

**"QUARTZ" LLC**

## **FUSES PN22 SERIES**

Technical description and user manual

**UITSG. 674351.008 TO**

## 1. Purpose

1.1. PN-22 series fuses, manufactured by "Quartz" LLC in accordance with TU U 3.11-19274160-106-98 and DSTU EN 60269-1:2015, are intended for protection of stationary electrical installations and electric circuits with voltages of 220 and 380 V AC with frequencies of 50 and 60 Hz with short closures and overloads. The fuses are used in low voltage switchgears and other electrical installations of industrial enterprises. PN22 Fuses are entirely interchangeable with fuses series PN2 in accordance with their installation, dimensional and protective characteristics.

1.2. The structure of the symbol for the fuses is given in Appendix A. The marking of the rated current of the fuse-link is printed on the terminal, the rated voltage is on the fuse cover.

1.3. Fuses are manufactured in climatic version UHL3.

1.4. Fuses should be used in enclosed spaces or in cabinets with natural ventilation, where fluctuations in temperature and humidity, as well as the presence of dust, are substantially less than on open air.

## 2. Technical data

2.1. The main parameters of the fuses are shown in Table 1.

Table 1

Fuse type	Rated fuse current, A	Rated current of the fuse-link, A	Power loss, W	Maximum breaking current, kA
PN22-100-XX UHL3	100	31,5	7,0	80
		40	7,5	
		50	8,5	
		63	11,5	
		80	12,5	
PN22-250-XX UHL3	250	100	12,5	80
		125	16,0	
		160	21,0	
		200	28,0	
		250	30,0	
PN22-400-XX UHL3	400	200	30,0	40
		250	34,0	
		315	49,0	
		400	56,0	
PN22-630-XX UHL3	630	315	49,0	25
		400	56,0	
		500	60,0	
		630	85,0	
PN22-1000-XX UHL3	1000	800 1000	95,0 130,0	25

### **NOTE:**

1) the sign "XX" means the design of the fuse according to the installation conditions and the presence of a trigger in accordance with the structure of the symbol;

2.2. Nominal operating mode - continuous.

2.3. Cooling of fuses - air with natural convection.

2.4. Fuses are designed to work under the following conditions:

- lower value of ambient air temperature - 40 °C;
- the upper value of the ambient air temperature + 40 °C;
- altitude above sea level - not more than 1000 m;
- atmosphere - industrial or conditionally clean according to GOST 15150;

In the case of installing fuses in cabinets at an ambient temperature of over 40 °C, the permissible operating currents should be reduced in accordance with the requirements of Table 2.

Table 2

Fuse type	Rated current of the fusible inserts, A	Permissible operating current, A at ambient temperature, °C		
		45	50	55
PN22-100	31,5	31,5	31,5	31,5
	40	40	40	40
	50	50	50	45
	63	63	53	50
	80	80	67	60
	100	100	80	75
PN22-250	80	80	80	80
	100	100	100	100
	125	125	105	100
	160	160	130	125
	200	200	170	160
	250	250	200	190
PN22-400	200	200	200	200
	250	235	220	210
	315	300	280	260
	400	355	335	315
PN22-630	315	300	290	280
	400	375	365	355
	500	475	440	400
	630	550	500	480
PN22-1000	800	700	635	610
	1000	875	800	760

2.5. The fuses belong to the "g" class in accordance with DSTU EN 60269-1:2015 and provide the disconnection of currents from the conventional melting current to the maximum breaking current at a returning voltage of 110% of the rated value with power factor of the circuit not less than:

- 0,3 at currents up to 10 kA;
- 0,2 at currents from 10 to 20 kA;
- 0,1 at currents above 20 kA.

The conventional values of the non-melting current, melting current, and conditional time are given in Table 3.

Table 3

Rated current of the fusible insert, A	Ratio of the conventional non-melting current to the rated current	Ratio of the conventional melting current to the rated current	The conditional time, h
31,5÷63	1,3	1,6	1
80; 100	1,3	1,6	2
125; 160	1,2	1,6	2
200÷400	1,2	1,6	3
500; 630	1,2	1,6	4
800, 1000	1,2	1,6	4

2.6. The timing of the breaking current characteristics is given in Appendix B.

2.7. The minimum operating voltage of the operation indicator is 100 V.

2.8. Fuses are supplied in the form of separate components, connected by the customer at the installation site. The package includes the components shown in Table 4. Upon agreement with the manufacturer, an insulating handle is supplied to the fuse-batch to replace the fuse-links.

Table 4

The design of the fuse in the structure of the conventional designation	The number of components, pcs.			
	Fusible inserts	Contacts	Insulators	Fastening parts
11	1	2	2	1
10	1	2	2	1
21	1	2	—	1
20	1	2	—	1
01	1	—	—	—
00	1	—	—	—

For each batch of fuses, a passport, a technical description and instructions for operating the fuses are supplied.

Fuses with a triggering indicator are manufactured by separate agreement with the manufacturer.

2.9. Overall, mounting and connecting dimensions and weight of the fuses are given in Appendix B. Maximum deviations of the mass  $\pm 10\%$ .

### 3. Installation of fuses

3.1. The installation of fuses should be carried out in accordance with the requirements of dimensional and installation drawings and the current "Rules for the setup of electrical installations" (SEI).

The position of the fuses in space is any, except for the position under the fixing plane.

3.2. Connection of external conductors to fuses for currents from 31,5 to 400 A should be carried out with copper cables or buses; connection of fuses for currents of 500 and higher - only with copper buses. The cross-section of the conductors must be no less than those specified in Table 5. When connecting external aluminum conductors, their cross-section must be increased accordingly, and the contact surfaces are protected from corrosion by a galvanic conductive coating.

Table 5

Fuse current, A	Cross-section of the conductor, mm <sup>2</sup>	Fuse current, A	Cross-section of the conductor, mm <sup>2</sup>
31,5÷50	10	250	120
63	16	315, 400	240
80	25	500	30x5 (two splints)
100	35	630	40x5 (two splints)
125; 160	50	800	40x6 (two splints)
200	95	1000	40x8 (two splints)

3.4. The electrical gaps from the parts of the fuse under voltage to the metal and other conductive parts of the complete device should be not less than 12 mm.

### 4. Maintenance and safety measures

4.1. Maintenance of the electrical installation using the PN22 fuses should be carried out by electrical personnel authorized to service electrical installations with voltages up to 1000 V, in accordance with the "Rules for the Technical Operation of Consumer Electrical Installations" and the "Rules for the Safe Operation of Consumer Electrical Installations."

4.2. Before putting the fuses into service, it is necessary to perform an external inspection, check the integrity of the fuse links and measure the insulation resistance. The fuses should not have mechanical damages preventing their operation (cracks on the casing, loosening of the lid or leakage of sand).

The insulation resistance is measured by a megger at 1000 V.

4.3. Remove and install fuses when the voltage is off. It is allowed to install and remove fuses on the connections under voltage, but without load, in the circuit of which there are no switching devices, allowing to reduce the voltage.

When removing and installing fuses under voltage, it is necessary to use insulating mites or dielectric gloves and goggles.

To install and remove fuses from contacts it is recommended to use a special insulating handle, which is supplied by the fuse manufacturer as agreed.

4.4. During operation, external inspection and preventive maintenance of the fuses must be carried out at least once a year. At the same time, it is necessary to remove dust from insulators and live parts,

check the tightness of the power contact connections and ensure the reliability of the knife joint of the fuse-link with the base contacts.

4.5. It is recommended to repair the burnt fuses at the factory. This requires special technological equipment and special materials.

4.6. Fuses do not contain harmful substances and materials. Disposal of fuses must be carried out in accordance with the procedure stipulated by the decisions of the regional organization of sanitary and epidemiological surveillance.

## **5. Transportation and storage**

5.1. Transportation of fuses is allowed to be performed by any kind of closed transport (in containers, ship holds, closed vehicles, etc.).

5.2. Fuses should be stored indoors with natural ventilation.

5.3. Climatic conditions during transportation and storage:

- upper temperature value +50 °C;
- The lower temperature value is -50 °C.

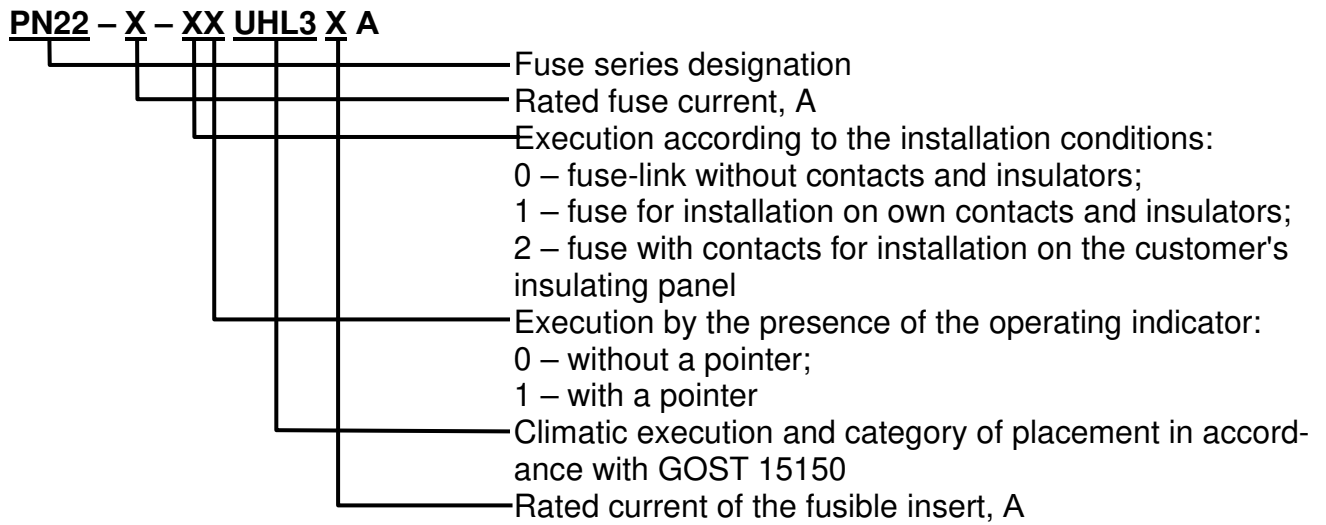
In this case, the duration of the fuses in the period of transportation and storage at an ambient temperature of less than -40 °C should not exceed 30 days.

5.4. The permissible period of protection of the fuses in the manufacturer's packaging is 2 years.

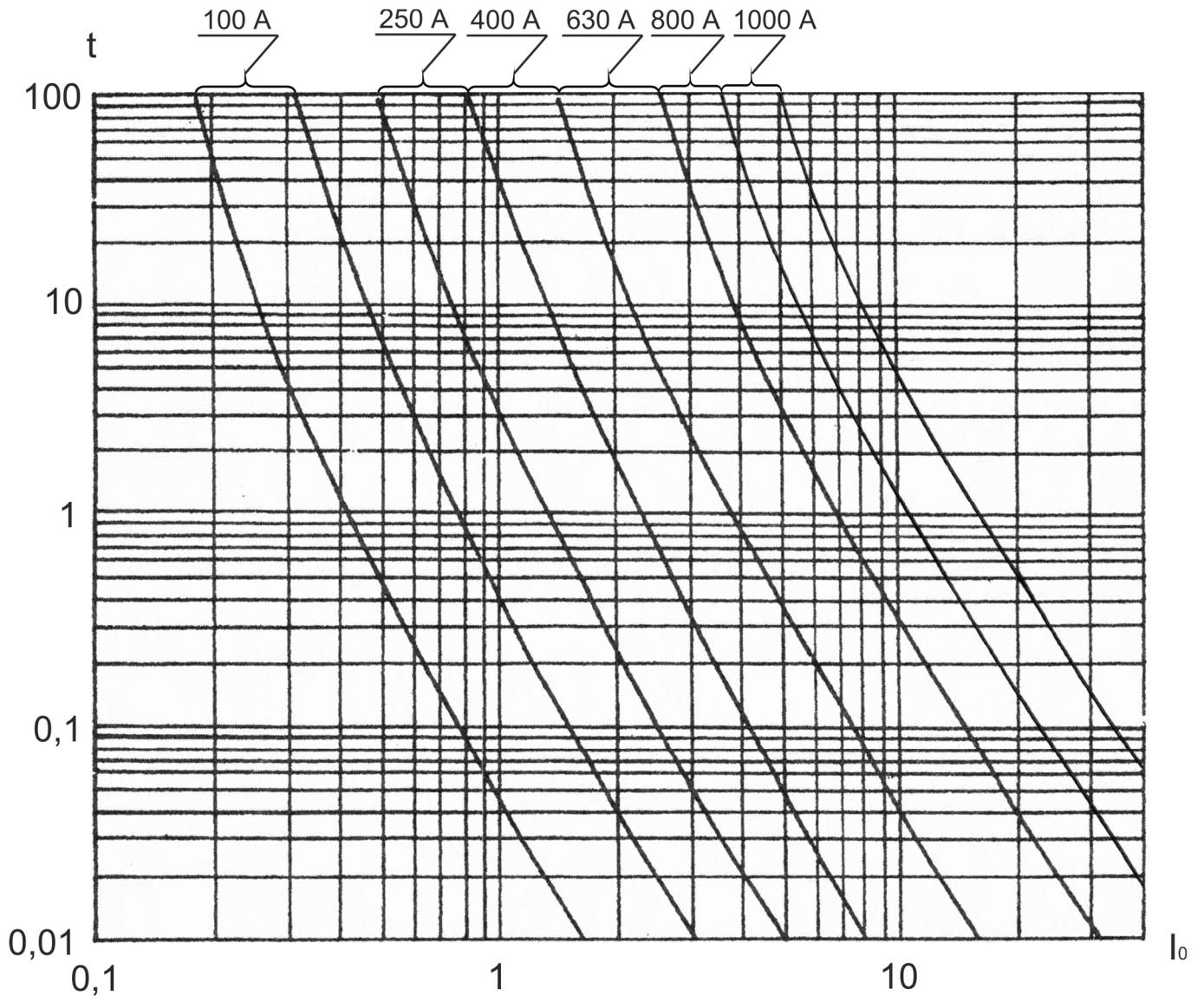
## **6. Warranty of the manufacturer**

6.1. The manufacturer guarantees that the quality of the fuses meets the requirements of TU U 3.11-19274160-106-98 if the user observes the conditions of transportation, storage, installation and operation specified in this operating manual.

6.2. The warranty period is 24 months from the date of commissioning, but not later than 36 months from the date of manufacture.

**Decoding of the conventional designation of fuses series PN22**

## FUSE CHARACTERISTICS



$I_0$  – effective value of the breaking current, kA;

$t$  – breaking time, s

Fig. B.1. Time-current characteristics of the shutdown

**Overall, mounting, connecting dimensions  
and weight of fuses**

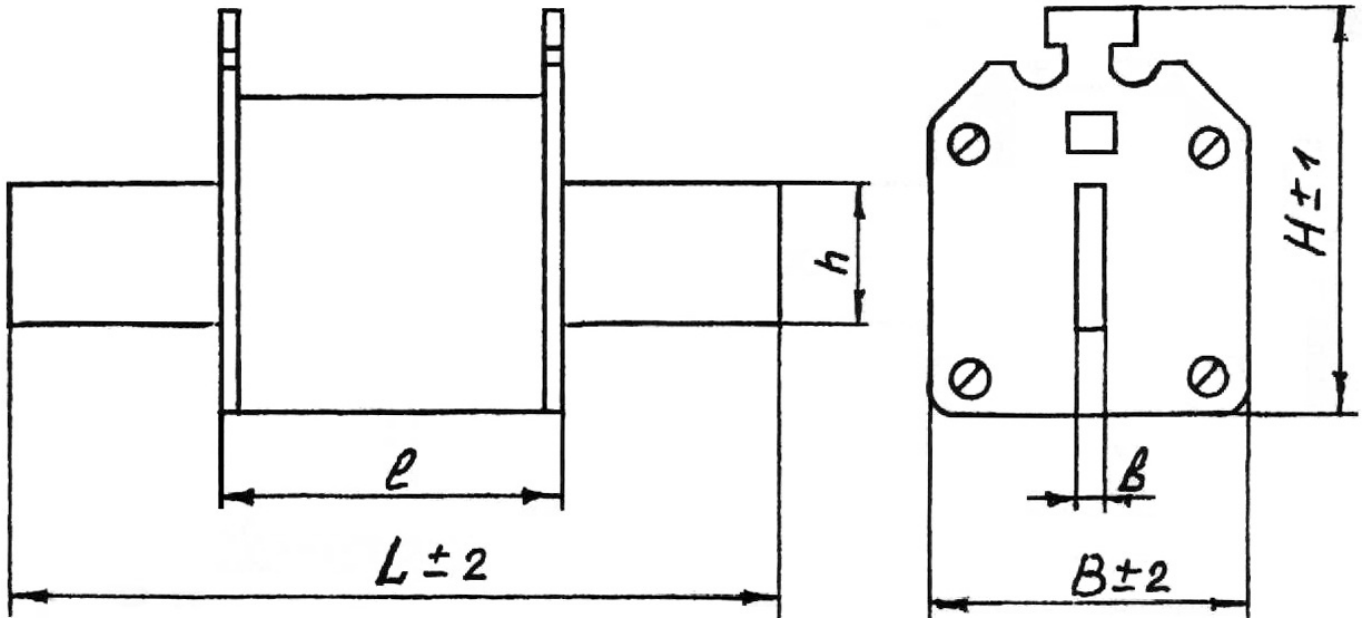


Fig. C.1. Fusible insert

Type of Fuse	Dimensions, mm						Weight, kg
	L	B	H	l	b	h	
PN22-100	123	40	52	70	3	16	0,27±0,03
PN22-250	141	50	63	70	4	28	0,40±0,04
PN22-400	167	66	78	70	6	35	0,69±0,07
PN22-630	203	80	93	72	6	35	1,07±0,10



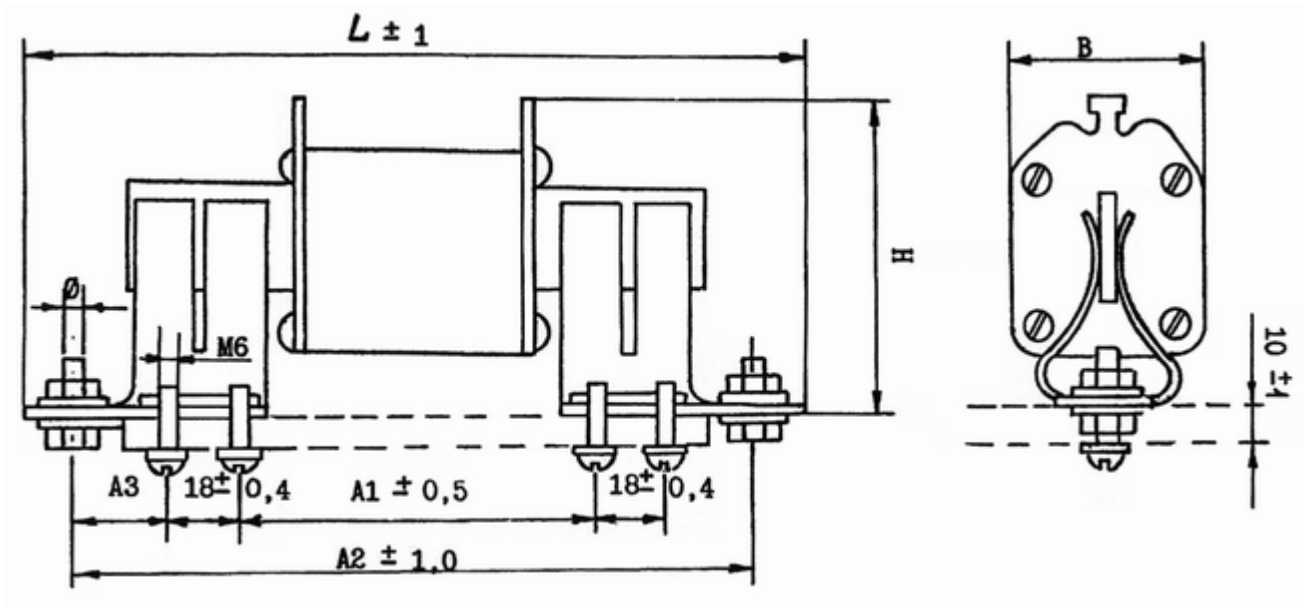


Fig. B 2. Fuses for installation on the customer's insulating plate

Type of Fuse	Dimensions, mm							Weight, kg
	L	B	H	A1	A2	A3	$\emptyset$	
PN22-100	183	40	63,5	87	165	21	M8	$0,40 \pm 0,04$
PN22-250	197	50	81,5	95	171	20	M10	$0,65 \pm 0,07$
PN22-400	245	66	88	107	219	38	M10	$1,10 \pm 0,10$
PN22-630	305	80	115	137	275	51	M12	$1,87 \pm 0,19$

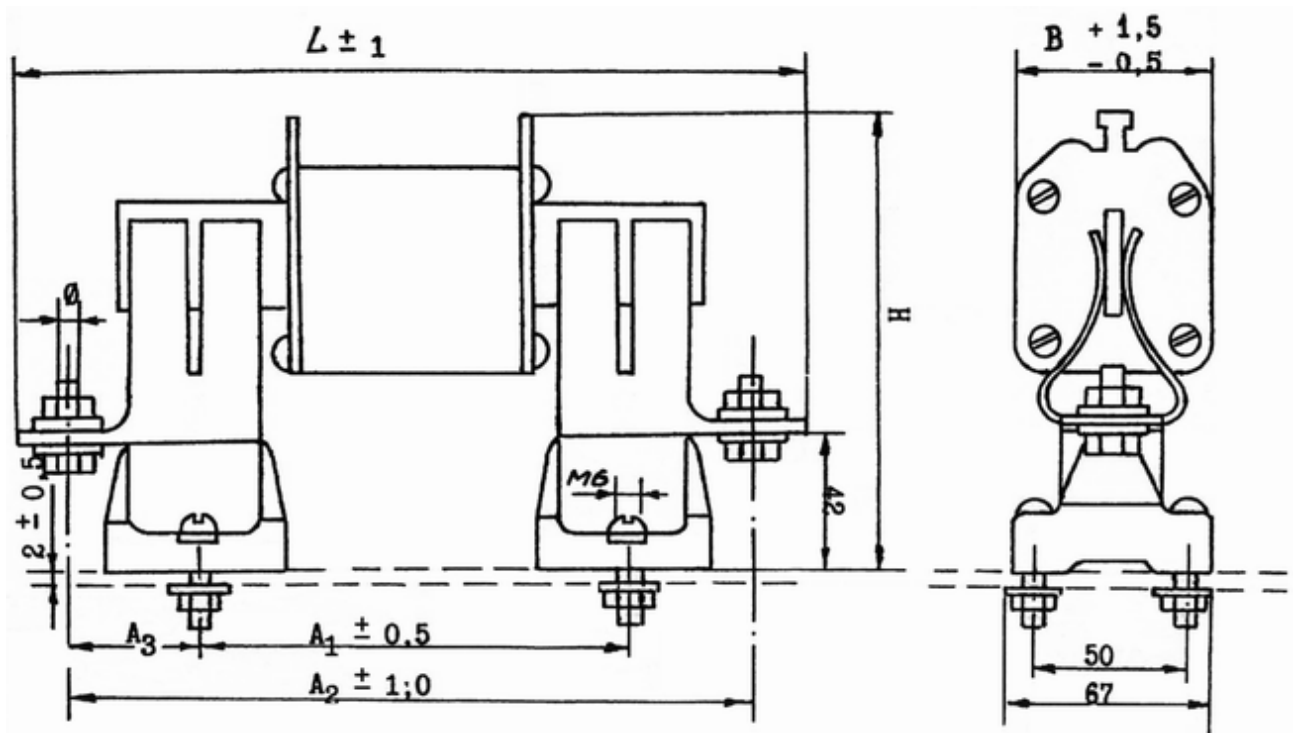


Fig. B3. Fuses for installation on proprietary contacts and insulators

Type of Fuse	Dimensions, mm							Weight, kg
	L	B	H	A1	A2	A3	Ø	
PN22-100	183	40	110	105	165	30	M8	0,69±0,07
PN22-250	197	50	132	113	171	29	M10	0,94±0,10
PN22-400	245	66	139	125	219	47	M10	1,40±0,14
PN22-630	305	80	160	155	275	60	M12	2,16±0,21

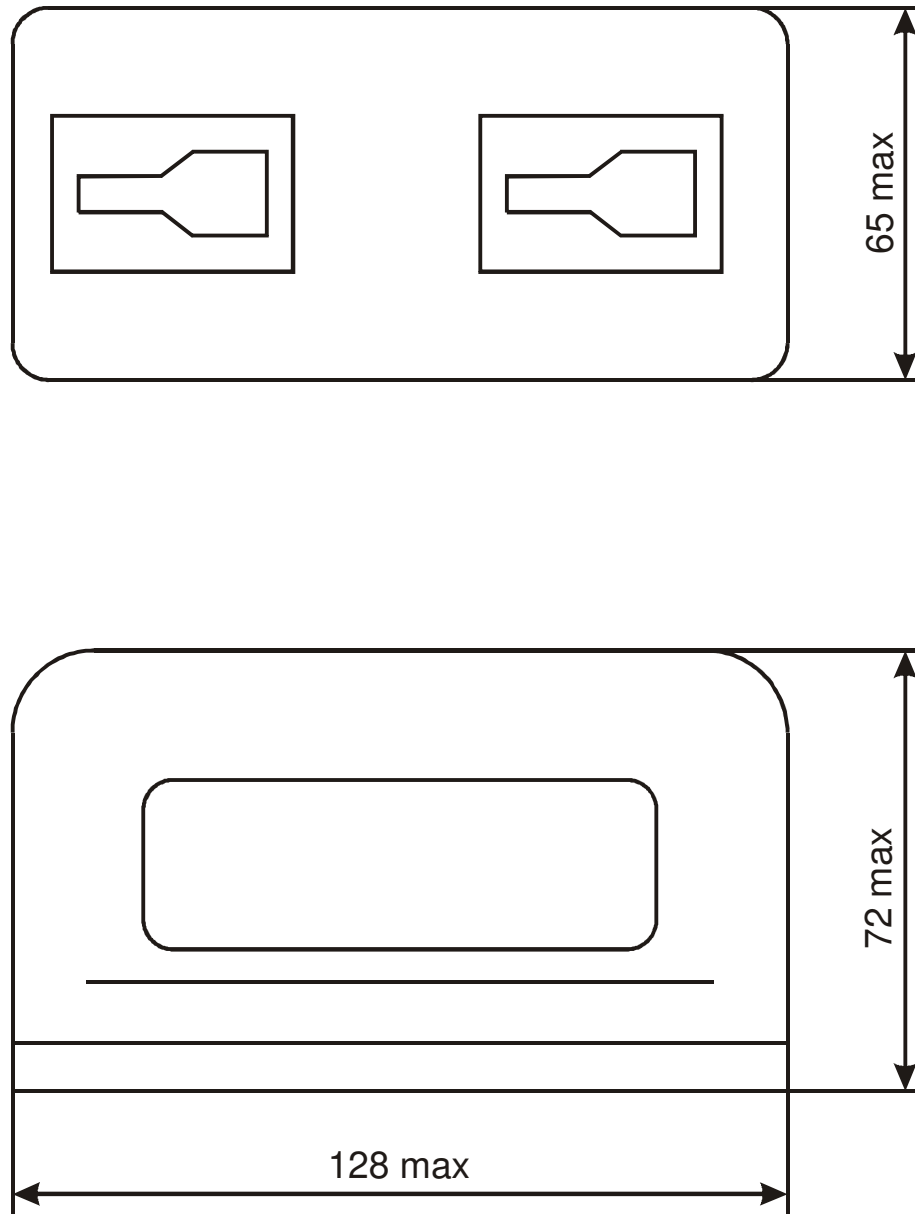


Fig. B4. Handle for the replacement of fusible inserts