R48-0193

Test Report

APPARATUS	**MCCB(Molded Case Circuit-Breaker)**
TYPE	TS630N FTU630
RATINGS	3 Poles, 50/60 Hz, 690 V, 630 A, 65 kA - 415 V
STANDARD	IEC 60068-2-1: 2007, Testing specification of client
TEST PERFORMED	Cold test (at -40 °C)
DATE OF TESTS	January 30, 2008 – January 31, 2008
CLIENT	LS Industrial Systems Co., Ltd.
MANUFACTURER	LS Industrial Systems Co., Ltd.

Test result

The tests have been carried out in accordance with the instructions of the applicant.

The test results are presented in the record of tests with the performance of the apparatus tested and the observations made during the tests.

The test results apply only to the specific samples tested.

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Number of pages : total(8), cover(1), records(5), photographs(2)

LS Industrial Systems

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Date of issue **January 31, 2008**

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Client

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LS Industrial Systems Co., Ltd.
Quality assurance Team

Witnessed by

Contents

The measurement uncertainty of the test results in this document is maximum 5 % for voltage, current and time. Which is estimated at the level of twice the standard deviation (corresponding to a confidence level of 95 % for the coverage factor of 1.96 in the case of normal distribution).

Representation of test result in the records of test:

Passed = Satisfied with criteria
Failed = Unsatisfied with criteria
N.A. = Not applicable

Apparatus Designation

Test specimen	MCCB (Molded-case circuit-breaker)
Manufacturer	LS Industrial Systems Co., Ltd.
Type	TS630N FTU630
Frame size	630 AF
Number of poles	3
Rated frequency	50/60 Hz
Rated operational voltage	AC 690 V
Rated insulation voltage	AC 750 V
Rated impulse withstand voltage	8 kV
Suitability for isolation	Yes
Rated current	630 A
Current setting	630 A (fixed)
Rated ultimate short-circuit breaking capacity	10 kA - 660/690 V 42 kA - 480/500 V 65 kA - 440/460 V 65 kA - 380/415 V 100 kA - 220/24 V
Utilization category	A
Type of tripping device	Thermal magnetic
Instantaneous releases:	≥ 10*In (fixed)
Release dependent on ambient air temperature	No
Reference temperature	40℃
Motor operator;	MOP3
Rated supply voltage	AC 230 V/DC 220 V
Dimension of specimen	140(W) x 260(H) x 110(D)
Dimension of metal screen	180(W) x 380(H) x 110(D)

Table of test

No.	Test items	Quantity	Test results		Test date	Page
			Passed	Failed		
1	Cold test	1	1	0	2008.01.30 ~ 2008.01.31	5 ~ 6

Analysis of test result

1. The apparatus was satisfactorily operated during the cold test at -40 °C.
2. Remark: The MOP was satisfactorily operated during the intermediately measurement by power supply variation.

Cold test

Apparatus	MCCB (Molded Case Circuit-Breaker)	Quantity	1 EA
Type	TS630N FTU630	Rating	3 Poles, 50/60 Hz, 690 V, 630 A, 65 kA - 415 V
Standard	IEC 60068-2-1: 2007, Testing specification of client	Ambient temperature & humidity in Lab.	+ 10 °C, 15 %R.H.
Test date	2008.01.30 ~ 01.31	Tested by	Kim, Myoung-Seok

1. Test method and/or condition
   1) Initial measurements
      Normal operational test at ambient temperature.
      The test performed as below table 1.
   2) The apparatus shall be exposed to the low temperature (-40 °C) conditions and achieved temperature stability.
   3) Final measurements
      Visual inspection and same as initial measurements.

Table 1.

Test items	Description
Normal operational test	a. manual operating; On/off position by the manual operation means. b. auxiliary switch(AX, AL) operating; AX: On/off operated by switch handle AL: induce the electrical signal by trip test-button or electrical tripping. c. MOP operating; The normal switching sequence shall be performed three times at 70 %, 85 %, 100 %, and 110 % of the rated control supply voltage with MOP(motor operator)

   4) The apparatus is exposed to these conditions for the specified duration: at least 2 hours
   5) The switching handle position of apparatus: ON position

2. Test equipment/instrument
   1) Temperature & humidity chamber. HITACHI, EC-85MHHP, 70-0270
   2) Programmable power source. CROMA, 56-0149

3. Criterion
   1) Normal operational test: manual operating, auxiliary switch and motor operating test shall be satisfactorily operated by the relevant specification.

Verdict	Passed

Cold test

Apparatus	MCCB (Molded Case Circuit-Breaker)	Quantity	1 EA
Type	TS630N FTU630	Rating	3 Poles, 50/60 Hz, 690 V, 630 A, 65 kA - 415 V
Standard	IEC 60068-2-1: 2007, Testing specification of client	Ambient temperature & humidity in Lab.	+ 10 °C, 15 %R.H.
Test date	2008.01.30 ~ 01.31	Tested by	Kim, Myoung-Seok

4. Test results

1) Initial measurement

Sample number	Verification of test items				Results
#1	Manual operational test				satisfactorily operate
	Auxiliary switch operating			AX	satisfactorily operate
				AL	satisfactorily operate
	Motor-operator (MOP)	AC	70 %	161 Va.c.	satisfactorily operate
			85 %	196 Va.c	satisfactorily operate
			100 %	230 Va.c.	satisfactorily operate
			110 %	253 Va.c.	satisfactorily operate
		DC	70 %	154 Vd.c.	satisfactorily operate
			85 %	187 Vd.c.	satisfactorily operate
			100 %	220 Vd.c.	satisfactorily operate
			110 %	242 Vd.c.	satisfactorily operate

2) Final measurement

Sample number	Verification of test items				Results
#1	Visual inspection				Not visible harm
	Manual operational test				satisfactorily operate
	Auxiliary switch operating			AX	satisfactorily operate
				AL	satisfactorily operate
	Motor Operator (MOP)	AC	70 %	161 Va.c.	satisfactorily operate
			85 %	196 Va.c	satisfactorily operate
			100 %	230 Va.c.	satisfactorily operate
			110 %	253 Va.c.	satisfactorily operate
		DC	70 %	154 Vd.c.	satisfactorily operate
			85 %	187 Vd.c.	satisfactorily operate
			100 %	220 Vd.c.	satisfactorily operate
			110 %	242 Vd.c.	satisfactorily operate

Verdict	**Passed**

Photograph

Photo. 1. test arrangement of outer chamber
- Programmable power source and temperature chamber

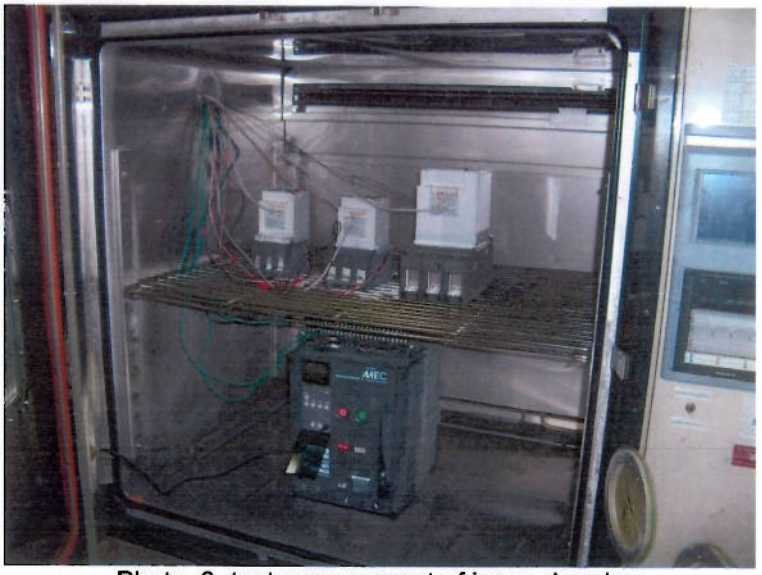

Photo. 2. test arrangement of inner chamber

Photograph

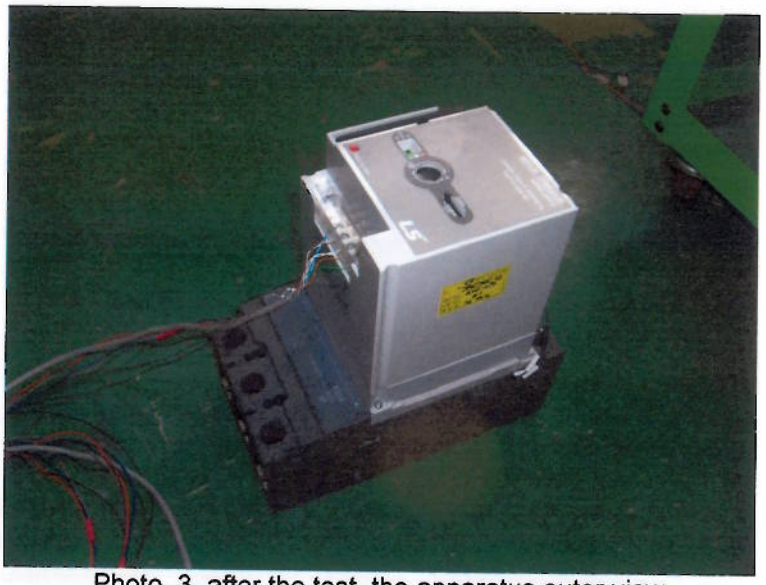

Photo. 3. after the test, the apparatus outer view