'प्रबोधन'

'PRABODHAN'

CAPACITORS

Seva Engineering Works Pvt. Ltd.

PROFILE

'PRABODHAN CAPACITORS' - *For Power Factor Improvement....*

We are leading manufacturers of L.T. & H.T. shunt capacitors for power factor improvement that find application in any industry or establishment that uses electrical power. Our product is known for quality, performance, & reliability.

****

****

Address	:	Seva Engineering Works Pvt. Ltd. 24, Punit Apartment, 526, Narayan Peth, Opp. Modi Ganapati, Pune - 411 030.
Office	:	020-24450363,
Mobile	:	09422526975
Works	:	02115-222451
Telefax	:	020-24455344,
Email	:	sevaengg@vsnl.net; seva_engg@vsnl.net; prabodhancapacitor@gmail.com
Website	:	www.prabodhancapacitors.in

****

INDEX

INTRODUCTION

Enlisting "PRABODHAN" Make Capacitors in your approved list of Manufacturers of Electrical Equipment.

With reference to the above subject, we are pleased to introduce ourselves as leading Manufacturers of "PRABODHAN" Make L.T/ H.T. Power factor improvement Capacitors & Automatic Power factor improvement Panel. Our factory is located at Saswad, Tal: Purandhar, Dist: Pune, 30 Kms. away from Pune City in Maharashtra. We would like to brief about our product & Manufacturing Unit as under:-

1) **We are Manufacturing "PRABODHAN" Make L.T. & H.T. Shunt Capacitors for p. f. improvement.**
   a) **MPP (Metallised Polypropylene) as per IS 13340.**
   b) **ALL PP (All Polypropylene) as per IS 13585 Part-1.**
   c) **H.T. Capacitors as per IS 13925.**
   d) **L.T. & H.T. A.P.F.C. Panels.**
   e) **L.T. & H.T. Harmonic Filters.**
   f) **Surge Capacitors as per IS 11548.**

   We are having team of highly experienced technical personnel at our works who observe & maintain high quality norms. We are having ISI Mark upto & including 25 KVAR Single Unit & 100 KVAR Capacitor Banks for SH & NSH Designs rated 415 & 440 V.A.C.

2) **Construction :-**
   a) **Each basic element is wound in dust free atmosphere on automatic winding machine with the help of Electrical Grade MPP / PP / High purity Aluminum Foil.**
   b) **Assembly is done with series parallel combination N-PCB Oil is used for impregnation under vacuum for high dielectric strength.**
   c) **In ALL PP Design every internal element is provided with epoxy cast fuse. In case of fault it isolates particular element keeping balance unit in operation.**
   d) **Losses for Capacitors are very low & generally less than 1 watt per KVAR The entire assembly is done in sturdy CRCA Container which is hermetically sealed after impregnation process.**

3) **Our Capacitors are tested at reputed electrical laboratories like ERDA, Vadodara, CPRI Bangalore & have passed all tests.**
   Due to continuous rise in electricity cost every year, it is highly essential to maintain power factor & save energy.

   "PRABODHAN" Capacitor are used for improvement of P.F. for typical applications such as welding machines, induction motors ,power transformers AC Plants induction furnaces In Short, wherever inductive load is in operation.

   We are regularly supplying "PRABODHAN" Capacitors to all Government, Semi Government, Public Sector undertaking companies, Private Industries, Water & Effluent Projects, Steel Rolling mills, Sugar Factories, & they are in satisfactory operation for last 25 Years.

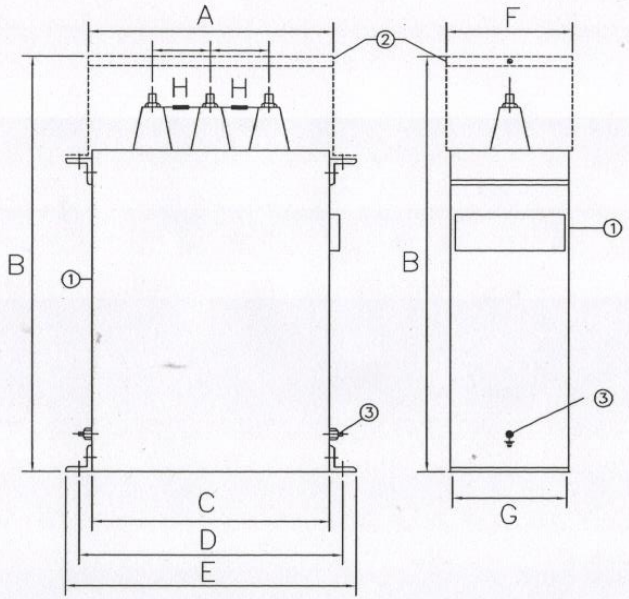
   Our Automatic Power Factor Control Panel is useful for smooth control of P.F.in Installations requiring capacitive correction which varies with the load. The technical features are in rush current limiting inductive coils, contactors & thyristers of appropriate rating & power factor relay.

   We undertake harmonic analysis, Capacitor testing at site & design harmonic fitters.
   We manufacture surge Capacitors & LAVT panels for large generators.

   We request you to kindly include "PRABODHAN" Make Capacitors in your approved list of manufacturers & favour us with valued enquiries for Capacitors & Power Factor Panels.

G. T. P. FOR L.T. MPP CAPACITORS

Make	:	PRABODHAN
Type	:	MPP (Vacuum Impregnated with N-PCB Oil) Dielectric: - PP. Electrode: - Thin layer of metal spread over PP.
Rated Voltage	:	415 / 440 V. A.C.
Supply	:	3 Phase, 50 Cycles A.C.
Max. Service Voltage	:	110% of rated voltage.
Max. Overload Permissible	:	135% of rated current.
Discharge Device	:	External Resistances.
Earthings	:	Two earthing terminals per unit.
Dielectric Loss	:	Approx. 0.2 Watt per KVAR.
Impregnant	:	N-PCB Oil.
Construction	:	Internally Delta.
Ambient	:	50°C.
Enclosure	:	CRCA Steel
Installation	:	In-door floor Mounting.
Paint	:	Siemens Gray.
IS Reference	:	IS-13340.
ISI Mark	:	Up to 25 KVAR Single Unit & 100 KVAR in Bank.



① BASIC CAPACITOR

② TERMINAL COVER

③ EARTHING TERMINALS

NOTE :-

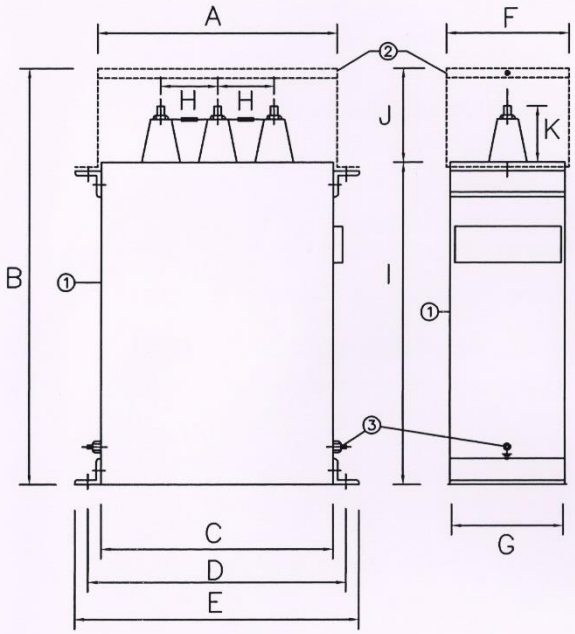
1. ALL DIMENSTION ARE IN MM TOLERANCE ± 5%
2. ALL DIMENSTION ARE FOR 440V, 3 PHASE, 50 C/S. AC CAPACITORS

CAPACITOR DIMENTIONS ARE IN MM								
KVAR	A	B	C	D	E	F	G	H
1	105	180	100	120	145	50	45	30
2	105	205	100	120	145	50	45	30
3	105	225	100	120	145	50	45	30
4	105	240	100	120	145	65	60	30
5	105	255	100	120	145	65	60	30
6	105	225	100	120	160	95	90	30
7	105	230	100	120	160	105	90	30
8	105	240	234	120	160	105	100	30
10	120	265	110	140	165	110	105	32
12.5	160	260	145	175	200	115	105	40
15	180	315	170	200	225	115	105	50
20	180	360	170	200	225	115	105	50
25	180	410	170	200	225	115	105	50

REV.	DRAWN BY	CHKD. BY	DATE		DRN	ASK.	18.02.2010	MANUFACTURER	TITLE :
					CHKD			SEVA ENGINEERING WORKS PVT LTD. SASWAD – DIST – PUNE – 412301	MPP CAPACITORS IS REF. 13340
					APPD.				
					W.O.NO.				DRG. NO. SEWPL /10-18/1 | SHEET NO. 1 OF 1 | REV. 0
					CAD NO.				

G. T. P. FOR L.T. APP CAPACITORS

Make	:	PRABODHAN
Type	:	APP (Vacuum Impregnated with N-PCB Oil) Dielectric: - Both side hazy PP film Electrode: - Aluminum foil
Rated Voltage	:	415 / 440 V. A.C.
Supply	:	3 Phase, 50 Cycles A.C.
Max. Service Voltage	:	110% of rated voltage.
Max. Overload Permissible	:	135% of rated current.
Discharge Device	:	External Resistances.
Earthings	:	Two earthing terminals per unit.
Dielectric Loss	:	Approx. 0.2 Watt per KVAR.
Impregnant	:	N-PCB Oil.
Construction	:	Internally Delta, Extended foil design, With built – in internal fuse for each element.
Ambient	:	50°C.
Protection	:	internal fuses for each element
Enclosure	:	CRCA Steel
Installation	:	In-door floor Mounting.
Paint	:	Siemens Gray.
IS Reference	:	IS-13585 Part -1.
ISI Mark	:	Up to 25 KVAR Single Unit & 100 KVAR in Bank.



1. BASIC CAPACITOR
2. TERMINAL COVER
3. EARTHING TERMINALS

CAPACITOR DIMENSIONS ARE IN MM											
KVAR	A	B	C	D	E	F	G	H	I	J	K
1	122	240	113	143	162	50	44	30	170	75	33
2	122	240	113	143	162	63	58	30	170	75	33
3	122	240	113	143	162	80	75	30	170	75	33
4	122	240	113	143	162	99	95	30	170	75	33
5	122	340	113	143	162	75	70	30	270	75	33
6	122	340	113	143	165	84	78	30	270	75	33
7	122	340	113	143	165	94	89	30	270	75	33
8	122	340	113	143	165	114	105	30	270	75	33
10	245	230	233	265	290	122	115	60	160	75	33
12.5	245	260	233	265	290	122	115	60	210	75	33
15	245	320	233	265	290	122	115	60	250	100	60
20	245	370	233	265	290	122	115	60	310	100	60
25	245	420	233	265	290	122	115	60	370	100	60

NOTE :- ALL DIMENSIONS ARE IN MM
TOLERANCE ± 5%

REV.	DRAWN BY	CHKD. BY	DATE		DRN	SEVA	23.01.2014	MANUFACTURER	TITLE : APP CAPACITORS, 440 V. A.C. 3 PH, 50 HZ IS REF. 13585 PART-1		
					CHKD			SEVA ENGINEERING WORKS PVT LTD. SASWAD – DIST – PUNE – 412301			
					APPD.				DRG. NO. SEWPL/11/14-1	SHEET NO. 1 OF 1	REV. 0
					W.O.NO.						
					CAD NO.						

भारतीय मानक ब्यू
BUREAU OF INDIAN STANDAI

Pune Branch Office

Addres Plot No. 657 to 660,MAIDC Build
s: Market Yard, Gultekdi
Pune-411037
Phones 020-24274803,4,5,6,7
:
Fax: 020-24268659
E-Mail:pnbo@bis.org.in
web : http://www.bis.org.in

ATTACHMENT TO LICENCE NO. CM/L- 7371676

CML/NO	NAME OF THE LICENSEE WITH THE ADDRESS	NAME OF THE PRODUCT	IS NO.
7371676	SEVA ENGG WORKS S.NO. 566/7 SASWAD TALUKA PURANDAR Distt : Pune Maharashtra 412301	Power Capacitors of Self-healing Type for AC Power Systems having Rated Voltage up to 1000 V - Specification	IS 13340 : 1993

ENDORSEMENT NO. 9 Dated..... 27 Apr 2015

Renewed for a further period of two years from **Seventeenth April Two Thousand and Fifteen** to **Sixteenth April Two Thousand and Seventeen**

Other terms and conditions of Licence remain the same.

नविंद्र गौतम

Navindra Gautam)
Sc C

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

Pune Branch Office

Address : Plot No. 657 to 660,MAIDC Building,
Market Yard, Gultekdi
Pune
411037
Phones : 020-24274803,4,5,6,7

Fax : 020-24268659
E-mail : pnbo@bis.org.in
Web : http://www.bis.org.in

ATTACHMENT TO LICENCE NO. CM/L- 1440942

CML NO	NAME OF THE LICENSEE WITH ADDRESS	PRODUCT	IS NO
1440942	SEVA ENGG WORKS S.NO. 566/7 SASWAD TALUKA PURANDAR Pune Maharashtra 412301	Shunt capacitors of non self healing type for ac power systems having a rated voltage upto and including 650 v	IS 13585 : Part 1 : 1994

ENDORSEMENT NO. 25 Dated - 22/07/2014

Renewed for a further period from Sixteenth August Two Thousand and Fourteen to Thirty First July Two Thousand and Sixteen.

Other terms and conditions of Licence remain the same.

Shyam Kumar
23/07/14
(Shyam Kumar)
Scientist B

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
Certificate No. : T-0071

TEST REPORT

NAME & ADDRESS OF CUSTOMER.	REPORT NO.: HCCT/06/342 DATED: 10/06/2010
Seva Engineering Works Pvt. Ltd. 24, Punit Apartment, 526, Narayan Peth, Opp. Modi Ganapati, Pune – 411 030.	**CUSTOMER REF. NO.:** SEWPL/VYT/1052 **DATE:** 04-05-2010
	DATE OF SAMPLE RECEIPT: 05/05/2010 **DATE OF TESTING:** 02/06/2010 & 07/06/2010
SAMPLE DESCRIPTION **MPP POWER CAPACITOR** 25 kVAr, 440 V, 50 Hz, Δ, 3Φ MPP/ SH/ NPCB, 50°C, 32.81A, Insulation Level: 3/- kV ac Discharge Device: Res E	**SAMPLE IDENTIFICATION** **ERDA ID NO.:** HCCT-213 **SR. NO.:** M3332 **BRAND NAME :** "PRABODHAN" **MAKE:** SEVA ENGINEERING WORKS PVT. LTD. **REF. IS:** 13340 **YEAR:** 2010
TEST DETAILS As per sheet 2 of 4.	**TEST SPECIFICATION** As per IS:13440-1993 with Amendment Nos. 1 & 2, March 2002 & June 2002 respectively.
REMARKS: The capacitor **CONFORMS** to the requirements of the above mentioned ISS in tests carried out.	
PREPARED BY	**CHECKED BY** / **APPROVED BY**

Note: 1. This report relates only to the particular sample received in good condition for testing at E.R.D.A.
2. This report cannot be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from Director, E.R.D.A.
4. Only the tests asked for by the customer have been carried out.

TE0460838

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT NO.: HCCT/06/342 **DATE:** 10.06.2010

Test Details:

1) Sealing Test (Cl. No.: 14)
2) Insulation Resistance Test (Cl. No,: 16)
3) AC Voltage Test Between Terminals (Cl. No.: 18)
4) Test For Output and Capacitance (Cl. No.: 15)
5) Capacitor Loss Tangent (Tan δ) Measurement (Cl. No.: 17)
6) AC Voltage Test Between Terminals and Container (Cl. No.: 19)
7) Test For Discharge Device (Cl. No.: 20)
8) Thermal Stability Test (Cl. No.: 21)
9) Capacitor Loss Tangent (Tan δ) Measurement at Elevated Temperature (Cl. No.: 22)

PREPARED BY **CHECKED BY**

High Voltage Products Division • ERDA • Vadodara •

TE0460833

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT NO.: HCCT/06/342 **DATE:** 10.06.2010

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
1.	Sealing Test (Cl. No.: 14)	No leakage shall be observed after keeping the capacitor at (20 ± 2)°C above rated temperature for 2 hours.	Kept at 70°C No Leakage Observed	Conforms
2.	Insulation Resistance Test (Cl. No.: 16)	Insulation resistance between terminals and capacitor container shall not be less than 50 M ohms.	>50 M ohms at 29°C	Conforms
3.	Ac Voltage Test Between Terminals (Cl. No.: 18)	Capacitor shall withstand 1.75 Un ac (3 phase) for 10 seconds.	Withstood, No puncture or flashover observed.	Conforms
4.	Test For Output And Capacitance (Cl. No.: 15)	-5% to +10% of 25 kVAr Cn = 205.520 μF The ratio of max. to min. value of the capacitance measured between any two line terminals shall not exceed 1.05	25.986 kVAr Capacitance between, 1&2 = 213.590 μF 2&3 = 213.693 μF 3&1 = 213.590 μF $C_{MAX.}/C_{MIN.} < 1.05$	Conforms
5.	Capacitor Loss Tangent (Tan Δ) Measurement (Cl. No.: 17)	Tan δ shall be ≤ 0.0025 1 & (2 & 3 short) 2 & (3 & 1 short) 3 & (1 & 2 short)	 0.00072 0.00089 0.00073	Conforms
6.	Ac Voltage Test Between Terminals And Container (Cl. No.: 19)	Capacitor shall withstand 3.0 kV rms ac for 1 minute, between all the terminals connected together and container.	Withstood, No puncture or flashover observed.	Conforms

PREPARED BY **CHECKED BY**

High Voltage Products Division • ERDA • Vadodara

TE0460834

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT NO.: HCCT/06/342 **DATE:** 10.06.2010 **SHEET** 4 **OF** 4

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
7.	Test For Discharge Device (Cl. No.: 20)	The test shall be made with a dc voltage of 1.4 Un and then the capacitor shall be disconnected. The voltage shall reduce to 50 V. within 1 minute.	50 V D.C. at 46th second.	Conforms
8.	Thermal Stability Test (Cl. No.: 21)	The capacitor was kept in a hot air circulating chamber at a temp. of 50±2°C ambient, then energized at 1.44 times the rated kVAr for 48 hrs. In last 10 hours, the change in temp. rise near the top of container shall not be >2°C. Change in capacitance shall not be > 2%. The value of the second measurement of loss angle shall not be greater than the first by more than 0.0002.	Hr. Oven °C Cap. °C 38 50.2 56.9 40 50.2 56.9 42 50.2 56.9 44 50.1 56.9 46 50.1 56.9 48 50.1 56.9 Capacitance before test between 1&2 = 213.590 µF 2&3 = 213.693 µF 3&1 = 213.590 µF Capacitance after test between 1&2 = 213.331 µF 2&3 = 213.432 µF 3&1 = 213.331 µF	Conforms
9.	Capacitor Loss Tangent (Tan Δ) Measurement At Elevated Temperature (Cl. No.: 22)	Tan δ, Between 1 & (2-3 short) 2 & (3-1 short) 3 & (1-2 short) Tan δ, Between 1 & (2-3 short) 2 & (3-1 short) 3 & (1-2 short) Tan δ ≤ 0.0025 1 & (2-3 short) 2 & (3-1 short) 3 & (1-2 short)	Tan δ before test 0.00072 0.00089 0.00073 Tan δ after test 0.00075 0.00096 0.00079 0.00074 0.00091 0.00074	Conforms

TE0460835

PREPARED BY **CHECKED BY**

High Voltage Products Division • Vadodara •

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT

NAME & ADDRESS OF CUSTOMER. **Seva Engineering Works Pvt. Ltd.** 24, Punit Apartment, 526, Narayan Peth, Opp. Modi Ganapati, Pune – 411 030.	**REPORT NO.:** HCCT/06/343 **DATED:** 10.06.2010 **CUSTOMER REF. NO.:** SEWPL/VYT/1051 **DATE:** 04-05-2010	
	DATE OF SAMPLE RECEIPT	**DATE OF TESTING**
	05.05.2010	02.06.2010 to 10.06.2010
SAMPLE DESCRIPTION **APP Type 25 kVAr Power Capacitor** 25 kVAr, 440V, 50°C, 32.81A, PP, NPCB, 3-Ø, Δ, 50 Hz, Insulation Level: 3/- kV ac, Discharge Device: RES E Year : 2010	**SAMPLE IDENTIFICATION** **ERDA ID NO**: HCCT-214 **SR. No.:** 2049 **BRAND NAME:** "PRABODHAN" **REF IS:** IS: 13585 (Part 1) **MAKE:** SEVA ENGINEERING WORKS PVT. LTD.	
TEST DETAILS As per sheet 2 of 5.	**TEST SPECIFICATION** IS: 13585(Part-1):1994,Amend.No.1:June 2002	
REMARKS: The capacitor **CONFORMS** to the requirements of the above mentioned ISS in the tests carried out.		
PREPARED BY	**CHECKED BY**	**APPROVED BY**

Note:1. This report relates only to the particular sample received for testing in good condition at E.R.D.A.
2. This report cannot be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from Director, E.R.D.A.
4. Only the tests asked for by the customer have been carried out.

High Voltage Products Division Vadodara

TE0460836

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

Test Details:

1) Sealing Test (Cl. No.: 14)
2) Measurement of output and capacitance (Cl. No.: 15)
3) Insulation resistance between terminals and container (Cl. No.: 16)
4) Capacitor loss tangent (Tan δ) measurement (Cl. No.: 21)
5) Voltage test between terminals (Cl. No.: 17)
6) AC voltage test between terminals and container (Cl. No.: 18)
7) Test of discharge device (Cl. No.: 19)
8) Thermal stability test (Cl. No.: 20)
9) Capacitor loss tangent (Tan δ) measurement at elevated temperature (Cl. No.: 21)
10) Short circuit discharge test (Cl. No.: 24)

PREPARED BY **CHECKED BY**

High Voltage Products Division • Vadodara •

TE 0460828

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT NO. HCCT/06/343 **DATE:** 10.06.2010 **SHEET** 3 **OF** 5

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
1.	Sealing Test (Cl. No.: 14)	No leakage shall be observed after keeping the capacitor at 80 ± 5°C for 2 hours.	No Leakage Observed	Conforms
2.	Measurement of Output and Capacitance (Cl. No.: 15)	-5% to +10% of 25 kVAr Cn = 205.520 µF The ratio of max to min value of the capacitance measured between any two line terminals shall not exceed 1.05. The value of line current shall not differ by more than 5% from the highest value.	25.777 kVAr, Capacitance between terminals 1&2 = 211.826 µF 2&3 = 211.025 µF 3&1 = 211.876 µF I_1 = 33.663 A I_2 = 33.520 A I_3 = 33.524 A	Conforms
3.	Insulation Resistance Between Terminals and Container (Cl. No.: 16)	Shall not be less than 50 M ohms	>50 MΩ 29.5°C	Conforms
4.	Capacitor Loss Tangent (tan δ) Measurement (Cl. No.: 21)	Tan δ ≤ 0.0025 1 & (2 & 3 short) 2 & (3 & 1 short) 3 & (1 & 2 short)	 0.00053 0.00072 0.00044	Conforms
5.	Voltage Test Between Terminals (Cl. No.: 17)	Capacitor shall withstand 4.3 Un D.C., for 10 Seconds.	Withstood	Conforms
6.	AC Voltage Test Between Terminals and Container (Cl. No.: 18)	Capacitor shall withstand 3.0 kV rms for 1 minute for indoor type sample & under artificial rain for outdoor type sample.	Withstood No Puncture / flashover occurred , under dry condition	Conforms
7.	Test of Discharge Device (Cl. No.: 19)	The capacitor shall be charged with a dc voltage of 1.4 Un and then it is disconnected from source. The voltage shall reduce to 50 V. within 1 minute.	50 V. D.C. at 46th second	Conforms

PREPARED BY **CHECKED BY**

High Voltage Products Division Vadodara

TE 0460829

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT NO. HCCT/06/343 **DATE:** 10.06.2010

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
8.	Thermal Stability Test (Cl. No.: 20)	The capacitor was kept in a hot air circulating chamber at a temp. of 50±2°C ambient, then energized at 1.44 times the rated kVAr for 48 hrs. In last 10 hours, the change in temp. rise near the top of container shall not be >2°C. Change in capacitance shall not be > 2%. The value of the second measurement of loss angle shall not be greater than the first by more than 0.0002.	Hr. Cap. °C Oven °C 38 53.6 50.1 40 53.6 50.1 42 53.6 50.1 44 53.7 50.2 46 53.8 50.2 48 53.8 50.2 Capacitance before test between 1&2 = 211.826 µF 2&3 = 212.025 µF 3&1 = 211.876 µF Capacitance after test between 1&2 = 212.158 µF 2&3 = 212.308 µF 3&1 = 212.208 µF Between — Tan δ before test 1 & (2-3 short) — 0.00053 2 & (3-1 short) — 0.00072 3 & (1-2 short) — 0.00044 Between — Tan δ after test 1 & (2-3 short) — 0.00054 2 & (3-1 short) — 0.00073 3 & (1-2 short) — 0.00046	Conforms
9.	Capacitor Loss Tangent (Tan Δ) Measurement At Elevated Temperature (Cl. No.: 22)	Tan δ ≤ 0.0025 1 & (2-3 short) 2 & (3-1 short) 3 & (1-2 short)	0.00051 0.00070 0.00042	Conforms

PREPARED BY **CHECKED BY**

High Voltage Products Division ERDA Vadodara

TE 0460830

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT NO. HCCT/06/343 **DATE:** 10.06.2010 **SHEET** 5 **OF** 5

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
10.	Short Circuit Discharge Test (Cl. No.: 24)	Apply 2 Un dc, between capacitor terminals 1 & [2-3] shorted and discharge 5 times within 10 min. Apply 4.3Un dc for 10 seconds. Change in Capacitance shall not be > 2%.	Capacitance before test between 1&2 = 212.158 µF 2&3 = 212.308 µF 3&1 = 212.208 µF Capacitance after test between 1&2 = 212.092 µF 2&3 = 212.292 µF 3&1 = 212.192 µF	Conforms

PREPARED BY **CHECKED BY**

High Voltage Products Division Vadodara

TE 0460831

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

TEST REPORT

NAME & ADDRESS OF CUSTOMER	**REPORT NO.:** HCCT/06/193 **DATED:** 20.05.2010
Seva Engineering Works Pvt. Ltd. 24, Punit Apartment, 526, Narayan Peth, Opp. Modi Ganapati, Pune – 411 030.	**CUSTOMER REF. NO.:** SEWPL/VYT/1050 **DATE:** 04-05-2010

DATE OF SAMPLE RECEIPT	**DATE OF TESTING**
05.05.2010	11.05.2010 & 20.05.2010

SAMPLE DESCRIPTION	**SAMPLE IDENTIFICATION**
H.T. SHUNT CAPACITOR FOR AC POWER SYSTEM 50 kVAr, 7200V, 6.95A, 50°C, PP/NPCB, 1 Phase, 50 Hz, Insulation Level: 20/60 kV Internal Fuse: Provided Discharge Device : RES I, Warning Instruction: Marked in RED colour	**ERDA ID NO. :** HCCT- 212 **Sr. No. :** 2087 **Brand Name :** "PROBODHAN" **Year:** 2010 **Ref.:** IS – 13925 Part 1 **Make:** Seva Engineering Works Pvt. Ltd.

TEST DETAILS	**TEST SPECIFICATION**
Routine & Type Tests [Except Impulse] (Cl. No. 12.1 & 12.2)	As per IS:13925 (part 1) - 1998 with Amendment No. 1 December 2004

REMARKS: The capacitor **CONFORMS** to the requirements of the above mentioned ISS in the above mentioned tests.

PREPARED BY **CHECKED BY** **APPROVED BY**

Note: 1. This report relates only to the particular sample received for testing in good condition at ERDA.
2. This report cannot be reproduced in part under any circumstances.
3. Publication of this report requires prior permission in writing from Director, ERDA.
4. Only the tests asked for by the customer have been carried out.

High Voltage Products Division • Vadodara

TE 0419592

Certificate No. : T-0071

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org

REPORT NO.: HCCT/06/193 **DATE:** 20.05.2010 **SHEET** 2 **OF** 3

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
1.	Sealing Test (Cl. No.: 19)	No leakage shall be observed after keeping the capacitor at 80 ± 5°C for 4 hours after attaining the container temperature of 75-85°C.	No Leakage Observed	Conforms
2.	Measurement Of Capacitance (Cl.No.:14)	-5% to +15 % of Cn for capacitor units or banks. Cn =3.070 μF The change in capacitance Before and After voltage test shall be ≤ 2% Qn = 50 kVAr	Capacitance between terminals; before voltage test 3.057 μF, after voltage test 3.053 μF Q = 48.748 kVAr	Conforms
3.	Voltage Test Between Terminals (Cl. No.: 16)	Capacitor shall withstand 4.3 Un d.c. for 10 Secs. Neither puncture nor flashover shall occur.	Withstood	Conforms
4.	AC Voltage Test Between Terminals & Container (Cl. No.: 17)	Capacitor shall withstand 28 kV r.m.s. a.c. for 10 sec. Neither puncture nor flashover shall occur.	Withstood	Conforms
5.	Test Of Discharge Device (Cl. No.: 18)	The capacatior shall be charged at a voltage of √2 Un dc and then shall be disconnected from source. The voltage shall reduce to 75 Volts within 10 minutes.	< 75 Volts d.c. within 10 minutes.	Conforms
6.	Capacitor Loss Tangent (Tan δ) Measurement (Cl. No.: 15)	Tanδ ≤ 0.0010	0.000075	Conforms
7.	Insulation Resitance Test (As per customer's requirement)	500 V. DC applied between terminals connected together and container for 1 minute.	150 GΩ observed at 40°C	---

TE 0419593

PREPARED BY **CHECKED BY**

High Voltage Products Division • Vadodara •

ELECTRICAL RESEARCH AND DEVELOPMENT ASSOCIATION
(Accredited by the National Accreditation Board for Testing and Calibration Laboratories, Govt. of India)
ERDA Road, Makarpura Industrial Estate, Vadodara-390 010, India.
EPABX : +91 (0265) 2642942, 2642964, 2642377, 3043128 / 29 / 30 / 31 / 33,
Fax : +91 (0265) 2638382
E-mail : erda@erda.org
Web : http://www.erda.org
Certificate No. : T-0071

REPORT NO.: HCCT/06/193 **DATE:** 20.05.2010 **SHEET** 3 **OF** 3

Sr. No.	Particulars of Tests & Cl. No.	Requirement as per Specification	Obtained Value	Remarks
8.	Thermal Stability Test (Cl. No.: 20)	The capacitor shall be placed between two dummy units in an enclosure at (55±2)°C and energized at a voltage to give 1.44 x rated kVAr for 48 hours. In last 10 hrs., temp. rise near the top of container shall not be > 1°C Change in capacitance shall not be > 2%.	Hr. Oven °C Cap °C 38 56.5 64.3 40 56.5 64.4 42 56.7 64.7 44 56.9 64.9 46 57.0 65.3 48 57.0 65.4 Capacitance before test between terminals 3.053 µF Capacitance after test between terminals 3.050 µF	Conforms
9.	Capacitor Loss Tangent (Tan δ) at Elevated Temperature (Cl. No.: 21)	Tan δ ≤ 0.0010	0.000080	Conforms
10.	Short Circuit Discharge Test (Cl. No.: 23)	The unit shall be charged at 2.5 Un dc and then discharged through a gap. It shall be subjected to five such discharges within 10 minutes. Then it shall be subjected to voltage test between terminals. The Change in Capacitance shall not be > 2%.	Capacitance before test between terminals 3.050 µF Capacitance after test between terminals 3.055 µF	Conforms

PREPARED BY **CHECKED BY**

High Voltage Products Division * Vadodara *

TE 0419594

3.3 KV Capacitors 21

CENTRAL POWER RESEARCH INSTITUTE,
BANGALORE-560 012

REPORT OF TEST

Date : 2.11.88

Test Report No. : CC- 2686
Test requested by : M/s.Seva Engineering Works Pvt. Ltd., Pune
Reference No. & Date : SEW/134/88/3259 dt 14.9.88
Material tested : 3.3 Kv 83 KVAR Shunt capacitor.

Description of the sample(s) : (As reported by the client)

a) Sl. No. 307
b) Type/Batch Number -
c) Voltage rating 3.3Kv
d) Current 14.5A
e) Capacity 83 KVAR
f) Frequency 50 Cycles
g) Method of connections : ~~single phase~~ three phase delta connected
h) Temperature category : 45°C
i) Type of Dielectric used M
j) Type of impregnant NPCB
k) Insulation level : 16 Kv
l) Total weight : 80 Kgs
m) ISI Sealing -
n) Code -

No. of samples tested : One

Test conducted : All routine and Type tests as per IS : 2834-1981 / 1986

THIS REPORT CONSISTS OF THE FOLLOWING

No. of Pages :

CONTINUATION SHEET No. One

Test Report No. CC - 2686 Date 2.11.88

TEST RESULTS

Sl.No. of the sample: 307 Capacity: 83 KVAR

Type tests as per IS:2834-1986

The following tests were carried out on the sample as desired by the client.

1. Voltage test between terminals: (As per Cl.16.1(a))

Between terminals 1 and 2 withstood 14.2 KvDC for 10 seconds
Between terminals 2 and 3 withstood 14.2 KVDC for 10 seconds
Between terminals 3 and 1 withstood 14.2 KVDC for 10 seconds

2. Voltage test between terminals and container: (As per Cl.16.2

Between terminals 1,2 & 3 shorted against the body grounded: Withstood 16 KVAC for 60 seconds

3. Dielectric Loss Angle test: (As per Cl.14.1)

Tan delta between terminal No.1 and 2,3 connected together	0.000685
Tan delta between terminal No.2 and 3,1 connected together	0.000780
Tan delta between terminal No.3 and 1,2 connected together	0.000684
Mean value	0.000716

4.(a) Thermal Stability Test: (As per Cl.15)

Cooling air temperature in the enclosure: 50°C

a) Tan delta after 38 hours	0.000436
b) Tan delta after 40 hours	0.000429
c) Tan delta after 42 hours	0.000425

CENTRAL POWER RESEARCH INSTITUTE
CONTINUATION SHEET No. Two

Test Report No. CC - 2686 Date 2.11.88

TEST RESULTS

d) Tan delta after 44 hours	0.000420
e) Tan delta after 46 hours	0.000420
f) Tan delta after 48 hours	0.000418

b) Capacitance measurement (As per Cl.15.2.4)

Capacitance of the sample before Stability test	12.98 Microfarads at 30°C
Capacitance of the sample after stability test	12.96 Microfarads at 30°C

NOTE: 1) The dielectric loss angle measurements, whereever applicable, were measured with discharge device fitted inside the capacitor sample.

2) This is only a test report giving results of tests on the sample supplied by the customer. It is not a performance evaluation report.

(S. RAMA PRASATH)
E.O.II

LIST OF CUSTOMERS USING
'PRABODHAN' MAKE H.T. CAPACITORS
(Up to 12.6 KV)

1. Kirloskar Brothers Ltd. Pune / Bangalor.
2. Jyoti Ltd. Vadodara.
3. Mather & Platt Pumps Ltd. Pune.
4. WPIL Ltd. Kolkatta.
5. Walchandnagar Industries Ltd. Pune.
6. Pune Municipal Corporation.
7. Pimpri Chinchwad Municipal Corporation.
8. Solapur Municipal Corporation.
9. Mumbai Municipal Corporation.
10. Aurangabad Municipal Corporation.
11. Ashwini Naval Hospital. Mumbai.
12. IVRCL Pune.
13. Adani Power Maharahtra Ltd.
14. Jamkhandi Sugars Ltd.
15. Nirani Sugars Ltd.
16. Gems Sugars Ltd.

LIST OF USERS
'PRABODHAN' MAKE L. T. & H.T. CAPACITORS

Sr. No.	Name of Client
1.	Mahindra and Mahindra Ltd.,
2.	Walchandnagar Industries Ltd., (Project Division Pune)
3.	Finolex Cables Ltd., Pune, Goa & Ratnagiri
4.	Theramx Ltd., (All Divisions)
5.	Alfa Lavel Ltd., Pune
6.	Century Enka Ltd., Pune / Mahad
7.	Godrej (GE) Appliances Ltd., Shirwal
8.	National Heavy Engg. Co-op. (Project Division), Talegaon Dabhade, Dist. Pune
9.	Serum Institute Ltd., Pune
10.	Bharat Forge Ltd., Mundhava / Chakan, Pune
11.	Kalyani Forge Ltd., Chakan
12.	Jejuplast Ltd., Jejuri MIDC
13.	Kimbarle Clark Ltd., Sanaswadi, Pune
14.	Bajaj Auto Ltd. Akurdi, Pune & Aurangabad
15.	Sudarshan Chemicals Ltd., Pune / Mahad
16.	Rathi Dychem Ltd., Pune / Roha
17.	B.S.E.S. Ltd.,Contract Division, Pune
18.	CNP Security Press, Nashik
19.	Force Motors Ltd., Akurdi, Pune
20.	Jaya Hind Industries Ltd., Akurdi, Pune
21.	Central Public Works Division (Elect.) Pune
22.	C.I.D. Co. of Maharashtra Ltd.
23.	MIDC (E/M) Divisions
24.	Kirloskar Brothers Ltd., Projects Division Pune.
25.	Mather & Platt Ltd., Chinchwad.
26.	Jyoti Ltd., Vadodara.
27.	Worthington Pumps Ltd., Kolkatta.
28.	Flowmore Ltd. Delhi.
29.	Telco, Maval Foundry, Maval
30.	Deptt. Of Tele Communication, Lucknow
31.	Ahmednagar Forgings Ltd., Ahmednagar
32.	Mahindra British Telecom Ltd., Pune
33.	Pune Municipal Corporation, Pune
34.	JBM Tools Ltd., Chakan, Dist- Pune
35.	Mahati Electricals, Pune
36.	German Remedies Ltd. Goa
37.	Goa Carbon Ltd., Goa
38.	Mahindra & Mahindra Ltd., Mumbai / Nashik & Jahirabad
39.	Almost all Co-Op. Sugar Factories in Maharashtra.

SALES DETAILS (OUT OF COUNTRY)

Sr. No.	Exporter	Customer	Description of Goods	Qty.
1	ISGEC Heavy Engiineering Ltd. A-4 , Sector 24 Noida.	Wonji/Shoa Sugar Factory Expansion Project Ethiopia	L. T. Cubicle 100 KVAR, 440 V. A.C. 3 Ph, 50 C/s.	5 Nos.
			L. T. Cubicle 50 KVAR, 440 V. A.C. 3 Ph, 50 C/s.-	2 Nos
2	ISGEC Heavy Engiineering Ltd. A-4 , Sector 24 Noida.	CAN THO SUGAR JOINT STOCK COMPANY (CASUCO) VIETNAM	APP Capacitor Bank 25 KVAR, 380 VAC, 3 Phase, 50 C/s	1 No.
			APP Capacitor Bank 10 KVAR, 380 VAC, 3 Phase, 50 C/s	1 No.
3	ISGEC Heavy Engiineering Ltd. A-4 , Sector 24 Noida.	Sugar Corporation of Uganda Lugazi (Scoul), Uganda 3500TCD White Sugar Plant	100 KVAR (25 KVAR X 4 nos.) Capacitor Bank with Reactor	1 No.
			75 KVAR (25 KVAR X 3 nos.) Capacitor Bank with Reactor	1 No.
4	Walchandnagar Industries Ltd ,	M/s. Kamadhenu Ventures Cambodia Ltd.	100 KVAR (25 KVAR X 4 nos.) Capacitor Bank with fuse & box	2 Nos.
			75 KVAR Bank (25 KVAR X 3 Nos.)	1 No.
5	Walchandnagar Industries Ltd ,	M/s Konkola Copper Mines PLC - Zambia	APP Capacitor Bank 50 KVAR, 525 VAC, 3 Phase, 50 C/s	10 Nos.
			APP Capacitor Bank 50 KVAR, 525 VAC, 3 Phase, 50 C/s	6 Nos.
6	Walchandnagar Industries Ltd ,	M/s Zambezi Portland Cement Africa	APP Capacitor Bank 50 KVAR, 400 VAC, 3 Phase, 50 C/s	1 No.
			APP Capacitor Bank 75 KVAR, 400 VAC, 3 Phase, 50 C/s	1 No.
7	A.B. Power System Solution, Pune	Ceylon Heavy Industries & Construction Company Ltd. Shri Lanka	600 KVAR (150 K X 4) 6.6 KV 3 Phase, 50 C/s AC	2 Nos.
			300 KVAR (150 K X 2) 6.6 KV 3 Phase, 50 C/s AC	2 Nos.
8	Exporter In Ahmedabad	South Africa & Tanzania for Rolling Mills	100 KVAR Bank	4 Nos.
			25 KVAR Bank	8 nos.
9	Hi-Tech Electromech Pvt. Ltd. Baramati.	Kibos Sugars & Allied Ind. Ltd Africa	25 KVAR Bank	2 nos.
			50 KVAR Bank	37 nos.
			75 KVAR Bank	2 nos.
			100 KVAR Bank	3 nos.
10	ISGEC Heavy Engiineering Ltd. A-4 , Sector 24 Noida.	KWALE INTERNATIONAL SUGAR CO. LTD. KENYA	400 KVAR, 11 KV, 3 Phase H.T. Capacitor Panel for fiberizor Motor	
			L.T. Detuned Reactors	
11	ISGEC Heavy Engiineering Ltd. A-4 , Sector 24 Noida.	BUTALI SUGAR MILLS LIMITED Africa	L.T. Detuned Reactors	
12	ISGEC Heavy Engiineering Ltd. A-4 , Sector 24 Noida.	MALAWI SUGAR MILLS LIMITED Africa	L.T. Detuned Reactors	

List of Sugar factories where our 11 KV H. T. Capacitor Panels are connected to 11 KV Fiberizer Motor & are working satisfactorily: -

1) **Malegaon S.S.K. Ltd.**
   Shivnagar, Tal. Baramati, Dist. Pune.

2) **Shri. Someshwar S.S.K. Ltd.**
   Someshwarnagar. Tal. Baramati, Dist. Pune.

3) **Kisanveer Satara Sah. Sakhar Karkhana Ltd.**
   Bhuinj, P.O. Kisanveer Nagar – 415 530, Tal. Wai, Dist. Satara (Maharashtra)

4) **Sadguru Sri Sri Sakhar Karkhana Ltd.**
   Sri Sri Nagar,Rajewadi, Taluka-Atpadi, District- Sangli

5) **Venkateshkrupa Sugar Mills Ltd.**
   A/p. Jategaon BK., Tal-Shirur, Dist. Pune.

6) **Shree Datta S.S.S.K. Ltd. Shirol**
   Jayshingpur, Dist. Sangli

7) **SMS Mohite Patil SSK Ltd.**
   Shankarnagar, Akluj, Dist – Solapur.

8) **Doodhganga Vedganga sahakari sakhar karkhana**
   Post – Bidri, Taluka – Kagal, Dist – Kolhapur – 416 208.

9) **Shri. Dudhganga Krishna S.S.K. Ltd.**
   Chikadi – 591 247, Belgaum District.

10) **M/s. Jamkhandi Sugars Limited.,**
    At: Hirepadasalagi,Post: Naganur - 587 301, Tq: Jamkhandi Dt: Bagalkot, Karnataka (INDIA)

11) **Prabhulingeshwar Sugar Works Ltd**
    Location Siddapur, Teh. Jankhandi, Dist. - Bagalkot.

12) **Nirani Sugar Ltd. Mudhol, Karnataka.**

13) **ISGEC heavy Engg. Ltd. Noida. A/c. Kwale International Sugar Co Ltd. Project**

14) **Daund Sugar Ltd.**
    Alegaon, Tal. Daund. Dist. Pune.

15) **Shri. Ambalika Sugar Pvt. Ltd.**
    Ambikanagar, Rashin, Dist. Ahmednagar.

16) **JAKRAYA SUGAR LTD. MANGALWEDHA**

17) **VRL Automation Pvt. Ltd. Bangalore.**

18) **Shri Sai Priya Sugars Ltd. Hippargi-Mygur, Tal. Jamkhandi, Dist. Bagalkot (Karnataka)**

19) **Kukadi S.S.K. Ltd. Pimpalgaon Pisa, Dist. Ahmednagar.**

SURGE PROTECTION CAPACITORS FOR HIGH VOLTAGE EQUIPMENTS

TECHNICAL DATA

Power apparatus is continuously subjected to abnormal voltages due to internal or external reasons. These may occur on account of lightening, switching operations, system faults, and other abnormal conditions. Surge Capacitors are capable of bringing down the steepness or slop of over voltage transients, that may appear across transformer and other A.C. line connected equipment's. Unless the transients are swamped effectively they may cause catastrophic failure of these devices. By reducing the slop of incoming surge conventional arresters fitted in conjunction with Surge Capacitors, the level gets truncated before operating across the insulation of a device. The Surge Capacitors must be designed to withstand and absorb damped or oscillatory line disturbances without affecting the mains frequency performance at the point of common coupling.

For the above purpose, normally 0.1 micro farad, 0.25 farad or 0.5 micro farad capacitance is used. Typical Voltage rating 3.3 KV, 11 KV or 33 KV, other ratings may be supplied on request.

DESIGN & CONSTRUCTION

It is expected that a surge Capacitor should never fail in service. The Capacitor sections are of multilayer dielectric of P.P. Film and Foil design. In order to make units electrically tough and durable, large number of Series section are used with phase insulation many times greater than the system nominal Voltage. To withstand higher transient currents, the windings are made with extended foil design. The dielectric is design to cause very low loss at power frequencies. The containers are treated with two coats of red oxide primer & painted with two coats of synthetic enamel to resist moist atmosphere. They are rectangular and of heavy gauge steel welded with high quality are welding. The surge Capacitors are connected in STAR with neutral grounded. Maximum clearances are provided between the high voltage terminals.

RANGE OF PRODUCTS:

The value given in the table is based on IS: 11548 / 1986, however, other value also can be given on request. The RC network shall be given by providing the series resistor with the Capacitor unit internally or externally. (Note: Above 33 KV System voltage, the surge Capacitors are manufactured as per customer's specification).

TESTING

The Capacitors manufactured will be subjected to Type & Routine Test in the conventional way. As per IS: 11548 or IEC specifications.

TABLE:

System Voltage	3.3 KV	6.6 KV	11 KV	22 KV	33 KV
Capacitance in MFD per Phase	0.1 to 0.5	0.1 to 0.5	0.1 to 0.5	0.1 to 0.5	0.1 to 0.5
Rated Voltage of Surge Capacitor per Phase	6 KV	12 KV	18 KV	28 KV	40 KV
Impulse Voltage	60 KVP	75 KVP	100 KVP	140 KVP	190 KVP

Names of our valued Customers who have used our Surge Capacitors:

1) Poona Switchgears Pvt. Ltd., Pune.
2) Accusonic Controls Pvt. Ltd., Pune.
3) Powercare Electrical Engineering Co., Pune.
4) System Controls & Switchgears New-Delhi.
5) Samtel Colour Ltd. Kota.
   & many other parties all over India.

Harmonic Analysis and Design, Manufacturing of Harmonic Filters: -

We are pleased to inform you that, we are in a position to carry out harmonic analysis on 3 phase (at a time) harmonic analysis imported specially from Japan.
This service is on chargeable basis.

Automatic Power Factor Control Panels to achieve Unity Power Factor: -

Many electricity boards are giving incentives if consumer maintains unity p. f.

We undertake service like survey of connected load & deciding KVARs required with help of our power quality analyzer.

We design APFC Panels on basis of above data, manufacture them & install at site to achieve unity p. f.