



NiCad

min

BATERIE I OGNIWA ZASADOWE KIESZONKOWE
BATTERIES AND POCKET ALKALINE CELLS



General Description

Application of Nicad normal-resistance batteries:

- railway engineering: carriages and locomotives
- trams
- emergency power supply for marine radio stations
- power supply for emergency lighting in mining
- UPS - uninterruptible power supply systems
- power supply for research and measurement equipment
- telecommunications

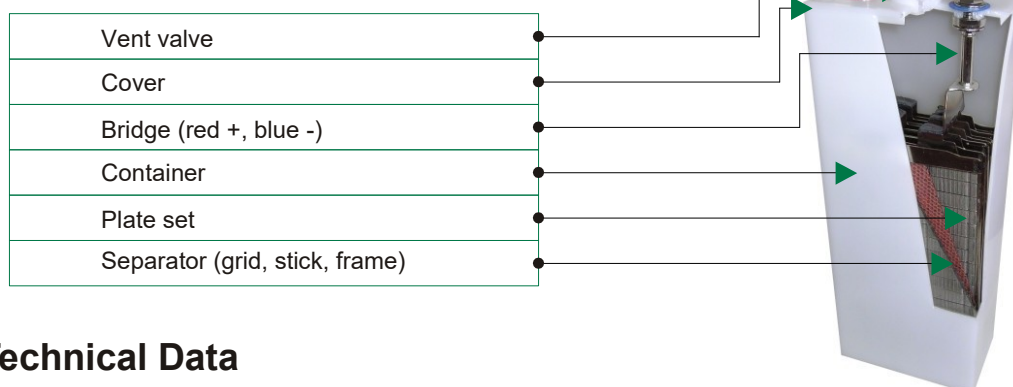
Optional accessories:

- metal frameworks - for batteries and cells (compact installation of a battery)
- fireproof valves
- feeders - for optimal charging
- additional equipment: voltmeters, aerometres, tools and spare parts (toolbox)

Special types of batteries and cells:

- tropical
- marine

Normal-resistance Battery Overview



Basic Technical Data

Final charging voltage	1,80 - 1,60
Supercharging	1,60 - 1,50
Buffer voltage	1,41 - 1,45
Electro-motive force of a battery	1,28
Nominal voltage	1,20
Nominal discharge voltage	0,80

Direct Current Charging $I=\text{const}$

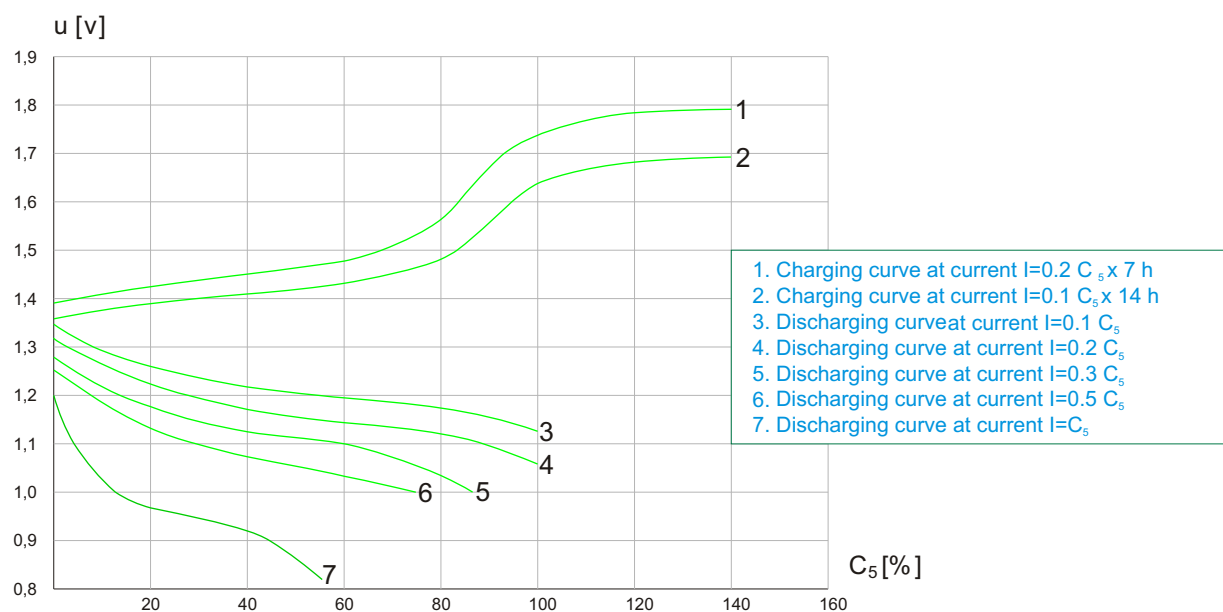
Type	Full charging	Efficient charging	Quick charging
KL	C/5 - 10 h	C/5 - 7 h	C/3 - 2.5 h C/4 - 2 h

Constant Voltage Charging

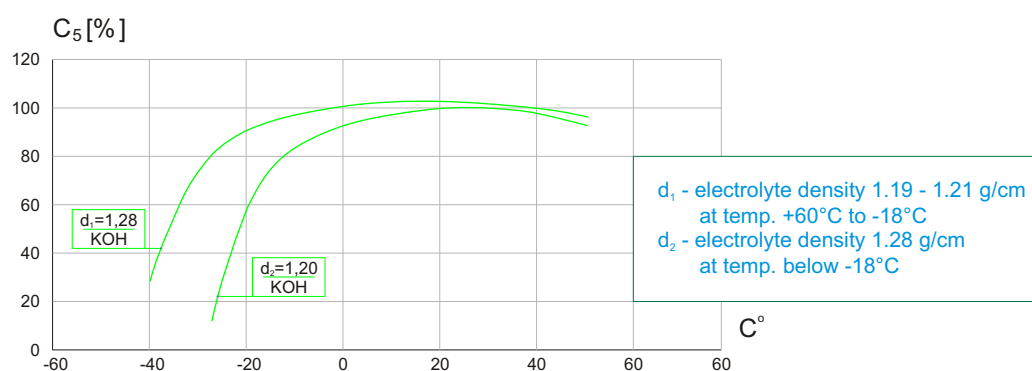
Type	Minimum charging voltage	Automatic charging voltage
KL	1.4 V/cell	1.47 V/Cell

NiCad batteries are produced according to PN-EN 60 623 standard for the class "L"

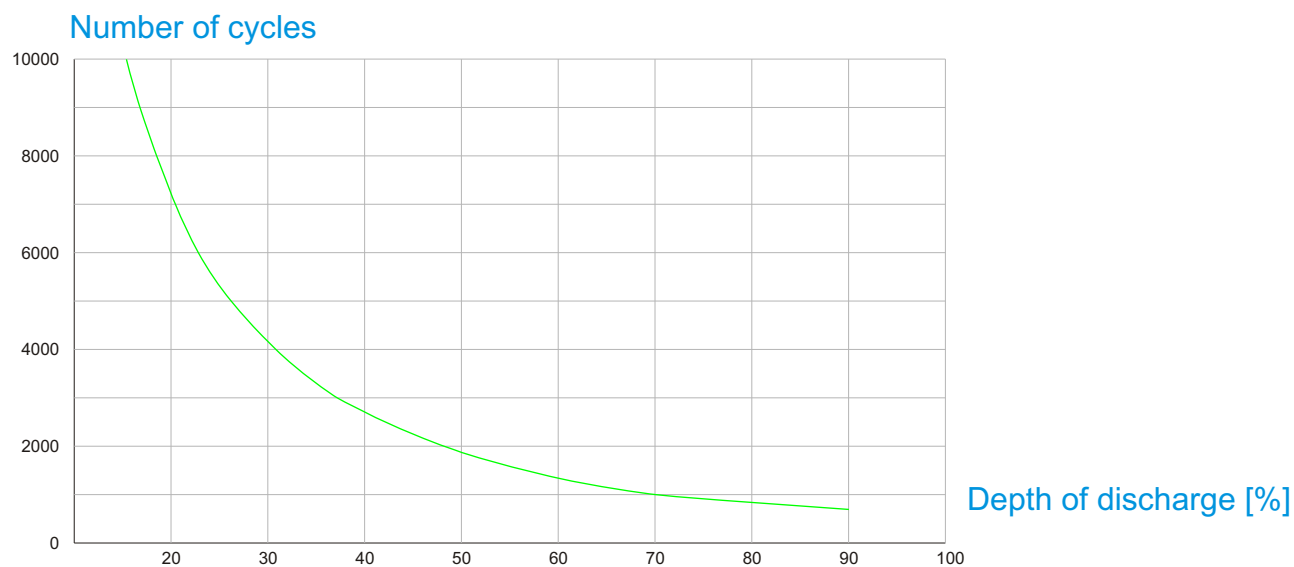
KL Normal-resistance Batteries Characteristics At 20°C



Available Capacity In Relation To The Temperature



Normal-resistance Batteries Lifespan In Relation To The Depth of Discharge



NORMAL-RESISTANCE CELLS AND BATTERIES

Plastic container

CELL

Length mm L

Width mm W

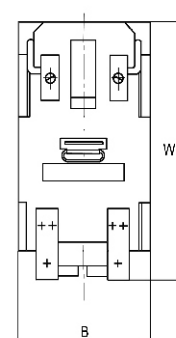
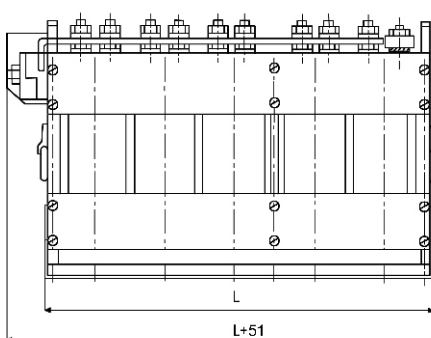
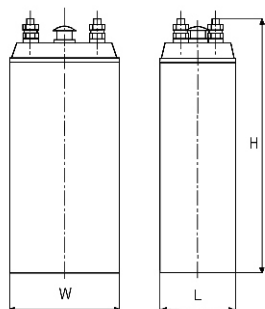
Total Height mm H

BATTERIES

Battery Length mm L

Battery Width mm W

Battery Height mm H



Single Cell

	KL20P	KL30P	KL45P	KL60P	KL80P	KL100P	KL120P	KL140P	KL160P	KL200P	KL250P	KL270P
Discharging	Capacity 5 h Ah	20	30	45	60	80	100	120	140	160	200	270
	Nominal voltage V	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2	1,2
	Nominal discharging current A	4	6	9	12	16	20	24	28	32	40	54
	Final voltage V	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Charging	Charging voltage V	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8
	Nominal charging current A	4	6	9	12	16	20	24	28	32	40	54
	Standard charging time h	8	8	8	8	8	8	8	8	8	8	8
Dimensions	Length mm L	46	60	60	60	75	75	75	103	103	115	115
	Width mm W	85	136	136	136	136	136	136	136	136	165	165
	Total Height mm H	212	265	265	265	365	365	365	370	370	375	375
	Number and types of terminals	2xM6	2xM10	2xM10	2xM10	2xM10	2xM10	2xM10	2xM16	2xM16	2xM16	2xM16
Approximate weight (with electrolyte) kg		1,1	2,4	3	3,5	5,4	5,5	5,6	8,5	8,6	10,9	10,9
Electrolyte volume l		0,35	0,85	0,85	0,83	1,8	1,7	1,7	2,7	2,5	2,5	2,5
Maximum level of electrolyte above the plates mm		25	35	35	35	60	60	50	35	35	45	45

Batteries

	KL20P	KL30P	KL45P	KL60P	KL80P	KL100P	KL120P	KL140P	KL160P	KL200P	KL250P	KL270P
Width mm B	106	158	158	158	170	170	170	175	175	205	205	205
Height mm W	237	288	288	288	395	395	395	401	401	406	406	406
Length without terminal nuts mm L	2 cells	126	165	165	200	200	200	253	253	268	268	268
	3 cells	174	228	228	228	278	278	357	357	381	381	381
	4 cells	222	292	292	292	357	357	482	482	515	515	515
	5 cells	273	355	355	355	436	436	586	586	628	628	628
	6 cells	319	419	419	419	534	534	690	690	-	-	-
	7 cells	367	482	482	482	613	613	794	794	-	-	-
	8 cells	415	546	546	546	691	691	-	-	-	-	-
	9 cells	464	609	609	609	770	770	-	-	-	-	-
	10 cells	512	673	673	673	849	849	-	-	-	-	-
Approximate battery weight / one cell kg		1,3	2,9	3,5	3,8	6,0	6,1	6,2	9,4	9,5	12,0	12,0

Caution: All given dimensions do not include factory tolerances. Non-standard capacity cells may be produced after a prior arrangement with Nicad Sp z o.o

DISCHARGING TIME OF NORMAL-RESISTANCE CELLS IN PLASTIC CONTAINERS AT 20 ± 5°C

Type	Final voltage (V)	Discharging time (h)				Discharging time (min.)					
		10	8	5	2	90	60	30	15	5	1
Discharging current (A)											
KL20P	1,14	2,0	2,4	3,3	5,1	5,5	6,2	8,0	10,4	10,8	13,5
	1,10	2,0	2,4	3,6	6,3	6,9	8,0	10,0	12,0	13,2	16,5
	1,05	2,1	2,5	3,9	7,6	8,5	9,8	12,4	14,4	16,8	20,4
	1,00	2,2	2,6	4,0	8,5	9,7	11,4	14,8	17,6	19,2	24,0
KL30P	1,14	3,0	3,6	5,0	7,65	8,2	9,3	12,0	15,6	16,2	20,3
	1,10	3,1	3,7	5,6	9,50	10,4	12,0	15,0	18,0	19,8	24,8
	1,05	3,2	3,8	5,9	11,40	12,8	14,7	18,6	21,6	25,2	30,6
	1,00	3,3	3,9	6,0	12,70	14,6	17,1	22,2	26,4	28,8	36,0
KL45P	1,14	4,5	5,4	7,5	11,5	12,3	13,9	18,0	23,4	24,3	30,5
	1,10	4,8	5,6	8,5	14,1	15,6	18,0	22,5	27,0	29,7	37,2
	1,05	4,9	5,8	8,8	17,1	19,2	22,0	27,9	32,7	37,8	45,9
	1,00	5,0	5,9	9,0	19,1	21,9	25,6	33,3	39,6	43,2	54,0
KL60P	1,14	6,0	7,3	10,0	15,3	16,4	18,6	24,0	31,2	32,4	40,7
	1,10	6,3	7,6	11,3	18,9	20,8	24,0	30,0	36,0	39,6	49,7
	1,05	6,4	7,8	11,7	22,8	25,6	29,4	37,2	43,2	50,4	61,2
	1,00	6,6	7,9	12,0	25,5	29,2	34,2	44,4	52,8	57,6	72,0
KL80P	1,14	8,0	9,7	13,3	20,4	21,8	24,8	32,0	41,6	43,2	54,3
	1,10	8,4	10,2	15,0	25,2	27,7	32,0	40,0	49,0	52,8	66,0
	1,05	8,6	10,4	15,7	30,4	31,4	39,2	49,6	57,6	67,2	81,6
	1,00	8,8	10,5	16,0	34,0	39,9	45,6	59,2	70,4	76,8	96,0
KL100P	1,14	10,0	12,1	16,6	25,5	27,3	31,0	40,0	52,0	54,0	68,0
	1,10	10,5	12,7	18,8	31,5	34,6	40,0	50,0	60,0	66,0	82,8
	1,05	10,8	12,9	19,6	38,0	42,6	49,0	62,0	72,0	84,0	102,0
	1,00	11,0	13,1	20,0	42,5	48,6	57,0	72,0	88,0	96,0	120,0
KL120P	1,14	12,0	14,5	19,9	30,6	32,8	37,2	48,0	62,4	64,8	81,5
	1,10	12,6	15,2	22,5	37,8	41,6	48,0	60,0	72,0	79,2	99,0
	1,05	12,9	15,5	23,5	45,6	51,2	58,8	74,4	86,4	100,8	122,4
	1,00	13,2	15,7	24,0	51,0	58,4	68,4	88,8	105,6	115,2	144,0
KL140P	1,14	14,1	17,0	23,2	35,7	39,2	43,4	56,0	72,8	75,6	95,0
	1,10	14,8	17,9	26,3	44,1	48,5	56,0	70,0	84,0	92,4	116,0
	1,05	15,1	18,2	27,4	53,2	59,7	68,6	86,8	100,8	117,6	143,0
	1,00	15,4	18,4	28,0	59,5	68,1	79,8	103,6	123,2	134,4	168,0
KL160P	1,14	16,1	19,4	26,5	40,8	43,7	49,6	64,0	83,2	86,4	108,0
	1,10	16,9	20,4	30,0	50,4	55,4	64,0	80,0	96,0	105,6	132,0
	1,05	17,2	20,8	31,3	60,8	68,2	78,4	99,2	115,2	134,4	163,0
	1,00	17,6	21,0	32,0	68,0	77,8	91,2	118,4	140,8	153,6	192,0
KL200P	1,14	20,1	24,2	33,2	51,0	54,6	62,0	80,0	104,0	108,0	136,0
	1,10	21,1	25,4	37,0	63,0	69,3	80,0	100,0	120,0	132,0	165,0
	1,05	21,5	25,9	39,2	76,0	85,3	98,0	124,0	144,0	168,0	204,0
	1,00	22,0	26,2	40,0	85,0	97,3	114,0	148,0	176,0	192,0	240,0
KL250P	1,14	25,1	30,3	41,5	63,7	68,3	77,5	100,0	130,0	135,0	170,0
	1,10	26,4	31,9	47,0	78,7	86,6	100,0	125,0	150,0	165,0	207,0
	1,05	26,9	32,4	49,0	95,0	106,6	122,5	155,0	180,0	210,0	255,0
	1,00	27,5	32,8	50,0	106,2	121,6	142,5	185,0	220,0	240,0	300,0
KL270P	1,14	27,1	32,7	44,8	68,8	73,8	83,7	108,0	140,4	145,8	183,0
	1,10	28,5	34,4	50,7	85,0	93,6	108,0	135,0	162,0	178,2	223,0
	1,05	29,1	35,0	52,9	102,6	115,2	132,3	167,4	194,4	226,8	275,0
	1,00	29,7	35,4	54,0	114,7	131,4	153,9	199,8	237,6	259,0	324,0

Caution: All the data given in the chart are approximate values

NORMAL-RESISTANCE CELLS AND BATTERIES

Metal container

CELL

Length mm **L**

Width mm **W**

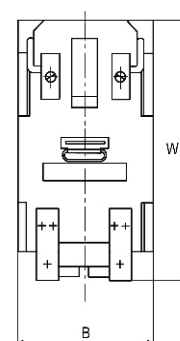
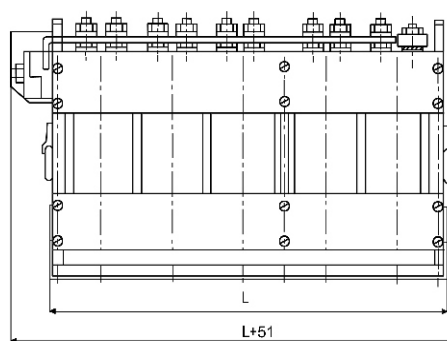
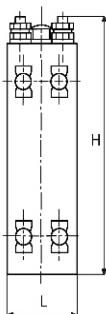
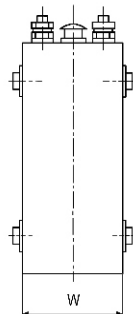
Total Height mm **H**

BATTERIES

Battery Length mm **L**

Battery Width mm **W**

Battery Height mm **H**



Single Cell

		KL60H	KL140H	KL170H	KL200H	KL270H	KL375H	KL500H
Discharging	Capacity 5 h Ah	60	140	170	200	270	375	500
	Nominal voltage V	1,2	1,2	1,2	1,2	1,2	1,2	1,2
	Nominal discharging current A	12	28	34	40	54	75	100
	Final voltage V	1,0	1,0	1,0	1,0	1,0	1,0	1,0
Charging	Charging voltage V	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8	1,35-1,8
	Nominal charging current A	12	28	34	40	54	75	100
	Standard charging time h	8	8	8	8	8	8	8
Dimensions	Length mm L	45	91	91	112	126	145	145
	Width mm W	128	128	128	128	186	156	156
	Total Height mm H	340	395	460	420	340	515	547
	Number and types of terminals	2xM10	2xM14	2xM14	2xM14	2xM14	4xM14	4xM14
	Approximate weight (with electrolyte) kg	4,1	9,1	10,7	12	15	25	27,5
	Electrolyte volume l	0,7	2	2,4	2,7	2,7	5	5,9
	Maximum level of electrolyte above the plates mm	55	50	70	70	40	100	60

Batteries

		KL60H	KL140H	KL170H	KL200H	KL270H	KL375H	KL500H
	Width mm B	180	180	180	180	250	207	207
	Height mm W	370	428	493	450	365	555	587
Length without terminal nuts mm L	2 cells	162	270	270	310	339	375	375
	3 cells	218	379	379	441	479	557	557
	4 cells	274	506	506	594	619	-	-
	5 cells	330	615	615	725	759	-	-
	6 cells	396	724	724	-	-	-	-
	7 cells	442	833	833	-	-	-	-
	8 cells	498	-	-	-	-	-	-
	9 cells	554	-	-	-	-	-	-
	10 cells	610	-	-	-	-	-	-
	Approximate battery weight / one cell kg	4,7	10,6	12,5	13,8	16,5	27,5	30

Caution: All given dimensions do not include factory tolerances. Non-standard capacity cells may be produced after a prior arrangement with Nicad Sp. z o.o.

DISCHARGING TIME OF NORMAL-RESISTANCE CELLS IN METAL CONTAINERS AT 20 ± 5°C

Type	Final voltage (V)	Discharging time (h)				Discharging time (min.)					
		10	8	5	2	90	60	30	15	5	1
Discharging current (A)											
KL60H	1,14	6,0	7,3	10,0	15,3	16,4	18,6	24,0	31,2	32,4	40,7
	1,10	6,3	7,6	11,3	18,9	20,8	24,0	30,0	36,0	39,6	49,7
	1,05	6,4	7,8	11,7	22,8	25,6	29,4	37,2	43,2	50,4	61,2
	1,00	6,6	7,9	12,0	25,5	29,2	34,2	44,4	52,8	57,6	72,0
KL140H	1,14	14,1	17,0	23,2	35,7	38,2	43,4	56,0	72,8	75,6	95,0
	1,10	14,8	17,9	26,3	44,1	48,5	56,0	70,0	84,,0	92,4	116,0
	1,05	15,1	18,2	27,4	53,2	59,7	68,6	86,8	100,8	117,6	143,0
	1,00	15,4	18,4	28,0	59,5	68,1	79,8	103,6	123,2	134,4	168,0
KL170H	1,14	17,1	20,6	28,2	43,3	46,5	52,7	68,0	88,4	91,8	115,5
	1,10	17,9	21,6	31,9	53,5	58,9	68,0	85,0	102,0	112,2	141,0
	1,05	18,3	22,0	33,3	64,6	72,5	83,3	105,4	122,4	142,8	173,0
	1,00	18,7	22,3	34,0	72,2	82,7	96,9	125,8	149,6	163,2	204,0
KL200H	1,14	20,1	24,2	33,2	51,0	54,6	62,0	80,0	104,0	108,0	136,0
	1,10	21,1	25,4	37,6	63,0	69,3	80,0	100,0	120,0	132,0	165,0
	1,05	21,5	25,9	39,2	76,0	85,3	98,0	124,0	144,0	168,0	204,0
	1,00	22,0	26,2	40,0	85,0	97,3	114,0	148,0	176,0	192,0	240,0
KL270H	1,14	27,1	32,7	44,8	68,8	73,8	83,7	108,0	140,4	145,8	183,0
	1,10	28,5	34,4	50,7	85,0	93,6	108,0	135,0	162,0	178,2	223,0
	1,05	29,1	35,0	52,9	102,0	115,2	132,3	167,4	194,4	226,8	275,0
	1,00	29,7	35,4	54,0	114,7	131,4	153,9	199,8	237,6	259,0	324,0
KL375H	1,14	37,7	45,5	62,2	95,6	102,5	116,2	150,0	195,0	202,0	254,0
	1,10	39,5	47,8	70,5	118,0	130,0	150,0	187,5	225,0	247,0	310,0
	1,05	40,3	48,7	73,5	142,5	160,0	183,7	232,5	270,0	315,0	382,0
	1,00	41,2	49,2	75,0	159,0	182,5	213,7	277,5	330,0	360,0	450,0
KL500H	1,14	50,3	60,7	83,0	127,5	136,0	155,0	200,0	260,0	270,0	340,0
	1,10	52,8	63,7	94,0	157,5	173,3	200,0	250,0	300,0	330,0	414,0
	1,05	53,9	64,9	98,0	190,0	213,3	245,0	310,0	360,0	420,0	560,0
	1,00	55,0	65,6	100,0	212,0	243,3	285,0	370,0	440,0	480,0	600,0

BATTERIES AND CELLS PRODUCED BY NiCad

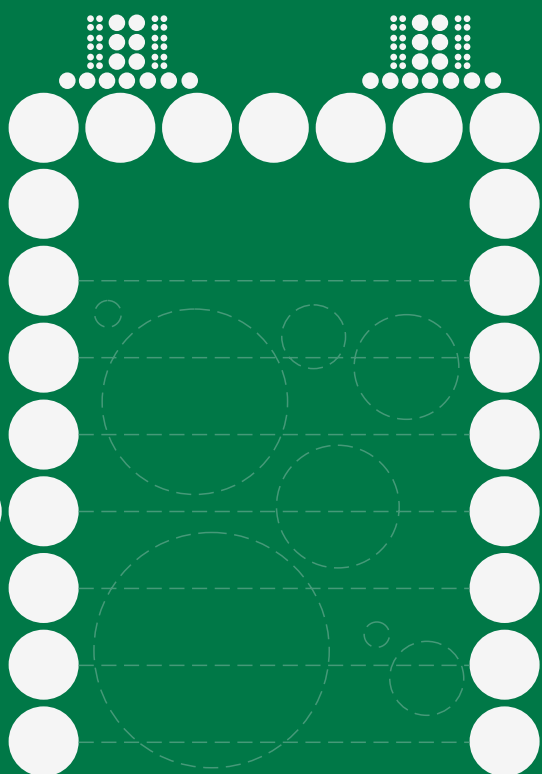
Plastic container



Metal container



Caution: All the data given in the chart are approximate values



NiCad

NICAD sp. z o.o.
Ul. Polna 8
62-001 Gołęczewo
NIP 779-22-07-392

Tel.: +48 (061) 811 74 40
Kom. +48 603 118 645
Fax: +48 (061) 811 74 40
e-mail: nicad@nicad.pl