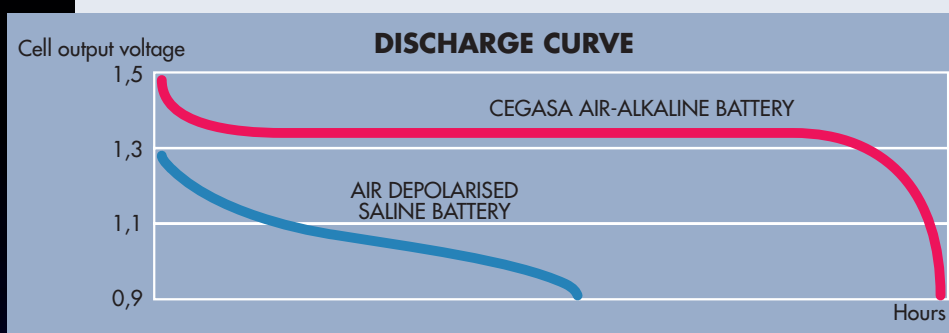


FIGURE 2

Exceptional Energy Density

Exceptional energy density compared with other technologies (see figure 3 and table 1) (377 Wh/Kg., 676 Wh/dm³).

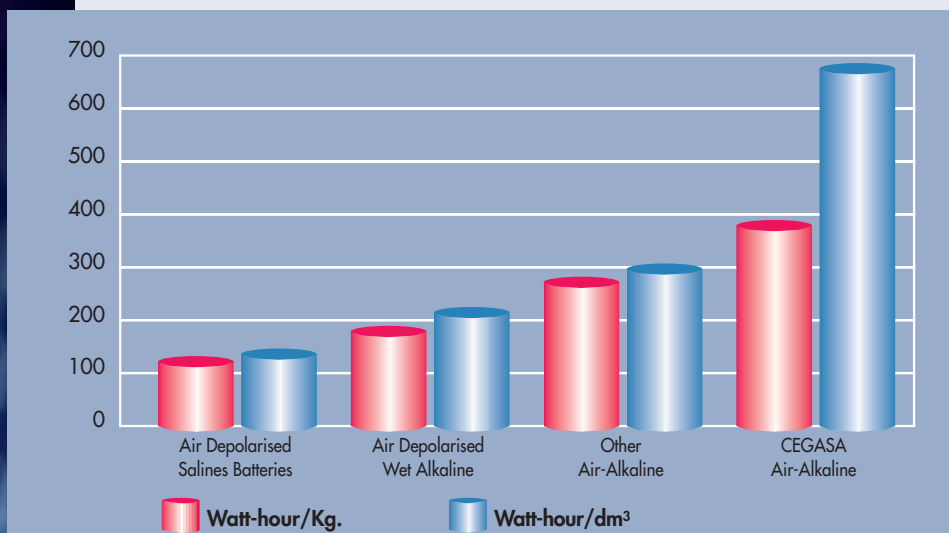


FIGURE 3

	Air Depolarised Saline Batteries	Air Depolarised Wet Alkaline	Other Air-Alkaline	CEGASA Air-Alkaline
Watt-hour/Kg.	140	180	260	377
Watt-hour/dm ³	150	220	300	676

TABLE 1

Easy to use batteries - Maintenance free

- Activated by removing ventilation seal or by means of special plugs supplied with the batteries.
- MAINTENANCE FREE. Ready to use without adding any liquid.
- Safe to handle, without danger of spilling any liquids.
- Solid state: Battery operates in any position, even in installations in motion.

Best cost-efficiency

- Due to the higher energy density, the CEGASA AIR-ALKALINE batteries have the best cost of energy you can find in the market.
- One AIR-ALKALINE battery (4AS2/45) can replace nine (9) standard zinc carbon batteries (4R25). This means there is a high reduction in total volume to dispose of (see figure 4)

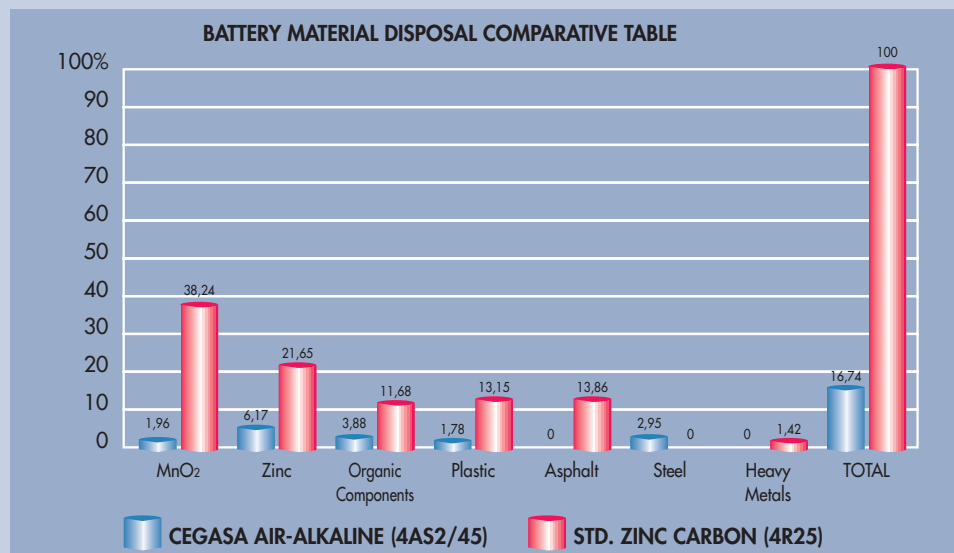
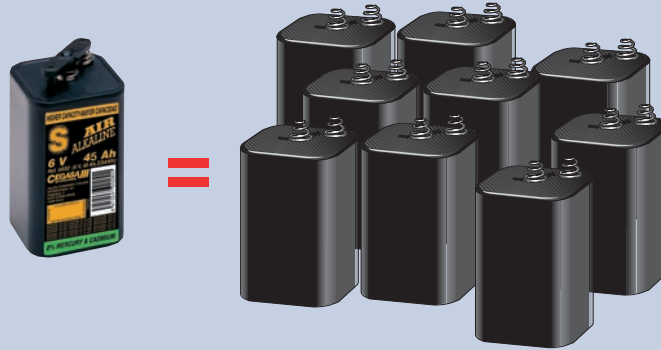


FIGURE 4

Environmental friendly - Mercury and Cadmium free

The CEGASA AIR-ALKALINE batteries protect the environment. They are Mercury and Cadmium free with less waste disposal volume (see figure 4)

Manufactured under the Quality System Certificate ISO 14001.

More reliable

Tested and approved by numerous National and International Authorities for use in safety critical appliances. Conforms to the requirements of the European and other International Standards.

Manufactured under the Quality System Certificate ISO 9001

Guarantee - Higher shelf life

- Two-years shelf life.
- Capacity loss of the stored batteries is just 5% in one year.
- Capacity loss of the stored batteries is just 8% in two years.



Main applications

CEGASA AIR-ALKALINE batteries

Railway signalling

The world-wide Railway Authorities continue to perfect and improve their signal lighting systems for regulating the traffic and increasing safety. The CEGASA AIR-ALKALINE batteries are specially designed to power these safety critical devices.

Temporary speed restrictions, track circuit signals, warning lights on trains, level crossings, traffic regulation and communication rely on high performance, autonomous and zero maintenance batteries that also have to operate in extreme conditions of temperature and humidity in static or moving installations.

The CEGASA AIR-ALKALINE batteries are perfectly engineered to satisfy the above mentioned requirements and to provide:

- Reliability
- Constant and high voltage.
- Longer life.



Road traffic signalling

Traffic density in motorways and normal roads is continuously increasing in modern countries. To improve safety, the CEGASA AIR-ALKALINE batteries have the following advantages giving reliable energy to hazard warning lights:



- Maximum safety through high constant light.
- Long operating time: up to 7.000 hours.
- Reduced supervision and maintenance.



Navigation aids

Maritime and waterway safety is totally dependent on Navigation aids.

Emergency power for lighthouses, buoy lighting, signal lights and radio beacons need an autonomous, high performance, long life and reliable power source.

These requirements are more than fully satisfied by the CEGASA AIR-ALKALINE batteries. They are the ideal power source for these devices which cannot be frequently inspected and are subject to extreme climatic conditions.



Telecommunications

In difficult and varying environmental conditions, CEGASA AIR-ALKALINE batteries fulfill the mission of supplying emergency power for:

- Mountain Radio telephones.
- Highway emergency phones.
- Scientific and meteorological laboratories.
- Telemeters.



Electric fences

An electric fencing system must be:

- Reliable.
- Powerful.
- Economical.

The CEGASA AIR-ALKALINE batteries with their high and constant voltage gives to the battery operated electronic fence systems:

- Constant energy output – more reliable –
- Higher energy output – more powerful –
- Lower consumption – more economical –



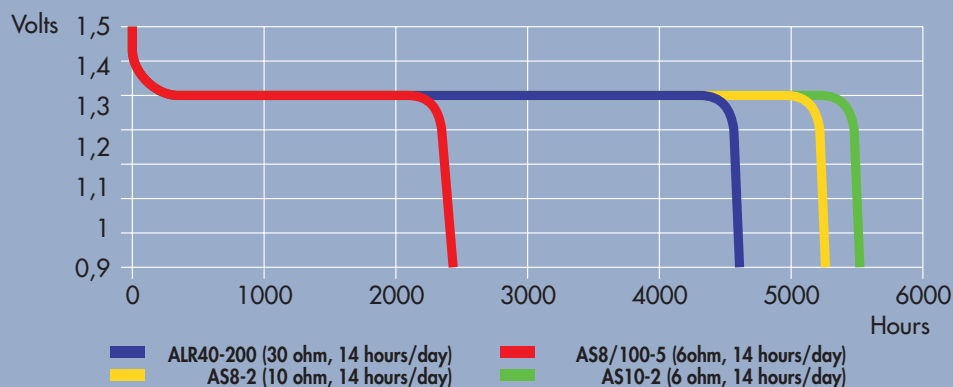
Parking meters and ticket machines

The new generation of parking meters and ticket machines are more compact and self powered. The new equipment reduces to the minimum the civil works for the installation and the environment impact.

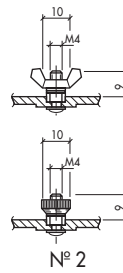
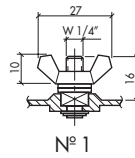
The CEGASA AIR-ALKALINE batteries with their high and constant voltage are a reliable power source for the new equipment. Their exceptional energy gives to the equipment's manufacturers the possibility of having a very compact battery with a very high energy

Battery Model	O.C.V. Voltage (V)	Capacity (Ah)	Energy (Wh)	Maximum Continuous Drain (mA)	Max. Intermittent Drain (<1 min) (mA)	Maximum Pulse Drain (<1 sec) (mA)	Max. Hourly Capacity (mAh)	Terminals
Family AS10								
8AS10	12	600	6240	250	1000	2000	185	1
4AS10	6	600	3120	250	1000	2000	185	1
2AS10	3	600	1560	250	1000	2000	185	1
AS10-8	1,5	4800	6240	2000	8000	16000	1500	1
AS10-6	1,5	3600	4680	1500	6000	12000	1125	1
AS10-4	1,5	2400	3120	1000	4000	8000	750	1
AS10-2	1,5	1200	1560	500	2000	4000	375	1
AS10	1,5	600	780	250	1000	2000	185	1
Family AS8								
6AS8-350	9	350	2730	200	800	1600	150	2
4AS8-3	6	700	3640	300	1200	2400	225	-
2AS8	3	350	910	200	800	1600	150	2
AS8-10	1,5	1000	1300	1000	4000	8000	750	2
AS8-2	1,5	700	910	400	1600	3200	300	2
AS8F-5	1,5	500	650	500	2000	4000	375	2
AS8	1,5	350	455	200	800	1600	150	2
Family AS6								
2ALR40/100	3	100	260	55	220	440	41	2
ALR40/200	1,5	200	260	110	440	880	82	2
ALR40/100	1,5	100	130	55	220	440	41	2

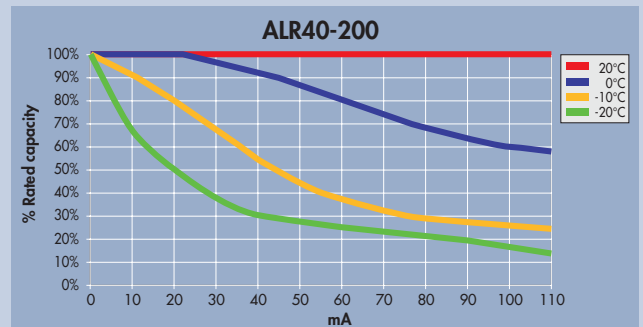
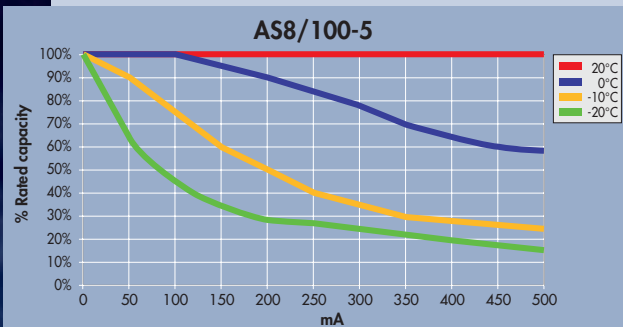
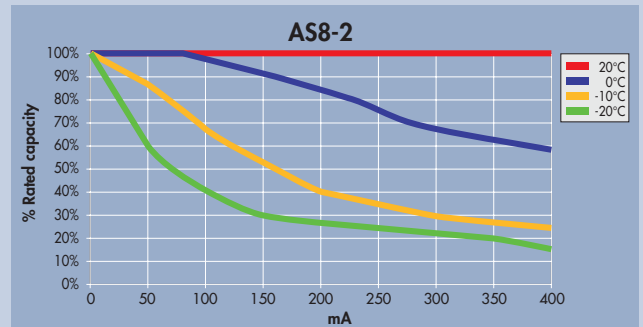
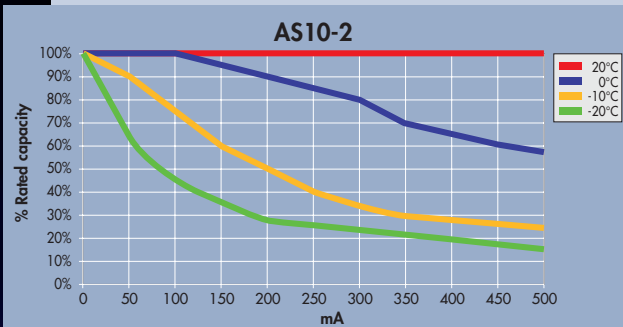
TYPICAL DISCHARGE CURVE



TERMINALS

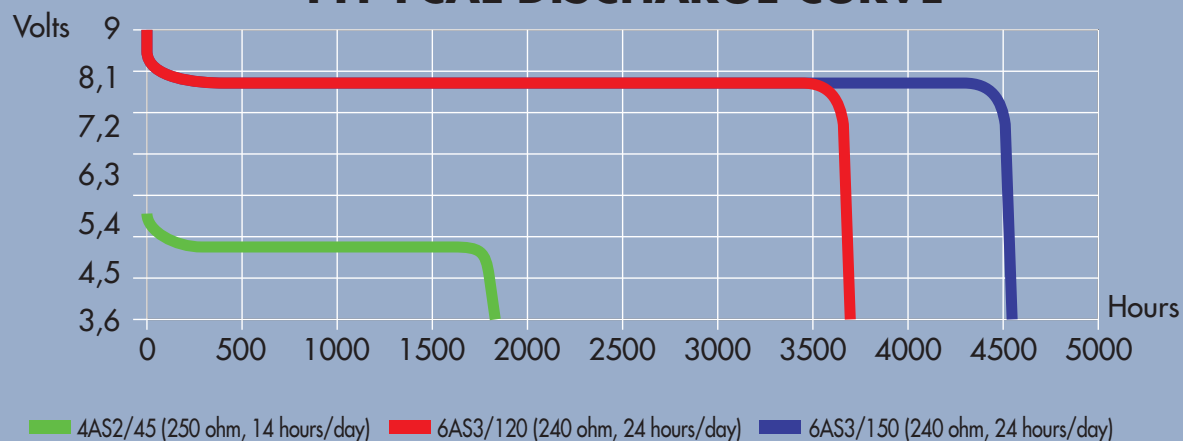


Capacity vs. Temperature

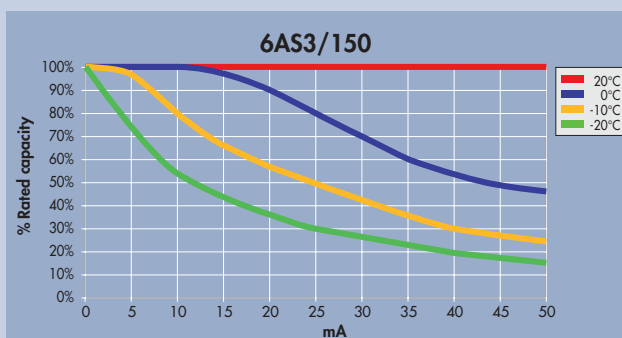
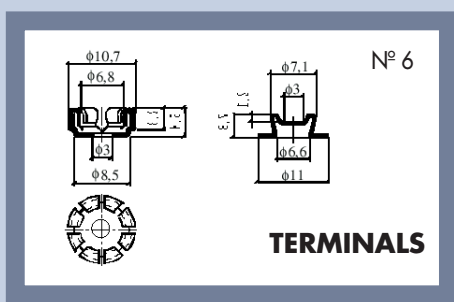
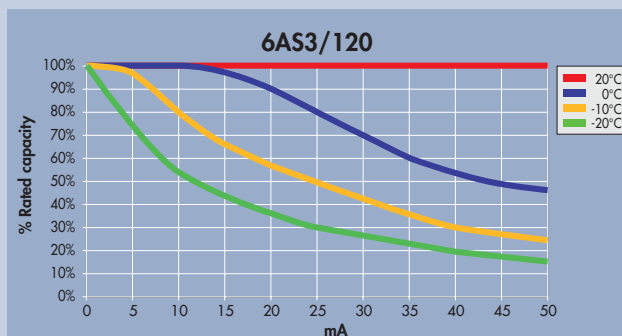
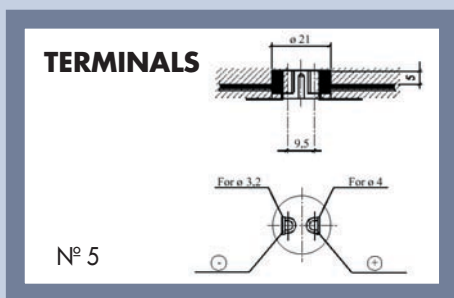
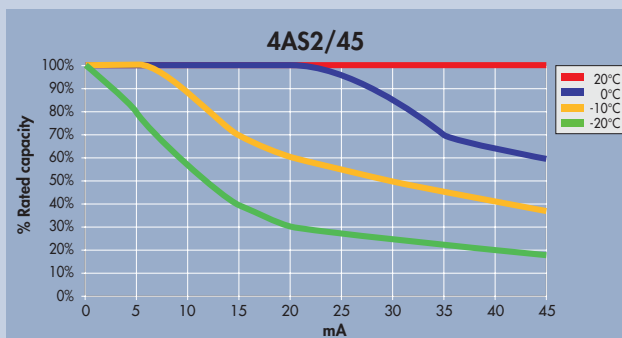
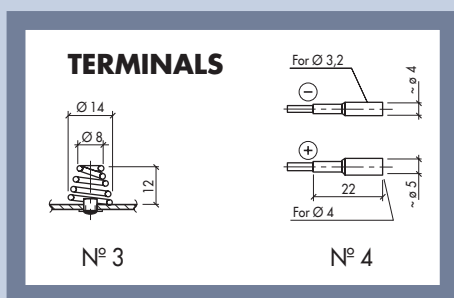


Battery Model	O.C.V. Voltage (V)	Capacity (Ah)	Energy (Wh)	Maximum Continuous Drain (mA)	Max. Intermittent Drain (<1 min) (mA)	Maximum Pulse Drain (<1 sec) (mA)	Max. Hourly Capacity (mAh)	Terminals
Family AS3								
8AS3/120	12	120	1248	100	400	800	75	5
8AS3/60	12	60	624	50	200	400	38	4
6AS3/165	9	165	1300	50	200	400	38	4
6AS3/150	9	150	1100	50	200	400	38	4
6AS3/120 A	9	120	940	50	200	400	38	4
6AS3/120 B	9	120	940	50	200	400	38	4
6AS3/90 A	9	90	750	50	200	400	38	4
6AS3/90 B	9	90	750	50	200	400	38	4
6AS3/65 A	9	65	507	50	200	400	38	4
6AS3/65 B	9	65	507	50	200	400	38	4
6AS3/45	9	45	350	50	200	400	38	4
5AS3/90	7,5	90	585	50	200	400	38	2
5AS3/65	7,5	65	500	50	200	400	38	2
4AS3/60	6	60	312	50	200	400	38	2
Family AS2								
4AS2P/40	6	40	208	45	180	360	34	6
4AS2/45	6	45	234	45	180	360	34	3
4AS2/25	6	25	130	45	180	360	34	3

TYPICAL DISCHARGE CURVE



Capacity vs. Temperature



Tailor made batteries

If you do not find a suitable battery model in our Batteries Program, our Design and Development Department is open to study other battery configurations according to your requirements.

Private Labelling

CEGASA is also specialised in the field of private label batteries. This distinction allows us to offer our clients the best in battery technology, along with flexible conditions and an excellent service adapting to the specific characteristic of each request.



BATTERY		BATTERY DIMENSIONS			BOX	PALLET INFORMATION		
Model	Weight (Kg)	Length (mm)	Width (mm)	Height (mm)	Batteries per box	Number of batteries	Gross Weight	Dimensions (mm)
Family AS10								
8AS10	17,5	216	216	226	1	60	1075	1200x1000x870
4AS10	8,75	216	108	226	2	96	1075	1200x1000x870
2AS10	4,37	108	108	220	4	240	1075	1200x1000x870
AS10-8	17,5	216	216	226	1	60	1075	1200x1000x870
AS10-6	13,15	334	116	234	2	60	814	1200x1000x870
AS10-4	8,75	216	108	226	2	120	1075	1200x1000x870
AS10-2	4,37	108	108	220	4	240	1075	1200x1000x870
AS10	2,18	108	108	220	4	320	761	1200x1000x1110
Family AS8								
6AS8-350	7,57	265	95	212	4	160	1237	1200x1000x1030
4AS8-3	10,35	170	170	210	2	90	956	1200x1000x825
2AS8	2,6	85	85	209	12	396	1065	1200x1000x810
AS8-10	4,95	178	93	212	6	240	1213	1200x800x810
AS8/100-5	2,4	85	85	209	12	288	725	1200x1000x810
AS8-2	2,6	85	85	209	12	396	1064	1200x1000x810
AS8	1,5	85	85	209	12	660	1064	1200x1000x1250
Family AS6								
2ALR40/100	0,8	Ø 64,5	-	163	4	960	814	1200x800x1230
ALR40/200	0,8	Ø 64,5	-	163	4	960	814	1200x800x1230
ALR40/100	0,55	Ø 64,5	-	163	4	960	646	1200x800x1230
Family AS3								
8AS3/120	4	147	136	122	4	288	1198	1200x1000x930
8AS3/60	2,47	166	112	114	4	396	1005	1200x1000x1239
6AS3/165	3,25	190	126	160	4	168	568	1200x800x1025
6AS3/150	3,17	190	126	160	4	168	555	1200x800x1010
6AS3/120A	2,9	190	126	160	4	320	977	1200x1000x1526
6AS3/120B	2,5	166	112	114	4	352	905	1200x1000x1118
6AS3/90A	2,3	190	126	160	4	320	785	1200x1000x1526
6AS3/90B	2,2	166	112	114	4	240	592	1200x800x876
6AS3/65A	1,94	190	126	160	4	272	550	1200x800x1450
6AS3/65B	1,7	166	112	114	4	440	780	1200x1000x1239
6AS3/45	1,6	166	112	114	4	440	740	1200x1000x1239
5AS3/90	2,1	Ø180	-	171	4	168	387	1200x800x1480
5AS3/65	1,8	Ø180	-	171	4	168	337	1200x800x1550
5AS3/60	1,7	133	70	235	6	540	664	1200x1000x1455
Family AS2								
4AS2/45	0,7	66	66	110	12	1344	1041	1200x800x1142
4AS2P/40	0,8	110	64,5	197	12	720	655	1200x1000x1458
4AS2/25	0,55	66	66	110	12	1680	988	1200x800x1390

OPERATING INSTRUCTIONS



Operating temperature range

The CEGASA AIR-ALKALINE batteries can be used over a wide range of ambient temperature: -20°C . to $+50^{\circ}\text{C}$.

However, for optimum results the recommended range is -10°C to $+40^{\circ}\text{C}$.

Similar to other dry batteries, the capacity falls quickly for high drain rates when operating below -10°C . Then it is recommended to connect batteries in parallel in order to decrease the discharge level.

Influence of humidity

- When humidity is between 25% and 85%, it has no influence on the battery's operation.
- When humidity is lower than 25% or higher than 85%, the battery has a 5% to 15% capacity loss.

Storage

The CEGASA AIR-ALKALINE batteries are supplied in air-tight boxes, with the ventilation holes closed with a tape.

They can be stored for two years without significant loss in the battery's capacity.



Installation

- The CEGASA AIR-ARKALINE batteries are supplied ready for use. There is no need to add any liquid.
- Before connecting the battery, the tapes that cover the ventilation holes must be removed.
- The batteries require a continuous supply of air to obtain correct operation.
- They can not be used in completely air-tight installations.
- There is no need for periodic inspections nor maintenance during the operation life. The removal of discharged batteries and the connection of new ones is a very easy operation that does not require qualified personnel

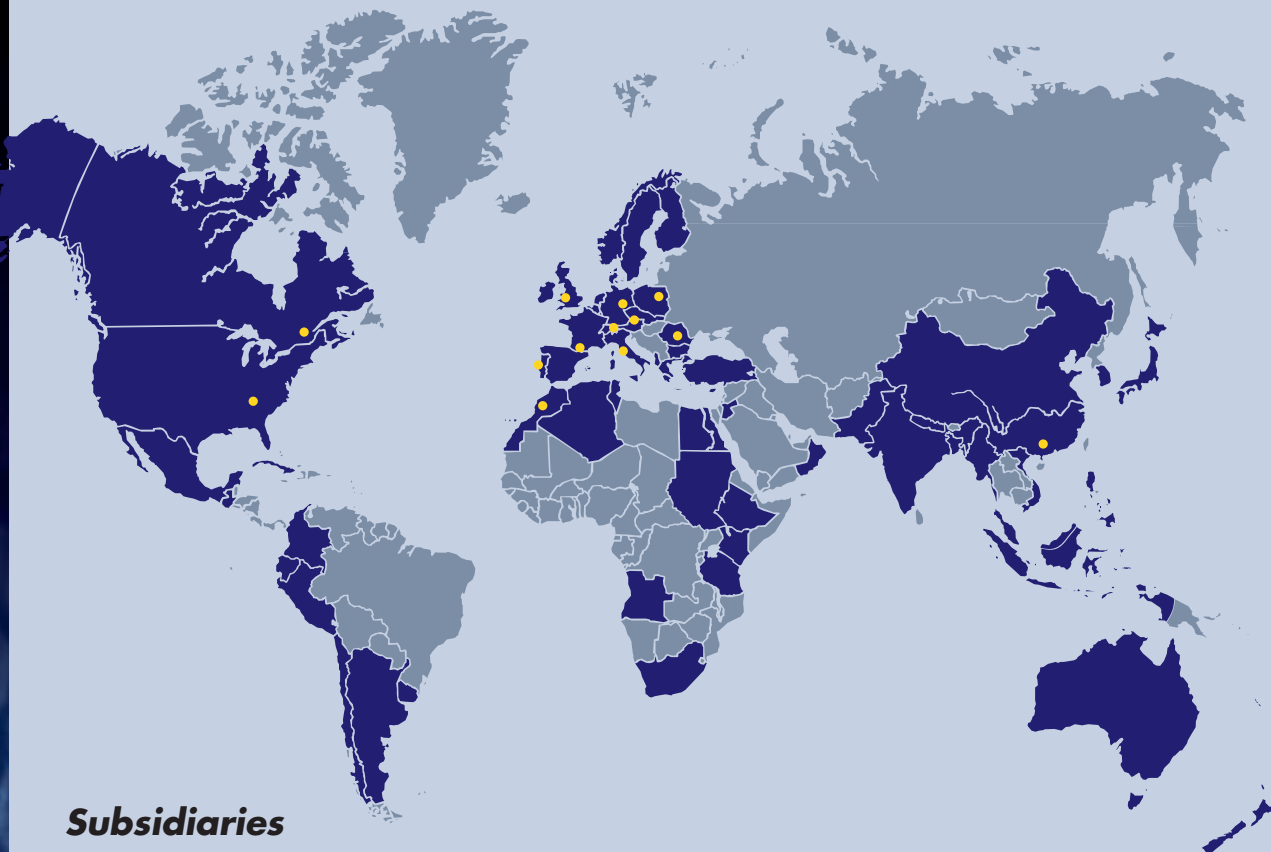
The High standards that we constantly achieve have been recognised by the award of Quality Management System. Cegasa has held an ISO 9001 certificate since 1999.

Our manufacturing sister company has also been certified to ISO 14001, as their Environmental Management System meets stringent environmental standards.



CEGASA WORLDWIDE

CEGASA INTERNATIONAL markets its products in more than 50 countries of the 5 continents thanks to its extensive sales network of subsidiaries and representatives.



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