

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Monitoring Relay

with type designation(s)
TVOC-2

Issued to

ABB AB, Control Products
VÄSTERÅS, Sweden

is found to comply with

Det Norske Veritas' Rules for Classification of Ships, High Speed & Light Craft and Det Norske Veritas' Offshore Standards

Application :

This Certificate is valid until **2018-06-30**.

Issued at **Høvik** on **2015-07-28**

DNV GL local station: **Stockholm**

Approval Engineer: **Nicolay Horn**

for **DNV GL**

Marit Laumann
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.

Product description

Arc fault monitoring system with fiber optic sensors

Type	Type number	Description
Arc Monitor	TVOC-2-240	Including one HMI and door accessories
Arc Monitor	TVOC-2-48	Including one HMI and door accessories
Extension	TVOC-2-E1	10 optical inputs
Extension	TVOC-2-E3	10 optical inputs for 60 m detector cable
HMI	TVOC-2-H1	Human machine interface - additional

Optical inputs and outputs	
Optical detectors	10 inputs on arc monitor
	10 inputs on Extension unit X2 (optional)
	10 inputs on Extension unit X3 (optional)
Current signal from CPU	2 inputs: X1.21, X1.22 (optical)
Forward current signal to another Arc monitor	1 output: X1.23 (optical)

Power supply	
Rated supply voltage U_s	100 - 240 V AC, 50/60 Hz, 100 - 250 V DC, 24 - 48 V DC
U_s variation	AC -20% +10%, DC: -25% +30%
Rated insulation voltage	250 V AC with reinforced insulation
Rated impulse withstand voltage	4 kV

Environmental conditions	
Permissible ambient temperature	-25 °C to +55 °C
Degree of protection	IP20 Arc monitor, IP54 HMI front side

Application/Limitation

Installation of the unit is to be according to manufacturer's specifications.

Type Approval documentation

Tests carried out

Type tests in accordance with IEC 60947-5-1 & IEC 61010-1. Environmental tests in according to IEC 60945 (Low temperature, Dry heat, damp heat and vibration. EMC in accordance with the EMC directive.

Marking of product

ABB AB – Type designation

Job Id: **262.1-015119-2**
Certificate No: **TAE000001N**

Periodical assessment

The scope of the periodical assessment is to verify that the conditions stipulated for the Type approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the survey are:

- Inspection on factory samples, selected at random from the production line (where practicable)
- Results from Production Sample Tests (PST) and Routines (RT) checked (if not available tests according to PST and 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.

Assessment to be performed at least every second year.

END OF CERTIFICATE