АДС

Autonomous Power Sources

Manufacturer of alkaline cells and batteries

www.ads.ua


KL 125 P
AΔC
KH 150 P

The ADS presents a new achievement in manufacturing of batteries for mining locomotives:

The LED electrolyte level sensor.

This device, when applied with our batteries, simplifies the maintenance and prolongates the service life of our batteries.
The main features of our device are:

- LED shows and signalizes about electrolyte level, thus nullifying the necessity of manual inspecting of electrolyte level with a glass stick, minimizing human danger factors.
- When watering the cell – the sensor signalizes when the maximum level is reached, avoiding diluting of electrolyte below necessary point. This significantly increases the service life of the (battery) cell.
- Indicates the current status of the cell, thus allows to check the operability of the cell before operating. The green LED indicates, that the cell is ready for operating.
- The device consumes the cell's power, so no need of external power supply. Also the sensor doesn't need any maintenance. The devices design allows replacing broken sensor without disassembling the cell.

The electrolyte level at MAX point:
- the cell is operable
- no watering needed

The electrolyte level below MAX point:
- the cell is operable
- no watering needed

The electrolyte level is at MIN point:
- the cell is operable
- need to water* the cell

* when watering the cell, please check the blue LED and stop watering when the blue LED turns off.

The "ADS" batteries are the best choice for industrial purposes. They are used as reliable back-up and main power sources in energetics, oil & gas industry, different types of buildings, airports, ships, in road and railroad infrastructure and other industrial branches.

The company offers wide variety of nickel-cadmium batteries with capacity from 24 to 700 A*h. Accumulator batteries are available in polypropylene or metal frame versions. We can also produce batteries with nonstandard dimensions and equip them with different accessories according to the costumer's individual requirements.

«ADS» accumulators KL 160

The main advantages of "ADS" nickel-cadmium batteries of KL, KM and KH series to the lead-acid analogues:

- battery service life – 20+ years;
- batteries are insensitive to overdischarges *(do not collapse or loose capacity,);*
- batteries are insensitive to overcharges *(do not bloat, collapse or loose capacity);*
- batteries are insensitive to short circuit *(do not bloat, collapse or loose capacity);*
- batteries are insensitive to recurrent undercharging *(do not loose capacity);*
- warranty – 5 years;
- wide range of operating temperatures: from -40°C to + 45 °C.

The main advantages of "ADS" nickel-cadmium batteries of KL, KM and KH series to the similar nickel-cadmium batteries from other manufacturers:

- airtight valve which prevents air from accessing the electrolyte (thus prolonging its service life);
- spring of the valve has a lock - for the convenient maintenance (e.g. refill with distilled water);
- application of a special emulsion that is part of the electrolyte and covers it with 5 mm. layer. This prevents water from quick evaporation from the electrolyte, increasing the refilling periods.*
- each battery unit can be equipped with an electronic sensor of the electrolyte level, equipped with LED. The sensor allows visual inspection of the batteries, minimizing the necessity of contact with alkali. LED signalizes about low level of electrolyte, and as soon as the electrolyte returns to its normal level - LED signalizes to stop refilling.*

* - option

CHOOSING THE BATTERY

"АДС" accumulators KL 270 P

Accumulator batteries consist of the battery cells, the number of cells depends on the required voltage of the whole battery. The rated voltage of the cell is 1.2 V. The battery rated voltage can be calculated by the formula:

$$U_{batt.} = U_{cell.} \cdot n_{cell.}$$

where: $U_{batt.}$ – the battery rated voltage, V; $U_{cell.}$ – the cell rated voltage, V; $n_{cell.}$ – number of cells in the battery, pcs.

E.g.: if you need the accumulator battery with the rated voltage 48V, then the necessary number of cells will be (48 ÷ 1.2) 40 pcs.

When choosing a nickel-cadmium battery one should consider that the recommended final disruption voltage of the element is 1V. The voltage drop on connecting cables and bus bars does not exceed 2%.

CHOOSING THE BATTERY'S CAPACITY

First thing to do is to calculate the device's consuming current (i.e. battery discharge current). If the device's consumed power and operating voltage are known, the current can be calculated by the formula:

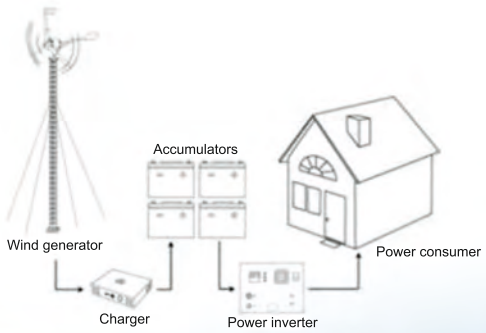
$$I_{dis.} = W_{dev.} \div U_{dev.}$$

where: $I_{dis.}$ – battery discharge current, A; $W_{dev.}$ – consumption power of the device, VA, $U_{dev.}$ – operating voltage of the device, V.

Next, knowing the operational cycle duration (i.e. battery discharge time), we can determine the required capacity of the battery using the formula:

$$C_{batt1.} = I_{dis.} \cdot T_{dis.}$$

where: $C_{batt1.}$ – required capacity of the battery, A/h; $I_{dis.}$ – discharge current of the battery, A; $T_{dis.}$ – time of the battery discharge, h.



The calculated capacity of the battery will work if the battery is fully charged and the environment temperature is between +15 °C and +25 °C. In case, when the batteries are used in the UPS system based on wind turbines or solar cells, it is impossible to fully charge the battery (because windless or no sunshine). For that purposes you should take the battery with a certain capacity reserve or power source - wind turbine or solar panel, with power reserve.

Therefore, to choose the battery with capacity reserve, you can calculate the necessary capacity with this formula:

$$C_{batt2.} = C_{batt1.} \cdot n$$

where: $C_{batt2.}$ – required battery capacity, A/h; $C_{batt1.}$ – battery capacity without reserve, A; n – the amount of the battery discharge cycles per one 100% charge.

Also, when choosing the battery capacity, you should consider the possibility of using it at low temperatures. The "ADS"'s nickel-cadmium batteries are operable at low temperatures (down to -40°C). But when the temperature decreases, so does battery's capacity; this phenomenon affects all types of batteries but this effect is not permanent or irreversible for nickel-cadmium batteries. When the temperature increases, the capacity grows, and as soon as the temperature settles between +15 ° C and +25°C capacity recovers to it's normal level. The discharge capacity of nickel-cadmium batteries at extremely low temperatures (-40 °C) is 25 - 30% of nominal. At the same time, certain types of lead-acid batteries when used under sub-zero conditions can lose it's capacity irreversibly.

Considering these facts capacity of the required battery should be taken with a reserve for the low temperatures operating.

CHOOSING BATTERIES BY TYPE AND PURPOSE OF USE

Depending on the construction, there are three types of "ADS" nickel-cadmium batteries:

KL-series - these batteries produce long-lasting discharges with relatively low currents (0,2 Cnom). As a rule they are installed within the uninterrupted power supply systems. Also the KL-batteries are used to power the electric motors of loading machinery, electro-trucks, mining electric locomotives, etc.

KM-series - are suitable with devices, where the discharges of mediocre currents (1 Cnom) and high battery power are necessary. The batteries of this series have all the advantages of KL-series. They provide long-lasting discharges with low currents (0,2 Cnom), but when necessary, they also can produce long-lasting discharges with medium current (1 Cnom). That's why they are recommended for use in electric transport as a motor supplying source. For example, when a mine locomotive starts moving with trolleys fully loaded, or when the fork-truck lifts a heavy load off the ground – they both need the higher current. That's where the KM-series battery proves to be more effective than the KL-series.

KH-series - are used for starting combustion engines; they produce high discharge current (10 Cnom). The "ADS" starter batteries of KH-series are mainly used in railway transport for diesel locomotives main engine starting.

ACCUMULATOR BATTERY CHARGE

The charging and discharging device, conducting of forming and cycling.

Adjusting the charging parameters.

Recommended charge current for batteries of KL series is calculated by formula:

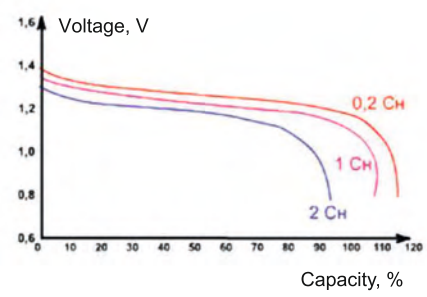
$$I_{cha.} = C_{nom.} \cdot 0{,}2$$

where: $I_{cha.}$ – recommended charge current, A; $C_{nom.}$ – rated battery capacity, A/h (in serial connection, the battery capacity is equal to the one element capacity).

Charging of batteries is more efficient, when you can set the proper charging current of charging device. If the charger has no current adjustment – you should use the voltage regulator, to set the voltage at which the current will match the recommended value for the battery. Avoid exceeding the recommended charging voltage (i.e. 1.7 V). In case of exceeding recommended settings (including the current) the amount of emitted gases will increase and shorten the maintenance period due to higher usage of distilled water.

Make sure that the room, where charging takes place has a free air flow!

DISCHARGE OF THE ACCUMULATOR BATTERY



The graph of nickel-cadmium batteries discharge

The maximal discharge current is calculated by formula:

$I_{dis.} = C_{nom.} \cdot 0{,}5$ – KL series

$I_{dis.} = C_{nom.} \cdot 1$ – KM series

$I_{dis.} = C_{nom.} \cdot 10$ – KH series

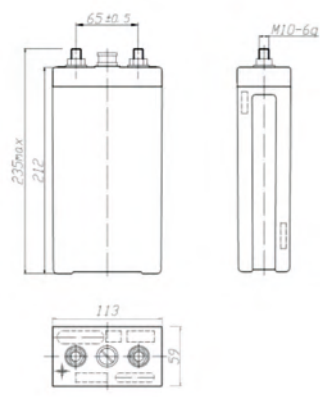
where: $I_{dis.}$ – the maximum discharge current, A; $C_{ном.}$ – rated battery capacity, A/h (in serial connection the battery capacity is equal to the one element capacity).

TECHNICAL SPECIFICATIONS

The "ADS" company offers batteries with different capacitive ratings in the following dimensions:

Option 1

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 24 P	24	59	113	212	235	5, 10	1,12	1,51
KL 30 P	30	59	113	212	235	5, 10	1,27	1,64
KL 40 P	40	59	113	212	235	5, 10	1,8	2,68
KL 45 P	45	59	113	212	235	5, 10	1,92	2,8
KL 55 P	55	59	113	212	235	5, 10	2,05	2,82



"ADS" accumulator KL 24...55P

"ADS" accumulator KL 55P

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: polypropylene (PP) of K 499 type, heat, frost, acid-alkali resistant rubber

Terminals: 20-th grade nickel plated steel

Nuts: M10 h=5 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

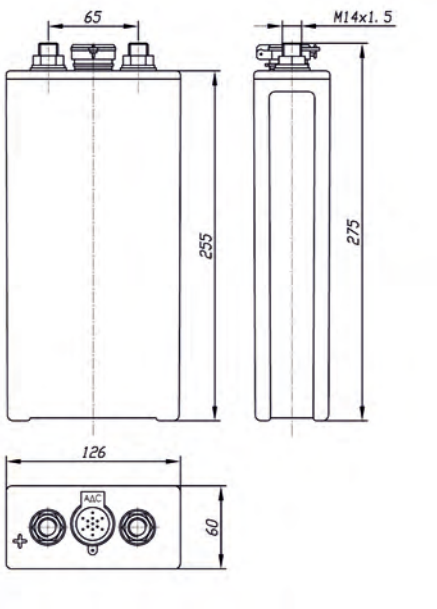
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 2

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 70 P	70	60	126	255	275	14	2.9	3.7



"ADS" Battery KL 70P sketch

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: ABS plastic

Terminals: 20-th grade nickel plated steel

Nuts: M14 h=7 mm DIN 80705, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

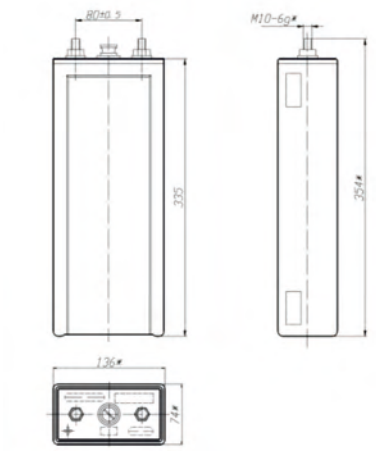
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 3

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 70 P	70	74	136	335	354	10	3,12	5,08
KL 80 P	80	74	136	335	354	10	3,37	5,32
KL 100 P	100	74	136	335	354	10	3,78	5,61
KL 125 P	125	74	136	335	354	10	3,96	5,74
KL 140 P	140	74	136	335	354	10	4,47	6,07



"ADS" Battery KL 65...140P sketch

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: polypropylene (PP) of K 499 type, heat, frost, acid-alkali resistant rubber

Terminals: 20-th grade nickel plated steel

Nuts: M10 h=5 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

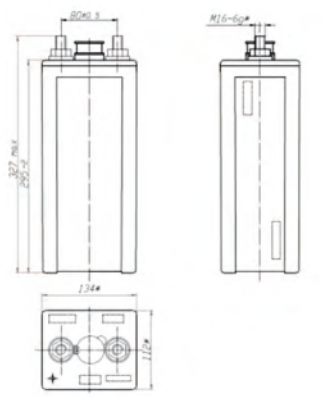
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 4

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 150 P	150	112	134	295	327	16	4,9	7,1
KL 160 P	160	112	134	295	327	16	5,7	9,8
KL 185 P	185	112	134	295	327	16	6,33	9,99
KL 200 P	200	112	134	295	327	16	6,69	10,35



"ADS" Battery KL 65…140P sketch

"ADS" Battery KL 160P

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: polypropylene (PP) of K 499 type, heat, frost, acid-alkali resistant rubber

Terminals: 20-th grade nickel plated steel

Nuts: M16 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

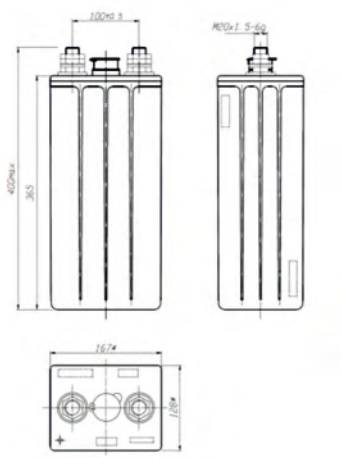
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 5

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 240 P	240	128	167	365	400	16, 20	7,5	10,8
KL 270 P	270	128	167	365	400	16, 20	8,32	11,26
KL 300 P	300	128	167	365	400	16, 20	9,14	11,72
KL 350 P	350	128	167	365	400	16, 20	11,4	16,6



"ADS" Battery KL 240...350P sketch

"ADS" batteries group KL 270 P

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: polypropylene (PP) of K 499 type, heat, frost, acid-alkali resistant rubber

Terminals: 20-th grade nickel plated steel

Nuts: M20 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

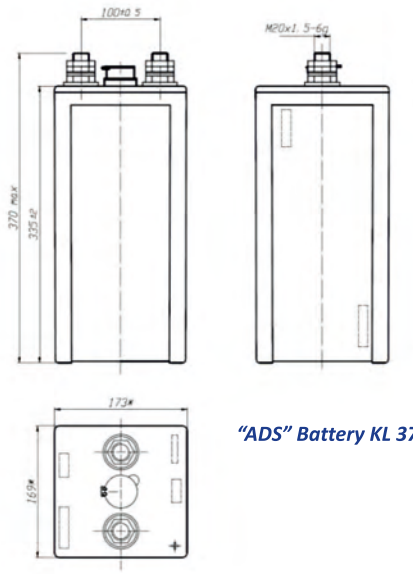
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 6

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 375 P	375	173	169	335	370	16, 20	12,2	17,1
KL 400 P	400	173	169	335	370	16, 20	13,0	17,7
KL 435 P	435	173	169	335	370	16, 20	13,8	18,2
KL 470 P	470	173	169	335	370	16, 20	14,6	18,8



"ADS" Battery KL 375...470P sketch

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: ABS plastic

Terminals: 20-th grade nickel plated steel

Nuts: M20 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

Batteries can be shipped in frames with a certain amount of cells.

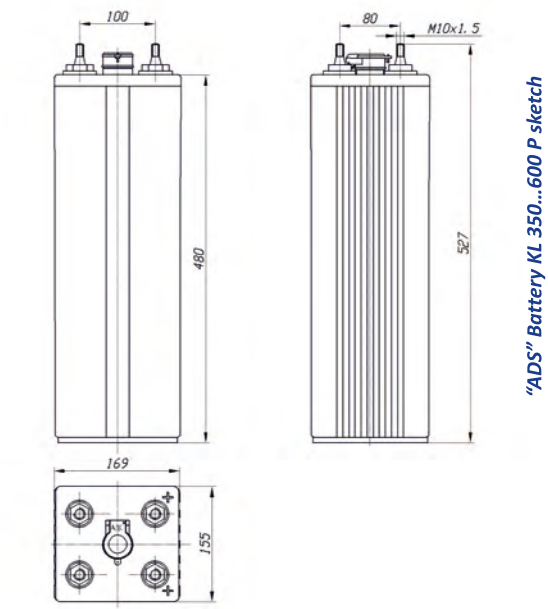
Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 7

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 350 P	350	153	165	454	495	10, 16, 20	12,0	16,9
KL 400 P	400	153	165	454	495	10, 16, 20	13,1	17,9
KL 450 P	450	153	165	454	495	10, 16, 20	14,1	18,6
KL 500 P	500	153	165	454	495	10, 16, 20	14,9	19,5
KL 550 P	550	153	165	454	495	10, 16, 20	14,6	18,8
KL 600 P	600	153	165	454	495	10, 16, 20	14,6	18,8

"ADS" Battery KL 450 P YS



"ADS" Battery KL 350...600 P sketch

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: ABS plastic

Terminals: 20-th grade nickel plated steel

Nuts: M20 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

Batteries can be shipped in frames with a certain amount of cells.

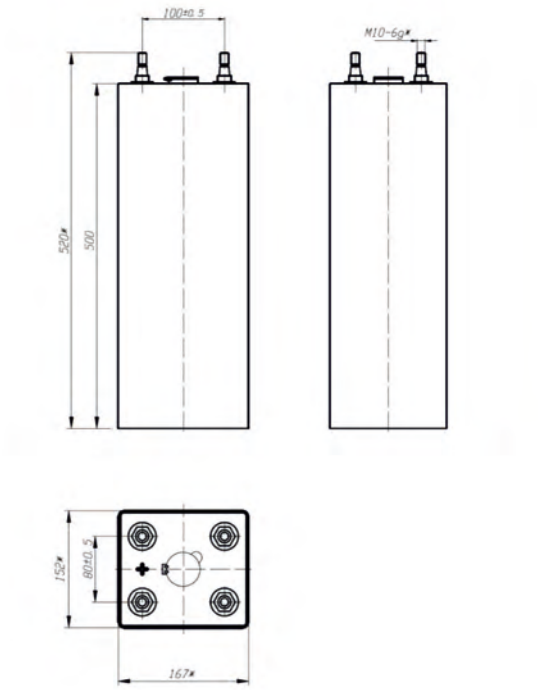
Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 8

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KL 350 P	375	152	167	500	520	10, 16, 20	12,2	17,1
KL 400 P	400	152	167	500	520	10, 16, 20	13,0	17,7
KL 450 P	435	152	167	500	520	10, 16, 20	13,8	18,2
KL 500 P	470	152	167	500	520	10, 16, 20	14,6	18,8
KL 550 P	550	152	167	500	520	10, 16, 20		
KL 600 P	600	152	167	500	520	10, 16, 20		

"ADS" Battery KL 350...600P sketch



MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: ABS plastic

Terminals: 20-th grade nickel plated steel

Nuts: M20 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

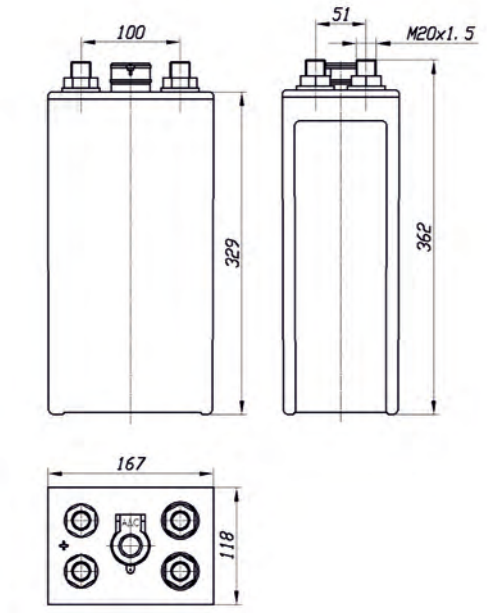
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 9

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KH 150P	150	118	167	329	362	20	9.6	13.1



"ADS" Battery KH 150P sketch

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: ABS plastic

Terminals: 20-th grade nickel plated steel

Nuts: M20 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

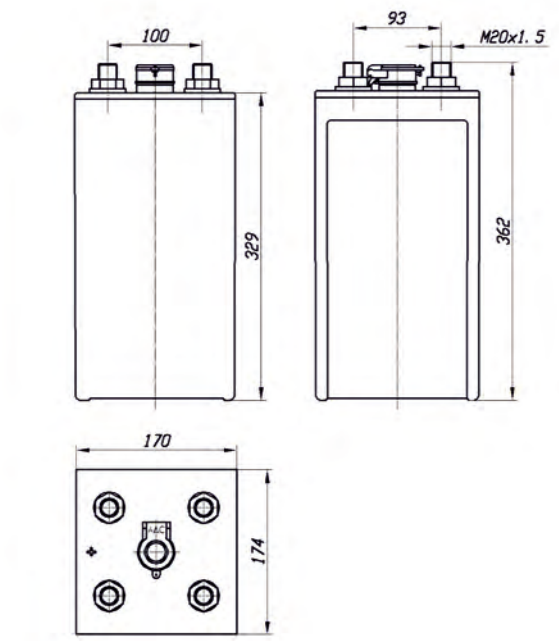
Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

Option 10

Battery	Rated capacity A/h	Dimensions				Available diameters of terminals (2 units) mm.	Weight	
		Length	Width	Height	Height1		without electrolyte	with electrolyte
KH 220P	220	170	174	329	362	20	14.55	18.75



"ADS" Battery KH 220P sketch

MATERIAL CHARACTERISTICS:

Frame: polypropylene (PP) of K 499 type

Cover: polypropylene (PP) of K 499 type

Valve: ABS plastic

Terminals: 20-th grade nickel plated steel

Nuts: M20 h=7 mm DIN 934, galvanized with nickel

Washers: steel of 08 KP type, galvanized with nickel

Electrolyte: solution of potassium hydroxide (p=1,26 g/cm^3) with the addition of lithium hydroxide 20 g/l

Batteries can be shipped in frames with a certain amount of cells.

Batteries can be shipped in frames with a certain amount of cells:

- busbars to connect the elements into the battery *(length on demand);*
- wires with tips for batteries sections connection;
- nuts and washers to fixate the plates and wires;
- spare valves and nipple gums;
- spanners for the battery mounting.

PRODUCTS DELIVERY

Batteries are shipped in wooden crates covered with foamed PVC in order to secure the batteries during transportation. On customer's demand the crate’s dimensions can be changed.

АДС

Autonomous Power Sources

80074, Ukraine, Lviv region,
Velyki Mosty city, Lvivska street, 2V

tel.: +38 (044) 492-02-91
tel./fax: +38 (044) 492-02-90

www.ads.ua