

PEH 169 105°C

- High performance
- Long Life, > 10 years at 50°C
- Low ESR and ESL
- High stability, 10 years shelf life

APPLICATION	BASIC DESIGN
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Smoothing, energy storage, or pulse operation in telecommunication demanding power supplies, process control, AC-motor control, traction, welding and measuring.

PEH 169 is a Long Life electrolytic capacitor with outstanding reliability and electrical performance. Polarized, all-welded design, heavy duty screw terminals, negative pole connected to the case, safety vent and plastic insulation. The PEH 169 winding is housed in a cylindrical aluminium can with a reinforced moulded lid incorporating a safety vent. The sealing system is designed for

electrolyte leakage free operation and a very low gas-diffusion rate of electrolyte. Mechanical contact between the winding and the case allows excellent heat transfer from the winding to the ambient, which means cooler operation. Low ESR is a result of a low resistive paper/electrolyte system, at least two tabs per foil and all-welded design.

SPECIFICATION

Standards	Standards IEC 384-4 Long Life Grade 40/105/56, DIN 41240, type 1A CECC 30300	
CECC	DIN 40040 GPF, DIN 41248 CECC 30301-030, Corresponding to CECC 30301-803	
Capacitance range	100–330000 µF	
Capacitance tolerance	–10 to +30%	
Rated voltage	10–350 VDC	
Temperature range	–40 to +105°C	
Operational life time	25000 h at 105°C Case Ø = 90 mm	
Shelf life	5000h at 0V +105°C, or 10 years at 0V +40°C	
Diameter range	35–90 mm	

Dimensions table PEH 169 (mm)

D x L	Case code	D1 ±1.0	L1 ±1.0	L2 ±1.0	L3 ±1.0	S	S1	M	a ±0.5	b	d	m*	Weight approx (g)
35 x 51	A	36.6	51.5	54.5	58.9	12	11.0	M8	13.0	—	8	M5	70
35 x 60	B	36.6	59.5	62.5	66.9	12	11.0	M8	13.0	—	8	M5	85
35 x 75	C	36.6	73.5	76.5	80.9	12	11.0	M8	13.0	—	8	M5	105
35 x 95	D	36.6	94.5	97.5	101.9	12	11.0	M8	13.0	—	8	M5	130
50 x 75	H	51.6	74.5	77.5	82.4	16	15.0	M12	22.0	13	15	M5	180
50 x 95	J	51.6	95.5	98.5	103.4	16	15.0	M12	22.0	13	15	M5	240
50 x 105	K	51.6	103.5	106.5	111.4	16	15.0	M12	22.0	13	15	M5	265
50 x 115	I**	51.6	115.5	118.5	123.4	16	15.0	M12	22.0	13	15	M5	300
65 x 105	O	66.6	106.0	109.2	113.0	16	14.8	M12	28.5	13	15	M5	415
65 x 115	Q**	66.6	118.0	121.2	125.0	16	14.8	M12	28.5	13	15	M5	460
65 x 130	S**	66.6	129.0	132.2	136.0	16	14.8	M12	28.5	13	15	M5	520
75 x 78	L	76.6	77.0	80.2	84.0	16	14.8	M12	32.0	13	15	M5	430
75 x 98	P**	76.6	98.0	101.2	105.0	16	14.8	M12	32.0	13	15	M5	530
75 x 105	T	76.6	106.0	109.2	113.0	16	14.8	M12	32.0	13	15	M5	585
75 x 115	U	76.6	118.0	121.2	125.0	16	14.8	M12	32.0	13	15	M5	640
75 x 145	V	76.6	146.0	149.2	153.0	16	14.8	M12	32.0	13	15	M5	800
75 x 220	X	76.6	221.0	224.2	228.0	16	14.8	M12	32.0	13	15	M5	1400
90 x 78	M	91.6	76.5	79.7	83.4	16	14.8	M12	32.0	13	15	M5	750
90 x 98	N	91.6	97.5	100.7	104.4	16	14.8	M12	32.0	13	15	M5	950
90 x 145	Y	91.6	145.5	148.7	152.4	16	14.8	M12	32.0	13	15	M5	1400

* M6 and other threads on request. **on request

ARTICLE TABLE PEH 169 (105°C)

C _R	D x L	Case code	I _{RAC} *	I _{RAC} *	I _{RAC} *	ESR*	ESR*	L _{ESL} Approx.	Article code
			105°C	50°C	40°C	20°C	20°C		
μF	mm		100 Hz A	10 kHz A	10 kHz A	100 Hz mΩ	100 kHz mΩ	nH	
10 VDC (U_R)									
6800	35 x 51	A	5.2	21.8	15.4	46	37	12	PEH169EA4680Q
10000	35 x 51	A	6.2	26.3	17.5	33	27	12	PEH169EA5100Q
15000	35 x 60	B	7.4	28.9	20.5	23	19	12	PEH169EB5150Q
22000	35 x 75	C	8.8	34.8	24.3	17	14	12	PEH169EC5220Q
33000	35 x 95	D	10.4	38.3	28.0	12	10	12	PEH169ED5330Q
47000	50 x 75	H	11.0	42.9	30.0	12	10	16	PEH169EH5470Q
68000	50 x 95	J	13.5	51.8	34.1	9	8	16	PEH169EJ5680Q
100000	50 x 105	K	14.0	48.5	35.0	8	7	16	PEH169EK6100Q
150000	65 x 105	O	14.7	47.6	35.5	9	8	16	PEH169EO6150Q
220000	75 x 105	T	19.4	62.8	46.7	6	5	17	PEH169ET6220Q
330000	75 x 145	V	22.5	70.7	54.6	4	4	17	PEH169EV6330Q
16 VDC (U_R)									
6800	35 x 51	A	5.5	25.5	16.7	36	28	12	PEH169GA4680Q
10000	35 x 51	A	6.4	28.0	18.9	27	21	12	PEH169GA5100Q
15000	35 x 75	C	8.3	34.3	24.6	18	14	12	PEH169GC5150Q
22000	35 x 95	D	9.7	38.6	28.5	13	10	12	PEH169GD5220Q
33000	50 x 75	H	11.7	43.0	31.0	12	10	16	PEH169GH5330Q
47000	50 x 95	J	13.2	46.2	34.5	9	8	16	PEH169GJ5470Q
68000	65 x 105	O	14.4	47.7	36.2	9	8	16	PEH169GO5680Q
100000	75 x 105	T	21.6	70.9	54.7	6	5	17	PEH169GT6100Q
150000	75 x 115	U	19.8	67.3	50.0	5	5	17	PEH169GU6150Q
220000	75 x 145	V	23.6	74.7	58.0	4	4	17	PEH169GV6220Q
25 VDC (U_R)									
4700	35 x 51	A	4.9	24.1	16.5	41	29	12	PEH169HA4470Q
6800	35 x 51	A	5.8	27.7	18.5	30	22	12	PEH169HA4680Q
10000	35 x 75	C	7.1	31.2	22.8	20	15	12	PEH169HC5100Q
15000	35 x 95	D	8.7	36.8	27.2	15	11	12	PEH169HD5150Q
22000	50 x 75	H	11.0	42.9	30.9	13	10	16	PEH169HH5220Q
33000	50 x 95	J	12.6	46.5	34.6	10	8	16	PEH169HJ5330Q
47000	65 x 105	O	15.8	53.7	42.1	8	7	16	PEH169HO5470Q
68000	75 x 105	T	20.2	68.1	51.9	6	6	17	PEH169HT5680Q
100000	75 x 115	U	21.9	70.3	55.4	5	5	17	PEH169HU6100Q
150000	75 x 145	V	22.1	71.4	55.3	4	4	17	PEH169HV6150Q
40 VDC (U_R)									
3300	35 x 51	A	4.6	26.3	17.6	41	25	12	PEH169KA4330Q
4700	35 x 60	B	5.6	29.6	20.5	30	19	12	PEH169KB4470Q
6800	35 x 75	C	6.7	32.6	23.6	22	14	12	PEH169KC4680Q
10000	35 x 95	D	7.8	34.8	26.8	16	11	12	PEH169KD5100Q
15000	50 x 75	H	10.2	42.9	30.5	14	10	16	PEH169KH5150Q
22000	50 x 95	J	11.9	46.5	34.8	10	8	16	PEH169KJ5220Q
33000	65 x 105	O	15.0	53.8	41.4	8	7	16	PEH169KO5330Q
47000	75 x 105	T	19.9	69.5	55.0	6	5	17	PEH169KT5470Q
68000	75 x 115	U	20.6	70.7	53.9	6	5	17	PEH169KU5680Q
100000	75 x 145	V	23.0	71.0	59.0	4	4	17	PEH169KV6100Q
63 VDC (U_R)									
1500	35 x 51	A	3.5	23.1	15.9	63	31	12	PEH169MA4150Q
2200	35 x 51	A	4.1	27.0	18.1	46	23	12	PEH169MA4220Q
3300	35 x 75	C	5.3	31.6	22.9	30	15	12	PEH169MC4330Q
4700	35 x 95	D	6.2	34.2	25.9	22	11	12	PEH169MD4470Q
6800	50 x 75	H	8.5	42.6	30.8	18	10	16	PEH169MH4680Q
10000	50 x 95	J	9.9	45.3	34.2	13	8	16	PEH169MJ5100Q

* Maximum values

** 2 m/s forced air, studmounted on 3°C/W aluminium chassis.

ARTICLE TABLE PEH 169 (105°C)

C_R	D x L	Case code	I_{RAC}^* 105°C	I_{RAC}^* 50°C **	I_{RAC}^* 40°C	ESR* 20°C	ESR* 20°C	L_{ESL} Approx.	Article code
μF	mm		100 Hz A	10 kHz A	10 kHz A	100 Hz m Ω	100 kHz m Ω	nH	
63 VDC (U_R)									
15000	65 x 105	O	13.1	53.0	41.1	10	6	16	PEH169MO5150Q
22000	75 x 105	T	17.7	73.0	55.8	6	4	17	PEH169MT5220Q
33000	75 x 115	U	18.9	71.0	54.3	6	5	17	PEH169MU5330Q
47000	75 x 145	V	20.9	73.0	58.0	5	4	17	PEH169MV5470Q
100 VDC (U_R)									
680	35 x 51	A	2.4	14.4	9.9	160	95	12	PEH169PA3680Q
1000	35 x 51	A	2.9	17.4	11.7	110	67	12	PEH169PA4100Q
1500	35 x 75	C	3.6	20.5	14.9	73	44	12	PEH169PC4150Q
2200	35 x 95	D	4.3	23.2	17.6	50	31	12	PEH169PD4220Q
3300	50 x 75	H	6.4	33.8	23.8	30	23	16	PEH169PH4330Q
4700	50 x 95	J	7.7	37.1	27.6	26	17	16	PEH169PJ4470Q
6800	65 x 105	O	10.4	46.4	35.5	18	12	16	PEH169PO4680Q
10000	65 x 105	O	11.7	49.1	36.6	14	10	16	PEH169PO5100Q
15000	75 x 115	U	16.0	67.5	51.1	9	6	17	PEH169PU5150Q
22000	75 x 145	V	18.2	70.6	55.3	7	5	17	PEH169PV5220Q
160 VDC (U_R)									
330	35 x 51	A	1.4	9.6	6.6	400	210	12	PEH169QA3330Q
470	35 x 51	A	1.7	11.2	7.6	290	160	12	PEH169QA3470Q
680	35 x 75	C	2.1	13.8	10.3	190	100	12	PEH169QC3680Q
1000	35 x 95	D	2.6	15.7	12.3	130	70	12	PEH169QD4100Q
1500	50 x 75	H	3.8	22.1	16.2	93	51	16	PEH169QH4150Q
2200	50 x 95	J	4.7	25.4	19.6	64	36	16	PEH169QJ4220Q
3300	65 x 105	O	6.5	32.0	25.0	45	26	16	PEH169QO4330Q
4700	75 x 105	T	8.7	48.1	36.9	26	13	17	PEH169QT4470Q
6800	75 x 115	U	10.2	50.9	39.6	19	10	17	PEH169QU4680Q
10000	75 x 145	V	11.9	55.7	43.2	14	8	17	PEH169QV5100Q
200 VDC (U_R)									
330	35 x 51	A	1.5	8.1	5.6	480	300	12	PEH169RA3330Q
470	35 x 60	B	1.8	9.7	6.9	340	210	12	PEH169RB3470Q
680	35 x 95	D	2.2	10.0	7.9	250	160	12	PEH169RD3680Q
1000	50 x 75	H	3.3	15.5	11.4	170	110	16	PEH169RH4100Q
1500	50 x 95	J	4.0	18.0	14.0	120	76	16	PEH169RJ4150Q
2200	50 x 105	K	4.9	23.1	17.2	76	49	16	PEH169RK4220Q
3300	65 x 105	O	6.7	28.8	22.0	55	37	16	PEH169RO4330Q
4700	75 x 105	T	8.6	41.6	31.1	33	20	17	PEH169RT4470Q
6800	75 x 145	V	10.1	45.2	35.2	24	16	17	PEH169RV4680Q
250 VDC (U_R)									
150	35 x 51	A	1.0	7.0	4.9	730	370	12	PEH169SA3150Q
220	35 x 51	A	1.3	8.9	6.0	500	250	12	PEH169SA3220Q
330	35 x 60	B	1.6	11.0	7.7	320	160	12	PEH169SB3330Q
470	35 x 75	C	2.0	11.7	8.9	240	130	12	PEH169SC3470Q
680	50 x 75	H	2.9	17.2	12.6	170	90	16	PEH169SH3680Q
1000	50 x 75	H	3.5	21.0	15.5	110	58	16	PEH169SH4100Q
1500	50 x 105	K	4.2	24.1	17.9	79	43	16	PEH169SK4150Q
2200	65 x 105	O	5.8	25.8	23.6	56	32	16	PEH169SO4220Q
3300	75 x 105	T	7.9	41.5	31.5	36	20	17	PEH169ST4330Q
4700	75 x 145	V	9.2	46.6	37.8	26	14	17	PEH169SV4470Q
6800	75 x 220	X	9.4	42.6	36.8	19	12	17	PEH169SX4680Q
6800	90 x 145	Y	11.9	53.5	43.5	20	12	16	PEH169SY4680Q

* Maximum values.

** 2 m/s forced air, studmounted on 3°C/W aluminium chassis.

ARTICLE TABLE PEH 169 (105°C)

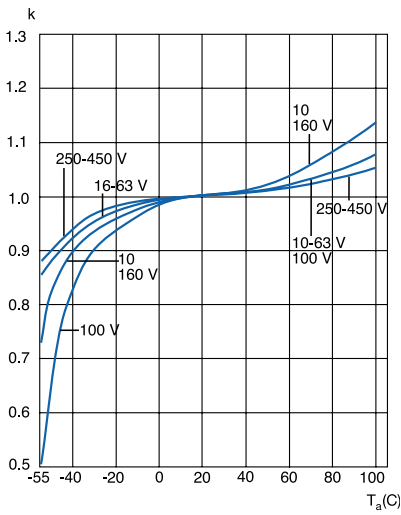
C_R	D x L	Case code	I_{RAC}^* 105°C	I_{RAC}^* 50°C **	I_{RAC}^* 40°C	ESR* 20°C	ESR* 20°C	L_{ESL} Approx.	Article code
μF	mm		100 Hz A	10 kHz A	10 kHz A	100 Hz m Ω	100 kHz m Ω	nH	
350 VDC (U_R)									
100	35 x 51	A	1.0	6.7	4.6	810	410	12	PEH169UA3100Q
150	35 x 51	A	1.3	8.8	6.1	520	250	12	PEH169UA3150Q
220	35 x 75	C	1.5	10.1	7.3	360	180	12	PEH169UC3220Q
330	35 x 95	D	1.9	11.8	9.1	250	120	12	PEH169UD3330Q
470	50 x 75	H	2.7	17.1	12.3	180	91	16	PEH169UH3470Q
680	50 x 95	J	3.3	19.9	14.8	120	64	16	PEH169UJ3680Q
1000	50 x 105	K	4.1	24.3	18.0	82	42	16	PEH169UK4100Q
1500	65 x 105	O	5.5	30.6	23.5	60	33	16	PEH169UO4150Q
2200	75 x 105	T	7.5	42.6	32.6	39	20	17	PEH169UT4220Q
3300	75 x 145	V	9.0	44.1	38.0	26	14	17	PEH169UV4330Q
4700	75 x 220	X	9.4	41.4	35.9	22	13	17	PEH169UX4470Q
4700	90 x 145	Y	11.6	50.8	41.7	23	14	16	PEH169UY4470Q

* Maximum values

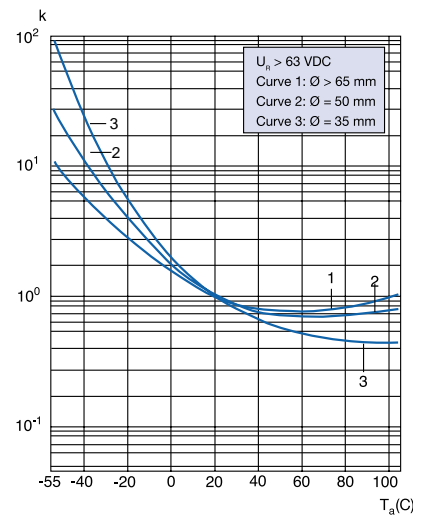
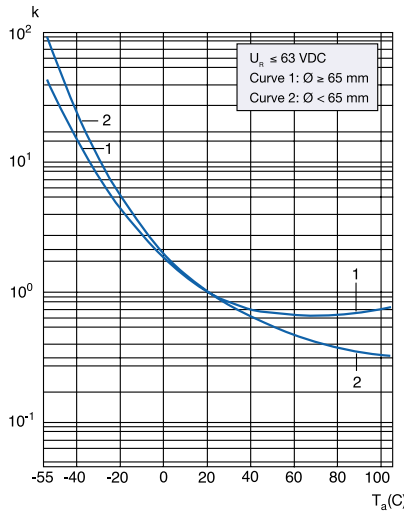
** 2 m/s forced air, studmounted on 3°C/W aluminium chassis.

TECHNICAL DATA PEH 169 (85°C AND 105°C)

The capacitance vs ambient temperature (T_a) at $f = 100$ Hz



ESR as a function of ambient temperature (T_a) at $f = 100$ kHz. $k = R_{ESR}(T_a)/R_{ESR}(20^\circ\text{C})$



LEAKAGE CURRENT

Rated leakage current, I_{RL} (μA).

Rated voltage, U_R (V).

Rated capacitance, C_R (μF). $I_{RL} = 0.003 \times C_R \times U_R + 4$

R_{th} – short form table versus chassis area and air speed

D x L	Case code	STUD MOUNTED				CLIP MOUNTED	
		$R_{thhs} = 3^\circ\text{C/W}$ (0.5 m/s)	$R_{thhs} = 2^\circ\text{C/W}$ (0.5 m/s)	$R_{thhs} = 3^\circ\text{C/W}$ (2.0 m/s)	$R_{thhs} = 2^\circ\text{C/W}$ (2.0 m/s)	(0.5 m/s)	(2.0 m/s)
35 x 51	A	5.6	5.3	4.5	4.4	10.6	7.4
35 x 60	B	5.4	5.1	4.4	4.3	9.8	7.0
35 x 75	C	5.3	5.1	4.4	4.3	9.2	6.7
35 x 95	D	5.3	5.1	4.4	4.3	8.9	6.7
50 x 75	H	3.6	3.3	2.8	2.7	6.3	4.4
50 x 95	J	3.4	3.2	2.7	2.6	5.8	4.2
50 x 105	K	3.4	3.2	2.7	2.6	5.8	4.2
50 x 115	I	3.4	3.2	2.7	2.6	5.8	4.2
65 x 105	O	2.6	2.4	2.1	2.0	4.2	3.1
65 x 115	Q	2.6	2.4	2.1	2.0	4.2	3.1
65 x 130	S	2.6	2.4	2.1	2.0	4.2	3.1
75 x 78	L	2.3	2.0	1.8	1.7	4.1	2.7
75 x 98	P	2.3	2.0	1.8	1.7	4.0	2.7
75 x 105	T	2.3	2.1	1.7	1.6	3.7	2.6
75 x 115	U	2.2	2.0	1.6	1.5	3.5	2.5
75 x 145	V	2.2	2.0	1.6	1.5	3.4	2.5
75 x 220	X	2.3	2.1	2.0	1.9	3.4	2.6
90 x 78	M	1.9	1.7	1.6	1.4	3.4	2.2
90 x 98	N	1.9	1.7	1.5	1.4	3.1	2.1
90 x 145	Y	1.8	1.6	1.5	1.4	2.7	1.9

OPERATIONAL DATA

Please see operational lifetime section, page 85.

RELIABILITY

The failure rate is derived from our periodic test results. The failure rate (I_a) is therefore only given at test temperature for life tests. An estimation is also given at 60°C.

The expected failure rate for this capacitor range is based on our periodic test results for capacitors with structural similarity.

T_a	Failure rate per hour
85°C	1×10^{-6}
60°C	1×10^{-7}

Failure rate per hour for catastrophic plus parametric failures.

MECHANICAL DATA

Mounting position

The capacitor can be mounted upright or inclined to a horizontal position.

Clamp fixing

Clips must be ordered separately. See "Accessories".

Stud fixing

Nylon cap nut must be ordered separately.

For the stud fixing insulated version the outer insulation serves as lock washer. See "Accessories". Max tightening torque: M8: 3 Nm M12: 8 Nm. Max chassis thickness 5 mm. Mounting hole: See "Accessories".

Screw terminals

M5 x 10 according to DIN 41.248. Max tightening torque: 2.5 Nm. Must be ordered separately: See "Accessories".

Recommended max connector thickness with delivered screw: 4 mm. M6 thread on request.

Insulation can

PEH169 is supplied with a polypropylene insulation can, thickness 0.8 mm. Voltage proof of the insulation sleeve: ≥ 4000 VDC.

PVC shrink sleeve only on request.

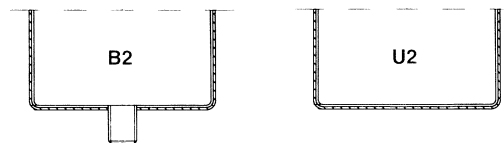
ORDERING INFORMATION

Pos 1–20

P	E	H	1	6	9	K	U	5	6	8	0	Q	B	2						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	

Capacitance tolerances:
Pos. 13: Q= -10 to +30%
M: -20 to +20%

Pos. 14-15: B2 = with bottom stud
U2 = without bottom stud



Quantities and weights

CASE CODE	A	B	C	D	H	I	J	K	L	M	N	O	P	Q	S	T	U	V	X	Y
Weight approx (g)	70	85	105	130	180	300	240	265	430	750	950	415	530	460	520	585	640	800	1400	1400
Standard box quantity	42	42	42	42	20	20	20	20	9	6	6	12	9	12	12	9	9	9	9	6