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.

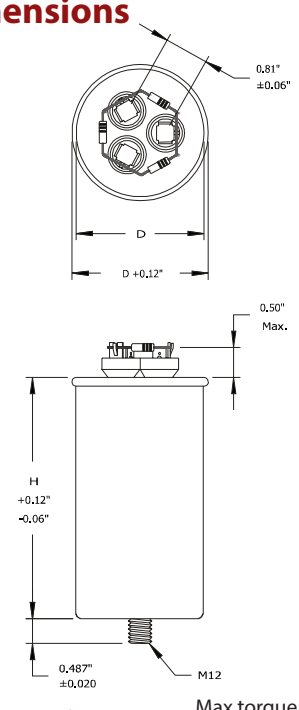
Highlights

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

Specifications

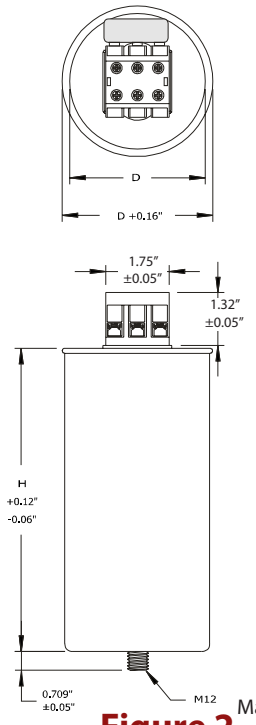
Capacitance Tolerance	0 to +10%
Rated Frequency (f_R)	50 Hz and 60 Hz
Rated AC Voltages (V_R)	240 Vac, 480 Vac, 600 Vac
Operating Temperature Range	–40 ºC to +55 ºC
kvar Range	0.5 kvar to 30.2 kvar
Maximum Permissible Voltage (Vmax)	110% of rated rms voltage 120% of rated peak voltage (1.2 x √2x Vrms)
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
Regulatory Information	

Dimensions



Max torque 88.5 in-lbs.

Figure 1



Max torque 88.5 in-lbs.

Figure 2

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

Type PFCH, 3-Phase AC Power Harmonic Filter Capacitors

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 (50.8 mm) **T** = 2½″ Round (63.5 mm) **V** = 3″ Round (76 mm) **W** = 3.35″ Round (85 mm) **X** = 3.5″ Round (88 mm) **Y** = 4.0" Round (100 mm) **Z** = 4.5" Round (116 mm)	**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	

Type PFCH, 3-Phase AC Power Harmonic Filter Capacitors

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	

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

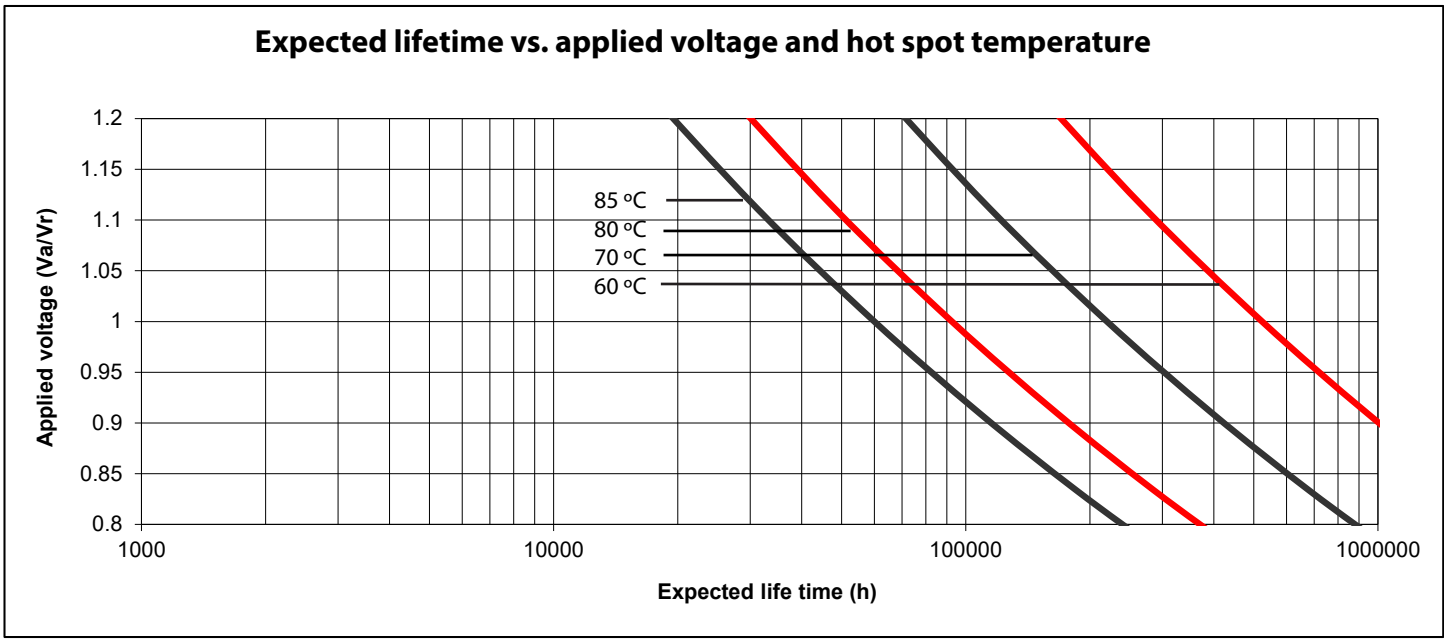
P_{max}: Maximum power dissipation: $P_{max} = (85\ ºC - T_a) / R_{th}$ (Watts)

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



Type PFCH, 3-Phase AC Power Harmonic Filter Capacitors

Notice and Disclaimer: All product drawings, descriptions, specifications, statements, information and data (collectively, the "Information") in this datasheet or other publication are subject to change. The customer is responsible for checking, confirming and verifying the extent to which the Information contained in this datasheet or other publication is applicable to an order at the time the order is placed. All Information given herein is believed to be accurate and reliable, but it is presented without any guarantee, warranty, representation or responsibility of any kind, expressed or implied. Statements of suitability for certain applications are based on the knowledge that the Cornell Dubilier company providing such statements ("Cornell Dubilier") has of operating conditions that such Cornell Dubilier company regards as typical for such applications, but are not intended to constitute any guarantee, warranty or representation regarding any such matter – and Cornell Dubilier specifically and expressly disclaims any guarantee, warranty or representation concerning the suitability for a specific customer application, use, storage, transportation, or operating environment. The Information is intended for use only by customers who have the requisite experience and capability to determine the correct products for their application. Any technical advice inferred from this Information or otherwise provided by Cornell Dubilier with reference to the use of any Cornell Dubilier products is given gratis (unless otherwise specified by Cornell Dubilier), and Cornell Dubilier assumes no obligation or liability for the advice given or results obtained. Although Cornell Dubilier strives to apply the most stringent quality and safety standards regarding the design and manufacturing of its products, in light of the current state of the art, isolated component failures may still occur. Accordingly, customer applications which require a high degree of reliability or safety should employ suitable designs or other safeguards (such as installation of protective circuitry or redundancies or other appropriate protective measures) in order to ensure that the failure of an electrical component does not result in a risk of personal injury or property damage. Although all product-related warnings, cautions and notes must be observed, the customer should not assume that all safety measures are indicated in such warnings, cautions and notes, or that other safety measures may not be required.