

PULSE OVERVOLTAGE SUPPRESSOR SERIES OPN-M



OPERATING MANUAL



*Quality control system on the development and deviceion complies with requirements
ISO 9001:2015*

Dear customer,

Company NOVATEK-ELECTRO Ltd. thanks you for purchasing our devices.
You will be able to use properly the device after carefully studying the Operating Manual.
Keep the Operating Manual throughout the service life of the device.

ATTENTION! ALL REQUIREMENTS OF THIS OPERATING MANUAL ARE COMPULSORY TO BE MET!



WARNING! – DEVICE TERMINALS AND INTERNAL COMPONENTS ARE UNDER POTENTIALLY LETHAL VOLTAGE

TO ENSURE THE DEVICE SAFE OPERATION **IT IS STRICTLY FORBIDDEN THE FOLLOWING:**

- **TO CARRY OUT MOUNTING WORKS AND MAINTENANCE WITHOUT DISCONNECTING THE DEVICE FROM THE MAINS;**
- TO OPEN AND REPAIR THE DEVICE INDEPENDENTLY;
- TO OPERATE THE DEVICE WITH MECHANICAL DAMAGES OF THE CASE.

IT IS NOT ALLOWED WATER PENETRATION ON TERMINALS AND INTERNAL ELEMENTS OF THE DEVICE.

During operation and maintenance the regulatory document requirements must be met, namely:

- Regulations for Operation of Consumer Electrical Installations;
- Safety Rules for Operation of Consumer Electrical Installations;
- Occupational Safety when in Operation of Electrical Installations.

Installation, adjustment and maintenance of the device must be performed by qualified personnel having studied this Operating Manual.

In compliance with the requirements of this Operating Manual and regulations the device is safe for use.

This Operation Manual is intended to let you know about the device, safety requirements, operation and maintenance procedures for the Pulse Overvoltage Suppressor, series OPN-M ((hereinafter in the text; device, OPN-M).

The device meets the requirements of the following: IEC/EN 61643-1.

Harmful substances, in more than allowed concentration, are not available.

1. DESIGNATION

1.1 Designation of the device

Pulse overvoltage suppressors OPN-M are designed to protect internal distribution circuits of residential and public buildings from lightning and switching pulse surges. Suppressors are designed for operation in single-phase or three-phase electric AC networks with voltage up to 400 V and frequency of 50 Hz.

The main scope of suppressors: input-distribution devices, metering and distribution switchboards of residential and public buildings, group apartment and floor shields.

Suppressors consist of a base and replaceable cartridges with a signal indicator:

- green: a normal operating condition;
- orange: the cartridge must be replaced.

Note - *Claims to suppressors subjected to direct or indirect impact of lightning or pulse surges are not accepted.*

The electrical circuit diagram of suppressors and wiring diagrams are given in Appendix A.

1.2. Operation conditions

The device is designed for operation in the following conditions:

- Ambient temperature: from minus 40 to +70°C;
- Atmospheric pressure: from 84 to 106.7 kPa;
- Relative air humidity (at temperature of +25 °C): 30 ... 80%.

If the temperature of the device after transportation or storage differs from the environment temperature at which it is expected to operate, then before connection to electric mains keep the device under the operating conditions within two hours (because the device elements may have moisture condensation).

ATTENTION! The device is not intended for operation in the following conditions:

- Significant vibration and shocks;
- High humidity;
- Aggressive environment with content in the air of acids, alkalis, etc., as well as severe contaminations (grease, oil, dust, etc.).

2 TECHNICAL SPECIFICATIONS

The main technical characteristics are shown in Table 1.

Table 1

Name of parameter	Value		
	B (class I)	C (class II)	D (class III)
Class of protection	B (class I)	C (class II)	D (class III)
Rated/maximum continuous operating voltage U_c , V	~ 385/400	~ 385/400	~ 230/255
Rated impulse withstand voltage, U_{imp} , V	6000		
Rated discharge current 8/20 I_n , kA	30	20	5/10
Maximum discharge current 8/20 I_{max} , kA	60	40	10/20
Maximum surge current I_{imp} 10/350, kA	10	-	-
Charge Q , A · s (during 10 ms)	5.0	-	-
Specific energy W/R , kJ / Ω	25	-	-
Protective voltage level U_p , no more, kV	2.2	1.8	1.2/1.8
Response time, no more, ns	25		
Network frequency, Hz	48 - 63		
Protection mode	L-PE, N-PE (1P, 2P, 3P, 3P + N)		
Protection class	IP 20		
Climatic version	NF 3.1		
Number of poles	1 – 4		
Response time, no more, ns	25		
Cross-section of wires for connection to terminals, mm ²	4.0 – 25.0		
Tightening torque of terminal block screws, N*m	2±0.2		

Overall dimensions, mm	Height	79
	Width	1S – 18; 2S – 36; 3S – 54; 4S – 72
	Depth	68
Mass, kg, not more		0.15
Installation (mounting) on a standard 35 mm DIN rail		
The device retains its operability in any position in the space		
Body frame material - self-extinguishing plastic		

Table 2

Name	Number of poles	Rated discharge current 8/20 mcs, kA	Maximum discharge current 8/20 mcs, kA	Rated operating voltage, V	Fig. 1
OPN-M	1	5	10	255	1S
OPN-M	1	20	40	385	1S
OPN-M	1	30	60	385	1S
OPN-M	2	5	10	255	2S
OPN-M	2	20	40	385/255	2S
OPN-M	3	20	40	385	3S
OPN-M	3	30	60	385	3S
OPN-M	4	10	20	385	4S
OPN-M	4	20	40	385	4S

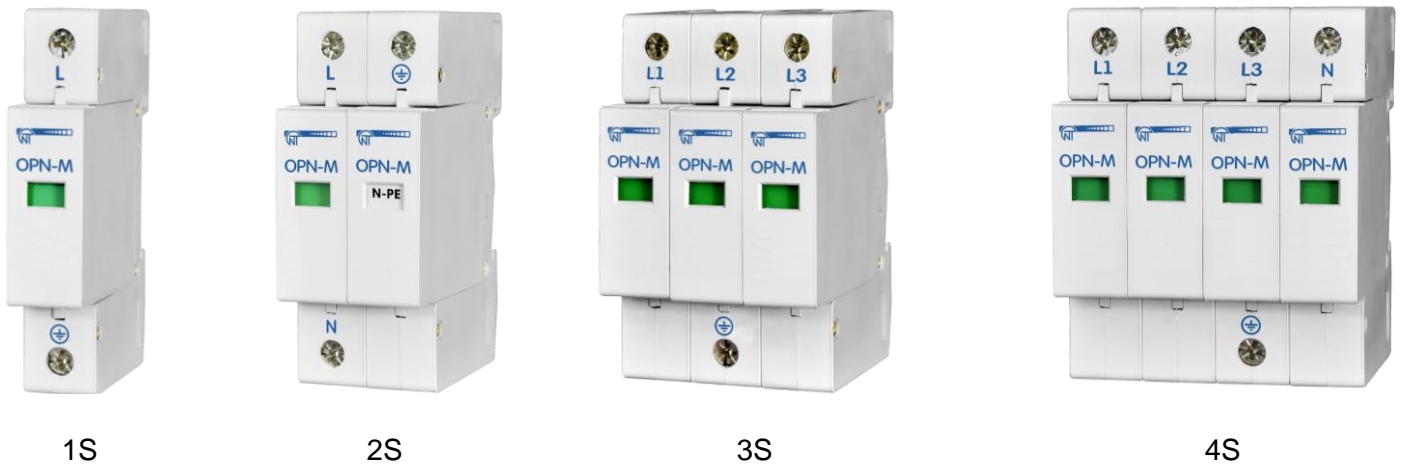


Fig. 1 – Design versions

3. INTENDED USE

3.1. Preparation for operation

3.1.1. Preparation for connection:

- Unpack and check the device for damage after transportation; in case of such damages detection, contact the supplier or manufacturer;
- Carefully study the Operating Manual;
- If you have any questions regarding the installation of the device, please contact the manufacturer by telephone number indicated at the end of this Operating Manual.

3.1.2 Device connection

ATTENTION! ALL CONNECTIONS MUST BE PERFORMED WHEN THE DEVICE IS DE-ENERGIZED

Error when performing the installation works may damage the device and connected devices.

ATTENTION! A circuit breaker or a fuse matching to the load of the network must be installed in the suppressor circuit on the mains side. Install a circuit breaker or a fuse in accordance with the circuit diagram given in Appendix A.

To ensure reliability of electrical connections, flexible (multi-wire) wires with insulation for a voltage of at least 450 V should be used, the ends of which must be stripped of insulation by 5 ± 0.5 mm and squeezed with bushings. The fastening of the wires should exclude mechanical damage, twisting and abrasion of the wire insulation.

Cable cross section for fuse: < 50 A – at least 6 mm²; 63 A – at least 16 mm²; 100 A – at least 25 mm².

IT IS NOT ALLOWED TO LEAVE EXPOSED PORTIONS OF WIRE PROTRUDING BEYOND THE TERMINAL BLOCK.

For a reliable contact, tighten the terminal screws with the force indicated in Table 1.

When reducing the tightening torque, the junction point is heated, the terminal block may be melted and wire can burn. If you increase the tightening torque, it is possible to have thread failure of the terminal block screws or the compression of the connected wire.

- 3.1.2.1 **Switch OFF the supply voltage with a circuit breaker.**
- 3.1.2.2 Connect the device in accordance with the circuit specified in Appendix A.
- 3.1.2.3. Check for correct connection according to the circuit specified in Appendix A.

4 SERVICE LIFE AND WARRANTY

- 4.1 Service life – is 5 years. Contact manufacturer upon the expiry of the service life.
- 4.2 Guaranteed storage life – is 3 years.
- 4.3 Warranty period of the device operation is 3 months from the date of sale.

During the warranty period the Manufacturer is responsible for free repair of the device, if the Consumer has complied with the requirements of this Operating Manual.

ATTENTION! IF THE DEVICE HAS BEEN OPERATED WITH VIOLATION OF THE REQUIREMENTS OF THIS OPERATION MANUAL, BUYER WILL FORFEIT THE RIGHT TO WARRANTY SERVICE.

- 4.4 Warranty service is performed at the place of purchase or by the Manufacturer of the device.
- 4.5 Before sending for repair, the device should be packed in the original or other packaging excluding mechanical damage.

5 TRANSPORTATION AND STORAGE

OPN-M in the shipping box should be stored indoors at a temperature of -40 to +70 °C and relative humidity of no more than 80% with no vapors available in the air.

6 ACCEPTANCE CERTIFICATE

OPN-M is manufactured and accepted in accordance with the applicable technical documentation and considered as fit for use.

Head of quality division

Date of manufacture

Stamp

7 NOTICES OF CLAIMS

The Company is grateful to you for the information about the quality of the device and suggestions for its operation.



With questions and comments, please contact manufacturer at the following address:

"Novatek-Electro" Ltd.
 59, Admiral Lazarev str.,
 Odessa, Ukraine, 65007.
 Tel: +38 048 738-00-28; +38 0482 37-48-27;
 Fax: +38 0482 34 36 73.
 www.novatek-electro.com

Sale date _____

Appendix A

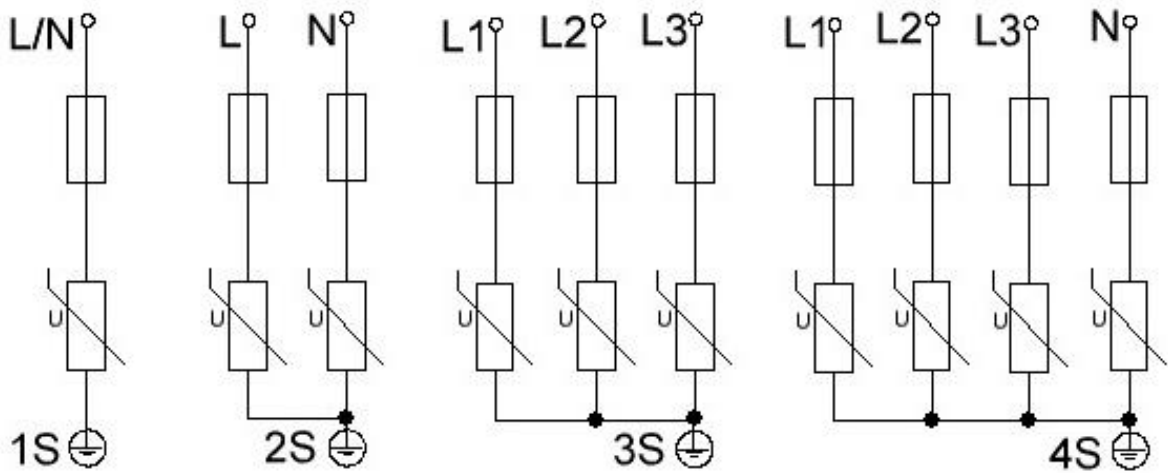


Fig.A1 – Electrical circuit diagrams of suppressors

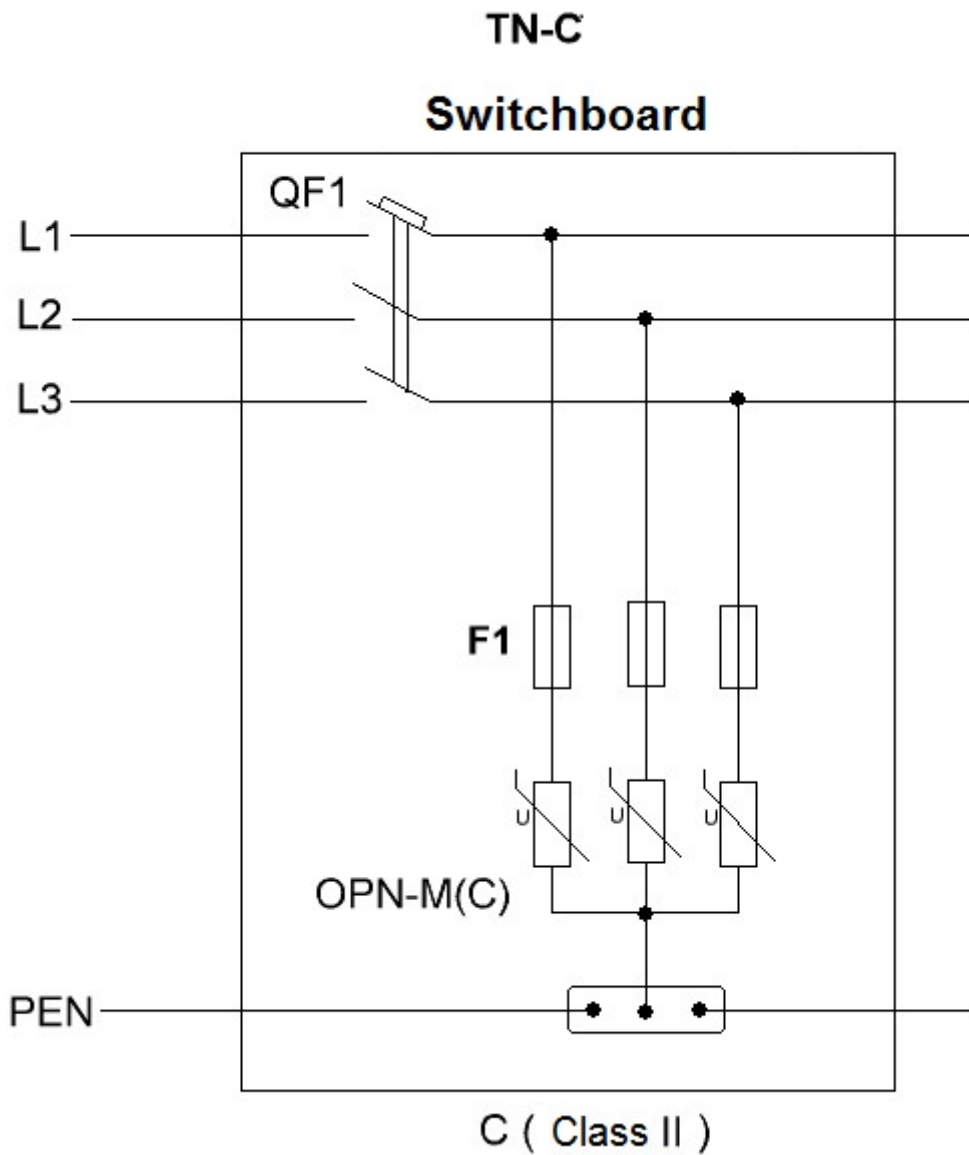


Fig. A2 – Installation option with PEN

TN-S Switchboard

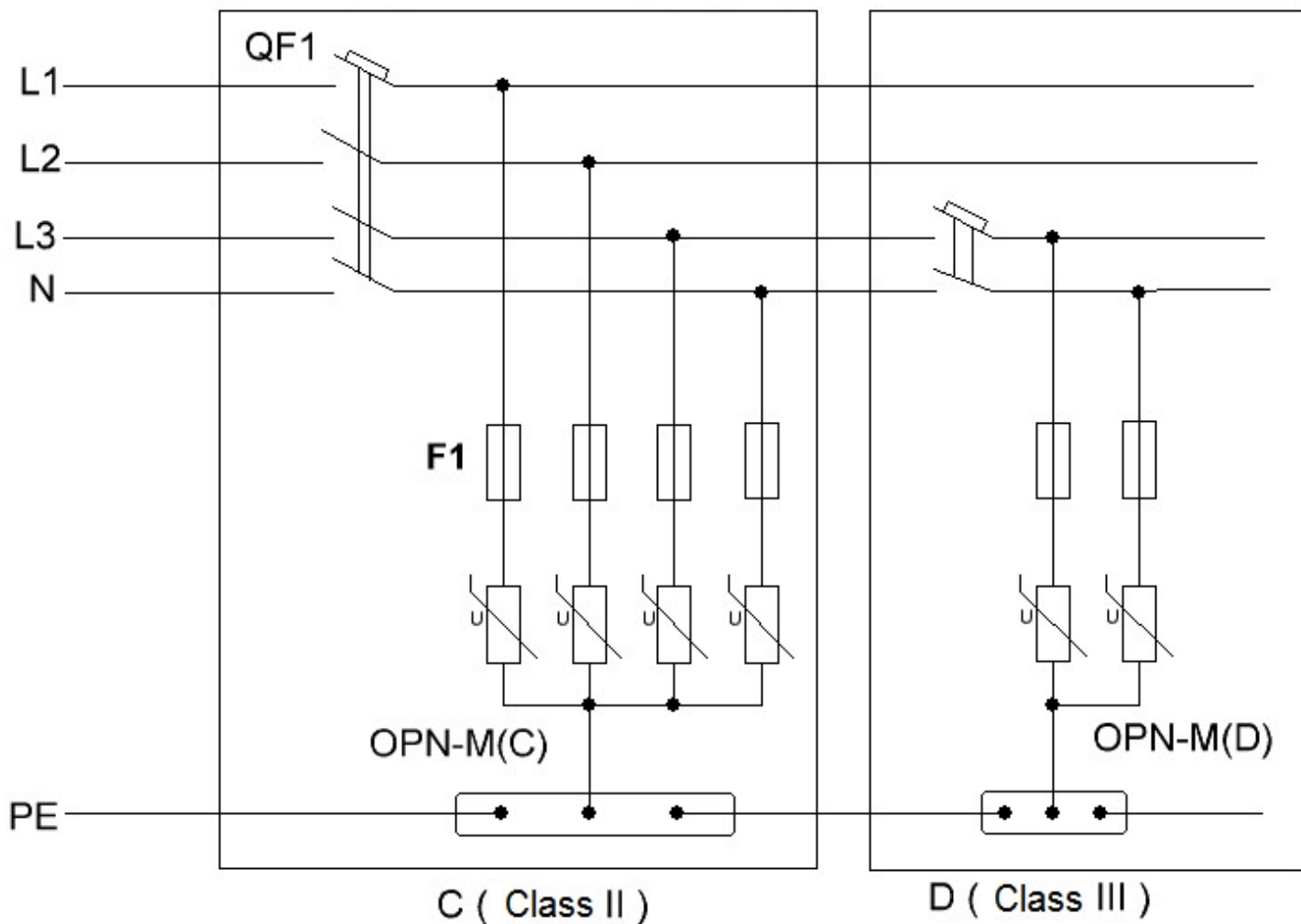


Fig. 3 – Installation option with N - PE

Note:

The presence of F1 fuses is mandatory if the rating of the QF1 circuit breaker exceeds the value specified in the Manual for this type of OPN-M. It is allowed to replace F1 fuses with automatic machines. The magnitude of the tripping current must never exceed that specified in the manufacturer's catalog.

In many cases, to ensure the continuity of the supply, QF1 circuit breakers are installed with a current rating less than the line breaker. In this case, it becomes necessary to additionally monitor the state of the OPN-M and primarily the varistor blocks.

