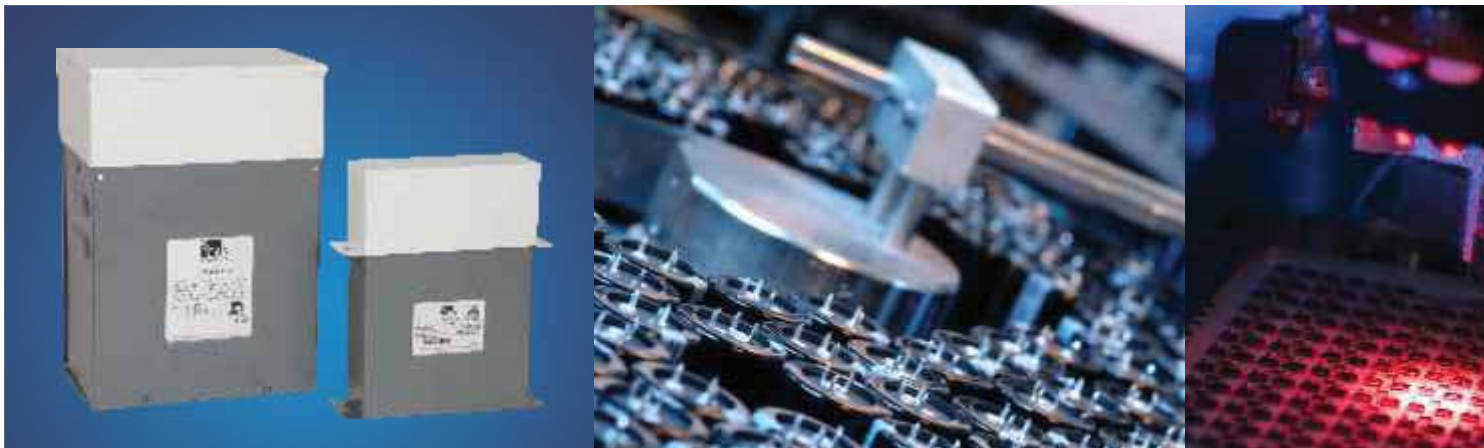


We touch your **electricity** everyday!



# Rectangular Capacitors



While the electrical is getting more scarce and expensive in the developing countries, the need for power factor improvement by installing Capacitors is well understood by the users.

The improved power factor means:

- Reduced line losses
- Improved voltage profile
- Reduced system current
- Reduced cable sizes
- Optimum usage of transformer
- Monetary saving.

We are pleased to offer an all New Rectangular Series of Power Factor Correction Capacitors with enhanced performance.

It helps you to achieve better economy by selecting an application specific Capacitor type.

The Rectangular Capacitor series is now available in three designs viz.

C&S Normal Duty Capacitor for normal inductive linear loads.

C&S Long Life (heavy duty) Capacitor for loads exhibiting some amount of non-linearity, presence of harmonics, medium size industries.

C&S Super Heavy Duty Capacitor for non-linear arduous and fluctuating loads and systems containing higher degree of harmonics.

Rectangular PFC Capacitors are ISI approved and comply

with IS 13340 and latest IEC specifications.

Basic Construction of the Capacitor

## 1.) Film

The three layer Metalized (Silver-Zinc-Aluminum) Polypropylene Film (MPP) with heavy edge is manufactured in house on the latest technology machines. This gives advantages of higher stability obtained from Zinc and longer shelf life obtained from Aluminium. Heavy edge construction of the film provide a better bonding between electrode and metal end spray (scooping), thereby enabling an increase in current carrying capacity and ensuring better withstanding to the electro-mechanical stress that occurs due to switching surges

## 2) Winding

The basic single phase Capacitors are wound on computer controlled automatic winding machines and impregnated with polyurethane resin (dry technology). Thus ionization and carona discharge are eliminated resulting in Capacitors with highly stable characteristics and long life.

## 3) Safety Systems

A) Burst proof safety device – To prevent the Capacitor from bursting in case of permanent breakdown caused by very high voltage in repetitive peaks and which can not be “self – healed” by the self-regenerative property, the Capacitor from the power source. When the internal pressure increase to an unsafe level it produces expansion of the bellow and snapping of the inner connection off the supply and avoiding possible bursting



# Rectangular Capacitors



B) Self-healing property – If the dielectric breakdown strength is exceeded locally at a weak points, at pores or impurities in the dielectric, a dielectric breakdown occurs. The energy released by the arc discharge in the breakdown channel is sufficient to totally evaporate the thin metal coating in the vicinity of the channel. The rapid expansion of the plasma in the breakdown channel causes it to cool within few microseconds, thus quenching the discharge. This results in formation of insulated region around the faulty area thus the capacitor regains its full operation ability.

C) Due to polyurethane resin filling and non use of oil or PCB there is no risk of the fire caused by spurting or leaking oil. In ecologically sensitive applications this design (dry) is a must

## 4) Modular Construction

Single units in excess of 6KVAR are made up of the required number of basic single phase modules. There are housed in a single metallic container and are connected to the three terminals which are brought out through the terminal block. This construction enables easy and inexpensive repair at site and also considerably saves on spares inventory cost.

## 5) Inductor Coil

For rating of 6KVAR and above each Single Phase Capacitor module is provided with an inductor coil to control the inrush current to the Capacitor, particularly in case of parallel switching and automatic control applications. This features ensures long-term stability of KVAR output and extended life.

## 6) Discharge Resistor

All Capacitors are provided with discharge resistors in order to discharge the Capacitor to voltage less than 50Volts within one minute of disconnecting the supply. However, all Capacitor terminals must be properly discharged before handling them.

## C&S Super Heavy Duty Capacitor (Double Dielectric Type)

These Capacitors meet the demands of heavy duty industrial loads. These loads are of the type, rectifiers, arc of induction furnaces, large rolling mills, cement factories, textile spinning mills, welding divisions etc. The basic reason which makes these loads arduous in nature is that each load gives rise to high over current or higher over voltage in an irregular manner. Rectifier load or arc furnace generates harmonic voltage which would impose continuous and severe over current on Capacitors.

In order to build up the correct degree of protection, a Capacitor needs to be given a higher over current and also higher surge voltage withstand capacity. This dual consideration has been taken into account to evolve a different construction of Capacitors, This design of Capacitors has been evolved keeping in mind the basic simplicity of construction of primary MPP cell and its superiority in the capital and operating costs. The new design retains all these features and still raises by about a factor of two, over current as also the surge voltage withstand capacity making it a real Super Heavy Duty Capacitor.

Unit Ratings are available from 1 to 50KVAR



# Rectangular Capacitors

## Construction

- Dielectric: Polypropylene film
- Semi dry; high viscosity PU resin; non-PCB
- Container type / finish: MS sheet metal/powder coated gray colour
- Built-in inductor coil

## Features

- Three phase
- Self-healing technology
- Naturally air cooled (or forced air cooling)
- Explosion proof

## Typical applications

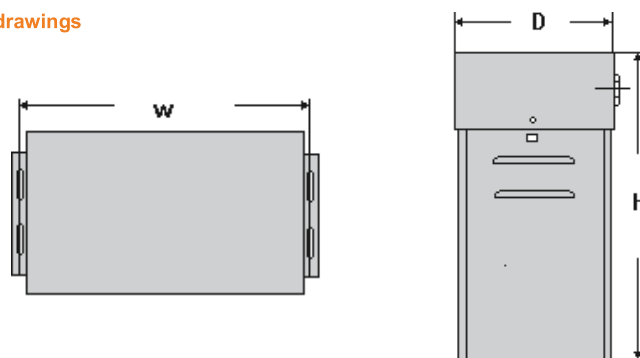
- For power factor correction

## Technical data and specifications

Characteristics	Normal Duty	Long Life (Heavy Duty)	Super Heavy Duty
Tolerance	--0/+10%	--0/+10%	-0/+10%
Rated Voltage-Vac	415,440V*	415,440V*	415,440V*
Rated frequency fr	50/60Hz	50/60Hz	50/60Hz
Dielectric Losses	≤ 0.2 W/kvar	≤ 0.2 W/kvar	≤ 0.2 W/kvar
Losses (Single Phase cell)	≤ 0.5 W/kvar	≤ 0.5 W/kvar	≤ 0.5 W/kvar
<b>Maximum ratings</b>			
Maximum Permissible Voltage	1.1 Un	1.2 Un	1.3Un
Maximum Permissible Current	1.3 In (A)	1.4 In (A)	1.5In(A)
Transient peak Current max Permissible	100In (A)	200In (A)	300In (A)
<b>Climatic category</b>			
Tmin	-25 C	-25 C	-25 C
Tmax	+50C	+50C	+50C
Rel humidity	Av < 95%	Av < 95%	Av < 95%
Maximum altitude	4000 m	4000 m	4000 m
Mean life expectancy			
TLD	Upto 100,000 Hrs	Upto 125,000 Hrs	Upto 150,000 Hrs
<b>Design data</b>			
Impregnation	Non -PCB,PU Resin		
Dielectric	Polypropylene film (metallised)		
Terminals	Threaded Stud terminals with Ceramic bushings		
Mounting and Grounding	Self standing with mounting plates and screws for grounding		
Connection	Delta		
Cooling	Natural		
Case Shape/Finish	Rectangular/ Powder coated Siemens gray colour		
Casing of Capacitor Cell	Extruded Aluminium (hermatically sealed)		
Enclosure	IP41-Fabricated sheet metal		
<b>Safety</b>			
Safety	Overpressure disconnecter, Self healing Sheet metal enclosure		
Max short circuit current	AFC:10kA		
Discharge resistor	Included		
Discharge resistor time	< 1 min(50 V)		

\* Other voltages available on request

## Dimensional drawings



# Rectangular Capacitors

**Selection Table - Rectangular Normal Duty Capacitor Rated Voltage 440V, Delta Connection**

Volts	Sach No.	KVAr	Capacitance Value µf	Rated Current (A)	Dimension (mm)		
					H	W	D
440	CSSND0001440	1	3*5.5	1.31	170	125	45
	CSSND0002440	2	3*11	2.62	170	125	45
	CSSND0003440	3	3*16.5	3.94	240	185	60
	CSSND0004440	4	3*22	5.25	240	185	60
	CSSND0005440	5	3*27.5	6.56	240	185	60
	CSSND0075440	7.5	3*41.5	9.84	325	210	70
	CSSND0010440	10	3*55	13.12	325	240	80
	CSSND0125440	12.5	3*69	16.40	325	240	80
	CSSND0015440	15	3*83	19.68	325	240	80
	CSSND0020440	20	6*55	26.24	325	240	160
	CSSND0025440	25	6*69	32.80	325	240	160
	CSSND0050440	50	12*69	65.60	375	240	320

**Selection Table - Rectangular Long Life (Heavy Duty) Capacitor Rated Voltage 440V, Delta Connection**

Volts	Sach No.	KVAr	Capacitance Value µf	Rated Current (A)	Dimension (mm)		
					H	W	D
440	CSSLD0001440	1	3*5.5	1.31	170	125	45
	CSSLD0002440	2	3*11	2.62	170	125	45
	CSSLD0003440	3	3*16.5	3.94	240	185	60
	CSSLD0004440	4	3*22	5.25	240	185	60
	CSSLD0005440	5	3*27.5	6.56	240	185	60
	CSSLD0075440	7.5	3*41.5	9.84	325	240	80
	CSSLD0010440	10	3*55	13.12	325	240	80
	CSSLD0125440	12.5	3*69	16.40	325	240	80
	CSSLD0015440	15	3*83	19.68	325	240	80
	CSSLD0020440	20	6*55	26.24	325	240	160
	CSSLD0025440	25	6*69	32.80	325	240	160
	CSSLD0050440	50	12*69	65.60	375	240	320

**Selection Table - Rectangular Super Heavy Duty Capacitor Rated Voltage 440V, Delta Connection**

Volts	Sach No.	KVAr	Capacitance Value µf	Rated Current (A)	Dimension (mm)		
					H	W	D
440	CSSHD0001440	1	3*5.5	1.31	265	185	60
	CSSHD0002440	2	3*11	2.62	265	185	60
	CSSHD0003440	3	3*16.5	3.94	325	240	80
	CSSHD0004440	4	3*22	5.25	325	240	80
	CSSHD0005440	5	3*27.5	6.56	325	240	80
	CSSHD0075440	7.5	3*41.5	9.84	425	240	80
	CSSHD0010440	10	3*55	13.12	425	240	80
	CSSHD0125440	12.5	3*69	16.40	425	240	80
	CSSHD0015440	15	3*83	19.68	425	250	165
	CSSHD0020440	20	6*55	26.24	425	250	165
	CSSHD0025440	25	6*69	32.80	425	250	165
	CSSHD0050440	50	12*69	65.60	480	250	325

# Cylindrical Capacitors



## Cylindrical Capacitors:

Cylindrical Capacitors are a tried and tested series of MPP (Metalized Polypropylene) Capacitors from C&S. The power range varies from 1.0 to 30.0 kvar. The Cylindrical Capacitor is especially intended for power factor correction in industrial and semi-industrial applications. The Capacitors are manufactured using metalized polypropylene film as the dielectric and housed in a Cylindrical Aluminum case.

The Cylindrical Capacitors are self-healing, metalized polypropylene film Capacitor. The current-carrying AlZn metal layer is vapor-deposited onto one side of the film.

## Features

### Compact design -low weight and small volume

The entire three-phase Capacitor is composed of three single-phase element stacks. The electrodes are connected by metal spraying on the face ends of the winding elements. The winding elements are encapsulated in a Cylindrical Aluminum case and hermetically sealed either by a press-rolled metal lid or plastic disk with fast-on terminals.

## Dual safety system

Self-healing: The Capacitor repairs itself after overload (to IEC60831). Self-healing Capability prevents permanent dielectric breakdown in case of sporadic voltage surges, overcurrent or over temperature (to IEC60831).

## Cylindrical Capacitor selection

To specify and select Capacitors for PFC, several factors affecting the performance and the expected useful life of the Capacitors must be considered.

- Voltage
- Harmonics
- Temperature
- Total RMS current
- Inrush current / switching
- Operations

Permanent overvoltage shortens the useful life of a Capacitor. The Capacitor's rated voltage must be equal or higher than the operating voltage of the circuit to which it is connected.

Harmonics produce overvoltage and overcurrent on the Capacitors themselves. If the total harmonics distortion level



# Cylindrical Capacitors



for voltage (THO-V) e.g. exceeds 5%, serious damage to the installation may be caused by the resonance of the circuit.

In such cases usage of series reactors (detuning) is recommended. Operation of the Capacitors above the upper category temperature level will accelerate degradation of the dielectric and shorten the Capacitor's useful life.

By keeping min. 20 mm spacing and Cylindrical Capacitors mounted in upright position, better thermal conditions will ensure best performance and a longer useful life. Residual voltage should not exceed 10% of rated voltage for re-switching Capacitors.

During the charging period of the Capacitors the current is very high - if they are connected in automatic Capacitor banks, it is very likely that discharged Capacitors are connected to charged ones already connected to the grid. In such cases the maximum permissible current peak reaches values up to  $150 \cdot I_R$ .

During the switching process thermal and electrodynamic stresses are developed caused by transient overcurrents of high amplitude and frequency and may damage the system. Capacitor contactors with inrush current limiting resistors or

series-inductance (e.g. detuned harmonic filter) will avoid excessive transient currents.

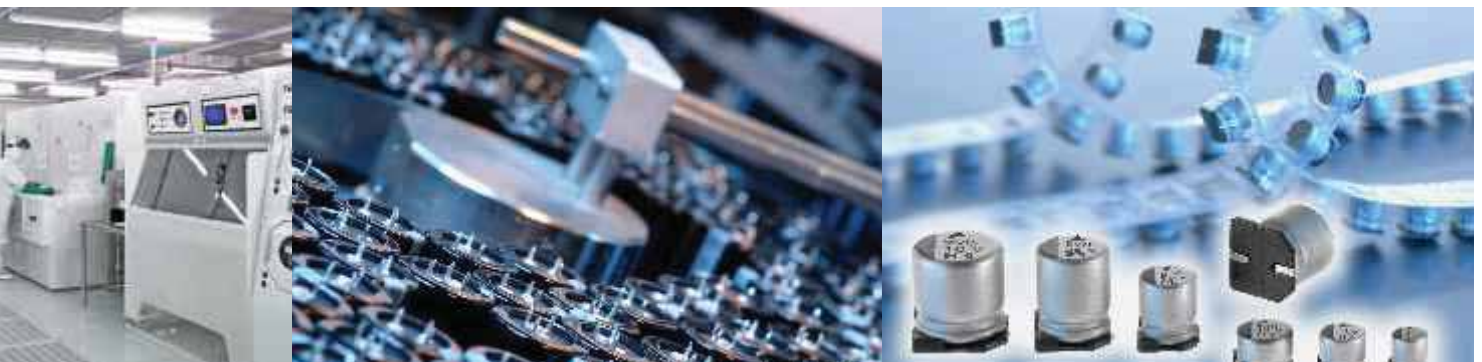
## Life expectancy of up to 100000 operating hours

After a long drying phase to eliminate moisture from the active element, the Capacitor is impregnated. The case is filled with biodegradable soft resin. This production process helps to avoid oxidation and partial discharges (corona effect), promoting Capacitance stability over a long period an essential in detuned PFC.

## High inrush current withstand .. capability is crucial

Capacitors used for power factor correction undergo a lot of switching operations. The high inrush currents that go along with this must be handled without degrading useful life.

The pulse strength of this technology comes in particular from the enlarged, sensitive contact area (improved metal spraying). Cylindrical Capacitors can handle inrush currents of upto 200 times rated current (max.5000 switching operations. according to IEC 60831 standard).



# Cylindrical Capacitors

## Construction

- Dielectric: Polypropylene film
- Three phase, delta connected
- Semi dry; high viscosity PU resin; non-PCB
- Extruded round aluminum can with stud

## Features

- Self-healing technology
- Naturally air cooled (or forced air cooling)
- Indoor mounting
- Dual safety system

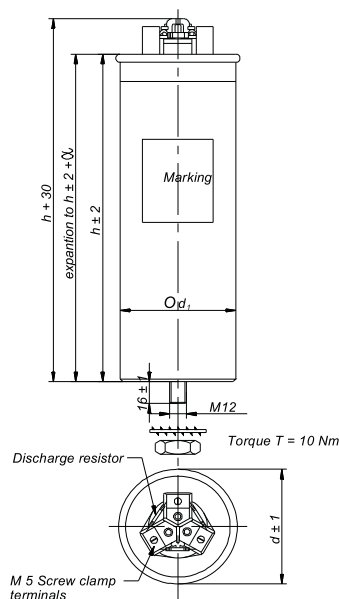
## Typical applications

- For power factor correction

## Technical data and specifications

Characteristics	ND	HD
Rated capacitance $C_R$	As per table	As per table
Tolerance	-5 / +10%	0 / +10%
Connection	$\Delta$ (Delta)	$\Delta$ (Delta)
Rated Voltage	As per table	As per table
Rated frequency $f_R$	50 Hz / 60 Hz	50 Hz / 60 Hz
Output	As per table	As per table
Rated current $I_R$	As per table	As per table
Dielectric losses	$\leq 0.2$ W / kVAr	$\leq 0.2$ W / kVAr
Maximum ratings		
$V_{max}$ (up to 8 h daily)	$V_R + 10\% V_R$ V AC	$V_R + 10\% V_R$ V AC
$V_{max}$ (up to 1 min)	$V_R + 30\% V_R$ V AC	$V_R + 30\% V_R$ V AC
$I_{max}$	$1.3 \cdot I_R$ (A)	$1.5 \cdot I_R$ (A)
$I_s$	$200 \cdot I_R$ (A)	$200 \cdot I_R$ (A)
Test data		
$V_{TT}$	$1.75 \cdot V_R$ V AC / 50 Hz	$1.75 \cdot V_R$ V AC / 50 Hz
	during 2 s	during 2 s
$V_{TC}$	3,000 V AC / 50 Hz during 10 s	3,000 V AC / 50 Hz during 10 s
Total losses	$\leq 0.45$ W / kVAr	$\leq 0.5$ W / kVAr
Climatic category / -25/D		
$T_{min}$	-25 °C	-25 °C
$T_{max}$	+55 °C	+55 °C
Rel. humidity	av. < 95%	av. < 95%
Maximum altitude	4,000m	4,000m
Mean life expectancy		
$t_{LD}$	up to 100,000 hours	up to 100,000 hours
Max. 5,000 switchings per year to IEC 60831		
Design data		
Dimensions ( $\Phi \times h$ )	As per table	As per table
Impregnation	Biodegradable soft resin	Biodegradable soft resin
Fixing	Threaded bolt M12	Threaded bolt M12
Mounting position	Vertical position. See "Maintenance and Installation Manual" for further details.	Vertical position. See "Maintenance and Installation Manual" for further details.
Terminals		
Degree of protection	Isolated terminals, IP20	Isolated terminals, IP20
Max. torque	1.2 Nm	1.2 Nm for terminal for 16sq mm cable & 2.0 Nm for terminal for 25sq mm cable
Creepage distance (min.)	12.7 mm	12.7 mm
Clearance (min.)	9.6 mm	9.6 mm
Safety		
Mechanical safety	Overpressure disconnecter	Overpressure disconnecter
Max. short circuit current	AFC: 10 kA	AFC: 10 kA
Discharge resistor time	$\leq 1$ min (50 V)	$\leq 1$ min (50 V)
Reference Standards		
IEC 60831-1/2, IS: 13340/41		

## Dimensional drawings



# Cylindrical Capacitors

**Selection Table - Cylindrical Normal Duty Capacitor Rated Voltage 440V, Delta Connection**

50 Hz		60 Hz		I <sub>max</sub> ,RMS A	C <sub>n</sub> μF	dxh mm	Ordering code
Kvar	In (A)	Kvar	In (A)				
6.0	7.9	7.2	9.4	11.17	3*33	78.4*195	CSPND0006440
7.0	9.2	8.4	11.8	13.05	3*38.5	78.4*195	CSPND0007440
7.5	9.8	9.0	11.8	13.85	3*41	78.4*195	CSPND0075440
8.3	10.9	10.0	13.07	15.41	3*45.5	78.4*195	CSPND0083440
9.0	11.8	10.8	14.4	16.68	3*49.5	78.4*195	CSPND0009440
10.0	13.1	12.0	15.7	18.52	3*55	88.4*195	CSPND0010440
12.5	16.4	15.0	19.7	23.18	3*68.5	88.4*270	CSPND0125440
15.0	19.7	18.0	23.6	27.85	3*82.5	88.4*270	CSPND0015440
16.7	21.9	20.0	26.3	30.96	3*91.5	88.4*345	CSPND0167440
19.0	24.9	23.0	29.9	35.20	3*104.5	88.4*345	CSPND0019440
20.0	27.3	24.0	32.8	38.60	3*110	88.4*345	CSPND0020440
20.8	27.3	25.0	32.8	38.60	3*114	88.4*345	CSPND0208440
25.0	32.8	30.0	39.4	46.37	3*137.5	93.5*345	CSPND0025440
28.0	36.7	-	44.0	51.89	3*157.5	93.5*345	CSPND0028440
30.0	39.4	36.0	47.3	55.71	3*164.5	93.5*345	CSPND0030440

**Selection Table - Cylindrical Heavy Duty Capacitor Rated Voltage 440V, Delta Connection**

Voltage	Kvar		Current		Capacitance μF	dxh mm	Ordering code
	50 Hz	60 Hz	50 Hz	60 Hz			
440	3	3.6	3.9	4.7	3 x 16.5	78.4 x 195	CSPHD0003440
440	4	4.8	5.2	6.3	3 x 22	78.4 x 195	CSPHD0004440
440	5	6	6.6	7.9	3 x 27.5	78.4 x 195	CSPHD0005440
440	6	7.2	7.8	9.4	3 x 33	88.4 x 195	CSPHD0006440
440	7.5	9	9.8	11.8	3 x 41.5	88.4 x 270	CSPHD0075440
440	8	9.6	10.5	12.6	3 x 44	88.4 x 270	CSPHD0008440
440	9	10.8	11.8	14.2	3 x 49.5	88.4 x 270	CSPHD0009440
440	10	12	13.1	15.7	3 x 55	88.4 x 270	CSPHD0010440
440	12.5	15	16.4	19.7	3 x 68.5	93.5 X 270	CSPHD0125440
440	15	18	19.7	23.6	3 x 82.5	105.5 X 280	CSPHD0015440
440	20.8	25.0	27.3	32.8	3 x 114	121.5 x 280	CSPHD0208440
440	25	30.0	32.8	39.4	3 x 137	121.5 x 325	CSPHD0025440



# Capacitors

Recommended size/rating for accessories (cable, fuses and switchgear)  
for use with 415/440V AC, 50 cycles, three-phase delta - connected PFC capacitors

Output Qn KVAR	Rated Current		Switch rating (A)	HRC Fuse rating (A)	Cu cable mm <sup>2</sup>	Al cable mm <sup>2</sup>
	415V	440V				
1	1.4	1.3	16	4	0.75	1.5
2	2.8	2.6	16	4	0.75	1.5
3	4.2	3.9	16	16	1.5	1.5
4	5.6	5.2	16	16	1.5	1.5
5	7	6.5	16	16	2.5	4
6	8.4	7.8	32	16	2.5	4
7	9.8	9.1	32	16	2.5	4
8	11.2	10.4	32	25	2.5	4
9	12.5	11.7	32	25	4	6
10	14	13	32	25	4	6
12.5	17.5	16.3	32	35	6	10
15	21	19.5	63	35	6	10
20	28	26	63	50	10	16
25	35	32.5	63	63	16	25
30	42	39	100	80	25	35
40	56	52	125	100	35	70
45	63	58.5	125	125	35	70
50	70	65	160	125	50	95
60	84	78	200/250	160	50	95
75	105	97.5	200/250	160	70	185
100	140	130	300	200	120	240



# Capacitors

Capacitor (KVAR) selection chart

Current (ACTUAL) Tan φ	Cos φ	achievable (TARGET) Cos φ							Q <sub>c</sub>	TARGET Cos φ = 0.96		
		0.80	0.82	0.85	0.88	0.90	0.92	0.94		Cos φ ≤ 1		
		Factor F								Q <sub>c</sub> = P <sub>mot</sub> × F(0.96) = ... (KVAR) 100 × 1.01 = 101.0 KVAR		
									0.96	0.98	1.00	
3.18	0.30	2.43	2.48	2.56	2.64	2.70	2.75	2.82	2.89	2.98	3.18	
2.96	0.32	2.21	2.26	2.34	2.42	2.48	2.53	2.60	2.67	2.76	2.96	
2.77	0.34	2.02	2.07	2.15	2.23	2.28	2.34	2.41	2.48	2.56	2.77	
2.59	0.36	1.84	1.89	1.97	2.05	2.10	2.17	2.23	2.30	2.39	2.59	
2.43	0.38	1.68	1.73	1.81	1.89	1.95	2.01	2.07	2.14	2.23	2.43	
2.29	0.40	1.54	1.59	1.67	1.75	1.81	1.87	1.93	2.00	2.09	2.29	
2.16	0.42	1.41	1.46	1.54	1.62	1.68	1.73	1.80	1.87	1.96	2.16	
2.04	0.44	1.29	1.34	1.42	1.50	1.56	1.61	1.68	1.75	1.84	2.04	
1.93	0.46	1.18	1.23	1.31	1.39	1.45	1.50	1.57	1.64	1.73	1.93	
1.83	0.48	1.08	1.13	1.21	1.29	1.34	1.40	1.47	1.54	1.62	1.83	
1.73	0.50	0.98	1.03	1.11	1.19	1.25	1.31	1.37	1.45	1.63	1.73	
1.64	0.52	0.89	0.94	1.02	1.10	1.16	1.22	1.28	1.35	1.44	1.64	
1.56	0.54	0.81	0.86	0.94	1.02	1.07	1.13	1.20	1.27	1.36	1.56	
1.48	0.56	0.73	0.78	0.86	0.94	1.00	1.05	1.12	1.19	1.28	1.48	
1.40	0.58	0.65	0.70	0.78	0.86	0.92	0.98	1.04	1.11	1.20	1.40	
1.33	0.60	0.58	0.63	0.71	0.79	0.85	0.91	0.97	1.04	1.13	1.33	
1.30	0.61	0.55	0.60	0.68	0.76	0.81	0.87	0.94	1.01	1.10	1.30	
1.27	0.62	0.52	0.57	0.65	0.73	0.78	0.84	0.91	0.99	1.06	1.27	
1.23	0.63	0.48	0.53	0.61	0.69	0.75	0.81	0.87	0.94	1.03	1.23	
1.2	0.64	0.45	0.50	0.58	0.66	0.72	0.77	0.84	0.91	1.00	1.20	
1.17	0.65	0.42	0.47	0.55	0.63	0.68	0.74	0.81	0.88	0.97	1.17	
1.14	0.66	0.39	0.44	0.52	0.60	0.65	0.71	0.78	0.85	0.94	1.14	
1.11	0.67	0.36	0.41	0.49	0.57	0.63	0.68	0.75	0.82	0.90	1.11	
1.08	0.68	0.33	0.38	0.46	0.54	0.59	0.65	0.72	0.79	0.88	1.08	
1.05	0.69	0.30	0.35	0.43	0.51	0.56	0.62	0.69	0.76	0.85	1.05	
1.02	0.70	0.27	0.32	0.40	0.48	0.54	0.59	0.66	0.73	0.82	1.02	
0.99	0.71	0.24	0.29	0.37	0.45	0.51	0.57	0.63	0.70	0.79	0.99	
0.96	0.72	0.21	0.26	0.34	0.42	0.48	0.54	0.60	0.67	0.76	0.96	
0.94	0.73	0.19	0.24	0.32	0.40	0.45	0.51	0.58	0.65	0.73	0.94	
0.91	0.74	0.16	0.21	0.29	0.37	0.42	0.48	0.55	0.62	0.71	0.91	
0.88	0.75	0.13	0.18	0.26	0.34	0.40	0.46	0.52	0.59	0.68	0.88	
0.86	0.76	0.11	0.16	0.24	0.32	0.37	0.43	0.50	0.57	0.65	0.86	
0.83	0.77	0.08	0.13	0.21	0.29	0.34	0.40	0.47	0.54	0.63	0.83	
0.8	0.78	0.05	0.10	0.18	0.26	0.32	0.38	0.44	0.51	0.60	0.80	
0.78	0.79	0.03	0.08	0.16	0.24	0.29	0.35	0.42	0.49	0.57	0.78	
0.75	0.80		0.05	0.13	0.21	0.27	0.32	0.39	0.46	0.55	0.75	
0.72	0.81			0.10	0.18	0.24	0.30	0.36	0.43	0.52	0.72	
0.7	0.82			0.08	0.16	0.21	0.27	0.34	0.41	0.49	0.70	
0.67	0.83			0.05	0.13	0.19	0.25	0.31	0.38	0.47	0.67	
0.65	0.84			0.03	0.11	0.16	0.22	0.29	0.36	0.44	0.65	
0.62	0.85				0.08	0.14	0.19	0.26	0.33	0.42	0.62	
0.59	0.86				0.05	0.11	0.17	0.23	0.30	0.39	0.59	
0.57	0.87					0.08	0.14	0.21	0.28	0.36	0.57	
0.54	0.88					0.06	0.11	0.18	0.25	0.34	0.54	
0.51	0.89					0.03	0.09	0.15	0.22	0.31	0.51	
0.48	0.90						0.06	0.12	0.19	0.28	0.48	
0.46	0.91						0.03	0.10	0.17	0.25	0.46	
0.43	0.92							0.07	0.14	0.22	0.43	
0.40	0.93							0.04	0.11	0.19	0.40	
0.36	0.94								0.07	0.16	0.36	
0.33	0.95									0.13	0.33	

## State of the art Manufacturing Facilities



Haridwar, Noida Ph-I  
& Noida Ph-II Plant



### **C&S Electric Ltd.**

**Corporate Office :** 222, Okhla Industrial Estate, New Delhi - 110 020  
**Tel. :** +91-11-3088 7520 - 29, **Fax:** +91-11-2684 7154, 2682 9063

**International Business Division: Tel. :** +91-11-4161 3503, 3088 7520-29, **Fax:** +91-11-2683 8291, 2684 7342  
**email :** exports@cselectric.co.in

**Central Marketing Office: Tel. :** +91-11-3088 7520-29, **Fax:** +91-11-2684 8241, 2684 7342  
**email :** cmo@cselectric.co.in, info@cselectric.co.in

