Certificate No: **2602062359553938**
TL Project No: **25-4649**

TYPE APPROVAL CERTIFICATE

This is to certify that the

Condensers

Manufacturer	:	**BITZER KÜHLMASCHINENBAU GMBH**
Address	:	**Etzwiesenstraße 42-44 72108 Rottenburg-Hailfingen Germany**
Product Type	:	**Heat exchanger**
Reference Rule	:	**TL Rules, Part E, Chapter 103 - Metallic Materials, Special Materials for Naval Ships, 01.01.2022** **TL Rules, Part E, Chapter 107 - Naval Ship Technology, Ship Operation Installations and Auxiliary System, 01.01.2022** **TL Rules, Part A, Chapter 3, Welding, 01.01.2023** **TL Rules, Part A, Chapter 2, Material, 01.07.2024** **TL Rules, Part B, Chapter 4, Machinery, 01.07.2024**

Subject to the conditions referred to in the following pages, this certificate is valid until **02.03.2031**

Surveyor: **Caner COŞKUN**

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Issued at **İSTANBUL** on **06.03.2026**

This document is electronically signed and does not require a manual signature

Click here for the verification website

Emrah SÖĞÜTÇÜ
New Building Division Manager
TÜRK LOYDU

Expire Date of Previous Certificate: -

For Information Only

This certificate is subject to terms and conditions described below:
Any significant change in design or construction may render this Certificate invalid. Certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. This certificate is not valid for products without marking above mentioned. The manufacturer should notify TÜRK LOYDU of any modifications or changes to equipment in order to obtain valid certificate. This certificate shows that tested specimens as representative of the product complies of the TÜRK LOYDU rules, and relevant international instruments that apply to it.

Product	**: Condensers**
Approval No / Date	**: PAE-EPAS/023673/25-4649/ŞÜ, 22.01.2026**
Performed Tests	**: - Quality Management System Audit - Visual Inspection - Dimensional Checks according to approved drawings - Visual Inspection - Hydrostatic Pressure tests - NDT checks reports reviewed. - Review of calibration certificates of test and measurement tools were found satisfactory.**
Last Inspection Date	**: 02.03.2026**
Test Place	**: BITZER KÜHLMASCHINENBAU GMBH, Sindelfingen, Germany**
Test Place	**: BITZER KUHLMASCHINENBAU GMBH, Sindelfingen, Germany**
Application/Limitation	**: Condensers are approved according to TL-PartB-Chapter4-Section 14-Pressure Vessels (July 2024 Edition). They are classified as pressure equipment class II (TL-PartB-Chapter4-Section14-Table 14.1). Connection efficiency v=0.85, corrosion allowance 0 mm. All materials used for pressure parts must be delivered with material certificates. Materials must comply with TL-PartA-Chapter2 (July 2024 Edition). The material certificates must specify the thickness tolerance class according to EN 10029-Table 1. Parts with a negative tolerance of C1=0 in the calculation must have a thickness tolerance class of C. Each pressure vessels manufactured to this type approval is to be: -- For these types of approved products to be used in TL's Classified ships, they must also have a TL product certificate. -- Constructionally checked and hydraulic pressure tested 1.5 x design pressure, -- Certified by TL and delivered with a product certificate. Marking of product For traceability to this type approval the products are at least to be marked with: --the name and domicile of the manufacturer, --the manufacturer's type designation and serial number, --the year of manufacture, --the design pressure, --the design temperature in °C, --the hydraulic test pressure, and --TL's identifying mark.**

	Type of Product	Product Description	Volume	Design Temperature	Design Pressure	Test Pressure
1	Heat exchanger	Condenser D500	Shell side: 181 - 201 l, Tube side: 74 - 92 l	Shell side: -10 to 120 °C. Tube Side : -10 to 95 °C.	Shell side: -1 to 28 bar HFC, EN378-1 Tube Side: 10 bar Water glyco	Shell side: -1 to 42 bar HFC, EN378-1 Tube Side: 15 bar Water glyco
2	Heat exchanger	Condenser D368	Shell side: 65 - 154 l, Tube side: 28 - 57 l	Shell side: -10 to 120 °C. Tube Side : -10 to 95 °C.	Shell side: -1 to 28 bar HFC, EN378-1 Tube Side: 10 bar Water glyco	Shell side: -1 to 42 bar HFC, EN378-1 Tube Side: 15 bar Water glyco

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3	Heat exchanger	Condenser D298	Shell side: 45 - 76 l, Tube side: 13,8 - 25 l	Shell side: -10 to 120 °C. Tube Side : -10 to 95 °C.	Shell side: -1 to 28 bar HFC, EN378-1 Tube Side: 10 bar Water glyco	Shell side: -1 to 42 bar HFC, EN378-1 Tube Side: 15 bar Water glyco
4	Heat exchanger	Condenser D216	Shell side: 14 - 44 l, Tube side: 4 - 12 l	Shell side: -10 to 120 °C. Tube Side : -10 to 95 °C.	Shell side: -1 to 28 bar HFC, EN378-1 Tube Side: 10 bar Water glyco	Shell side: -1 to 42 bar HFC, EN378-1 Tube Side: 15 bar Water glyco
5	Heat exchanger	Condenser D159	Shell side: 8 - 24 l, Tube side: 1,2 - 5 l	Shell side: -10 to 120 °C. Tube Side : -10 to 95 °C.	Shell side: -1 to 28 bar HFC, EN378-1 Tube Side: 10 bar Water glyco	Shell side: -1 to 42 bar HFC, EN378-1 Tube Side: 15 bar Water glyco
6	Heat exchanger	Condenser D108	Shell side: 3,4 - 5,2 l, Tube side:0,4 - 0,9 l	Shell side: -10 to 120 °C. Tube Side : -10 to 95 °C.	Shell side: -1 to 28 bar HFC, EN378-1 Tube Side: 10 bar Water glyco	Shell side: -1 to 42 bar HFC, EN378-1 Tube Side: 15 bar Water glyco

Approval Conditions **: -**

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