Type PFCH, 3-Phase AC Power Harmonic Filter Capacitors

Type PFCH 3-phase series capacitors are designed to filter undesirable harmonics at the AC output of large inverter system. Each PFCH capacitor is made with three self-healing metallized polypropylene windings, connected in delta, enclosed in a cylindrical aluminum case and filled with an environmentally friendly fluid. Typical applications include wind turbine PFC controllers, solar inverter output filters, and power line conditioning.

Highlights

- For 3-phase AC power harmonic filtering
- Delta connected
- Discharge resistors included
- UL810 approved internal pressure interrupter

Specifications

Capacitance Tolerance	0 to +10%
Rated Frequency (f_R)	50 Hz and 60 Hz
Rated AC Voltages (V_R)	240 Vac, 480 Vac, 600 Vac
Operating Temperature Range	–40 ºC to +55 ºC
kvar Range	0.5 kvar to 30.2 kvar
Maximum Permissible Voltage (Vmax)	110% of rated rms voltage 120% of rated peak voltage (1.2 x √2x Vrms)
Internal Connection	Delta (Δ)
Maximum Permissible Current (Imax)	135% of nominal rms current based on rated kvar and rated voltage - (up to 150% of I_R including combined effects of harmonics, over voltages and capacitances, tolerance)
Life	60,000 h w/94% survival rate
International Standards	Meets IEEE18, Standard (ANSI/IEEE Standard 18)
FIT (Failure In Time)	≤300 X 10^9 component h
Maximum Short Circuit Current	10 kA (according to UL 810)
Mechanical and Electrical Safety	Pressure Interrupter (PI) disengages all 3 phases in the event of capacitor end of life or overload
Discharge Resistor Time	≤ 60 seconds ≤ 50 V for 600 V or less; over 600 V ≤ 5 minutes
RoHS Compliant	

Dimensions

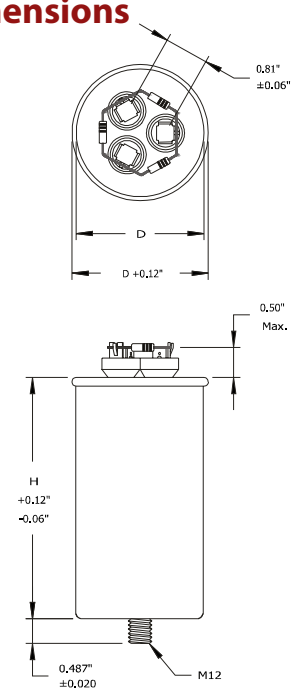

Figure 1

Max torque 88.5 in-lbs.

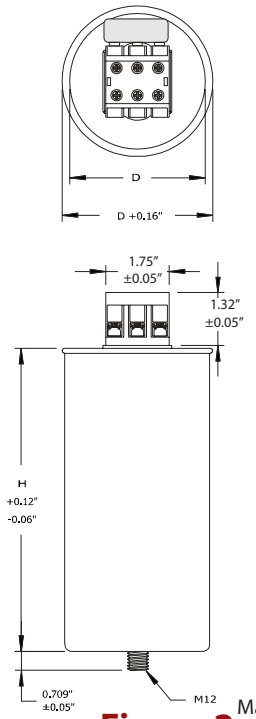

Figure 2

Max torque 88.5 in-lbs.

Construction Details	
Case Material	Extruded aluminum with steel or aluminum cover
Encapsulation	Environmentally safe dielectric fluid
Terminal Material	Tin plated copper, brass or steel

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Part Numbering System

PFC	H	T	480	C	6	S	779	T
Type		**Base Type**	**Voltage (Vac)**	**Case Material**	**kvar**	**Tolerance (%)**	**Can Height (inches)**	**Phases**
PFC	**H** = Harmonic	**S** = 2″ Round **T** = 2½″ Round **V** = 3″ Round **X** = 3.5″ Round	**24** = 240 **48** = 480 **60** = 600	**C** = Aluminum case w/steel cover M12 Stud **D** = Aluminum case w/aluminum cover M12 Stud	**Full kvar value** including decimals @ 60 Hz and	**S** = 0/+10%	**Expressed as 3 digit** number of the case height from base to top of lip (including seam) rounded and displayed without decimal point	**T** = 3-Phase

Ratings

NOTE: Other ratings, sizes and performance specifications are available. Contact us.

CDE Catalog Number	60Hz Output Kvar	50Hz Output Kvar	Capacitance (µF)	R_s (mΩ)	R_{th} (°C/W)	Max Power (W) 55°C	65°C	70°C	Case Diameter (in)	Height (in)	SA (in²)	Style
240 Vac												
PFCHS24C0.5S572T	0.5	0.4	3 x 7.7	5.8	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS24C1S572T	1	0.8	3 x 15.4	4.2	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS24C1.5S572T	1.5	1.3	3 x 23.0	3.7	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHT24C2S572T	2	1.7	3 x 30.7	3.4	5.1	5.9	3.9	2.9	2.5	5.72	55	Fig. 1
PFCHT24C2.5S572T	2.5	2.1	3 x 38.4	3.2	5.1	5.9	3.9	2.9	2.5	5.72	55	
PFCHT24C3S572T	3	2.5	3 x 46.1	3.1	5.1	5.9	3.9	2.9	2.5	5.72	55	
PFCHT24C4S778T	4	3.3	3 x 61.4	4.5	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHV24D5S842T	5	4.2	3 x 76.8	1.8	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV24D6S842T	6	5.0	3 x 92.1	1.7	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV24D6.3S842T	6.3	5.3	3 x 96.7	1.6	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV24D7.5S108T	7.5	6.3	3 x 115.1	2.2	2.4	12.4	8.3	6.2	3.0	10.78	116	
PFCHV24D8.3S108T	8.3	6.9	3 x 127.4	2.1	2.4	12.4	8.3	6.2	3.0	10.78	116	Fig. 2
PFCHX24D10S108T	10	8.3	3 x 153.5	2.0	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX24D12.5S108T	12.5	10.4	3 x 191.9	1.8	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX24D15S137T	15	12.5	3 x 230.3	2.4	1.7	18.2	12.2	9.1	3.5	13.73	170	
PFCHX24D16.7S137T	16.7	13.9	3 x 256.4	2.3	1.7	18.2	12.2	9.1	3.5	13.73	170	
PFCHX24D17.5S137T	17.5	14.6	3 x 268.6	2.2	1.7	18.2	12.2	9.1	3.5	13.73	170	
480 Vac												
PFCHS48C0.5S572T	0.5	0.4	3 x 1.9	11.3	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS48C1S572T	1	0.8	3 x 3.8	6.9	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS48C1.5S572T	1.5	1.3	3 x 5.8	5.4	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS48C2S572T	2	1.7	3 x 7.7	4.7	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS48C2.5S572T	2.5	2.1	3 x 9.6	4.3	6.6	4.5	3.0	2.3	2.0	5.72	42	Fig. 1
PFCHS48C3S572T	3	2.5	3 x 11.5	4.0	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHT48C4S572T	4	3.3	3 x 15.4	3.6	5.1	5.9	3.9	2.9	2.5	5.72	55	
PFCHT48C5S572T	5	4.2	3 x 19.2	3.4	5.1	5.9	3.9	2.9	2.5	5.72	55	

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CDE Catalog Number	60Hz Output Kvar	50Hz Output Kvar	Capacitance (µF)	R_s (mΩ)	R_{th} (°C/W)	Max Power (W) 55°C	65°C	70°C	Case Diameter (in)	Height (in)	SA (in²)	Style
480 Vac												
PFCHT48C6S778T	6	5.0	3 x 23.0	5.3	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHT48C7.5S778T	7.5	6.3	3 x 28.8	4.9	4.0	7.6	5.1	3.8	2.5	7.78	71	**Fig. 1**
PFCHT48C8.3S778T	8.3	6.9	3 x 31.9	4.8	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHV48D9S842T	9	7.5	3 x 34.5	2.2	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV48D10S842T	10	8.3	3 x 38.4	2.1	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV48D12.5S108T	12.5	10.4	3 x 48.0	2.8	2.4	12.4	8.3	6.2	3.0	10.78	116	
PFCHV48D15S108T	15	12.5	3 x 57.6	2.6	2.4	12.4	8.3	6.2	3.0	10.78	116	
PFCHX48D16.7S108T	16.7	13.9	3 x 64.1	2.4	2.0	14.8	9.8	7.4	3.5	10.78	138	**Fig. 2**
PFCHX48D18S108T	18	15.0	3 x 69.1	2.3	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX48D20S108T	20	16.7	3 x 76.8	2.2	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX48D25S137T	25	20.8	3 x 95.9	2.9	1.7	18.2	12.2	9.1	3.5	13.73	170	
PFCHX48D30S137T	30	25.0	3 x 115.1	2.7	1.7	18.2	12.2	9.1	3.5	13.73	170	
600Vac												
PFCHS60C1S572T	1	0.8	3 x 2.5	7.4	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS60C1.5S572T	1.5	1.3	3 x 3.7	5.9	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS60C2S572T	2	1.7	3 x 4.9	5.1	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHS60C2.5S572T	2.5	2.1	3 x 6.1	4.6	6.6	4.5	3.0	2.3	2.0	5.72	42	
PFCHT60C3S572T	3	2.5	3 x 7.4	4.2	5.1	5.9	3.9	2.9	2.5	5.72	55	
PFCHT60C4S572T	4	3.3	3 x 9.8	3.8	5.1	5.9	3.9	2.9	2.5	5.72	55	**Fig. 1**
PFCHT60C5S778T	5	4.2	3 x 12.3	5.9	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHT60C6S778T	6	5.0	3 x 14.7	5.5	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHT60C6.1S778T	6.1	5.1	3 x 15.0	5.5	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHT60C6.3S778T	6.3	5.3	3 x 15.5	5.4	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHT60C6.9S778T	6.9	5.8	3 x 16.9	5.3	4.0	7.6	5.1	3.8	2.5	7.78	71	
PFCHV60D7.5S842T	7.5	6.3	3 x 18.4	2.6	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV60D8.1S842T	8.1	6.8	3 x 19.9	2.5	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV60D8.3S842T	8.3	6.9	3 x 20.4	2.5	3.0	10.0	6.7	5.0	3.0	8.42	94	
PFCHV60D10S108T	10	8.3	3 x 24.6	3.6	2.4	12.4	8.3	6.2	3.0	10.78	116	
PFCHV60D12.2S108T	12.2	10.2	3 x 30.0	3.1	2.4	12.4	8.3	6.2	3.0	10.78	116	
PFCHV60D12.5S108T	12.5	10.4	3 x 30.7	3.1	2.4	12.4	8.3	6.2	3.0	10.78	116	
PFCHX60D13.8S108T	13.8	11.5	3 x 33.9	2.9	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX60D14.6S108T	14.6	12.2	3 x 35.9	2.8	2.0	14.8	9.8	7.4	3.5	10.78	138	**Fig. 2**
PFCHX60D15S108T	15	12.5	3 x 36.8	2.8	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX60D16.7S108T	16.7	13.9	3 x 41.0	2.6	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX60D17.5S108T	17.5	14.6	3 x 43.0	2.5	2.0	14.8	9.8	7.4	3.5	10.78	138	
PFCHX60D20S137T	20	16.7	3 x 49.1	3.6	1.7	18.2	12.2	9.1	3.5	13.73	170	
PFCHX60D22.5S137T	22.5	18.8	3 x 55.3	3.4	1.7	18.2	12.2	9.1	3.5	13.73	170	
PFCHX60D25S137T	25	20.8	3 x 61.4	3.2	1.7	18.2	12.2	9.1	3.5	13.73	170	

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Performance Notes

R_s: Equivalent series resistance – Ohmic resistances (Ohm)

Dielectric Dissipation Factor: tan δ (Polypropylene: 0.0002)

T_{hs}: Hot spot temperature within the capacitor: $T_{hs} = T_a + (P_{total} \cdot 280 / SA)$

T_a: Ambient temperature

R_{th}: Thermal resistance: °C/ Watt, indicates hot spot temperature rise due to power dissipation losses

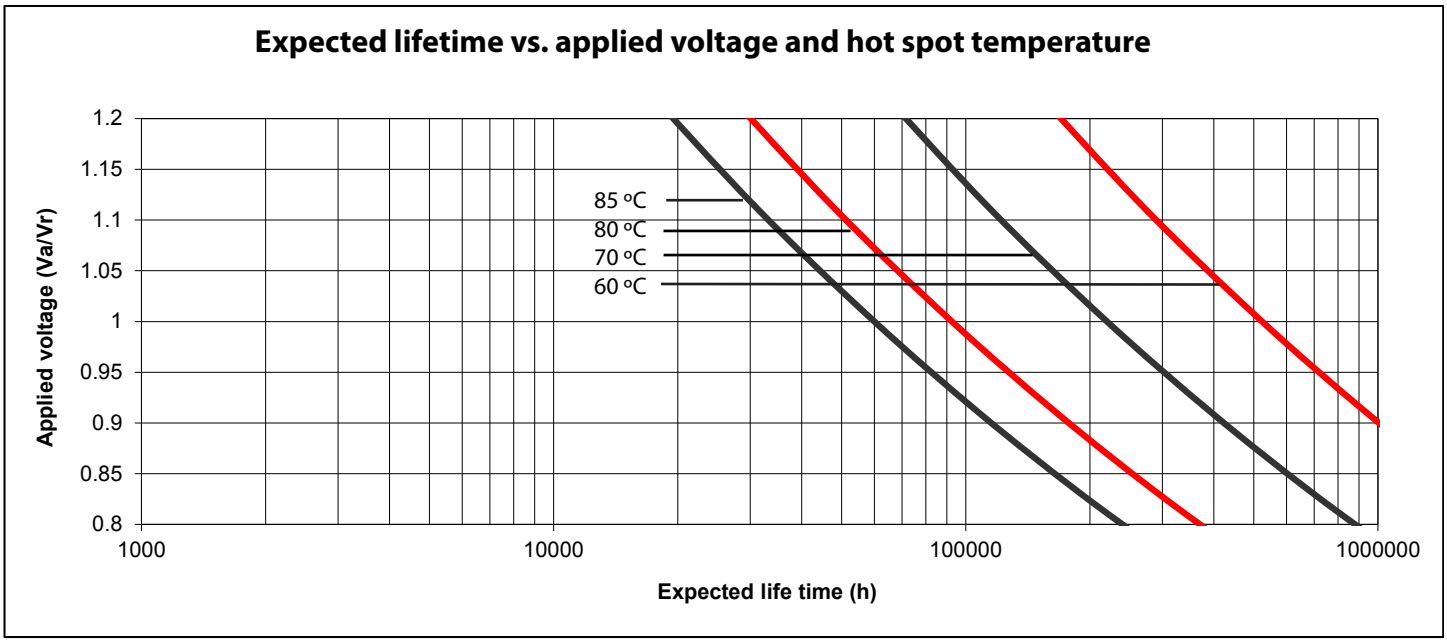
P_{max}: Maximum power dissipation: $P_{max} = (85\ ºC - T_a) / R_{th}$ (Watts)

P_{Total}: Total Power generated by Dielectric and Ohmic Losses: $P = V_{peak}^2 \cdot C \cdot TT \cdot F \cdot DF$ (Watts) given Voltage

$P = I^2 \cdot [R_s + (X_C \cdot DF)]$ (Watts) given Current

Where $P_{Total} = P_{Fund} + P_{Harm1} + P_{Harm2} + ... + P_{Harm\infty}$

Design life: 60,000 hours 94% survival T_{hs}: 85 °C



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