



केन्द्रीय विद्युत अनुसंधान संस्थान

(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)

प्रो.सर.सी.वी. रामन रोड, सदाशिवनगर डाक घर, पो.बा.सं. 8066, बेंगलूरु - 560 080, भारत

CENTRAL POWER RESEARCH INSTITUTE

(A Government of India Society, Ministry of Power)

Prof. Sir C.V. Raman Road, Sadashivanagar Post Office, P.B. No. 8066, Bengaluru - 560 080, India

वेब साइट / website : <http://www.cpri.in>



सं./No. CPRI LRHVD20T0522

दिनांक/Date: 14 October 2020.

सेवा में /To

म/स. लेकों एनर्जेटिक्स पवत्. ल्टड.,
नो.484 ब&सी, ईव फेज़, ऑप.बंटक डीपो नो.9,
पीया इंडस्ट्रियल एरिया, बेंगलूरु-560058.

M/s. Lecon Energetics Pvt. Ltd.,
No.484 B&C, IV Phase, Opp.BMTC Depot No.9,
Peenya Industrial Area, Bengaluru-560058.

विषय/ Sub:-परीक्षण रिपोर्ट/ Test Report

महोदय /Dear Sir(s),

आपके दिनांक 29 September 2020 के अनुरोध पर रिपोर्ट सं CPRI LRHVD20T0522 दिनांक 14 October 2020 इसके साथ संलग्न है।

With Reference to your request dated. 29 September 2020, we are enclosing herewith report No./s CPRI LRHVD20T0522 dated 14 October 2020 कृपया पावती भेजे / Kindly acknowledge the receipt of the same.

कृपया ध्यान दें कि संलग्न परीक्षण रिपोर्ट में विषमताएँ/विसंगतियाँ, यदि कोई पाई गई तो इस पत्र की प्राप्ति के 45 दिनों के अंदर सीपीआरआई के ध्यान में लाएँ।

Please note that anomalies/discrepancies in the test report enclosed, if any, shall be brought to the notice of CPRI within 45 days of receipt of this letter.

साथ ही, कृपया ध्यान दें कि इस पत्र के जारी दिनांक से 15 दिनों के भीतर परीक्षण के लिए लाए गए नमूने तथा उनके साथ लाई गई अतिरिक्त सामग्री उच्च वोल्टता प्रयोगशाला के परिसर से हटा दी जाएँगी। उपरोक्त अवधि के बाद किसी भी दावे पर विचार नहीं किया जाएगा तथा कुछ और दिनों के लिए नमूनों को रखने के लिए इस अवधि के अंदर कोईलिखित अनुरोध की अनुपलब्धि पर सीपीआरआई के मानकों के अनुसार नमूनों का निपटारा किया जाएगा।

Also, please note that the samples and any additional material brought along with them for the testing shall be removed from the High Voltage Laboratory premises within 15 days from the date of issue of this letter. No claims will be entertained after the above period and samples will be disposed of as per CPRI norms, unless written request is received within this period for retaining the samples for a few more days.

भविष्य में भी हमारी सर्वोत्तम सेवाओं का आश्वासन तथा धन्यवाद के साथ।

Thanking you and assuring you of the best of our services in the future also.

भवदीय / Yours faithfully,

यु.आर.शेषगिरि राव

(यु.आर.शेषगिरि राव)

(U R SHESHAGIRI RAO)

अपर निर्देशक & एच ओ डी/ ADDITIONAL DIRECTOR & HOD

उच्च वोल्टता प्रभाग / HIGH VOLTAGE DIVISION



"Happiness is when what you think, what you say and what you do are in harmony" - Mahatma Gandhi

CPRI

TEST REPORT



Central Power Research Institute

**(A Govt. of India Society)
P.B. No. 8066, Sadashivanagar P.O.,
Prof. Sir. C.V. Raman Road,
Bangalore - 560 080**

CENTRAL POWER RESEARCH INSTITUTE



CPRI

TEST REPORT

Test Report Number	: CPRI BLRHVD20T0522	Dated: 14 October 2020.
Name & Address of the customer	: M/s. Lecon Energetics Pvt. Ltd., No.484 B&C, IV Phase, Opp.BMTC Depot No.9, Peenya Industrial Area, Bengaluru-560058.	
Name & Address of the Manufacturer	: M/s. Lecon Energetics Pvt. Ltd., No.484 B&C, IV Phase, Opp.BMTC Depot No.9, Peenya Industrial Area, Bengaluru-560058.	
Particulars of samples tested	: Ref No: Nil.	
Type	: Dated: 29 September 2020.	
Description of test sample	: M/s. Lecon Energetics Pvt. Ltd., No.484 B&C, IV Phase, Opp.BMTC Depot No.9, Peenya Industrial Area, Bengaluru-560058.	
Serial Number	: FCMA ^{plus} /HFSR Softstarter, Dry.	
Number of samples tested	: 15.65mH, 13800 V, 60 Hz, Single Phase, Air cored, Copper Wound Reactor. (meant for 5500 kW, 60Hz, 3 phase, FCMA ^{plus} /HFSR Soft Starter for motor starting)	
Date(s) of Test(s)	: EW363/1/2020.	
CPRI Sample code Number(s).	: One.	
Particulars of tests conducted	: 29 September 2020.	
Test in accordance with	: HVD20S0467.	
Standard/Specification	: 1) Lightning impulse test & 2) Separate source a.c. withstand voltage test.	
Sampling Plan	: Clauses 8.9.8 & 8.9.12 of IEC 60076-6:2007.	
Customer's Requirement	: Not Applicable.	
Deviations if any	: Nil.	
Name of the witnessing persons	: Nil.	
Customers representative	: Mr. Naidu Babu.K & Mr.Y.Phanendra Kumar.	
Other than customer's representatives	: None.	
Test subcontracted with address of the laboratory	: None.	
Documents constituting this report(in words)		
Number of Sheets	: Five.	
Number of Oscillogram(s)	: Sixteen.	
Number of Graph(s)	: Nil.	
Number of Photograph(s)	: One.	
Number of Test Circuit Diagram(s)	: Two.	
Number of Drawing(s)	: Two.	

(Signature)
(Dharmesh Y)
Test Engineer



(Signature)
(U. R. Sheshagiri Rao)
Head of Division
Approved by

ULR-TC5452200HVD20522F
Discipline: Electrical Testing
Group: Insulating materials
and Insulators

High Voltage Division
P.B.No.8066, Sadashivanagar P.O
Prof.Sir.C.V.Raman Road, Bangalore - 560 080, India
Tele: +91 (0) 80-2207 2377

Sheet 1 of 5

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



Test Report No. CPRI BLRHVD20T0522

Date: 14 October 2020.

DESCRIPTION OF SAMPLE TESTED (As assigned by the manufacturer)

Rated inductance	:	15.65mH
Rated voltage (Volts)	:	13800
Rated current (Amps)	:	825
Number of Phases	:	1
Rated frequency (Hz)	:	60
Type of cooling	:	AN
Insulation level	:	LI- 95 kVp AC- 35 kVrms
Core material	:	Air
Conductor material	:	Copper

Y. Dharmesh
(Dharmesh Y)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



Test Report No. CPRI BLRHVD20T0522

Date: 14 October 2020.

SUMMARY OF TESTS CONDUCTED

1. Tests conducted : Dielectric type test.
2. Rating for which tested : 15.65mH, 13800 V.
3. Schedule of tests

Tests Conducted	Clause Numbers	Sheet
Lightning impulse test	Clause 8.9.12 of IEC 60076-6:2007	Sheet 4 of 5
Separate source a.c. withstand voltage test	Clause 8.9.8 of IEC 60076-6:2007	Sheet 4 of 5

4. Oscillogram Numbers : 1 to 8 (each consists of voltage and current oscillograms)
5. Graph Numbers : Nil
6. Photograph Numbers : P1
7. Test Circuit Diagram Numbers. : CD1, CD2

LIST OF DRAWINGS

Drawing Numbers

The manufacturer has guaranteed that the sample submitted for the test(s) has been manufactured in accordance with the following drawings

Sl. No.	Drawing Number	Sheet Number	Revision Number
1	EW363/1/2020-21-A	01 of 03	0
2	EW363/1/2020-21-B	03 of 03	0

It is verified that these drawings adequately represent the sample tested. Verification of this drawing by CPRI is limited to dimensional check only wherever possible.


(Dharmesh Y)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



Test Report No. CPRI BLRHVD20T0522

Date: 14 October 2020.

TEST RESULTS

1) Lightning impulse test

Source connected to	Earth connected to	Shot No.	Negative Polarity *		
			Wave Type	Test Voltage (kV _{Peak})	Osc. No.
Terminal L1	L2 through shunt, Frame.	1	RFW	65	1
		2	FW	95	2
		3	FW	95	3
		4	FW	96	4
Terminal L2	L1 through shunt, Frame.	1	RFW	65	5
		2	FW	96	6
		3	FW	96	7
		4	FW	95	8
Remarks: The reactor has withstood the above mentioned impulse voltage applications.					

Note: RFW - Reduced Full Wave, FW - Full Wave, LV - Low Voltage and HV - High Voltage.

2) Separate source a.c. withstand voltage test

Test Arrangement	Test Voltage kV _{rms} *	Remarks
Source connected to L1 and L2 Terminals. Frame earthed.	35	Withstood for one minute

Conclusion: The sample tested complies with the requirement of Clauses 8.9.8 and 8.9.12 of IEC 60076-6 for the tests conducted.

* These voltages are applied under ambient condition which is given below:

Temperature in Degree Celsius		Atmospheric Pressure in mm of Hg.
Dry Bulb	Wet Bulb	
26	21	682

Y. Dharmesh
(Dharmesh Y)
Test Engineer

ULR-TC5452200HVDT0522F
Discipline: Electrical Testing
Group: Insulating materials
and Insulators

High Voltage Division
P.B.No.8066, Sadashivanagar P.O
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Sheet 4 of 5

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



Test Report No. CPRI BLRHVD20T0522

Date: 14 October 2020.

NOTE

- The Test results relate only to the sample(s) tested.
- Publication or reproduction of this Test Report /Test Certificate in any form other than by complete set of the whole Test Report /Test Certificate and in the language written is not permitted without the written consent of CPRI.
- Any Corrections/erasure invalidates the Test Report/Test Certificate
- NABL has Accredited this laboratory as per ISO/IEC17025:2017, vide certificate no.TC-5452 for the tests carried out.
- Any anomaly/discrepancy in the Test Report / Test Certificate should be brought to the notice of CPRI within 45 days from the date of issue.
- All documents constituting the Test Report/Test Certificate are stitched together with a continuous silk thread/silk ribbon, the two ends of which have been brought over the front sheet of the Test Report/Test Certificate and sealed with a CPRI logo printer paper sticker/embossed

Y. Dharmesh

(Dharmesh Y)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

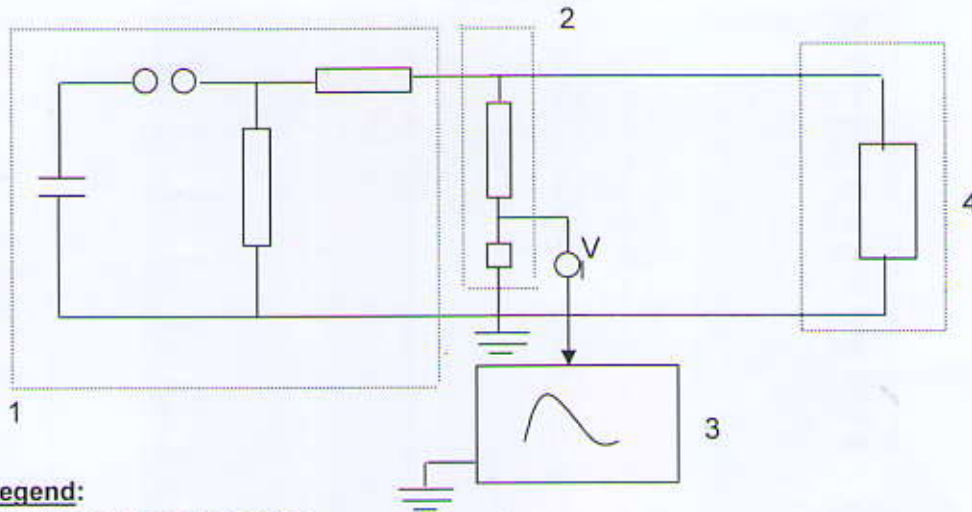
TEST REPORT



Test Report Number: CPRI BLRHVD20T0522

Date: 14 October 2020

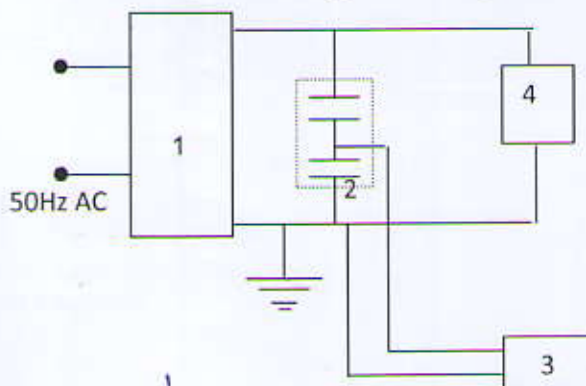
CD1. Circuit Diagram for Impulse Test



Legend:

1. Impulse voltage generator
2. Impulse voltage divider
3. Digital recorder for measurement of voltage
4. Test object
- V. Voltage

CD2. Circuit Diagram for Separate source a.c. withstand voltage test



Legend:

- 1: HV AC Source
- 2: Voltage Divider
- 3: RMS Voltmeter
- 4: Test Sample

Y. Dharmesh
(Dharmesh Y)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT



CPRI

Test Report Number: CPRIBLRHVD20T0522

Date: 14 October 2020

Test sample



Photograph Number: P1.

Y. Dharmesh

(Dharmesh Y)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

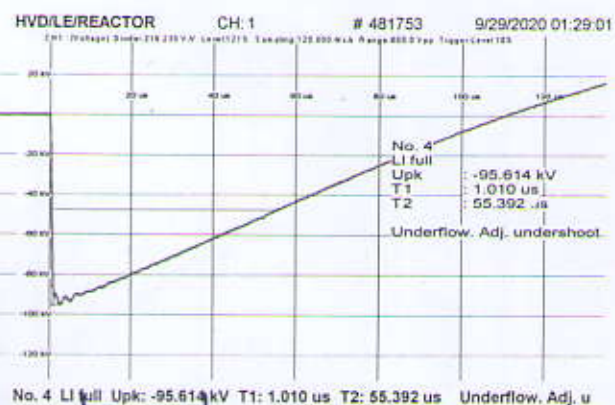
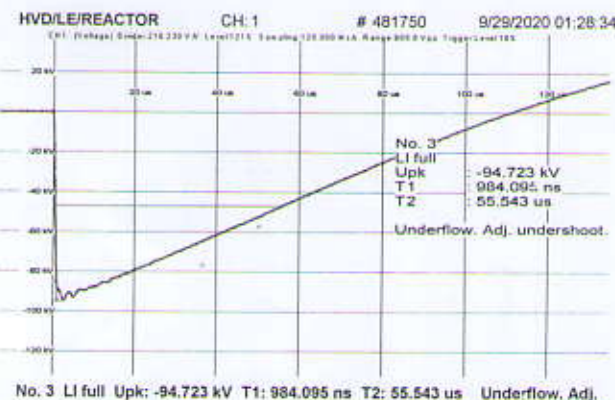
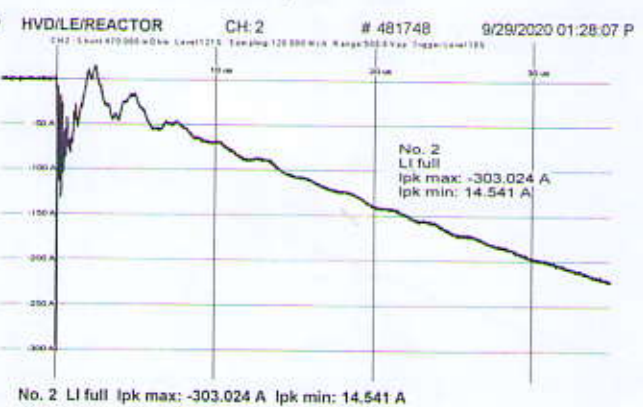
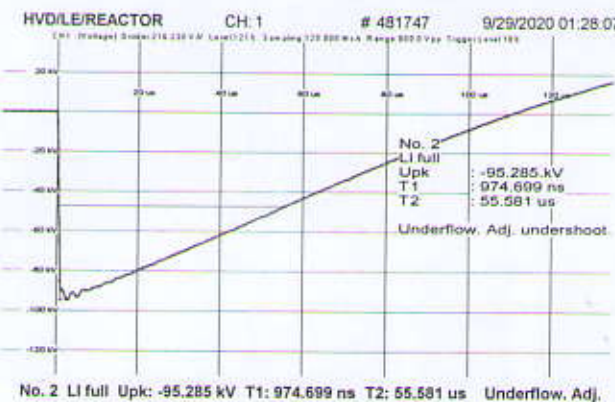
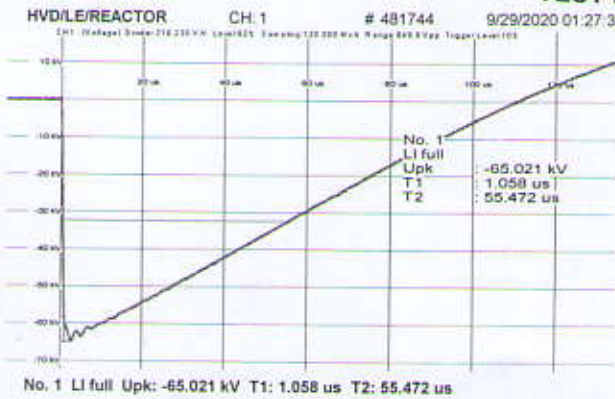
TEST REPORT

Test Report Number: CPRIBLRHVD20T0522

Date: 14 October 2020



TEST RESULTS



Y. Dharmesh
(Dharmesh Y)
Test Engineer

CENTRAL POWER RESEARCH INSTITUTE

TEST REPORT

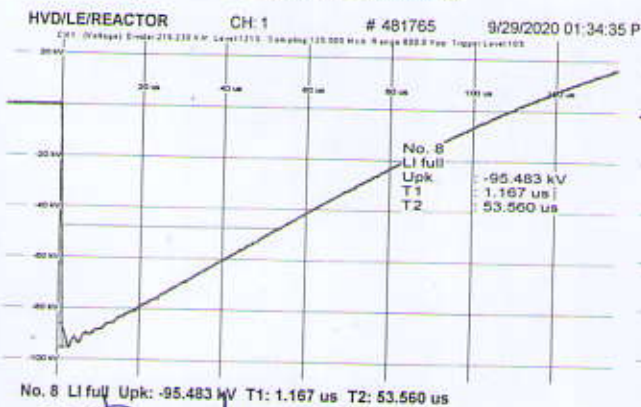
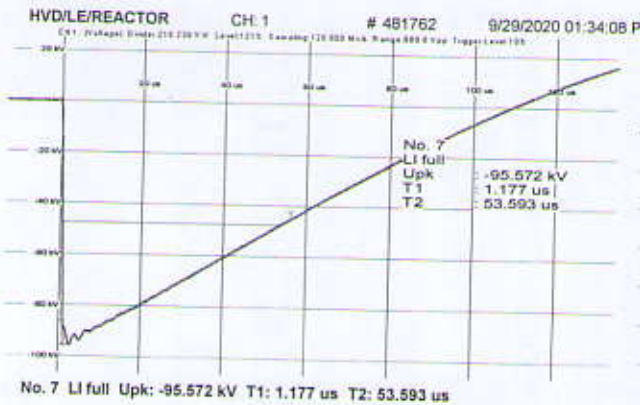
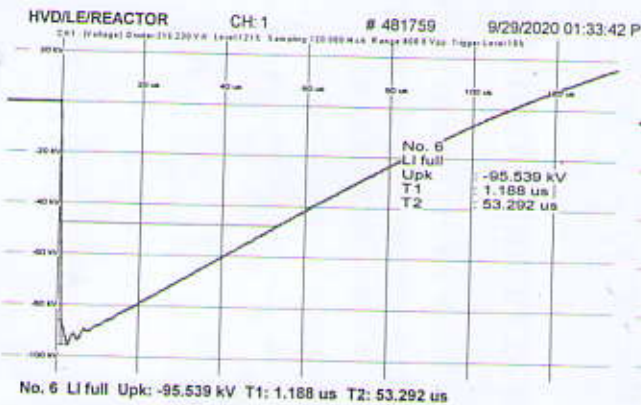
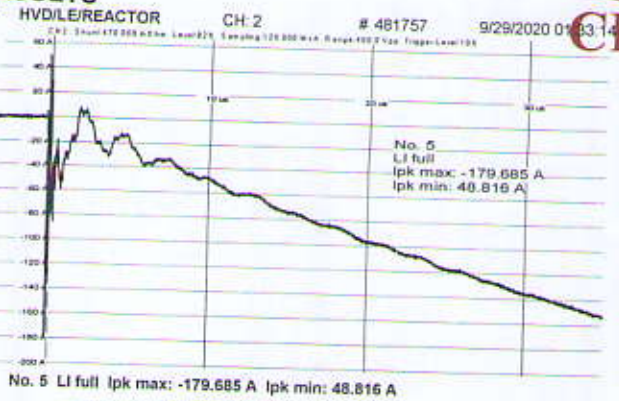
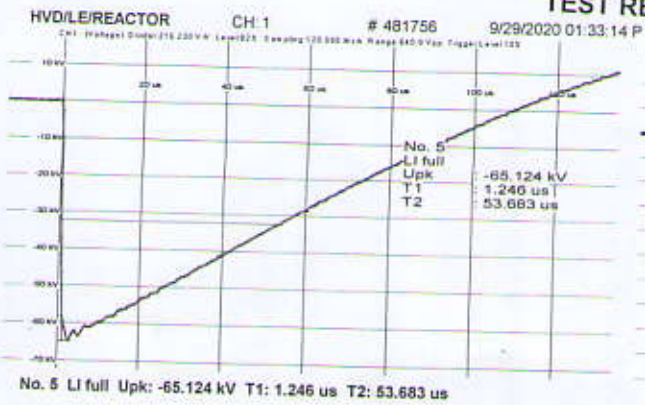
Test Report Number: CPRIBLRHVD20T0522

Date: 14 October 2020



TEST RESULTS

CPRI



Y. Dharmesh
(Dharmesh Y)
Test Engineer

IF IN DOUBT, ASK

1 2 3 4 5 6 7 8 9 10

LECON ENERGETICS PVT LTD

MODEL NO: FCMA^{Plus} -N-5500-13.8KV-25KA1-MD

PRODUCT DESCRIPTION : 15.65 mH Reactor for FCMA^{Plus} /HFSR Soft Starter
(As per IEC60076-6)

CUSTOMER : M/s. AIR LIQUIDE GLOBAL E&C SOLUTIONS.
PROJECT : MANSOURAH-MASSARAH GOLD PROJECT
RATING : 13.8KV, 60 Hz
APPLICATION : COMPRESSOR STARTING MOTOR(5500KW,SUPPLY 3 Ph)
S. NO : EW363/1/2020

LECON ENERGETICS PVT LTD -NO, 484 B&C, IV Phase, OPP. BMTC Depot
NO.9, Peenya Industrial Area,Bangalore-560058,Karnataka,India.

इस रेखाचित्र परीक्षण दस्तावेज

सं. सीपीआरआईवीएलआएचवी.....से संलग्न है।

THIS DRAWING PERTAINS TO TEST REPORT

No. CPRI/BLRHV/D20.T0522

Dated.....14 October 2020

Y. Damodhar

इंजीनियरी अधिकारी / ENGINEERING OFFICER
उच्च वोल्टता प्रभाग / HIGH VOLTAGE DIVISION

सी पी आर आई / CPRI
बैंगलूरु / BANGALORE - 560 080

TITLE.		W.O. NO	DRN	PHANEENDRA	LECON ENERGETICS. PVT LTD	
NAME PLATE DRAWING OF 15.65mH REACTOR FOR 5500KW/13.8KV FCMA ^{Plus} /HFSR SOFT STARTER		EW363/1/2020-21	DGN	PHANEENDRA	NO.484 B&C, IV Phase, OPP. BMTC Depot, NO.9 Peenya Industrial Area,Bangalore-560058, Karnataka, EMAIL ID sales@leconsystem.com , lecongm@gmail.com PH.NO.9449041220, WEB SITE:leconenergetics.com	
DATE:	MODEL NO:	DRG NO:	CHD	M.A. KULKARNI		
28/09/2020	FCMA PLUS-N-5500KW-13.8KV-25KA1-01-MD	EW363/1/2020-21-A	APP	M.A. KULKARNI		
QMS/DES/FORM/10	SCALE:NTS	THIS DRAWING IS PROPERTY OF LECON ENERGETICS AND IS NOT TO BE COPIED OR USED WITHOUT ITS WRITTEN PERMISSION			SHEET	REV
					01 OF 03	0

