

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Circuit Breaker**

with type designation(s)  
**Metasol MCCB Series (400/800AF)**

Issued to

**LSIS Co., Ltd.**  
**Cheongju-si Chungcheongbuk-do, Republic of Korea**

is found to comply with  
**Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards**  
**IEC 60947-2**

**Application :**

**Ships, High Speed & Light Craft and Offshore installation**

**Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

<b>Rated Voltage (V)</b>	<b>up to 460V (See product description)</b>
<b>Rated Current (A)</b>	<b>250-400(400AF)/500-800(800AF)</b>
<b>Frequency (Hz)</b>	<b>50/60</b>

This Certificate is valid until **2019-07-05**.

Issued at **Busan** on **2015-07-06**

for **DNV GL**

DNV GL local station: **Seoul**

Approval Engineer: **Eun Sook Kim**

.....  
**Baeg Soon Choi**  
**Head of Section**

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

## Product description

Metasol 400/800AF : Moulded case circuit breakers with the following data:

		ABN403c	ABS403c	ABH403c	ABL403c
Rated insulation voltage AC (V)		750	750	750	750
Rated operational voltage AC (V)		460	460	460	460
Rated Current (A)		250-400	250-400	250-400	250-400
Rated Frequency (Hz)		50/60	50/60	50/60	50/60
Rated ultimate breaking capacity Icu (kA)	415/440/460V	50	75	85	125
	220/240/250V	37	50	65	85
Rated service breaking capacity Ics (% Icu)		100	100	100	75
Utilization category		A	A	A	A

		ABN803c	ABS803c	ABL803c
Rated insulation voltage AC (V)		750	750	750
Rated operational voltage AC (V)		460	460	460
Rated Current (A)		500-800	500-800	500-800
Rated Frequency (Hz)		50/60	50/60	50/60
Rated ultimate breaking capacity Icu (kA)	415/440/460V	50	85	125
	220/240/250V	37	65	85
Rated service breaking capacity Ics (% Icu)		100	100	75
Utilization category		A	A	A

## Type Approval documentation

Technical document for Metasol 400/800AF dated 2011-05-25.  
 PT&T test report no. R49-0813 dated 2009-06-23 for 400AF  
 PT&T test report no. R49-0816 dated 2009-06-23 for 800AF  
 KEMA test report no. 2126589.51 dated 2009-08-19 for 400AF  
 KEMA test report no. 2126589.54 dated 2009-08-19 for 800AF  
 PT&T Environmental test report no. R411-0324 dated 2011-04-26

DNVGL Retention survey report for E-11172 dated 2015-05-18

## Tests carried out

Type tests according to IEC60947-2, inclination test (static & dynamic), vibration test, dry heat test, humidity test and cold test

## Marking of product

Metasol - Type designation – Electrical data

## Periodical assessment

The scope of the retention/renewal survey is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Review of type approval documentation



Job Id: **262.1-011735-2**  
Certificate No: **TAE000004G**

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routine Tests (RT) checked (if not available, tests according to PST and RT to be carried out)
- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE