



TYPE APPROVAL CERTIFICATE

Certificate No:
TAA00001CH
Revision No:
1

This is to certify:

That the Test and Calibration Equipment

with type designation(s)
iso685x - series, FP200 - series, EDS44x - series

Issued to

Bender GmbH & Co. KG
Grünberg, Germany

is found to comply with

DNV 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:

Type	Temperature	Humidity	Vibration	EMC	Enclosure
iso685x - series	D	B	A	A	A
FP200 - series	D	B	A	A	A
EDS44x - series	D	B	A	A	A

Issued at **Hamburg** on **2023-05-22**

This Certificate is valid until **2027-11-02**.

for **DNV**

DNV local unit: **Essen**

Approval Engineer: **Holger Jansen**

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

iso 685 – series:

Insulation monitoring device for unearthed AC, AC/DC and DC systems

Type designation: iso x¹ 685 x² – x³ – x⁴ – x⁵ – x⁶ – x⁷

x ¹ – Application:	Blank: Standard device
	MIL: Military
	HR: High resistor
	NAV: Navy
	DB: German railway
	SIL: Functional safety device
	RW: Railway
x ² – Environment requirement:	Blank: Standard device
	W: Device with increased environmental requirements
x ³ – Display:	S: Without display
	D: With display
x ⁴ – Extended options:	Blank: Standard device
	I: Impact measurement technology
x ⁵ – Features:	Blank: Standard device
	B: Deactivation of measurement in several coupled systems
	P: Deactivation of measurement in several coupled systems and with additional current limiter
	C: Additional cooling element
X ⁶ – Supply voltage:	Blank; 24...240 VAC/VDC; 50...400Hz
X ⁷ – Language:	Blank: Standard device
	CN: Chinese
	RU: Russian
	VN: Vietnamese

FP200 – series:

Display and operator unit devices of the iso685 – series without display

Type designation: FP200 x¹

x ¹ - Environment requirement:	Blank: Standard device
	W: Device for increased environmental requirements

EDS 44x – series:

Insulation fault locators for localisation of insulation faults in unearthed DC, AC and three-phase power supply systems

Type designation: EDS44 x¹x² – x³ – x⁴ x⁵

x ¹ - Variants:	0: Standard device
	1: Modified measuring range
x ² - Environment requirement:	Blank: Standard device
	W: Device for increased environmental requirements
x ³ – Display:	S: Without display, only ON LED
	D: With LCD-display
	L: With LED-line
	LAB: With LED-line and connecting W...AB series measuring current transformers
	LNA: With LED-line for hospital market in US
x ⁴ – Supply voltage:	1: 24V DC / BB-Bus
	4: 24...240 VAC/VDC; 50...400Hz
x ⁵ – Language:	Blank: Standard device
	CN: Chinese
	RU: Russian

Application/Limitation

Supply voltage U_s : AC 24...240 V / DC 24...240 V
Frequency range U_s : DC, 50...400 Hz

Operational Temperature:
Standard variants: -25°C ... +55°C
W-variants: -40°C ... +70°C
FP200 – Series: Degree protection with transparent cover IP65

For installation inside switchboards/ enclosures onboard ships.
Operating instruction of the manufacturer to be observed.

Type Approval documentation

Tests carried out

Applicable tests according to Class Guideline DNV-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 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