Certificate No:
TAA0000315

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Actuators and valves, miscellaneous

with type designation(s)
4WRPE...-3x/...-948, 4WRPE...-3x/...-960

Issued to
Bosch Rexroth AG
Lohr a. Main, Bayern, **Germany**

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.

Location classes:

Temperature	**B**
Humidity	**B**
Vibration	**B**
EMC	**A**
Enclosure	**B**

Issued at **Hamburg** on **2021-09-22**
This Certificate is valid until **2026-09-21**.
DNV local station: **Augsburg**

Approval Engineer: **Holger Jansen**

for **DNV**

Joannis Papanuskas
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 4WRPE …-3X/…-948 and the 4WRPE …-3X/…-960 are 4/3 directional control valves with on-board electronics.

Type: 4WRPE * ** *** S **** -3X/ *****/ 24/ F1 ******

Nomenclature:

4WRPE:	4/3 servo solenoid valve with on-board electronics		
*:	Normal size		
	Size 6:	6	
	Size 10:	10	
**:	Symbols: E, EA, E1, W, W1, W6, W8, V, V1		
***:	Nominal flow rate at 5 bar valve pressure difference per metering notch		
	Size 6:	08:	08l/min
		18:	18 l/min
		32:	32 l/min
	Size 10:	50:	50 l/min
		80:	80 l/min
S:	Flow characteristic: progressive		
****:	w/o designation:		w/o Overlap compensating jump
	J:		w/ Overlap compensating signal
-3X/:	Unit series		
*****/:	M:		NBR seals
	V:		FKM seals
24/:	Voltage supply of electronics +24Vdc		
F1:	Interface for electronics:		setpoint input 4…20mA
******:	-948:		28% mechanic offset of the spool stroke
	-960:		w/o offset

Application/Limitation

The Type Approval covers hardware listed under Product description. When the hardware is used in applications to be classed by DNV GL, documentation for the actual application is to be submitted for approval by the manufacturer of the application system in each case. Reference is made to DNV GL Rules for Ships Pt.4 Ch.9 Control and Monitoring Systems.

Type Approval documentation

Tests carried out

Applicable tests according to class guideline DNVGL-CG-0339, August 2021.

Marking of product

The products to be marked with:

- Manufacturer name
- Model name
- Serial number

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:

- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines
- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the 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