DNV·GL

Certificate No:
TAE00002GN

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Frequency Converter

with type designation(s)
ADF P100, ADF P300, PPM 300 and SCC2

Issued to
Comsys AB
Lund, Sweden

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 **Høvik** on **2018-01-18**
This Certificate is valid until **2023-01-17**.
DNV GL local station: **Stockholm**

Approval Engineer: **Georgy Abramenko**

for **DNV GL**

Andreas Kristoffersen
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: **262.1-023707-1**
Certificate No: **TAE00002GN**

Product description

Dynamic active filters

P100, 70 – 130A:

Model	ADF P100-70/480	ADF P100-100/480	ADF P100-130/480	ADF P100-90/960
Rated power*	49/59 kVA	70/84 kVA	91/109 kVA	94/108 kVA
Compensation current capacity at 50/60 Hz, A rms	70	100	130	90
System voltage	480 V (208 – 480 V)			690 V (480 - 690 V)
Nominal frequency	50/60 Hz ± 5 %			
Maximum air flow requirement	600 m³/h			
Environment	0 to 95 % RH non-condensing			
Operating temperature	0 to 50 °C, up to 40 °C without derating			
Protection class	IP20 according to IEC 529			
Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4			

P100v2B, 50-120A:

Model	ADF P100-50/480	ADF P100-75/480	ADF P100-90/480	ADF P100-120/480
Rated power *	35 / 42 kVA	52 / 62 kVA	62 / 75 kVA	83 /100 kVA
Compensation current capacity at 50/60 Hz	50 A_{RMS}	75 A_{RMS}	90 A_{RMS}	120 A_{RMS}
System voltage	480 V (208 – 480 V)			
Maximum air flow requirement	600 m³/h			
Noise level	< 70 dB(A)			
Environment	0 to 95 % RH non-condensing			
Operating temperature	0 to 50 °C, up to 40 °C without derating			
Dimensions	230 x 1790 x 470 mm (W x H x D) 31.5 x 84.8 x 24 inch (W x H x D)			
Weight	91 kg			105 kg
Enclosure color	RAL 7035 (light grey) RAL 5017 (traffic blue)			
Protection class	IP20, IP21, IP54 (cabinet) according to IEC 529			
Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4			

P300, 90 – 360A:

Model	ADF P300-120/480 (ADF P300-90/690)	ADF P300-240/480 (ADF P300-180/690)	ADF P300-380/480 (ADF P300-270/690)
Rated power*	83 / 100 / 94 / 108 kVA	166 / 200 / 187 / 215 kVA	249 / 299 / 281 / 323 kVA
Compensation current capacity at 50/60 Hz, A rms	120 (90)	240 (180)	360 (270)
System voltage	480 V (208 – 480 V), 690 V (480 - 690 V)		
Nominal frequency	50/60 Hz ± 5 %		
Maximum air flow requirement	600 m³/h	1200 m³/h	1800 m³/h
Environment	0 to 95 % RH non-condensing		
Operating temperature	0 to 50 °C, up to 40 °C without derating		

Protection class	IP21 according to IEC 529, IP43 optional
Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4

*Compensation power at 400 V / 480 V (600 V / 690 V) nominal voltage

PPM300 Air Cooled, 50 – 120 A

Model	**PPM300v2-3-A-120/480**	**PPM300v2-3-A-90/690**	**PPM300v2B-3-A-50/480 PPM300v2B-3-A-75/480 PPM300v2B-3-A-90/480**	**PPM300v2B-3-A-120/480**
Rated current	120 A_{RMS}	90 A_{RMS}	50 A_{RMS} 75 A_{RMS} 90 A_{RMS}	120 A_{RMS}
System voltage	480 V (208 – 480 V)	690 V (480 – 690 V)	480 V (208 – 480 V)	
Nominal frequency	50/60 Hz ± 5 %			
Maximum air flow requirement	600 m^3/h			
Noise level	< 70 dB(A)			
Environment	0 to 95 % RH non-condensing			
Operating temperature	0 to 50 °C, up to 40 °C without derating			
Dimensions	230 x 1400 x 470 mm (W x H x D)			
Weight	133 kg	138 kg	79 kg	93 kg
Protection class	IP20 according to IEC 529			
EMC class	EN55011, Class B			

PPM300 Liquid cooled, 140-150 A

Model	**PPM300v2-3-W-150/480**	**PPM300v2-3-W-140/690**
Rated current	150 A_{RMS}	140 A_{RMS}
System voltage	480 V (208 – 480 V)	690 V (480 – 690 V)
Nominal frequency	50/60 Hz ± 5 %	
Water flow requirement	P = 100 kPa @ 14 l/min P = 60 kPa @ 10 l/min 1000 kPa design pressure Recommended media flow = 10 l/min @ 45 °C, 100% water	
Media connectors	G ½" M BSPP	
Cooling circuit	Aluminum, Stainless steel and EPDM rubber	
Noise level	< 70 dB(A)	
Environment	0 to 95 % RH non-condensing	
Operating temperature	0 to 50 °C, and up to 45 °C cooling media 32 to 122 °F, and up to 113 °F cooling media	
Dimensions	230 x 1400 x 470 mm (W x H x D)	
Weight	133 kg	138 kg
Protection class	IP20 according to IEC 529	
EMC class	EN55011, Class B	

SCC2

Model	**SCC2-P3 OEM**	**SCC2-P6 OEM**
Controlled PPM	PPM300	

System voltage	<690 V +10%	
Voltage Measurement	3x Phase + neutral or PEN N/PEN must be removed for IT-grid	
Current Measurement	5 A, 3 phases (<0.2 VA)	
Auxuliary voltage	24 VDC	
Dimensions	290 x 210 x 46 (incl sockets) (W x D x H)	
Operating temperature	0 to 55 °C	
Rate of harmonic reduction	better than 98 %	
External connections	3x Flat Cable PPM	6x Flat Cable PPM
	1x RJ45 Ethernet connector	
	1x Multi-Master (special connector – HDMI)	
	2x I/O Bus (USB Connector) for HMI, Temp Stick	
	4x Digital input 24VDC (3 configurable)	
	4x Digital output (250VAC / 5A) (1 configurable)	
	1x SD-card slot for logging data	
Expandability	Up to 3 modules can be controlled by one SCC2-P3 Up to 6 modules can be controlled by one SCC2-P6 Cluster of several SCC2 units can work in parallel for up to 90 PPM modules	

Application/ Limitation

Supply voltage range: 480V, 690V, 50/60 Hz
Voltage variation: ± 10 % , -15% reduced power rating (steady state)
Frequency variation: ± 5 %
Temperature range in operation: 0 - 40 °C, 41 - 50 °C with current derating of 1.5% / °CLiqud cooled modules 0 – 50 °C without derating
Temperature class: A
Vibration class: A
Humidity class: B
EMC class: A*

The ADF shall be regarded as a component. The actual installation to be designed according to Comsys Operating Instructions and according to the applicable DNV-GL Rules for the actual application. A DNV GLProduct Certificate is required. A copy of the type approval certificate is to be submitted for each certification.

Each harmonic filter shall be protected against short circuit and overcurrent. Circuit protection in filter units shall be monitored and provided with an alarm to a manned control station.

* The filter ADF is EMC classed C3 according to IEC 61800-3 and class B according to EN55011

The Type Approval covers hardware and software for the basic controller.

Clause for 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-GL for evaluation and approval. Major changes in the software are to be approved before being installed in the converter.

Datasheets, manuals and test reports, ref DNV-GL type approval job 262.1-023707-1

Tests carried out

Visual inspection, Performance, Power supply failure, Power supply variations, Voltage/frequency variation, Vibration/shock, Dry heat, Damp heat, Insulation resistance, High voltage, EMC tests

Marking of product

Comsys – Type designation – Power – Voltage

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