

FUKUDA®

Delivering Power To People



FUKUDA® Nickel Cadmium Battery

is the most reliable source for standby backup today.

The Nickel Cadmium battery is manufactured to a design standard that meets a variety of harsh environments with a wide temperature range.

It has resilience to handle electrical and mechanical abuse.

Environmentally friendly, it is recyclable.



APPLICATIONS



- Switchgear Tripping
- Oil & Gas Petrochemical
- Railway Lighting/Starting
- Emergency Power Backup
- Uninterrupted Power Supply (UPS)
- Photovoltaic | Telecommunication System

MANUFACTURING STANDARD

FUKUDA® Nickel Cadmium Battery

has complied with all requirements specified by IEC 60623

INTRODUCTION

Introducing **FUKUDA** Pocket Plated Nickel Cadmium Battery – the most reliable battery system available in the market today.

It is designed and manufactured for a wide variety of harsh environments at wide temperature range, resistance to electrical and mechanical abuse and recyclable.

It is not surprising, therefore, that the nickel cadmium battery has become an obvious first choice for users looking for a reliable, long life, low maintenance, system.

FUKUDA NICKEL CADMIUM BATTERY

FUKUDA KAP Series Nickel Cadmium Battery works by an electrochemical reaction between a Nickel positive plate and a Cadmium negative plate, immersed in a liquid alkaline electrolyte (potassium hydroxide). This reaction produces a nominal voltage of 1.2 volts per cell. Required voltages are obtained by connecting these cells together in series to form a battery. The potassium hydroxide electrolyte used in **FUKUDA** Nickel Cadmium cells acts only as an ion conductor between the positive and negative plates and takes no part in the chemical reaction of the cell. As the concentration of the electrolyte does not alter during operation, the battery is not damaged at low temperatures, due to freezing.

All **FUKUDA** Nickel Cadmium batteries are fitted with a flip top flame arrestor vent designed to increase the operational safety in all environments.

BATTERY CASING

FUKUDA cell comes in both high-impact translucent polypropylene casing. Easy to assemble and allow full visibility of the electrolyte level.

MANUFACTURING STANDARD

FUKUDA Nickel Cadmium Batteries has complied with all requirements specified by IEC60623 and making them suitable for any local regulation.

BATTERY DESIGN FEATURE

- More than 15 years long life time
- Operation over a wide range of temperatures
 - 40°C to + 60°C
- No sudden death
- Flip-top flame arresting vents as standard
- High cycle ability
- Easy to transport and install. It can be stored for long period without the need of refresher charges.
- Resistance to electrical and mechanical abuse

APPLICATION

- Petrochemical Refineries
- Switchgear Tripping
- Railway Signalling
- Power Plants
- Emergency Power Backup
- UPS, etc.
- Water Treatment Plant

TECHNICAL CHARACTERISTICS

CHARGING

The battery can be charged by all normal methods. Generally, batteries in parallel operations with charger and load are charged with constant voltage. In operations where the battery is charged separately from the load, charging with constant current is recommended. High-rate or overcharging will not damage the battery, but excessive charging will increase water consumption to certain degree.

NOMINAL VOLTAGE PER CELL

Nominal voltage : 1.2 V/cell

CONSTANT VOLTAGE CHARGING

Continuous parallel operation with occasional battery discharge. A high voltage will increase the speed and efficiency of the recharging.

Recommended charge voltage :

Float charge : 1.40 – 1.42 V/cell

Boost charge : 1.55 – 1.60 V/cell

Commissioning charge : 1.70 – 1.75 V/cell

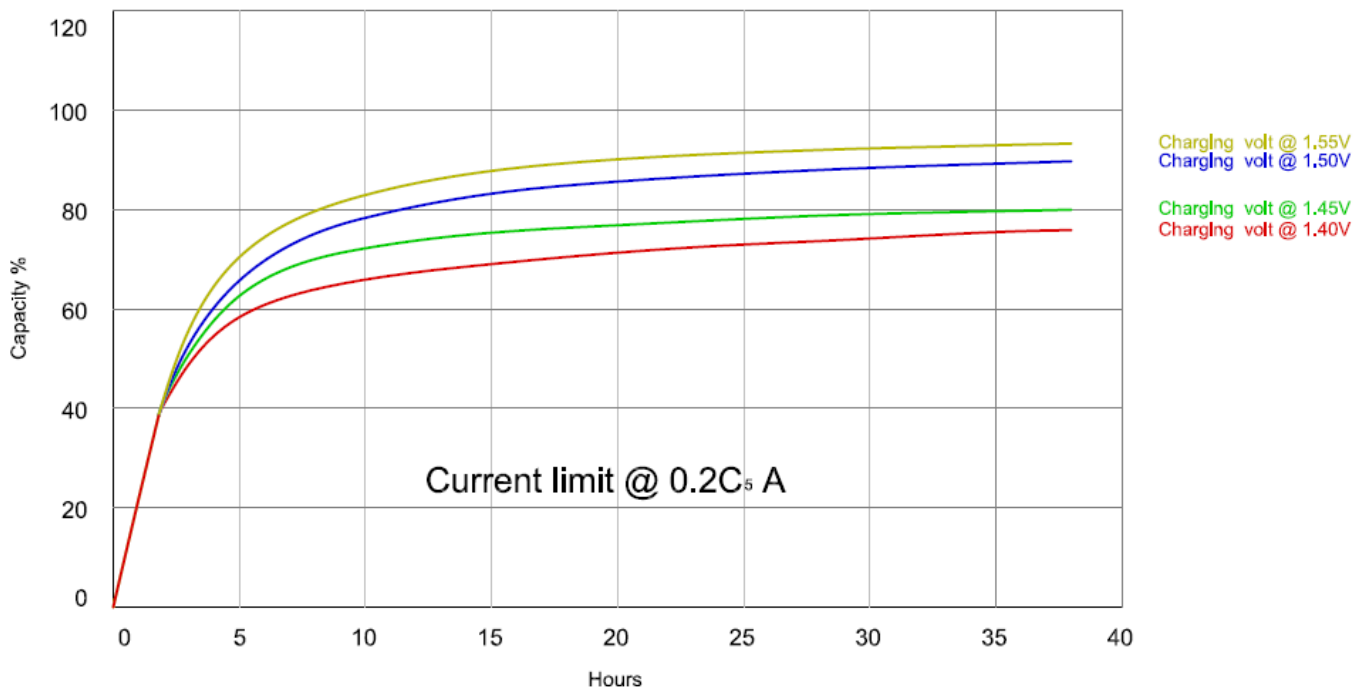
CONSTANT CURRENT CHARGING

Normal Charge : 0.2C₅ amperes for 10 hours

Fast Charge : 0.4C₅ amperes for 2.5 hours
followed by 0.2C₅ amperes
for 2.5 hours

Minimum Current Charge : 2.0 mA per Ah

CHARGING CURVES



Charging Curves of KAP Rate Series (20 ± 5 °C)

CELL CAPACITY AND DIMENSIONS

| Cell Type | Nominal Capacity (Ah) | Cell Dimension (mm) | | | Cell Weights Filled (kg) | Electrolyte Litres |
|-----------|-----------------------|---------------------|--------|--------|--------------------------|--------------------|
| | | Width | Length | Height | | |
| KAP 1 | 10 | 84 | 38 | 157 | 1.00 | 0.16 |
| KAP 2 | 20 | 110 | 30 | 230 | 1.80 | 0.60 |
| KAP 3 | 30 | 132 | 54 | 273 | 2.00 | 0.50 |
| KAP 4 | 40 | 132 | 54 | 273 | 2.60 | 0.50 |
| KAP 5 | 50 | 136 | 62 | 277 | 3.50 | 0.90 |
| KAP 6 | 60 | 140 | 71 | 300 | 4.00 | 1.10 |
| KAP 8 | 80 | 140 | 71 | 300 | 4.60 | 0.90 |
| KAP 10 | 100 | 135 | 77 | 373 | 6.00 | 1.40 |
| KAP 13 | 130 | 162 | 108 | 340 | 9.00 | 1.85 |
| KAP 15 | 150 | 162 | 108 | 340 | 9.30 | 2.00 |
| KAP 18 | 180 | 162 | 108 | 340 | 13.00 | 3.10 |
| KAP 20 | 200 | 162 | 108 | 340 | 10.00 | 1.80 |
| KAP 25 | 250 | 240 | 142 | 420 | 14.00 | 3.40 |
| KAP 30 | 300 | 245 | 145 | 450 | 21.00 | 6.00 |
| KAP 35 | 350 | 245 | 145 | 450 | 23.00 | 5.80 |
| KAP 40 | 400 | 245 | 145 | 450 | 23.00 | 5.00 |
| KAP 50 | 500 | 245 | 140 | 490 | 33.60 | 7.80 |
| KAP 60 | 600 | 285 | 172 | 490 | 34.00 | 7.50 |
| KAP 70 | 700 | 285 | 172 | 490 | 40.00 | 9.40 |
| KAP 80 | 800 | 395 | 185 | 560 | 57.50 | 15.50 |
| KAP 90 | 900 | 395 | 185 | 560 | 63.50 | 17.00 |
| KAP 100 | 1000 | 395 | 185 | 560 | 70.00 | 18.50 |
| KAP 110 | 1100 | 395 | 185 | 560 | 76.00 | 20.00 |
| KAP 120 | 1200 | 395 | 185 | 560 | 82.00 | 21.50 |

KAP Series Battery

Discharge performance data after prolonged float charge of fully charged cells
Available Ampere at 20°C ±5°C

END VOLTAGE 1.00 VOLT / CELL

| Cell Type | C5 Ah | Hours | | | | | | Minutes | | | | | | Seconds | | |
|-----------|-------|-------|------|------|------|------|------|---------|------|------|------|------|------|---------|------|------|
| | | 10 | 8 | 5 | 3 | 2 | 1 | 30 | 20 | 15 | 10 | 5 | 1 | 30 | 5 | 1 |
| KAP 1 | 10 | 1.03 | 1.28 | 2.0 | 3.2 | 4.5 | 6.7 | 8.6 | 8.3 | 10.3 | 11.0 | 12.3 | 15.1 | 15.6 | 19.1 | 19.5 |
| KAP 2 | 20 | 2.06 | 2.55 | 4.0 | 6.2 | 8.9 | 13.2 | 16.6 | 17.8 | 18.7 | 20.9 | 22.8 | 29.7 | 35.3 | 42.0 | 43.0 |
| KAP 3 | 30 | 3.09 | 3.83 | 6.0 | 9.3 | 13.2 | 19.5 | 24.0 | 25.5 | 27.5 | 30.4 | 33.2 | 48.3 | 52.7 | 57.3 | 58.7 |
| KAP 4 | 40 | 4.12 | 5.11 | 8.0 | 12.4 | 18.3 | 26.3 | 32.6 | 34.3 | 36.8 | 40.8 | 44.1 | 56.4 | 70.5 | 75.7 | 78.3 |
| KAP 5 | 50 | 5.15 | 6.39 | 10.0 | 15.5 | 22.3 | 32.5 | 40.3 | 42.5 | 45.4 | 51.2 | 59.8 | 69.3 | 91.3 | 95.5 | 97.9 |
| KAP 6 | 60 | 6.19 | 7.66 | 12.0 | 18.6 | 26.1 | 39.6 | 48.4 | 51.2 | 54.8 | 62.3 | 71.4 | 92.4 | 107 | 114 | 117 |
| KAP 8 | 80 | 8.25 | 10.2 | 16.0 | 24.8 | 35.6 | 52.9 | 64.2 | 68.5 | 72.1 | 84.4 | 94.5 | 118 | 143 | 152 | 156 |
| KAP 10 | 100 | 10.3 | 12.8 | 20.0 | 32.8 | 45.1 | 67.4 | 87.5 | 96.7 | 105 | 110 | 123 | 152 | 177 | 191 | 195 |
| KAP 13 | 130 | 13.4 | 16.6 | 26.0 | 41.1 | 57.3 | 93.4 | 104 | 124 | 134 | 130 | 164 | 183 | 212 | 273 | 254 |
| KAP 15 | 150 | 15.5 | 19.2 | 30.0 | 46.5 | 65.5 | 97.5 | 120 | 128 | 135 | 152 | 173 | 210 | 265 | 286 | 293 |
| KAP 18 | 180 | 18.4 | 22.3 | 36.0 | 54.4 | 76.1 | 114 | 140 | 154 | 164 | 182 | 202 | 245 | 309 | 334 | 342 |
| KAP 20 | 200 | 20.6 | 25.5 | 40.0 | 62.4 | 86.7 | 130 | 160 | 180 | 192 | 211 | 230 | 280 | 353 | 382 | 391 |
| KAP 25 | 250 | 25.8 | 31.9 | 50.0 | 77.5 | 108 | 163 | 200 | 213 | 225 | 250 | 288 | 305 | 390 | 477 | 489 |
| KAP 30 | 300 | 30.9 | 38.3 | 60.0 | 96.3 | 128 | 205 | 260 | 281 | 300 | 327 | 360 | 402 | 450 | 573 | 587 |
| KAP 35 | 350 | 36.1 | 44.7 | 70.0 | 112 | 154 | 253 | 280 | 315 | 336 | 370 | 403 | 489 | 526 | 607 | 685 |
| KAP 40 | 400 | 41.2 | 51.1 | 80.0 | 124 | 168 | 260 | 320 | 340 | 360 | 422 | 461 | 559 | 624 | 764 | 783 |
| KAP 50 | 500 | 51.5 | 63.9 | 100 | 159 | 210 | 325 | 400 | 415 | 450 | 528 | 550 | 610 | 780 | 955 | 979 |
| KAP 60 | 600 | 61.9 | 76.6 | 120 | 189 | 252 | 390 | 480 | 510 | 540 | 634 | 660 | 732 | 936 | 1146 | 1174 |
| KAP 70 | 700 | 72.2 | 89.4 | 140 | 221 | 294 | 455 | 560 | 595 | 630 | 739 | 770 | 854 | 1093 | 1337 | 1370 |
| KAP 80 | 800 | 82.5 | 103 | 160 | 253 | 336 | 520 | 640 | 680 | 720 | 845 | 880 | 976 | 1249 | 1528 | 1566 |
| KAP 90 | 900 | 92.8 | 115 | 180 | 284 | 378 | 585 | 720 | 765 | 810 | 950 | 990 | 1098 | 1405 | 1719 | 1762 |
| KAP 100 | 1000 | 103 | 128 | 200 | 315 | 420 | 650 | 800 | 850 | 900 | 1056 | 1100 | 1220 | 1561 | 1910 | 1958 |
| KAP 110 | 1100 | 113 | 141 | 220 | 347 | 462 | 715 | 880 | 935 | 990 | 1162 | 1210 | 1342 | 1651 | 1981 | 2129 |
| KAP 120 | 1200 | 124 | 153 | 240 | 378 | 504 | 780 | 960 | 1020 | 1080 | 1264 | 1320 | 1464 | 1801 | 2161 | 2323 |

END VOLTAGE 1.05 VOLT / CELL

| Cell Type | C5 Ah | Hours | | | | | | Minutes | | | | | | Seconds | | |
|-----------|-------|-------|------|------|------|------|------|---------|------|------|------|------|------|---------|------|------|
| | | 10 | 8 | 5 | 3 | 2 | 1 | 30 | 20 | 15 | 10 | 5 | 1 | 30 | 5 | 1 |
| KAP 1 | 10 | 1.02 | 1.26 | 1.96 | 3.1 | 4.3 | 6.1 | 6.9 | 7.6 | 8.2 | 8.7 | 11.2 | 12.9 | 14.3 | 16.1 | 16.8 |
| KAP 2 | 20 | 2.04 | 2.53 | 3.92 | 6.1 | 8.5 | 12.2 | 13.8 | 15.2 | 16.4 | 17.4 | 22.1 | 25.8 | 31.4 | 35.3 | 37.1 |
| KAP 3 | 30 | 3.06 | 3.79 | 5.88 | 9.2 | 12.8 | 18.3 | 20.7 | 22.8 | 24.6 | 26.1 | 33.0 | 38.7 | 42.8 | 48.1 | 50.6 |
| KAP 4 | 40 | 4.08 | 5.05 | 7.84 | 12.2 | 17.1 | 24.4 | 27.6 | 30.4 | 32.8 | 34.8 | 42.9 | 51.6 | 57.1 | 64.1 | 67.5 |
| KAP 5 | 50 | 5.10 | 6.31 | 9.80 | 15.3 | 21.4 | 30.5 | 34.5 | 38 | 41 | 43.5 | 55.4 | 64.5 | 71.4 | 80.2 | 84.3 |
| KAP 6 | 60 | 6.12 | 7.58 | 11.8 | 18.4 | 25.6 | 36.6 | 41.4 | 45.6 | 49.2 | 52.2 | 66 | 77.4 | 85.7 | 96 | 101 |
| KAP 8 | 80 | 8.16 | 10.1 | 15.7 | 24.5 | 34.2 | 48.8 | 55.2 | 60.8 | 65.6 | 69.6 | 88 | 103 | 114 | 128 | 135 |
| KAP 10 | 100 | 10.2 | 12.7 | 19.8 | 30.6 | 42.7 | 61.7 | 69.8 | 76.5 | 82.1 | 87.4 | 110 | 129 | 142 | 160 | 168 |
| KAP 13 | 130 | 13.3 | 16.5 | 25.7 | 40.3 | 55.1 | 87.3 | 95.6 | 112 | 122 | 127 | 147 | 171 | 185 | 208 | 219 |
| KAP 15 | 150 | 15.3 | 19.1 | 29.7 | 45.9 | 64.1 | 91.5 | 104 | 114 | 123 | 131 | 165 | 194 | 213 | 240 | 253 |
| KAP 18 | 180 | 18.2 | 22.2 | 34.6 | 53.5 | 74.7 | 107 | 121 | 133 | 144 | 153 | 193 | 226 | 249 | 280 | 295 |
| KAP 20 | 200 | 20.4 | 25.4 | 39.6 | 61.2 | 85.4 | 122 | 138 | 152 | 164 | 174 | 220 | 258 | 285 | 320 | 337 |
| KAP 25 | 250 | 25.5 | 31.8 | 49.5 | 76.5 | 107 | 153 | 173 | 190 | 205 | 218 | 275 | 281 | 356 | 400 | 421 |
| KAP 30 | 300 | 30.6 | 38.1 | 59.4 | 94 | 122 | 180 | 217 | 240 | 251 | 274 | 308 | 339 | 427 | 480 | 506 |
| KAP 35 | 350 | 35.7 | 44.5 | 69.3 | 107 | 148 | 233 | 258 | 302 | 327 | 357 | 398 | 452 | 499 | 560 | 590 |
| KAP 40 | 400 | 40.8 | 50.8 | 79.2 | 125 | 163 | 240 | 289 | 320 | 335 | 365 | 411 | 517 | 570 | 640 | 675 |
| KAP 50 | 500 | 51.0 | 63.5 | 99.0 | 157 | 203 | 300 | 362 | 400 | 418 | 457 | 513 | 565 | 713 | 801 | 813 |
| KAP 60 | 600 | 61.2 | 76.2 | 119 | 188 | 244 | 360 | 434 | 480 | 502 | 548 | 616 | 678 | 855 | 961 | 1012 |
| KAP 70 | 700 | 71.4 | 88.9 | 139 | 219 | 285 | 420 | 506 | 560 | 586 | 639 | 719 | 791 | 1000 | 1121 | 1181 |
| KAP 80 | 800 | 81.6 | 102 | 158 | 251 | 325 | 480 | 579 | 640 | 669 | 731 | 821 | 904 | 1141 | 1281 | 1350 |
| KAP 90 | 900 | 91.8 | 114 | 178 | 282 | 366 | 540 | 651 | 720 | 753 | 822 | 924 | 1017 | 1283 | 1441 | 1518 |
| KAP 100 | 1000 | 102 | 127 | 198 | 313 | 407 | 600 | 723 | 800 | 837 | 913 | 1027 | 1130 | 1426 | 1602 | 1687 |
| KAP 110 | 1100 | 112 | 140 | 218 | 345 | 447 | 660 | 796 | 880 | 920 | 1005 | 1129 | 1231 | 1569 | 1761 | 1856 |
| KAP 120 | 1200 | 122 | 152 | 238 | 376 | 488 | 720 | 868 | 960 | 1004 | 1096 | 1232 | 1344 | 1712 | 1921 | 2025 |

KAP Series Battery

Discharge performance data after prolonged float charge of fully charged cells
Available Ampere at 20°C ±5°C

END VOLTAGE 1.10 VOLT / CELL

| Cell Type | C5 Ah | Hours | | | | | | | Minutes | | | | | | Seconds | | |
|-----------|-------|-------|------|------|------|------|------|------|---------|------|------|------|------|------|---------|------|--|
| | | 10 | 8 | 5 | 3 | 2 | 1 | 30 | 20 | 15 | 10 | 5 | 1 | 30 | 5 | 1 | |
| KAP 1 | 10 | 1.00 | 1.23 | 1.8 | 2.9 | 4.1 | 4.7 | 5.8 | 6.4 | 6.6 | 7.3 | 8.5 | 10.1 | 11.5 | 13.8 | 14.3 | |
| KAP 2 | 20 | 2.00 | 2.45 | 3.7 | 5.8 | 8.2 | 9.4 | 11.6 | 12.8 | 13.2 | 14.6 | 17.4 | 20.2 | 25.4 | 30.1 | 31.6 | |
| KAP 3 | 30 | 3.00 | 3.68 | 5.6 | 8.7 | 11.9 | 14.1 | 17.4 | 19.2 | 19.8 | 21.9 | 25.5 | 30.3 | 35.9 | 41.2 | 43.0 | |
| KAP 4 | 40 | 4.00 | 4.9 | 7.5 | 11.6 | 15.9 | 18.8 | 23.2 | 25.6 | 26.4 | 29.2 | 34.3 | 40.4 | 47.5 | 54.9 | 57.4 | |
| KAP 5 | 50 | 5.00 | 6.1 | 9.4 | 14.6 | 19.9 | 23.5 | 29.0 | 32.1 | 33.7 | 36.5 | 42.5 | 50.5 | 59.1 | 68.6 | 71.7 | |
| KAP 6 | 60 | 6.00 | 7.3 | 11.3 | 17.5 | 23.9 | 28.2 | 34.8 | 38.4 | 39.6 | 43.8 | 51.2 | 60.6 | 71.5 | 82.3 | 86.1 | |
| KAP 8 | 80 | 8.00 | 9.8 | 15.1 | 23.3 | 31.8 | 37.6 | 46.4 | 51.2 | 52.8 | 58.4 | 68.4 | 80.8 | 95.4 | 109 | 114 | |
| KAP 10 | 100 | 10.0 | 12.3 | 18.8 | 29.1 | 39.8 | 47.2 | 58.3 | 64.7 | 66.1 | 73.1 | 85.8 | 101 | 120 | 137 | 143 | |
| KAP 13 | 130 | 13.0 | 16.0 | 24.5 | 38.9 | 48.6 | 61.1 | 75.4 | 83.2 | 85.8 | 109 | 121 | 141 | 155 | 178 | 186 | |
| KAP 15 | 150 | 15.0 | 18.4 | 28.5 | 43.7 | 59.7 | 70.5 | 87.7 | 96.5 | 99.2 | 110 | 128 | 152 | 179 | 205 | 215 | |
| KAP 18 | 180 | 18.0 | 21.4 | 33.1 | 50.9 | 69.6 | 82.4 | 102 | 112 | 116 | 128 | 149 | 177 | 209 | 240 | 251 | |
| KAP 20 | 200 | 20.0 | 24.5 | 37.7 | 58.2 | 79.6 | 94.3 | 116 | 128 | 132 | 146 | 170 | 202 | 238 | 274 | 287 | |
| KAP 25 | 250 | 25.0 | 30.7 | 47.1 | 72.8 | 99.5 | 118 | 145 | 160 | 165 | 183 | 213 | 253 | 288 | 343 | 358 | |
| KAP 30 | 300 | 30.0 | 36.8 | 56.5 | 82 | 106 | 138 | 178 | 195 | 208 | 217 | 251 | 276 | 345 | 411 | 430 | |
| KAP 35 | 350 | 35.0 | 42.9 | 65.9 | 104 | 130 | 165 | 203 | 224 | 231 | 256 | 326 | 354 | 403 | 480 | 502 | |
| KAP 40 | 400 | 40.0 | 49.1 | 75.3 | 109 | 141 | 184 | 237 | 260 | 277 | 289 | 335 | 368 | 460 | 549 | 574 | |
| KAP 50 | 500 | 50.0 | 61.3 | 94.2 | 137 | 177 | 230 | 297 | 325 | 347 | 362 | 418 | 460 | 576 | 686 | 717 | |
| KAP 60 | 600 | 60.0 | 73.6 | 113 | 164 | 212 | 276 | 356 | 390 | 416 | 434 | 502 | 552 | 691 | 823 | 861 | |
| KAP 70 | 700 | 70.0 | 85.9 | 132 | 191 | 247 | 322 | 415 | 455 | 485 | 506 | 586 | 644 | 805 | 959 | 1000 | |
| KAP 80 | 800 | 80.0 | 98.2 | 151 | 219 | 283 | 368 | 475 | 520 | 555 | 579 | 669 | 736 | 921 | 1098 | 1148 | |
| KAP 90 | 900 | 90.0 | 110 | 169 | 246 | 318 | 414 | 534 | 585 | 624 | 651 | 753 | 828 | 1036 | 1235 | 1291 | |
| KAP 100 | 1000 | 100 | 123 | 188 | 273 | 353 | 460 | 593 | 650 | 693 | 723 | 837 | 920 | 1152 | 1372 | 1453 | |
| KAP 110 | 1100 | 110 | 135 | 207 | 301 | 389 | 506 | 653 | 715 | 763 | 796 | 920 | 1012 | 1268 | 1515 | 1575 | |
| KAP 120 | 1200 | 120 | 147 | 226 | 328 | 424 | 552 | 712 | 780 | 832 | 868 | 1004 | 1104 | 1384 | 1654 | 1718 | |

END VOLTAGE 1.14 VOLT / CELL

| Cell Type | C5 Ah | Hours | | | | | | | Minutes | | | | | | Seconds | | |
|-----------|-------|-------|------|------|------|------|------|------|---------|------|------|------|------|------|---------|------|--|
| | | 10 | 8 | 5 | 3 | 2 | 1 | 30 | 20 | 15 | 10 | 5 | 1 | 30 | 5 | 1 | |
| KAP 1 | 10 | 0.98 | 1.2 | 1.6 | 2.7 | 3.2 | 4.6 | 4.7 | 5.3 | 5.8 | 6.1 | 6.6 | 8.9 | 10.5 | 10.9 | 11.2 | |
| KAP 2 | 20 | 1.96 | 2.4 | 3.3 | 5.4 | 6.5 | 8.5 | 9.4 | 10.6 | 11.6 | 12.2 | 13.1 | 17.8 | 21.7 | 24.1 | 24.6 | |
| KAP 3 | 30 | 2.94 | 3.5 | 4.9 | 8.1 | 9.7 | 12.3 | 14.1 | 15.8 | 17.4 | 18.3 | 19.5 | 26.7 | 31.5 | 32.7 | 33.6 | |
| KAP 4 | 40 | 3.92 | 4.7 | 6.6 | 10.8 | 12.9 | 16.7 | 18.8 | 21.1 | 23.2 | 24.4 | 28.5 | 35.6 | 41.9 | 43.6 | 44.8 | |
| KAP 5 | 50 | 4.90 | 5.9 | 8.3 | 13.6 | 16.2 | 20.4 | 23.5 | 26.4 | 29 | 30.5 | 35.4 | 44.5 | 52.5 | 54.5 | 56.1 | |
| KAP 6 | 60 | 5.88 | 7.1 | 10.0 | 16.3 | 19.4 | 24.6 | 28.2 | 31.7 | 34.8 | 36.6 | 42.3 | 53.4 | 62.9 | 64.4 | 67.2 | |
| KAP 8 | 80 | 7.84 | 9.4 | 13.3 | 21.7 | 25.8 | 32.8 | 37.6 | 42.2 | 46.4 | 48.8 | 56.9 | 71.2 | 83.4 | 87.3 | 89.6 | |
| KAP 10 | 100 | 9.80 | 11.8 | 16.6 | 27.1 | 32.3 | 40.1 | 47.4 | 52.8 | 58.3 | 61.1 | 70.5 | 89.3 | 104 | 108 | 118 | |
| KAP 13 | 130 | 12.7 | 15.0 | 21.6 | 36.1 | 42.8 | 59.8 | 61.1 | 68.5 | 83.3 | 87.7 | 97.3 | 119 | 129 | 139 | 146 | |
| KAP 15 | 150 | 14.7 | 17.7 | 24.9 | 40.7 | 48.5 | 60.4 | 70.5 | 79.2 | 87.6 | 91.5 | 105 | 133 | 142 | 152 | 168 | |
| KAP 18 | 180 | 17.2 | 20.6 | 29.0 | 47.4 | 56.5 | 70.4 | 82.3 | 92.6 | 102 | 107 | 122 | 156 | 177 | 185 | 196 | |
| KAP 20 | 200 | 19.6 | 23.6 | 33.2 | 54.2 | 64.6 | 80.5 | 94.2 | 106 | 116 | 122 | 140 | 178 | 211 | 218 | 224 | |
| KAP 25 | 250 | 24.5 | 28.8 | 41.5 | 65.9 | 80.8 | 100 | 118 | 132 | 145 | 153 | 175 | 223 | 263 | 272 | 280 | |
| KAP 30 | 300 | 29.4 | 34.6 | 49.8 | 68.3 | 82.3 | 120 | 139 | 158 | 168 | 178 | 217 | 258 | 310 | 327 | 330 | |
| KAP 35 | 350 | 34.3 | 40.4 | 58.0 | 79.9 | 91.0 | 128 | 165 | 185 | 203 | 214 | 269 | 321 | 368 | 381 | 392 | |
| KAP 40 | 400 | 39.2 | 46.1 | 66.2 | 92.5 | 105 | 136 | 185 | 211 | 224 | 237 | 289 | 376 | 393 | 436 | 448 | |
| KAP 50 | 500 | 49.0 | 57.6 | 82.9 | 116 | 133 | 168 | 232 | 263 | 280 | 297 | 362 | 430 | 522 | 545 | 560 | |
| KAP 60 | 600 | 58.8 | 69.2 | 100 | 139 | 159 | 201 | 278 | 316 | 336 | 356 | 434 | 516 | 627 | 654 | 672 | |
| KAP 70 | 700 | 68.6 | 80.7 | 116 | 162 | 186 | 235 | 324 | 369 | 392 | 415 | 506 | 602 | 731 | 763 | 784 | |
| KAP 80 | 800 | 78.4 | 92.2 | 133 | 185 | 210 | 268 | 371 | 421 | 448 | 475 | 579 | 688 | 845 | 873 | 896 | |
| KAP 90 | 900 | 88.2 | 104 | 149 | 206 | 237 | 301 | 417 | 474 | 504 | 534 | 651 | 774 | 940 | 982 | 1008 | |
| KAP 100 | 1000 | 98.0 | 115 | 166 | 230 | 260 | 334 | 463 | 527 | 560 | 593 | 723 | 860 | 1043 | 1091 | 1120 | |
| KAP 110 | 1100 | 108 | 127 | 182 | 253 | 289 | 367 | 510 | 579 | 616 | 653 | 796 | 946 | 1130 | 1200 | 1232 | |
| KAP 120 | 1200 | 117 | 138 | 199 | 275 | 315 | 403 | 556 | 632 | 672 | 712 | 868 | 1032 | 1225 | 1309 | 1352 | |