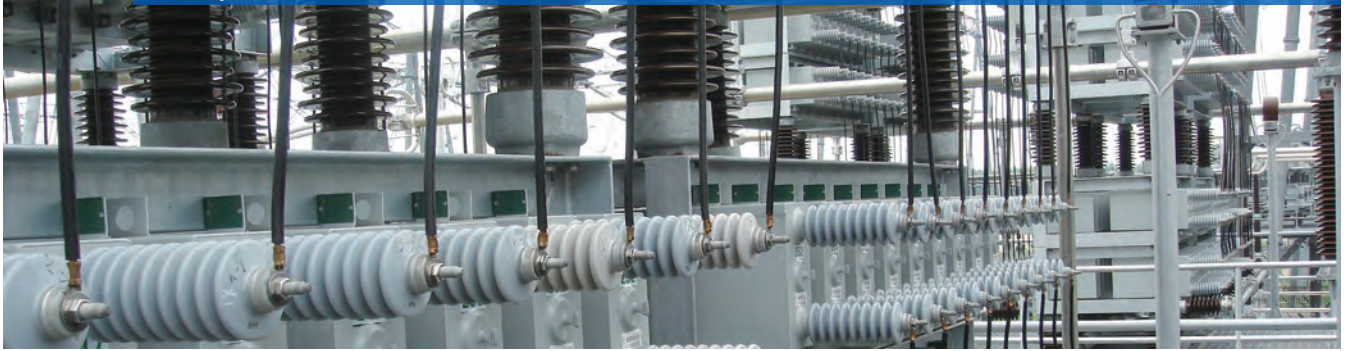


# Eaton's Cooper Power Systems Power Capacitors – Capacitor Banks and Switches



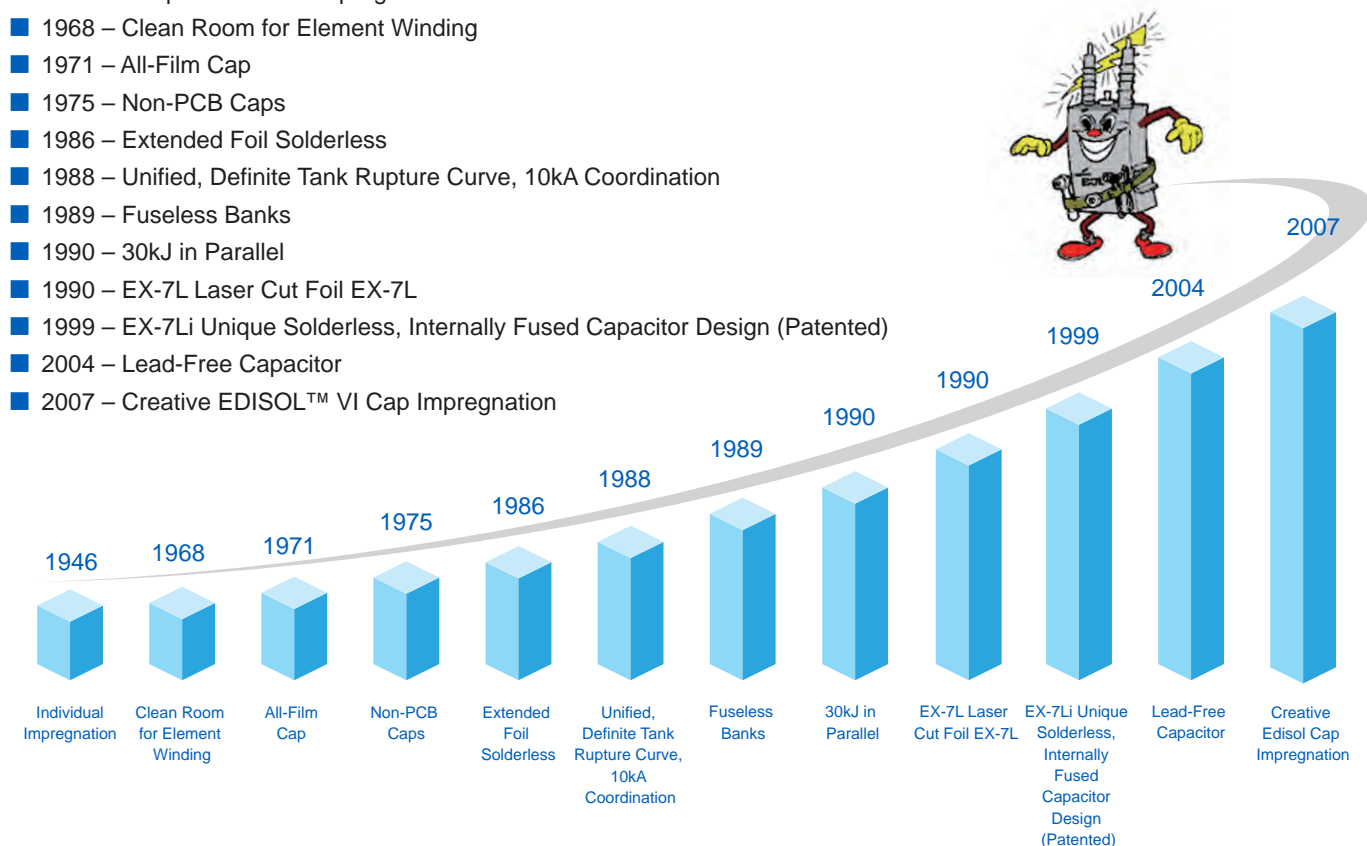
## Introduction

Cooper McGraw-Edison™ EX™-7 Single-Phase externally fused, fuseless and internally fused HV capacitors feature the latest design innovations: all-film, extended foil and solderless connections. They are designed, manufactured, and tested to meet or exceed the requirements of all applicable IEC and ANSI/IEEE, NEMA, GB, DL standards. Their low cost per kvar makes these capacitors a simple, economical source of reactive power on electric power systems for power factor correction, voltage support, loss reduction, improving power transfer capability and releasing system capacity.

Cooper Shanghai Power Capacitor Co.,Ltd has obtained ISO9001:2000 quality management system certificate and enjoyed the isochronous manufacture technics with Eaton's Cooper Power Systems , which has more than 70 years experience on power capacitor manufacture, located in Greenwood USA .

## Splendent Development Milestone

- 1946 – Unique Individual Impregnation in the World
- 1968 – Clean Room for Element Winding
- 1971 – All-Film Cap
- 1975 – Non-PCB Caps
- 1986 – Extended Foil Solderless
- 1988 – Unified, Definite Tank Rupture Curve, 10kA Coordination
- 1989 – Fuseless Banks
- 1990 – 30kJ in Parallel
- 1990 – EX-7L Laser Cut Foil EX-7L
- 1999 – EX-7Li Unique Solderless, Internally Fused Capacitor Design (Patented)
- 2004 – Lead-Free Capacitor
- 2007 – Creative EDISOL™ VI Cap Impregnation



Powering Business Worldwide

## Advanced Technology

### Patent Mechanical Crimp

EX™ mechanical connection system provides solderless internal connections that eliminate localized heating and cold solder joints. The EX crimping system also allows 100% inspection during assembly assuring integrity of internal connections and maximizes operational safety.

### Unique Individual Impregnation

Individual closed loop capacitor fluid impregnation system assures superior fluid impregnation and gas molecule evacuation resulting in low infantile failure rates and long lasting electrical performance.

### Environmentally Acceptable Edison™ VI Non-PCB Dielectric Fluid

Environmentally acceptable Edison™ VI dielectric fluid that eliminates adverse health and environmental hazards is a blue non-PCB decal.

### CLEANBREAK™ Element Fusing System

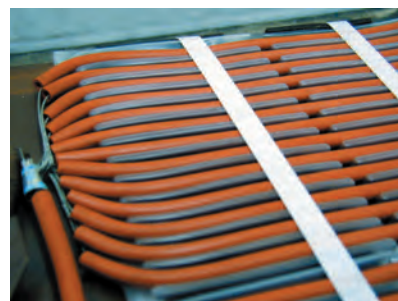
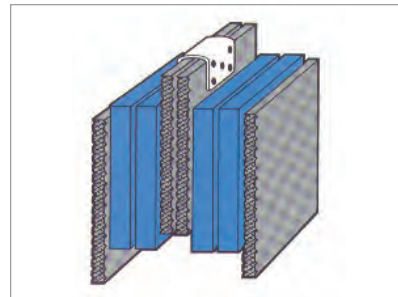
Each element is protected with a series connected CLEANBREAK™ current limiting fuse. This patented fusing system incorporates the following features:

- Polymer fuse card provides isolated fuse mounting which prevents potential damage to adjacent capacitor elements and fuses.
- Fuses are individually mounted within a polymer fuse tube. The tube protects the fuse from damage due to adjacent element failures and fuse operations. This significantly improves the dielectric performance by preventing fluid contamination and promotes proper clearing of element fuse.
- The CLEANBREAK™ fuse operates in a current limiting mode to chop the fault current into the failed element. This prevents the energy stored in the parallel connected elements from being discharged into the fault thus minimizing gassing and damage to the failed element and adjacent dielectric.

### Low Losses

- Internally fused unit  $\leq 0.16\text{Watt/kvar}$
- Externally fused/fuseless unit  $\leq 0.1\text{Watt/kvar}$

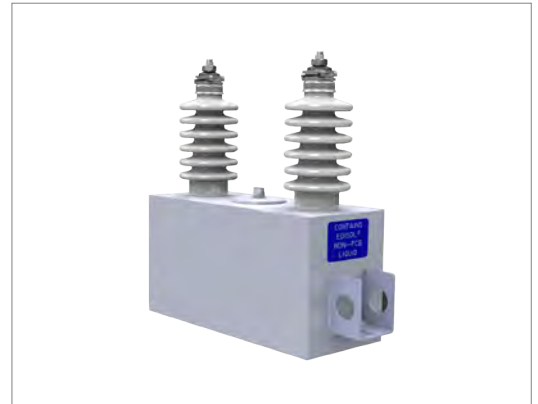
Low losses lead to low temperature rise after energization, reduce the losses of energy and operation cost. it is essential and important for optimum operating performance and long service life.



## Cooper HV Power Capacitor

### EX™-7L Externally Fused/ Fuseless Capacitor

- Capacity: 50 ~ 800kvar
- Voltage: 2 ~ 24kV
- Losses: 0.1W/kvar
- Frequency: 50, 60Hz, 0, others
- BIL: 75, 95, 110, 125, 150, 170, 200kV
- EDISOL™VI, Non-PCB Dielectric Fluid
- Temperature category: -40 C ~ +45 C; (-50 C ~ +55 C customized)
- All-film, Extended Foil, Laser-cut Foil



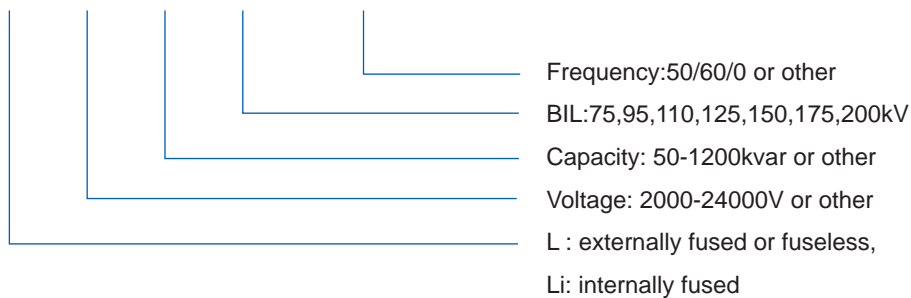
### EX™-7Li Internally Fused Capacitor

- Capacity: 100 ~ 1200kvar
- Voltage: 2 ~ 14kV
- Losses: 0.16W/kvar
- Frequency: 50, 60Hz, 0, others
- BIL: 75, 95, 110, 125, 150kV
- EDISOL™VI, Non-PCB Dielectric Fluid
- Temperature Category: -40 C ~ +45 C; (-50 C ~ +55 C Customized)
- All-film, Extended Foil, Laser-cut Foil
- Cooper Patent CLEANBREAK™ Fusing System
- Solderless Connections



## Type

EX - 7    □ - □ - □ - □ BIL □ Hz



# Power Capacitors – Capacitor Banks and Switches

## Bank Products and Reference of Export Project

Business covers Asia, America, Europe, Australia, Africa, and the company totally commits to global users with high quality capacitor units and banks.



Series Capacitor Bank



HVDC



HV Shunt Bank



MV Metal Encloser



HV Filter Bank



Pole-mounted Capacitor Bank

## Project Reference

Project	Country	System Voltage(kV)	Application	Total Capacity(kvar)
South Grid YunGuang -Suidong HVDC	China	±800	HVDC Filter	1,001,373
South Grid GuiGuang II - Shenzhen HVDC	China	±500	HVDC Filter	1,643,760
State Grid Hunyuan Series Project	China	500	Series Bank	3,664,000
State Grid Xindu Station Series Project	China	500	Series Bank	1,655,000
Brazil TP SC, Paranatinga Substation	Brazil	500	Series Bank	2,017,536
Brazil TP SC, Rio Verde Norte Substation	Brazil	500	Series Bank	475,200
Ethiopia Akaki Substation	Ethiopia	400	Shunt Bank	99,216
ElectraNet - Tungkillo Substation	Australia	275	Shunt Bank	148,080
Indonesia PNL	Indonesia	170	Shunt Bank	52,496
KEPCO Shunt Capacitor- Korea	Korea	161	Shunt Bank	525,231
ElectraNet - Whyalla / Ardrossan / Kincaig / Kadina East	Australia	132	Shunt Bank	110,640
Jordan NEPCO 132/33kV Substation	Jordan	33	Shunt Bank	129,798
International Thermonuclear Experimental Reactor Project	France	66	SVC Filter	1,620,000
Brazil TP SVC, Paranatinga Substation	Brazil	35	SVC Filter	402,552
Brazil TP SVC, Rio Verde Norte Substation	Brazil	35	SVC Filter	573,228
German SK Project	Germany	35	SVC Filter	358,800
KEPCO SVC 2013 - Korea	Korea	20	SVC Filter	296,400
Turkey TOSYALI High Line 34.5kV	Turkey	34.5	SVC Filter	25,920
Powerlink SVC	Australia	33	SVC Filter	73,831
Thailand SPM 22kv SCV Project	Thailand	22	SVC Filter	14,400
Poland ELMA 33KV SVC Project	Poland	33	SVC Filter	238,800
Oman Steel 150t Electric Furnace 33kV/SVC	Oman	33	SVC Filter	336,710
Fuji-EMAL Booster - UAE	UAE	33	Filter Bank	134,850
KRARA Mining Filter	Australia	35	Filter Bank	128,004
Mt Mercer Wind Farm 33kV Shunt Passive Filters	Australia	33	Filter Bank	76,800
Musselroe Wind Farm Filter	Australia	35	Filter Bank	50,616
HK DSD Project	Hong Kong	11	Metal Enclosure	150
China National Petroleum Corporation - Yunnan	China	10	Metal Enclosure	80,000
ADR Metal Enclosed Capacitor Bank	New Zealand	11	Metal Enclosure	3,192



Eaton and Cooper Power Systems are registered trademarks.  
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