

PEH 169 105°C

RoHS
Compliant

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

APPLICATION

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

BASIC DESIGN

PEH 169 is a Long Life electrolytic capacitor with outstanding reliability and electrical performance. Polarized, all-welded design, heavy duty screw terminals, extended cathode construction, 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 60384-4 Long Life Grade 40/105/56, DIN 41240, type 1A

CECC

CECC 30300
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

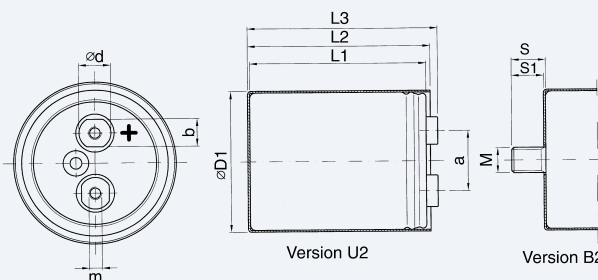
25000 h at 105°C

Shelf life

Case Ø = 90 mm
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} * 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 mΩ	100 kHz mΩ	nH	U2 = Plain can B2 = Stud can
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 mΩ	100 kHz mΩ	nH	U2 = Plain can B2 = Stud can
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)

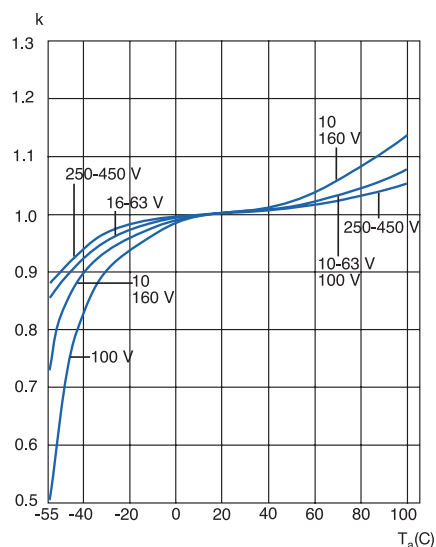
C_R	D x L	Case code	I_{RAC}^* 105°C	I_{RAC}^* 50°C **	I_{RAC}^* 40°C	ESR* 20°C	ESR* 20°C	L_{ESL} Approx.	Article code
μF	mm		100 Hz A	10 kHz A	10 kHz A	100 Hz $m\Omega$	100 kHz $m\Omega$	nH	U2 = Plain can B2 = Stud can
350 VDC (U_R)									
100	35 x 51	A	1.0	6.7	4.6	810	410	12	PEH169UA3100Q--
150	35 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

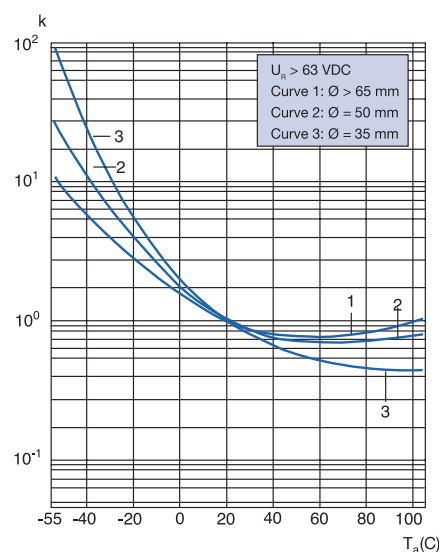
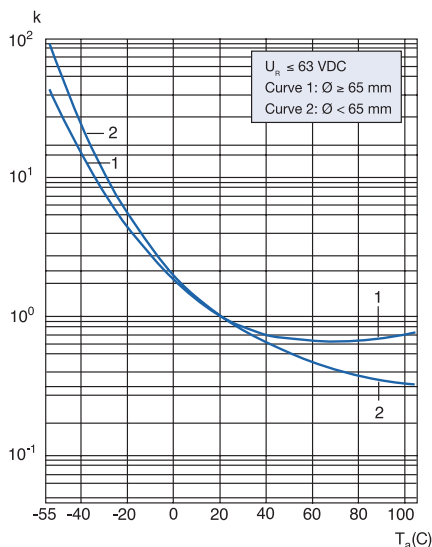
** 2 m/s forced air, studmounted on 3°C/W aluminium chassis.

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.

RELIABILITY

The failure rate is derived from our periodic test results. The failure rate (I_R) 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.

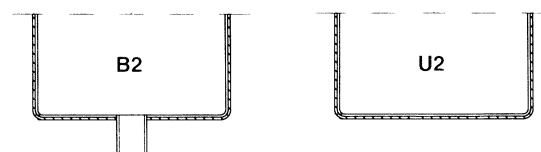
ORDERING INFORMATION

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