2022-2025

CATALOGUE BROCHURE

ABOUT COMPANY

ELECTRICAL COMPONENTS SDN BHD was incorporated in 1978 as a research facility by 2 engineers who used to be attached with SIRIM. Eventually it was bought over by the present owners in 1979 as part of a family business diversification exercise.

The company originally began production of A C Power Capacitor utilizing kraft paper and oil impregnation technology. With technological changes and in keeping with international environmental safety requirement, the Company began production of dry-type metallised polypropylene film capacitor in 1983 using European capacitor production technology with the following product ranges in consultation with a consultant from the EU and produced the following first draw of capacitor products.

- ECL 88 Metallised Polypropylene Capacitor For Fluorescent Lamps
- ECM 88 Metallised Polypropylene Capacitor For Single Phase AC Motors and General AC Use
- ECP 88 Three-phase Metallised Polypropylene Film Capacitors For Low Voltage Power Factor Correction

The Brand ELCO, formed out of the first 2 letters of the company name was born in 2005 as we began exploring markets outside of Malaysia and in 2011, ELCO became the first and only Aluminium-Cased Cylindrical 3-phase Low Voltage Power Capacitor manufacturer in Malaysia. It was launched during the Official Opening Ceremony of ASEAN ELENEX 2011, by the then Minister of Energy, Green Technology and Water, Datuk Seri Peter Chin and began marketing aggressively to ASEAN countries working in partnership with local wholesalers. Hitherto, ELCO is firmly a well known brand in ASEAN.

In our quest to continually establishing ourselves in the domestic and international arena, ELCO adopted the following Mission & Value Systems which by itself exemplifies the personal aspirations of the 2nd Generation of Leadership in the company.

Mission

"To be the First Choice in Energy Efficiency"

Vision

"To be the First Choice of Power Capacitors In ASEAN by 2026"

Our Values

Integrity-being consistent in method of delivery and being honest and fair about expectations of results from each other

Sincerity- applying this to communications between each other

Accountability-behaving in a manner which takes responsibility of both the actions taken that produces the outcomes whether desired or not

Positiveness/Think Win-Win-It is human nature to be selfish, in discharging our responsibilities, always leave something on the table for the other, that way the relationship can be nurtured harmoniously

Key Focus Areas to Achieving Mission Statement

Cost-innovative ways to deliver better cost without sacrificing quality

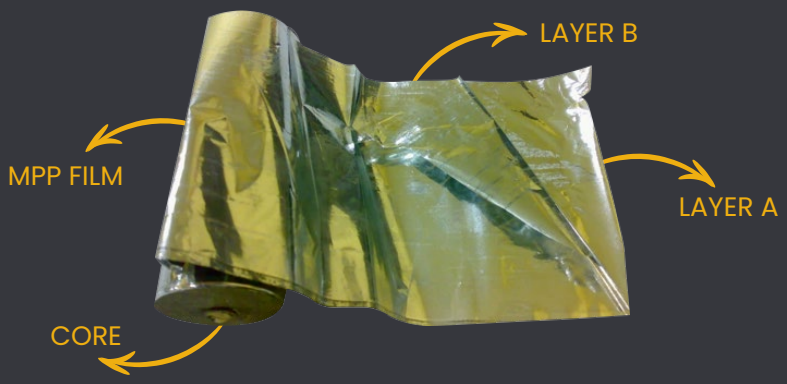
Quality- is a habit and passion of continuous improvement seeking ever higher quality products and services

Service-delivery of products/services in timely fashion, with service quality which exceeds expectations whilst behaving responsibly and being cost competitive

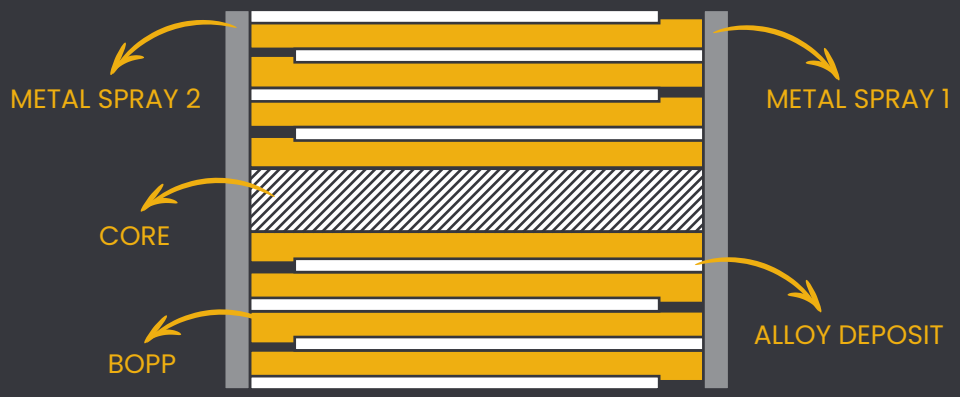
METALLISED FILM CAPACITOR TECHNOLOGY

Metallized Film Capacitor, MPP technology was developed more than 40 years ago and its technology reaped the rewards from advancements in plastics. This advancement has gone a long way over the last 40 years giving fruit to BOPP as a base material used in MPP. The original BOPP developed had a DC breakdown strength, BDV of a little over 300Vdc but in today's advanced production of plastics with the right quantities of ash and crystals formations as well as internal 'know-how' which is a closely guarded secret, today's BOPP can attain a BDV value of over 700Vdc and the advantage of MPP lies in its low losses and ability to self heal.

The basic structure of the MPP capacitor follows the winding in an environmental controlled room of 2 layers of BOPP with alloys coated in a vacuum coating machine. These layers of alloy are only a few Angstroms thick and relative to the BOPP which houses it, is more than 100 times thicker. This BOPP then acts as a dielectric allowing charges to form and reform as the pulsation of electrical fields changes direction in alternating current systems. The following picture shows the basic construct of this capacitor.



The internal layers forming plates of opposing electrostatic fields are arranged in the following structure.

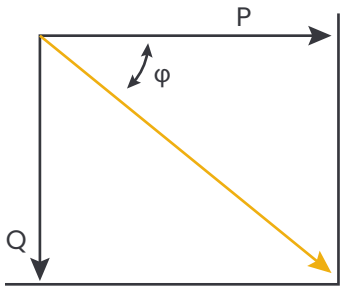


These plates with tens of Angstroms of deposited zinc-alluminium layers will form the charging substrate layer giving rise to what is known as capacitance, which is usually measured in units of microfarad,uF . It is also this thin layer of alloy which allows a phenomenon known as self healing to occur forming what is known today as a self-healing capacitor. The act of self-healing occurs when a localized over voltage occurs which surpasses the voltage strength at that location which could be due to over voltage that happens due to harmonics or simply due to a weakness in the base BOPP substrate.

ELCO, prides itself with a deep working of these dielectrics having acquired the experiences through years of hard work, failure and a spirit of continuous improvement giving birth to newer generations of AC power capacitors used in the field of power quality.

ELCO POWER CAPACITOR
BASIC PRINCIPLES OF POWER FACTOR CAPACITORS

Introduction to What is the Meaning of Power Factor and Importance of Reactive Power



In this representation, the Power Factor (P/S) is equal to coxφ

Power Factor is denoted by the symbol, cosφ and the circulation of reactive power in the electrical network has major technical and economic consequences. For the same active power P, a higher reactive power means a higher apparent power and thus, a higher current must be supplied. We, cannot escape the need for reactive power as it is used by inductive loads in making and maintaining magnetic fields.

- The circulation of active power over time is resulting in active energy (in kWh).
- The circulation of reactive power over time is resulting in reactive energy (kvarh).
- In an electrical circuit, the reactive energy is supplied in addition to the active energy.

But, a circulation of reactive energy on distribution networks results in:
1. Overload of transformers,
2. Higher temperature rise of the supply cables,
3. Additional losses,
4. Large voltage drops,
5. Higher energy consumption and cost,
6. Less distributed active power- assuming that the kva capacity is fixed.

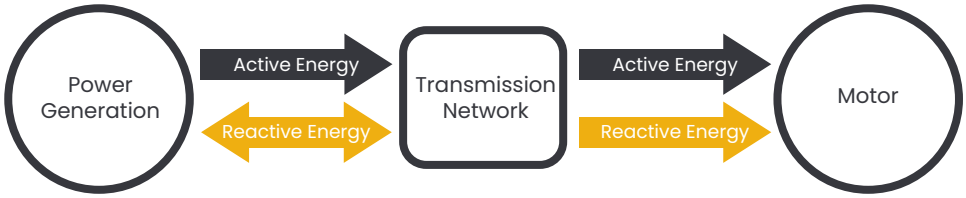


Figure 1 *Reactive energy supplied and billed by the energy supplier*

Due to these reasons, reactive energy generated at the load level is an advantage to prevent the unnecessary circulation of current in the network.

This is what is known as **"Power Factor Correction"**. This is obtained by the connection of capacitors, which is able to produce reactive energy in opposition to the energy absorbed by loads such as motors.

The result is a reduced apparent power, and an improved power factor (PF) as illustrated on the Figure 2. The power generation and transmission networks are partially relieved, reducing power losses and making additional transmission capability available. Since the reactive power is supplied by capacitors there is no billing of reactive power by the utility (energy supplier)

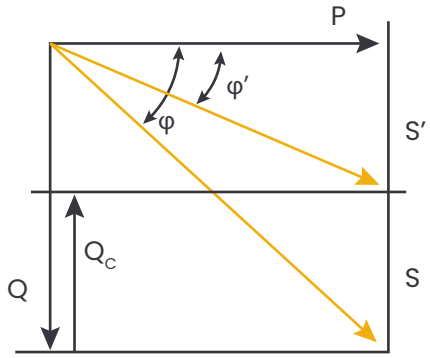


Figure 2 *Diagram of PF correction*

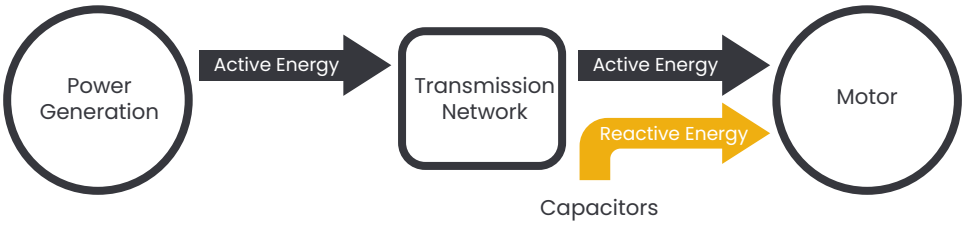


Figure 3 *Reactive energy supplied and by Power Capacitor*

CALCULATION OF REQUIRED REACTIVE POWER

The reactive power which is necessary to achieve a desired power factor is calculated by the formula: QC= P• F

- QC - reactive power of the required power capacitor
- P - active power of the load to be corrected
- F - conversion factor according to Table 1

Original Power Factor cosφ1	Conversion Factor F For A Target Power Factor									
	cosφ1									
cosφ1	0.70	0.75	0.80	0.85	0.90	0.92	0.94	0.96	0.98	1.00
0.20	3.879	4.017	4.149	4.279	4.415	4.473	4.536	4.607	4.696	4.899
0.25	2.853	2.991	3.123	3.253	3.389	3.447	3.510	3.581	3.670	3.873
0.30	2.160	2.298	2.430	2.560	2.695	2.754	2.817	2.888	2.977	3.180
0.35	1.656	1.795	1.926	2.057	2.192	2.250	2.313	2.385	2.473	2.676
0.40	1.271	1.409	1.541	1.672	1.807	1.865	1.928	2.000	2.088	2.291
0.45	0.964	1.103	1.235	1.365	1.500	1.559	1.622	1.693	1.781	1.985
0.50	0.712	0.850	0.982	1.112	1.248	1.306	1.369	1.440	1.529	1.732
0.55	0.498	0.637	0.768	0.899	1.034	1.092	1.156	1.227	1.315	1.518
0.60	0.313	0.451	0.583	0.714	0.849	0.907	0.970	1.042	1.130	1.333
0.65	0.149	0.287	0.419	0.549	0.685	0.743	0.806	0.877	0.966	1.169
0.70	0.138	0.270	0.400	0.536	0.594	0.657	0.729	0.817	1.020	
0.75	0.132	0.262	0.398	0.456	0.519	0.590	0.679	0.882		
0.80	0.130	0.266	0.324	0.387	0.458	0.547	0.750			
0.85	0.135	0.194	0.257	0.328	0.417	0.620				
0.90	0.058	0.121	0.193	0.281	0.484					
0.95	0.037	0.126	0.320							

Table 1 *conversion factor*

CALCULATION BASED ON THE CONSUMPTION DATA

- consumption of active energy: WP = 400.000 kWh
- consumption of reactive energy: WQ = 500.000 kvarh
- number of working hours: t = 800 h

1) Calculation of average active power P

$$\frac{WP}{t} = \frac{400000}{800} = 500\ KW$$

2) Calculation of initial power factor cosφ1

$$\frac{WP}{\sqrt{(WP)^2 + (WQ)^2}} = 0.62$$

3) From Table 1, we read the factor 1.042 for the improvement of the power factor from 0.6 to 0.96.
4) Calculation of required capacitor power QC = 500 kW x F(1.042) = 521 kvar

BASIC TYPES OF REACTIVE COMPENSATION

Central Compensation (CC)
The capacitor bank is connected at the head of the installation[upstream] to be compensated in order to provide reactive energy for the whole installation. This configuration is convenient for stable and continuous load factor.

Group Compensation (GC)
The capacitor bank is connected at the head of the feeders supplying one particular group to be compensated. This configuration is convenient for a wide installation, with workshops having different load factors.

Individual Compensation (IC)
The capacitor bank is connected right at the inductive load terminals (especially large motors). This is the technical ideal configuration, as the reactive energy is produced exactly where it is needed, and adjusted directly to the demand.

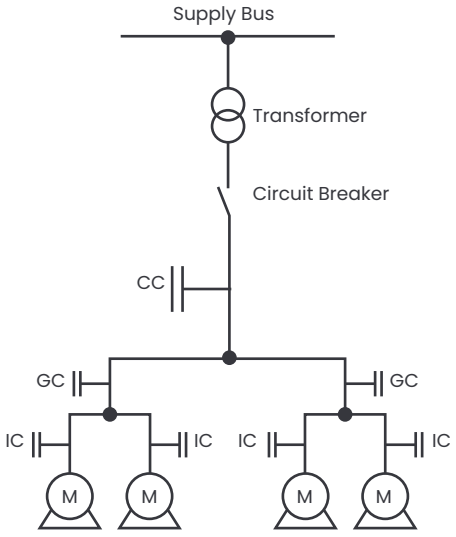


Figure 4 *Method of compensation*

INFLUENCE OF HARMONICS ON CAPACITORS

Harmonic currents are currents circulating in the networks and which its frequency is an integer multiple of the supply frequency. Harmonic currents are caused by non-linear loads connected to the distribution system. A load is said to be non-linear when the current it draws does not have the same sinusoidal waveform as the supply voltage. The flow of harmonic currents through system impedances in turn creates voltage harmonics, which distort the supply voltage which then creates further complications like machine stoppages and outages. Unfortunately, these non-linear loads have undesirable effects on the incoming AC supply, drawing appreciable inductive reactive power and a non-sinewave current.

The harmonics lead to a higher capacitor current, because the reactive impedance as seen from the terminals of a capacitor reduces with rising frequency. The rising capacitor current can be accommodated by constructional improvements in the manufacture of the capacitor. However, a resonating circuit between the power factor correction capacitors, the inductance of the feeding transformer and/or the mains may occur. If the frequency of such a resonating circuit is close enough to a harmonic frequency, the resulting circuit amplifies the oscillation and leads to immense over-currents and over-voltages.

Harmonic distortion of an AC supply can result in any or all of the following:
• Premature failure of capacitors.
• Nuisance tripping of circuit breakers and other protective devices.
• Failure or maloperation of computers, motor drives, lighting circuits and other sensitive loads

Typical non-linear loads (generating harmonics)
• converters, rectifiers, inverters, choppers
• thyristor controls, three-phase controllers
• electronic valves
• phase controls
• UPS units (inverter technology), LEDs
• discharge lamps with magnetic ballasts

CHOICE OF RATED VOLTAGE & OVERLOAD CURRENTS OF ELCO CAPACITOR

According to IEC 60831-1, rated voltage (UN) of a capacitor is defined as the continuously admissible operating voltage. The rated current (IN) of a capacitor is the current flowing through the capacitor when the rated voltage (UN) is applied at its terminals, assuming a purely sinusoidal voltage and the exact value of reactive power (kvar) generated. Capacitor units shall be suitable for continuous operation at an

RMS Current 1.3 x (IN).

In order to accept system voltage fluctuations, ELCO Capacitors are designed to sustain over-voltages of limited duration but to comply to IEC standard, capacitors are for example requested to sustain over-voltages equal to

1.1 x UN for a duration of 8h per 24h.

ELCO range of capacitors have been designed and tested extensively to operate safely on industrial networks. The design margin allows operation on networks including voltage fluctuations and common disturbances. Capacitors can be selected with their rated voltage corresponding to the network voltage. For different levels of expected disturbances, different technologies are proposed, with larger design margin for capacitors adapted to the most stringent working conditions.

Voltage Factor x Un r.m.s.	Maximum Duration	Observations
1.00	Continuous	Highest average value during any period of capacitor energization. For energization periods less than 24h, exeptions apply as indicated below (see clause 29).
1.10	8 hr in every 24 hr	System voltage regulation and fluctuations
1.15	30min in every 24hr	System voltage regulation and fluctuations
1.20	5 min	Voltage rise at light load (see clause 29)
1.30	1 min	

Table 2 *Admissible voltage levels in service as per IEC 60831-1-2014*

CAPACITOR SELECTION + HARMONICS

The percentage of non-linear loads N_{LL} is an indicator for the magnitude of harmonics on any network but to determine this level of harmonics, it is measured and the Figure below shows where these values can be obtained on a given network.

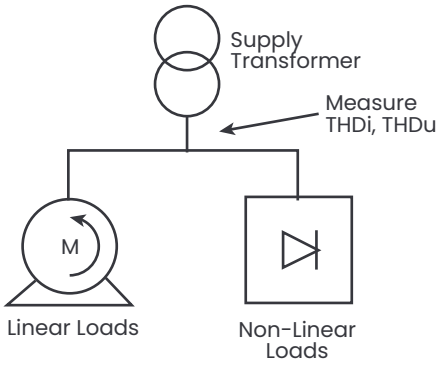


Figure 5 *Measuring Point*

Baseline indicators are current harmonic distortion THDi and voltage harmonic distortion THDu, measured at the transformer secondary, with no capacitors connected. Depending on measured distortion, different technologies of capacitors can be selected as shown in Figure 6 below. Heavy Duty capacitors can simply mean choice of a capacitor with higher rated voltage.

THDi (%)	5	8	10	20
Normal Duty	●	●		
Heavy Duty	●	●	●	●
Heavy Duty + Reactor	●	●	●	●

THDi (%)	3	5	6	8
Normal Duty	●	●		
Heavy Duty	●	●	●	●
Heavy Duty + Reactor	●	●	●	●

Figure 6 *Capacitor selection Guide*

INSTALLATION & MAINTENANCE INSTRUCTIONS – INDUSTRIAL BEST PRACTICE

MOUNTING POSITION

Capacitors installed in a cubicle should be placed at the coolest position- usually at the bottom of the cubicle in order to ensure the lowest stress temperature possible average < 35°C

The ELCO Power Factor Correction Capacitor may be mounted in a vertical or horizontal position as it is dry and internal encapsulation material does not change position due to gravity as in oil or gas filled capacitors.

However, when mounting in horizontal position, additional mechanical support is recommended to prevent breaking of the mounting bolt in case of mechanical shock or vibrations. This support should be placed at short distance below the bead at the top end of the capacitor.

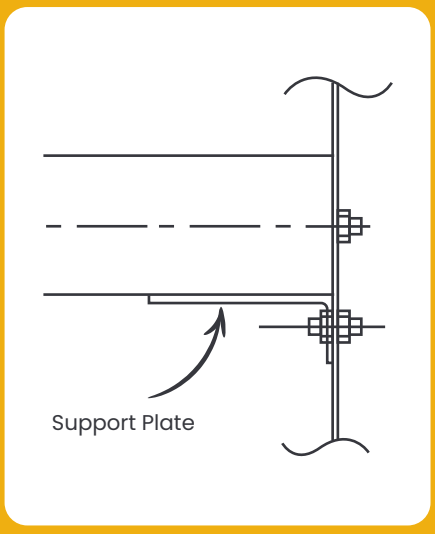


Figure 7 *Horizontal mounting method*

Warning! *Do not install the capacitor in case the external aluminum case display dents > 1.0 mm or is punctured*

MOUNTING CONDITION

PFC capacitors must be installed in a cool and well ventilated place, and not close to objects that radiate heat such as filter circuit reactors and furnaces, or in the direct sunlight (Please consult ELCO for such special applications)

CAPACITOR INSTALLATION SPACE

Make sure that sufficient cooling space is provided (see Figure 8):

a. A minimum distance of 50 mm between the capacitors is necessary to maintain sufficient cooling.

b. Keep at least 50 mm space above the capacitor and do not attach any mounting components at the crimp or on top. This gap will allow a longitudinal extension of the can in order to ensure that the overpressure disconnector can fully extend.

Figure 8 *Minimum Space over and between the Capacitor*

USING REACTORS

If reactors are used in an application, do note that they operate at a much higher temperatures vis-à-vis capacitors. Typical Class H reactors are expected to operate at around (115~135)°C whilst Class F reactors are expected to operate at temperatures around (90~105)°C. From experience, reactors should always be mounted at higher levels in a cubicle away from capacitors so that convected heat do not flow over the capacitors. If the cubicle has space restrictions and the reactor has to be mounted on the same floor pan, then the distance between the reactor and capacitor must be large enough and fan air flow do not bring hot gas over the capacitor. There is no rule of thumb here simply because different ambient causes different operating conditions. So beware!

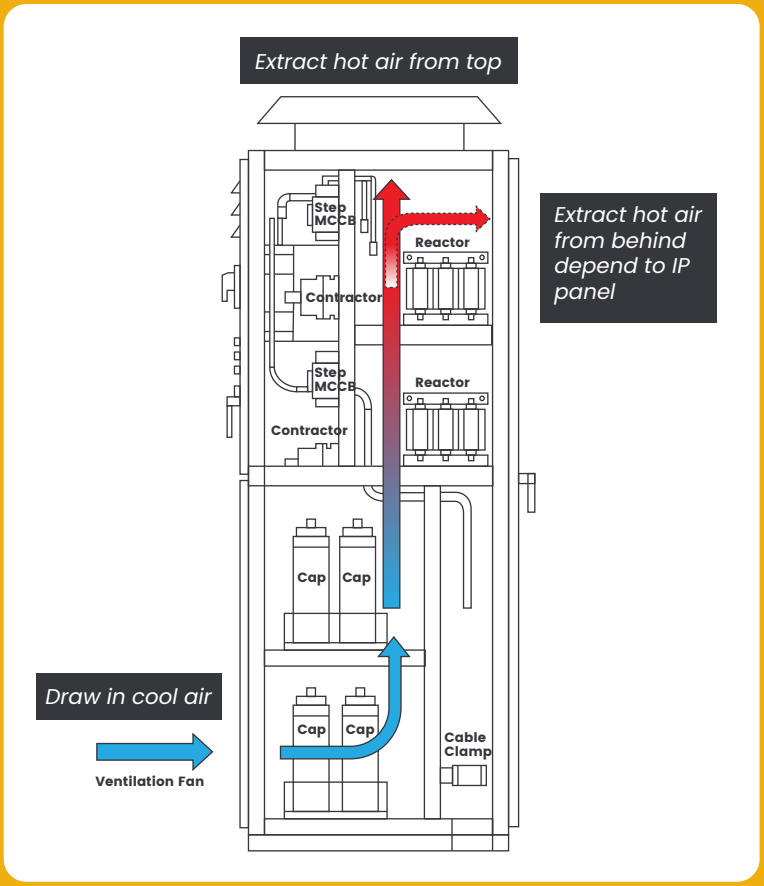


Figure 9 *Example Air flow into Capacitor Bank*

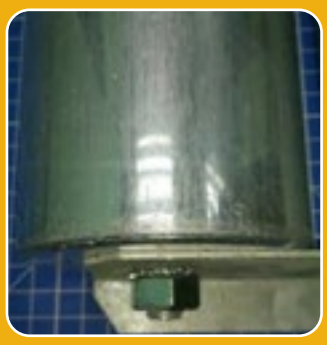


Figure 10 *Mounting Stud*

EARTH GROUNDING

The M12 bottom stud is also used for grounding. Connect it to the ground by cable, or connect the capacitor to any other conductive item which is connected to the ground.

M12 bottom stud: torque 15 Nm max.

CONNECTING

When connecting, avoid bending cables, or the use of excessive force on the terminals. Otherwise, irreparable damage could disable the safety device or simply cause premature damage to the capacitor termination and create a hot-spot.

Ensure firm fixing of terminals, Respect fixing torque recommendations.!

SCREW DRIVER

Use an appropriate screw driver. Capacitors are supplied with partially engaged terminal screws.

700 / 705 / 784 series

Maximum torque: 3Nm
Head type: PH 2

Figure 10 *Fixing Supply Cable*

USING DISCHARGE RESISTORS

Discharge resistors are included in the delivery package, pre-mounted by the factory 200 / 205 /700 / 705 /784 Series are provided with external discharge module.

Discharge resistors are required for discharging of capacitors to protect operating personal (risk of electric shock hazard) and for re-switching capacitors in automatic PFC equipment.

ELCO discharge resistors are designed to discharge capacitors down to 75 V or less within 180 seconds.

DISCHARGE THE CAPACITOR

Before re-switching, capacitors must be discharged to 10% of the rated voltage or below.

OVERPRESSURE DISCONNECTOR

ELCO power capacitor is self-healing type capacitors. As polypropylene-type capacitors seldom produce a pronounced short circuit, HRC fuses or circuit breakers alone do not offer sufficient protection.

All capacitors 200 / 205 / 700 / 705 / 784 Series are consequently fitted with a mechanical disconnector that responds to overpressure. If numerous electric breakdowns occur at the end of life or as the result of thermal or electric overload (within IEC 60831 specification), the formation of gas causes the pressure inside the capacitor case to rise.

This causes a change in length because of curvature of the lid or stretching of the expansion head. Expansion beyond a certain degree will separate the internal wires (tear-off fuses) and disconnect the capacitor from the line.

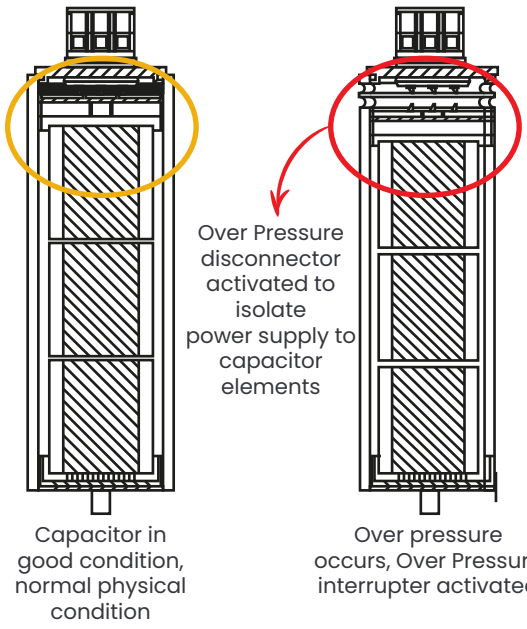


Figure 12 *Over pressure interrupter function*

Warning! *DO NOT TIE UP CONNECTING CABLES SUCH THAT IT RESTRICTS THE VERTICAL MOVEMENT OF THE OVERPRESSURE INTERRUPTOR. THIS WILL CAUSE UNDESIRABLE EXPLOSIONS!*

AC-6B CONTACTOR

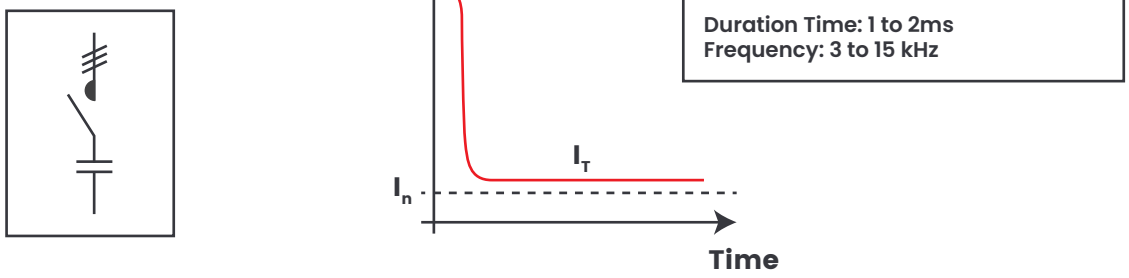
Special contactors designed for switching 3 phase or multiple-steps capacitor banks. The contactors are conformed to standards IEC / EN 60947 and VDE 0660.

BACKGROUND OF CONTACTOR OPERATION

While switching on and switching off the capacitor banks under load, transient spikes are observed as the capacitor fills up with charges. Therefore, in order to protect electrical installation its necessary to use AC-6b contactors to quench these arc forming switching transients.

The high currents from switching spikes can lead to melting of the main contacts of the contactor, and it is also detrimental to capacitors' internal spray/shooping contacts. The value of the transient current depends on the type of compensation, which is displayed with the following schedules, which are generic assumptions but can be computed in detail if you know the system, Isc and the value of the capacitor unit or bank total reactive power.

SINGLE COMPENSATION

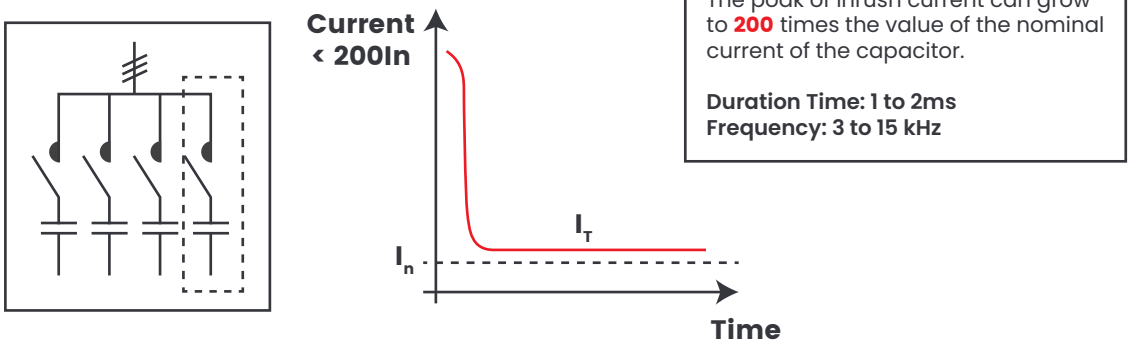


The poak of inrush current can grow to **30** times the value of the nominal current of the capacitor.

Duration Time: 1 to 2ms
Frequency: 3 to 15 kHz

Figure 13 *Inrush current single compensation*

CENTRAL MULTISTAGE COMPENSATION



The poak of inrush current can grow to **200** times the value of the nominal current of the capacitor.

Duration Time: 1 to 2ms
Frequency: 3 to 15 kHz

Figure 14 *Inrush current multistage compensation*

AC-6B CONTACTOR OPERATION

In these capacitor contactors (AC-6b) pre-contacts are used to limit transient current. Each pre-contact is connected in series with a resistor to limit the transient current of the capacitors. Pre-contacts are closed before the main contacts, and open when the main contacts are closed. Such construction of capacitor contactors ensures effective functioning in their working time. The functioning of capacitor contactor is shown in Figure 15.

The diagram below shows the differences between with and without AC-6B contactor operation of transient behavior at contact plates.

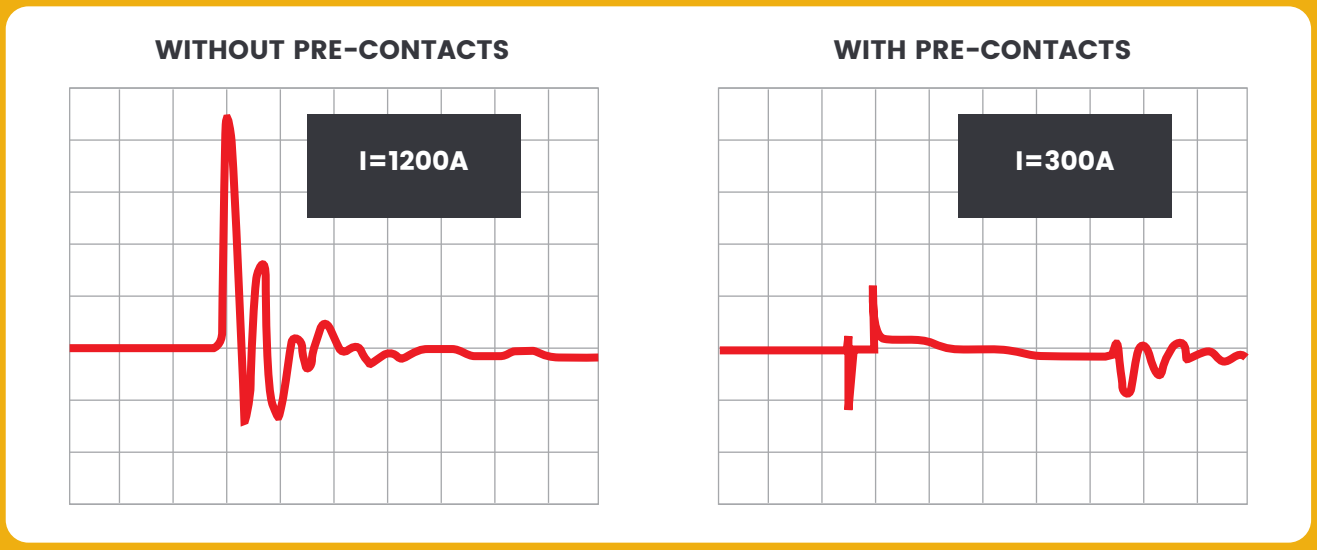


Figure 15 *Diagram of the current transient for 12.5 kVar capacitor (In = 18A; Un = 400V)*
Scale: I: 250A / unit; t: 0.5ms / unit, Transformer z=6%, S=2,000kva

EXPLANATION NOTE

Inrush transient current formula is shown for Reference in Annex B as per IEC60831-1,'.
Detail, please refer ***IEC60831-1: 2014 Edition 3 Shunt Power Capacitors of the self-healing type for a.c systems having a rated voltage up to and including 1000V annex B Page 34 B.4. Inrush transient current.***

B.4.1 SWITCHING IN OF SINGLE CAPACITOR

$$\hat{i}_s \approx I_N \sqrt{\frac{2S}{Q}}$$

$\hat{i}_s$ is the Peak of inrush capacitor current in amperes (A);
I_N is the Rated Capacitor Current (r.m.s.)in amperes (A);
S is the short-circuit power (MVA)where the capacitor is to be installed;
Q is expressed in megavars (Mvar)

B.4.2 SWITCHING OF CAPACITORS IN PARALLEL WITH ENERGIZED CAPACITOR (S)

$$\hat{i}_s = \frac{U\sqrt{2}}{\sqrt{X_c X_l}}$$

$$f_s = f_N \frac{X_c}{X_L}$$

$\hat{i}_s$ is the Peak of inrush capacitor current in amperes (A);
U is the phase-to-earth voltage in volts (V);
X_C is the series-connected capacitive reactances per phase in ohms (Ω);
X_L is the inductive reactance per phase between the banks in ohms (Ω);
f_s is the frequency of the inrush current in hertz (Hz)
f_N is the rated frequency in hertz (Hz)

ELCO PRISMATIC-TYPE POWER CAPACITORS

134 SERIES

Three-phased Box-Type Capacitor Bank is used to correct Power Factor for Motors, Low Voltage Transformers and inside Industrial Switchboard. It is sometimes used with blocking reactors with harmonics presence.

PRODUCT SPECIFICATION

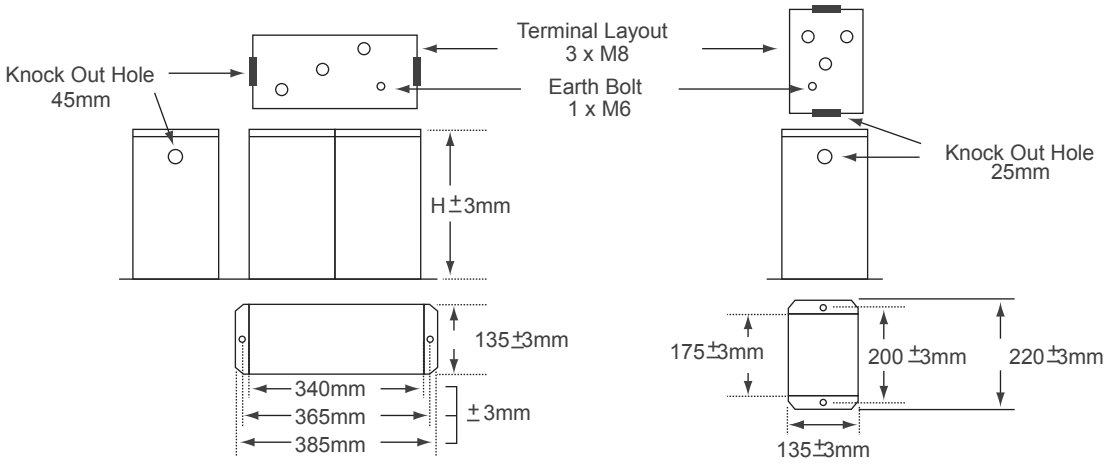
No.	Specifications	Data
1	Construction	Metal Box
2	External Terminal Box & Casing Finishing	Yes & Epoxy Powder coated Sheet Steel
3	Type	Dry, Self-Healing
4	Dielectric	Bi-Axially Oriented Polypropylene
5	Plate	Zinc-Aluminium Alloy
6	Rated Voltage (U_N)	440V
7	Frequency (f_N)	50 / 60 Hz
8	Connection	Internal Delta
9	Temperature Category	D / -25°C to +55°C
10	Capacitance Tolerance	-5% / +10%
11	Dielectric Loss	≤ 0.5W / KVAR
12	Encapsulation/Impregnation	Cells-Polyurethanic Resin Oven Cured
13	Testing Voltage Between Terminals / time	2.15 U_N / 2s
14	Testing Voltage Between Terminals and Container / time	3000 V / 10s
15	Maximum Permissible Voltage For 8 hrs in every 24 hrs	1.1 U_N
16	Maximum Permissible Current	1.43 I_N
17	Maximum Inrush Current	200 I_N
18	Discharge Resistor (Discharge time - 3 min to 75V)	External
19	Terminals / Screw Torque	M8 ≤ 4 Nm
20	Minimum Installation Clearance	50mm between units
21	Statistical Life Expectancy	> 200,000 Operating Hours
22	Standards	IEC 60831 - 1 / 2
23	IP Rating	IP40(With Cable Gland)
24	Safety Device	Over temp cut off

PRODUCT INFORMATION – 134 SERIES

f_N	50Hz										60Hz										Dimension (mm)				Weight (kg)
U_N	440V		415V		400V		380V		240V		440V		415V		400V		380V		240V						
Product Code	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	W	L	L_1	H	
134QELCO0050	5.0	6.6	4.4	6.2	4.1	6.0	3.7	5.7	1.5	3.6	6.0	7.9	5.3	7.4	5.0	7.2	4.5	6.8	1.8	4.3	135	175	220	260	4.25
134QELCO0075	7.5	9.8	6.7	9.3	6.2	9.0	5.6	8.5	2.2	5.4	9.0	11.8	8.0	11.1	7.4	10.7	6.7	10.2	2.7	6.4	135	175	220	260	4.25
134QELCO0100	10.0	13.1	8.9	12.4	8.3	11.9	7.5	11.3	3.0	7.2	12.0	15.8	10.7	14.9	9.9	14.3	9.0	13.6	3.6	8.6	135	175	220	260	4.25
134QELCO0125	12.5	16.4	11.1	15.5	10.3	14.9	9.3	14.2	3.7	9.0	15.0	19.7	13.3	18.6	12.4	17.9	11.2	17.0	4.5	10.7	135	175	220	260	4.5
134QELCO0150	15.0	19.7	13.3	18.6	12.4	17.9	11.2	17.0	4.5	10.7	18.0	23.6	16.0	22.3	14.9	21.5	13.4	20.4	5.4	12.9	135	175	220	260	4.5
134QELCO0200	20.0	26.2	17.8	24.8	16.5	23.9	14.9	22.7	6.0	14.3	24.0	31.5	21.4	29.7	19.8	28.6	17.9	27.2	7.1	17.2	135	340	385	280	8.5
134QELCO0250	25.0	32.8	22.2	30.9	20.7	29.8	18.6	28.3	7.4	17.9	30.0	39.4	26.7	37.1	24.8	35.8	22.4	34.0	8.9	21.5	135	340	385	280	8.5
134QELCO0300	30.0	39.4	26.7	37.1	24.8	35.8	22.4	34.0	8.9	21.5	36.0	47.2	32.0	44.6	29.8	42.9	26.9	40.8	10.7	25.8	135	340	385	280	8.5
134QELCO0350	35.0	45.9	31.1	43.3	28.9	41.8	26.1	39.7	10.4	25.1	42.0	55.1	37.4	52.0	34.7	50.1	31.3	47.6	12.5	30.1	135	340	385	380	12.0
134QELCO0400	40.0	52.5	35.6	49.5	33.1	47.7	29.8	45.3	11.9	28.6	48.0	63.0	42.7	59.4	39.7	57.3	35.8	54.4	14.3	34.4	135	340	385	380	12.0
134QELCO0450	45.0	59.1	40.0	55.7	37.2	53.7	33.6	51.0	13.4	32.2	54.0	70.9	48.0	66.8	44.6	64.4	40.3	61.2	16.1	38.7	135	340	385	380	12.0
134QELCO0500	50.0	65.6	44.5	61.8	41.3	59.6	37.3	56.7	14.9	35.8	60.0	78.7	53.4	74.3	49.6	71.6	44.8	68.0	17.9	42.9	135	340	385	380	12.5
134QELCO0550	55.0	72.2	48.9	68.1	45.5	65.6	41.0	62.3	16.4	39.4	66.0	86.6	58.7	81.7	54.5	78.7	49.2	74.8	19.6	47.2	135	340	385	380	12.5
134QELCO0600	60.0	78.7	53.4	74.3	49.6	71.6	44.8	68.0	17.9	42.9	72.0	94.5	64.1	89.1	59.5	85.0	53.7	81.6	21.4	51.5	135	340	385	380	12.5
134QELCO0650	65.0	85.3	57.8	80.4	53.7	77.5	48.5	73.7	19.3	46.5	78.0	102.4	69.4	96.5	64.5	93.0	58.2	88.4	23.2	55.8	135	340	385	480	15.0
134QELCO0700	70.0	91.9	62.3	86.6	57.9	83.5	52.2	79.3	20.8	50.1	84.0	110.2	74.7	104.0	69.4	100.2	62.7	95.2	25.0	60.1	135	340	385	480	15.0
134QELCO0750	75.0	98.4	66.7	92.8	62.0	89.5	55.9	85.0	22.3	53.7	90.0	118.1	80.1	111.4	74.4	107.4	67.1	102.0	26.8	64.4	135	340	385	480	15.0
134QELCO0800	80.0	105.0	71.2	99.0	66.1	95.4	59.7	90.7	23.8	57.3	96.0	126.0	85.4	118.8	79.3	114.5	71.6	108.8	28.6	68.7	135	340	385	480	17.5
134QELCO0850	85.0	111.5	75.6	105.2	70.2	101.4	63.4	96.3	25.3	60.8	102.0	133.8	90.7	126.2	84.3	121.7	76.1	115.6	30.3	73.0	135	340	385	480	17.5
134QELCO0900	90.0	118.1	80.1	111.4	74.4	107.4	67.1	102.0	26.8	64.4	108.0	141.7	96.1	133.7	89.3	128.8	80.6	122.4	32.1	77.3	135	340	385	480	17.5
134QELCO0950	95.0	124.7	84.5	117.6	78.5	113.3	70.9	107.7	28.3	68.0	114.0	149.6	101.4	141.1	94.2	136.0	85.0	129.2	33.9	81.6	135	340	385	580	20.0
134QELCO1000	100.0	131.2	89.0	123.8	82.6	119.3	74.6	113.3	29.8	71.6	120.0	157.5	106.8	148.5	99.2	143.1	89.5	136.0	35.7	85.9	135	340	385	580	20.0

Q_N = kVAr ; I_N = Amps

PRODUCT DIMENSION



20kvar & above **5-15kvar**

ELCO PRISMATIC-TYPE POWER CAPACITORS

135 SERIES

Three-phased Box-Type Capacitor Bank is used to correct Power Factor for Motors, Low Voltage Transformers and inside Industrial Switchboard. It is sometimes used with blocking reactors with harmonics presence.

PRODUCT SPECIFICATION

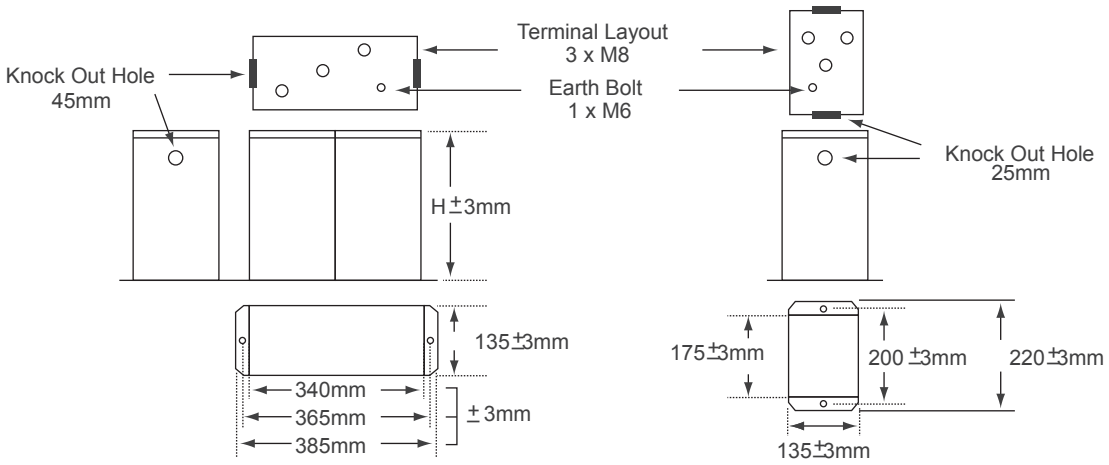
No.	Specifications	Data
1	Construction	Metal Box
2	External Terminal Box & Casing Finishing	Yes & Epoxy Powder coated Sheet Steel
3	Type	Dry, Self-Healing
4	Dielectric	Bi-Axially Oriented Polypropylene
5	Plate	Zinc-Aluminium Alloy
6	Rated Voltage (U_N)	525V
7	Frequency (f_N)	50 / 60 Hz
8	Connection	Internal Delta
9	Temperature Category	D / -25°C to +55°C
10	Capacitance Tolerance	-5% / +10%
11	Dielectric Loss	≤ 0.5W / KVAR
12	Encapsulation/Impregnation	Cells-Polyurethanic Resin Oven Cured
13	Testing Voltage Between Terminals / time	2.15 U_N / 2s
14	Testing Voltage Between Terminals and Container / time	3000 V / 10s
15	Maximum Permissible Voltage For 8 hrs in every 24 hrs	1.1 U_N
16	Maximum Permissible Current	1.43 I_N
17	Maximum Inrush Current	200 I_N
18	Discharge Resistor (Discharge time - 3 min to 75V)	External
19	Terminals / Screw Torque	M8 ≤ 4 Nm
20	Minimum Installation Clearance	50mm between units
21	Statistical Life Expectancy	> 200,000 Operating Hours
22	Standards	IEC 60831 - 1 / 2
23	IP Rating	IP40(With Cable Gland)
24	Safety Device	Over temp cut off

PRODUCT INFORMATION – 135 SERIES

f_N	50Hz								60Hz								Dimension (mm)				Weight (kg)
U_N	525V		500V		480V		440V		525V		500V		480V		440V						
Product Code	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	Q_N	I_N	W	L	L1	H	
135QELCO0050	5.0	5.5	4.5	5.2	4.2	5.0	3.5	4.6	6.0	6.6	5.4	6.3	5.0	6.0	4.2	5.5	135	175	220	260	4.25
135QELCO0075	7.5	8.3	6.8	7.9	6.3	7.5	5.3	6.9	9.0	9.9	8.2	9.4	7.5	9.1	6.3	8.3	135	175	220	260	4.25
135QELCO0100	10.0	11.0	9.1	10.5	8.4	10.1	7.0	9.2	12.0	13.2	10.9	12.6	10.0	12.1	8.4	11.1	135	175	220	260	4.25
135QELCO0125	12.5	13.8	11.3	13.1	10.4	12.6	8.8	11.5	15.0	16.5	13.6	15.7	12.5	15.1	10.5	13.8	135	175	220	260	4.5
135QELCO0150	15.0	16.5	13.6	15.7	12.5	15.1	10.5	13.8	18.0	19.8	16.3	18.9	15.0	18.1	12.6	16.6	135	175	220	260	4.5
135QELCO0200	20.0	22.0	18.1	21.0	16.7	20.1	14.0	18.4	24.0	26.4	21.8	25.1	20.1	24.1	16.9	22.1	135	340	385	280	8.5
135QELCO0250	25.0	27.5	22.7	26.2	20.9	25.1	17.6	23.0	30.0	33.0	27.2	31.4	25.1	30.2	21.1	27.7	135	340	385	280	8.5
135QELCO0300	30.0	33.0	27.2	31.4	25.1	30.2	21.1	27.7	36.0	39.6	32.7	37.7	30.1	36.2	25.3	33.2	135	340	385	280	8.5
135QELCO0350	35.0	38.5	31.7	36.7	29.3	35.2	24.6	32.3	42.0	46.2	38.1	44.0	35.1	42.2	29.5	38.7	135	340	385	380	12.0
135QELCO0400	40.0	44.0	36.3	41.9	33.4	40.2	28.1	36.9	48.0	52.8	43.5	50.3	40.1	48.3	33.7	44.2	135	340	385	380	12.0
135QELCO0450	45.0	49.5	40.8	47.1	37.6	45.3	31.6	41.5	54.0	59.4	49.0	56.6	45.1	54.3	37.9	49.8	135	340	385	380	12.0
135QELCO0500	50.0	55.0	45.4	52.4	41.8	50.3	35.1	46.1	60.0	66.0	54.4	62.8	50.2	60.3	42.1	55.3	135	340	385	380	12.5
135QELCO0550	55.0	60.5	49.9	57.6	46.0	55.3	38.6	50.7	66.0	72.6	59.9	69.1	55.2	66.4	46.4	60.8	135	340	385	480	12.5
135QELCO0600	60.0	66.0	54.4	62.8	50.2	60.3	42.1	55.3	72.0	79.2	65.3	75.4	60.2	72.4	50.6	66.4	135	340	385	480	12.5
135QELCO0650	65.0	71.5	59.0	68.1	54.3	65.4	45.7	59.9	78.0	85.8	70.7	81.7	65.2	78.4	54.8	71.9	135	340	385	480	15.0
135QELCO0700	70.0	77.0	63.5	73.3	58.5	70.4	49.2	64.5	84.0	92.4	76.2	88.0	70.2	84.5	59.0	77.4	135	340	385	480	15.0
135QELCO0750	75.0	82.5	68.0	78.6	62.7	75.4	52.7	69.1	90.0	99.0	81.6	94.3	75.2	90.5	63.2	83.0	135	340	385	480	15.0
135QELCO0800	80.0	88.0	72.6	83.8	66.9	80.4	56.2	73.7	96.0	105.6	87.1	100.6	80.2	96.5	67.4	88.5	135	340	385	480	17.5
135QELCO0850	85.0	93.5	77.1	89.0	71.1	85.5	59.7	78.3	102.0	112.2	92.5	106.8	85.3	102.6	71.6	94.0	135	340	385	480	17.5
135QELCO0900	90.0	99.0	81.6	94.3	75.2	90.5	63.2	83.0	108.0	118.8	98.0	113.1	90.3	108.6	75.9	99.5	135	340	385	480	17.5
135QELCO0950	95.0	104.5	86.2	99.5	79.4	95.5	66.7	87.6	114.0	125.4	103.4	119.4	95.3	114.6	80.1	105.1	135	340	385	580	20.0
135QELCO1000	100.0	110.0	90.7	104.7	83.6	100.6	70.2	92.2	120.0	132.0	108.8	125.7	100.3	120.7	84.3	110.6	135	340	385	580	20.0

Q_N = kVAr ; I_N = Amps

PRODUCT DIMENSION



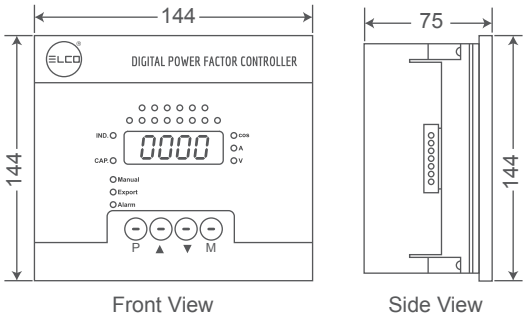
20kvar & above

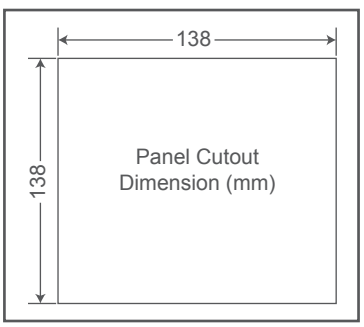
5-15kvar

DIGITAL POWER FACTOR CONTROLLER

PFR5ELCO0006
PFR5ELCO0014

DIMENSION (MM)





MEASUREMENT

- Full Measurement Range Of Cos ϕ (0.0 Inductive - 0.0 Capacitive)
- Phase To Neutral Voltage And Current
- Reactive Power
- Total Harmonic Distortion (THD) For Voltage And Current
- Harmonic Spectrum Info Up To 19th Order For Voltage And Current
- Capacitor Harmonic Load Factor (CHL)
- Switching Sensitivity From Range Of 5 - 1200 Seconds
- Ambient Temperature

Power Factor Compensation For Inductive And Capacitive

Programmable Cos ϕ Desired (0.8 Inductive - 0.8 Capacitive)

Step Switching Operation Mode

- Auto (Rotational, Linear, Four-Quadrant)
- Manual

Automatic Connection Configuration Detection

Automatic Step Power Recognition For Both Capacitor And Choke

Automatic CT Polarity Correction

Two Tariff Settings For Power Import And Export Mode

Control Bandwidth (Anti-Hunting Function)

Programmable Fixed Steps

Programmable Fan And Alarm Relay

LED Indication For Individual Step

Working Temperature From Range Of -40°C To +60°C

TECHNICAL SPECIFICATION

	Parameters	PFR5ELCO0006	PFR5ELCO0014
Adjustable Parameters	Power Factor Desired	0.80 Inductive - 0.80 Capacitive	
	Connection Time	5 - 1200 Seconds	
	Reconnection Delay Time	5 - 1200 Seconds	
	Operation Mode	Automatic Mode (Rotational, Linear, Four- Quadrant); Manual Mode	
Ranges, Accuracy	Power Supply And Voltage Measurement	90 - 275 VAC; 43 – 67HZ; 7VA	
	Voltage Measurement Accuracy	+/-1% Of Range, +/- 1 Digit	
	Measuring Voltage Loss Response Time	≤ 20 ms	
	Measurement Current (Galvanically Isolated)	0.02 - 7 A	
	Current Input Serial Impedance	< 10 mΩ	
	Current Measurement Accuracy • Range 0.5 – 7A • Range 0.02 - 0.5 A	 +/- 0.02A, +/- 1 Digit +/- 0.002A, +/- 1 Digit	
	Maximum Phase Angle Error (Power Factor And Powers Measurement)	+/-1° At I > 3 % Of Range; Otherwise +/-3°	
	Voltage And Current Harmonic Measurement	Up To 19th Harmonic	
	Harmonic Component And THD Measurement Accuracy	±5 %, ± 1 Digit (For U, I > 10 % Of Range)	
	Temperature Measurement Range And Accuracy	-30 - +60 °C, ± 5 °C	
	Number Of Output Relays	6	14
	Output Relay Load Rating	250 VAC / 4 A	
	Installation Category / Level Of Pollution	In Compliance With Standard: EN 61010-1, III-2	
Operating Conditions	Operating Temperature	-40° - +60°C	
	Relative Humidity	5 - 100 %	
Electromagnetic Compatibility, EMC	Noise Suppression Level	In Compliance With Standard: EN 50081-2 EN 55011, Class A EN 55022, Class A	
	Immunity	In Compliance With Standard: EN 61000-4-2 Ed.2:2009 EN 61000-4-3 Ed.3:2006+A1+A2 EN 61000-4-4 Ed.3:2013 EN 61000-4-5 Ed.3:2015 EN 61000-4-6 Ed.4:2014 EN 61000-4-11 Ed.2:2005	
	Emission	In Compliance With Standard: EN 55011 Ed.3:2010, Class A EN 55022 Ed.3:2011, Class A	
Physical	Enclosure • Front Panel • Back Panel	 IP 40 IP 20	
	Dimensions • Front Panel • Built-in Depth • Installation Cutout	 144 x 144 MM 75 MM 138^{+1} x 138^{+1} MM	
	Mass	Max. 0.7 Kg	

ELCO CYLINDRICAL-TYPE CAPACITOR BANK

205 SERIES

3/8KV	4/12KV	6/15KV

Three-phased Cylindrical-Type Capacitor Bank is used to correct Power Factor for Motors, Low Voltage Transformers and inside Industrial Switchboard. It is sometimes used with blocking reactors with harmonics presence.

PRODUCT SPECIFICATION

No.	Specifications		Data
1	Construction		Cylindrical
2	External Terminal Box & Casing Finishing		Aluminum
3	Type		Dry, Self-Healing
4	Dielectric		Bi-Axially Oriented Polypropylene
5	Plate		Zinc-Aluminium Alloy
6	Rated Voltage (U_N)		525V
7	Frequency (f_N)		50 / 60 Hz
8	Connection		Internal Delta
9	Temperature Category		D / -25°C to +55°C
10	Capacitance Tolerance		-5% / +10%
11	Dielectric Loss		≤ 0.2W / KVAR
12	Testing Voltage Between Terminals / time		2.15 U_N / 2s
13	Testing Voltage Between Terminals and Container / time		3000 V / 10s | 4000 V / 10s | 6000 V / 10s
14	Lightning Impulse Test Between Terminal-Container		8 KV | 12 KV | 15 KV
15	Maximum Permissible Voltage For 8 hrs in every 24 hrs		1.1 U_N
16	Maximum Permissible Current		1.43 U_N
17	Maximum Inrush Current		200 In
18	Discharge Resistor	For 1 – 5 Kvar	Internal / 3 sets of 2 x 6.3mm Double Tags
		For 10 – 30 Kvar	External / 3 x M8 Treaded Cu Stud
19	Screw Torque		M8 < 4Nm; M12 < 10Nm
20	Minimum Installation Clearance		50mm Between Top of Capacitor to Enclosure; 50mm between units
21	Service Life		> 100,000 Operating Hours
22	Standards		IEC 60831-1/2
23	Safety Device		Internal Over-Pressure Disconnector
24	Altitude Above Sea Level (Max)		2000m

205 Q ELCO 0010

Rated Kvar
0010 - 1Kvar
||
0400 - 40Kvar

Insulation Level
Q: 3 / 8KV
A: 4 / 12KV
B: 6 / 15KV

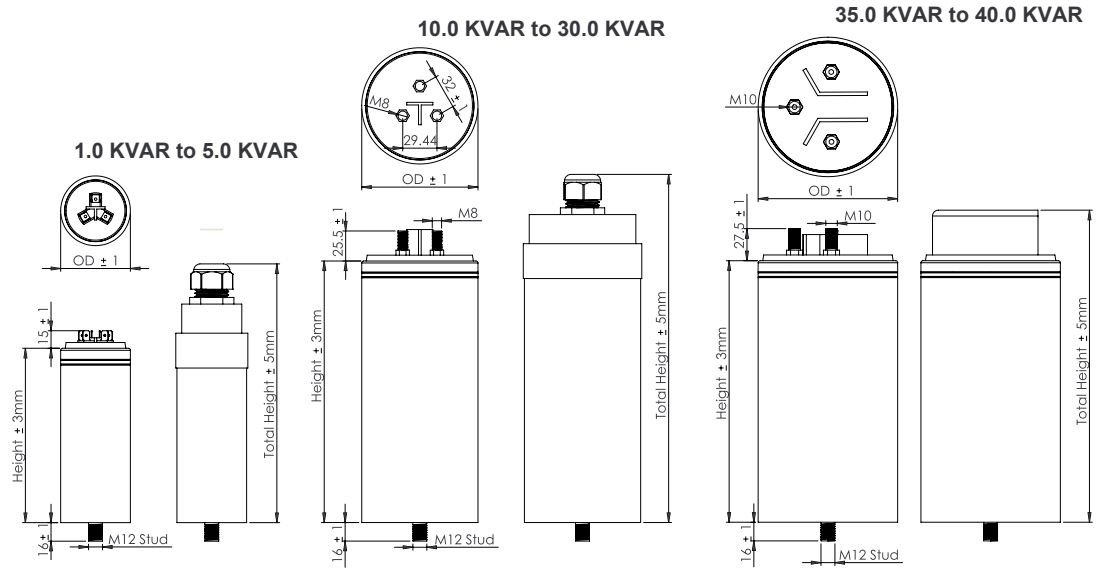
PRODUCT INFORMATION – 205 SERIES

Product Code	f_N	50Hz								Dimension (mm)			Weight (kg) +/- 0.2
	U_N	525		500		480		400					
	Ordering Code	QN	IN	QN	IN	QN	IN	QN	IN	OD	Height	Total Height	Weight
205QELCO0050	ELCO-525-1.3M-005	5.0	5.5	4.5	5.2	4.2	5.0	2.9	4.2	65	206	270	0.5
205QELCO0100	ELCO-525-1.3M-010	10.0	11.0	9.1	10.5	8.4	10.1	5.8	8.4	86	225	292	1.4
205QELCO0150	ELCO-525-1.3M-015	15.0	16.5	13.6	15.7	12.5	15.1	8.7	12.6	86	225	292	1.4
205QELCO0200	ELCO-525-1.3M-020	20.0	22.0	18.1	20.9	16.7	20.1	11.6	16.8	86	287	332	2.0
205QELCO0250	ELCO-525-1.3M-025	25.0	27.5	22.7	26.2	20.9	25.1	14.5	20.9	100	287	360	2.5
205QELCO0300	ELCO-525-1.3M-030	30.0	33.0	27.2	31.4	25.1	30.2	17.4	25.1	100	287	360	2.5
205QELCO0400	ELCO-525-1.3M-2HBP-040	40.0	44.0	36.3	41.9	33.4	40.2	23.2	33.5	2 x 20 Kvar			4.0
205QELCO0500	ELCO-525-1.3M-2HBP-050	50.0	55.0	45.4	52.4	41.8	50.3	29.0	41.9	2 x 25 Kvar			5.0
205QELCO0600	ELCO-525-1.3M-2HBP-060	60.0	66.0	54.4	62.8	50.2	60.3	34.8	50.3	2 x 30 Kvar			5.0
205QELCO0750	ELCO-525-1.3M-3HBP-075	75.0	82.5	68.0	78.6	62.7	75.4	43.5	62.8	3 x 25 Kvar			7.5
205QELCO0800	ELCO-525-1.3M-4HBP-080	80.0	88.0	72.6	83.8	66.9	80.4	46.4	67.0	4 x 20 Kvar			8.0
205QELCO1000	ELCO-525-1.3M-4HBP-100	100.0	110.0	90.7	104.7	83.6	100.5	58.0	83.8	4 x 25 Kvar			10.0
205QELCO1200	ELCO-525-1.3M-4HBP-120	120.0	132.0	108.8	125.7	100.3	120.7	69.7	100.5	4 x 30 Kvar			10.0

Product Code	f_N	60Hz								Dimension (mm)			Weight (kg) +/- 0.2
	U_N	525		500		480		400					
	Ordering Code	QN	IN	QN	IN	QN	IN	QN	IN	OD	Height	Total Height	Weight
205QELCO0050	ELCO-525-1.3M-005	6.0	6.6	5.4	6.3	5.0	6.0	3.5	5.0	65	206	270	0.5
205QELCO0100	ELCO-525-1.3M-010	12.0	13.2	10.9	12.6	10.0	12.1	7.0	10.1	86	225	292	1.4
205QELCO0150	ELCO-525-1.3M-015	18.0	19.8	16.3	18.9	15.0	18.1	10.4	15.1	86	225	292	1.4
205QELCO0200	ELCO-525-1.3M-020	24.0	26.4	21.8	25.1	20.1	24.1	13.9	20.1	86	287	332	2.0
205QELCO0250	ELCO-525-1.3M-025	30.0	33.0	27.2	31.4	25.1	30.2	17.4	25.1	100	287	360	2.5
205QELCO0300	ELCO-525-1.3M-030	36.0	39.6	32.7	37.7	30.1	36.2	20.9	30.2	100	287	360	2.5
205QELCO0400	ELCO-525-1.3M-2HBP-040	48.0	52.8	43.5	50.3	40.1	48.3	27.9	40.2	2 x 20 Kvar			4.0
205QELCO0500	ELCO-525-1.3M-2HBP-050	60.0	66.0	54.4	62.8	50.2	60.3	34.8	50.3	2 x 25 Kvar			5.0
205QELCO0600	ELCO-525-1.3M-2HBP-060	72.0	79.2	65.3	75.4	60.2	72.4	41.8	60.3	2 x 30 Kvar			5.0
205QELCO0750	ELCO-525-1.3M-3HBP-075	90.0	99.0	81.6	94.3	75.2	90.5	52.2	75.4	3 x 25 Kvar			7.5
205QELCO0800	ELCO-525-1.3M-4HBP-080	96.0	105.6	87.1	100.5	80.2	96.5	55.7	80.4	4 x 20 Kvar			8.0
205QELCO1000	ELCO-525-1.3M-4HBP-100	120.0	132.0	108.8	125.7	100.3	120.7	69.7	100.5	4 x 25 Kvar			10.0
205QELCO1200	ELCO-525-1.3M-4HBP-120	144.0	158.4	130.6	150.8	120.4	144.8	83.6	120.7	4 x 30 Kvar			10.0

Q_N = kVar ; I_N = Amps

PRODUCT DIMENSION



CYLINDRICAL-TYPE POWER CAPACITOR

700 SERIES

3/8KV	4/12KV	6/15KV

Three-phased Cylindrical - Type Power Capacitor is used to correct power factor for motors, low voltage transformers and inside industrial switchboard. It is sometimes used with blocking reactors with harmonics presence.

FEATURES

- Dry type, cylindrical aluminium case
- 3 phase connection
- Available for rated voltage 525V
- Maximum permissible current 1.43x rated current
- Maximum inrush current 200 x rated current
- Compliance to standard IEC 60831-1 & 2
- Equipped with pressure activated series interruptor
- Statistical Life Expectancy >150,000 operating hours

TECHNICAL SPECIFICATION

	700 Series
Construction	
Type	Dry, Self-Healing
Casing	Cylindrical Extruded Aluminum Can
Dielectric	Bi-Axially Oriented Polypropylene, with Zinc-Aluminum Alloy
Encapsulation/Impregnation	Polyurethane Resin Oven Cured Flame Retardant
Electrical Performance	
Rated Voltage (UN)	440V
Frequency (fN)	50 / 60 Hz
Connection	Internal Delta
Temperature Category	D / -25°C to +55°C
Relative Humidity	≤ 95%
Capacitance Tolerance	-5% / 10%
Dielectric Loss	< 0.2W / KVAR
Total Losses (Including Discharge resistor)	< 0.5W / KVAR
Testing Voltage Between Terminals	2.15 Un For 2s
Testing Voltage Between Terminals and Container	3000 V / 10s | 4000 V / 10s | 6000 V / 10s
Lightning Impulse Test Between Terminal~Container	8 KV | 12 KV | 15 KV
Maximum Permissible Voltage For 8 hrs in every 24 hrs	1.10 UN
Maximum Permissible Current	1.43 IN
Maximum Inrush Current	200 IN
Capacitor Discharge time	3 min to 75V
Statistical Life Expectancy	> 150,000 Operating Hours
Standards	IEC 60831-1 / 2
Installation	
Terminal Arrangements	Terminal Block
Screw Torque	M5 : ≤ 2 Nm M12 : ≤ 15 Nm
Minimum Installation Clearance	50mm Between Top of Capacitor to Enclosure 50mm Between units
Altitude Above Sea Level (Max)	2000m
Safety Features	
Safety Device	Pressure Activated Series Interrupter
IP Rating	IP20

700 **Q** ELCO **0010**

- **0010** → Rated Kvar: 0010 - 1Kvar || 0400 - 40Kvar
- **Q** → Insulation Level: Q: 3 / 8KV, A: 4 / 12KV, B: 6 / 15KV

PRODUCT INFORMATION – 700 SERIES

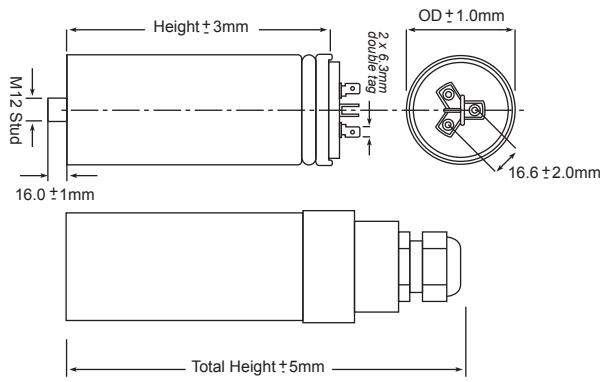
Product Code	f_N	50Hz						Dimension (mm)			Weight (kg) +/- 0.2
	U_N	440		400		240					
	Ordering Code	QN	I_N	QN	IN	QN	IN	OD	Height	Total Height	Weight
700QELCO0010	ELCO-440-1M-001	1.0	1.3	0.8	1.2	0.3	0.7	60	153	225	0.5
700QELCO0015	ELCO-440-1M-0015	1.5	2.0	1.2	1.8	0.4	1.1	60	153	225	0.5
700QELCO0020	ELCO-440-1M-002	2.0	2.6	1.7	2.4	0.6	1.4	60	153	225	0.5
700QELCO0025	ELCO-440-1M-0025	2.5	3.3	2.1	3.0	0.7	1.8	60	153	225	0.5
700QELCO0030	ELCO-440-1M-003	3.0	3.9	2.5	3.6	0.9	2.1	60	153	225	0.5
700QELCO0050	ELCO-440-1M-005	5.0	6.6	4.1	6.0	1.5	3.6	60	153	225	0.5
700QELCO0100	ELCO-440-1M-010	10.0	13.1	8.3	11.9	3.0	7.2	75	225	270	1.3
700QELCO0150	ELCO-440-1M-015	15.0	19.7	12.4	17.9	4.5	10.7	75	225	270	1.3
700QELCO0200	ELCO-440-1M-020	20.0	26.2	16.5	23.9	6.0	14.3	75	287	332	2.0
700QELCO0250	ELCO-440-1M-025	25.0	32.8	20.7	29.8	7.4	17.9	86	287	332	2.0
700QELCO0300	ELCO-440-1M-030	30.0	39.4	24.8	35.8	8.9	21.5	86	329	374	2.5
700QELCO0400	ELCO-440-1.2M-2HBP-040	40.0	52.5	33.1	47.7	11.9	28.6	2 x 20 Kvar			3.0
700QELCO0500	ELCO-440-1.2M-2HBP-050	50.0	65.6	41.3	59.6	14.9	35.8	2 x 25 Kvar			4.0
700QELCO0600	ELCO-440-1.2M-2HBP-060	60.0	78.7	49.6	71.6	17.9	42.9	2 x 30 Kvar			5.0
700QELCO0750	ELCO-440-1.2M-3HBP-075	75.0	98.4	62.0	89.5	22.3	53.7	3 x 25 Kvar			6.0
700QELCO0800	ELCO-440-1.2M-4HBP-080	80.0	105.0	66.1	95.4	23.8	57.3	4 x 20 Kvar			6.0
700QELCO1000	ELCO-440-1.2M-4HBP-100	100.0	131.2	82.6	119.3	29.8	71.6	4 x 25 Kvar			8.0
700QELCO1200	ELCO-440-1.2M-4HBP-120	120.0	157.5	99.2	143.1	35.7	85.9	4 x 30 Kvar			10.0

Product Code	f_N	60Hz						Dimension (mm)			Weight (kg) +/- 0.2
	U_N	440		400		240					
	Ordering Code	QN	I_N	QN	IN	QN	IN	OD	Height	Total Height	Weight
700QELCO0010	ELCO-440-1M-001	1.2	1.6	1.0	1.4	0.4	0.9	60	153	225	0.5
700QELCO0015	ELCO-440-1M-0015	1.8	2.4	1.5	2.1	0.5	1.3	60	153	225	0.5
700QELCO0020	ELCO-440-1M-002	2.4	3.1	2.0	2.9	0.7	1.7	60	153	225	0.5
700QELCO0025	ELCO-440-1M-0025	3.0	3.9	2.5	3.6	0.9	2.1	60	153	225	0.5
700QELCO0030	ELCO-440-1M-003	3.6	4.7	3.0	4.3	1.1	2.6	60	153	225	0.5
700QELCO0050	ELCO-440-1M-005	6.0	7.9	5.0	7.2	1.8	4.3	60	153	225	0.5
700QELCO0100	ELCO-440-1M-010	12.0	15.7	9.9	14.3	3.6	8.6	75	225	270	1.3
700QELCO0150	ELCO-440-1M-015	18.0	23.6	14.9	21.5	5.4	12.9	75	225	270	1.3
700QELCO0200	ELCO-440-1M-020	24.0	31.5	19.8	28.6	7.1	17.2	75	287	332	1.5
700QELCO0250	ELCO-440-1M-025	30.0	39.4	24.8	35.8	8.9	21.5	86	287	332	2.0
700QELCO0300	ELCO-440-1M-030	36.0	47.2	29.8	42.9	10.7	25.8	86	329	374	2.5
700QELCO0400	ELCO-440-1.2M-2HBP-040	48.0	63.0	39.7	57.3	14.3	34.4	2 x 20 Kvar			3.0
700QELCO0500	ELCO-440-1.2M-2HBP-050	60.0	78.7	49.6	71.6	17.9	42.9	2 x 25 Kvar			4.0
700QELCO0600	ELCO-440-1.2M-2HBP-060	72.0	94.5	59.5	85.9	21.4	51.5	2 x 30 Kvar			5.0
700QELCO0750	ELCO-440-1.2M-3HBP-075	90.0	118.1	74.4	107.4	26.8	64.4	3 x 25 Kvar			6.0
700QELCO0800	ELCO-440-1.2M-4HBP-080	96.0	126.0	79.3	114.5	28.6	68.7	4 x 20 Kvar			6.0
700QELCO1000	ELCO-440-1.2M-4HBP-100	120.0	157.5	99.2	143.1	35.7	85.9	4 x 25 Kvar			8.0
700QELCO1200	ELCO-440-1.2M-4HBP-120	144.0	189.0	119.0	171.8	42.8	103.1	4 x 30 Kvar			10.0

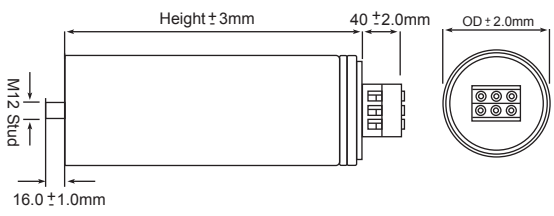
Q_N = kVar ; I_N = Amps

PRODUCT DIMENSION

1.0 KVAR to 5.0 KVAR



10.0 KVAR to 40.0 KVAR



CAPACITOR DUTY CONTACTORS

ELCO CNNK series AC-6B contactor is designed for power factor correction application.

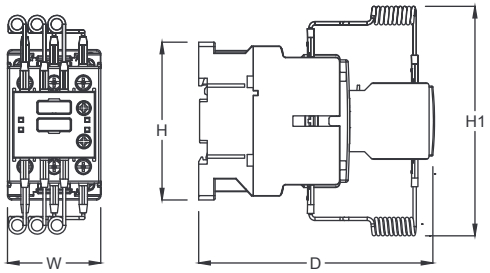
The contactor is equipped with damping resistor which protect the capacitor from high rush current (approximately 100~200 times of rated current) during capacitor switching.

FEATURES

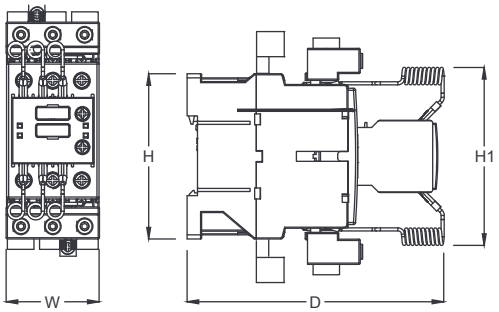
- In conformity with: IEC 60947-4-1
- Switching of 3 phase capacitors
- Available for rated voltage 525V
- Ambient temperature up to 55°C
- Maximum permissible peak current I ≤ 200 I

PRODUCT SPECIFICATION

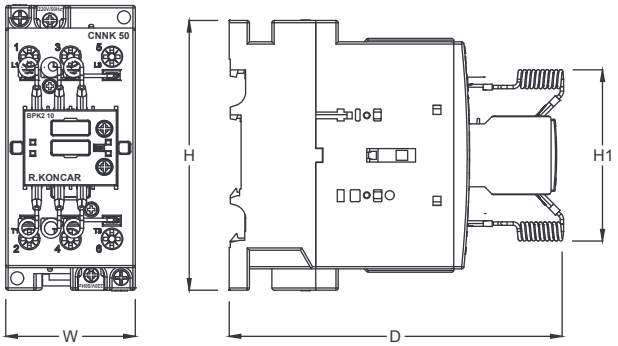
Type		CNNK 12	CNNK 20	CNNK 30	CNNK 40	CNNK 50	CNNK 60	CNNK 75	CNNK 80
Rated operation current Ie Amps		18	29	44	58	72	87	108	116
Rated Capacitor Power	220/240V AC-6b(Kvar)	6.7	11	20	25	29	32	38	45
	400/440V AC-6b(Kvar)	12.5	20	30	40	50	60	75	80
	500/550V AC-6b(Kvar)	15	24	35	50	60	70	80	100
	660/690V AC-6b(Kvar)	18	30	40	58	70	80	105	115
Electrical Endurance *Operating-cycles*		250,000	175,000	125,000				100,000	75,000
Permissible Operating Temperature °C		-25 to +55							
Frequency of Operation, max *Cycles/Hour*		240	120		100				
Rated Impulse Withstand Voltage *KV*		8							
Degree of Protection		IP20							
Rated insulating voltage Ui V		690			1000				
Maximum permissible fuse rating	main circuit gL/gG, A	35	50	80	100	125	160		
	auxilliary circuit, A	16	16	16	16	16	16		
Consumption of electromagnet in cold state with Un AC Operated	Closing, VA	62		65	155			204	310
	p.f.	0.75		0.75	0.6			0.54	0.5
	Closed,VA	7		8	12			16	25
	p.f.	0.3		0.3	0.29			0.26	0.24



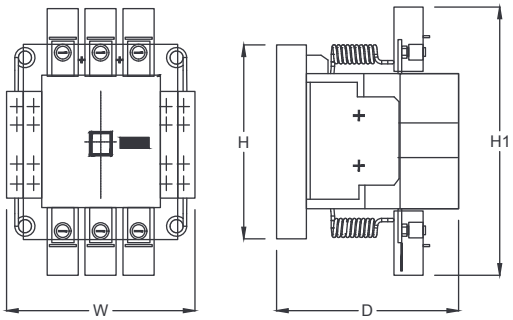
CNNK 12 / 20



CNNK 30



CNNK 40 / 50 / 60



CNNK75

THE FIRST CHOICE IN ENERGY EFFICIENCY