



# 規格承認書

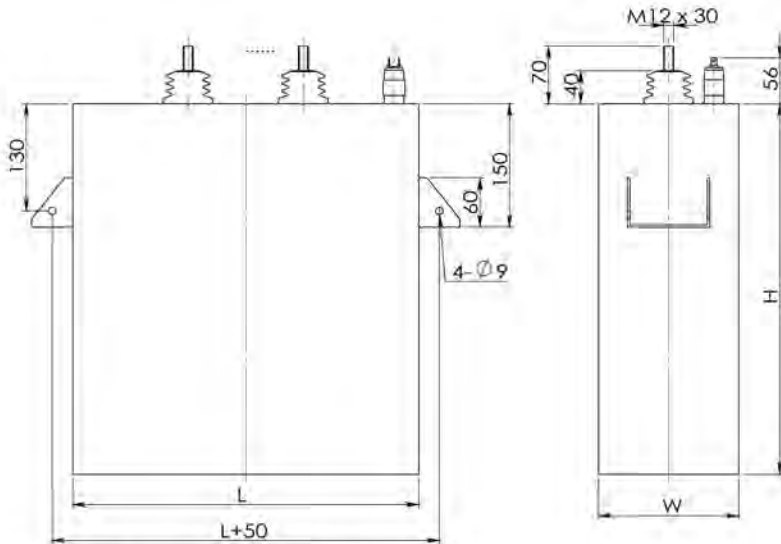
## (SPECIFICATION FOR APPROVAL)

File No.: Q/BH .TS16949.13TECH1303

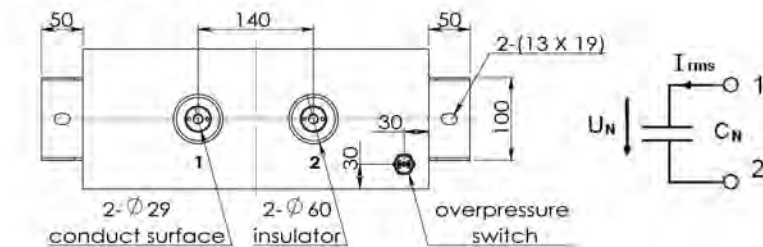
Product Name: High Voltage DC-Link Capacitor (Dry-type 105°C)  
Product Type: C3E( 干式直流滤波电容器)  
Product Code: C3E  
Customer:  
Customer Code:  
Issue Date: (V3.0)

## 干式高压直流滤波电容器 High Voltage DC-Link Capacitor (Dry-Type)

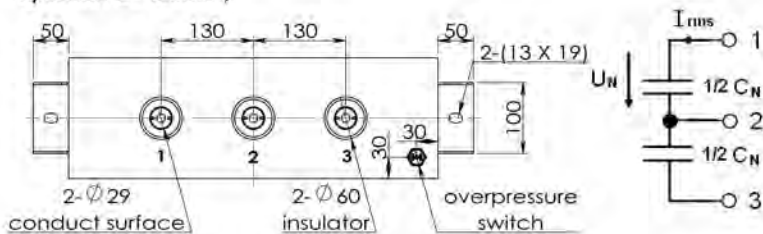
### ■ 外形图 Outline Drawing



1) When L=340mm or 420mm,



2) When L=520mm,



### ■ 特点

- 不锈钢外壳，阻燃树脂灌封
- 干式结构，不会漏液
- 有自愈性，采用安全膜设计
- 等效电阻小，自感小
- 能承受较高的纹波电流

### ■ 应用

- DC-Link
- 变速传动(驱动、牵引)
- 风能变流器
- 变电站

### ■ Features

- Stainless steel case, Epoxy resin sealing
- Dry construction, No leaking fluids
- Self-healing property, Segmented metalized-film design
- Low ESL & Low ESR
- High rms current capability

### ■ Applications

- DC-Link
- Speed inverter (driver and traction)
- Wind power converter
- Substations



C3E

■ 技术要求 Specifications

引用标准 Reference Standard	IEC 61071, IEC 61881		
额定电压 Rated Voltage ( $U_N$ )	2 000Vdc~6 000Vdc		
电容量范围 Capacitance Range ( $C_N$ )	100 $\mu$ F~6 000 $\mu$ F		
电容量偏差 Capacitance Tolerance	$\pm 5\%$ (J), $\pm 10\%$ (K)		
介质损耗因素 Dielectric Dissipation Factor ( $\text{tg}\delta_0$ )	0.0002		
运行温度范围 ( $\theta_{\text{case}}$ ) Operating Temperature Range ( $\theta_{\text{case}}$ )	-40 $^{\circ}$ C~70 $^{\circ}$ C		
热点温度 Hot-spot temperature ( $\theta_{\text{hs}}$ )	$\leq 70^{\circ}$ C		
贮存温度范围 Storage Temperature Range	-40 $^{\circ}$ C~70 $^{\circ}$ C		
气候类别 Climatic Category	40/70/56		
外壳类型 Case	Stainless steel		
耐电压(两极之间) Test Voltage Between Terminals	1.5 $U_N$ , 10s		
耐电压(极壳之间) Test Voltage Between Terminals And Case	$(\sqrt{2}U_N+1000)$ Vac, 10s		
绝缘电压 Insulation Voltage ( $U_i$ )	$U_N/\sqrt{2}$ Vac		
过电压 Over Voltage	1.1 $U_N$ (30% of on-load-dur.) 1.15 $U_N$ (30min/day) 1.2 $U_N$ (5min/day) 1.3 $U_N$ (1min/day) 1.5 $U_N$ (30ms every time, 1 000times during the whole life)		
绝缘电阻 Insulation Resistance ( $IR \times C_N$ )	$\geq 5\ 000$ s (20 $^{\circ}$ C, 100Vdc, 1min)		
电极端子 Terminals	Thread hole M10 $\times$ 24	Thread stud M12 $\times$ 30	Others on request
最大电极扭矩 Max. Torque of terminals	8Nm	12Nm	-
保护方式 Protection	Overpressure switch		
最高使用海拔 Max. Altitude	2 000m		
预期寿命 Expected lifetime	100 000hrs @ $U_N$ , $\theta_{\text{hs}} \leq 70^{\circ}$ C		
失效率 Failure rate	100 FIT		

产品编码说明 Part number system

■ 18位产品代码如下:

The 18 digits part number is formed as follow:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
C	3	E															

<p>第1~3位 型号代码 C3E</p> <p>第4~5位 直流额定电压 4M=1 500V, 3D=2 000V, 2N=2 200V 1N=2 400V, 3N=2 600V, 6P=2 800V 4Q=3 000V, 3G=4 000V, 3H=5 000V 6U=6 000V</p> <p>第6~8位 标称容量 举例: 207=20 <math>\times</math> 10<sup>7</sup> pF=200uF</p>	<p>Digit 1 to 3 Series code C3E</p> <p>Digit 4 to 5 DC rated voltage 4M=1 500V, 3D=2 000V, 2N=2 200V 1N=2 400V, 3N=2 600V, 6P=2 800V 4Q=3 000V, 3G=4 000V, 3H=5 000V 6U=6 000V</p> <p>Digit 6 to 8 Rated capacitance value for example: 207=10 <math>\times</math> 10<sup>7</sup> pF=200uF</p>
--	--



C3E

第9位 容量等级  
 $J = \pm 5\%$ ,  $K = \pm 10\%$ ,  $N = 0 \sim 10\%$   
 第10~15位 产品序列号  
 第16~18位 内部特征码

Digit 9 Capacitance tolerance  
 $J = \pm 5\%$ ,  $K = \pm 10\%$ ,  $N = 0 \sim 10\%$   
 Digit 10 to 15 Sequence number  
 Digit 16 to 18 Internal use

■ 技术参数 Technical Data

U <sub>N</sub> (Vdc)	C <sub>N</sub> (μF)	R <sub>s</sub> (mΩ) @20°C 1kHz	L <sub>s</sub> (nH)	R <sub>th</sub> (K/W)	Î (A)	I <sub>rms</sub> (A)			Dimensions (mm)			Weight (kg)	Part number
						40°C	50°C	60°C	L ± 3	W ± 3	H ± 3		
2 000	1 550	0.41	<100	0.68	9 800	220	220	169	340	140	285	22.6	C3E3D158-00001+++
	2 070	0.37	<100	0.55	13 100	220	220	198	340	140	365	28.1	C3E3D208-00002+++
	2 590	0.35	<100	0.46	16 400	220	220	220	340	140	445	33.6	C3E3D258-00003+++
	3 100	0.33	<100	0.40	19 700	220	220	220	340	140	525	39.2	C3E3D318-00004+++
	3 620	0.32	<100	0.34	22 900	220	220	220	340	140	610	45.1	C3E3D368-00005+++
	4 140	0.31	<100	0.31	26 200	220	220	220	340	140	690	50.6	C3E3D418-00006+++
	4 660	0.30	<100	0.27	29 500	220	220	220	340	140	770	56.2	C3E3D468-00007+++
	1 940	0.38	<100	0.56	12 300	220	220	195	420	140	285	27.4	C3E3D198-00008+++
	2 590	0.34	<100	0.46	16 400	220	220	220	420	140	365	34.1	C3E3D258-00009+++
	3 230	0.32	<100	0.38	20 500	220	220	220	420	140	445	40.9	C3E3D328-00010+++
	3 880	0.31	<100	0.33	24 600	220	220	220	420	140	525	47.7	C3E3D388-00011+++
	4 530	0.30	<100	0.29	28 700	220	220	220	420	140	610	55.0	C3E3D458-00012+++
	5 180	0.29	<100	0.26	32 800	220	220	220	420	140	690	61.7	C3E3D518-00013+++
	5 820	0.29	<100	0.23	36 900	220	220	220	420	140	770	68.5	C3E3D588-00014+++
	2x1 640	0.44	<100	0.37	10 400	220	220	159	520	140	375	43.3	C3E3D328-00015+++
2x2 050	0.41	<100	0.31	13 000	220	220	180	520	140	455	51.6	C3E3D418-00016+++	
2x2 460	0.39	<100	0.27	15 600	220	220	200	520	140	540	60.5	C3E3D498-00017+++	
2x2 870	0.37	<100	0.23	18 200	220	220	219	520	140	625	69.4	C3E3D578-00018+++	
2 200	1 250	0.43	<100	0.69	8 800	220	220	168	340	140	285	22.5	C3E2N128-000051+++
	1 670	0.38	<100	0.56	11 700	220	220	198	340	140	365	28.1	C3E2N168-000052+++
	2 080	0.36	<100	0.47	14 700	220	220	220	340	140	445	33.6	C3E2N208-000053+++
	2 500	0.34	<100	0.40	17 600	220	220	220	340	140	525	39.1	C3E2N258-000054+++
	2 920	0.32	<100	0.35	20 600	220	220	220	340	140	610	45.1	C3E2N298-000055+++
	3 340	0.31	<100	0.31	23 500	220	220	220	340	140	690	50.6	C3E2N338-000056+++
	3 760	0.31	<100	0.28	26 500	220	220	220	340	140	770	56.1	C3E2N378-000057+++
	1 560	0.39	<100	0.57	11 000	220	220	194	420	140	285	27.3	C3E2N158-000058+++
	2 080	0.35	<100	0.46	14 700	220	220	220	420	140	365	34.1	C3E2N208-000059+++
	2 610	0.33	<100	0.39	18 400	220	220	220	420	140	445	40.9	C3E2N268-000060+++
	3 130	0.32	<100	0.33	22 100	220	220	220	420	140	525	47.7	C3E2N318-000061+++
	3 650	0.31	<100	0.29	25 800	220	220	220	420	140	610	54.9	C3E2N368-000062+++
	4 170	0.30	<100	0.26	29 400	220	220	220	420	140	690	61.7	C3E2N418-000063+++
	4 700	0.29	<100	0.23	33 100	220	220	220	420	140	770	68.5	C3E2N478-000064+++
	2x1 320	0.46	<100	0.37	9 300	220	220	156	520	140	375	43.3	C3E2N268-000065+++
2x1 650	0.42	<100	0.31	11 600	220	220	177	520	140	455	51.6	C3E2N338-000066+++	
2x1 980	0.40	<100	0.27	14 000	220	220	198	520	140	540	60.5	C3E2N398-000067+++	
2x2 320	0.38	<100	0.23	16 300	220	220	216	520	140	625	69.4	C3E2N468-000068+++	
2 400	1 030	0.45	<100	0.69	8 000	220	220	164	340	140	285	22.5	C3E1N108-000101+++
	1 370	0.40	<100	0.56	10 700	220	220	194	340	140	365	28.1	C3E1N138-000102+++
	1 720	0.37	<100	0.47	13 300	220	220	220	340	140	445	33.6	C3E1N178-000103+++
	2 060	0.35	<100	0.41	16 000	220	220	220	340	140	525	39.1	C3E1N208-000104+++
	2 410	0.33	<100	0.35	18 700	220	220	220	340	140	610	45.1	C3E1N248-000105+++
	2 750	0.32	<100	0.31	21 400	220	220	220	340	140	690	50.6	C3E1N278-000106+++
	3 100	0.31	<100	0.28	24 100	220	220	220	340	140	770	56.1	C3E1N318-000107+++
	1 290	0.40	<100	0.58	10 000	220	220	190	420	140	285	27.3	C3E1N128-000108+++
	1 720	0.36	<100	0.47	13 300	220	220	220	420	140	365	34.1	C3E1N178-000109+++
	2 150	0.34	<100	0.39	16 700	220	220	220	420	140	445	40.9	C3E1N218-000110+++
	2 580	0.32	<100	0.34	20 000	220	220	220	420	140	525	47.6	C3E1N258-000111+++
	3 010	0.31	<100	0.29	23 400	220	220	220	420	140	610	54.9	C3E1N308-000112+++
	3 440	0.30	<100	0.26	26 700	220	220	220	420	140	690	61.7	C3E1N348-000113+++
	3 870	0.30	<100	0.24	30 100	220	220	220	420	140	770	68.4	C3E1N388-000114+++
	2x1 090	0.47	<100	0.38	8 500	220	216	153	520	140	375	43.2	C3E1N218-000115+++
2x1 360	0.43	<100	0.32	10 600	220	220	174	520	140	455	51.5	C3E1N278-000116+++	
2x1 630	0.41	<100	0.27	12 700	220	220	194	520	140	540	60.4	C3E1N328-000117+++	
2x1 910	0.39	<100	0.24	14 800	220	220	213	520	140	625	69.3	C3E1N388-000118+++	
2 600	1 100	0.48	<100	0.69	7 300	220	220	158	340	170	285	26.3	C3E3N118-000151+++
	1 470	0.43	<100	0.56	9 800	220	220	186	340	170	365	32.7	C3E3N148-000152+++
	1 830	0.39	<100	0.48	12 200	220	220	212	340	170	445	39.2	C3E3N188-000153+++
	2 200	0.37	<100	0.41	14 700	220	220	220	340	170	525	45.6	C3E3N228-000154+++



C3E

■ 技术参数 Technical data(mm)

U <sub>N</sub> (Vdc)	C <sub>N</sub> (μF)	R <sub>s</sub> (mΩ) @20°C 1kHz	L <sub>s</sub> (nH)	R <sub>th</sub> (K/W)	İ (A)	I <sub>rms</sub> (A)			Dimensions (mm)			Weight (kg)	Part number
						40°C	50°C	60°C	L ± 3	W ± 3	H ± 3		
2 600	2 570	0.35	<100	0.36	17 100	220	220	220	340	170	610	52.5	C3E3N258-000155+++
	2 940	0.34	<100	0.32	19 600	220	220	220	340	170	690	59.0	C3E3N298-000156+++
	3 310	0.33	<100	0.29	22 000	220	220	220	340	170	770	65.4	C3E3N338-000157+++
	1 380	0.43	<100	0.57	9 100	220	220	183	420	170	285	31.9	C3E3N138-000158+++
	1 830	0.39	<100	0.47	12 200	220	220	214	420	170	365	39.8	C3E3N188-000159+++
	2 290	0.36	<100	0.40	15 300	220	220	220	420	170	445	47.7	C3E3N228-000160+++
	2 750	0.34	<100	0.34	18 300	220	220	220	420	170	525	55.5	C3E3N278-000161+++
	3 210	0.33	<100	0.30	21 400	220	220	220	420	170	610	64.0	C3E3N328-000162+++
	3 670	0.31	<100	0.27	24 500	220	220	220	420	170	690	71.9	C3E3N368-000163+++
	4 130	0.31	<100	0.24	27 500	220	220	220	420	170	770	79.8	C3E3N418-000164+++
	2x1 160	0.51	<100	0.38	7 700	220	207	146	520	170	375	50.4	C3E3N238-000165+++
	2x1 450	0.46	<100	0.33	9 700	220	220	166	520	170	455	60.0	C3E3N298-000166+++
2x1 750	0.43	<100	0.28	11 600	220	220	186	520	170	540	70.4	C3E3N358-000167+++	
2x2 040	0.41	<100	0.25	13 600	220	220	204	520	170	625	80.8	C3E3N408-000168+++	
2 800	930	0.50	<100	0.69	6 700	220	219	155	340	170	285	26.3	C3E6P937-000201+++
	1 250	0.44	<100	0.57	9 000	220	220	183	340	170	365	32.7	C3E6P128-000202+++
	1 560	0.40	<100	0.48	11 300	220	220	208	340	170	445	39.1	C3E6P158-000203+++
	1 870	0.37	<100	0.41	13 500	220	220	220	340	170	525	45.6	C3E6P188-000204+++
	2 190	0.36	<100	0.36	15 800	220	220	220	340	170	610	52.5	C3E6P218-000205+++
	2 500	0.34	<100	0.32	18 000	220	220	220	340	170	690	59.0	C3E6P258-000206+++
	2 810	0.33	<100	0.29	20 300	220	220	220	340	170	770	65.4	C3E6P288-000207+++
	1 170	0.45	<100	0.58	8 400	220	220	179	420	170	285	31.9	C3E6P118-000208+++
	1 560	0.40	<100	0.48	11 300	220	220	210	420	170	365	39.8	C3E6P158-000209+++
	1 950	0.37	<100	0.40	14 100	220	220	220	420	170	445	47.6	C3E6P198-000210+++
	2 340	0.35	<100	0.35	16 900	220	220	220	420	170	525	55.5	C3E6P238-000211+++
	2 730	0.33	<100	0.30	19 700	220	220	220	420	170	610	64.0	C3E6P278-000212+++
	3 130	0.32	<100	0.27	22 600	220	220	220	420	170	690	71.9	C3E6P318-000213+++
	3 520	0.31	<100	0.24	25 400	220	220	220	420	170	770	79.8	C3E6P358-000214+++
	2x990	0.52	<100	0.39	7 100	220	202	143	520	170	375	50.4	C3E6P198-000215+++
	2x1 240	0.48	<100	0.33	8 900	220	220	163	520	170	455	60.0	C3E6P248-000216+++
2x1 480	0.44	<100	0.28	10 700	220	220	182	520	170	540	70.4	C3E6P298-000217+++	
2x1 730	0.42	<100	0.25	12 500	220	220	200	520	170	625	80.8	C3E6P348-000218+++	
3 000	800	0.52	<100	0.70	6 200	220	214	151	340	170	285	26.3	C3E4Q807-000251+++
	1 070	0.45	<100	0.58	8 300	220	220	179	340	170	365	32.7	C3E4Q108-000252+++
	1 340	0.41	<100	0.49	10 400	220	220	204	340	170	445	39.1	C3E4Q138-000253+++
	1 610	0.38	<100	0.42	12 500	220	220	220	340	170	525	45.6	C3E4Q168-000254+++
	1 880	0.36	<100	0.37	14 600	220	220	220	340	170	610	52.5	C3E4Q188-000255+++
	2 150	0.35	<100	0.33	16 700	220	220	220	340	170	690	58.9	C3E4Q218-000256+++
	2 420	0.34	<100	0.29	18 800	220	220	220	340	170	770	65.4	C3E4Q248-000257+++
	1 010	0.46	<100	0.59	7 800	220	220	175	420	170	285	31.9	C3E4Q108-000258+++
	1 340	0.41	<100	0.48	10 400	220	220	206	420	170	365	39.7	C3E4Q138-000259+++
	1 680	0.37	<100	0.41	13 100	220	220	220	420	170	445	47.6	C3E4Q168-000260+++
	2 020	0.35	<100	0.35	15 700	220	220	220	420	170	525	55.5	C3E4Q208-000261+++
	2 350	0.34	<100	0.31	18 300	220	220	220	420	170	610	64.0	C3E4Q238-000262+++
	2 690	0.33	<100	0.27	20 900	220	220	220	420	170	690	71.9	C3E4Q268-000263+++
	3 030	0.32	<100	0.25	23 600	220	220	220	420	170	770	79.7	C3E4Q308-000264+++
	2x850	0.54	<100	0.39	6 600	220	198	140	520	170	375	50.4	C3E4Q178-000265+++
	2x1 060	0.49	<100	0.33	8 300	220	220	160	520	170	455	60.0	C3E4Q218-000266+++
	2x1 280	0.46	<100	0.29	9 900	220	220	179	520	170	540	70.4	C3E4Q258-000267+++
	2x1 490	0.43	<100	0.25	11 600	220	220	196	520	170	625	80.8	C3E4Q298-000268+++

备注: 1. “-”表示容量偏差。 “-”=capacitance tolerance code, J= ± 5.0%,K= ± 10%  
 2. “+++”表示内部特征码。 “+++” = Internal use  
 3.其它容量、电压、尺寸系列可按用户需要定制。Other capacitances,voltages,and dimensions are available on request.  
 4.R<sub>s</sub>是电容器导体部分的等效内阻,其近似电阻温度系数为0.004/°C。  
 R<sub>s</sub> is the effective ohmic resistance of the conductors of a capacitor and the approximate TCR is 0.004/°C.  
 5.上表中列出的R<sub>th</sub>值是在自然冷却条件下的数值。The R<sub>th</sub> values listed in above table depend on natural cooling.  
 6.上表中列出的I<sub>rms</sub>值是在环境温度 θ<sub>amb</sub>分别为40°C、50°C、60°C时的最大电流有效值。该值通过公式  

$$\theta_{hs} = \theta_{amb} + I_{rms}^2 \times (R_s + t_g \delta_o / (2 \times \pi \times r_{fripple} \times C_N))$$
 计算得到,但不允许超出电极端子的持续载流强度。如需要更大电流,可以通过增大电极端子的直径或者增加电极端子数来实现。  
 The I<sub>rms</sub> values listed in above table are the maximum allowable r.m.s current at θ<sub>amb</sub> (40°C,50°C or 60°C). We can get these values by the formula  $\theta_{hs} = \theta_{amb} + I_{rms}^2 \times (R_s + t_g \delta_o / (2 \times \pi \times r_{fripple} \times C_N))$ , but they can't exceed the maximum allowed continuous current through the terminals. We can get higher current on request by increasing the diameter of terminals or adding the quantity of terminals.