DNV·GL

Certificate No:
TAE000038U

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Frequency Converter

with type designation(s)
SINAMICS DCM DC Converter

Issued to
Siemens AG Process Industries and Drives Large Drives PD LD
Nürnberg, Bayern, Germany

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

Application :

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

Issued at **Hamburg** on **2018-07-01**
This Certificate is valid until **2023-06-30**.
DNV GL local station: **Augsburg**

Approval Engineer: **Maik Gagern**

for **DNV GL**

Arne Schaarmann
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: **262.1-007907-10**
Certificate No: **TAE000038U**

Product description

6RA80 Series. Microprocessor based Converter for Variable-speed DC Drives.

Nomenclature :

6RA80	**x x**	-	**4**	**D**	**S**	**2**	**2**	-	**0AA0**	-	**Z**
I	**II**		**III**	**IV**	**V**	**VI**	**VII**		**VIII**		**IX**

I - Basic Designation 6RA80

II -Nominal DC Current / Cooling

		2 Quadrant Power Output in kW at Input Voltage						
II	**Nominal Current**	400V	480V	575V	690V	830V	950V	
25	60A	29,1	34,5	41,4	----	----	----	Self Ventilation
28	90A	43,7	51,8	----	----	----	----	
31	125A	60,6	71,9	86,3	----	----	----	
75	210A	101,9	120,8	144,9	----	----	----	Forced Ventilation
78	280A	135,8	161,0	----	----	----	----	
81	400A	194,0	-----	276,0	----	----	----	
82	450A	----	258,8	----	----	----	----	
85	600A	291,0	345,0	414,0	----	----	----	
86	720A	----	----	----	597,6	----	----	
87	800A	----	----	552,0	----	----	----	
87	850A	412,3	488,8	----	----	----	----	
88	950A	----	----	----	----	950,0	----	
90	1000A	----	----	----	830,0	----	----	
90	1100A	----	----	759,0	----	----	----	
91	1200A	582,0	690,0	----	----	----	----	
93	1500A	----	----	----	1245,0	1500,0	----	
93	1600A	776,0	----	1104,0	----	----	----	
95	1900A	----	----	----	----	1900,0	----	
95	2000A	970,0	----	1380,0	1660,0	----	----	
96	2200A	----	----	1518,0	----	----	2508,0	
97	2600A	----	----	----	2158,0	----		
97	2800A	----	----	1932,0	----	----		
98	3000A	1455,0	----	----	----	----		

		4 Quadrant Power Output in kW at Input Voltage						
II	**Nominal Current**	400V	480V	575V	690V	830V	950V	
13	15A	6,3	6,3	----	----	----	----	Self Ventilation
18	30A	12,6	15,0	----	----	----	----	
25	60A	25,2	30,0	36,0	----	----	----	
28	90A	37,8	45,0	----	----	----	----	
31	125A	52,5	62,5	75,0	----	----	----	
75	210A	88,2	105,0	126,0	----	----	----	Forced Ventilation
78	280A	117,6	140,0	----	----	----	----	
81	400A	168,0	-----	240,0	----	----	----	
82	450A	----	225,0	----	----	----	----	
85	600A	252,0	300,0	360,0	----	----	----	
86	760A	----	----	----	551,0	----	----	
87	850A	357,0	425,0	510,0	----	----	----	

88	950A	----	----	----	----	831,3	----	
90	1000A	----	----	----	725,0	----	----	
90	1100A	----	----	660,0	----	----	----	
91	1200A	504,0	600,0	----	----	----	----	
93	1500A	----	----	----	1087,5	1312,5	----	
93	1600A	672,0	----	960,0	----	----	----	
95	1900A	----	----	----	----	1662,5	----	
95	2000A	840,0	----	1200,0	1450,0	----	----	
96	2200A	----	----	1320,0	----	----	2200,0	
97	2600A	----	----	----	1885,0	----	----	
97	2800A	----	----	1680	----	----	----	
98	3000A	1260,0	----	----	----	----	----	

III - Thyristor construction
4: Disk thyristors
6: Thyristor modules
IV - Rated supply voltage:
D: 400V K: 690V
F: 480V L: 830V
G: 575V M: 950V
V - Converter circuit
S: B6C (2Q)
V: (B6)A(B6)C(4Q)
VI - Closed-loop control armature:
2: 2 Quadrant
6: 4 Quadrant
VII - Closed-loop control field:
2: Field with closed-loop control
VIII - 0AA0: Innovation
IX Z: with Options

2. Quadrant / Inputvoltage

2Q / 400 V :
6RA80 followed by (18,25,28,31,75,78,81,85,87,91,93,95,98) followed by -6(4)DS22-0AA0

2Q / 480 V :
6RA80 followed by (18,25,28,31,75,78,82,85,87,91) followed by -6 FS22-0AA0

2Q / 575 V :
6RA80 followed by (25,31,75,81,85,87,90,93,95,96,97) followed by -6(4) GS22-0AA0

2Q / 690 V :
6RA80 followed by (86,88,93,95,97) followed by -6(4) KS22-0AA0

2Q / 830 V :
6RA80 followed by (88, 93,95) followed by -6(4)LS22-0AA0

2Q / 950 V :
6RA80 followed by 96 followed by -4MS22AA0

4. Quadrant / Inputvoltage :
4Q /400 V :
6RA80 followed by (13,18,25,28,31,75,78,81,85,87,91,93,95,98) followed by -6(4)DV62-0AA0

Application/Limitation

Converter for variable speed drives. Range: 6 kW to 2500 kW 400 - 950 VAC supply

Supply voltage range:	400 - 950 V AC
Voltage variation:	min. ± 10 %
Frequency variation:	45 – 65 Hz , max. 10Hz/sec slope
Temperature range in operation:	0 – 40 °C (40 – 50 °C when derated).
Protection degree:	IP 00 (optinal 20 for devices from 15A – 850A)
Temperature class:	A
Vibration class:	A
Humidity class:	A
EMC class:	IEC 61800-3 /CN 2.4 To be used on EMC class A locations

The SINAMICS DCM must be regarded as a component. The actual installation to be designed according to Siemens Instructions Manual and according to the applicable DNV Rules for the actual application. To be installed in an enclosure with an IP degree in accordance with DNV Rules w.r.t. location.

For devices with enhanced air cooling the current output must be derated 5 % at 45 oC ambient temperature and with 10 % at 50 oC . For location in devices with self cooling current output must be derated 6 % at 50 oC. For details, see Siemens Operating Instructions.

Application Software:
The Type Approval does not cover application software. For application software, the following applies: When the frequency converter is used in an application to be classed by DNV, documentation for the actual application is to be submitted for approval in each case. Reference is made to DNV Rules for Pt.4 Ch.8 Electrical Installations and Pt.4 Ch.9 Instrumentation and Automation.
Clause for application software control:
All changes in software are to be recorded as long as the system is in use on board. The records of all changes are to be forwarded to DNV for evaluation and approval. Major changes in the software are to be approved before being installed in the computer. Software version: **V1.4**

Type Approval documentation

Tests carried out

Visual inspection, Performance, Power supply failure, Power supply variations, Vibration, Dry heat, Damp heat, Insulation resistance, High voltage.
EMC: The following tests are in accordance with the IEC 601800-3 / CN 2.4: Electrical fast transient (Burst), electrical slow transient (Surge), RF-common mode Voltage, radiated RF-electromagnetic fields, electric discharge (ESD), radiated and conducted emission.

Marking of product

Siemens SINAMICS DCM – Type designation – Current – Voltage

Place of Production

Siemens Electrical Drives Ltd., Tianjin, P.R. China
No. 1 Haitaichuangxin 5th Road
Huayuan Industry Development Area
Tianjin Hi-Tech Industry Park, 300384, P.R. China

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.

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE