

Shreem

Shreem

Safe Journey of
Electricity with
Capacitor

A.C. Power Factor
Correction (PFC)
Components

DRAFT COPY

Shreem Electric Ltd.

Corporate Office :
P. B. No. 43, Industrial Estate,
Jaysingpur - 416 144
Dist. : Kolhapur, Maharashtra, (INDIA)

Tel : +91-2322-221021/22/24/45
Fax : +91-2322-221023
e-mail : info@shreemelectric.com
Web : www.shreemelectric.com

Corporate Idaes/9823053716/01-2020



Shreem Electric Ltd.

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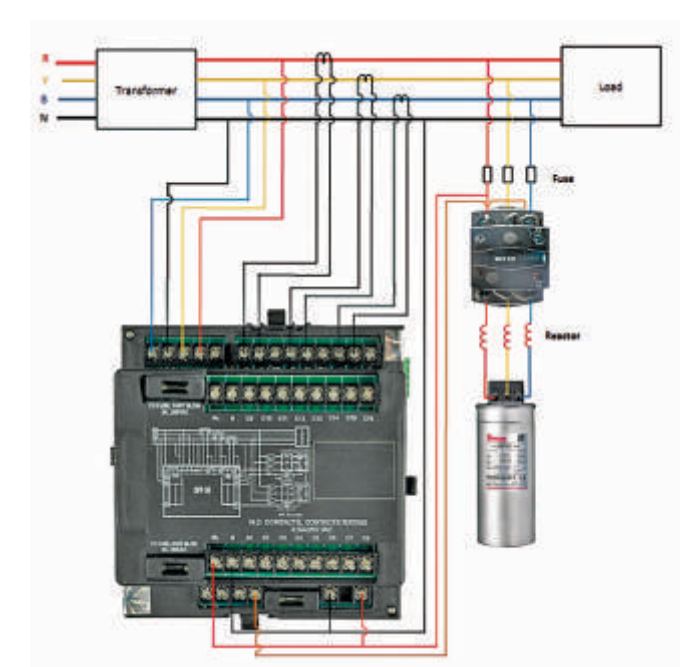
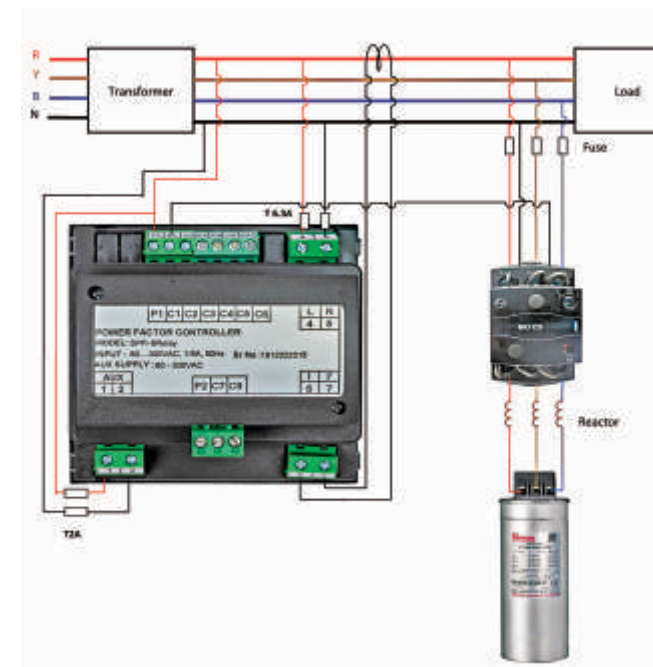
SPFi-L Series

Description	SPFi-L - 04 / 06 / 08
AUXILIARY SUPPLY	80-300 VAC, 50 Hz.
MEASUREMENT SUPPLY	80-300 VAC, 240 V nominal.
RELAY	Max. 250 VAC/1000 W.
CURRENT INPUT	1A/5A, Single CT
CURRENT MEASUREMENT	10 mA-5 A
DISPLAY	3 digit , 7- Segment LED Display
OPERATING TEMP.	0 to 55°C
WEIGHT	0.25 kg.
MECH. DIMENSION	96 x 96 x 35 mm
PROTECTION CLASS	Front side IP-54, Back side IP-20
P.F. CORRECTION TIME	5-999 Sec.
DISCHARGE TIME	10-999 Sec.
FEATURES	Min. user intervention by auto CT polarity correction, Auto bank value detection, Connected bank count. Self optimized intelligent control mode. Auto no. of detection of Cap. bank & blocking of non connected bank. Intelligent bank algorithm for optimum bank switching. Min. system setting in Auto mode. User configurable connection, disconnection & Discharge timing.
PROTECTION/ALARM	Over/Under voltage, Under current, Capacitor protection.
DISPLAY PARAMETER	Power Factor
STD. COMPATIBILITY	Safety std. IEC 61010-1, EMC Std. IEC 61326
COMMUNICATION PORT	NA



SPF3-XXM-XXMT Series

Description	SPF3 - 08MT/16MT, SPF3 - 08M/16M
AUXILIARY SUPPLY	100-500 VAC, 47-53 Hz.
MEASUREMENT SUPPLY	Ph-N 60-300 VAC.
RELAY	SPF3-XXMT : TTL O/P 20 mA, max. capacity. Using external supply, 12/24 V DC. SPF3-XXM : "NO" contacts with 0.5 A/250 VAC capacity.
CURRENT INPUT	1A/5A, Three CT
CURRENT MEASUREMENT	1.5 % of I _N
DISPLAY	16 x 2 line graphical LCD Display
OPERATING TEMP.	0 to 55°C
WEIGHT	1 kg.
MECH. DIMENSION	146 x 146 x 96 mm
PROTECTION CLASS	Front side IP-54, Back side IP-10
P.F. CORRECTION TIME	SPF3-XXMT : 1-250 Cycle, SPF3-XXM : 1-240 Sec.
DISCHARGE TIME	SPF3-XXMT : 1-60 Sec, SPF3-XXM : 0-300 Sec.
FEATURES	External, removable fast blow fuse protection for cap. bank O/P, Aux. Supply & Measurement supply. Real time clock (RTC), Dual target Power factor setting. Data log-in for interval, faults, events records in internal memory.
PROTECTION/ALARM	Over/Under voltage, O/U current, Over temp., O/U freq., Under compensation, Voltage/Current THD %.
DISPLAY PARAMETER	Overall, Max./min. & individual phase values for Voltage, Current, Reactive /Active/App. power, Active/Reactive energy, THD in % for Voltage & current , Neutral current, Step kVAr. Last 2 characters of display shows various status & faults of Cap. bank like OV, ZV, OK, VH etc.
STD. COMPATIBILITY	Safety std. IEC 61010-1, EMC Std. IEC 61000-4
COMMUNICATION PORT	RS-232 Serial port, RS-485 MODBUS.





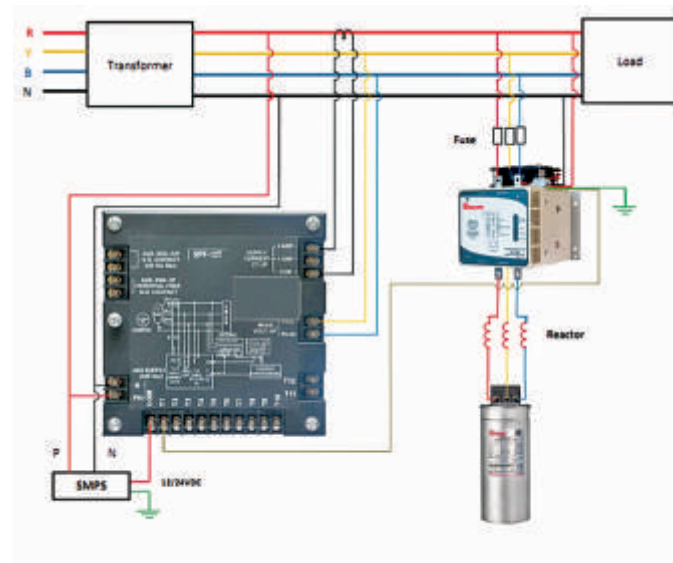
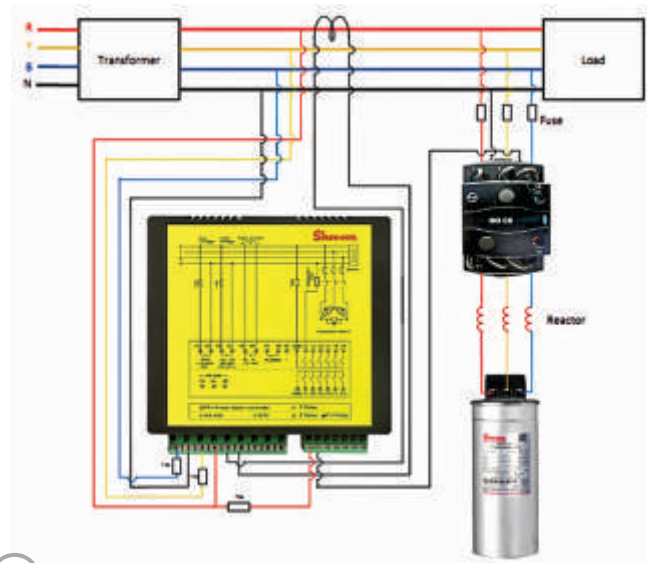
SPFi Series

Description	SPFi - 04 / 06 / 08 / 12
AUXILIARY SUPPLY	110-550 VAC, 42-70 Hz.
MEASUREMENT SUPPLY	30-550 VAC, 42-70 Hz.
RELAY	240 V, 5 A Relay
CURRENT INPUT	1A/5A, Single CT
CURRENT MEASUREMENT	10 mA-5 A
DISPLAY	16 x 2 line graphical LCD Display
OPERATING TEMP.	10 to 60°C
WEIGHT	0.5 kg.
MECH. DIMENSION	For 4 stage - 96 x 96 x 35 mm For 6 / 8/ 12 stage - 144 x 144 x 56 mm
PROTECTION CLASS	Front side IP-54, Back side IP-20
P.F. CORRECTION TIME	1-1800 Sec.
DISCHARGE TIME	1-60 Sec.
FEATURES	Auto initialization to detect no. of cap. connected kVAR values (for balanced load condition), phase correction angle.
	Cap. kVAR can be programmed either as direct kVAR value, Control series or auto detected value.
	Voltage & current inputs are configurable & adopt system network itself according to configuration.
	Demand parameter, Recall function of recorded values. Storage Max. & Min. line parameters.
PROTECTION/ALARM	THD & Individual harmonics for voltage & current upto 31 order.
PROTECTION/ALARM	Over/Under voltage, O/U current, Over temp., O/U freq., O/U compensation, Over cap. switching utilization count.
DISPLAY PARAMETER	Line voltage, Current, Reactive /Active/App. power, Temp., THD-V/I- ind. harmonics in %, difference to PF, Energy kWh, kVAh (Import/Export), kVAh, Run hour, On Hour, No. of interruptions, System fault 1/2, System Warning.
STD. COMPATIBILITY	Safety std. IEC 61010-1, EMC Std. IEC 61326
COMMUNICATION PORT	RS - 485 (Optional).



SPF Series

Description	SPF-08T / 12T
AUXILIARY SUPPLY	90-240 VAC, 47-53 Hz.
MEASUREMENT SUPPLY	Ph-Ph 415 V (+ 20% to -40% voltage tolerance).
RELAY	TTL O/P 20 mA. max. capacity. Using external supply. 12/24 V DC.
CURRENT INPUT	1A/5A, Single CT
CURRENT MEASUREMENT	Accuracy Class - 2
DISPLAY	16 x 2 line LCD Display
OPERATING TEMP.	10 to 50°C
WEIGHT	1 kg.
MECH. DIMENSION	144 x 144 x 70 mm
PROTECTION CLASS	Front side IP-54, Back side IP-10
P.F. CORRECTION TIME	1-250 Cycle
DISCHARGE TIME	1-60 Sec.
FEATURES	High speed switching transistor output of SPF to control high speed capacitor switches.
	Dual target power factor setting
PROTECTION/ALARM	THD & Individual harmonics for voltage & current upto 15th order.
PROTECTION/ALARM	Over/Under voltage, O/U current, Over temp., O/U freq., O/U compensation, Voltage THD-F %, Load current THD-F %.
DISPLAY PARAMETER	Line voltage, Current, Reactive /Active/App. power, Frequency, Temperature., THD-V/I- individual harmonics in % for V & I, Each step kVAR., Back status & Control status.
STD. COMPATIBILITY	Safety std. IEC 61010-1, EMC Std. IEC 61000-4
COMMUNICATION PORT	NA



In A.C. electric system inductive loads consume active power and also reactive power. This reactive power is needed to generate magnetic field for inductive loads.

The power factor is the ratio of KW (active power) component to the KVA (apparent power) component.

Power factor (PF) will be leading if current is leading the voltage & it is lagging when current is lagging the voltage. The reactive power needs to be generated in electrical system. For that most of electrical utilities penalise for lower power factor with additional charges. A.C. capacitor is the most economical component to supply reactive power which gives following advantages. ...

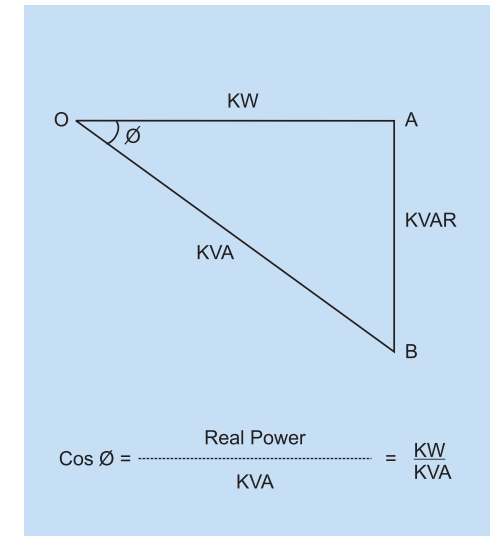
- Power factor improvement.
- Additional power will be available at secondary of transformer.
- Decrease in cable losses.
- Improved voltage profile.

The reactive power necessary to achieve the P.F. is calculated as under

$$KVAR = KW (\tan \theta_1 - \tan \theta_2)$$

$$\cos \theta_1 - \text{original P.F.}$$

$$\cos \theta_2 - \text{desired P.F.}$$



The multiplying factors to calculate required KVAR are given in following table. -

Original P. F.	Multiplication factor (tan θ1 - tan θ2) for a target power factor									
	Cos θ1					Cos θ2				
0.40	0.70	0.75	0.80	0.85	0.90	0.92	0.94	0.96	0.98	1.00
0.45	1.271	1.409	1.541	1.672	1.807	1.865	1.928	2.000	2.088	2.291
0.50	0.964	1.103	1.235	1.365	1.500	1.559	1.622	1.693	1.781	1.985
0.55	0.712	0.850	0.982	1.112	1.248	1.306	1.369	1.440	1.529	1.732
0.60	0.498	0.637	0.768	0.899	1.034	1.092	1.156	1.227	1.315	1.518
0.65	0.313	0.451	0.583	0.714	0.849	0.907	0.970	1.042	1.130	1.333
0.70	0.149	0.287	0.419	0.549	0.685	0.743	0.806	0.877	0.966	1.169
0.75		0.138	0.270	0.400	0.536	0.594	0.657	0.729	0.817	1.020
0.80			0.132	0.262	0.398	0.456	0.519	0.590	0.679	0.882
0.85				0.130	0.266	0.324	0.387	0.458	0.547	0.750
0.90					0.135	0.194	0.257	0.328	0.417	0.620
0.95						0.058	0.121	0.193	0.281	0.484
								0.037	0.126	0.329

Example :

- a) Consumption of active energy Ew = 300 000 Kwh
- b) Consumption of reactive energy EB = 400 000 Kvarh
- c) No. of working hours t = 600 h

$$\text{Active energy power } P = \frac{300\,000 \text{ Kwh}}{600 \text{ h}} = 500 \text{ KW}$$

$$\text{Calculation of the original power factor } \cos \theta_1 := \frac{1}{\sqrt{\left(\frac{EB}{Ew}\right)^2 + 1}} = \frac{1}{\sqrt{\left(\frac{400\,000}{300\,000}\right)^2 + 1}} = 0.6$$

For the improvement of the power factor from 0.6 to 0.9 we read factor 0.849 from table. Hence required capacitor power is Qc = 500KW X 0.849 ≈ 425 KVAR

L.V. Capacitor Technology

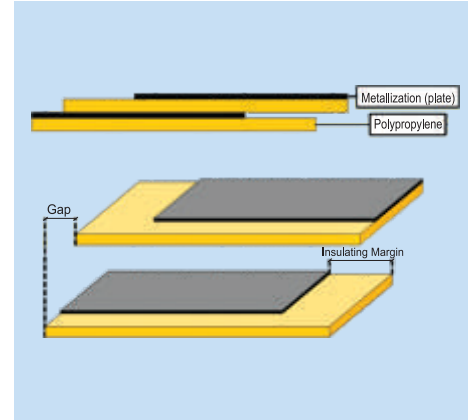


Harmonic Filter Reactors / Thyristor Switching Modules



Since last 20 years it is observed that service life of capacitor is hampered due to following causes.

- Use of low priced material hampers quality, technology working environment resulting in low life of capacitors.
- Non linear inductive loads such as drives, furnaces etc. generate harmonics which leads to increase in voltage and current across capacitor.
- Ambient temperature.



Type of the Low Voltage Capacitors

Shreem low voltage capacitors are designed and manufactured with most advanced technology which can sustain 10% to 25% of harmonic generating load (w.r.t. total connected load) and provide complete range of P.F. correction system.

A) MPP Capacitors (Metallized Polypropylene Film)

The MPP type capacitor consists of a low-loss Di-electric formed by pure polypropylene film. A thin self healing mixture of zinc and aluminum is metallized directly on one side of the PP film under vacuum. This technology ensures a long operating life of the capacitor.

After insertion of capacitor elements into aluminum case, its filled by a viscous semi solid bio degradable resin.

Self-healing dielectric

Both dielectric structures described above are "self healing", In event of a voltage breakdown the metal layers around the breakdown channel are evaporated by the temperature of the electric arc that forms between the electrodes. They are removed within a few microseconds and pushed apart by the over pressure generated in the center of the breakdown spot. An insulation area is formed which is reliably resistive and voltage proof for all operating requirements of the capacitor. The capacitor remains fully functional during and after the breakdown.

Advantages of MPP technology

- Results of the comparably simple construction technology. MPP capacitor can be manufactured using less material and consequently enjoy a competitive price level.
- With a thicker dielectric, capacitor usually have smaller dimensions.
- MPP- type capacitors have a high specific capacitance and a high AC load capacity.

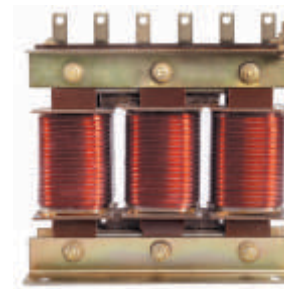
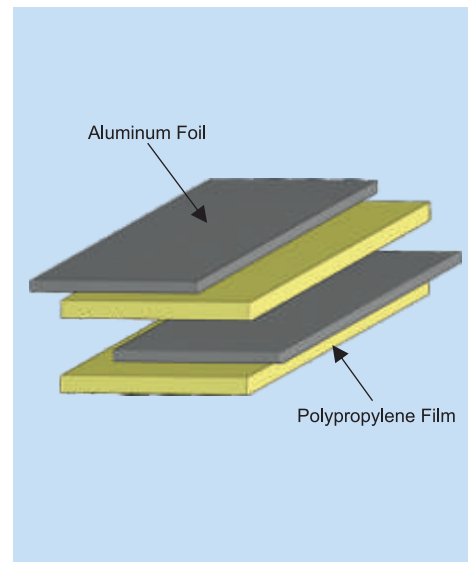
B) APP capacitors

APP (all polypropylene) film type i.e. film + foil

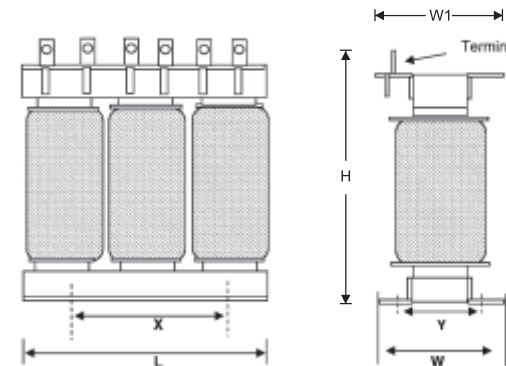
The dielectric of APP type capacitor takes the form of a low-loss polypropylene film + foil elements completely dried in high vacuum and impregnated in NPCB oil.

Advantages of the APP technology

- The vacuum drying and impregnation procedure frees the dielectric from any voids and minimize the occurrence of partial discharges. This results in long life expectancy and extremely stable electrical characteristics.
- The zinc contact layer forms a stable contact with the foil and guarantee a very high resistance to impulse charges reducing the self-inductance of the capacitor.
- Very low losses through the application of polypropylene dielectric and aluminum foil.
- Thanks to its low losses and the heat dissipation qualities of the oil impregnate, the capacitor may be operated at high ambient and case temperature upto 70°C without effecting the life of the capacitor.



Technical Data	Description
STANDARD	IS-5553.IEC-60076
RATED kVAr	5 to 100 kVAr (other ratings upon request)
RATED VOLTAGE	440V, 525V, 690V, 750V
FILTER FACTOR	5.67%, 7%, 14%
TYPE	Copper/Aluminum wound - Iron core
LINEARITY	160 % (180% & 200% upon request)
INSULATION CLASS	'F' & 'H' Class
TOLERANCE	+3%
WINDING	Coil wound with multiple conductors to reduce skin effect.
COOLING	Natural Air Cooling
FREQUENCY	50 Hz / 60 Hz
NOISE LEVEL	> 60dB at rated load
TERMINAL	Tin Plated
Mechanically sturdy design to withstand vibrations, keep low noise level & ensure performance guarantee.	



Aluminum Wound

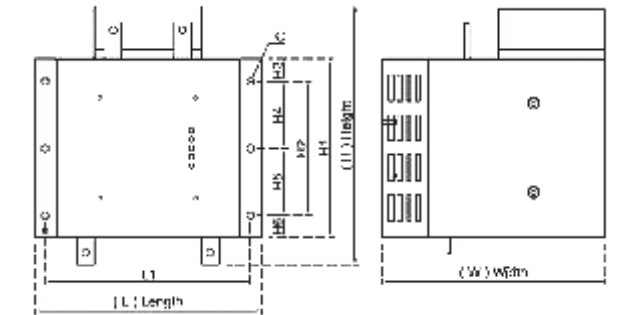
Value	L	W	H	W1	X	Y
5 KVAR 7%	210	110	190	125	180	80
7.5 KVAR 7%	210	110	200	125	180	80
10 KVAR 7%	210	110	200	130	180	80
12.5 KVAR 7%	210	120	220	140	180	90
15 KVAR 7%	210	120	240	140	180	90
20 KVAR 7%	210	125	220	165	180	95
25 KVAR 7%	270	135	270	165	180	100
30 KVAR 7%	270	135	270	165	180	100
40 KVAR 7%	270	140	280	170	180	105
50 KVAR 7%	270	145	305	175	180	115
75 KVAR 7%	300	160	305	205	180	130
100 KVAR 7%	330	170	325	220	180	130

Copper Wound

Value	L	W	H	W1	X	Y
5 KVAR 7%	165	90	170	115	120	65
7.5 KVAR 7%	210	110	170	140	180	80
10 KVAR 7%	210	110	180	140	180	80
12.5 KVAR 7%	210	120	200	145	180	85
15 KVAR 7%	210	120	220	145	180	85
20 KVAR 7%	240	135	220	165	180	95
25 KVAR 7%	240	135	240	165	180	100
30 KVAR 7%	240	135	260	165	180	105
40 KVAR 7%	240	155	280	175	180	120
50 KVAR 7%	240	160	260	185	180	125
75 KVAR 7%	300	165	290	200	180	130
100 KVAR 7%	300	185	300	220	180	150



Technical Data	Description
SHR-12.5/25/50/100 STM	Shreem Thyristor Module
RATED kVAr	12.5/25/50/100 kVAr
AUXILIARY SUPPLY	220 VAC
CONTROL DC SUPPLY	12V/24V DC / TTL
CONTROL CURRENT CONSUMPTION	<5 mA
PEAK INVERSE VOLTAGE	1800 V / 2200 V (Optional)
OPERATING MODE	Zero differential voltage
INDICATIONS	Switch ON, Temperature indication
COOLING	Natural Air for 12.5 kVAr & Forced Air cooling for 25 to 100 kVAr
PROTECTION CLASS	IP 00
FREQUENCY	50 Hz / 60 Hz
HUMIDITY	10 to 95% without Moisture
PROTECTION	Over-Temperature, dv/dt
OPERATING TEMP.	0° C to 45° C



Thyristor Module kVAr	L	L1	H	H1	H2	H3
12.5 kVAr	210	185	225	152	100	27
25 kVAr	210	185	225	152	100	27
50 kVAr	210	185	250	152	100	27
100 kVAr	260	235	295	201	150	26

Thyristor Module kVAr	H4	H5	H6	W	C	WT in kg.
12.5 kVAr	-	-	25	195	Ø8	4.3
25 kVAr	-	-	25	195	Ø8	4.6
50 kVAr	-	-	25	220	Ø8	5
100 kVAr	75	75	25	255	Ø8	10.5

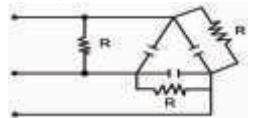
Note : Tolerance ±10mm for overall dimensions. ± 2mm for mounting dimensions.

Unique Features

- Zero crossing detection & turn-on through electronic active firing circuit.
- Zero crossing accuracy within ±3V peak.
- Glitches free current wave form.
- Due to intelligent micro controller, thyristors are protected against high Peak Inverse Voltage. (PIV).

Fast Discharge Resistor Module

- Enhance the thyristor module switching response time.
- Increase life of thyristor module & capacitor.
- Cater the kVAr requirement of dynamic load.



APP (all polypropylene) film capacitor - APP HD / ULTRA HD

Protection against failure

ULTRA HD APP Capacitor : Features

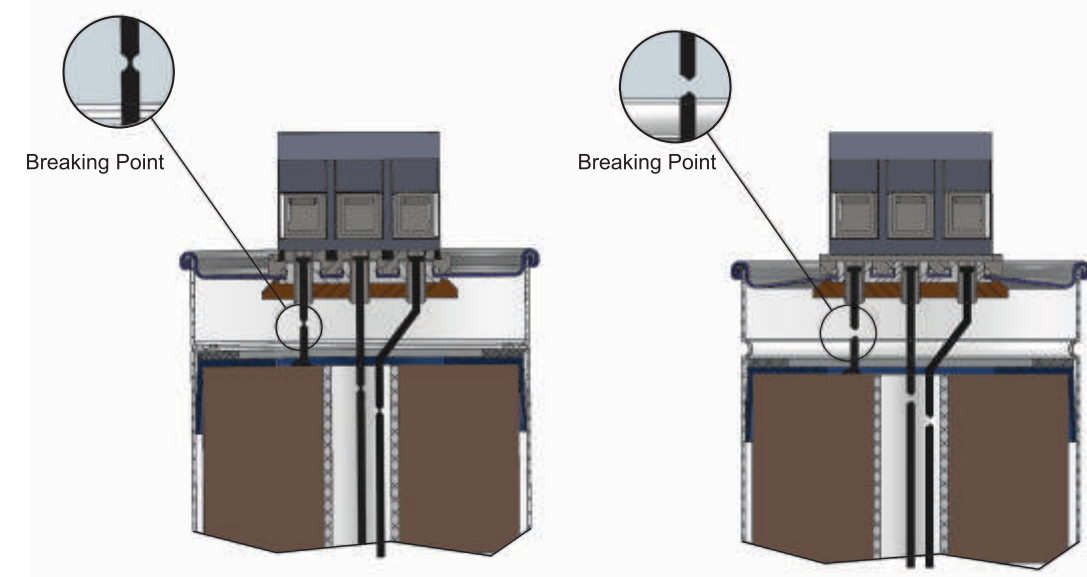
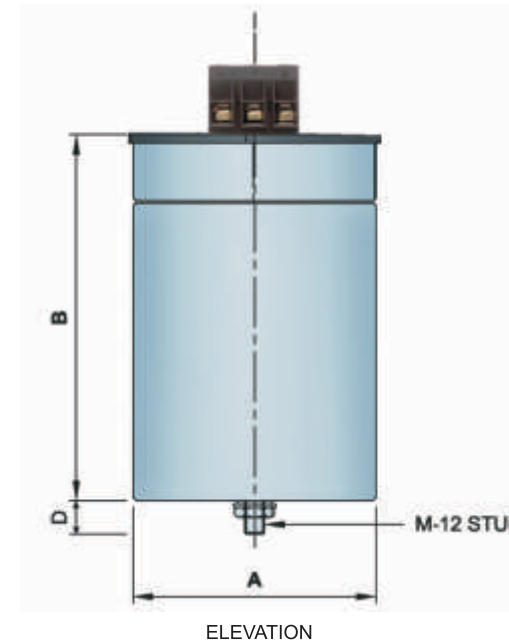
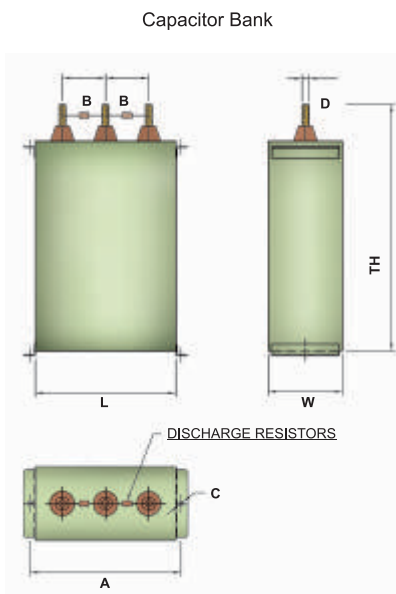
- Capacitor can handle over current due to safe design of conducting material.
- Due to high thickness of conducting plate, it offers low resistance.
- Capacitor has designed at lower stress.
- long working life due to low Voltage stress.
- Deep penetration of oil between the layers of polypropylene film increases dielectric break down strength.
- Sufficient end contact area due to extension of conducting plate .
- APP UHD Capacitor can withstand higher switching inrush current.
- Current carrying capacity and Mechanical strength of the terminal is more.



HD APP Capacitor : Features

- Film + Foil design.
- Operated at high temperature.
- Better thermal conductivity & higher viscosity of impregnating oil.
- Highest inrush current withstanding capacity.
- Epoxy moulded bushings, leakage is avoided.
- High grade steel tank.
- Best suitable design in supertropical countries like India.
- Life Expectancy 2,50,000 hours.

Description	APP HD Capacitor	APP ULTRA Heavy Duty Capacitor
STANDARDS	IS-13585-2012 / IEC60931-1-1996	IS-13585-2012 / IEC60931-1-1996
RATED OUTPUT	5 kVAr to 25 kVAr	10 kVAr to 25 kVAr
RATED VOLTAGE	415 V, 440 V, 525 V	415 V, 440 V
OVER VOLTAGE	U _N + 10% 30 min in every 24 h	U _N + 10% 30 min in every 24 h
	U _N + 15% 08 min in every 24 h	U _N + 15% 08 min in every 24 h
	U _N + 20% 05 min in every 24 h	U _N + 20% 05 min in every 24 h
	U _N + 30% 01 min in every 24 h	U _N + 30% 01 min in every 24 h
OVER CURRENT	1.5* I _N	2* I _N
RATED FREQUENCY	50 Hz	50 Hz
DISCHARGE RESISTOR	Externally Fitted	Externally Fitted
DISCHARGE TIME	3 min 75 V	3 min 75 V
MAX. CAPACITANCE (0% of Rated Capacitance) tolerance	-5% to +7%	-5% to +7%
TEST VOLTAGE TERMINAL TO TERMINAL	4.3* U _N for 10 sec (DC)	4.3* U _N for 10 sec (DC)
TEST VOLTAGE TERMINAL / CASE	3 KV for 1 min. or 3.6 KV for 2 sec.	3 KV for 1 min. or 3.6 KV for 2 sec.
POWER LOSS PER KVAR OF REACTIVE POWER RATING	<0.5 watts / kVAr	<0.5 watts / kVAr
IMPREGNATION	Non PCB, Non Toxic oil - PXE/C101	Non PCB, Non Toxic oil - PXE/C101
PROTECTION	Internal fuse / External fuse	Internal fuse / External fuse



Before



After

APP HD Dimension Details :

Sr. No.	Capacitor Rating	L	W	TH	A	B	C	D
1	5 KVAR	228	123	130	253	50	Ø10	M6
2	7.5 KVAR	228	123	160	253	50	Ø10	M6
3	10 KVAR	228	123	175	253	50	Ø10	M8
4	12.5 KVAR	228	123	205	253	50	Ø10	M8
5	15 KVAR	228	123	250	253	70	Ø10	M10
6	20 KVAR	228	123	295	253	70	Ø10	M10
7	25 KVAR	228	123	335	253	70	Ø10	M10
8	50 KVAR	348	123	480	380	70	Ø10	M12

UHD APP Dimension Details :

Sr. No.	RATING	L	W	TH	A	B	C	D
1	10 kVAr	228	123	175	253	70	Ø10	M 10
2	15 kVAr	228	123	300	253	70	Ø10	M 12
3	20 kVAr	228	123	300	253	70	Ø10	M 12
4	25 kVAr	228	123	415	253	70	Ø10	M 12

Note : Above dimensions are in mm for 440 V. Dimensions tolerance ± 10%

In MPP type capacitors pressure increases inside the capacitor due to number of self healing breakdowns in event of over-voltage. This results in bursting of capacitor. In order to prevent it from bursting, protection is provided. In this provision when pressure is increased inside the capacitor, there is change in length of capacitor due to expansion, due to which the conductor gets separated resulting in disconnection of capacitor from the circuit.



Features

- Cylindrical - Normal Duty + Premium MPP Capacitor.
- Metallized polypropylene (MPP) film design.
- Compact cylindrical aluminum can design.
- Biodegradable resin impregnation gives cooling effect.
- Better heat dissipation.
- Explosion proof design (over pressure disconnecter)
- Low losses due to advanced winding and zinc spray equipments.

Application

- Fixed P.F. correction.
- Automatic P.F. correction.
- Agriculture Load



Technical Data	ND-VAR Normal Duty	ND-VAR Normal Duty+	Agristar
STANDARDS	IS 13340-1/2, IEC 60831-1/2	IS 13340-1/2, IEC 60831-1/2	IS 13340-1/2
RATED VOLTAGE (U _N)	440 VOLT	440 VOLT	440 VOLT
RATED FREQUENCY	50 Hz	50 Hz	50 Hz
OVER VOLTAGE	U _N + 10% 12 hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min. in every 24 h	U _N + 10% 12 hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min. in every 24 h	U _N + 10% 12 hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min. in every 24 h
OVER CURRENT	1.3* I _N	1.5* I _N	1.3* I _N
CAPACITANCE TOLERANCE	-5 to + 10% As per standards	-5 to + 10% As per standards	-5 to + 10% As per standards
TEST VOLTAGE, TERMINAL	2.15 * U _N , AC 2S	2.15 * U _N , AC 2S	1.75 * U _N , AC 2S
TEST VOLTAGE, TERMINAL & CASE	3.6 kV, AC 2S	3.6 kV, AC 2S	3.6 kV, AC 2S
INRUSH CURRENT	Up to 200 I _N	Up to 250 I _N	Up to 200 I _N
LOSSES	<0.20 W/kVAr (Dielectric), <0.5 W/kVAr (Total)	<0.20 W/kVAr (Dielectric), <0.5 W/kVAr (Total)	<0.20 W/kVAr (Dielectric), <0.5 W/kVAr (Total)
CASING	Cylindrical Aluminium Can	Cylindrical Aluminium Can	Cylindrical Aluminium Can
ENCLOSURE	IP00	IP00	IP00
MEAN LIFE EXPECTANCY	1,00,000 h	1,50,000 h	1,00,000 h
TEMPERATURE CLASS	-10/55°C	-25/55°C	-10/55°C
COOLING	Natural air cooled Casing Temp. max 60°C permitted on top of the can	Natural air cooled Casing Temp. max 60°C permitted on top of the can	Natural air cooled Casing Temp. max 60°C permitted on top of the can
DIELECTRIC SYSTEM	Metallized polypropylene film, Self-healing property	Metallized polypropylene film, Self-healing property	Metallized polypropylene film, Self-healing property
IMPREGNATION	NPCB, Biodegradable natural semi soft resin.	NPCB, Biodegradable natural semi soft resin.	NPCB, Hard epoxy
SAFETY FEATURES	Overpressure sensitive 3 phase disconnecter	Overpressure sensitive 3 phase disconnecter	Overpressure sensitive 3 phase disconnecter
ALTITUDE	Max. 2000 Meter above sea level	Max. 2000 Meter above sea level	Max. 2000 Meter above sea level
RELATIVE HUMIDITY	Max. 95%	Max. 95%	Max. 95%
MOUNTING POSITION	Vertical	Vertical	Random
MOUNTING & EARTHING	M8x10mm, M12x16mm threaded stud, on bottom of case with Nut & Washer	M8x10mm, M12x16mm threaded stud, on bottom of case with Nut & Washer	M8x10mm, M12x16mm threaded stud, on bottom of case with Nut & Washer
DISCHARGE RESISTORS	External 3 minutes , 75 V	External 3 minutes , 75 V	External 3 minutes , 75 V
TERMINALS	i) ND-VAR AW cap - Clip on terminals ii) ND-VAR - With MS screw on single three-way terminals	i) ND-VAR AW cap - Clip on terminals ii) ND-VAR - With MS screw on single three-way terminals	For Agricap with wire terminals extended 300 mm.

Note : U_N - RMS Voltage at fundamental frequency without harmonics.
I_N - Rated RMS current (line) at rated voltage and frequency without transients.

BOX-VAR

BOX-VAR Series - Normal Duty - 415 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAR	Capacitance (in Mfd)	Current (in Amp)	Dimensions L*W*H (in mm)	Drawing No.
SC-N010-R0415-S1S3	1.0	3*6.16	1.39	145*50*220	SC-1
SC-N020-R0415-S1S3	2.0	3*12.33	2.78	145*50*220	SC-1
SC-N030-R0415-S1S3	3.0	3*18.49	4.17	145*50*220	SC-1
SC-N040-R0415-S1S3	4.0	3*24.66	5.56	145*50*220	SC-1
SC-N050-R0415-S1S3	5.0	3*30.82	6.96	185*75*235	SC-1
SC-N075-R0415-S1S3	7.5	3*46.23	10.43	185*75*235	SC-1
SC-N100-R0415-S1S3	10.0	6*30.82	13.91	175*115*280	SC-1
SC-N125-R0415-S1S3	12.5	6*38.52	17.39	175*115*280	SC-1
SC-N150-R0415-S1S3	15.0	6*46.23	20.87	175*115*280	SC-1
SC-N200-R0415-S1S3	20.0	12*30.82	27.82	225*155*315	SC-1
SC-N250-R0415-S1S3	25.0	12*38.52	34.78	225*155*315	SC-1

BOX-VAR Series - Normal Duty - 440 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAR	Capacitance (in Mfd)	Current (in Amp)	Dimensions L*W*H (in mm)	Drawing No.
SC-N010-R0440-S1S3	1.0	3*5.48	1.31	145*50*220	SC-1
SC-N020-R0440-S1S3	2.0	3*10.97	2.62	145*50*220	SC-1
SC-N030-R0440-S1S3	3.0	3*16.45	3.94	145*50*220	SC-1
SC-N040-R0440-S1S3	4.0	3*21.93	5.25	145*50*220	SC-1
SC-N050-R0440-S1S3	5.0	3*27.42	6.56	185*75*235	SC-1
SC-N075-R0440-S1S3	7.5	3*41.42	9.84	185*75*235	SC-1
SC-N100-R0440-S1S3	10.0	6*27.42	13.12	175*115*280	SC-1
SC-N125-R0440-S1S3	12.5	6*34.27	16.40	175*115*280	SC-1
SC-N150-R0440-S1S3	15.0	6*41.42	19.68	175*115*280	SC-1
SC-N200-R0440-S1S3	20.0	12*27.42	26.24	225*155*315	SC-1
SC-N250-R0440-S1S3	25.0	12*34.27	32.80	225*155*315	SC-1

BOX-VAR Series - Heavy Duty - 440 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAR	Capacitance (in Mfd)	Current (in Amp)	Dimensions L*W*H (in mm)	Drawing No.
SC-H050-R0440-S1S3	5.0	3*27.42	6.56	180*70*265	SC-1
SC-H075-R0440-S1S3	7.5	3*41.12	9.84	180*70*265	SC-1
SC-H100-R0440-S1S3	10.0	6*27.42	13.12	200*125*315	SC-1
SC-H125-R0440-S1S3	12.5	6*34.27	16.40	200*125*315	SC-1
SC-H150-R0440-S1S3	15.0	6*41.12	19.68	200*125*315	SC-1
SC-H200-R0440-S1S3	20.0	12*27.42	26.24	237*182*365	SC-1
SC-H250-R0440-S1S3	25.0	12*34.27	32.80	237*182*365	SC-1
SC-H500-R0440-S1S3	50.0	8*51.40	65.61	305*157*455	SC-1

BOX-VAR Series - Heavy Duty - 525 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAR	Capacitance (in Mfd)	Current (in Amp)	Dimensions L*W*H (in mm)	Drawing No.
SC-H050-R0525-S1S3	5.0	3*19.26	5.50	180*70*265	SC-1
SC-H075-R0525-S1S3	7.5	3*28.89	8.25	180*70*265	SC-1
SC-H100-R0525-S1S3	10.0	6*19.26	11.00	200*125*315	SC-1
SC-H125-R0525-S1S3	12.5	6*24.07	13.75	200*125*315	SC-1
SC-H150-R0525-S1S3	15.0	6*28.89	16.50	200*125*315	SC-1
SC-H200-R0525-S1S3	20.0	12*19.26	21.99	237*182*365	SC-1
SC-H250-R0525-S1S3	25.0	12*24.07	27.49	237*182*365	SC-1

Other voltage rating ,output Kvar,single-phase and Frequency available on request.



Features

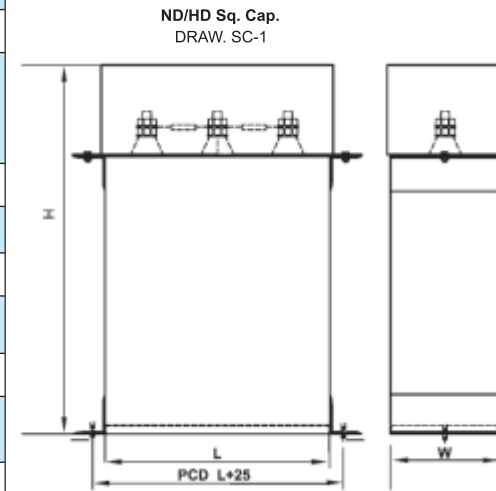
- Square Design - Normal/Heavy Duty MPP Capacitor.
- Metallized polypropylene (MPP) film design.
- C.R.C.A. square box casing design.
- Biodegradable Resin/Oil impregnation gives cooling effect.
- Louvers provided for better heat dissipation.
- Explosion proof design.
- Low losses due to advanced winding and spray equipments.

Applications

- Fixed P.F. correction.
- Automatic P.F. correction.
- Harmonic filter system.



Technical Data	BOX-VAR Normal Duty	BOX-VAR Heavy Duty
STANDARDS	IS 13340-1/2	IS 13340-1/2
RATED VOLTAGE (U _N)	415...440 VOLT	440...525 VOLT
RATED FREQUENCY	50/60 Hz	50/60 Hz
OVER VOLTAGE	U _N + 10% 12 hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min. in every 24 h	U _N + 10% 12 hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min. in every 24 h
OVER CURRENT	1.8 * I _N	2.8 * I _N
CAPACITANCE TOLERANCE	-5 to +10% As per standards	-5 to +10% As per standards
TEST VOLTAGE, TERMINAL	2.15 * U _N , AC 2S	2.15 * U _N , AC 2S
TEST VOLTAGE, TERMINAL & CASE	3.6 kV, AC 2S	3.6 kV, AC 2S
INRUSH CURRENT	Up to 300 * I _N	Up to 450 * I _N
LOSSES	<0.20 W/kVAr (Dielectric) <0.50 W/kVAr (Total)	<0.20 W/kVAr (Dielectric) <0.50 W/kVAr (Total)
CASING	C.R.C.A. Square box casing	C.R.C.A. Square box casing
ENCLOSURE	Indoor mounting	Indoor mounting
MEAN LIFE EXPECTANCY	1,35,000 h	1,80,000 h
TEMPERATURE CLASS	-10/55°C	-25/55°C
COOLING	Natural air cooled	Natural air cooled
DIELECTRIC SYSTEM	Metallized polypropylene film, Self-healing property	Metallized polypropylene film, Self-healing property
IMPREGNATION	NPCB, Biodegradable natural semi soft resin	NPCB, Biodegradable natural semi soft resin
SAFETY FEATURES	Overpressure sensitive 3 ph disconnector	Overpressure sensitive 3 ph disconnector
ALTITUDE	Max. 3000 meter above sea level	Max. 4000 meter above sea level
RELATIVE HUMIDITY	Max. 95%	Max. 95%
MOUNTING POSITION	Vertical	Vertical
MOUNTING & EARTHING	Vertical or wall mounting	Vertical or wall mounting
DISCHARGE DEVICE	External 3 minutes, 75V	External 3 minutes, 75V
TERMINALS	Threaded studs M4,M6,M8, M10,M12	Threaded studs M4,M6,M8, M10,M12



ND-VAR Cylindrical - Normal Duty MPP Capacitor

Normal Duty - 440 Volts - 50 Hz - 3ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
MC-N050-R0440-S1R3	5.0	3*27.42	6.56	65*150	C-2
MC-N075-R0440-S1R3	7.5	3*41.12	9.84	65*195	C-2
MC-N100-R0440-S1R3	10.0	3*54.83	13.12	75*196	C-3
MC-N125-R0440-S1R3	12.5	3*68.54	16.40	90*203	C-3
MC-N150-R0440-S1R3	15.0	3*82.25	19.68	90*203	C-3
MC-N200-R0440-S1R3	20.0	3*109.67	26.24	90*243	C-3
MC-N250-R0440-S1R3	25.0	3*137.08	32.80	90*283	C-3

ND-VAR Cylindrical - Normal Duty+ - Premium MPP Capacitor

Agrowire Series - Normal Duty + – Premium - 440 Volts - 50 Hz - 3 Ph – Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
AW-P010-R0440-S1R3	1.0	3*5.48	1.31	50*125	C-1
AW-P020-R0440-S1R3	2.0	3*10.97	2.62	50*125	C-1
AW-P030-R0440-S1R3	3.0	3*16.45	3.93	65*130	C-2
AW-P040-R0440-S1R3	4.0	3*21.93	5.24	65*130	C-2

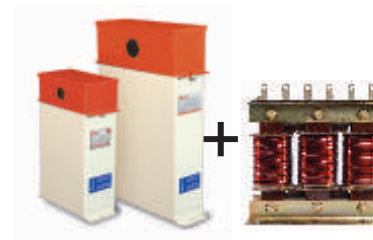
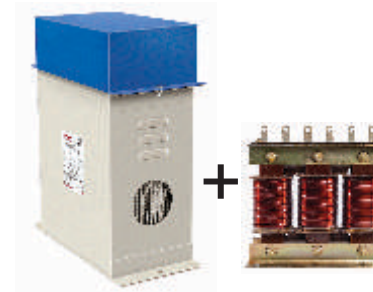
Normal Duty + – Premium - 440 Volts - 50 Hz - 3 Ph – Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
MC-P050-R0440-S1R3	5.0	3*27.42	6.56	75*196	C-3
MC-P075-R0440-S1R3	7.5	3*41.12	9.84	75*196	C-3
MC-P100-R0440-S1R3	10.0	3*54.83	13.12	90*203	C-3
MC-P125-R0440-S1R3	12.5	3*68.54	16.40	90*203	C-3
MC-P150-R0440-S1R3	15.0	3*82.25	19.68	90*243	C-3
MC-P200-R0440-S1R3	20.0	3*109.67	26.24	116*243	C-4
MC-P250-R0440-S1R3	25.0	3*137.08	32.80	116*243	C-4

Cylindrical – Agristar Capacitor

Agristar Series - Normal Duty – 440 Volts - 50 Hz – 3 Ph – Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
AS-N010-R0440-S1R3	1.0	3*5.48	1.31	50 * 125	AS-1
AS-N020-R0440-S1R3	2.0	3*.10.97	2.62	50 * 125	AS-1
AS-N030-R0440-S1R3	3.0	3*16.45	3.93	65 * 130	AS-2
AS-N040-R0440-S1R3	4.0	3*21.93	5.24	65 * 130	AS-2
AS-N050-R0440-S1R3	5.0	3*27.42	6.56	65 * 150	AS-2
AS-N060-R0440-S1R3	6.0	3*32.88	7.87	65 * 190	AS-2

Note : U_N - RMS Voltage at fundamental frequency without harmonics.
I_N - Rated RMS current (line) at rated voltage and frequency without transients.





Features :

- Metallized polypropylene (MPP) film design.
 - Compact cylindrical aluminum can design.
 - Biodegradable resin/Oil impregnation gives cooling effect.
 - Better heat dissipation.
 - Explosion proof design (over pressure disconnecter)
 - Low losses due to advanced winding and zinc spray equipments.
 - Finger touch proof terminal connectors.
- Metallized polypropylene MPP Film design.
 - Operated at high temperature.
 - Manufactured as per IS 13340/IEC 60831.
 - Highest inrush current withstanding capacity.
 - Suitable design for tough applications.
 - Life expectancy
 - Extended warranty.

Technical Data :	HD-VAR	UXHD
STANDARDS	IS 13340-1/2, IEC 60831-1/2	IS 13340-1/2, IEC 60831-1/2
RATED VOLTAGE (U _N)	400... 525 VOLT	440... 525 VOLT
RATED FREQUENCY	50/60 Hz	50/60 Hz
OVER VOLTAGE	U _N + 10% hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min in every 24 h	U _N + 10% hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min in every 24 h
OVER CURRENT	2.2 * I _N	3.5 * I _N
CAPACITANCE TOLERANCE	-5 to +10% As per standards	-5 to +10% As per standards
TEST VOLTAGE, TERMINAL	2.15 * U _N , AC 2S	2.15 * U _N , AC 2S
TEST VOLTAGE, TERMINAL & CASE	2*U _N + 2 kV or 3 kVac whichever is higher for 10S or 20% higher for 2S	2*U _N + 2 kV or 3 kVac whichever is higher for 10S or 20% higher for 2S
INRUSH CURRENT	Up to 400 * I _N	Up to 500*I _N
LOSSES	<0.20 W/kVAr (dielectric) <0.5 W/kVAr (total)	<0.20 W/kVAr (dielectric) <0.45 W/kVAr (total)
CASING	Cylindrical Aluminium Can	Cylindrical Aluminium Can
ENCLOSURE	IP20	IP20
MEAN LIFE EXPECTANCY	1,80,000 h	2,10,000 h
TEMPERATURE CLASS	-40/55°C	-40/55°C
COOLING	Natural air cooled Casing temp. max 80°C permitted on top of the can	Natural air cooled Casing temp. max 80°C permitted on top of the can
DIELECTRIC SYSTEM	Metallized polypropylene film, Self-healing property	Metallized polypropylene film, Self-healing property
IMPREGNATION	NPCB, Biodegradable natural semi soft resin	NPCB, Biodegradable natural semi soft resin
SAFETY FEATURES	Overpressure sensitive 3 phase disconnecter	Overpressure disconnecter
ALTITUDE	Max. 4000 Meter above sea level	Max. 4000 Meter above sea level
RELATIVE HUMIDITY	Max. 95%	Max. 95%
MOUNTING POSITION	Vertical	Vertical
MOUNTING & EARTHING	M8X10mm, M12X16mm threaded stud, on bottom of case with Nut & Washer	M8X10mm, M12X16mm threaded stud, on bottom of case with Nut & Washer
DISCHARGE RESISTORS	External 3 Minutes, 75V	External 3 Minutes, 75V
TERMINALS	i) HD-VAR - with M5 Screw on double three way terminals ii) HD-VAR BT - with M-10 threaded Stud	UXHD - with M5 Screw on double three way terminals

Note : U_N - RMS Voltage at fundamental frequency without harmonics.
I_N - Rated RMS current (line) at rated voltage and frequency without transients.

HD -VAR + Detuned Series Reactor

	Q _N at 480			7%	
Effective kVAr@440V	7%	MFD X 3	I _N (A) at 480V	L	I
10	11.06	50.95	13.30	4.610	14.43
12.5	13.83	63.69	16.64	3.710	18.04
15	16.59	76.42	19.96	3.090	21.65
25	27.65	127.37	33.26	1.850	36.08

	Q _N at 525			7%	
Effective kVAr@440V	7%	MFD X 3	I _N (A) at 525V	L	I
10	13.23	50.95	14.55	4.610	14.43
12.5	16.54	63.69	18.19	3.710	18.04
15	19.85	76.42	21.83	3.090	21.65
25	33.08	127.37	36.38	1.850	36.08

BOX -VAR + Detuned Series Reactor

	Q _N at 480			7%	
Effective kVAr@440V	7%	MFD X 3	I _N (A) at 480V	L	I
10	11.06	50.95	13.30	4.610	14.43
12.5	13.83	63.69	16.64	3.710	18.04
15	16.59	76.42	19.96	3.090	21.65
25	27.65	127.37	33.26	1.850	36.08
50	55.30	254.75	66.52	0.920	72.16

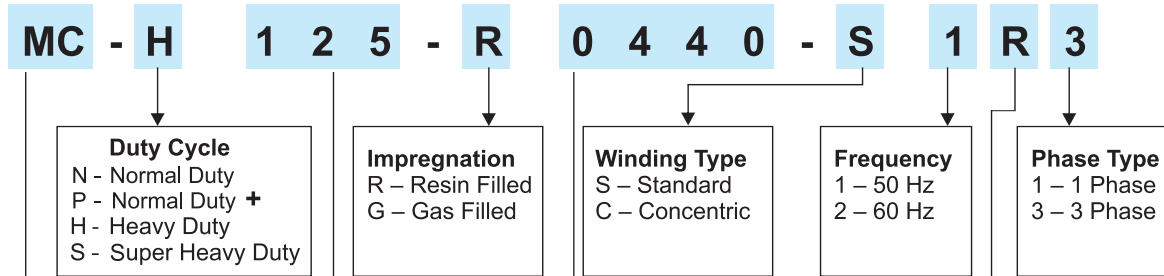
	Q _N at 525			7%	
Effective kVAr@440V	7%	MFD X 3	I _N (A) at 480V	L	I
10	13.23	50.95	14.55	4.610	14.43
12.5	16.54	63.69	18.19	3.710	18.04
15	19.85	76.42	21.83	3.090	21.65
25	33.08	127.37	36.38	1.850	36.08
50	66.15	254.75	72.75	0.920	72.16

APP + Detuned Series Reactor

	Q _N at 480			7%	
Effective kVAr@440V	7%	MFD X 3	I _N (A) at 480V	L	I
10	11.06	50.95	13.30	4.610	14.43
12.5	13.83	63.69	16.64	3.710	18.04
15	16.59	76.42	19.96	3.090	21.65
25	27.65	127.37	33.26	1.850	36.08

	Q _N at 525			7%	
Effective kVAr@440V	7%	MFD X 3	I _N (A) at 525V	L	I
10	13.23	50.95	14.55	4.610	14.43
12.5	16.54	63.69	18.19	3.710	18.04
15	19.85	76.42	21.83	3.090	21.65
25	33.08	127.37	36.38	1.850	36.08

Product identification for placing order



Series
AW - ND-VAR (Plastic top with wire terminals)
MC - ND-VAR (DMC screw type terminals)
FT - HD-VAR (Finger touch IP20 type terminals)
BT - HD-VAR (Bolt type stud terminals)
TC - G-VAR (Finger touch IP20 type terminals)
AS - Agristar (Epoxy top with wire terminals)
SC - BOX-VAR (Container with stud terminals)

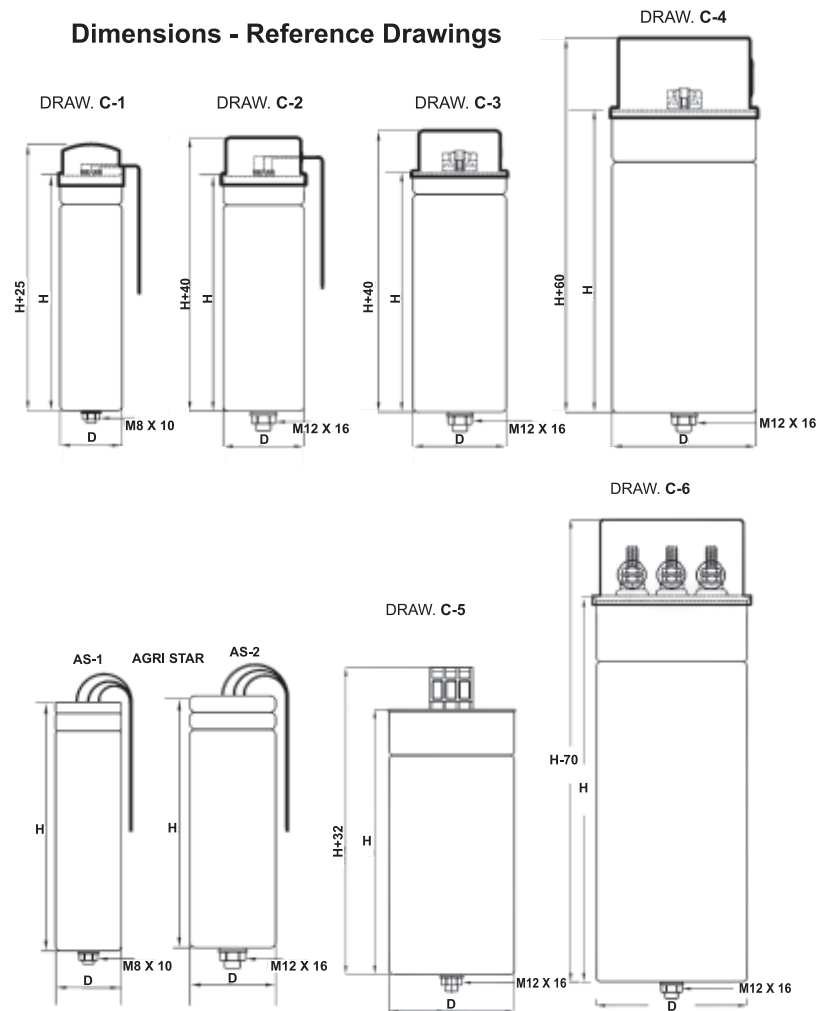
Voltage Rating e.g.
010 - 01.0 kVAr
020 - 02.0 kVAr
030 - 03.0 kVAr
040 - 04.0 kVAr
050 - 05.0 kVAr
075 - 07.5 kVAr
100 - 10.0 kVAr
125 - 12.5 kVAr
150 - 15.0 kVAr
200 - 20.0 kVAr
250 - 25.0 kVAr
300 - 30.0 kVAr
500 - 50.0 kVAr
000 - 100.0 kVAr

Voltage Rating e.g.
230 - 230 Volts
400 - 400 Volts
415 - 415 Volts
440 - 440 Volts
480 - 480 Volts
525 - 525 Volts
600 - 600 Volts
690 - 690 Volts
1000 - 1000 Volts

Capacitor Type
R - Round Cap or (Cylindrical Cap)
S - Square Cap

e.g. (MC-H125-R0440-S1R3)
It Means
DMC Screw Type Terminals - Heavy Duty - 12.5 kVAr - Resin Filled - 440 Volts - Standard Winding - 50 Hz - Cylindrical Cap - 3 Ph - Capacitor

Dimensions - Reference Drawings



HD-VAR Cylindrical - Heavy Duty MPP Capacitor

HD-VAR Series - Heavy Duty - 400 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-R0400-S1R3	5.0	3*33.17	7.22	75*196	C-5
FT-H075-R0400-S1R3	7.5	3*49.76	10.83	75*196	C-5
FT-H100-R0400-S1R3	10.0	3*66.35	14.43	90*203	C-5
FT-H125-R0400-S1R3	12.5	3*82.94	18.04	90*203	C-5
FT-H150-R0400-S1R3	15.0	3*99.52	21.65	90*243	C-5
FT-H200-R0400-S1R3	20.0	3*132.70	28.87	116*243	C-5
FT-H250-R0400-S1R3	25.0	3*165.87	36.09	116*243	C-5
FT-H300-R0400-S1R3	30.0	3*199.04	43.30	116*283	C-5
BT-H400-R0400-S1R3	40.0	3*265.39	57.74	136*346	C-6
BT-H500-R0400-S1R3	50.0	3*331.74	72.17	136*346	C-6

HD-VAR Series - Heavy Duty - 415 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-R0415-S1R3	5.0	3*30.82	6.96	75*196	C-5
FT-H075-R0415-S1R3	7.5	3*46.23	10.43	75*196	C-5
FT-H100-R0415-S1R3	10.0	3*61.64	13.91	90*203	C-5
FT-H125-R0415-S1R3	12.5	3*77.05	17.39	90*243	C-5
FT-H150-R0415-S1R3	15.0	3*92.46	20.87	90*243	C-5
FT-H200-R0415-S1R3	20.0	3*123.28	27.82	116*243	C-5
FT-H250-R0415-S1R3	25.0	3*154.10	34.78	116*283	C-5
BT-H400-R0415-S1R3	40.0	3*246.55	55.65	136*346	C-6

HD-VAR Series - Heavy Duty - 440 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-R0440-S1R3	5.0	3*27.42	6.56	75*196	C-5
FT-H075-R0440-S1R3	7.5	3*41.12	9.84	75*196	C-5
FT-H100-R0440-S1R3	10.0	3*54.83	13.12	90*203	C-5
FT-H125-R0440-S1R3	12.5	3*68.54	16.40	90*203	C-5
FT-H150-R0440-S1R3	15.0	3*82.25	19.68	90*243	C-5
FT-H200-R0440-S1R3	20.0	3*109.67	26.24	116*243	C-5
FT-H250-R0440-S1R3	25.0	3*137.08	32.80	116*243	C-5
FT-H300-R0440-S1R3	30.0	3*164.50	39.37	116*283	C-5
BT-H400-R0440-S1R3	40.0	3*219.33	52.49	136*346	C-6
BT-H500-R0440-S1R3	50.0	3*277.17	65.61	136*346	C-6

HD-VAR Series - Heavy Duty - 480 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-R0480-S1R3	5.0	3*23.04	6.01	75*196	C-5
FT-H075-R0480-S1R3	7.5	3*34.56	9.02	75*196	C-5
FT-H100-R0480-S1R3	10.0	3*46.08	12.03	90*203	C-5
FT-H125-R0480-S1R3	12.5	3*57.59	15.04	90*203	C-5
FT-H150-R0480-S1R3	15.0	3*69.11	18.04	90*243	C-5
FT-H200-R0480-S1R3	20.0	3*92.15	24.06	116*243	C-5
FT-H250-R0480-S1R3	25.0	3*115.19	30.07	116*243	C-5
FT-H300-R0480-S1R3	30.0	3*138.23	36.09	116*283	C-5
BT-H400-R0480-S1R3	40.0	3*184.30	48.11	136*346	C-6
BT-H500-R0480-S1R3	50.0	3*230.38	60.14	136*346	C-6

ULTRA XL Series - Heavy Duty (UXHD) - 440 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-R0440-S1R3	5.0	3*27.42	6.56	75*196	C-5
FT-H075-R0440-S1R3	7.5	3*41.12	9.84	90*203	C-5
FT-H100-R0440-S1R3	10.0	3*54.83	13.12	90*243	C-5
FT-H125-R0440-S1R3	12.5	3*68.54	16.40	100*243	C-5
FT-H150-R0440-S1R3	15.0	3*82.25	19.68	116*243	C-5
FT-H200-R0440-S1R3	20.0	3*109.67	26.24	116*283	C-5
FT-H250-R0440-S1R3	25.0	3*137.08	32.80	136*293	C-5



Features :

- Cylindrical - Gas filled MPP Capacitor.
- Metallized Polypropylene / Wavy cut film design.
- Compact cylindrical aluminum can design.
- Gas impregnation gives cooling effect.
- Better heat dissipation.
- Explosion proof design (over-pressure disconnecter).
- Low losses due to advanced winding and spray equipments.
- Finger touch proof terminal connectors (Scope to parallel connection).

Applications :

- Fixed P.F. correction.
- Automatic P.F. correction.
- Harmonic filter system.
- Wind mills.



Technical Data :

STANDARDS	IS 13340-1/2, IEC 60831-1/2
RATED VOLTAGE (U _N)	400...525 VOLT
RATED FREQUENCY	50/60 Hz
OVER VOLTAGE	U _N + 10% 12 hours in every 24 h U _N + 15% 30 min. in every 24 h U _N + 20% 5 min. in every 24 h U _N + 30% 1 min. in every 24 h
OVER CURRENT	2.2 * I _N
CAPACITANCE TOLERANCE	-5 to +10% As per standards
TEST VOLTAGE, TERMINAL	2.15 * U _N , AC 2S
TEST VOLTAGE, TERMINAL & CASE	2 * U _N +2 kV or 3 kVac whichever is higher for 10S or 20% higher for 2S
INRUSH CURRENT	Up to 400 * I _N
LOSSES	<0.20 W/kVAr (Dielectric), <0.45 W/kVAr (Total)
CASING	Cylindrical Aluminium Can
ENCLOSURE	IP20, on request IP54, Outdoor mounting
MEAN LIFE EXPECTANCY	1,80,000 h
TEMPERATURE CLASS	-40/55°C
COOLING	Natural air cooled Casing temp. max 60°C permitted on top of the can
DIELECTRIC SYSTEM	Metallized polypropylene film, Self-healing property
IMPREGNATION	Inert Gas, Nitrogen (N ₂)
SAFETY FEATURES	Overpressure sensitive 3 phase disconnecter
ALTITUDE	Max. 4000 Meter above sea level
RELATIVE HUMIDITY	Max. 95%
MOUNTING POSITION.	Random
MOUNTING & EARTHING	M12X16mm threaded stud on bottom of case with Nut & Washer
DISCHARGE DEVICE	External 3 Minutes, 75V
TERMINALS	i) G-VAR Cap - with M5 Screw on double three way terminals ii) G-VAR BT Cap - with M-10 threaded Stud

Note : U_N - RMS Voltage at fundamental frequency without harmonics.
I_N - Rated RMS current (line) at rated voltage and frequency without transients.

G-VAR

G-VAR Series - Heavy Duty - 400 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-G0400-S1R3	5.0	3*33.17	7.22	75 * 196	C-5
FT-H075-G0400-S1R3	7.5	3*49.76	10.83	75 * 196	C-5
FT-H100-G0400-S1R3	10.0	3*66.35	14.43	90 * 203	C-5
FT-H125-G0400-S1R3	12.5	3*82.94	18.04	90 * 203	C-5
FT-H150-G0400-S1R3	15.0	3*99.52	21.65	90 * 243	C-5
FT-H200-G0400-S1R3	20.0	3*132.70	28.87	116 * 243	C-5
FT-H250-G0400-S1R3	25.0	3*165.87	36.09	116 * 243	C-5
FT-H300-G0400-S1R3	30.0	3*199.04	43.30	116 * 283	C-5
BT-H400-G0400-S1R3	40.0	3*265.39	57.74	136 * 346	C-6
BT-H500-G0400-S1R3	50.0	3*331.74	72.17	136 * 346	C-6

G-VAR Series - Heavy Duty - 415 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-G0415-S1R3	5.0	3*30.82	6.96	75 * 196	C-5
FT-H075-G0415-S1R3	7.5	3*46.23	10.43	75 * 196	C-5
FT-H100-G0415-S1R3	10.0	3*61.64	13.91	90 * 203	C-5
FT-H125-G0415-S1R3	12.5	3*77.05	17.39	90 * 243	C-5
FT-H150-G0415-S1R3	15.0	3*92.46	20.87	90 * 243	C-5
FT-H200-G0415-S1R3	20.0	3*123.28	27.82	116 * 243	C-5
FT-H250-G0415-S1R3	25.0	3*154.10	34.78	116 * 283	C-5
BT-H400-G0415-S1R3	40.0	3*246.55	55.65	136 * 346	C-6

G-VAR Series - Heavy Duty - 440 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-G0440-S1R3	5.0	3*27.42	6.56	75 * 196	C-5
FT-H075-G0440-S1R3	7.5	3*41.12	9.84	90 * 203	C-5
FT-H100-G0440-S1R3	10.0	3*54.83	13.12	90 * 203	C-5
FT-H125-G0440-S1R3	12.5	3*68.54	16.40	90 * 243	C-5
FT-H150-G0440-S1R3	15.0	3*82.25	19.68	116 * 243	C-5
FT-H200-G0440-S1R3	20.0	3*109.67	26.24	116 * 243	C-5
FT-H250-G0440-S1R3	25.0	3*137.08	32.80	116 * 283	C-5
FT-H300-G0440-S1R3	30.0	3*164.50	39.37	136 * 343	C-5
BT-H400-G0440-S1R3	40.0	3*219.33	52.49	136 * 346	C-6

G-VAR Series - Heavy Duty - 480 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-G0480-S1R3	5.0	3*23.04	6.01	75 * 196	C-5
FT-H075-G0480-S1R3	7.5	3*34.56	9.02	75 * 196	C-5
FT-H100-G0480-S1R3	10.0	3*46.08	12.03	90 * 203	C-5
FT-H125-G0480-S1R3	12.5	3*57.59	15.04	90 * 243	C-5
FT-H150-G0480-S1R3	15.0	3*69.11	18.04	90 * 243	C-5
FT-H200-G0480-S1R3	20.0	3*92.15	24.06	116 * 243	C-5
FT-H250-G0480-S1R3	25.0	3*115.19	30.07	116 * 243	C-5
FT-H300-G0480-S1R3	30.0	3*138.23	36.09	116 * 283	C-5
BT-H400-G0480-S1R3	40.0	3*184.30	48.11	136 * 346	C-6
BT-H500-G0480-S1R3	50.0	3*230.38	60.14	136 * 346	C-6

G-VAR Series - Heavy Duty - 525 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
FT-H050-G0525-S1R3	5.0	3*19.26	5.50	75 * 196	C-5
FT-H075-G0525-S1R3	7.5	3*28.89	8.25	75 * 196	C-5
FT-H100-G0525-S1R3	10.0	3*38.52	11.00	90 * 203	C-5
FT-H125-G0525-S1R3	12.5	3*48.14	13.75	90 * 203	C-5
FT-H150-G0525-S1R3	15.0	3*57.77	16.50	90 * 243	C-5
FT-H200-G0525-S1R3	20.0	3*77.03	21.99	116 * 243	C-5
FT-H250-G0525-S1R3	25.0	3*96.29	27.49	116 * 243	C-5
FT-H300-G0525-S1R3	30.0	3*115.55	32.99	116 * 243	C-5
BT-H400-G0525-S1R3	40.0	3*154.06	43.99	136 * 346	C-6
BT-H500-G0525-S1R3	50.0	3*192.58	54.99	136 * 346	C-6

G-VAR Series - Turbine Cap Heavy Duty - 690 Volts - 50 Hz - 3 Ph - Delta Connection					
Product Code	Output kVAr	Capacitance (in Mfd)	Current (in Amp)	Dimensions D*H (in mm)	Drawing No.
TC-H125-G0690-S1R3	12.5	3*27.87	10.46	90 * 243	C-5
TC-H150-G0690-S1R3	15.0	3*33.45	12.55	90 * 243	C-5
TC-H200-G0690-S1R3	20.0	3*44.59	16.74	116 * 243	C-5
TC-H250-G0690-S1R3	25.0	3*55.74	20.92	116 * 243	C-5