

HCGW3 · Screw-Terminal · 5000 h/70 °C

Highest capacitance · Ultra Compact

Optional design for permanent and deep charge-discharge application with high voltage hub and pulsed operation mode upon request.

Spezielles Design für häufige und tiefe Lade-, Entladeanwendungen mit hohem Spannungshub und Impulsbetrieb auf Anfrage erhältlich.

> Specifications · Spezifikationen

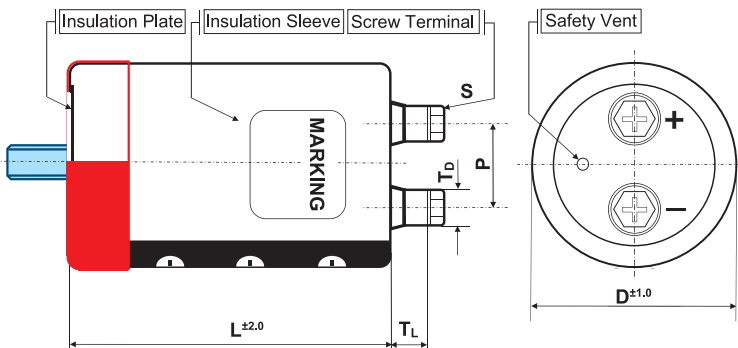
Items	Characteristics
Temperature range	-10°C ~ +70°C
Capacitance tolerance (at 20°C)	Standard +/- 20%, -10/+30% on request
Surge voltage	Repetitive max. 30 sec per 6 Minutes
Leakage current max. I _L (20°C, 5 min)	0.01 • C • V, [μA] or 7 mA, which is smaller.
Useful life	5 000 hours at 70°C
Field failure rate	0.5 FIT = 0.5 • 10 ⁻⁹ Failures/hour
RoHS conform	Directive 2011/65/EU & (EU)2015/863
Specification / Vibration	JIS C 5101-4/0.75mm, 10...55Hz, 10g, 3x2h
Outer materials	UL94-V0/UL224-VW1 certified (cap/sleeve)
Sleeve withstanding voltage	4000 Vac/1min between terminals bundled and plate*



* Typical value

> Shape designation · Formbezeichnung

- for details refer to p. 8–9 · technische Details siehe S. 8–9
- for mounting options refer to p. 149ff · Montageoptionen siehe S. 149ff



	B	I/Y	N
outer sleeve	•	•	•
insulation plate	•	•	•
stud bolt	•		
bottom double sleeve		•	

ØD	available shape	P	S	T _L	T _D	Cap material
77	B, N, I, Y	31.5	M6x12	9.0	12	PH
90	B, N, I, Y	31.5	M6x12	8.0	12	PH

Size in mm

> Product Code · Bestellbezeichnung

Example: Series HCGW3 · 36000 μF · 400 V · D=90 mm · L=230mm with Y-Bracket

HCGW3	2G	363	Y	F	230																		
Type of series	Rated voltage code	Capacitance code	Fixing symbol code	Case code diameter	Specific features																		
	<table border="1"> <thead> <tr> <th>Code</th> <th>Voltage</th> <th>Code</th> <th>Voltage</th> </tr> </thead> <tbody> <tr> <td>2V</td> <td>350</td> <td>2W</td> <td>450</td> </tr> <tr> <td>2G</td> <td>400</td> <td>2H</td> <td>500</td> </tr> </tbody> </table>	Code	Voltage	Code	Voltage	2V	350	2W	450	2G	400	2H	500	The first two digits are significant. The last digit indicates the number of following zeros in μF.	B : Bolt N : single outer sleeve I : 2 Stoppers Bracket Y : 3 Stoppers Bracket	<table border="1"> <thead> <tr> <th>ØD</th> <th>Code</th> </tr> </thead> <tbody> <tr> <td>77</td> <td>E</td> </tr> <tr> <td>90</td> <td>F</td> </tr> </tbody> </table>	ØD	Code	77	E	90	F	
Code	Voltage	Code	Voltage																				
2V	350	2W	450																				
2G	400	2H	500																				
ØD	Code																						
77	E																						
90	F																						
			Capacitance tolerance	Case Code length																			
			Ø : ±20 % Q : -10 % ~ +30 %	Length in mm (3 digits)																			

Rated VoltageCode (Surge Voltage) V_r [V DC]	Capacitance C_r [μ F]	Ripple Current at 70°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [m Ω]	Zmax at 20°C/10kHz [m Ω]	ESL (typ) [nH]	Dissipation Factor at 20°C/120Hz Tan δ	DxL [mm]	Product Code # = variable value, see fixing code in the product code
350 VDC Code: 2V Surge Voltage 400 VDC	19 000	15.8	36.3	18	19	20	0.70	77x148	HCGW32V193#E148
	21 000	17.3	39.8	16	17	20	0.70	77x165	HCGW32V213#E165
	25 000	19.4	44.6	14	15	20	0.70	77x188	HCGW32V253#E188
	28 000	20.4	46.9	12	13	20	0.70	90x150	HCGW32V283#F150
	30 000	22.0	50.6	12	13	20	0.70	90x167	HCGW32V303#F167
	31 000	23.4	53.8	11	12	20	0.70	77x228	HCGW32V313#E228
	35 000	24.3	55.9	10	11	20	0.70	90x190	HCGW32V353#F190
	44 000	29.5	67.9	8	9	20	0.70	90x230	HCGW32V443#F230
400 VDC Code: 2G Surge Voltage 450 VDC	16 000	14.5	33.4	21	22	20	0.70	77x148	HCGW32G163#E148
	17 000	15.6	35.9	20	21	20	0.70	77x165	HCGW32G173#E165
	20 000	17.4	40.0	17	18	20	0.70	77x188	HCGW32G203#E188
	22 000	18.2	41.9	16	17	20	0.70	90x150	HCGW32G223#F150
	24 000	19.7	45.3	14	15	20	0.70	90x167	HCGW32G243#F167
	25 000	21.0	48.3	14	15	20	0.70	77x228	HCGW32G253#E228
	29 000	22.1	50.8	12	13	20	0.70	90x190	HCGW32G293#F190
	36 000	26.8	61.6	10	11	20	0.70	90x230	HCGW32G363#F230
450 VDC Code: 2W Surge Voltage 500 VDC	8 600	9.3	21.4	47	43	20	0.70	77x108	HCGW32W862#E108
	13 000	12.5	28.8	31	32	20	0.70	77x148	HCGW32W133#E148
		13.0	29.9	31	32	20	0.70	90x126	HCGW32W133#F126
	14 000	13.4	30.8	29	29	20	0.70	90x126	HCGW32W143#F126
	15 000	14.0	32.2	27	28	20	0.70	77x165	HCGW32W153#E165
	16 000	14.8	34.0	25	26	20	0.70	90x150	HCGW32W163#F150
	17 000	15.3	35.2	23	25	20	0.70	77x188	HCGW32W173#E188
	18 000	15.7	36.1	22	23	20	0.70	90x150	HCGW32W183#F150
	21 000	17.6	40.5	19	20	20	0.70	90x167	HCGW32W213#F167
	22 000	18.8	43.2	18	19	20	0.70	77x228	HCGW32W223#E228
	25 000	19.6	45.1	16	17	20	0.70	90x190	HCGW32W253#F190
32 000	24.1	55.4	12	13	20	0.70	90x230	HCGW32W323#F230	
500 VDC Code: 2H Surge Voltage 550 VDC	10 000	11.0	25.3	36	37	20	0.70	77x148	HCGW32H103#E148
	12 000	12.5	28.8	30	31	20	0.70	77x165	HCGW32H123#E165
	14 000	13.9	32.0	26	27	20	0.70	77x188	HCGW32H143#E188
	15 000	14.3	32.9	24	25	20	0.70	90x150	HCGW32H153#F150
	17 000	16.5	38.0	21	22	20	0.70	77x228	HCGW32H173#E228
		15.9	36.6	21	22	20	0.70	90x167	HCGW32H173#F167
	20 000	17.6	40.5	18	19	20	0.70	90x190	HCGW32H203#F190
	25 000	21.4	49.2	15	15	20	0.70	90x230	HCGW32H253#F230

Additional designs on request · Weitere Designs auf Anfrage

> Ripple Current Multiplier · Wechselstrommultiplikator

Frequency [Hz]	50/60	120	300	1k	≥ 10k	Forced cooling [m/sec]	v < 1.0	v ≥ 1.0
Multiplier	0.70	1.00	1.05	1.10	1.35	Multiplier	1.0	1.1

Ta (°C)	40	45	50	55	60	65	70
Multiplier	2.3	2.2	2.1	1.9	1.7	1.4	1.0

> Life Time Table · Brauchbarkeitsdauer – Tabelle

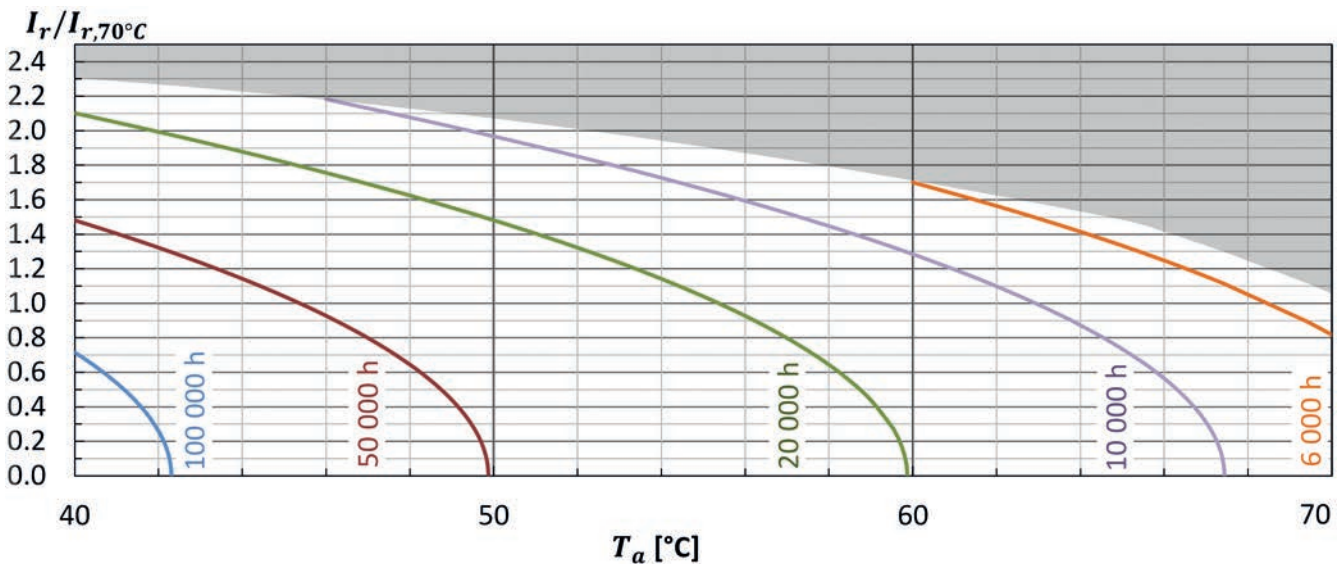
HCGW3 I_r at 70°C	Useful life as function of ambient temperature and ripple current										
	0.0	0.5	1.0	1.2	1.4	1.7	1.9	2.0	2.1	2.2	2.3
$T_a = 40^\circ\text{C}$	123	111	81	68	55	37	27	23	20	16	13
$T_a = 45^\circ\text{C}$	78	70	51	43	34	23	17	15	12	10	
$T_a = 50^\circ\text{C}$	49	44	32	27	22	15	11	9	8		
$T_a = 55^\circ\text{C}$	31	28	20	17	13	9	7				
$T_a = 60^\circ\text{C}$	19	17	13	10	8	6					
$T_a = 65^\circ\text{C}$	12	11	8	6	5						
$T_a = 70^\circ\text{C}$	7	7	5								

khrs

> Life Time Graph · Brauchbarkeitsdauer – Diagramm

Useful life depending on ambient temperature T_a and ripple current operating conditions I_r versus rated ripple current at the upper category temperature $I_{r, 70^\circ\text{C}, 120\text{Hz}}$

Brauchbarkeitsdauer in Abhängigkeit von Umgebungstemperatur T_a und Wechselstrombelastung I_r im Verhältnis zur max. Wechselstrombelastung bei oberer Kategorie-temperatur $I_{r, 70^\circ\text{C}, 120\text{Hz}}$



> Life Time Tests and Requirements · Anforderungen Brauchbarkeitsdauer

Life time test	Reference	Test procedure	Life time criteria
Endurance test	JIS-C-5101-4 JIS-C-5102 IEC 60384-4	$T_a = 70^\circ\text{C}$; V_r, I_r applied 4000 hours	$\Delta C/C \leq 10\%$ (of initial value) $\text{Tan}\delta \leq 175\%$ (of specified value) $I_L \leq$ specified value
Useful life	JIS-C-5104-4 IEC 60384-4	$T_a = 70^\circ\text{C}$; V_r, I_r applied 5000 hours	$\Delta C/C \leq 15\%$ (of initial value) $\text{Tan}\delta < 200\%$ (of specified value) $I_L \leq$ specified value

Reference Specification: JIS C 5101-4, JIS C 5102, IEC 60384-4