

HCGW3 · Screw-Terminal · 5000 h/70 °C

Highest capacitance · Double Anode Technology · Ultra Compact
Suited for optional permanent Charge-Discharge Design

Special charge-discharge proof design available upon request.

Auf Anfrage spezielles Design für Lade-, Entladeanwendungen erhältlich.

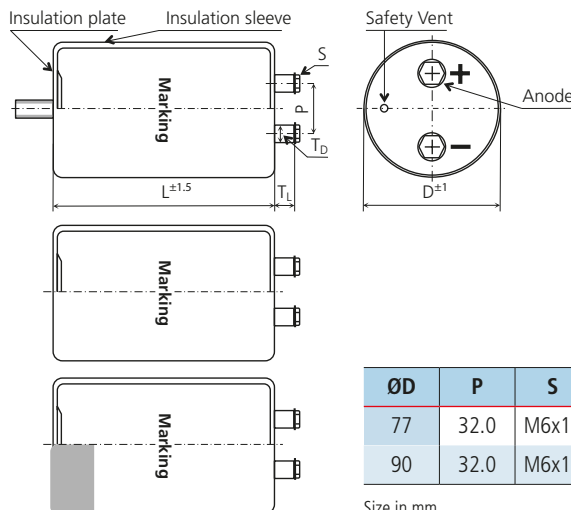
> Specifications · Spezifikationen

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



> Outline Drawings · Bauformen

- Shape: B (ØD = 77-90)
(for Bolt – Mounting, M12x16, stud bolt is not isolated)
- Form: B (ØD = 77-90)
(für Bolzenbefestigung, M12x16, Bolzen nicht isoliert)
- Shape: N, (for PBT-Holder ØD = 77-90 and Press Ring ØD = 77-90)
- Form: N, (für PBT-Halter ØD = 77-90 und Einpressring ØD = 77-90)
- Shape: Y (ØD = 77-90)
(double sleeve, bracket free of charge)
- Form: Y (ØD = 77-90)
(mit doppelter Isolierung, Y-Schelle wird kostenlos mitgeliefert)



> 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	Capacitance code	Rated voltage code	Fixing symbol code	Case code diameter	Customers' specification	Case Code length																		
	The first two digits are significant. The last digit indicates the number of following zeros in μF.	<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	B : Bolt ØD = 77 - 90 N : No double sleeve (PBT-Safety-holder or press ring) ØD = 77 - 90 Y : 3 Stoppers Bracket ØD = 77 - 90	<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		Length in mm (3 digits)
Code	Voltage	Code	Voltage																					
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Rated VoltageCode (Surge Voltage) V_r [V DC]	Capacitance C_r [μF]	Ripple Current at 70°C/120Hz I_r [A RMS]	Ripple Current at 40°C/120Hz [A RMS]	ESR (typ) at 20°C/100Hz [mΩ]	Zmax at 20°C/10kHz [mΩ]	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	0.7	77x148	HCGW32V193#E148
	21 000	17.3	39.8	16	17	20	0.7	77x165	HCGW32V213#E165
	25 000	19.4	44.6	14	15	20	0.7	77x188	HCGW32V253#E188
	28 000	20.4	46.9	12	13	20	0.7	90x150	HCGW32V283#F150
	30 000	22.0	50.6	12	13	20	0.7	90x167	HCGW32V303#F167
	31 000	23.4	53.8	11	12	20	0.7	77x228	HCGW32V313#E228
	35 000	24.3	55.9	10	11	20	0.7	90x190	HCGW32V353#F190
	44 000	29.5	67.9	8	9	20	0.7	90x230	HCGW32V443#F230
400 VDC Code: 2G Surge Voltage 450 VDC	16 000	14.5	33.4	21	22	20	0.7	77x148	HCGW32G163#E148
	17 000	15.6	35.9	20	21	20	0.7	77x165	HCGW32G173#E165
	20 000	17.4	40.0	17	18	20	0.7	77x188	HCGW32G203#E188
	22 000	18.2	41.9	16	17	20	0.7	90x150	HCGW32G223#F150
	24 000	19.7	45.3	14	15	20	0.7	90x167	HCGW32G243#F167
	25 000	21.0	48.3	14	15	20	0.7	77x228	HCGW32G253#E228
	29 000	22.1	50.8	12	13	20	0.7	90x190	HCGW32G293#F190
	36 000	26.8	61.6	10	11	20	0.7	90x230	HCGW32G363#F230
450 VDC Code: 2W Surge Voltage 500 VDC	13 000	12.5	28.8	31	32	20	0.7	77x148	HCGW32W133#E148
	15 000	14.0	32.2	27	28	20	0.7	77x165	HCGW32W153#E165
	17 000	15.3	35.2	23	25	20	0.7	77x188	HCGW32W173#E188
	18 000	15.7	36.1	22	23	20	0.7	90x150	HCGW32W183#F150
	21 000	17.6	40.5	19	20	20	0.7	90x167	HCGW32W213#F167
	22 000	18.8	43.2	18	19	20	0.7	77x228	HCGW32W223#E228
	25 000	19.6	45.1	16	17	20	0.7	90x190	HCGW32W253#F190
	32 000	24.1	55.4	12	13	20	0.7	90x230	HCGW32W323#F230
500 VDC Code: 2H Surge Voltage 550 VDC	10 000	11.0	25.3	36	37	20	0.7	77x148	HCGW32H103#E148
	12 000	12.5	28.8	30	31	20	0.7	77x165	HCGW32H123#E165
	14 000	13.9	32.0	26	27	20	0.7	77x188	HCGW32H143#E188
	15 000	14.3	32.9	24	25	20	0.7	90x150	HCGW32H153#F150
	17 000	16.5	38.0	21	22	20	0.7	77x228	HCGW32H173#E228
		15.9	36.6	21	22	20	0.7	90x167	HCGW32H173#F167
	20 000	17.6	40.5	18	19	20	0.7	90x190	HCGW32H203#F190
	25 000	21.4	49.2	15	15	20	0.7	90x230	HCGW32H253#F230

> 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	

Additional designs on request · Weitere Designs auf Anfrage

> Life Time Table · Brauchbarkeitsdauer – Tabelle

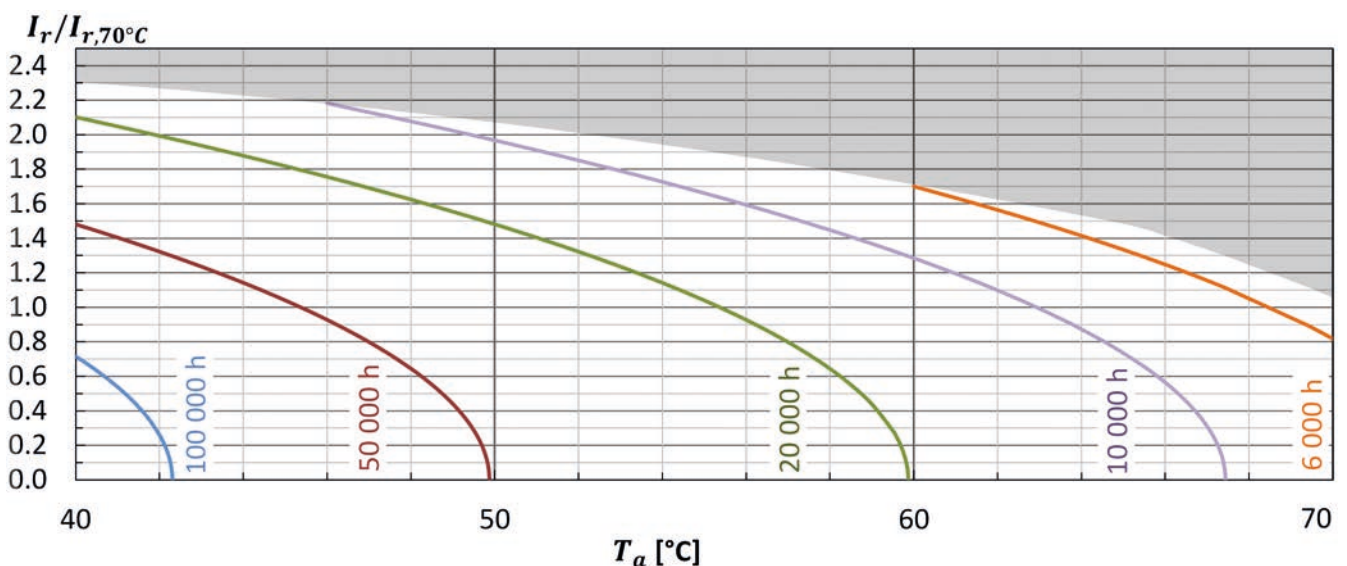
HCGW3 I_r at 70°C	Useful life as function of ambient temperature and ripple current										
	0.0	0.5	1.0	1.2	1.4	1.7	1.9	2.0	2.1	2.2	2.3
$T_a = 40^\circ\text{C}$	123	111	81	68	55	37	27	23	20	16	13
$T_a = 45^\circ\text{C}$	78	70	51	43	34	23	17	15	12	10	
$T_a = 50^\circ\text{C}$	49	44	32	27	22	15	11	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 Max. value limited to 250 000 hours.

> 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	$\Delta C/C \leq 20\%$ (of initial value) $\text{Tan}\delta \leq 200\%$ (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	$\Delta C/C \leq 30\%$ (of initial value) $\text{Tan}\delta < 300\%$ (of specified value) $I_L \leq$ specified value

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