DNV·GL

Certificate No:
TAE00001B3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Power Switch Board with Bus Bar

with type designation(s)
S225, S2000, S2000D, S2000HD, S2000HI & S2000HB, S2000 vert., S7000

Issued to
CUBIC-Modulsystem A/S
BRØNDERSLEV, Denmark

is found to comply with
DNV GL rules for classification – High speed and light craft
DNV GL rules for classification – Ships and offshore units

Application :

Type approval regards system design principle.

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

Type	Rated voltage (V)	Rated current (A)	Rated freq. (Hz)
S225	**1000**	**225**	**45-62**
S2000, S2000D, S2000HD, S2000HI & S2000HB	**1000**	**1800 (vert.) / 2250**	**45-62**
S2000 vert.	**1000**	**5750**	**45-62**
S7000	**1000**	**6300**	**45-62**

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

Issued at **Høvik** on **2016-09-06**

for **DNV GL**

DNV GL local station: **Aalborg**

Approval Engineer: **Marta Alonso Pontes**

Trond Sjåvåg
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: **262.1-001605-6**
Certificate No: **TAE00001B3**

Product description

CUBIC power switch board with:

Busbar types: S225, S2000D, S2000HD, S2000HI, S2000HB, S2000 Double, S2000 Tripple, S2000 Quadruple and S7000 with: Multi drawer, draw-out, plug-in, fixed inserts system and motor control centre type MCC

Type:	**S225**	**S2000/S2000D**	**S2000HD**	**S2000HI**	**S2000HB**
Rated voltage:	1000 V AC	1000 V AC	1000 V AC	1000 V AC	1000 V AC
Rated current at 30 °C temp rise:					
Vertical busbar:	225 A	1800 A	-	**-**	**-**
Main busbar:	225 A	2250 A	2250 A	2000 A	1440 A
Rated frequency:	45-62 Hz	45-62 Hz	45-62 Hz	45-62 Hz	45-62 Hz
Enclosure class:	Up to IP54	Up to IP54	Up to IP54	Up to IP54	Up to IP54
Short-circuit current: [2)]					
1. Peak withstand Ipk:	31,5kA	176 kA	176 kA	176 kA	105 kA
Withstand 1 sec. Icw:	-	80 kA	80 kA	80 kA	50 kA
2. Peak withstand Ipk:	-	176 kA	176 kA	176 kA	105 kA
Withstand 3 sec. Icw:	-	65 kA	65 kA	50 kA	50 kA

Type:	**S2000 Double**	**S2000 Tripple**	**S2000 Quadrupple**	**S7000**
Rated voltage:	1000 V AC	1000 V AC	1000 V AC	1000 V AC
Rated current at 30 °C temp rise:				
Vertical busbar:	2925 A	3925 A	5750 A	6300 A [1)]
Main busbar:	-	-	-	6300 A [1)]
Rated frequency:	45-62 Hz	45-62 Hz	45-62 Hz	45-62 Hz
Enclosure class:	Up to IP54	Up to IP54	Up to IP54	Up to IP54
Short-circuit current: [2)]				
1. Peak withstand Ipk:	220 kA	220 kA	264 kA	264 kA
Withstand 1 sec. Icw:	100 kA	100 kA	120 kA	120 kA
2. Peak withstand Ipk:	220 kA	220 kA	264 kA	264 kA
Withstand 3 sec. Icw:	65 kA	65 kA	65 kA	65 kA

1) 6000 A at IP54 without fans.
2) See comments to short circuit currents under Application/limitation.

The power switchboard to be mounted according to CUBIC's documentation – Instruction Manual:

Panel constructions:	Chapter 2
Covering:	Chapter 4
Installation Parts:	Chapter 5
19" Rack:	Chapter 6
Desk construction:	Chapter 7
Busbar systems:	Chapter 8
Cu-Flex:	Chapter 8
Incoming sections:	Chapter 9
Multi drawer system:	Chapter 9
Draw-out system:	Chapter 9

Plug-in: Chapter 9
Form covering: Chapter 9

For S225 see technical data on page 820 in the Instruction manual. Mounting information is shown on page 821-828.

For S2000 see technical data on 830, 850 and 860 in the Instruction manual. Mounting information is shown on page 831-849, 851-857 and 861-866.

For S7000 see technical data on page 870. Mounting information is shown on page 871-889.

List of parts: See Instruction Manual.

Application/Limitation

The type approval covers system design principle in accordance with IEC 60439-1 & IEC 61439-2. Equipmens as circuit breakers etc. are not covered by this type approval.

Documents and drawings for the actual application as bus-bar currents, short-circuit ratings, single line diagram, layout, functional description and schematics shall be submitted for approval in each case.

When Cu-flex is used as a part of the switchboard the peak short circuit current for this part of the switchboard will be regulated by the Cu-flex short circuit data.

Cu-flex bus bar used for one outgoing circuit may be rated on the basis of the reduced short-circuit stress occurring on the load side of the respective short-circuit productive device as stated in IEC 61439-1 item 8.6.1. part 1 while Cu-flex bus-bar used as a connection from the main bus-bar to a dropper with several outgoing circuits shall be designed in accordance with the requirements IEC 61439-1 item 8.6.1. part 2

See separate certificate for Cu-flex.

Type Approval documentation

Tests carried out

Type tests in accordance with IEC 60439-1 & IEC 61439-1 / 2 (High voltage test, short-circuit test, temperature rise), arcing test, vibration test, Seismic test / earthquake simulation in accordance with IEC 60068-2-57 Test Ff, temperature and humidity test.

Marking of product

Manufacturers name plate with type and key data in accordance with IEC 61439-1 / 2.

Periodical assessment

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

The main elements of the assessment are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Routine tests (RT) checked (if not available tests according to RT to be carried out)
- Review of type approval documentation

- Review of possible change in design, materials and performance
- Ensuring traceability between manufacturer's product type marking and Type Approval Certificate.

Assessment to be performed at least every second year.

END OF CERTIFICATE