

# K04 TYPE -40°C +85°C 20000H

RoHS Compliant

- Extended life.
- Surge-proof capacitor in aluminium can with insulation sleeve.
- To be mounted with ring clips or with threaded stud.
- Designed for high resistances to voltage spikes.

## APPLICATIONS

Power supplies, motor drives, welding, energy storage.

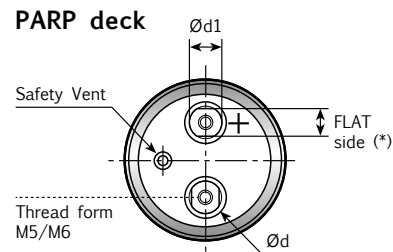
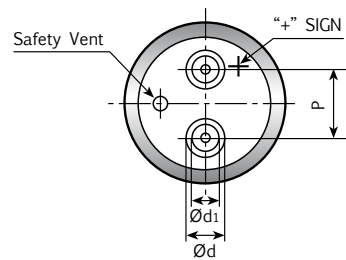
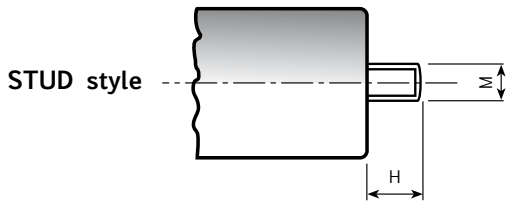
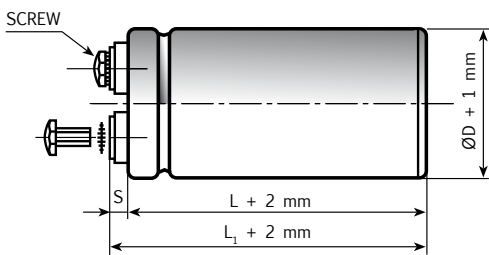


Diagram of dimensions (unit=mm)  
Insert and screw threads: Metric (mm), UNF (inches)

ØD	d	d1	P	STUD		INSERT	SCREW	L1 -L[-1+3]	S[-1+1]	INSERT STYLE CODE
				M	H					
35	11	7.9	12.7	M8	12	M5	5MA x 9.5	2.5	5	0
51	18.5	13	22.7	M12	16	M5	5MA x 9.5	2.5	5	H
63	18.5	13	28.6	M12	16	M5	5MA x 9.5	2.5	5	H
63	17.3	17.3	28.6	M12	16	UNF 1/4-28 Low Post	1/4-28 x 3/8"	3	4	W
63	17.3	17.3	28.6	M12	16	UNF 1/4-28 High Post	1/4-28 x 1/2"	6	7	R
63	7.9	7.9	28.6	M12	16	UNF 10-32 Low Post	10-32 x 1/4"	2	2.5	Z
63	12	7.9	28.6	M12	16	UNF 10-32 High Post	10-32 x 3/8"	6	7	U
76	18.5	13	31.8	M12	16	M5	5MA x 9.5	2.5	5	H
76	18.5	13	31.8	M12	16	M5	5MA x 9.5	2.5	7	L
76	23.2	17.7	31.8	M12	16	M6	6MA x 10	4.5	7	6
76	17.3	17.3	31.8	M12	16	UNF 1/4-28 Low Post	1/4-28 x 3/8"	3	4	W
76	17.3	17.3	31.8	M12	16	UNF 1/4-28 High Post	1/4-28 x 1/2"	6	7	R
76	7.9	7.9	31.8	M12	16	UNF 10-32 Low Post	10-32 x 1/4"	2	2.5	Z
76	12	7.9	31.8	M12	16	UNF 10-32 High Post	10-32 x 3/8"	6	7	U
90	23.2	17.7	31.8	M12	16	M6	6MA x 10	4.5	7	H
51	13	13 (10)*	22.7	M12	16	PARP M5	5MA x 9.5	6	7	K
63	15	15 (13)*	28.6	M12	16	PARP M5	5MA x 9.5	6	7	K
76	19	15 (13)*	31.8	M12	16	PARP M5	5MA x 9.5	6	7	K
76	19	15 (13)*	31.8	M12	16	PARP M6	6MA x 10	6	7	Q
90	19	15 (13)*	31.8	M12	16	PARP M6	6MA x 10	6	7	Q

Note: (\*) quote on the PARP deck of the flat side (PARP = Protection Against Reverse Polarity).

## SPECIFICATIONS

<b>Temperature Range</b>	Operating: -40°C +85°C [Environmental classification 40/85/56 IEC-68] Storage : Preferably below +25°C, not exceeding +40°C																																					
<b>Rated Voltage Range (V<sub>r</sub>)</b>	from 350V to 600V DC																																					
<b>Surge Voltage (V<sub>p</sub>)</b>	V <sub>p</sub> = 1.10 V <sub>r</sub> (V <sub>r</sub> ≤ 500 V DC)	V <sub>p</sub> = 1.05 V <sub>r</sub> (V <sub>r</sub> > 500 V DC)																																				
<b>Rated Capacitance Range</b>	from 1500 µF to 15000 µF																																					
<b>Capacitance Tolerance</b>	±20% at 100 Hz, 20°C [M class IEC-62] on request: -10% +30% at 100 Hz, 20°C [Q class IEC-62]																																					
<b>Leakage Current (I<sub>L</sub>) (mA, 5 min, 20°C)</b>	max I <sub>L</sub> = 0.006 C <sub>r</sub> V <sub>r</sub> + 4 µA At 85°C max I <sub>L</sub> = 0.04 C <sub>r</sub> V <sub>r</sub> µA	Kendeil product limit: I <sub>L</sub> = 0.003 C <sub>r</sub> V <sub>r</sub>																																				
<b>Ripple current (I<sub>r</sub>)</b>	Refer to table at 85°C and 100Hz: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>FREQUENCY</th> <th>50Hz</th> <th>100 Hz</th> <th>500Hz</th> <th>1000Hz</th> <th>&gt;10kHz</th> </tr> </thead> <tbody> <tr> <td>MULTIPLIER</td> <td>0.8</td> <td>1.0</td> <td>1.2</td> <td>1.3</td> <td>1.5</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>AMBIENT TEMP</th> <th>35°C</th> <th>45°C</th> <th>55°C</th> <th>65°C</th> <th>75°C</th> <th>85°C</th> <th>95°C</th> </tr> </thead> <tbody> <tr> <td>MULTIPLIER</td> <td>2.2</td> <td>2.1</td> <td>1.8</td> <td>1.6</td> <td>1.4</td> <td>1.0</td> <td>0.5</td> </tr> </tbody> </table> Due to the current load capability of the contact elements, the following limits must not be exceeded: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>CAPACITOR DIAMETER</th> <th>63mm</th> <th>76mm</th> <th>90mm</th> </tr> </thead> <tbody> <tr> <td>Maximum current</td> <td>40A</td> <td>50A</td> <td>70A</td> </tr> </tbody> </table>		FREQUENCY	50Hz	100 Hz	500Hz	1000Hz	>10kHz	MULTIPLIER	0.8	1.0	1.2	1.3	1.5	AMBIENT TEMP	35°C	45°C	55°C	65°C	75°C	85°C	95°C	MULTIPLIER	2.2	2.1	1.8	1.6	1.4	1.0	0.5	CAPACITOR DIAMETER	63mm	76mm	90mm	Maximum current	40A	50A	70A
FREQUENCY	50Hz	100 Hz	500Hz	1000Hz	>10kHz																																	
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CAPACITOR DIAMETER	63mm	76mm	90mm																																			
Maximum current	40A	50A	70A																																			
<b>Insulation Resistance</b>	At 100V DC for 1 min is >100 MΩ across insulating sleeve and terminals.																																					
<b>Vibration Resistance</b>	Frequency range: 10 Hz to 55 Hz, amplitude 0.75 mm Capacitor length ≤ 143 : max acceleration 10g for 3x2 h Capacitor length > 143 : max acceleration 5g for 3x0.5 h																																					
<b>Withstand voltage (between terminals bundled and plate)</b>	2500 VAC for 1 min																																					
<b>Life test</b>	After 4,000 hours application of rated voltage at 85°C capacitors meet characteristics aside	Cap change ≤ 10% tan δ ≤ 130% Leakage current (I <sub>L</sub> ) < initial limit Impedance (Z) ≤ 130%																																				
<b>Shelf life</b>	After leaving capacitors under no load for 2000 hours at 85°C, when restored at 20°C meet specifications aside	Cap change ≤ ±15% tan δ ≤ 150% Leakage current (I <sub>L</sub> ) < initial limit																																				
<b>Working life (V<sub>n</sub>, Temp rated I ripple applied)</b>	> 20000 h 85°C for V ≤ 450V > 15000 h for V ≤ 500V > 12000 h for V = 550V > 6000 h for V = 600V	Cap change ≤ ±25% tan δ ≤ 300% Leakage current (I <sub>L</sub> ) < initial limit																																				
<b>Failure percentage Failure rate</b>	≤ 1% (during working life) ≤ 33 fit (33 10 <sup>-9</sup> /h)																																					
<b>Self inductance</b>	Approx. 20 nH																																					
<b>Damp heat test (V<sub>n</sub> applied, 2000 hours, 85% RH)</b>	Stable electrical parameters in humidity ambient condition 85°C																																					
<b>Electrolyte</b>	All the capacitors of this series have self-extinguishing electrolyte in accordance with IEC EN 60695-11-10																																					
<b>Reference standards</b>	CECC 30.300 IEC 60384-4 LONG LIFE GRADE																																					

## K04 TYPE STANDARD RATINGS

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 85°C	PART NUMBER stud and insert style excluded
2200	63x105	0.13	42	30	11.0	K04350222__M0H105
3300	63x105	0.13	30	22	12.6	K04350332__M0H105
3300	76x105	0.13	30	22	13.8	K04350332__M0H105
4700	76x105	0.13	23	15	16.1	K04350472__M0J105
4700	76x143	0.13	23	15	18.5	K04350472__M0J143
5600	76x143	0.15	19	14	20.0	K04350562__M0J143
6800	76x143	0.15	15	11	21.8	K04350682__M0J143
8200	76x143	0.15	13	9	23.6	K04350822__M0J143
10000	76x214	0.17	11	8	31.7	K04350103__M0J214
15000	90x220	0.18	7	5	42.0	K04350153__M0L220

**RATED  
VOLTAGE  
VDC**

**350V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 kHz 20°C	I <sub>r</sub> a.c. A max 100 Hz 85°C	PART NUMBER stud and insert style excluded
1500	63x105	0.15	105	85	7.5	K04400152__M0H105
2200	63x105	0.15	80	63	8.8	K04400222__M0H105
2200	76x105	0.15	80	63	10.2	K04400222__M0J105
3300	63x105	0.15	50	40	10.7	K04400332__M0H105
3300	76x143	0.15	50	40	14.1	K04400332__M0J143
4700	76x105	0.17	40	32	14.7	K04400472__M0J105
4700	76x143	0.17	40	32	17.7	K04400472__M0J143
6800	76x143	0.17	27	22	18.0	K04400682__M0J143
10000	76x214	0.20	20	17	27.8	K04400103__M0J214

**RATED  
VOLTAGE  
VDC**

**400V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 Hz 20°C	I <sub>r</sub> a.c. A max 100 Hz 85°C	PART NUMBER stud and insert style excluded
1500	63x105	0.15	105	85	7.5	K04420152__M0H105
2200	63x105	0.15	80	63	8.8	K04420222__M0H105
2200	76x105	0.15	80	63	10.2	K04420222__M0J105
3300	63x105	0.15	50	40	10.7	K04420332__M0H105
3300	76x143	0.15	50	40	14.1	K04420332__M0J143
4700	76x105	0.17	40	32	14.7	K04420472__M0J105
4700	76x143	0.17	40	32	17.7	K04420472__M0J143
6800	76x143	0.17	27	22	18.0	K04420682__M0J143
10000	76x214	0.20	20	17	27.8	K04420103__M0J214

**RATED  
VOLTAGE  
VDC**

**420V**

## K04 TYPE STANDARD RATINGS

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 Hz 20°C	Ir a.c. A max 100 Hz 85°C	PART NUMBER stud and insert style excluded
1500	63x105	0.15	105	85	7.5	K04450152__M0H105
2200	63x105	0.15	80	63	8.8	K04450222__M0H105
2200	76x105	0.15	80	63	10.2	K04450222__M0J105
3300	63x105	0.15	50	40	10.7	K04450332__M0H105
3300	76x143	0.15	50	40	14.1	K04450332__M0J143
4700	76x105	0.17	40	32	14.7	K04450472__M0J105
4700	76x143	0.17	40	32	17.7	K04450472__M0J143
6800	76x143	0.17	27	22	18.0	K04450682__M0J143
10000	76x214	0.20	20	17	27.8	K04450103__M0J214
12000	90x220	0.20	15	11	34.5	K04450123__M0L220

**RATED  
VOLTAGE  
VDC**

**450V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 Hz 20°C	Ir a.c. A max 100 Hz 85°C	PART NUMBER stud and insert style excluded
1500	63x105	0.15	95	76	7.7	K04500152__M0H105
2200	63x105	0.15	65	55	8.9	K04500222__M0H105
2200	76x105	0.15	65	55	10.0	K04500222__M0J105
2200	76x143	0.15	65	55	11.4	K04500222__M0J143
3300	76x143	0.15	40	39	13.9	K04500332__M0J143
3900	76x143	0.17	38	34	14.7	K04500392__M0J143
4700	76x143	0.17	33	33	16.1	K04500472__M0J143
5600	76x143	0.17	30	26	17.5	K04500562__M0J143
6800	76x214	0.17	27	22	23.0	K04500682__M0J214
10000	90x220	0.20	20	17	30.4	K04500103__M0L220

**RATED  
VOLTAGE  
VDC**

**500V**

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 Hz 20°C	Ir a.c. A max 100 Hz 85°C	PART NUMBER stud and insert style excluded
1500	63x105	0.19	109	88	6.5	K04550152__M0H105
1800	76x105	0.19	99	80	7.6	K04550182__M0J105
2200	76x143	0.19	81	70	9.5	K04550222__M0J143
3300	76x143	0.20	59	49	10.2	K04550332__M0J143
4700	76x214	0.20	48	41	16.0	K04550472__M0J214
6800	90x220	0.21	34	28	18.1	K04550682__M0L220

**RATED  
VOLTAGE  
VDC**

**550V**

## K04 TYPE STANDARD RATINGS

Cap $\mu\text{F}$	$\varnothing \times L$ mm	Tan $\delta$ MAX 100 Hz 20°C	ESR TYP m $\Omega$ 100 Hz 20°C	Z TYP m $\Omega$ 10 Hz 20°C	Ir a.c. A max 100 Hz 85°C	PART NUMBER termination digit excluded
1500	63x105	0.15	71	54	7.9	K04600152__HM0H105
1800	76x105	0.15	61	47	9.5	K04600182__HM0J105
2200	76x143	0.15	48	37	11.9	K04600222__HM0J143
3300	76x143	0.15	36	27	14.1	K04600332__HM0J143
3900	90x145	0.15	28	22	17.3	K04600392__HM0L145
4700	76x214	0.15	21	17	18.7	K04600472__HM0J214
4700	90x145	0.15	23	19	20.1	K04600472__HM0L145
6800	90x220	0.15	16	13	26.9	K04600682__HM0L220

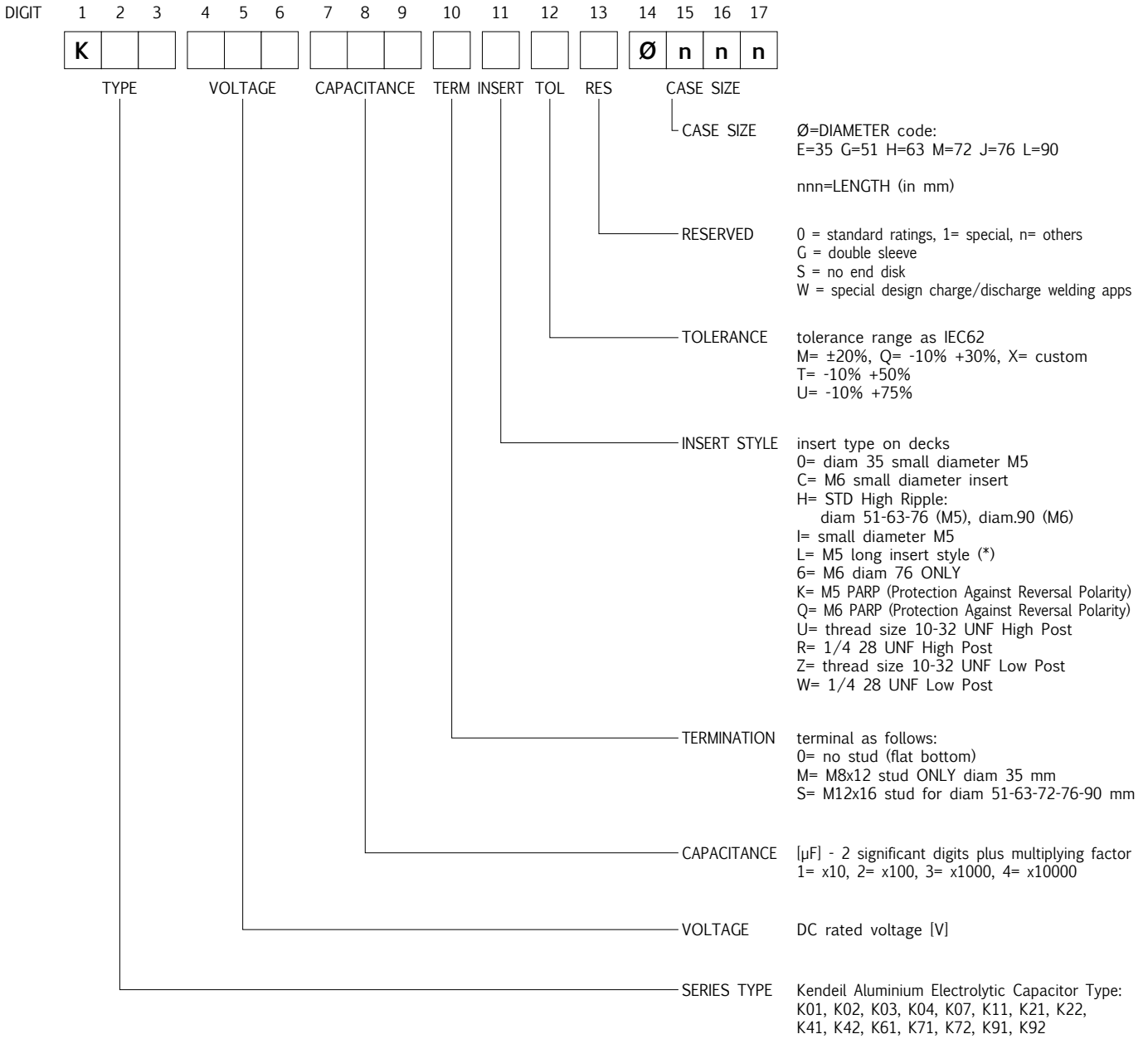
**RATED  
VOLTAGE  
VDC**

**600V**

PLEASE TO CONTACT OUR TECHNICAL SERVICE FOR MORE INFORMATION OR SPEC-IN ANALYSIS.

# PART NUMBER SYSTEM FOR SCREW TYPE CAPACITORS

New PART-NUMBER CODE in use since Sep 2010. Total length is 17 digits.  
Please see examples below and have a reference code from the standard ratings capacitors pages.



### EXAMPLES

K	0	1	1	0	0	2	2	3	0	H	M	0	H	1	0	5	K01 100V 22000µF, Hi ripple, -20%+20%, 63x105
K	0	1	0	6	3	2	2	3	S	H	Q	0	G	1	0	5	K01 63V 22000µF, stud M12x16, Hi rip. -10%+30%, 51x105
K	0	2	0	4	0	1	0	4	0	H	M	0	J	1	4	3	K02 40V 100000µF, Hi ripple, -20%+20%, 76x143

Specifications subject to change without notice

(\*) Note for INSERT STYLE digit\_11

M5 long insert style dedicated to not insulated bus bar (+2 mm height versus STD High Ripple code)