Certificate no.:
TAE00004WM

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Monitoring Relay

with type designation(s)
PGR-8800 (D1000)

issued to
Littelfuse Far East Pte. Ltd
Singapore, Coahuila, Singapore

is found to comply with
DNV rules for classification – Ships, offshore units, and high speed and light craft

Application:

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

Issued at **Høvik** on **2023-08-15**
This Certificate is valid until **2028-08-14**.
DNV local unit: **Copenhagen Fleet In Service**

Approval Engineer: **Qiang William Guo**

for **DNV**

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.

Place of Manufacture

Name of manufacture :	Littelfuse Relays Plant (PDS2) Piedras Negras, Coahuila, Mexico
Address of manufacture :	BLVD. FAUSTO Z. MARTINEZ # 1800 PIEDRAS NEGRAS, COAH. MEXICO 26070

Product description

PGR-8800 Series : Arc Flash Monitoring System

Type number	Description
PGR-8800	Main arc fault protection module

Trip / Signal inputs and outputs	
Optical sensors	1x local sensor
	6x inputs for external optical sensors (Point or Fiber-optic sensors)
Current sensors	3x phase current inputs
Digital input	2x remote trip
	2x inhibit
	2x reset inputs
Output relay (2x contact sets with LED)	1x online
	1x service
	1x tripped
Trip coil output	1x IGBT switch. Programmable to trip shunt or undervoltage circuit breaker
Link	Link up to 4x PGR-8800 modules via MODBUS RTU protocol (optional)
USB interface	Data logs and software configuration

Power supply	
Rated supply voltage Ur	100-240 V AC, 50-60 Hz or 110-250 V DC (may charge 24V DC external backup battery)
Rated supply voltage Ur (Low voltage)	14-48 V DC or 24 V DC external backup battery
Us variation	AC 85% to110%, DC: 80% to 110 %
Rated impulse withstand voltage	5 kV

Environmental conditions	
Operating temperature	-25 °C to +70 °C
Degree of protection	IP20 (optical sensors IP30)

Application/Limitation

Location Class according to DNV-CG-0339, Aug 2021
Temperature: B
Humidity: A
Vibration: A
EMC: A
Enclosure: A
Operating instruction of the manufacturer to be observed, Installation of the unit is to be according to manufacturer's specifications.

Type Approval documentation

Tests carried out

Test Specification for Type Approval'. Power supply voltage variations, acoustic noise signals and compass safe distance test according to IEC 60945:2002 and IEC 60945: CORRIGENDUM 1:2008. Enclosure protection test according to IEC 60529:2001
Test in accordance with EN60255-26 :2013-Measuring relays and protection equipment. Environmental test according to IACS E10 Rev.9 2023 and DNV-CG-0339 Aug.2021

Marking of product

Littelfuse – Model designation and 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