Certificate No:
TAM00001BG

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Refrigerant Compressor

with type designation(s)
4BES

Issued to
Bitzer Kühlmaschinenbau Schkeuditz GmbH
Schkeuditz, **Germany**

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.5 Rotating machinery – driven units

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Max. working press.:	**32 bar**
Operating media	**HCFC-refrigerants, HFC-single component refrigerants, HFC-refrigerant blends, HFO-refrigerants, HFO/HFC refrigerant blends, see page 2**

Issued at **Hamburg** on **2023-10-30**
This Certificate is valid until **2028-10-29**.
DNV local unit: **Hamburg – CMC North/East**

Approval Engineer: **Christian Kaemmer**

for **DNV**

Sven Klinger
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

Semi-Hermetic Refrigerant Compressor, reciprocating, with 4 cylinders.

Type	4BES
Displacement [m^3/h] @ 1450 1 /min	36,1

Casing Material: Cast Iron with Flake Graphite EN-GJL-250

Usable Refrigerants

HCFC-refrigerants of the safety group A1 and Fluid Group 2 PED
HFC-single-component refrigerant of the safety group A1 and Fluid Group 2 PED
HFC-refrigerant blends of the safety group A1 and Fluid Group 2 PED
HFO-refrigerant of safety group A2L and Fluid Group 1 PED
HFO-refrigerant of safety group A2L and Fluid Group 2 PED
HFO/HFC refrigerant blends of safety group A1 and Fluid Group 2 PED

Note: Fluid Groups acc. to PED = Pressure equipment directive 2014/68/EU
Safety Groups acc. to EN DIN 378-1:2017-03

Production place

- Bitzer Kühlmaschinenbau Schkeuditz GmbH, Industriestr. 48, 04435 Schkeuditz / Germany.

Application

Air Conditioning, Provision Cooling, Cargo Refrigeration.

Tests to be carried out

Compressors for cargo refrigeration are subject to a performance test at the manufacturer´s works under supervision of DNV and are to be presented for final inspection.

Type Approval documentation

Marking of product

The product shall be marked with manufacturer´s name, year of construction, effective suction rate [m3/h], discharge pressure [bar], speed [rpm], shaft power [kW], serial number.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Sec.4.

To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com