

# GAZ<sup>®</sup>

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*Industrial Ni-Cd Batteries    Standard Ranges*  
*Ni-Cd Industriebatterien    Standardbaureihen*  
*KL ... P | KM ... P | KH ... P*

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*Made in Germany*



**EnerSys<sup>®</sup>**  
Power/Full Solutions

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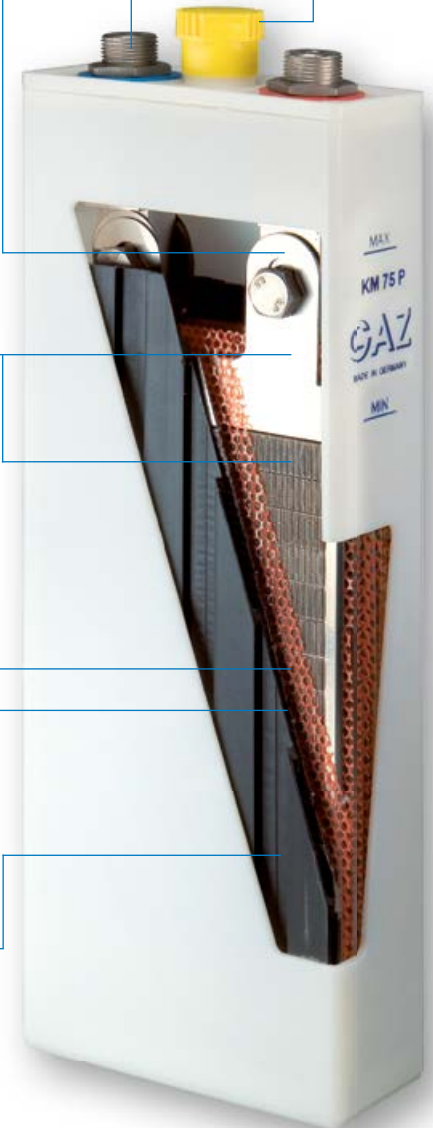
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**GAZ®**

GAZ® Ni-Cd cells and batteries with pocket plate electrodes have a proven design and reliability to give maximum service life. With more than 100 years of experience in the design, manufacturing and continuously improving and further developments in techniques will provide maximum performance and security independent of the mains electricity supply. Its outstanding features make the GAZ® Ni-Cd battery range one of the most reliable and adequate systems available in the market. It is a most effective durable and safe solution. GAZ® prides itself on the high standards of quality for which it is renowned.

GAZ® Ni-Cd battery cells fulfil all requirements according to IEC 60623 and EN 60623.

**Configuration forms**

GAZ® Ni-Cd cells can be assembled into many different configurations, for example:

- Placing on battery racks and cabinets
- Mounting as compact blocks
- Assembling in plastic/ stainless steel crates or battery troughs

**Fields of application**

UPS, railway, power and substations, renewable energy stations, ship equipment, telecommunications

**Quality Management System**

The Quality Management System of our company has been certified since 1993. Strict quality controls, the use of high quality materials, the steady further development of production and company processes and eventually an uncompromising service to our customers stand for the long company history as well as philosophy.

**KL ... P Battery Range**

This GAZ® cell type has been especially 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 recommended discharge time for the KL ... P range is 1 hour to 100 hours.

**Important Notice**

The nominal capacity  $C_5$  is not the basis for the performance of the batteries. Performance depends on the battery construction or on the different battery ranges, respectively. Therefore, our discharge tables should be used to find out the appropriated cell type for a specific application.

The nominal capacity  $C_5$  of KL ... P range batteries is based on the available ampere hours (Ah) at a discharge rate of 5 hours to a final discharge voltage of 1.00 V per cell at  $20\text{ °C} \pm 5\text{ °C}$ .

Nominal voltage per cell is 1.2 V.

**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 60623 und EN 60623, point 4.1.

**Charging conditions KL ... P Battery Range**

**1. Constant voltage**

- Stand by
- Float: 1.40 – 1.42 V/cell
- Boost charge: 1.55 – 1.70 V/cell
- Buffer operation
- Average value: 1.55 – 1.70 V/cell
- Current limitation:  $0.3 I_t A$

**2. Constant current at 25 °C [A]**

- Standard charge:  $0.2 I_t A$  for 7 – 8 h
- Boost charge:  $0.3 I_t A$  for 2.5 h followed by  $0.2 I_t A$  for 2.5 h
- Trickle charge: 0.001 – 0.002 A/Ah

**Baureihe KL ... P**

Ni-Cd Zellen dieser Baureihe sind speziell für niedrige Entladeströme während relativ langer Entladezeiten entwickelt worden. Die empfohlene Entladezeit für die KL ... P Baureihe beträgt 1 Stunde bis zu 100 Stunden.

**Wichtig**

Die Nennkapazität  $C_5$  ist keine Bemessungsgrundlage für die Leistung. Die Leistung hängt von der Batterie-konstruktion bzw. von der Typenbaureihe ab. Deshalb sollten unsere Entladetabellen genutzt werden, um den entsprechenden Zellentyp für eine bestimmte Anwendung zu bestimmen.

Die Nennkapazität  $C_5$  der KL ... P Baureihe basiert auf den entnehmbaren Amperestunden (Ah) bei fünfständiger Entladung und auf einer Entladeschlussspannung von 1,00 V pro Zelle bei  $20\text{ °C} \pm 5\text{ °C}$ .

Die Nennspannung pro Zelle beträgt 1,2 V.

**Entladeverhalten**

Die in unseren Tabellen angegebenen Entladewerte sowie die Nennkapazitäten beruhen auf ordnungsgemäß geladenen Zellen laut IEC 60623 und EN 60623, Abs. 4.1.

**Ladebedingungen Baureihe KL ... P**

**1. Konstanzspannung**

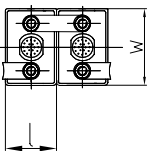
- Bereitschaftsbetrieb
- Erhaltungsladen: 1,40 – 1,42 V/Zelle
- Starkladen: 1,55 – 1,70 V/Zelle
- Pufferbetrieb
- Mittelwert: 1,55 – 1,70 V/Zelle
- Strombegrenzung:  $0,3 I_t A$

**2. Konstantstrom bei 25 °C [A]**

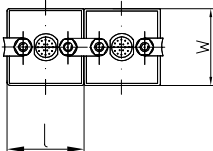
- Standardladung:  $0,2 I_t A$  während 7 – 8 h
- Starkladung:  $0,3 I_t A$  während 2,5 h dann  $0,2 I_t A$  während 2,5 h
- Erhaltungsladung: 0,001 – 0,002 A/Ah

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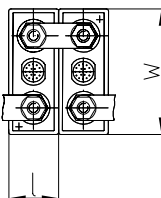
KL 11 P – KL 30 P



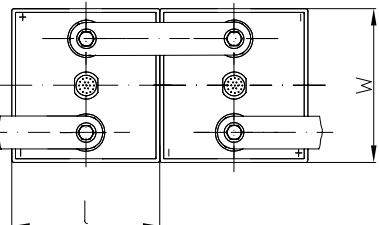
KL 40 P – KL 65 P



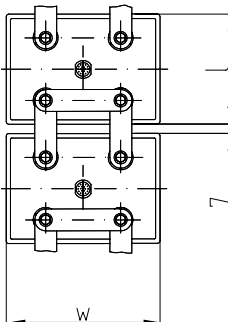
KL 80 P – KL 300 P



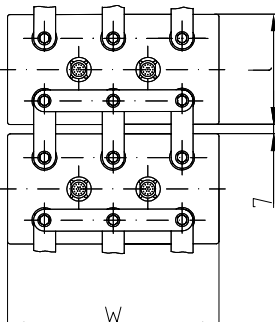
KL 340 P – KL 470 P (M 10)



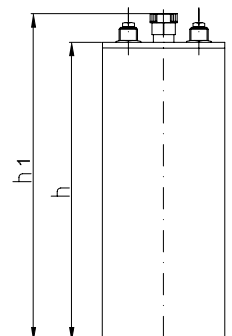
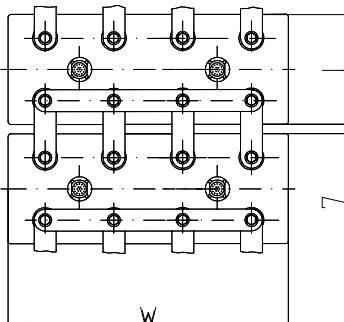
KL 520 P – KL 625 P (M 10)



KL 650 P – KL 910 P (M 10)



KL 1000 P – KL 1700 P (M 10)



KL	C <sub>s</sub> [A]	1.00	+ . ) [ ]*				M = ) S = "	) ) *	[ &*	
			3	,	)	' (				
KL 11 P	11	11	46	85	237	261	M	2 x M 10	0,7	1,3
KL 18 P	18	18	46	85	237	261	M	2 x M 10	0,8	1,3
KL 24 P	24	24	46	85	237	261	M	2 x M 10	0,9	1,4
KL 30 P	30	30	46	85	237	261	M	2 x M 10	1,1	1,5
KL 40 P	40	40	85	85	237	261	M	2 x M 10	1,5	2,5
KL 45 P	45	45	85	85	237	261	M	2 x M 10	1,6	2,5
KL 55 P	55	55	85	85	237	261	M	2 x M 10	1,8	2,7
KL 65 P	65	65	85	85	237	261	M	2 x M 10	2,0	2,8
KL 80 P	80	80	69	134	364	394	M	2 x M 16	3,0	5,1
KL 100 P	100	100	69	134	364	394	M	2 x M 16	3,4	5,3
KL 120 P	120	120	69	134	364	394	M	2 x M 16	3,9	5,7
KL 140 P	140	140	69	134	364	394	M	2 x M 16	4,4	5,9
KL 150 P	150	150	70	164	364	394	M	2 x M 16	4,6	6,9
KL 160 P	160	160	108	164	364	394	M	2 x M 16	5,0	9,3
KL 185 P	185	185	108	164	364	394	M	2 x M 16	5,6	9,7
KL 200 P	200	200	108	164	364	394	M	2 x M 16	6,1	10,0
KL 230 P	230	230	108	164	364	394	M	2 x M 16	7,0	10,5
KL 270 P	270	270	108	164	364	394	M	2 x M 16	8,3	11,2
KL 300 P	300	300	108	164	364	394	M	2 x M 16	9,2	11,8
KL 340 P	340	340	158	164	364	392	S	2 x M 10	10,4	15,8
KL 370 P	370	370	158	164	364	392	S	2 x M 10	11,1	16,4
KL 400 P	400	400	158	164	364	392	S	2 x M 10	12,0	16,9
KL 435 P	435	435	158	164	364	392	S	2 x M 10	12,9	17,4
KL 470 P	470	470	158	164	364	392	S	2 x M 10	13,7	18,0
KL 520 P	520	520	176	246	382	408	S	4 x M 10	16,9	25,8
KL 560 P	560	560	176	246	382	408	S	4 x M 10	18,8	27,0
KL 625 P	625	625	176	246	382	408	S	4 x M 10	20,4	28,0
KL 650 P	650	650	176	368	382	421	S	6 x M 10	23,7	37,3
KL 740 P	740	740	176	368	382	421	S	6 x M 10	25,9	38,9
KL 800 P	800	800	176	368	382	421	S	6 x M 10	26,5	40,4
KL 840 P	840	840	176	368	382	421	S	6 x M 10	28,1	40,5
KL 910 P	910	910	176	368	382	421	S	6 x M 10	30,5	42,0
KL 1000 P	1000	1000	176	448	382	421	S	8 x M 10	39,3	50,5
KL 1040 P	1040	1040	176	448	382	421	S	8 x M 10	40,5	51,0
KL 1120 P	1120	1120	176	448	382	421	S	8 x M 10	41,5	52,5
KL 1250 P	1250	1250	176	558	382	421	S	8 x M 10	42,5	61,5
KL 1350 P	1350	1350	176	558	382	421	S	8 x M 10	44,9	63,0
KL 1400 P	1400	1400	176	558	382	421	S	8 x M 10	46,5	64,5
KL 1500 P	1500	1500	176	558	382	421	S	8 x M 10	48,9	65,5
KL 1620 P	1620	1620	176	558	382	421	S	8 x M 10	49,7	67,5
KL 1700 P	1700	1700	176	558	382	421	S	8 x M 10	55,5	68,0

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## KM ... P Battery Range

This GAZ® M type has been especially designed for “mixed loads” that include a mixture of high and low rates of discharge. It is used for frequent and infrequent discharges and the recommended discharge time is 30 min to 120 min.

### Important Notice

The rated capacity  $C_5$  is not the basis for the performance of the batteries. Performance depends on the battery construction or on the different battery ranges, respectively. Therefore, our discharge tables should be used to find out the appropriated cell type for a specific application.

The rated capacity  $C_5$  of KM ... P range batteries is 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 at  $20\text{ °C} \pm 5\text{ °C}$ .

Nominal voltage per cell is 1.2 V.

### 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 60623 und EN 60623, point 4.1.

### Charging conditions KM ... P Battery Range

#### 1. Constant voltage

Stand by

Float: 1.40 – 1.42 V/cell

Boost charge: 1.55 – 1.70 V/cell

Buffer operation

Average value: 1.55 – 1.70 V/cell

Current limitation:  $0.4 I_t$  A

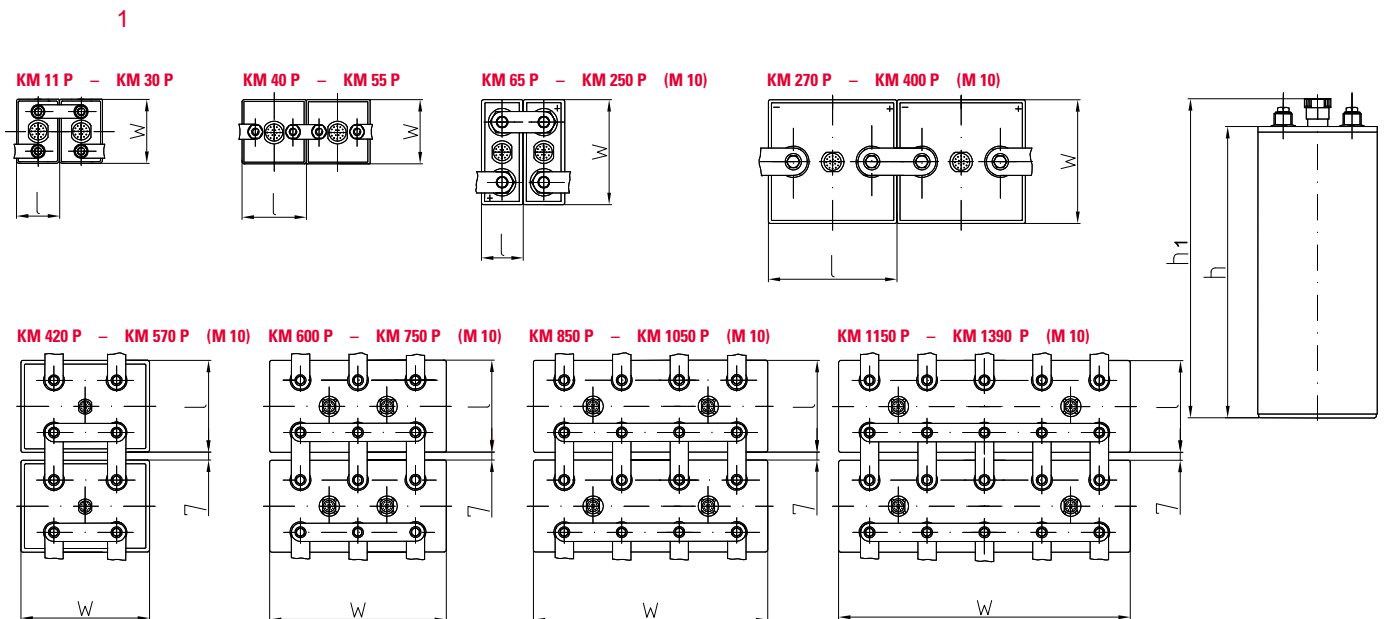
#### 2. Constant current at 25 °C [A]

Standard charge:  $0.2 I_t$  A for 7 – 8 h

Boost charge:  $0.4 I_t$  A for 2.5 h

followed by  $0.2 I_t$  A for 2.5 h

Trickle charge: 0.001 – 0.002 A/Ah





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KM 11 P	11	46	85	167	191	M	2 x M 10	0,7	1,0	
KM 18 P	18	46	85	237	261	M	2 x M 10	1,0	1,5	
KM 24 P	24	46	85	237	261	M	2 x M 10	1,1	1,5	
KM 30 P	30	46	85	237	261	M	2 x M 10	1,2	1,6	
KM 40 P	40	85	85	237	261	M	2 x M 10	1,7	2,7	
KM 48 P	48	85	85	237	261	M	2 x M 10	1,9	2,8	
KM 55 P	55	85	85	237	261	M	2 x M 10	1,9	2,9	
KM 65 P	65	53	134	364	392	S	2 x M 8	3,2	4,7	
KM 75 P	75	53	134	364	392	S	2 x M 8	3,7	4,9	
KM 90 P	90	69	134	364	392	S	2 x M 8	4,3	6,0	
KM 110 P	110	69	134	364	392	S	2 x M 8	4,9	6,5	
KM 125 P	125	70	164	364	392	S	2 x M 8	5,2	7,4	
KM 140 P	140	70	164	364	392	S	2 x M 8	5,8	7,7	
KM 160 P	160	108	164	364	392	S	2 x M 8	6,8	10,7	
KM 185 P	185	108	164	364	392	S	2 x M 8	7,5	11,0	
KM 205 P	205	108	164	364	392	S	2 x M 8	7,9	11,3	
KM 225 P	225	108	164	364	392	S	2 x M 8	8,8	11,8	
KM 250 P	250	108	164	364	392	S	2 x M 8	9,5	12,1	
KM 270 P	270	164	158	364	392	S	2 x M 10	11,2	16,3	
KM 300 P	300	164	158	364	392	S	2 x M 10	11,0	16,0	
KM 320 P	320	164	158	364	392	S	2 x M 10	11,6	16,5	
KM 340 P	340	164	158	364	392	S	2 x M 10	12,3	17,0	
KM 355 P	355	164	158	364	392	S	2 x M 10	13,7	18,0	
KM 380 P	380	164	158	364	392	S	2 x M 10	14,3	18,6	
KM 400 P	400	164	158	364	392	S	2 x M 10	15,1	18,9	
KM 420 P	420	176	246	382	408	S	4 x M 10	18,7	25,4	
KM 450 P	450	176	246	382	408	S	4 x M 10	20,0	27,3	
KM 470 P	470	176	246	382	408	S	4 x M 10	20,9	28,5	
KM 500 P	500	176	246	382	408	S	4 x M 10	21,2	28,3	
KM 520 P	520	176	246	382	408	S	4 x M 10	22,2	29,1	
KM 550 P	550	176	246	382	408	S	4 x M 10	21,1	28,2	
KM 570 P	570	176	246	382	408	S	4 x M 10	23,2	30,4	
KM 600 P	600	176	368	382	421	S	6 x M 10	25,9	39,8	
KM 630 P	630	176	368	382	421	S	6 x M 10	27,0	40,3	
KM 675 P	675	176	368	382	421	S	6 x M 10	28,9	41,8	
KM 705 P	705	176	368	382	421	S	6 x M 10	29,2	42,9	
KM 750 P	750	176	368	382	421	S	6 x M 10	30,9	42,9	
KM 850 P	850	176	448	382	421	S	8 x M 10	33,1	48,8	
KM 950 P	950	176	448	382	421	S	8 x M 10	40,7	53,2	
KM 1000 P	1000	176	448	382	421	S	8 x M 10	42,8	56,0	
KM 1050 P	1050	176	448	382	421	S	8 x M 10	44,9	58,8	
KM 1150 P	1150	176	558	382	421	S	10 x M 10	48,2	63,4	
KM 1250 P	1250	176	558	382	421	S	10 x M 10	52,4	68,9	
KM 1390 P	1390	176	558	382	421	S	10 x M 10	56,2	77,0	

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KM 11 P	8.00	7.40	6.60	6.20	5.10	4.29	3.70	2.86	2.20
KM 18 P	13.10	12.20	10.80	10.10	8.30	7.00	6.10	4.68	3.60
KM 24 P	17.50	16.20	14.40	13.50	11.00	9.40	8.10	6.24	4.80
KM 30 P	21.90	20.30	18.00	16.90	13.80	11.70	10.10	7.80	6.00
KM 40 P	30.80	27.10	24.00	22.50	18.30	15.60	13.40	10.40	8.00
KM 48 P	40.40	35.60	31.50	29.60	23.50	20.50	17.70	13.50	9.60
KM 55 P	50.00	44.00	39.00	36.60	28.60	25.30	22.00	16.50	11.00
KM 65 P	51.00	48.00	44.00	41.00	32.00	27.10	23.90	17.80	13.00
KM 75 P	59.00	56.00	50.00	47.00	37.00	31.30	27.50	20.50	15.00
KM 90 P	71.00	67.00	61.00	56.00	44.00	37.60	33.10	24.60	18.00
KM 110 P	87.00	82.00	74.00	69.00	54.00	45.90	40.40	30.10	22.00
KM 125 P	98.00	88.00	81.00	78.00	59.00	51.00	44.50	35.40	25.00
KM 140 P	109.00	99.00	89.00	81.00	66.00	57.00	49.90	39.60	28.00
KM 160 P	125.00	113.00	101.00	92.00	76.00	65.00	57.00	45.30	32.00
KM 185 P	144.00	131.00	117.00	106.00	88.00	75.00	66.00	52.30	37.00
KM 205 P	160.00	145.00	130.00	118.00	97.00	83.00	73.00	58.00	41.00
KM 225 P	169.00	153.00	137.00	124.00	102.00	91.00	80.00	60.00	45.00
KM 250 P	187.00	170.00	152.00	138.00	114.00	101.00	89.00	66.70	50.00
KM 270 P	202.00	183.00	164.00	149.00	123.00	109.00	96.00	72.00	54.00
KM 300 P	232.00	215.00	191.00	177.00	146.00	132.00	112.00	84.00	60.00
KM 320 P	248.00	229.00	203.00	189.00	156.00	141.00	120.00	89.60	64.00
KM 340 P	263.00	243.00	216.00	201.00	166.00	150.00	127.00	95.20	68.00
KM 355 P	275.00	254.00	226.00	209.00	173.00	157.00	133.00	99.00	71.00
KM 380 P	294.00	272.00	242.00	224.00	185.00	168.00	142.00	106.00	76.00
KM 400 P	302.00	279.00	248.00	230.00	190.00	172.00	146.00	112.00	80.00
KM 420 P	317.00	293.00	260.00	242.00	200.00	181.00	153.00	118.00	84.00
KM 450 P	337.00	306.00	277.00	248.00	205.00	192.00	180.00	135.00	90.00
KM 470 P	352.00	320.00	289.00	259.00	214.00	201.00	188.00	141.00	94.00
KM 500 P	374.00	340.00	308.00	276.00	228.00	213.00	200.00	150.00	100.00
KM 520 P	389.00	354.00	320.00	287.00	237.00	222.00	208.00	156.00	104.00
KM 550 P	412.00	374.00	339.00	303.00	251.00	235.00	220.00	165.00	110.00
KM 570 P	427.00	388.00	351.00	314.00	260.00	244.00	228.00	171.00	114.00
KM 600 P	449.00	408.00	369.00	331.00	273.00	256.00	240.00	180.00	120.00
KM 630 P	471.00	428.00	387.00	348.00	287.00	269.00	252.00	189.00	126.00
KM 675 P	506.00	459.00	416.00	372.00	308.00	288.00	270.00	203.00	135.00
KM 705 P	528.00	479.00	434.00	389.00	322.00	301.00	282.00	212.00	141.00
KM 750 P	562.00	510.00	462.00	413.00	342.00	320.00	300.00	225.00	150.00
KM 850 P	637.00	578.00	524.00	468.00	388.00	363.00	340.00	255.00	170.00
KM 950 P	712.00	646.00	585.00	523.00	433.00	405.00	380.00	285.00	190.00
KM 1000 P	749.00	680.00	616.00	551.00	456.00	427.00	400.00	300.00	200.00
KM 1050 P	786.00	714.00	647.00	579.00	479.00	448.00	420.00	315.00	210.00
KM 1150 P	861.00	782.00	708.00	634.00	524.00	491.00	460.00	345.00	230.00
KM 1250 P	936.00	850.00	769.00	689.00	569.00	533.00	500.00	375.00	250.00
KM 1390 P	1041.00	945.00	855.00	766.00	633.00	593.00	556.00	417.00	278.00

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	5	10	20	30	1 2	1.5 2	2 2	3 2	5 2
KM 11 P	11.70	10.20	8.60	8.00	6.50	5.24	4.47	3.30	2.33
KM 18 P	19.10	16.60	14.10	13.10	10.60	8.60	7.30	5.40	3.82
KM 24 P	25.40	22.20	18.80	17.40	14.10	11.40	9.80	7.20	5.09
KM 30 P	31.80	27.70	23.50	21.80	17.60	14.30	12.20	9.00	6.36
KM 40 P	38.80	34.50	30.80	28.30	23.40	19.00	16.40	12.00	8.48
KM 48 P	50.90	45.30	40.40	37.20	28.80	24.20	20.60	15.10	10.00
KM 55 P	63.00	56.00	50.00	46.00	34.10	29.40	24.80	18.10	11.50
KM 65 P	71.00	66.00	59.00	54.00	41.00	33.40	28.80	20.40	13.80
KM 75 P	82.00	76.00	68.00	62.00	48.00	38.60	33.20	23.50	15.90
KM 90 P	98.00	92.00	82.00	74.00	57.00	46.30	39.80	28.20	19.10
KM 110 P	120.00	112.00	100.00	91.00	70.00	56.60	48.70	34.50	23.30
KM 125 P	128.00	116.00	107.00	98.00	75.00	64.00	54.30	39.60	26.30
KM 140 P	143.00	130.00	120.00	109.00	88.00	72.00	60.80	44.40	29.40
KM 160 P	164.00	148.00	137.00	125.00	101.00	82.00	69.50	50.70	33.60
KM 185 P	190.00	171.00	158.00	144.00	116.00	95.00	80.00	58.70	38.90
KM 205 P	210.00	190.00	175.00	160.00	129.00	105.00	89.00	65.00	43.10
KM 225 P	221.00	200.00	184.00	169.00	136.00	115.00	98.00	69.80	47.30
KM 250 P	246.00	222.00	205.00	187.00	151.00	128.00	109.00	77.60	52.60
KM 270 P	266.00	240.00	221.00	202.00	163.00	138.00	117.00	83.80	56.80
KM 300 P	312.00	281.00	260.00	232.00	188.00	165.00	133.00	93.80	63.00
KM 320 P	332.00	299.00	277.00	248.00	200.00	176.00	142.00	100.00	67.20
KM 340 P	353.00	318.00	295.00	263.00	213.00	187.00	151.00	106.00	71.40
KM 355 P	369.00	332.00	308.00	275.00	222.00	196.00	157.00	111.00	74.60
KM 380 P	395.00	356.00	329.00	294.00	238.00	209.00	169.00	119.00	79.80
KM 400 P	405.00	365.00	338.00	302.00	244.00	215.00	173.00	125.00	84.00
KM 420 P	425.00	383.00	355.00	317.00	256.00	226.00	182.00	131.00	88.00
KM 450 P	443.00	400.00	369.00	337.00	272.00	238.00	203.00	149.00	94.50
KM 470 P	463.00	418.00	385.00	352.00	284.00	249.00	212.00	156.00	99.00
KM 500 P	492.00	444.00	410.00	374.00	302.00	264.00	226.00	166.00	105.00
KM 520 P	512.00	462.00	426.00	389.00	314.00	275.00	235.00	172.00	109.00
KM 550 P	541.00	489.00	451.00	412.00	332.00	291.00	248.00	182.00	116.00
KM 570 P	561.00	507.00	467.00	427.00	344.00	302.00	257.00	189.00	120.00
KM 600 P	591.00	533.00	492.00	449.00	363.00	317.00	271.00	199.00	126.00
KM 630 P	621.00	560.00	517.00	471.00	381.00	333.00	285.00	209.00	132.00
KM 675 P	665.00	600.00	554.00	506.00	408.00	357.00	305.00	224.00	142.00
KM 705 P	695.00	627.00	579.00	528.00	426.00	373.00	319.00	234.00	148.00
KM 750 P	738.00	667.00	615.00	562.00	453.00	397.00	338.00	248.00	158.00
KM 850 P	836.00	756.00	697.00	637.00	513.00	450.00	383.00	281.00	179.00
KM 950 P	935.00	845.00	779.00	712.00	574.00	503.00	428.00	314.00	200.00
KM 1000 P	984.00	889.00	820.00	749.00	604.00	529.00	451.00	331.00	210.00
KM 1050 P	1033.00	933.00	861.00	786.00	634.00	555.00	474.00	348.00	221.00
KM 1150 P	1132.00	1022.00	943.00	861.00	695.00	608.00	519.00	381.00	242.00
KM 1250 P	1231.00	1111.00	1025.00	936.00	756.00	661.00	564.00	414.00	263.00
KM 1390 P	1369.00	1235.00	1140.00	1041.00	841.00	735.00	627.00	460.00	292.00

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		5	10	20	30	1 2	1.5 2	2 2	3 2	5 2
KM	11 P	14.70	13.40	11.20	9.90	7.50	6.16	5.02	3.52	2.38
KM	18 P	24.10	21.90	18.30	16.10	12.30	10.10	8.20	5.76	3.89
KM	24 P	32.20	29.20	24.40	21.50	16.40	13.40	11.00	7.68	5.18
KM	30 P	40.20	36.50	30.50	26.90	20.50	16.80	13.70	9.60	6.48
KM	40 P	49.20	43.10	36.90	33.80	27.40	22.50	18.20	12.80	8.64
KM	48 P	64.60	56.60	48.50	44.40	33.20	27.20	22.40	15.90	10.40
KM	55 P	80.00	70.00	60.00	55.00	39.00	32.80	26.60	19.00	12.10
KM	65 P	85.00	78.00	70.00	64.00	47.00	38.40	30.60	21.20	14.10
KM	75 P	98.00	90.00	80.00	74.00	55.00	44.30	35.30	24.50	16.20
KM	90 P	118.00	108.00	97.00	88.00	65.00	53.20	42.40	29.40	19.50
KM	110 P	144.00	132.00	118.00	108.00	80.00	65.00	51.80	35.90	23.80
KM	125 P	154.00	139.00	127.00	116.00	89.00	74.00	59.10	41.20	26.90
KM	140 P	181.00	164.00	150.00	137.00	105.00	83.00	66.20	46.20	30.10
KM	160 P	207.00	187.00	172.00	156.00	120.00	95.00	75.70	52.80	34.40
KM	185 P	239.00	217.00	199.00	180.00	139.00	110.00	88.00	61.00	39.80
KM	205 P	265.00	240.00	220.00	200.00	154.00	122.00	97.00	67.60	44.10
KM	225 P	279.00	253.00	232.00	211.00	162.00	134.00	106.00	74.20	48.40
KM	250 P	310.00	281.00	258.00	234.00	180.00	149.00	118.00	82.40	53.80
KM	270 P	335.00	303.00	278.00	253.00	195.00	161.00	128.00	89.00	58.10
KM	300 P	377.00	346.00	315.00	284.00	223.00	185.00	141.00	96.00	64.50
KM	320 P	402.00	369.00	336.00	303.00	238.00	197.00	150.00	102.00	68.80
KM	340 P	427.00	392.00	357.00	322.00	253.00	209.00	160.00	109.00	73.10
KM	355 P	446.00	410.00	373.00	336.00	264.00	218.00	167.00	114.00	76.30
KM	380 P	477.00	438.00	399.00	360.00	283.00	234.00	178.00	122.00	81.70
KM	400 P	490.00	450.00	410.00	369.00	290.00	240.00	183.00	128.00	86.00
KM	420 P	515.00	473.00	431.00	387.00	305.00	252.00	192.00	134.00	90.00
KM	450 P	558.00	506.00	464.00	421.00	320.00	269.00	218.00	156.00	99.00
KM	470 P	583.00	528.00	485.00	440.00	334.00	281.00	228.00	163.00	103.00
KM	500 P	620.00	562.00	516.00	468.00	356.00	299.00	242.00	173.00	110.00
KM	520 P	645.00	584.00	537.00	486.00	370.00	311.00	252.00	180.00	114.00
KM	550 P	682.00	618.00	567.00	515.00	391.00	329.00	266.00	191.00	121.00
KM	570 P	707.00	640.00	588.00	534.00	405.00	341.00	276.00	198.00	125.00
KM	600 P	744.00	675.00	619.00	561.00	427.00	359.00	291.00	208.00	132.00
KM	630 P	781.00	709.00	650.00	589.00	448.00	377.00	306.00	218.00	139.00
KM	675 P	837.00	759.00	696.00	632.00	480.00	404.00	327.00	234.00	149.00
KM	705 P	874.00	793.00	727.00	660.00	501.00	422.00	342.00	244.00	156.00
KM	750 P	930.00	843.00	773.00	702.00	533.00	448.00	363.00	260.00	165.00
KM	850 P	1054.00	955.00	876.00	796.00	604.00	508.00	411.00	295.00	187.00
KM	950 P	1178.00	1068.00	979.00	889.00	675.00	567.00	460.00	329.00	209.00
KM	1000 P	1240.00	1124.00	1031.00	936.00	711.00	598.00	484.00	347.00	220.00
KM	1050 P	1302.00	1180.00	1083.00	983.00	747.00	628.00	508.00	364.00	231.00
KM	1150 P	1426.00	1293.00	1186.00	1076.00	818.00	688.00	557.00	399.00	253.00
KM	1250 P	1550.00	1406.00	1289.00	1169.00	889.00	747.00	606.00	433.00	275.00
KM	1390 P	1724.00	1563.00	1433.00	1300.00	989.00	831.00	674.00	481.00	306.00

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		5	10	20	30	1 2	1.5 2	2 2	3 2	5 2
KM	11 P	16.90	15.90	13.50	11.80	8.60	6.71	5.32	3.70	2.42
KM	18 P	27.70	26.00	22.10	19.80	14.50	11.00	8.70	6.06	3.96
KM	24 P	37.00	34.70	29.50	26.40	19.40	14.60	11.60	8.08	5.28
KM	30 P	46.20	43.40	36.90	33.00	24.30	18.30	14.50	10.10	6.60
KM	40 P	55.40	50.50	46.00	44.00	32.40	24.40	19.40	13.46	8.80
KM	48 P	72.70	66.30	54.80	52.30	37.80	30.30	23.70	16.30	10.50
KM	55 P	90.00	82.00	67.00	60.50	44.50	36.20	27.90	19.20	12.20
KM	65 P	98.00	91.00	80.00	74.00	54.00	40.70	32.00	21.90	14.30
KM	75 P	113.00	105.00	93.00	85.00	62.00	46.90	36.90	25.20	16.50
KM	90 P	135.00	126.00	111.00	102.00	74.00	56.30	44.30	30.30	19.80
KM	110 P	165.00	154.00	136.00	125.00	91.00	68.80	54.10	37.00	24.20
KM	125 P	182.00	168.00	151.00	139.00	101.00	79.00	61.00	42.10	27.50
KM	140 P	215.00	198.00	178.00	164.00	120.00	89.00	68.30	47.10	30.80
KM	160 P	246.00	226.00	203.00	187.00	137.00	101.00	78.00	53.90	35.20
KM	185 P	284.00	262.00	235.00	217.00	158.00	117.00	90.00	62.30	40.70
KM	205 P	315.00	290.00	260.00	240.00	175.00	130.00	100.00	69.00	45.10
KM	225 P	332.00	306.00	274.00	253.00	186.00	143.00	110.00	75.70	49.50
KM	250 P	369.00	340.00	304.00	281.00	205.00	159.00	122.00	84.10	55.00
KM	270 P	398.00	367.00	329.00	303.00	223.00	171.00	132.00	90.90	59.40
KM	300 P	460.00	415.00	370.00	335.00	250.00	187.00	144.00	98.30	66.00
KM	320 P	491.00	443.00	395.00	358.00	267.00	199.00	153.00	105.00	70.40
KM	340 P	521.00	471.00	419.00	380.00	283.00	212.00	163.00	111.00	74.80
KM	355 P	544.00	492.00	438.00	397.00	296.00	221.00	170.00	116.00	78.10
KM	380 P	583.00	526.00	469.00	425.00	317.00	237.00	182.00	124.00	83.60
KM	400 P	598.00	540.00	481.00	436.00	325.00	243.00	187.00	131.00	88.00
KM	420 P	628.00	567.00	505.00	458.00	341.00	255.00	196.00	138.00	92.00
KM	450 P	664.00	612.00	547.00	495.00	365.00	297.00	229.00	158.00	99.90
KM	470 P	694.00	639.00	571.00	517.00	381.00	310.00	239.00	165.00	104.00
KM	500 P	738.00	680.00	608.00	550.00	406.00	330.00	254.00	176.00	111.00
KM	520 P	768.00	707.00	632.00	572.00	422.00	343.00	265.00	183.00	115.00
KM	550 P	812.00	748.00	669.00	605.00	446.00	363.00	280.00	193.00	122.00
KM	570 P	842.00	775.00	693.00	627.00	462.00	376.00	290.00	200.00	126.00
KM	600 P	885.00	816.00	729.00	660.00	487.00	396.00	305.00	211.00	133.00
KM	630 P	929.00	857.00	765.00	693.00	511.00	416.00	320.00	222.00	140.00
KM	675 P	996.00	918.00	821.00	743.00	548.00	446.00	344.00	237.00	150.00
KM	705 P	1040.00	959.00	857.00	776.00	572.00	466.00	359.00	248.00	157.00
KM	750 P	1107.00	1020.00	912.00	825.00	608.00	495.00	382.00	263.00	167.00
KM	850 P	1255.00	1156.00	1034.00	935.00	689.00	561.00	433.00	298.00	189.00
KM	950 P	1402.00	1292.00	1155.00	1045.00	770.00	627.00	484.00	333.00	212.00
KM	1000 P	1476.00	1360.00	1216.00	1100.00	811.00	660.00	509.00	351.00	222.00
KM	1050 P	1550.00	1428.00	1277.00	1155.00	852.00	693.00	534.00	369.00	233.00
KM	1150 P	1697.00	1564.00	1398.00	1265.00	933.00	759.00	585.00	404.00	255.00
KM	1250 P	1844.00	1700.00	1519.00	1375.00	1014.00	825.00	636.00	439.00	278.00
KM	1390 P	2051.00	1890.00	1689.00	1529.00	1128.00	917.00	707.00	488.00	309.00

## KH ... P Battery Range

This GAZ® H type was designed especially for high current discharging over short discharge periods. The recommended discharge time for this cell range is 1 s to 30 min.

### Important Notice

The nominal capacity  $C_5$  is not the basis for the performance of the batteries. Performance depends on the battery construction or on the different battery ranges, respectively. Therefore, our discharge tables should be used to find out the appropriated cell type for a specific application.

The nominal capacity  $C_5$  of KH ... P range batteries is based on the available ampere hours (Ah) at a discharge rate of 5 hours to a final discharge voltage of 1.10 V per cell at  $20\text{ °C} \pm 5\text{ °C}$ .

Nominal voltage per cell is 1.2 V.

### 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 EN 60623/ IEC 60623.

### Charging conditions KH ... P Battery Range

#### 1. Constant voltage

Stand by

Float: 1.36 – 1.42 V/cell

Boost charge: 1.55 – 1.65 V/cell

Buffer operation

Average value: 1.55 – 1.60 V/cell

Current limitation:  $0.5 I_t$  A

#### 2. Constant current at 25 °C [A]

Standard charge:  $0.2 I_t$  A for 7 – 8 h

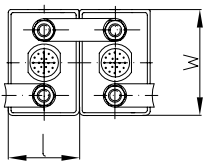
Boost charge:  $0.5 I_t$  A for 2.5 h

followed by  $0.2 I_t$  A for 2.5 h

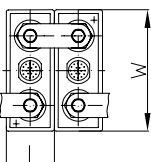
Trickle charge: 0.001 – 0.002 A/Ah

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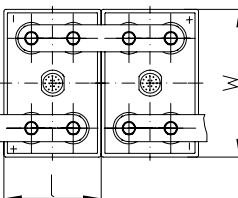
KH 10 P – KH 20 P



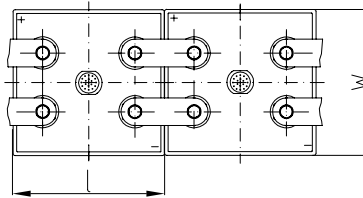
KH 30 P – KH 125 P (M 8)



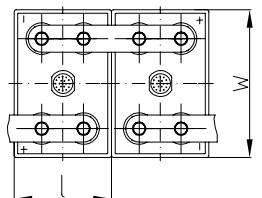
KH 150 P (M 8)



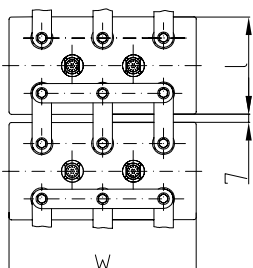
KH 185 P – KH 250 P (M 8)



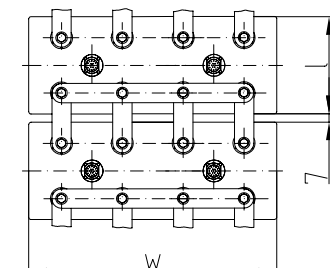
KH 280 P – KH 320 P (M 10)



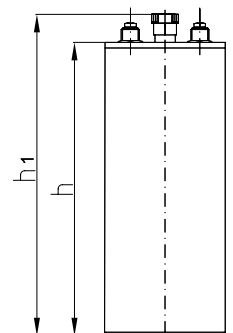
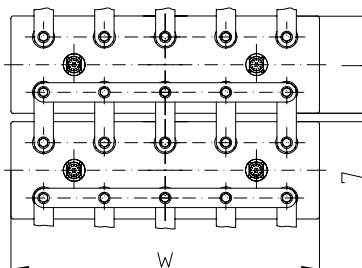
KH 360 P – KH 480 P (M 10)



KH 520 P – KH 640 P (M 10)



KH 700 P – KH 800 P (M 10)



KH	P	C <sub>s</sub> [A]	+ . ) [ ]*				M = ) S = "	)	[ &*	
			3						" ) *	' (
KH 10 P	10	10	46	85	237	261	M	2 x M 10	1,1	1,6
KH 20 P	20	20	46	85	237	261	M	2 x M 10	1,6	1,9
KH 30 P	30	30	53	134	330	360	S	2 x M 8	2,5	4,0
KH 40 P	40	40	53	134	330	360	S	2 x M 8	2,8	4,2
KH 50 P	50	50	53	134	330	360	S	2 x M 8	3,3	4,5
KH 65 P	65	65	69	134	330	360	S	2 x M 8	4,1	5,8
KH 80 P	80	80	69	134	330	360	S	2 x M 8	4,6	6,1
KH 100 P	100	100	104	134	330	360	S	2 x M 8	6,2	8,8
KH 125 P	125	125	104	134	330	360	S	2 x M 8	7,2	9,7
KH 150 P	150	150	108	164	330	360	S	4 x M 8	9,0	11,9
KH 185 P	185	185	164	158	330	360	S	4 x M 8	10,9	15,2
KH 200 P	200	200	164	158	330	360	S	4 x M 8	11,3	15,6
KH 235 P	235	235	164	158	330	360	S	4 x M 8	12,3	16,6
KH 250 P	250	250	164	158	330	360	S	4 x M 8	12,7	17,0
KH 280 P	280	280	176	246	330	360	S	4 x M 10	17,0	23,7
KH 300 P	300	300	176	246	330	360	S	4 x M 10	17,7	24,2
KH 320 P	320	320	176	246	330	360	S	4 x M 10	18,5	24,6
KH 360 P	360	360	176	368	330	360	S	6 x M 10	22,7	33,9
KH 390 P	390	390	176	368	330	360	S	6 x M 10	23,8	34,7
KH 420 P	420	420	176	368	330	360	S	6 x M 10	24,8	35,4
KH 450 P	450	450	176	368	330	360	S	6 x M 10	26,0	36,3
KH 480 P	480	480	176	368	330	360	S	6 x M 10	27,1	37,0
KH 520 P	520	520	176	448	330	360	S	8 x M 10	31,5	44,7
KH 560 P	560	560	176	448	330	360	S	8 x M 10	33,0	45,9
KH 600 P	600	600	176	448	330	360	S	8 x M 10	34,5	47,0
KH 640 P	640	640	176	448	330	360	S	8 x M 10	36,0	48,1
KH 700 P	700	700	176	558	330	360	S	10 x M 10	41,1	57,2
KH 750 P	750	750	176	558	330	360	S	10 x M 10	43,0	58,6
KH 800 P	800	800	176	558	330	360	S	10 x M 10	44,9	60,0

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Table with columns 1, 5, 10, 30, 1, 5, 10, 15, 30, 60, 90 and rows of KH values for codes 10 P to 800 P.

4 2 1 ) \* 1.10 3

Table with columns 1, 5, 10, 30, 1, 5, 10, 15, 30, 60, 90 and rows of KH values for codes 10 P to 800 P.

4 2 1 ) \* 1.05 3

Table with columns 1, 5, 10, 30, 1, 5, 10, 15, 30, 60, 90 and rows of KH values for codes 10 P to 800 P.



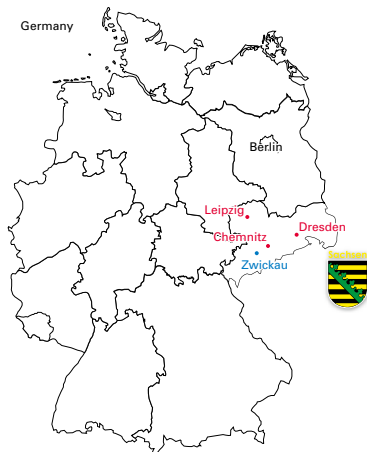
All dimensions and weights stated are subject to usual manufacturing tolerances. Electrical values are approximate.  
 The right is reserved to make any alterations without prior notice.  
 Alle Maß- und Gewichtsangaben unterliegen herkömmlichen Fertigungstoleranzen. Die elektrischen Werte sind angenähert.  
 Änderungen sind ohne Anzeigepflicht vorbehalten.



*...the opportunity to have the choice*

An ENERSYS Company

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