DNV·GL

TYPE APPROVAL CERTIFICATE

Certificate No:
TAE00003ND
Revision No:
1

This is to certify:

That the Frequency Converter

with type designation(s)
ATV6A0xxxx4, ATV6A0xxxx6, ATV9A0xxxx4, ATV9A0xxxx6, ATV6B0xxxx4, ATV6B0xxxx6, ATV9B0xxxx4, ATV9B0xxxx6, MODBUOxxxx4APM, MODBUOxxxx6APM

Issued to
Schneider Electric Power Drives (SEPD) GmbH
Wien, Austria

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 **2019-11-27**

This Certificate is valid until **2024-11-26**.
DNV GL local station: **Augsburg**

Approval Engineer: **Thomas Hartmann**

for **DNV GL**
Digitally Signed By: Schaarmann, Arne
Location: DNV GL SE Hamburg, Germany
Signing Date: 2020-06-04

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.

Product description

The APM (Altivar Process Modular) is a modular, scalable single drives assembly, for cabinet integration by Schneider Electric qualified panel builder.

The APM-series covers a voltage range of 400V up to 690V and a power range of 55kW up to 1200kW. It consists of the following main components:

a) Standard Diode-Front-End (DFE) variable speed drives with ATV600 or ATV900 control unit
b) Active-Front-End (AFE), low-harmonic variable speed drives with ATV600 or ATV900 control unit
c) Optional braking unit for 400V up 690V DFE and AFE variable speed drive converters.

Common technical data all Modules ATV6A0, ATV9A0, ATV6B0 and ATV9B0

Degree of protection IP	00	
Pollution degree [1)]	2	
Overvoltage Category	III	
Nominal Input frequency	50/60	Hz
Max. Prospective short-circuit current[2)]	50 kA, 100	msec
ATV6A0 - output frequency	0…500	Hz
ATV9A0 - output frequency	0…599	Hz

[1)] The air channel of the power modules is designed for use in pollution degree 3 environment. Cabinet integration in IP54 required.
[2)] Upstream protection gG fuse or circuit breaker as per Schneider Electric “Altivar Process APM Modules - DIA2ED2180301EN”

DFE-Modules (STD & Reduced Height)

400-480V			
Drive Modules type designation	ATV6A0xxxQ4 ATV9A0xxxQ4	ATV6A0xxxR4 ATV9A0xxxR4	ATV6A0xxxT4 ATV9A0xxxT4
Nominal Voltage [4)]	400 V	440 V	480 V
Input current	167…1335 A	155…1216 A	145…1146 A
Max. continuous output current [3)]	173…1420 A	173…1420 A	173…1420 A
Nominal Output Power [3)]	90…800 kW	90…800 kW	125…1100 HP
500-690V			
Drive Modules type designation	ATV6A0xxxN6 ATV9A0xxxN6	ATV6A0xxxT6 ATV9A0xxxT6 ATV6A0xxxS6 ATV9A0xxxS6	ATV6A0xxxQ6 ATV9A0xxxQ6
Nominal Voltage [4)]	500 V	600 V	690 V
Input current	83…1070 A	92…994 A	100…1161 A
Max. continuous output current [3)]	105…1230 A	105…1230 A	105…1230 A
Nominal Output Power [3)]	55…800 kW	100…1200 HP	90…1200 kW

AFE-Modules (Low Harmonics/ Power Regeneration)

400-480V			
Drive Modules type designation	ATV6B0xxxQ4 ATV9B0xxxQ4	ATV6B0xxxR4 ATV9B0xxxR4	ATV6B0xxxT4 ATV9B0xxxT4
Nominal Voltage [4]	400 V	440 V	480 V
Input current	144…1227 A	132…1115 A	125…1049 A
Max. continuous output current [3]	173…1420 A	173…1420 A	173…1420 A
Nominal Output Power [3]	90…800 kW	90…800 kW	125…1100 HP
500-690V			
Drive Modules type designation	ATV6B0xxxN6 ATV9B0xxxN6	ATV6B0xxxT6 ATV9B0xxxT6	ATV6B0xxxQ6 ATV9B0xxxQ6
Nominal Voltage [4]	500 V	600 V	690 V
Input current	72…991 A	82…937 A	85…1078 A
Max. continuous output current [3]	105…1230 A	105…1230 A	105…1230 A
Nominal Output Power [3]	55…800 kW	100…1200 HP	90…1200 kW

Braking Unit Modules (STD & Reduced Height)
Control voltage supply to braking units 24Vdc SELV

400-480V		
Drive Modules type designation	MODBUOC16x4APM; MODBUOC31x4APM; MODBUOC50x4APM; MODBUOC63x4APM; MODBUO C80x4APM	
Braking voltage	780	Vdc
Max DC link voltage	820	Vdc
Max. continuous braking current [3]	69…198	A
Max. continuous braking power [3]	75…355	kW
500-690V		
Drive Modules type designation	MODBUOC20x6APM; MODBUOC40x6APM; MODBUOC63x6APM; MODBUOC80x6APM; MODBUOM10x6APM; MODBUOM12x6APM	
Braking voltage	1130	Vdc
Max DC link voltage	1250	Vdc
Max. continuous braking current [3]	58…175	A
Max. continuous braking power [3]	85…550	kW

[3] Derating at ambient greater than 40 °C see manufacturer's technical Datasheet
[4] Input voltage variation for ATVxxxxxT4 at 480V and ATVxxxxxQ6 at 690V ± 10%

Cabinet integration
As per Schneider Electric Integration Manuals

Degree of protection	IP21/ IP54
Vibration dampers	required
Anti-Condensation heating	Yes, or installation at locations where special precautions to avoid condensation are taken

Application / Limitation

Location classes according to CG-0339:	
Temperature class	A
Vibration class	A
Humidity class	A
EMC class [5)]	A

[5)] Converters with conducted and radiated emission above the DNV GL required limits can be installed in "special power distribution zone" and "general power distribution zone", in accordance with IEC 60533 provided measures are taken to attenuate these effects on the distribution system, so the safe operation is assured. Planned EMC measures shall be submitted for approval prior to installation onboard.

Guidence Note:
The EMC measures should be derived from an EMC analysis and plan in accordance with IEC 60533 Annex B and /or IEC 61800-3 Annex E.
End of Guidenance note

For each delivery, all components subject to equipment certification (product certificate) shall:
In plan approval the following documents shall be submitted:

- Reference to this Type Approval Certificate
- Functional description for the intended use, configuration and interface (e.g. alarms, monitoring and auxilary power suplies)
- Test program for routine tests and functional tests
- If additional components to the type approved frequency converter are delivered, documentation according to DNV GL rules Pt.4 Ch.8 Sec.1 table 2 shall be submitted for review.

During product survey the following routine tests as per RU-SHIP Pt.4 Ch.8 Sec.7 Table 5 shall be performed:

- No.1 Visual Inspection
- No.2 Light load and function test
- No.5 Insulation tests
- No.9 Control and monitoring system

Type Approval documentation

AIT- Austrian Institute of Technology: 2.34.00585.1.0, SGP-09636-002-01, SGP-09636-002-02-#01, SGP-09636-020-02, SGP-09636-020-03, 2.0080525.1.0;
Schneider Electric Test reports: C1758, C1777, C1882, C1885, C1989, C2230, C2231, C2232, C2253, C2324, C2325, C2345, C2405, C2406, C2487, C2518, C2520, C2536, C2554, C2631, C2637, C2648, C2649, C2713, C2717, C2723, C2736, C2811_I2PS_2018-0036201, C2811, C2812, C2814, C2827V03, C2849, C3110, C3166, C3167, C3191, C3212, C3214, C3215, C3245, C3246, C3249, C3320, C3320, C3321, C3328, C3331, C3394, C3395, C3420, C3547, C3549, C3590, C3602, C3624, C3627, C3630, C3632, C3633, C3634, C3637, C3638, C3647, C3650, C3651, C3652, C3655, C3656, C3657, C3658, C3668, C3670, C3673, C3676, C3677, C3683, C3687, C3691, C3696, C3730, C3731, C3749, C3810, C3810, C3812, C3781V1, C3782V1, C729, C3755, FP16855, FP17035, FP17128, FP17195, FP17195, FP17219, FP17289, FP17315, FP17477, LTR_15370 (SE/Toshiba), LTR_14069 (SE/Toshiba);
TGM-Staatliche Versuchsanstalt (Elektrotechnik und Elektronik):TGM - VA EE 37435 EMC, TGM - VA EE 37725 EMC, TGM - VA EE 37725a EMC, TGM - VA EE 37333EMC, TGM - VA EE 37768 EMC, TGM - VA EE 37768a EMC, TGM - VA EE 38082 EMC, TGM-VA EE 38006EMC, TGM-VA EE 38007EMC, TGM-VA EE 38379 EMC
Sopemea Test reports: 1E322446M1, EHL18849, 1E31245M2, 1E322446M1-1, 1E30925M2
I²PS Test reports: 2018-0136304, 2018-0136403, 2018-0036201
TIZ-Grieskirchen Technolgie- und Innovationszentrum: 1382-101 V00; UL-file E116875
Schneider Electric technical documentation: Variable speed drives Altivar Process for Cabinet Integration DIA2ED2180301EN (2019-V3.0); Altivar Process Modular

Standard Integration Manual and PVZ Animation EN_PHA2451702_05; Altivar Process Modular Low Harmonic / Regen Integration Manual and PVZ Animation EN_PHA2452602_03; Altivar Process Modular Optional Braking Unit Integration Manual and PVZ Animation EN_MFR77831_02
Reduced Height additional tests:
C3845, C3846, C3849/E116875, C3853, C3872 Rev.2, C3879, C3880, C3881 Rev.2, C3882 Rev.2, Sopemea 1E32446M1-2

Tests carried out

Electrical and performance tests (IEC 61800-5-1, IEC 60146-1-1), Environmental, EMC and vibration tests (DNV GL CP-0395 ed.2015-12)

Marking of product

APM - Type designation - Power – Voltage

Place of Production

Schneider Electric Power Drive (SEPD) GmbH
Ruthnergasse 1
1210 Vienna
AUSTRIA

Schneider (Suzhou) Drives Co., Ltd.
SIP Suzhou, Jiangsu, 215121,
No.555 Fengting Avenue

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