DNV·GL

Certificate No:
TAE00001KF

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Circuit Breaker

with type designation(s)
AS, AH

Issued to
LSIS Co., Ltd. (Cheong-ju Plant)
Cheongju-si Chungcheongbuk-do, Republic of Korea

is found to comply with
DNV GL rules for classification – Ships, offshore units, and high speed and light craft
IEC 60947-2

Application :

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

Rated Voltage (V)	**600/690 (see specification)**
Rated Current (A)	**630 - 6300**
Frequency (Hz)	**50 - 60**

This Certificate is valid until **2021-06-30**.

Issued at **Busan** on **2017-01-02**
DNV GL local station: **Seoul** for **DNV GL**

Approval Engineer: **Eun Jin Lee**

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.

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Job Id: **262.1-004778-5**
Certificate No: **TAE00001KF**

Product description

I) Air circuit breaker with the following data: AS-Type

	AS06D	AS08D	AS10D	AS13D	AS16D	AS20D
Rated insulation voltage AC (V)	1000	1000	1000	1000	1000	1000
Rated operational voltage AC(V)	690/500	690/500	690/500	690/500	690/500	690/500
Rated Current, at 45℃ (A)	630	800	1000	1250	1600	2000
Rated Frequency Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Breaking Capacity Ics = 100% Icu (kA)	65/70	65/70	65/70	65/70	65/70	65/70
Rated making Capacity (kA)	143/154	143/154	143/154	143/154	143/154	143/154
Rated short time Capacity Icw (kA) 1 s	65	65	65	65	65	65
Utilization category	B	B	B	B	B	B

	AS20E	AS25E	AS32E	AS40E	AS40F	AS50F
Rated insulation voltage AC (V)	1000	1000	1000	1000	1000	1000
Rated operational voltage AC(V)	690/500	690/500	690/500	690/500	690/500	690/500
Rated Current, at 45℃ (A)	2000	2500	3200	4000	4000	5000
Rated Frequency Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Breaking Capacity Ics = 100% Icu (kA)	85/85	85/85	85/85	85/85	85/100	85/100
Rated making Capacity (kA)	187/187	187/187	187/187	187/187	187/220	187/220
Rated short time Capacity Icw (kA) 1 s	85	85	85	85	85	85
Utilization category	B	B	B	B	B	B

	AS40G	AS50G	AS63G
Rated insulation voltage AC (V)	1000	1000	1000
Rated operational voltage AC(V)	690/500	690/500	690/500
Rated Current, at 45℃ (A)	4000	5000	6300
Rated Frequency Hz	50/60	50/60	50/60
Rated Breaking Capacity Ics = 100% Icu (kA)	100/120	100/120	100/120
Rated making Capacity (kA)	220/264	220/264	220/264
Rated short time Capacity Icw (kA) 1 s	100	100	100
Utilization category	B	B	B

II) Air circuit breaker with the following data: AH-Type

	AH06D	AH08D	AH10D	AH13D	AH16D	AH20D
Rated insulation voltage AC (V)	1000	1000	1000	1000	1000	1000
Rated operational voltage AC(V)	690/500	690/500	690/500	690/500	690/500	690/500
Rated Current, at 45℃ (A)	630	800	1000	1250	1600	2000
Rated Frequency Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Breaking Capacity Ics = 100% Icu (kA)	65/85	65/85	65/85	65/85	65/85	65/85
Rated making Capacity (kA)	143/187	143/187	143/187	143/187	143/187	143/187
Rated short time Capacity Icw (kA) 1 s	65	65	65	65	65	65
Utilization category	B	B	B	B	B	B

	AH06E	AH08E	AH10E	AH13E	AH16E	AH20E
Rated insulation voltage AC (V)	1000	1000	1000	1000	1000	1000
Rated operational voltage AC(V)	690/500	690/500	690/500	690/500	690/500	690/500
Rated Current, at 45℃ (A)	630	800	1000	1250	1600	2000
Rated Frequency Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Breaking Capacity Ics = 100% Icu (kA)	85/100	85/100	85/100	85/100	85/100	85/100
Rated making Capacity (kA)	187/220	187/220	187/220	187/220	187/220	187/220

Rated short time Capacity Icw (kA) 1 s	85	85	85	85	85	85
Utilization category	B	B	B	B	B	B

	AH25E	AH32E	AH40E	AH40G	AH50G	AH63G
Rated insulation voltage AC (V)	1000	1000	1000	1000	1000	1000
Rated operational voltage AC(V)	690/500	690/500	690/500	690/500	690/500	690/500
Rated Current, at 45℃ (A)	2500	3200	4000	4000	5000	6300
Rated Frequency Hz	50/60	50/60	50/60	50/60	50/60	50/60
Rated Breaking Capacity Ics = 100% Icu (kA)	85/100	85/100	85/100	100/150	100/150	100/150
Rated making Capacity (kA)	187/220	187/220	187/220	220/330	220/330	220/330
Rated short time Capacity Icw (kA) 1 s	85	85	85	100	100	100
Utilization category	B	B	B	B	B	B

Application/Limitation

It shall be installed and tested according to DNVGL Rules for Classification of SHIP, High Speed &Light Craft and DNVGL Offshore Standards.
The manufacturer's instruction is to be observed.

It is suitable for use in an IT system with a capacity of 1.2 times the maximum trip current at 500VAC for types 2000AF and 5000AF and up 690V for other models.

Type Approval documentation

Tests carried out

IEC 60947-2, Sequence 1, 2 and Annex H.
DNVGL Class Program CP-0396, Inclination-, Vibration-, Dry heat-, Damp heat and EMC immunity-test

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 to be dealt with:

- Ensure that type approved documentation is available.
- Ensure that materials used comply with type approved documents and/or referenced material specifications.
- Review design, materials, performance and production process with respect to possible changes, in order to ensure compliance with the type approved documentation and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

Survey to be performed at least every second year.

END OF CERTIFICATE