

# TESTING CERTIFICATE



International Institute of  
Reliability Assessment

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Report No. :  
170901CJ01  
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1. Customer

- ☐ Company : LSIS Co., Ltd.
- ☐ Address : 127, LS-ro, Dongan-gu, Anyang-si, Gyeonggi-do, Korea

2. Use of the Test report : Product reliability and for accreditation assessment.

3. Sample information

- ☐ Product Name : Susol MCCB
- ☐ Model Name :

Sample No.	Model Name	Note	Sample No.	Model Name	Note
#1	TD160N FMU160 160A 3P EXP	Non ETS	#8	TS250N ETS23 250A 3P EXP	ETS
#2	TS160N ATU160 160A 3P EXP		#9	TS400N ETS33 400A 3P EXP	
#3	TS250N ATU250 250A 3P EXP		#10	TS630N ETS33 630A 3P EXP	
#4	TS400N ATU400 400A 3P EXP		#11	TS800N ETS43 800A 3P EXP	
#5	TS630N ATU630 630A 3P EXP		#12	TS400N ETM33 400A 3P EXP	ETM
#6	TS800N ATU800 800A 3P EXP		#13	TS630N ETM33 630A 3P EXP	
#7	TS160N ETS23 160A 3P EXP	ETS	#14	TS800N ETM43 800A 3P EXP	

- ☐ Quantity : 14 EA

4. Test duration : 2017.08.01 ~ 2017.08.23

5. Test method : Suggest by Applicant

6. Test Result : Test result reference

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
This laboratory is not accredited for the test results marked. \*-----

Confirm	Written by	Confirmed by
	Name : Eun-Jung, Cho ( Sign )	Technical Manager Name : Hyuck-Ki, Lee ( Sign )

2017-09-01  
IIRA Corporation (Sign)



# Test Result

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## ■ Storage temperature test

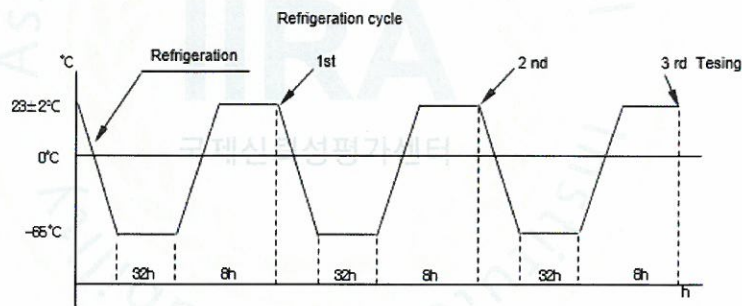
### 1. Test Information

Test Item	Environmental testing procedures test : Cold (Storage temperature test)	
Test duration	2017.08.01 ~ 2017.08.23	
Number of sample	Test division (14 EA)	Non ETS (#1 ~ #6), ETS (#7 ~ #11), ETM (#12 ~ #14)
	Chamber division (14 EA)	G1 (#1 ~ #6, #14), G2 (#7 ~ #13)
Test Method		

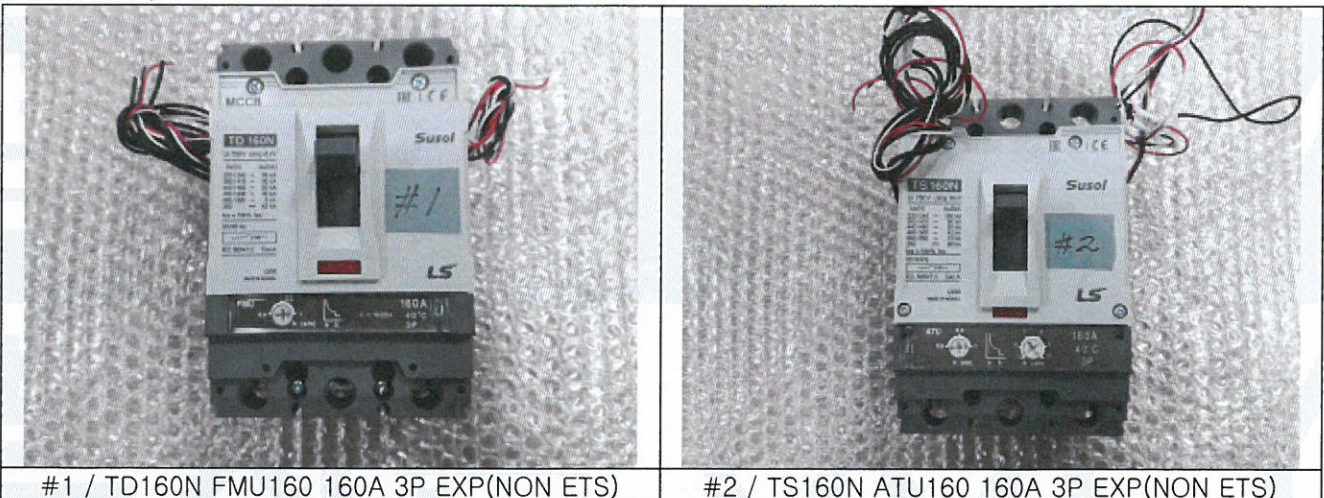
1) The cold cyclic test is performed at -65°C, 32h and then the normal operational test and overload release test at the ambient temperature

Test items	Description
Normal operational test	The normal switching sequence only one times after 3rd cycle without current condition under the the rated control supply voltage

2) Recovery condition : ambient temperature at least 8 hours



### 2. Test Sample



#1 / TD160N FMU160 160A 3P EXP(NON ETS)

#2 / TS160N ATU160 160A 3P EXP(NON ETS)

The result of this test report is applied for DUT which is given from applicant.



# Test Result

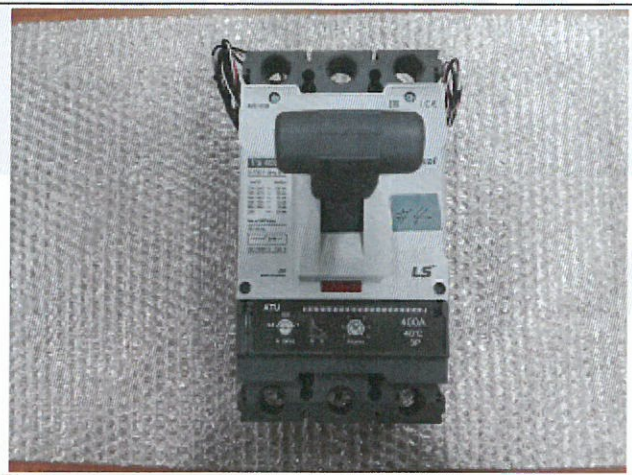
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#3 / TS250N ATU250 250A 3P EXP(NON ETS)



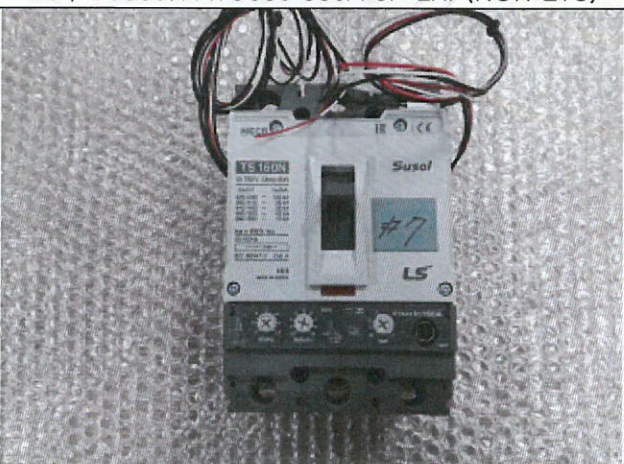
#4 / TS400N ATU400 400A 3P EXP(NON ETS)



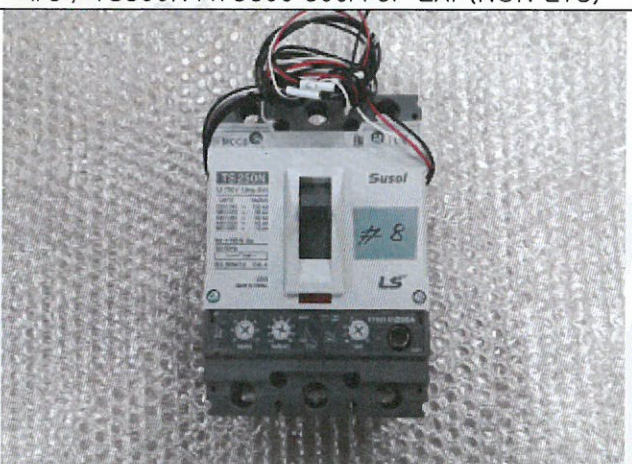
#5 / TS630N ATU630 630A 3P EXP(NON ETS)



#6 / TS800N ATU800 800A 3P EXP(NON ETS)



#7 / TS160N ETS23 160A 3P EXP(ETS)



#8 / TS250N ETS23 250A 3P EXP(ETS)

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#9 / TS400N ETS33 400A 3P EXP(ETS)



#10 / TS630N ETS33 630A 3P EXP(ETS)



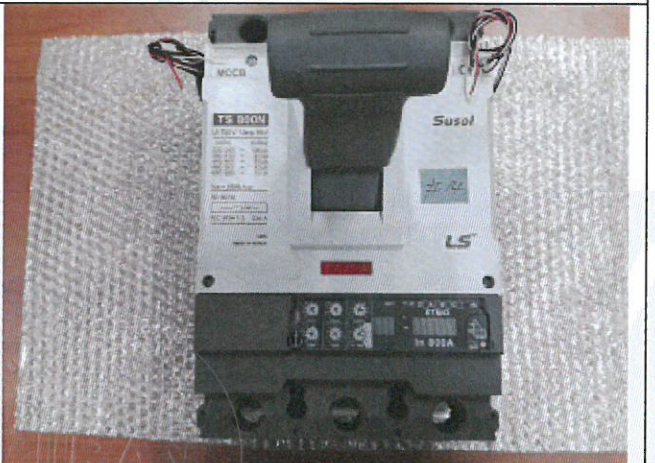
#11 / TS800N ETS43 800A 3P EXP(ETS)



#12 / TS400N ETM33 400A 3P EXP(ETM)



#13 / TS630N ETM33 630A 3P EXP(ETM)



#14 / TS800N ETM43 800A 3P EXP(ETM)

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# Test Result

Report No.		170901CJ01			Page (5) / (Total 11)																		
3. Test Result																							
Sample		Classification		Performance Check																			
Non ETS(#1~#6)		AX, SHT, AL		Normal Operation Status																			
		AX, SHT, AL		Normal Operation Status																			
ETS (#7 ~ #11) ETM (#12 ~ #14)		MCCB Test		<table border="1"> <tr> <th colspan="2">Tripping Curve</th> <th>Setting Values</th> <th>Tripping Time(s)</th> </tr> <tr> <td>①</td> <td>Long time delay</td> <td>4xIn (tr 6)</td> <td>11~17</td> </tr> <tr> <td>②</td> <td>Short time delay</td> <td>8(8.5)xIn (tsd 0.3)</td> <td>0.24~0.35</td> </tr> <tr> <td>③</td> <td>Instantaneous time delay</td> <td>11(11.5)xIn</td> <td>&lt; 0.04</td> </tr> </table>				Tripping Curve		Setting Values	Tripping Time(s)	①	Long time delay	4xIn (tr 6)	11~17	②	Short time delay	8(8.5)xIn (tsd 0.3)	0.24~0.35	③	Instantaneous time delay	11(11.5)xIn	< 0.04
Tripping Curve		Setting Values	Tripping Time(s)																				
①	Long time delay	4xIn (tr 6)	11~17																				
②	Short time delay	8(8.5)xIn (tsd 0.3)	0.24~0.35																				
③	Instantaneous time delay	11(11.5)xIn	< 0.04																				
※ Performance Check : Normal Operating Status																							
Sample		AX	SHT	AL	MCCB Test																		
		Off	On	Trip	On																		
		BK-RE	BK-BK	BK-WH	Tripping Curve	Setting Values	Tripping Time(s)																
Non ETS	# 1	OK	OK	OK	blank																		
	# 2	OK	OK	OK																			
	# 3	OK	OK	OK																			
	# 4	OK	OK	OK																			
	# 5	OK	OK	OK																			
	# 6	OK	OK	OK																			
ETS	# 7	OK	OK	OK	①	4	16.813																
					②	8(8.5)	0.3																
					③	11(11.5)	0.028																
	# 8	OK	OK	OK	①	4	16.358																
					②	8(8.5)	0.3																
					③	11(11.5)	0.028																
	# 9	OK	OK	OK	①	4	14.096																
					②	8(8.5)	0.294																
					③	11(11.5)	0.031																
	# 10	OK	OK	OK	①	4	13.537																
					②	8(8.5)	0.3																
					③	11(11.5)	0.028																
	# 11	OK	OK	OK	①	4	13.636																
					②	8(8.5)	0.3																
					③	11(11.5)	0.029																
ETM	# 12	OK	OK	OK	①	4	13.888																
					②	8(8.5)	0.3																
					③	11(11.5)	0.029																
	# 13	OK	OK	OK	①	4	14.801																
					②	8(8.5)	0.293																
					③	11(11.5)	0.03																
	# 14	OK	OK	OK	①	4	14.347																
					②	8(8.5)	0.293																
					③	11(11.5)	0.03																

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# Test Result

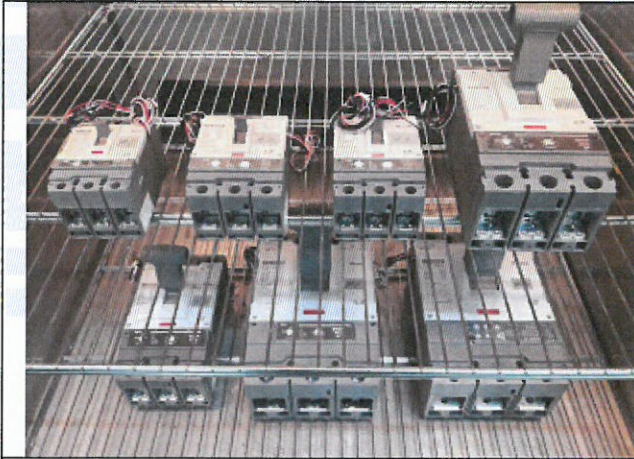
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## 4. Test Picture

### 4-1) G1



Sample No. : #1, #2, #3, #4, #5, #6, #14

### 4-2) G2

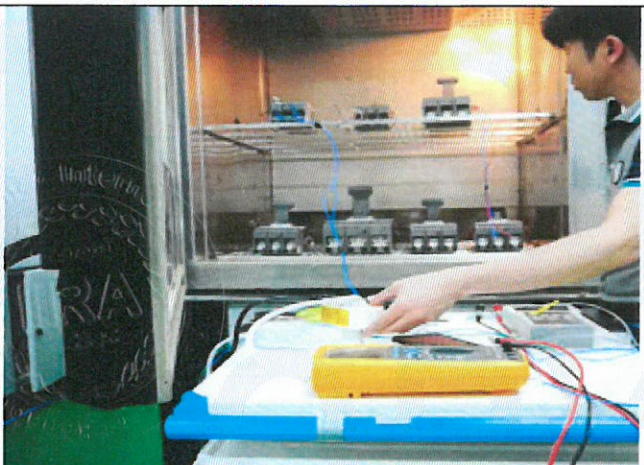


Sample No. : #7, #8, #9, #10, #11, #12, #13

### 4-3) Performance Check



G1



G2

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# Test Result

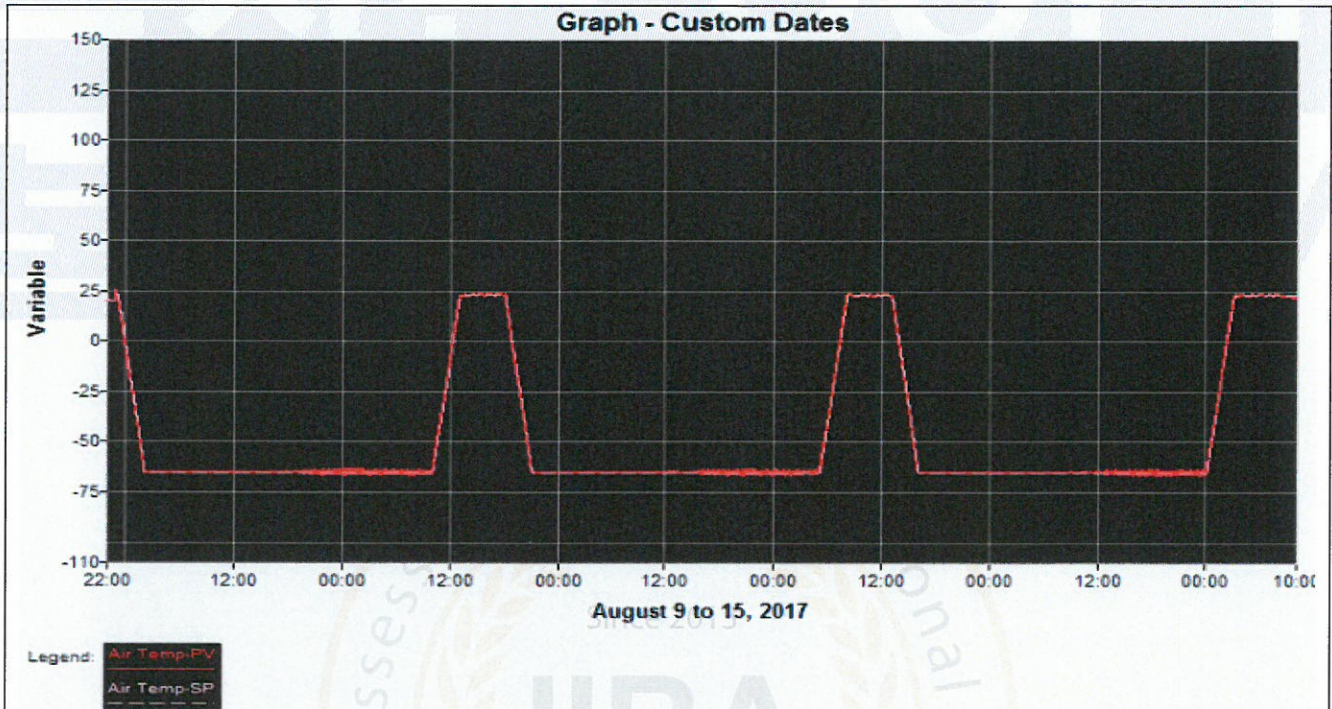
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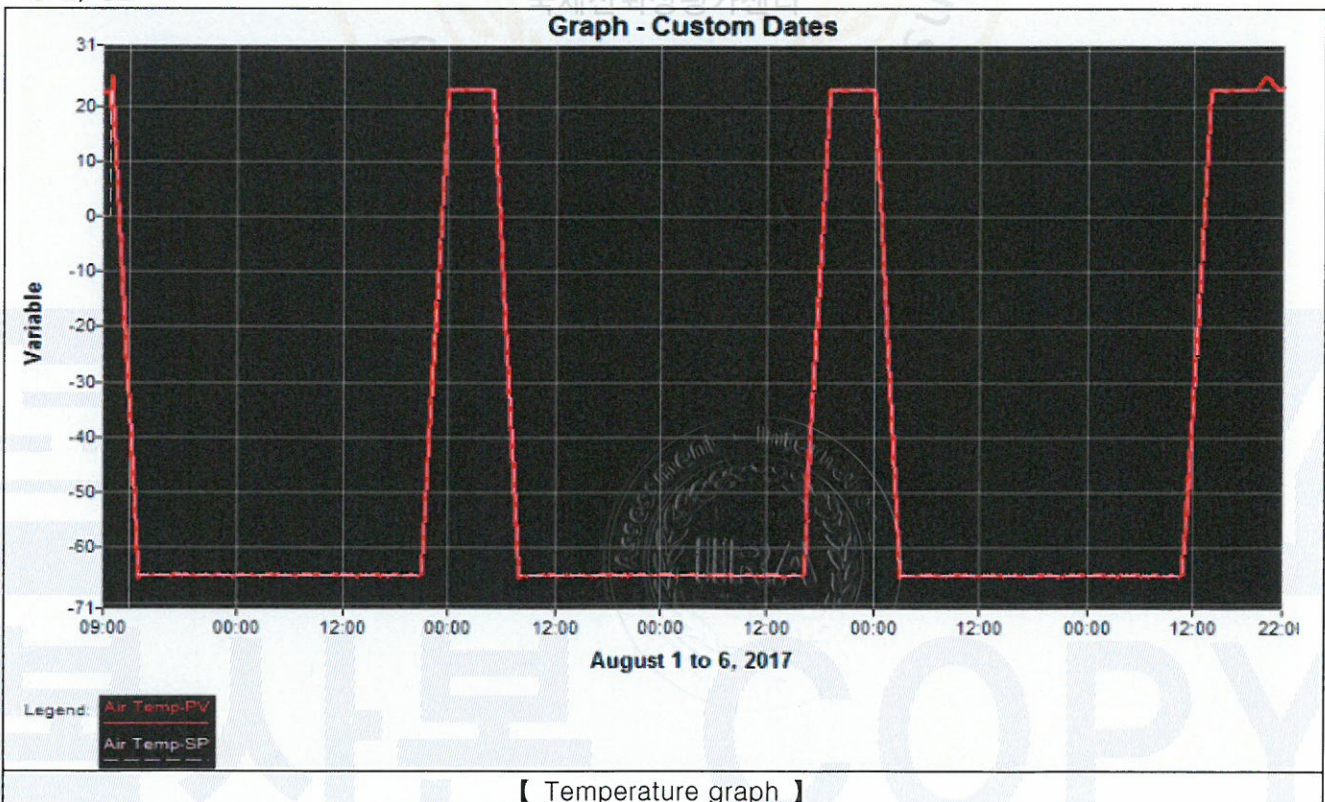
## 5. Test graph

### 5-1) G1



【 Temperature graph 】

### 5-2) G2



【 Temperature graph 】

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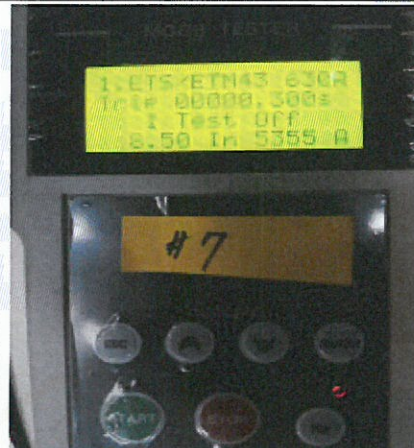
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## 6. MCCB Test

① Long time delay

② Short time delay

③ Instantaneous time delay



#7 : TS160N ETS23 160A 3P EXP(ETS)



#8 : TS250N ETS23 250A 3P EXP(ETS)



#9 / TS400N ETS33 400A 3P EXP(ETS)

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# Test Result

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<p>① Long time delay</p>  <p>1.ETS-ETM43 630A Trip 00013.537s 1 Test Off 4.00 In 2520 A</p> <p>#10</p>	<p>② Short time delay</p>  <p>1.ETS-ETM43 630A Trip 00000.300s 1 Test Off 8.50 In 5355 A</p> <p>#10</p>	<p>③ Instantaneous time delay</p>  <p>1.ETS-ETM43 630A Trip 00000.028s 1 Test Off 11.50 In 7245 A</p> <p>#10</p>
#10 : TS630N ETS33 630A 3P EXP(ETS)		
 <p>1.ETS-ETM43 630A Trip 00013.636s 1 Test Off 4.0 In 2520 A</p> <p>#11</p>	 <p>1.ETS-ETM43 630A Trip 00000.300s 1 Test Off 8.5 In 5355 A</p> <p>#11</p>	 <p>1.ETS-ETM43 630A Trip 00000.029s 1 Test Off 11.50 In 7245 A</p> <p>#11</p>
#11 : TS800N ETS43 800A 3P EXP(ETS)		
 <p>1.ETS-ETM43 630A Trip 00013.888s 1 Test Off 4.00 In 2520 A</p> <p>#12</p>	 <p>1.ETS-ETM43 630A Trip 00000.300s 1 Test Off 8.5 In 5355 A</p> <p>#12</p>	 <p>1.ETS-ETM43 630A Trip 00000.029s 1 Test Off 11.5 In 7245 A</p> <p>#12</p>
#12 : TS400N ETM33 400A 3P EXP(ETM)		

The result of this test report is applied for DUT which is given from applicant.



# Test Result

Report No.

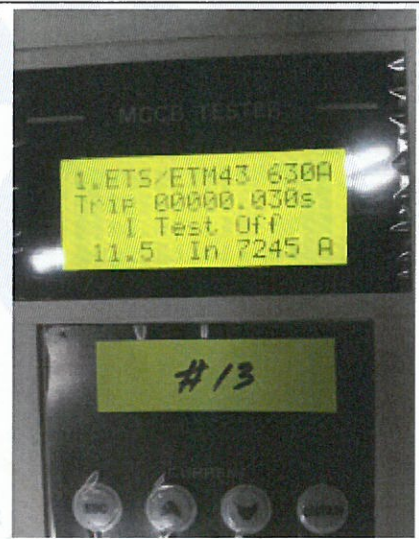
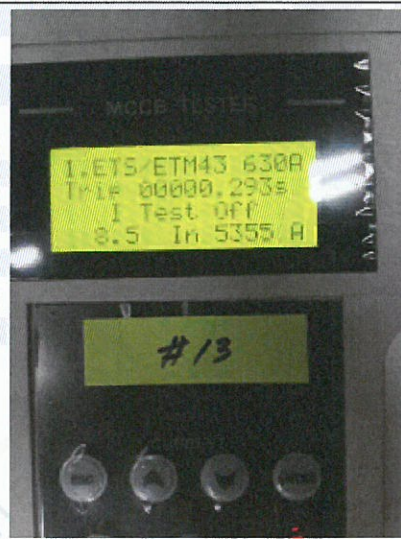
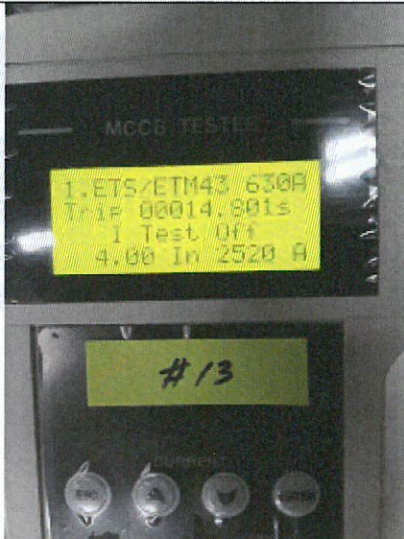
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① Long time delay

② Short time delay

③ Instantaneous time delay



#13 : TS630N ETM33 630A 3P EXP(ETM)



#14 : TS800N ETM43 800A 3P EXP(ETM)



# Test Equipment

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## 7. Test Equipment



Product	Serial No.	Manufacture	Calibration date
Temp & Hum Chamber	43147	Thermotron	2017.07.27
Temp & Hum Chamber	43145	Thermotron	2017.07.27



Product	Serial No.	Manufacture	Calibration date
MCCB TESTER	170724001	LS IS	2017.07.26.
	170724002		2017.07.26

The result of this test report is applied for DUT which is given from applicant.