C44P-T: Power Can AC Filter
Application Note

Iva Jaskoska, Product Marketing Manager & Digital Engagement, North Macedonia
TFE PBU
YAGEO GROUP

Introduction

In modern power electronics, especially within demanding industrial and renewable energy environments, the need for robust, long-lasting AC filtering components is more critical than ever. The YAGEO Group C44P-T series emerges as a first-to-market solution that uniquely combines long operational lifetime, high thermal endurance up to 90°C, and exceptional performance in harsh environmental conditions. Designed specifically for power applications where reliability and performance are paramount, this capacitor technology sets a new benchmark in cylindrical power film capacitors.

Product Overview

To support the growing demands of next-generation power electronics in renewable energy, industrial, AI, and power conversion applications, YAGEO Group is launching the C44P-T series — a cutting-edge capacitor solution tailored to meet the industry's needs for durability, thermal stability, and reliability in AC filtering applications.

The C44P-T capacitors are engineered for use in AC filtering within three-phase systems (Y and Δ configurations), offering a wide voltage range from 420 to 850 VAC and capacitance values ranging from 10 µF to 300 µF. These components are ideal for:

- **Renewable energy systems**
- **Industrial**
- **Smart Grid Systems**
- **Artificial intelligence-driven power modules**

Thanks to their advanced design, C44P-T capacitors deliver:

- Up to 12,000 hours of lifetime at 90°C
- Up to 100,000 hours at 85°C
- Up to 250,000 hours at 70°C

- Proven durability through **Grade IIIB harsh environment testing**
  (85°C, 85% R.H. at rated voltage for 1,000 hours)

Key Features

The C44P-T series incorporates several performance-driven attributes that make it a standout choice for AC filtering in high-reliability applications:

- **High Operating Temperature**
  Supports up to 90°C, enabling installation in compact, high-density designs without compromising lifespan.
- **Wide Capacitance and Voltage Range**
  From 10 µF to 300 µF and 420 VAC to 850 VAC, adaptable for a broad spectrum of power stages and system sizes.
- **Long Lifetime Ratings**
  - 12,000 hours @ 90°C
  - 100,000 hours @ 85°C
  - 250,000 hours @ 70°C
- **Harsh Environment Endurance**
  Qualified under **Grade IIIB** IEC testing:
  85°C | 85% R.H. | Rated Voltage | 1,000 hours
- **Rugged Cylindrical Design**
  Optimized for durability and thermal dissipation, with a case coding system that simplifies identification.

YAGEO Group's C44P-T is an evolution of the established **C44P-R series**, tailored to meet the industry's increasing demand for higher temperature operation, longer lifetime, and superior harsh environment performance. Below is a detailed comparison to guide engineers in selecting the best fit for their application.

Key Differentiators

- **Thermal Performance**: C44P-T extends max operating temperature to **90°C**, enabling integration in compact and high-density systems with limited cooling.
- **Lifetime and Reliability**: Significant improvements in lifetime across temperature points make C44P-T a superior choice for long-term deployment.
- **Environmental Robustness**: Certified to **Grade IIIB** conditions, making it ideal for **renewable energy** and **outdoor industrial** environments.

Feature / Specification	C44P-R	C44P-T *(New)*	Improvement
Voltage Range	330 – 1000 VAC	420 – 850 VAC	Narrowed for high-power filtering
Capacitance Range	10 µF – 300 µF	10 µF – 300 µF	
Max Operating Temperature	80°C	90°C	✓ Higher thermal endurance
Lifetime @ 90°C		Up to 12,000 hours	✓ Increased reliability
Lifetime @ 85°C		Up to 100,000 hours	✓ Increased reliability
Lifetime @ 70°C	Up to 150,000 hours	Up to 250,000 hours	✓ Long-term endurance
Harsh Environment Testing		Grade IIIB (85°C, 85% RH, 1,000h)	✓ Harsh environment qualified
Application Focus	General Industrial	Renewable, Industrial, AI, LCL	✓ Broader application compatibility

Application Use Cases for the C44P-T Series

As power conversion technologies evolve toward higher efficiency and reliability, the demand for film capacitors that can operate under elevated thermal and electrical stress continues to grow. The **YAGEO Group C44P-T series** addresses these needs by delivering superior performance in **medium and high-power AC applications**, particularly where **thermal endurance**, **long operational life**, and **filtering precision** are critical.

Typical applications include power conversion, commutation, power factor correction, and uninterruptible power supplies (UPS).

Main Benefits of C44P-T for below applications:

• Long Lifetime

• High Temperature Range

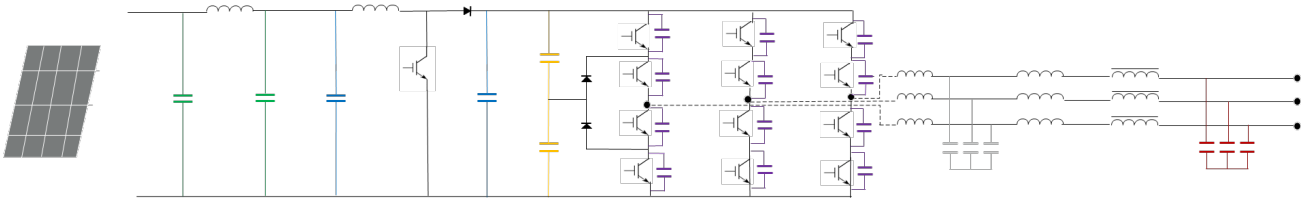
• Harsh Environment Capability

THB IIIB Grade 85°C | 85% R.H. | 1,000 h

• Low power losses

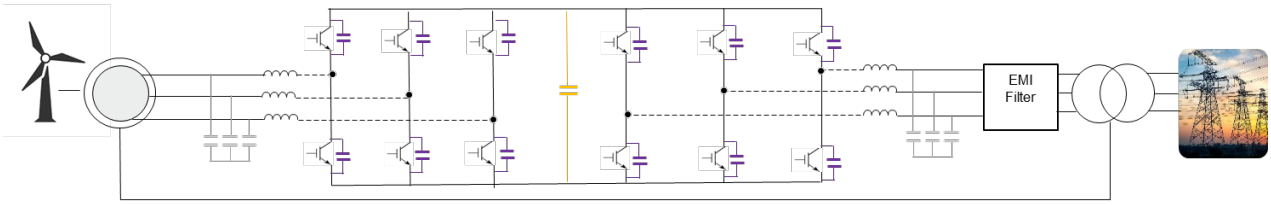
• High ripple current withstanding

C44P-T Application - Solar Inverters



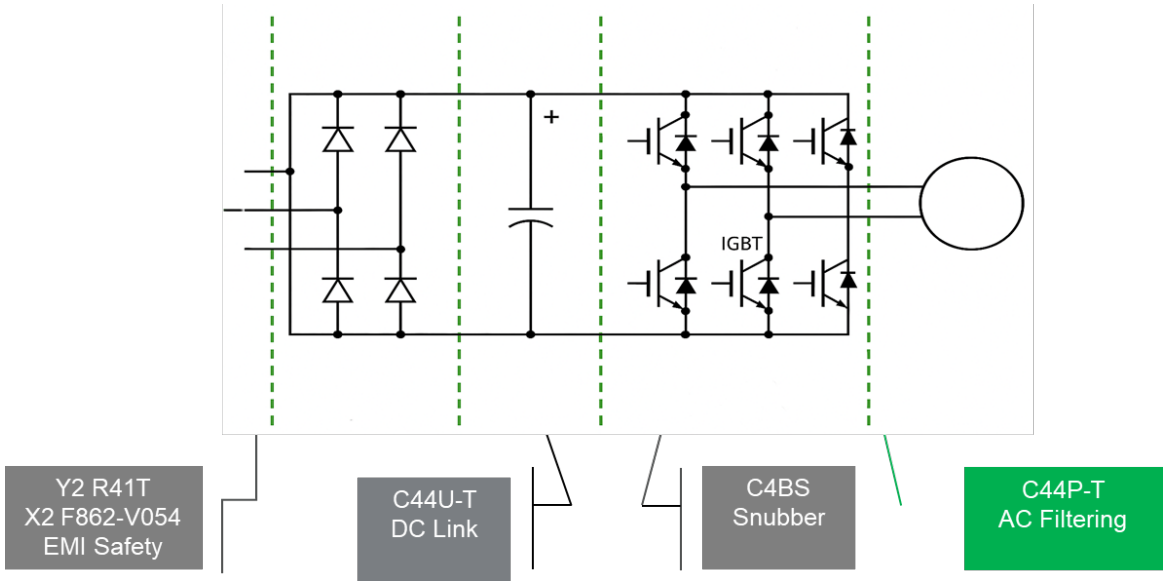
Application	Input DC EMI Filter(*)	DC/DC Conversion	DC Link Stage	DC/AC Inverter	AC Harmonic Filter	Output AC EMI Filter
Capacitor Technology	DC-Link / DC Filter			Pulse/Snubber	AC Filter	EMI Suppression
Central Inverter	C4AQ, C4AQ-M, C4AU, C4AQ-P / C4AK		C44U-T	4BS	4P-T	R47, PHE844, PHE845
String Inverter	C4AQ, C4AQ-M, C4AU, C4AQ-P / C4AK			R75/R75H, R76/R76H	4AF	F862 V054, R52 /R53 /R53 -B, R41-T R41-B, SMP253
Micro Inverter	C4AU Low Profile				F862 V054, R52 /R53 /R53 -B	

C44P-T Application – Wind Converter

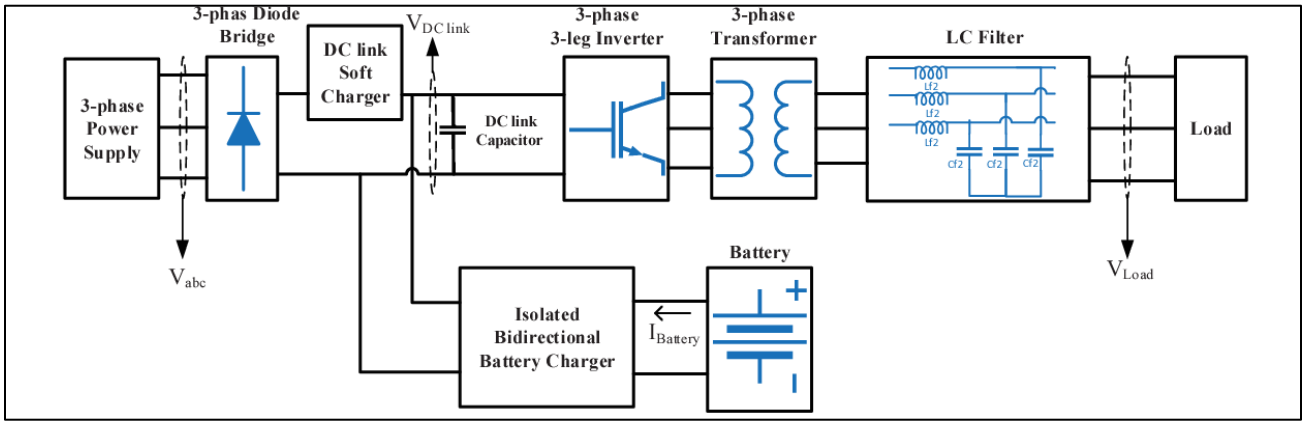


Application	AC - dV/dt Filter	AC/DC Converter	DC Link Stage	DC/AC Converter	AC Filter	EMI Filter
Capacitor Technology	AC Filter	Snubber	DC-Link	Snubber	AC Filter	EMI Suppression
	C44P-T C4DR	C4BS	C44U-T	C4BS	**C44P-T**	R47, PHE844, PHE845

Medium and High-Power Motor Drives (VFD)

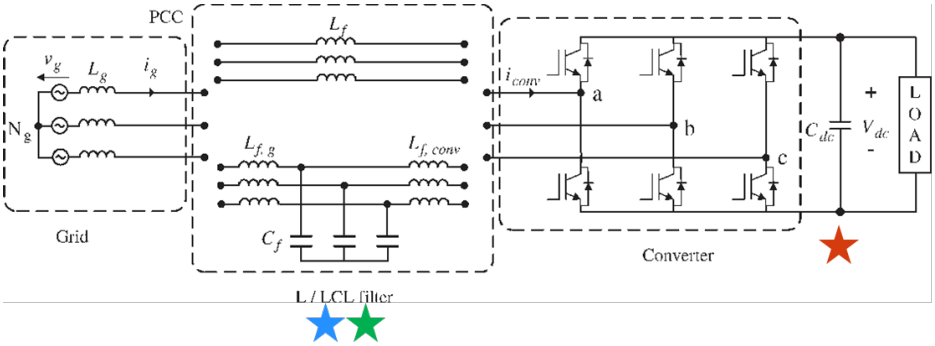


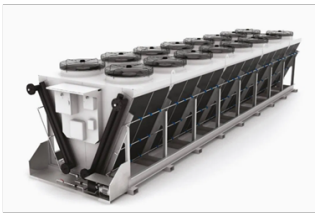
Film Capacitors for Uninterruptible Power Supply (UPS)



Application	EMI Filter	DC Link / PFC	AC Harmonic Filter	EMI Filter X
Capacitor Technology	EMI Filter Y	DC Link / PFC	AC Filter	EMI Suppression
	Y1 THB IIB R4Y	C44P-T	C44P-T	R58
		C44U-T	C4AF	F862 V054 R52 /R53 /R53 -B R41-T R41-B SMP253

Film Capacitors for Thermal Management





Application	EMI Filter	DC Link / PFC	AC Harmonic Filter	EMI Filter X
Capacitor Technology	EMI Filter Y	DC Link / PFC	AC Filter	EMI Filter Y
	Y1 THB IIB R4Y	C44P-T	C44P-T	R58
		C44U-T	C4AF	F862 V054 R52 /R53 /R53 -B R41-T R41-B SMP253

Conclusion

The YAGEO Group C44P-T series empowers designers to push the boundaries of performance and reliability in today's most demanding AC filtering applications. With extended temperature capability, superior lifetime endurance, and rugged performance under harsh conditions, the C44P-T delivers the confidence to build smaller, more efficient, and longer-lasting power systems. Whether in industrial drives, renewable energy, or advanced power converters, the C44P-T series offers the perfect balance of innovation and reliability — helping you design smarter, safer, and more sustainable solutions.