

EKON

KONDANSATÖR



World Wide Experience
Since 1983



www.ekoncapacitor.com

EKON

Ekon Capacitor was founded in 1989 by a technical team that brought the first capacitor production technology to Turkey. The purpose of its establishment was to eliminate dependency on foreign sources through capacitor production and to raise awareness about its usage. Over the years, the company has fulfilled its mission by organizing informational seminars on various platforms, emphasizing how capacitor usage minimizes energy losses.

The company has carefully and timely followed the evolving and renewing technologies, while also developing its own unique techniques in terms of quality and technical lifespan. With the renewed production line and molds in 2013, it is able to meet today's needs. Field analysis and user demands, which are the most critical phase of product development, are our starting point. With product diversity, customer satisfaction is targeted, and field issues are quickly resolved through accurate and timely information.

General

The Ekon capacitor series is a proven and reliable MPP (Metalized Polypropylene) capacitor series for AC current applications.

The series ranges from 0.5 to 50.0 kVAr for three-phase capacitors and from 0.5 to 10 kVAr for single-phase capacitors.

Ekon capacitors are specifically designed for power factor correction in industrial and semi-industrial applications. The capacitors are produced using metallized polypropylene film as the dielectric and are housed in a cylindrical aluminum casing.



Low Voltage Power Capacitors

EKON capacitors are used in a wide range of industrial applications for both fixed and automatic PFC (Power Factor Correction) systems. The three elements, along with impregnating materials, are placed inside a plastic case that provides double insulation between the metal housing. To ensure perfect filling during the resin impregnation process, the procedure is carried out before the elements are placed into the housing. In this way, the distribution and homogeneity of the impregnation can be thoroughly inspected both visually and dimensionally. The overpressure protection system is specially sized to ensure maximum safety, continuously providing grounding protection and protection against arc risks, even under conditions of high energy density. The characteristics of these capacitors make them particularly suitable for continuous operation under demanding conditions, especially in environments rich in harmonics.



Application

Power factor correction (PFC) automatic capacitor banks, fixed PFC applications such as motor compensation, AC power electronics, uninterruptible power supplies (UPS), drive engineering...

PPM / MKP Film Technology

Metalized polypropylene technology (PPM – MKP) utilizes a vacuum evaporation technique to deposit an extremely thin layer of metal on one side polypropylene film. The capacitor elements built using this technology are obtained by winding two propylene films. The capacitor plate consist of the metalized surface of the two films and the dielectric is the propylene film itself.

The main advantage of capacitors with metalized plates is their self-healing capacity. This means that they are capable of restoring their electrical properties following the occurrence of a short circuit between the plates. Due to the reduced thickness of the plates, the short circuit current generated area of a fault is capable of vaporizing the metal coating. The short circuit is thereby automatically extinguished without an appreciable reduction in capacitance or expenditure energy.

Dielectric

MKP-/MKPg-type capacitors are based on a low-loss dielectric formed by pure polypropylene film. A thin self-healing mixture of zinc and aluminum is metalized directly on one side of the PP-film under vacuum. Our long-term experience as well as on-going research and improvements in this technology ensure the excellent self-healing characteristics of the dielectric and a long operating life of our capacitors. The plastic film is wound into stable cylindrical windings on the most modern automated equipment. The ends of the capacitor windings are contacted by spraying with a metal contact layer, facilitating a high current load and ensuring a low-inductance connection between the terminals and windings.

Insulation

The use of impregnants and/or filling materials in capacitors is necessary in order to insulate the capacitor electrodes from oxygen, humidity, and other environmental interference. Without such insulation, the metal coating would corrode, an increasing number of partial discharges would occur, the capacitor would lose more and more of its capacitance, and suffer increased dielectric losses and a reduced operating life. Therefore, an elaborate vacuum-drying procedure is initiated immediately after insertion of the capacitor elements.

Installation

Before installing the capacitors it is necessary to check carefully the current Harmonic distortion in the power system. If non-linear load on your electrical system exceeds 15% of the total load, you can suffer from harmonic contaminated network. Capacitors are suitable for indoor installation, for any mounting position. Automatic capacitor banks must be equipped with a cooling fan, activated when the internal temperature exceeds the set value (normally 35 °C). Automatic capacitor banks should be completed with suitable capacitor switching contactors, equipped with pre-making (necessary to protect capacitors from inrush peak currents during switching operation) Scheduled periodic checks and inspections are mandatory to assure capacitors reliable operation.

Earthing

Capacitors with a metal case must be earthed at the mounting stud (M12) or by means of a separate metal strap or clamp.

Inrush Current Limitation

Switching LV PFC capacitors can cause high inrush currents of more than 200 times the rated current, especially when they are connected in parallel to others that are already energized. This may cause additional stress to contactors as well as to capacitors and reduce their life cycle. Inrush currents have a negative effect on power quality, e.g. transients, voltage drop. MKP-designs feature high impulse handling capability, inrush current limitation is required, e.g. contactors with precharging resistors for pre-loading of capacitors.

Overcurrent / short circuit protection

HRC fuses or moulded case circuit breakers (MCCBs) for short circuit protection have to be used. Short circuit protection equipment and connection cable should be dimensioned to handle the 1.5 times rated current of the capacitor permanently. Selection of connection cables should be dimensioned according to handling of current (for recommendations, refer to the appendix). HRC fuses do not protect the capacitor against overload. They are only a short circuit protection! MCCBs and HRC fuse rating has to be 1.6 ... 1.8 times nominal capacitor current. Do not use HRC fuses for switching capacitors (lightning arc!). Use thermal/magnetic over current relays for overload protection.

Harmonics

Harmonics are voltages and currents with frequencies that are different from a 50 Hz or 60 Hz power supply frequency. Harmonics result from the operation of electrical loads with non-linear voltage-current characteristics. They are mainly caused by loads operated with modern electronic devices, such as converters, electrical drives, welding machines and uninterruptible power supplies (UPS). Ensure that the current through the capacitor doesn't exceed the limits given in the specific data sheets. Ensure that the voltage doesn't exceed 1.1 U_n and the peak voltage doesn't exceed 1.6 U_n . Use a true rms and peak voltmeter or oscilloscope to check it.

Temperature Category

The average service life of low voltage power capacitors depends on several variables. But the most important of these variables is temperature. the table given in the 60831-1 standard should be examined for the capacitor operating temperature (see Table1.). In this table, the lower (-40 C for Ekon capacitors) and upper (Identifiable by One Letter) operating temperatures are indicated for the capacitor.

Failure to comply with the data in this table leads to a serious decrease in the operating life of the capacitor and a failure of the capacitor. (at high temperatures, it may cause the capacitor to burn or the safety device to explode.)

Table1. IEC 60831-1 Letter symbols used for the upper limit of the temperature

Temperature Category	Ambient Temperature Limits		
	Maximum	Max. Average over 24 hrs	Max. Average over 365 days
A	40 °C	30 °C	20 °C
B	45 °C	35 °C	25 °C
C	50 °C	40 °C	30 °C
D	55 °C	45 °C	35 °C

Discharge Resistor

Even after low voltage power capacitors are de-energized, there remains voltage on the capacitor due to its energy storage feature. Therefore, before reapplying voltage to the capacitor, the capacitor terminals must be short-circuited to discharge any residual voltage. The discharge resistors in EKON capacitors ensure that this residual voltage is discharged within 60 seconds, providing protection for both the capacitor and the operator

Three-Phase Capacitors

$$R \leq \frac{t}{C * \ln \frac{U_O * \sqrt{2}}{U_M}}$$

Single-Phase Capacitors

$$R \leq \frac{t * 1,5}{C * \ln \frac{U_O * \sqrt{2}}{U_M}}$$

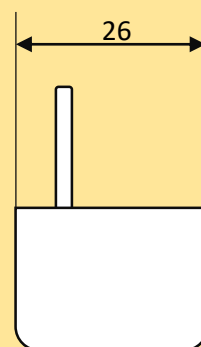
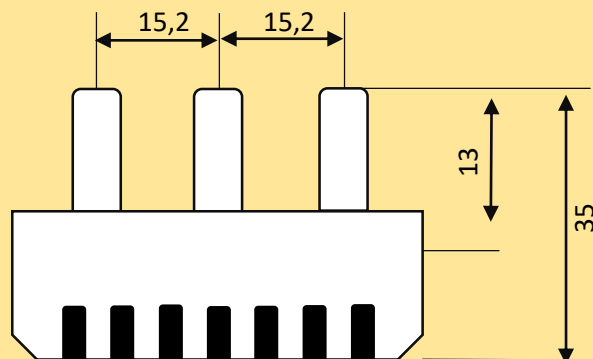
R..... Module resistance value (Ω)

t..... Discharge period (s)

C..... Partial capacitance of one phase (μF)

U_O..... Operating voltage (V)

U_M..... Maximum permissible voltage after period t (V)



OverPressure Disconnecter Technology

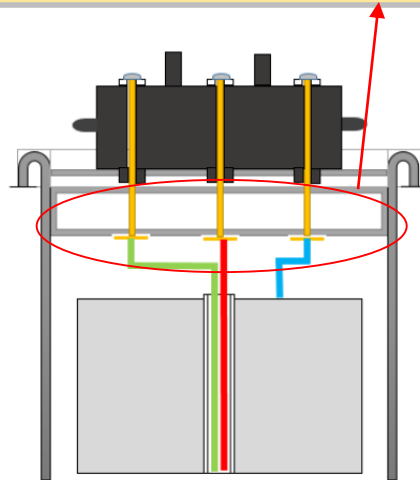
Electrical components do not have an unlimited lifespan. This is also true for self-healing capacitors. Since polypropylene-type capacitors rarely produce a noticeable short circuit, fuses do not provide reliable protection.

All EKON capacitors are equipped with a pressure-sensitive disconnection system. At the end of their service life, in the event of multiple electrical failures due to thermal or electrical overloads, gas will accumulate within the cylindrical housing. Once this gas reaches a certain pressure level, the cylindrical case cap will expand. This expansion will disconnect the connection between the elements inside the capacitor and the terminals on top of the capacitor. This system is crucial for protecting both the capacitor and the circuit elements it is connected to!

Before Fault Operation



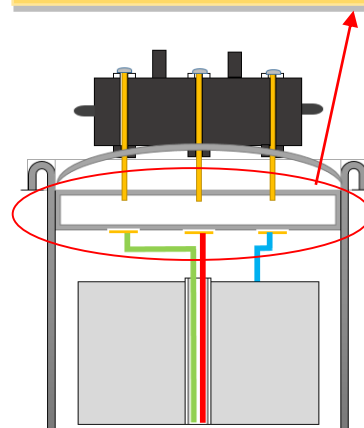
Connection Intact Before Fault Operation



After Fault Operation



Disconnection After Fault Action



EKON CYLINDRICAL TYPE CAPACITOR

Ekon Cylindrical tpe Capacitors are high grade metallizde polypropylene from 1-50 kVAR in cylindrical configuration. These capacitors come with a biodegradable soft resin. These capacitors are self-healing type. The capacitors come with an over pressure disconnecter terminals. They can be used to provide effective power factor correction in industrial & semi-industrial applications.



Table2. Capacitor Technical Features

TECHNICAL FEATURES	
Capacitor Type	Cylindrical
Standard	IEC 60831-1 & IEC 60831-2
Rated Reactive Power Voltage	0,5 – 50 kVAR
Rated Voltage	230 – 525 Volts
Rated Frequency	50 / 60 Hz
Maximum Over Voltage (Un Maximum)	Un + %10 (8 Hour in 24 Hours)
	Un + %15 (30 min. in 24 Hours)
	Un + %20 (5 min. in 24 Hours)
	Un + %30 (1 min. in 24 Hours)
Over Current	Up to 1,3 x I _R (Up to 1,5 x I _R including combined effect of harmonics, over voltage and capacitance)
Dielectric System	Metallized PolyProPylene Film, Self-Healing
Losses	<0,2 W/kVAR - <0,4 W/kVAR
Protection Class	IP20
Cooling	Natural Air Cooled
Max. Above from sea level	4000 meters
Case	Aluminium Can
Discharge Resistor	Special Design International Discharge Resistance 50V in less than 60 sec.
Terminal	Max. 16mm Cable with Arc Protection Double three day terminal
Execution	Indoor
Inrush Current	Up to 200 x I _R
Tolerance on Capacitance	-5 % to +10 %
Test Voltage (Terminal to Terminal)	2,15 x V _R AC for 10 sec.
Test Voltage (Terminal to Casing)	3000 V _{AC} for 10 sec.
Temperature Category	-40 °C / +65 °C
Mounting Position	Vertically
Max. Humidity	95 %
Grounding & Mounting	With M8/M12, Protection Type: Over Pressure Sensitive 3 Phase Disconnecter, Self- Healing, Dry Type.
Working Life (30°C, %50 Relative Humudity)	180.000 hrs.



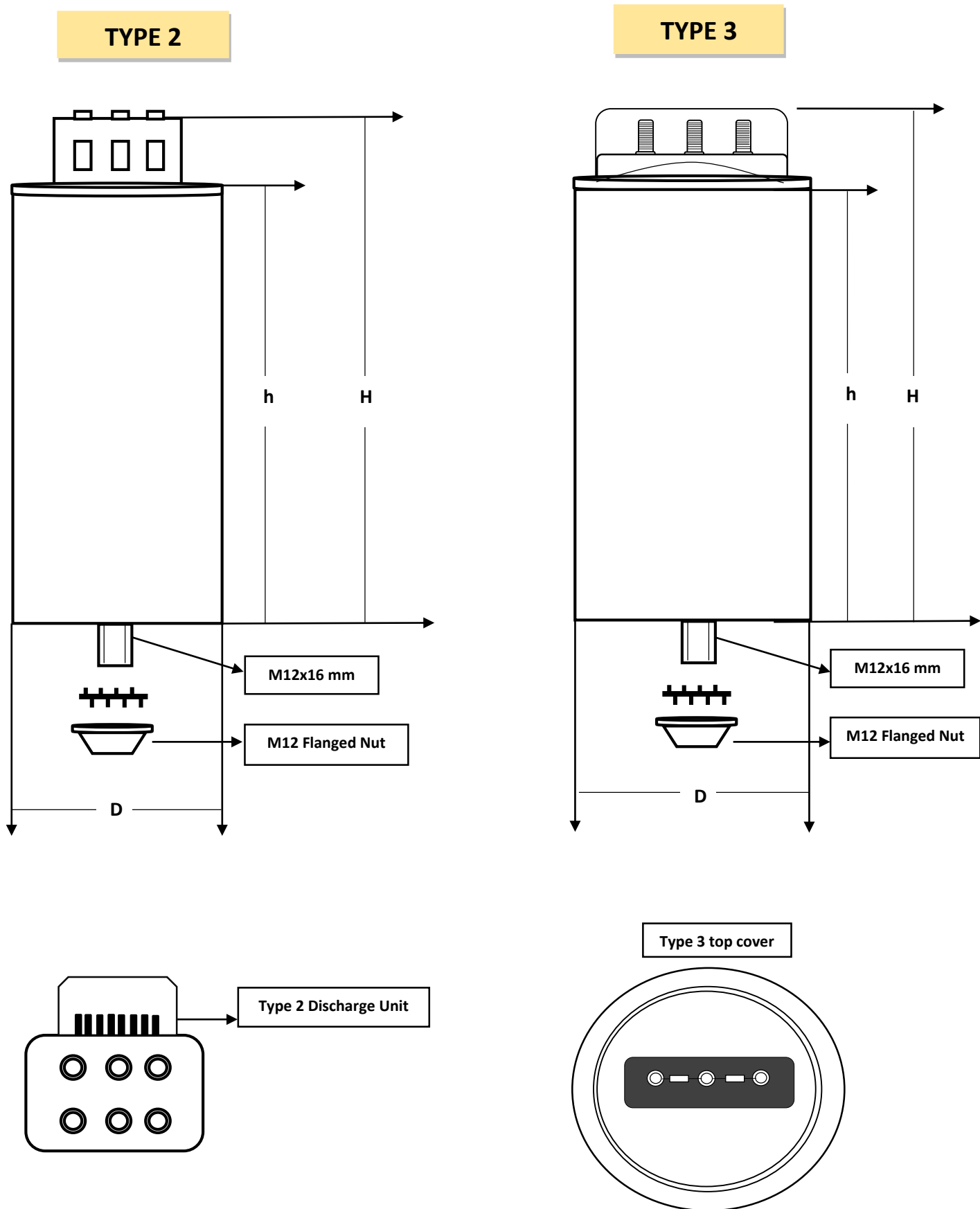


Figure1. Technical Drawing of Cylindrical Type Capacitor

Table3. Cylindrical Type Capacitor Dimensions Table

PRODUCT CODE	POWER (kVar)	VOLTAGE (V)	CAPACITY (UF)	CURRENT (A)	CASE TYPE	D (mm)	h (mm)	H (mm)	WEIGHT (Kg.)
41005	0,5	400	3x3,3	0,70	Type 1	55	130	165	0,13
41010	1,0	400	3x6,6	1,40	Type 1	55	130	165	0,15
41015	1,5	400	3x9,9	2,10	Type 1	55	130	165	0,23
41025	2,5	400	3x16,6	3,50	Type 1	65	100	135	0,26
41050	5,0	400	3x33,3	7,00	Type 1	55	200	235	0,47
41075	7,5	400	3x49,8	10,5	Type 1	65	200	235	0,55
41100	10,0	400	3x66,6	14,0	Type 2	75	210	255	0,95
41125	12,5	400	3x83,0	17,5	Type 2	85	210	285	1,10
41150	15,0	400	3x99,9	21,0	Type 2	85	210	285	1,28
41200	20,0	400	3x133,3	28,0	Type 2	100	240	285	1,78
41050	25,0	400	3x166,6	35,0	Type 2	100	240	285	1,95
41300	30,0	400	3x199,9	42,0	Type 2	116	240	285	2,70
41400	40,0	400	3x265,5	57,8	Type 3	136	290	335	4,95
41500	50,0	400	3x331,7	72,2	Type 3	136	290	335	5,15

Table4. Cylindrical Type Capacitor Dimensions Table

PRODUCT CODE	POWER (kVar)	VOLTAGE (V)	CAPACITY (UF)	CURRENT (A)	CASE TYPE	D (mm)	h (mm)	H (mm)	WEIGHT (Kg.)
42005	0,5	440	3x2,7	0,65	Type 1	55	130	165	0,15
42010	1,0	440	3x5,5	1,30	Type 1	55	130	165	0,20
42015	1,5	440	3x8,3	1,96	Type 1	55	130	165	0,22
42025	2,5	440	3x13,5	3,30	Type 1	65	100	135	0,25
42050	5,0	440	3x27,5	6,50	Type 2	55	200	235	0,45
42075	7,5	440	3x41,1	9,80	Type 2	65	200	235	0,50
42100	10,0	440	3x54,9	13,1	Type 2	75	210	255	0,91
42125	12,5	440	3x68,5	16,5	Type 2	85	240	285	1,08
42150	15,0	440	3x82,2	19,6	Type 2	85	240	285	1,25
42200	20,0	440	3x109,6	26,2	Type 2	100	240	285	1,75
42050	25,0	440	3x137,1	32,8	Type 2	100	240	285	1,91
42300	30,0	440	3x146,5	39,3	Type 2	116	240	285	2,66
42400	40,0	440	3x219,5	52,5	Type 3	136	290	335	4,80
42500	50,0	440	3x274,5	65,5	Type 3	136	290	335	5,00

Table5. Cylindrical Type Capacitor Dimensions Table

PRODUCT CODE	POWER (kVAr)	VOLTAGE (V)	CAPACITY (UF)	CURRENT (A)	CASE TYPE	D (mm)	h (mm)	H (mm)	WEIGHTH (Kg.)
43005	0,5	480	3x2,3	0,60	Type 1	55	130	165	0,19
43010	1,0	480	3x4,6	1,20	Type 1	55	130	165	0,21
43015	1,5	480	3x6,9	1,80	Type 1	55	130	165	0,24
43025	2,5	480	3x11,5	3,00	Type 1	65	100	135	0,29
43050	5,0	480	3x23,0	6,00	Type 2	55	200	235	0,55
43075	7,5	480	3x34,3	9,00	Type 2	65	200	235	0,65
43100	10,0	480	3x46,1	12,0	Type 2	75	210	255	1,10
43125	12,5	480	3x57,5	15,0	Type 2	85	240	285	1,25
43150	15,0	480	3x69,1	18,0	Type 2	85	240	285	1,50
43200	20,0	480	3x92,1	24,0	Type 2	100	240	285	2,05
43050	25,0	480	3x115,1	30,0	Type 2	100	240	285	2,15
43300	30,0	480	3x138,2	36,5	Type 2	116	240	285	2,63
43400	40,0	480	3x184,3	48,5	Type 3	136	290	335	4,70
43500	50,0	480	3x230,5	60,5	Type 3	136	290	335	4,95

Table4. Cylindrical Type Capacitor Dimensions Table

PRODUCT CODE	POWER (kVAr)	VOLTAGE (V)	CAPACITY (UF)	CURRENT (A)	CASE TYPE	D (mm)	h (mm)	H (mm)	WEIGHTH (Kg.)
43005	0,5	525	3x1,9	0,55	Type 1	55	130	165	0,17
43010	1,0	525	3x3,8	1,10	Type 1	55	130	165	0,19
43015	1,5	525	3x5,7	1,65	Type 1	55	130	165	0,20
43025	2,5	525	3x9,6	2,75	Type 1	65	100	135	0,25
42550	5,0	525	3x19,5	5,50	Type 2	55	200	235	0,50
42575	7,5	525	3x13,5	8,20	Type 2	65	200	235	0,60
42600	10,0	525	3x39,0	11,0	Type 2	75	210	255	1,00
42625	12,5	525	3x48,5	13,7	Type 2	85	240	285	1,20
42650	15,0	525	3x58,5	16,5	Type 2	85	240	285	1,45
42700	20,0	525	3x78,0	22,0	Type 2	100	240	285	2,00
42750	25,0	525	3x97,5	27,5	Type 2	100	240	285	2,10
42800	30,0	525	3x117,5	33,0	Type 2	116	240	285	2,58
42900	40,0	525	3x156,0	44,0	Type 3	136	290	335	4,65
43000	50,0	525	3x199,0	55,0	Type 3	136	290	335	4,90

EKON CAPACITOR_QUALITY CERTIFICATES



Low voltage power capacitor TS EN 60831-1:2015



Lighting capacitors TS EN 60148:2008



A.A. Motor capacitors TS EN 60252-1:2012



A.A. Motor capacitors TS EN 60252-2:2011



A.A. Motor capacitors TUV certificate



Lighting capacitors TUV certificate



LPC capacitors (Cylindrical) Certificate of Domestic Goods



LPC capacitors (Box) Certificate of Domestic Goods



ISO 9001:2015 certificate



ISO 14001:2015 certificate



ISO 45001:2018 certificate

EKON

KONDANSATÖR

CONTACT FOR INFORMATION

assist@ekoncapacitor.com

+90 216 314 5410

Esenkent Mahallesi Şair Baki Sokak No:10 Ümraniye/ İstanbul

www.ekonkoncapacitor.com

