PRODUCT CATALOGUE

Lomain Single Cell Ni-Cd Battery Range

GAZ ENERGY

140 years of excellence

Throughout our rich history, GAZ Geräte-und Akkumulatorenwerk Zwickau has always been at the forefront of technological development. Today we rank among the leading suppliers of industrial Ni-Cd batteries and energy storage solutions based on Li-ion batteries.

We develop and manufacture Ni-Cd cells of highest quality, pushing the boundaries of this proven chemistry with innovative design features. Delivering customized battery solutions to customers around the world, our battery systems serve as backup power sources for critical equipment in industries ranging from oil and gas, energy and communications to transportation and other infrastructure.

European quality without compromise

GAZ ENERGY Lomain Range cells are built with uncompromised quality and workmanship in accordance to IEC 62259 standards and EU battery regulations. And not only to meet but exceed the performance requirements specified in the standard. Special non-woven, needled inert fabric separators ensures high permeability to facilitate gas recombination and the same time absorb enough amount of electrolyte (even through capillary effect when the cell electrolyte goes below Minimum level) for sufficient ion exchange among electrodes. These features in combination with a low-pressure operated, flame-arresting vent plugs ensures ultra-low or no maintenance during its service life in normal operations.

MADE IN GERMANY
GAZ ENERGY
SINCE 1884

Superb performance and reliability with minimal maintenance

The unique design of GAZ ENERGY Lomain cells is optimized for ultra-low maintenance requirements, yet without any compromise in performance or other qualities. Firstly, the cells have a large reserve of electrolyte, which extends topping up intervals. Cell poles have a dual seal to prevent electrolyte carbonization, while a special felt separator improves the recombination of gases released during charging. Its highly absorptive capacity also enables the electrolyte reserves to be utilized as efficiently as possible. Other innovations include optimized electrode design and a valve-regulated venting system which eliminates the need to replenish water during the cell's designed lifespan and under normal operating conditions.

Together, these features make GAZ ENERGY Lomain cells a truly unique design which takes the proven Ni-Cd chemistry to another level. Not just in reliability and Total Cost of Ownership, but in a whole range of aspects, GAZ ENERGY Lomain cells far exceed industry standards, making them the first choice for the most demanding applications in energy or power backup even in extreme environments and remote locations.

Typical applications include

- UPS systems
- Emergency lighting
- Input power conditioning for critical processes
- Communication systems
- O&G on-shore, off-shore rigs
- O&G pipelines and refineries
- Trackside applications incl. railway signaling
  Security and alarm systems

GAZ ENERGY Lomain range of batteries offers

- Less maintenance costs
- Better recharge efficiency even at lower constant voltage boost charging
- More durability and safety thanks to its low-pressure valve operated flame arresting vent

Single cell construction

Low pressure valve regulated
Flame arresting vent plug

GAZ ENERGY safety terminal
Redundant leak protection minimizes carbonate formation

Electrode edge
Connected to terminal by bolting or welding providing high mechanical stability

Electrode frame
Consisting of electrode edge and side bars. Seals the plates and works as a current collector

Fleece separator
Special fleece separator insulates the plates and improves the internal recombination

Horizontal pockets
Formed by perforated steel strips containing the active material

GAZ ENERGY single cell design
Weld above the electrolyte level eliminates risk of faulty on the side and on the bottom of the cell

KGL and KGM ranges of the Lomain battery

GAZ ENERGY Ni-Cd Lomain cells build upon the proven pocket plate electrodes design that make GAZ ENERGY batteries the storage of choice for critical applications where failure is not an option. However, the Lomain range takes it even farther in terms of maximum service life and the lowest possible Total Cost of Ownership. Its outstanding features make the GAZ ENERGY Lomain range one of, if not the most reliable and advanced Ni-Cd battery on the market.

The optimal solution for any application

The KGL and KGM variants are designed to enhance their respective advantages. The choice between low and medium mixed load with momentary high discharge rates makes it easy to select the ideal battery for every usage.

	KGL	KGM
Capacity Steps	96	46
Capacity Range	10–1775 Ah	11–1560 Ah
Design and Performance	Thicker plate design for a low discharge rate of >3 h	Plate thickness optimized for medium, mixed or high discharge rates
Maintenance	Requiring zero or maximum one water top-up in 20+ years of designed service life	

General advantages of Pocket-Plate technology

- Robust all-steel electrodes insensitive to seismic vibration
- Short-term High rate of power discharge for mixed load
- Reliable for 20+ years
- Large electrolyte reserve reduces the need of top-up and thus optimizing the maintenance costs
- Comparable Lower internal resistance, higher charge acceptance even at low voltage charging
- No risk of sudden failure or thermal runaway
- No electrode corrosion or passivation in cells
- Better available capacity utilization even at lower temperature compared to other electrochemistries
- Tolerant to accidental over-charge and over-discharge
- No electrolyte stratification required
- Exceptional Total Cost-of-Ownership (TCO)
- Visible electrolyte level through translucent container
- No memory effect unlike with sealed cylindrical cell

Unique Features of GAZ ENERGY Lomain Ni-Cd cells

- Single cell design for all rated capacities are housed in unique mono-block plastic containers that has seamless, non-welded surface on all side walls and bottom of cell containe.
- All GAZ ENERGY cell containers are produced as one unit from a single injection molding. This ensures that liquid electrolyte inside the cell can never be stagnantly in contact with any plastic welded area.
- This ability prevent any chance of leakage of electrolyte and corresponding fire hazard in entire service life of GAZ ENERGY cells and minimizing handling and environmental hazards.
- More available capacity steps – More flexibility, in selection of sized battery for any applications.
- The extended range of GAZ ENERGY Lomain KGL reaches a new highest single cell capacity of 1775 Ah.
- Harmonized active mass distribution ratio among electrodes ensures the standardized Quality in production, minimizing Quality deviations and reduce production loses.
- Increased rechargeability, Faster recharge ensures maximum availability and system reliability.

GAZ ENERGY Lomain KGL Battery Range

GAZ ENERGY Lomain KGL cell type has been designed for low rates of discharge over long periods, i.e. the current is relatively low in comparison with the total stored energy. The discharges can generally be infrequent and the ideal discharge duration for the KGL range would be above 3 hours application.

The nominal C_5 capacity as per IEC 62259 of KGL range batteries is based on the available ampere hours (Ah) at a discharge rate of 5 hours to an end-of-discharge voltage 1.00 V per cell at 20 ± 5 °C.

Nominal voltage per cell
1.20 V per cell

Discharging conditions
The discharge performances as well as the nominal capacities C_5 given in this brochure are only valid for fully charged cells in accordance with IEC 62259.

Charging Recommendation – KGL Range

A. Constant Voltage
Recommendation for Stand-by Application

Boost Mode
Boost Voltage: 1.45–1.47 V/cell
Boost Current Limit: 0.1 I_t A dc

NOTE: Higher Boost voltage will improve the chargeability and charge duration but increase electrolysis and water consumption and affect the operation of low-pressure gas vent plugs. If a higher voltage and/or current limit is set features of lomain cells are affected.

Float Mode
Float Voltage: 1.40 –1.42 V/cell
Float Current: 1 to 2 mA/Ah cell capacity

Delay for switch from Boost to Float:
Boost Current ramped < 0.004 I_t A

Single level Charging
1.43–1.44 V/cell

Single level charging may increase the refilling rate or recharge time with operating conditions.

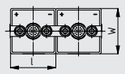
B. Constant Current mode

Charging for IEC-62259 Capacity Test
Constant Current: 0.1 I_t A dc for 16 h
Voltage Limit: No Limiting or >1.70 Vpc
Charging Temperature: 20 ± 5 °C

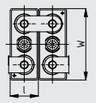
Fast Rechargeability
Fast rechargeability of GAZ ENERGY Lomain cells after a power failure, can be 80 ± 5% of the rated capacity in 8 h to 9 h at 1.46 ± 0.01 Vpc with 0.1 I_t A current limit at 20 °C to ensure optimum emergency backup power availability in an event of unpredictable mains failure of critical applications.

KGL 10 P - KGL 28 P

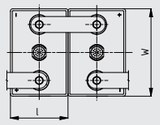
KGL 33 P - KGL 73 P



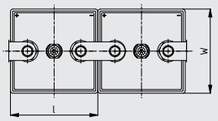
KGL 78 P - KGL 167 P



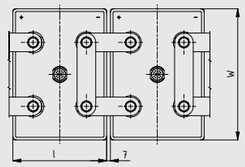
KGL 175 P - KGL 335 P



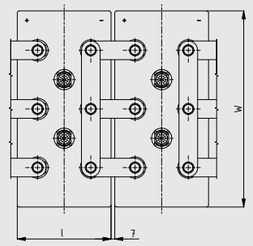
KGL 345 P - KGL 530 P



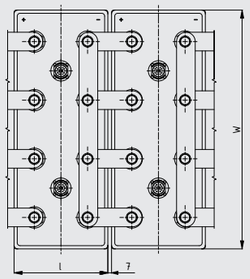
KGL 540 P - KGL 705 P



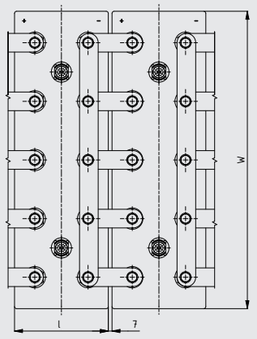
KGL 735 P - KGL 1060 P

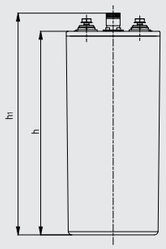


KGL 1080 P - KGL 1420 P



KGL 1475 P - KGL 1775 P





KGL Single Cell Range

Technical Specifications

KGL Type Models	IEC-62259 Capacity	Cell Dimensions [Tolerance ±2 mm]				Connection Type	Nr. Of Terminals	Type of Terminals	Electrolyte Volume	Filled Cell Weight	Internal Resistance
In Plastic Containers	5 h rate [C_5]	l	w	h	hl	M = Nut	Poles/Cell	Connector	Approx. [± 5%]	Approx. [± 5%]	IR at 100% SoC
	[Ah]	mm	mm	mm	mm	S = Screw	[Nr.]	Type	[L]	[Kg]	[mΩ]
KGL 10 P	10	46	85	237	262	M	2	M10	0,47	1,20	29,54
KGL 16 P	16					M	2	M10	0,43	1,31	18,82
KGL 20 P	20					M	2	M10	0,41	1,37	15,13
KGL 25 P	25					M	2	M10	0,38	1,45	12,23
KGL 28 P	28					M	2	M10	0,36	1,51	10,04
KGL 33 P	33	85	85	237	262	M	2	M10	0,87	2,31	8,34
KGL 38 P	38					M	2	M10	0,85	2,38	8,15
KGL 43 P	43					M	2	M10	0,82	2,48	6,62
KGL 47 P	47					M	2	M10	0,79	2,57	6,30
KGL 52 P	52					M	2	M10	0,77	2,63	5,59
KGL 57 P	57					M	2	M10	0,74	2,73	5,37
KGL 62 P	62					M	2	M10	0,71	2,80	4,80
KGL 67 P	67					M	2	M10	0,68	2,89	4,60
KGL 73 P	73					M	2	M10	0,65	2,97	3,76
KGL 78 P	78	53	134	364	392	S	2	M8	1,28	4,27	3,64
KGL 84 P	84					S	2	M8	1,25	4,34	3,29
KGL 93 P	93					S	2	M8	1,12	5,00	3,20
KGL 100 P	100					S	2	M8	1,09	5,09	2,74
KGL 105 P	105					S	2	M8	1,14	4,67	2,87
KGL 111 P	111					S	2	M8	1,10	4,75	2,45
KGL 116 P	116	69	134	364	392	S	2	M8	1,58	6,17	2,61
KGL 124 P	124					S	2	M8	1,54	6,28	2,38
KGL 132 P	132					S	2	M8	1,61	5,91	2,12
KGL 140 P	140					S	2	M8	1,57	6,02	2,12
KGL 147 P	147					S	2	M8	1,41	6,71	2,05
KGL 157 P	157					S	2	M8	1,47	6,37	1,75
KGL 167 P	167					S	2	M8	1,42	6,49	1,83
KGL 175 P	175	108	164	364	392	S	2	M8	3,70	9,53	1,59
KGL 187 P	187					S	2	M8	3,41	10,13	1,62
KGL 198 P	198					S	2	M8	3,56	9,94	1,54
KGL 205 P	205					S	2	M8	3,31	10,47	1,48
KGL 210 P	210					S	2	M8	3,51	10,10	1,47
KGL 222 P	222					S	2	M8	3,25	10,6	1,38
KGL 235 P	235					S	2	M8	3,39	10,5	1,17
KGL 245 P	245					S	2	M8	3,32	10,7	1,25
KGL 250 P	250					S	2	M8	3,08	11,2	1,21
KGL 260 P	260					S	2	M8	2,99	11,5	1,18
KGL 265 P	265					S	2	M8	3,21	11,0	1,03
KGL 280 P	280					S	2	M8	3,13	11,2	1,08
KGL 295 P	295					S	2	M8	2,84	12,0	0,98
KGL 300 P	300					S	2	M8	3,03	11,6	0,90
KGL 315 P	315					S	2	M8	2,74	12,2	0,89
KGL 320 P	320					S	2	M8	2,95	11,8	0,96
KGL 335 P	335					S	2	M8	2,85	12,1	0,87
KGL 345 P	345	164	158	364	392	S	2	M10	4,83	15,9	0,87
KGL 355 P	355					S	2	M10	4,77	16,1	0,82
KGL 365 P	365					S	2	M10	5,04	16,4	0,80
KGL 375 P	375					S	2	M10	4,66	16,4	0,75

* All dimensions and weights stated are subject to usual manufacturing tolerances. The right is reserved to make any alterations without prior notice.

KGL Single Cell Range

Technical Specifications

KGL Type Models	IEC-62259 Capacity	Cell Dimensions [Tolerance ±2 mm]				Connection Type	Nr. Of Terminals	Type of Terminals	Electrolyte Volume	Filled Cell Weight	Internal Resistance
In Plastic Containers	5 h rate [C_5]	l	w	h	hl	M = Nut	Poles/Cell	Connector	Approx. [± 5%]	Approx. [± 5%]	IR at 100% SoC
	[Ah]	mm	mm	mm	mm	S = Screw	[Nr.]	Type	[L]	[Kg]	[mΩ]
KGL 385 P	385	164	158	364	392	S	2	M10	4,61	16,6	0,76
KGL 395 P	395					S	2	M10	4,94	16,6	0,76
KGL 405 P	405					S	2	M10	4,86	16,9	0,75
KGL 410 P	410					S	2	M10	4,50	16,9	0,73
KGL 415 P	415					S	2	M10	4,46	17,1	0,72
KGL 425 P	425					S	2	M10	4,75	17,2	0,65
KGL 435 P	435					S	2	M10	4,68	17,5	0,68
KGL 440 P	440					S	2	M10	4,33	17,4	0,68
KGL 445 P	445					S	2	M10	4,30	17,6	0,61
KGL 455 P	455					S	2	M10	4,56	17,8	0,60
KGL 465 P	465					S	2	M10	4,50	18,0	0,60
KGL 475 P	475					S	2	M10	4,16	18,0	0,58
KGL 490 P	490					S	2	M10	4,38	18,4	0,56
KGL 505 P	505					S	2	M10	4,33	18,6	0,54
KGL 530 P	530					S	2	M10	4,20	18,9	0,54
KGL 540 P	540	176	246	382	408	S	4	M10	8,46	26,7	0,50
KGL 565 P	565					S	4	M10	8,31	27,1	0,49
KGL 585 P	585					S	4	M10	8,15	27,9	0,50
KGL 600 P	600					S	4	M10	8,10	27,8	0,47
KGL 625 P	625					S	4	M10	7,97	28,4	0,46
KGL 645 P	645					S	4	M10	7,94	28,3	0,42
KGL 670 P	670					S	4	M10	7,75	28,9	0,41
KGL 705 P	705					S	4	M10	7,56	29,4	0,43
KGL 735 P	735	176	368	382	418	S	6	M10	13,2	39,2	0,39
KGL 755 P	755					S	6	M10	13,2	39,6	0,39
KGL 790 P	790					S	6	M10	12,9	40,5	0,37
KGL 800 P	800					S	6	M10	12,9	40,3	0,34
KGL 850 P	850					S	6	M10	12,7	40,9	0,34
KGL 875 P	875					S	6	M10	12,4	42,0	0,34
KGL 900 P	900					S	6	M10	12,4	42,0	0,32
KGL 935 P	935					S	6	M10	12,2	42,8	0,32
KGL 960 P	960					S	6	M10	12,1	42,6	0,30
KGL 1010 P	1010					S	6	M10	11,8	43,6	0,30
KGL 1060 P	1060					S	6	M10	11,5	44,3	0,26
KGL 1080 P	1080	176	448	382	418	S	8	M10	15,2	51,4	0,28
KGL 1130 P	1130					S	8	M10	14,9	52,2	0,24
KGL 1175 P	1175					S	8	M10	14,6	53,7	0,25
KGL 1200 P	1200					S	8	M10	14,5	53,6	0,23
KGL 1250 P	1250					S	8	M10	14,3	54,7	0,22
KGL 1275 P	1275					S	8	M10	14,2	54,5	0,24
KGL 1330 P	1330					S	8	M10	13,8	55,8	0,20
KGL 1420 P	1420					S	8	M10	13,4	56,8	0,21
KGL 1475 P	1475	176	558	382	418	S	10	M10	18,3	66,5	0,19
KGL 1515 P	1515					S	10	M10	18,2	66,4	0,20
KGL 1575 P	1575					S	10	M10	17,9	67,8	0,19
KGL 1605 P	1605					S	10	M10	17,8	67,5	0,19
KGL 1675 P	1675					S	10	M10	17,3	69,1	0,17
KGL 1775 P	1775					S	10	M10	16,8	70,4	0,16

* All dimensions and weights stated are subject to usual manufacturing tolerances. The right is reserved to make any alterations without prior notice.

GAZ ENERGY Lomain KGM Battery Range

GAZ ENERGY Lomain range KGM cell type has been optimally designed for mixed load applications where these cells are capable of delivering variable high and also low rate discharges with economical battery capacity sizing. The discharges can generally be infrequent and the ideal discharge time for the KGM range is between 30 minutes till 3 hours but can perform for shorter duration even 1 minute discharge applications.

The nominal C_5 capacity of KGM range cells are based on the available ampere hours (Ah) at a discharge rate of 5 hours to a final discharge voltage of 1.15 V per cell (as per DIN 40771) and 1.00 V per cell (as per IEC 62259) at 20 ± 5 °C.

Nominal voltage per cell
1.20 V per cell

Discharging conditions
The discharge performances as well as the nominal capacities C_5 given in this brochure are only valid for fully charged cells in accordance with IEC 62259.

Charging Recommendation - KGM Range

A. Constant Voltage
Recommendation for Stand-by Application

Boost Mode
Boost Voltage: 1.44–1.46 V/cell
Boost Current Limit: 0.1 I_t A dc

NOTE: Higher Boost voltage will improve the chargeability and recharge duration but increase electrolysis and water consumption and affect the operation of low-pressure gas vent plugs. If a higher voltage and/or current limit is set features of lomain cells are affected.

Float Mode
Float Voltage: 1.40–1.42 V/cell
Float Current: 1 to 2 mA/Ah cell capacity

Delay for switch from Boost to Float:
Boost Current ramped < 0.004 I_t A

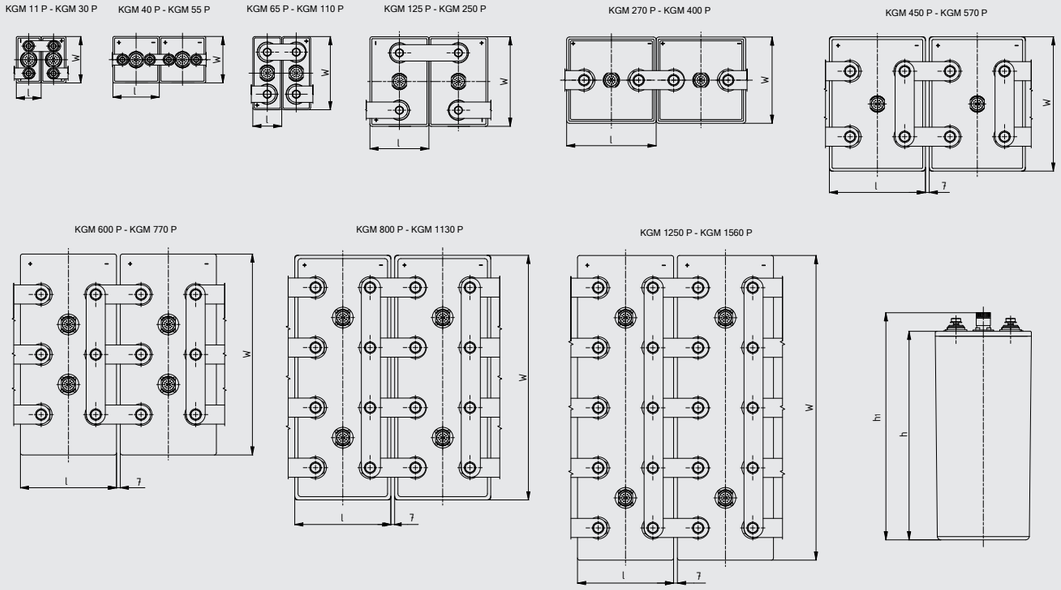
Single level Charging
1.42–1.44 V/cell

Single level charging may increase the refilling rate or recharge time with operating conditions.

B. Constant Current mode

Charging for IEC-62259 Capacity Test
Constant Current: 0.1 I_t A dc for 16 h
Voltage Limit: No Limiting or >1.70 Vpc
Charging Temperature: 20 ± 5 °C

Fast Rechargeability
Fast rechargeability of GAZ ENERGY Lomain cells after a power failure, can be 85 ± 5% of the rated capacity in 8 h to 9 h at 1.46 ± 0.01 Vpc with 0.1 I_t A current limit at 20 °C to ensure optimum emergency backup power availability in an event of unpredictable mains failure of critical applications.



KGM Single Cell Range

Technical Specifications

KGM Type Models	IEC-62259 Capacity	DIN-40771 Capacity	Cell Dimensions [Tolerance ±2 mm]				Connection Type	Nr. Of Terminals	Type of Terminals	Electrolyte Volume	Filled Cell Weight	Internal Resistance
In Plastic Containers	5 h rate [C_5 till 1.0V EOD]	5 h rate [C_5 till 1.15 V EOD]	l	w	h	hl	M = Nut	Poles/Cell	Connector	Approx. [± 5%]	Approx. [± 5%]	IR at 100% SoC
	[Ah]	[Ah]	mm	mm	mm	mm	S = Screw	[Nr.]	Type	[L]	[Kg]	[mΩ]
KGM 11 P	12	11	46	85	167	191	M	2	M10	0,31	1,00	17,62
KGM 18 P	19	18					M	2	M10	0,44	1,50	10,72
KGM 24 P	26	24	46	85	237	262	M	2	M10	0,37	1,60	8,10
KGM 30 P	33	30					M	2	M10	0,31	1,70	6,42
KGM 40 P	44	40					M	2	M10	0,84	2,70	4,86
KGM 48 P	52	48	85	85	237	262	M	2	M10	0,74	2,80	4,22
KGM 55 P	61	55					M	2	M10	0,64	2,90	3,77
KGM 65 P	71	65	53	134	364	392	S	2	M8	1,30	4,90	3,04
KGM 75 P	82	75					S	2	M8	1,17	5,00	2,76
KGM 90 P	99	90	69	134	364	392	S	2	M8	1,74	6,00	2,28
KGM 110 P	121	110					S	2	M8	1,74	6,30	1,82
KGM 125 P	137	125	70	164	364	392	S	2	M8	2,20	7,70	1,61
KGM 140 P	154	140					S	2	M8	1,73	7,80	1,40
KGM 160 P	176	160					S	2	M8	3,54	10,4	1,28
KGM 185 P	203	185					S	2	M8	3,27	10,8	1,09
KGM 205 P	225	205	108	164	364	392	S	2	M8	2,83	11,1	0,97
KGM 225 P	247	225					S	2	M8	2,68	11,6	0,91
KGM 250 P	275	250					S	2	M8	2,68	12,2	0,81
KGM 270 P	297	270					S	2	M10	4,98	15,8	0,73
KGM 300 P	330	300					S	2	M10	4,79	16,5	0,65
KGM 320 P	352	320					S	2	M10	4,60	17,0	0,64
KGM 340 P	374	340	164	158	364	392	S	2	M10	4,31	17,5	0,59
KGM 355 P	390	355					S	2	M10	4,12	18,0	0,57
KGM 380 P	418	380					S	2	M10	3,93	18,5	0,53
KGM 400 P	440	400					S	2	M10	3,64	18,9	0,48
KGM 450 P	499	450					S	4	M10	7,00	27,3	0,44
KGM 470 P	522	470					S	4	M10	7,00	27,8	0,42
KGM 500 P	555	500					S	4	M10	6,80	28,3	0,40
KGM 520 P	578	520	176	246	382	408	S	4	M10	6,80	28,9	0,39
KGM 550 P	610	550					S	4	M10	6,61	29,3	0,35
KGM 570 P	634	570					S	4	M10	6,61	29,7	0,36
KGM 600 P	665	600					S	6	M10	13,1	40,7	0,33
KGM 630 P	700	630					S	6	M10	13,1	41,2	0,31
KGM 675 P	750	675					S	6	M10	11,9	41,9	0,30
KGM 690 P	767	690	176	368	382	418	S	6	M10	11,9	42,3	0,29
KGM 750 P	835	750					S	6	M10	10,6	43,1	0,27
KGM 770 P	856	770					S	6	M10	10,6	43,8	0,27
KGM 800 P	889	800					S	8	M10	12,7	49,1	0,25
KGM 850 P	945	850					S	8	M10	12,7	51,4	0,24
KGM 950 P	1056	950	176	448	382	418	S	8	M10	12,7	53,7	0,21
KGM 1000 P	1110	1000					S	8	M10	12,7	57,6	0,20
KGM 1030 P	1145	1030					S	8	M10	12,7	58,9	0,19
KGM 1130 P	1256	1130					S	8	M10	12,7	61,9	0,18
KGM 1250 P	1390	1250					S	10	M10	17,3	68,9	0,16
KGM 1350 P	1501	1350	176	558	382	418	S	10	M10	17,3	70,1	0,14
KGM 1560 P	1735	1560					S	10	M10	16,5	71,7	0,12

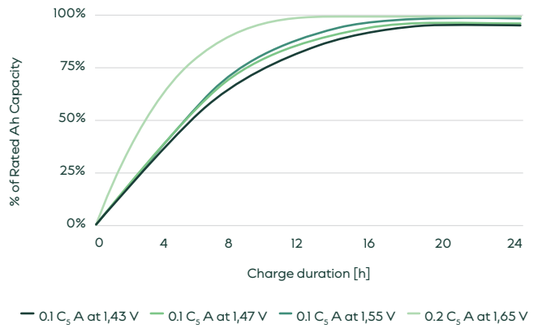
* All dimensions and weights stated are subject to usual manufacturing tolerances. The right is reserved to make any alterations without prior notice.

Superb chargeability

Thanks to their optimal anodic to cathodic active mass ratio, GAZ ENERGY Lomain cells can accept more capacity input with lower constant voltage constant-current charging limit. For their higher constant-current charge ratio for usage with UPS or DC Float cum Boost (FCBC) chargers, Lomain cells can be re-charged comparatively faster. See curve 1.

Lower boost charge voltage reduces the need of electronics components like voltage dropper diodes of UPS and chargers. GAZ ENERGY Lomain can fit perfectly in the voltage window of existing UPS or chargers used for VRLA or other Lead-Acid batteries and therefore can directly replace them without any additional investment in chargers or DC System.

Rechargeability of GAZ ENERGY Lomain KGL cells at +20 °C

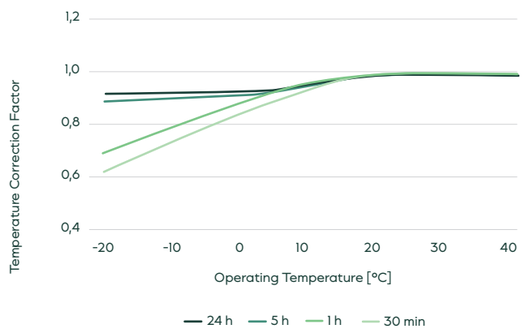


High performing even at extreme temperatures

Capacity utilization of lomain cells at lower operating temperature is far ahead compared to competition and other conventional electrochemistry. Resulting minimal temperature correction factors even for higher end-of-discharge voltages set by typical applications.

- For the temperature correction factor of GAZ ENERGY Lomain KGL range at different discharge rates and durations, see curve 2.
- Temperature correction factor variation for GAZ ENERGY Lomain KGL range at different End-of-Discharge (EOD) voltages is described in curve 3.

Temperature Correction Factor vs Discharge rates

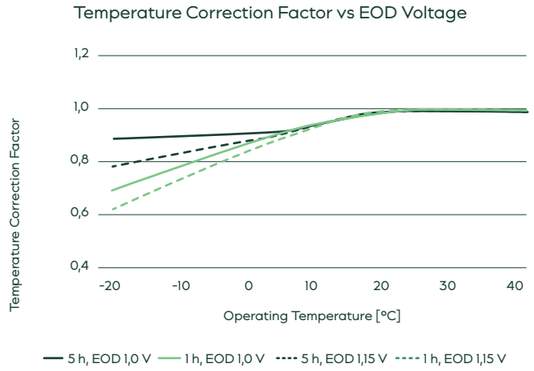


Configuration forms

GAZ ENERGY Lomain Ni-Cd cells are shipped only in filled and charged conditions. They can be quickly assembled into different configurations based on site and application requirements, for example:

- In battery racks and cabinets
- Mounted as compact blocks
- In plastic, FRP, or stainless-steel crates, or in customized battery troughs

Temperature Correction Factor vs EOD Voltage



Design your battery solution

Visit the GAZ ENERGY website for our easy-to-use Ni-Cd battery Calculator, a tool that allows you to quickly estimate or determine which battery configuration, type and size is best suited for your application. It will give you an idea of the battery storage system you need even before you inquire with the GAZ ENERGY sales department. The on-line battery calculator estimate the sizing in accordance to IEEE-1115, Recommended Practice for Sizing Nickel-Cadmium Batteries for Stationary Applications.

Ni-Cd Calculator

Current calculator

1. Period	Time	00:00:00	hh:mm:ss
	Current	0	amper
+	Time	00:00:00	hh:mm:ss
	Current	0	amper

Nominal Battery Voltage

48 V | 110 V | 220 V | Other

Ambient temperature °C / °F

20 — 30

Aging factor

1.00

Design margin factor

1.00

1. Load profile

Through a guided User-Interface, fill in the basic parameters of the required or expected load the batteries will be handling for a specific application.

The online calculator provides flexibility to choose input data for load in form of discharge current [A] or in form of aparent power [kVA] or real power [kW] for the UPS sysem battery calculation suitable to GAZ ENERGY Lomain Range.

2. Cell Quantity

Select or specify the DC system voltage for the application and the number of cells your battery set should contain with regards to their nominal voltage and end-of-discharge or DC system cut-off voltage.

3. Design Data

Input the operating environment for the battery in the application. Other key requirements can be factored and filtered into the evaluation as well.

Once the battery is calculated, you are one click away to generate and download a complete report in PDF format that consist of battery sizing as per IEEE-1115 and ventilation requirements as per IEC 62485-2 or EN 50272-2.

In case you require an battery sizing assistance or want to check possibility of further optimization of the sizing to increase the competitiveness, contact our global sales team or partners to create or optimize your sizing needs with our professional complex battery software.

The output will be a recommendation that is not only technologically, but also economically the most favorable.

Our Commitment to the Environment

At GAZ, as one of the leading manufacturer of Ni-Cd batteries for over 140 years, we pay rightful attention to the environmental footprint of our batteries. Proper recycling prevents pollution but also enables the recovery of materials that can be reused. Starting from the optimized design, GAZ ENERGY Ni-Cd batteries are composed of harmonized production elements that make their recycling more efficient and cost-effective without compromising the product performance and design lifetime.

The recycling efficiency reaches nearly 80% of the cell weight, which is higher than the prescribed recycling efficiency of 75% by regulations applicable to Ni-Cd batteries.

All GAZ ENERGY batteries are disposed of with certified long-term partners in compliance to regional regulations. GAZ also provides a recycling testimonial with unique recycling case number for complete traceability.

Regulatory compliance

- **EU Declaration of Conformity** – GAZ confirms and bear the responsibility of self-declaration of conformity of produced Ni-Cd cells according to recently adopted EU Battery Regulation.
- **RoHS** – Even though accumulators are not within the scope of EU's Restriction of Hazardous Substances (RoHS) regulation, GAZ voluntarily declares that the substances restricted by RoHS are not present in our batteries except for their electrochemical core.
- **REACH** – About EU's Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), GAZ voluntarily declares that our Ni-Cd accumulators contain more than 0.1% w/w of Cadmium (Cd) substances depending on delivery status.

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