



TYPE APPROVAL CERTIFICATE

Certificate No:
TAP000021S
Revision No:
1

This is to certify:

That the Liquid cooling unit

with type designation(s)
C-series liquid cooling station

Issued to
Adwatec Oy
Kangasala, Finland

is found to comply with
DNV GL rules for classification – Ships

Application :

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

Issued at **Høvik** on **2020-06-09**

This Certificate is valid until **2025-04-27**.

DNV local station: **Finland CMC**

Approval Engineer: **Dag Harald Williksen**

for **DNV**

Oddvar Deinboll
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

The closed loop cooling station circulates coolant between power electronics and a heat exchanger. A three-way valve is used to ensure constant temperature and to avoid condensation in power electronics.

The liquid cooling station can be stand-alone or part of the switchboard. It can be installed with or without cabinet and be arranged with redundancy or not.

Detailed specification of C-series liquid cooling station can be found in Adwated datasheet E052

Application/Limitation

The unit is approved for liquid cooling of power electronics onboard DNV classed vessels and may be configured as follows:

Pump size	Number of pumps	Three-way valve	Heat exchanger type	Control / Wiring	Supply voltage and frequency	Remote control / monitoring
CCE3x	S	0	E	0	D5	0
CCE5x	R	3	W	C	E6	N
CCE10x		T	S	P	F5	B
CCE15x			T	V	F6	D
CCE20x			G	PV	X5	M
CCE32x					X6	X

Product key writing example: CCE104R-3-W-0-D5-0

Product key description according to Adwatec Datasheet – “Water Cooling Stations, Heavy duty series”, E052/2020-01

Tests carried out

Type test carried out with CCE104R, serial no 009100220, on the 2020.01.30 and CCE153R, serial no 008981219, on the 2020-02-05 at Adwatec, Kangasala, Finland

Marking of product

The product to be marked with manufacturer's name or trademark and type number identification.

Periodical assessment

For retention of the type approval, a DNV surveyor shall perform an assessment after 2 years and after 3.5 years to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.

In case where the type approved product is manufactured at other companies, the periodical assessment shall verify that the type approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore, periodical assessment shall be carried out randomly at these companies.

Other Conditions

Flexible hoses used to connect the cooling station to the ship system to be type approved by DNV.

Control and monitoring systems, including sensors and actuators are not covered by this type approval certificate. Documentation for control and monitoring systems shall be submitted for approval according to the Rules Pt.4 Ch.9 Sec.1 Table 5 and/or as listed in relevant type approval certificates.

Electric cables and installation of this is not covered by this approval and must be verified to comply with the requirement of the Rules Pt.4 Ch.8 - Electrical Installation.

Documentation for components to be according to the Rules depending on intended duty onboard the vessel, e.g. pumps to be certified in case of supporting main function, Pt1 Ch1 Sec1 [2.1.2].

A product certificate can be issued to the cooling station if it is built and tested according to this type approval certificate.

END OF CERTIFICATE