SECRET/CLASSIFIED		NUMBER: TY 16-522.001-82
	I-1321	SHEET 1 OF 47
		SUPERSEDES

47

I-1321.

FUSES OF CП, ПВ types

and protection units Б3.

SPECIFICATION.

TY 16-522.001-82

(Instead of TY 16-522,001-76.

TRANSLATED	T.K.Gopalan.		Ordnance Factory Project Hyderabad.
AUTHENTICATED			
TYPED	R.P.T. SARMA.		
EDITED	A.R.Dubey	29.7.75	APPROVED
	NAME	SIGN DATE	

Sl.No. Details

5. Ref : page No.38 of 47

Remove : page No.38 (same table typed in page No137)

6. Ref : page No.39 of 47, Table, Appendix-1

Delete : GOST 519632-67

Add : GOST 9632-67

7. Ref : page No.42 of 47

Delete : weight not exceeding 2.1 gm

Add : Weight not exceeding 21 gm.

AWM/DS

AF/P.D.O

Copy to: CI,ICV.

The present specification pertain to fuses of ПВ, СП types and protection units of range B3, hereinafter refer to as "fuses" and "protection units", intended for protection of DC mains with voltage upto 30v from over-load and short circuit current. They are supplied for domestic requirements as well as for export.

Fuses СП-1 and СП-2 are also used in AC mains with voltage upto 208V, frequency 400c/s.

Fuses should meet the requirements for equipment of class 3.

Climatic version У х 5 of category of position is 3.

List of documents, referred to in this specification, is given in appendix I.

1	2
ПВ-100АС УХЛ3 export	34 2449 2112 04
БЗ-20	34 2443 0010 03
БЗ-20 УХЛ3	34 2443 0011 02
БЗ-20 УХЛ3 export	34 2445 0012 01
БЗ-30	34 2443 0020 01
БЗ-30 УХЛ3	34 2443 0021 00
БЗ-30 УХЛ3 export	34 2443 0022 10

1.2.2 Main parameters of fuses and protection units should conform to those specified in table 2.

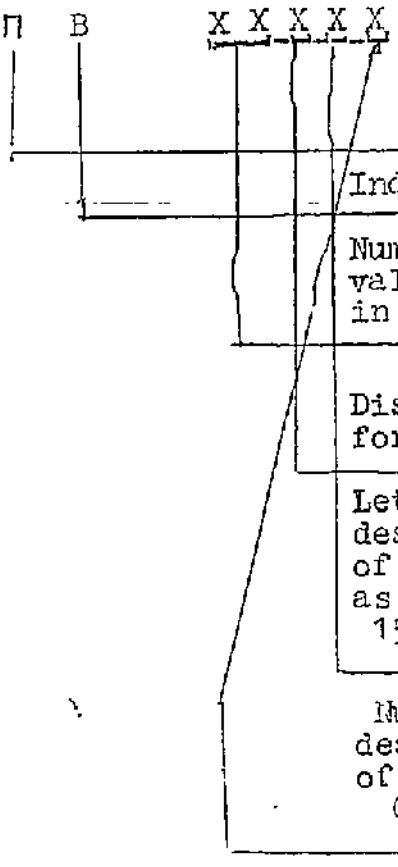
Table.2

Standard version of fuses and protection units	Rated current, in A	Voltage, V	Maximum cut off capacity, not less than, in A	Resistance 10^{-3} Ohm.
СП-1 УХЛ3	1	~208,400 Hz	At voltage	130-330
СП-2 УХЛ3		= 30	208V-50	40-100
			30V-200	
СП-5 УХЛ3	5		200	16-35
СП-10 УХЛ3	10			4.5-11
СП-15 УХЛ3	15			3.2-8
СП-20 УХЛ3	20			2.6-6.5
		+30		
СП-25 УХЛ3	25			1.4-3.5
СП-30 УХЛ3	30		350	1.0-3.3
СП-40 УХЛ3	40			0.5-2.5

Fuse

Standard version

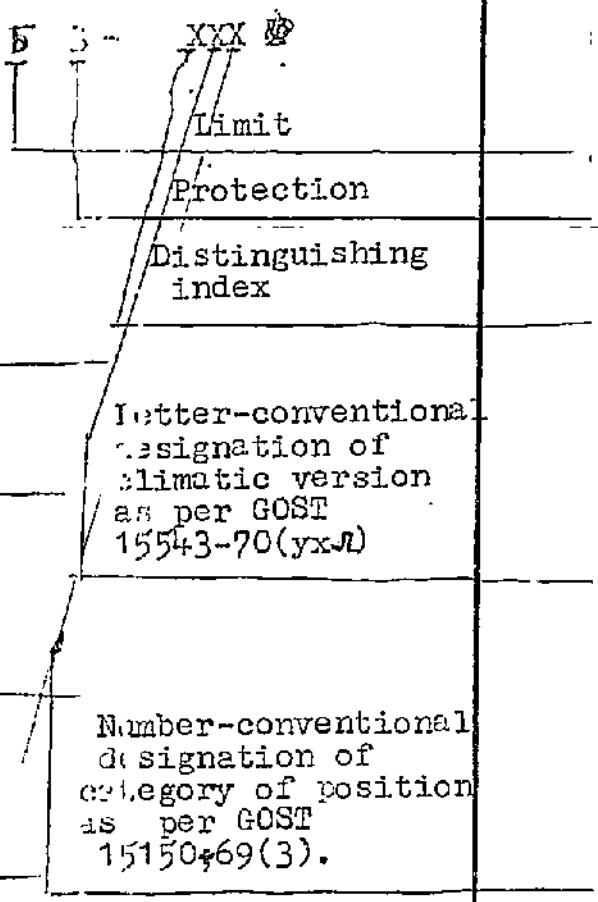
Type



Protection units

Standard version

Type



Example of writing designation of fuses and protection units while placing order and in technical papers of other items:

for domestic supply:

"Fuse ПВ-10Yх Л 3,30V, TY 16-522.001-82".

"Protection units Б3-30У х Л, 30v, TY16.522.001-82".

For export:

"Fuse ПВ-10У х Л 3, 30v. Export quality, TY16-522.001-82.

"Protection unit Б 3.30Y х Л 3, 30v. Export TY16-522.001-82".

~~For export:~~

~~"Fuse B-10Y x 3, 30v. Export quality, TY16-522.001-82.~~

~~"Protection unit 3.30Y x 3, 30v. Export TY16-522.001-82".~~

I. Technical requirements

1.1. Fuses and protection units should comply with requirements of the present specification and the complete sets of documentations Н ТАК 646114.001, Ч ТАК646214.001 646114.002, 646214.003, 64 6214.002 646314.001 and during export supply they should also meet the requirements of OST 16.0.800.210-75.

1.2. Main parameters and dimensions

1.2.1. Types of fuses, protection unit and codes of ОКП are indicated in table 1.

~~Table-1~~

~~Code of OKP~~

Standard version of fuses and Protection Units.

ГЧ - =/=

В - Volt

~~Export - Except~~

Table.1

Standard version of uses and protection units..	Code of OK
СП	34 2449 1000 04
СП-1	34 2449 1100 01
СП-1 208V, ~~400V~~ 400 c/s	34 2449 1110 10
СП-1УХЛ3 208V, 400Hz/s	34 2449 1111 09
СП-1УХЛ3 Export, 208V, 400Hz/s	34 2449 1112 08
СП-1 30V	34 2449 1120 08
СП-1УХЛ3 30V	34 2449 1121 07
СП-1УХЛ3 Export, 30V	34 2449 1122 06
СП-2	34 2449 1200 09
СП-2 208V, 400Hz	34 2449 1210 07
СП-2 УХЛ 208V, 400Hz	34 2449 1211 06
СП-2 УХЛ Export, 208V, 400Hz/s	34 2449 1212 05
СП-2 30V	34 2449 1220 05
СП-2 УХЛ-3, 30V	34 2449 1221 04
СП-2 УХЛ3 export 30V	34 2449 1222 03
СП-5	34 2449 1010 02
СП-5 УХЛ3	34 2449 1011 01
СП-5 УХЛ3 EXPORT	34 2449 1012 00
СП-10	34 2449 1020 00
СП-10 УХЛ3	34 2449 1021 10
СП-10 УХЛ3 export	34 2449 1022 09
СП-15	34 2449 1030 09
СП-15 УХЛ3	34 2449 1031 08
СП-15 УХЛ3 export	34 2449 1032 07
СП-20	34 2449 1040 07
СП-20 УХЛ3	34 2449 1041 06
СП-20 УХЛ3 export	34 2449 1042 05
СП-25	34 2449 1050 05
СП-25 УХЛ3	34 2449 1051 04
СП-25 УХЛ3 export	34 2449 1052 03
СП-30	34 2449 1060 03
СП-30 УХЛ3	34 2449 1061 02

Ordnance Factory Project Hyderabad.	T. 1734-1	NUMBER 7916-522-001-82
		SHEET 1 OF 2e7

1	2
СП-30 УХЛ3 export	34 2449 1062 01
автомат. СП-40	34 2449 1070 01
СП-40 УХЛ3	34 2449 1071 00
СП-40 УХЛ3 export	34 2449 1072 10
ПВ	34 2449 2000 00
ПВ-2	34 2449 2010 09
ПВ-2 УХЛ3	34 2449 2011 08
ПВ-2 УХЛ3 export	34 2449 2012 07
ПВ-6	34 2449 2020 07
ПВ-6 УХЛ3	34 2449 2021 06
ПВ-6 УХЛ3 export	34 2449 2022 05
ПВ-10	34 2449 2030 05
ПВ-10 УХЛ3	34 2449 2031 04
ПВ-10 УХЛ3 export	34 2449 2032 03
ПВ-20	34 2449 2040 03
ПВ-20 УХЛ3	34 2449 2041 02
ПВ-20 УХЛ3 export	34 2449 2042 01
ПВ-30	34 2449 2050 01
ПВ-30 УХЛ3	34 2449 2051 00
ПВ-30 УХЛ3 export	34 2449 2052 10
ПВ-40	34 2449 2060 10
ПВ-40 УХЛ3	34 2449 2061 09
ПВ-40 УХЛ3 export	34 2449 2062 08
ПВ-50	34 2449 2070 08
ПВ-50 УХЛ3	34 2449 2071 07
ПВ-50 УХЛ3 export	34 2449 2072 06
ПВ-60АС	34 2449 2080 06
ПВ-60АС УХЛ3	34 2449 2081 05
ПВ-60АС УХЛ3 export	34 2449 2082 04
ПВ-80АС	34 2449 2090 04
ПВ-80АС УХЛ3	34 2449 2091 03
ПВ-80АС УХЛ3 export	34 2449 2092 02
ПВ-100АС	34 2449 2110 06
ПВ-100АС УХЛ3	34 2449 2111 05

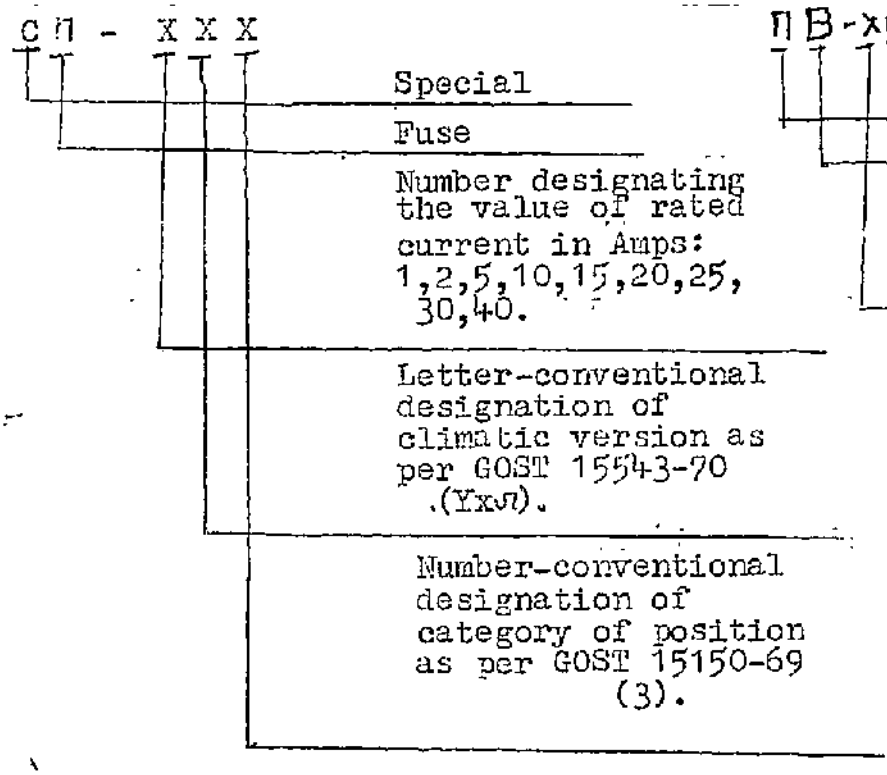
STRUCTURE OF CONVENTIONAL DESIGNATION OF STANDARD VERSION OF FUSES AND PROTECTION UNITS

A

Fuse

Standard version

Type

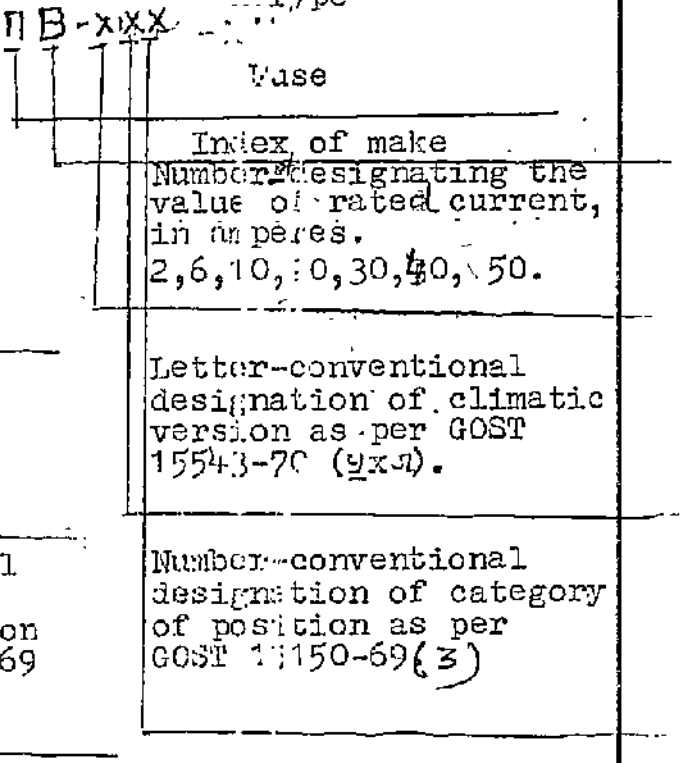


B

Fuse

Standard version

Type



1	2	3	4	5
ПВ-2 УХЛ3	2			40-100
ПВ-6 УХЛ3	6			13-26
ПВ-10 УХЛ3	10			7-15
ПВ-20 УХЛ3	20		500	2.5-6.5
ПВ-30 УХЛ3	30			1.4-3.5
ПВ-40 УХЛ3	40			1.0-2.5
ПВ-50 УХЛ3	50	=30		0.8-2.0
ПВ-60АС УХЛ3	60		Not less than 10 times the value of rated current	0.6-1.6
ПВ-80АС УХЛ3	80			0.35-0.85
ПВ-100АС УХЛ3	100			0.28-0.7
БЗ-20 УХЛ3	20			
БЗ-30 УХЛ3	30			

Note: 1. Fuses ПВ-60АС, ПВ-80АС and ПВ-100АС are meant for short time operations.

2. Protection units БЗ-20 are used in a set with fuses ПВ-30 to ПВ-100А.

3. Fuses of type СП are intended for mounting in holder with contacts through cylindrical part of fuse caps.

1.2.3. Overall, mounting dimensions, weight of fuses and protection units should comply with those specified in the appendix 2 figure.

1.3. Characteristics.

1.3.1. Fuses and protection units should be interchangeable within its type.

1.3.2. Working position - arbitrary.

1.3.3. Appearance of fuses and protection units as well as their quality of assembly and finishing should comply with standard samples. Standard samples are approved for a period equal to guarantee period of item.

1.3.4. Materials being used should have certificates ~~(passports)~~ or other documents issued by the supplier, approving their quality.

1.3.5. Fixing of fuse caps of ПВ0-2 to ПВ-50 should withstand a torque of 1 Nm.

Fixing of fuse caps of type СП-1 to СП-40 should withstand tightening force of not less than 30.

1.3.6. Surfaces of parts of fuses and protection units should have anti-corrosion coating.

1.3.7. Excess of temperature of protection units over ambient temperature on terminals of protection units under rated currents of fuses, specified in table 3, should not exceed the limited admissible value, stipulated in table 3.

Table 3

Type of protection unit	Type of fuses	Current in A	Admissible excess of temperature in °C
Б3-20	П В-20	20	100
~~Б3-25~~	П В-50	50	120
Б 3-30	П В-100А	100	200

1.3.8. Dielectric strength of insulation of protection units Б 3-20 and Б 3-30 should be such that a voltage of 500V AC 50c/s should not ~~ее~~ cause any breakdown or flash over.

Fuses СП -1 and СП -2, after testing for their cut-off capacity under conditions mentioned in table 2, should withstand a voltage of 2000v, applied between caps, in normal climatic conditions without break down or flash over.

1.3.9. Insulation resistance of protection units Б 3-20 and Б 3-30 should be not less than 2 M.ohm after 48 hours of being in a medium with relative humidity 95% and temperature +40°C.

1.3.10. Fuses should not cut off the circuit when conventional nonfusing current passes through them and should cutk off when fusing current passes through in time and at temperature, specified in table 4.

1.3.11. Time-current characteristics of fuses are tabulated in appendix 3.

1.3.12. Vibration resistance, vibration strength, impact resistance against multiple mechanical impacts and strength of fuses and protection units under linear accelerations should conform to the requirements, established for equipments as shown below.

a) vibration loads from 10 to 80 c/s with acceleration 4g;

b) impact loads with frequency of 40-80 impacts per minute, at acceleration 12g, pulse duration 20-50m.s.,

c) linear acceleration upto 10g.

d) transportation under impact loads with acceleration upto 15g, impact pulse duration 5-10m.s.

Table 4

Type of fuse	Ratio of conventional nonfusing current to rated, not exceeding	Ratio of conventional fusing current, to rated, not less than	Ratio of overload current to rated	Climatic conditions		Time
				Temperature in °C	Atmospheric pressure, in mm of Hg column	
ПВ-2	1,0	-		Plus 70 and 25±5°	760	not less than 1 hour
				Minus 60	41±2	
	-	1,5		25±5° / Minus 60	760	not more than 3.5 min.
ПВ-6 ПВ-10 ПВ-20 ПВ-30	1,0	-		Plus 70 and 25±5°	760	not less than one hour
				Minus 60	41±2	
ПВ-6 ПВ-10			1,5	25±5° / Minus 60	760	not more than 20 seconds.
ПВ-20 ПВ-30	-	[illegible]	1,5	25±5° / Minus 60	760	not more than 60 sec. not more than 40 sec.

I.(32)

Type of fuse	Ratio of conventional nonfusing current to rated, not exceeding	Ratio of conventional fusing current, to rated, not less than	Ratio of overload current to rated	Climatic conditions: Temperature in °C	Climatic conditions: Atmospheric pressure, in mm of Hg column	Time
IIB-40	1,0	-		Plus 70 25±5°	760	not less than 1 hour.
				Minus 60	41±2	
IIB-50	-	1,5		25±5° Minus 60	760	Not more than 2 min Not more than 3 min.
IIB-60AC	1,0	-		Plus 70 25±5°	760	
				Minus 60	41±2	Not less than 10 min.
	-	1,5		25±5° Plus 70 Minus 60	760	From 20 sec upto 3 min Not less than 20 sec. Not more than 12 min.
IIB-80AC	1,0	-		25±5° Plus 70	760	Not less than 10 min. Not less than 10 min.
				Minus 60	41±2	Not less than 4 min.

Ordnance Factory Project Hyderabad

T. 1321

NUMBER TY6-522-001-82

SHEET 44 OF 47

Type of fuse	Ratio of conventional nonfusing current to rated, not exceeding	Ratio of conventional fusing current, to rated, not less than	Ratio of overload current to rated	Climatic conditions		Time
				Temperature in °C	Atmospheric pressure, in mm of Hg column	
IIB-80AC	-	1,5		25±5° Plus 70 & Minus 60	760	From 20 sec to 2.5min not less than 20 sec. Not more than 8 min.
	1,0	-		25±5° Plus 70	760	Not less than 8 min. Not less than 4 min.
				Minus 60	41±2	Not less than 4 min.
IIB-100AC	-	1,5		25±5° Plus 70 Minus 60	760	From 20 sec upto 2.5min. Not less than 20 min. Sec. Not more than 4.5 min.
	1,0	-		Plus 70	760	Not less than 1 hour.
CII-1				Minus 60	41±2	
	1,25	-		25±5°	760	Not less than 20 min.
	-	1,6		25±5°	760	Not more than 30 min. Not more than 30 min.
				Minus 60		
	-	-		25±5°	760	From 0.2 sec upto 1.5sec

Ordnance Factory Project Hyderabad.

T-(321)

NUMBER 776-522.001.82

SHEET 45 OF 47

Type of fuse	Ratio of conventional nonfusing current to rated, not exceeding	Ratio of conventional fusing current, to rated, not less than	Ratio of overload current to rated	Climatic conditions		
				Temperature in °C	Atmospheric pressure, in mm of Hg column	Time
CП-2	1,0	-		Plus 70	760	not less than 1hour
				Minus 60	41±2	
	1,25	-		25±5°	760	not less than 20 min.
	-	2		25±5°	760	not more than 30 min.
	-	2,5		Minus 60	760	not more than 30 min.
CП-5	1,0	-		Plus 70	760	not less than 1 hour.
				Minus 60	41±2	
	1,2	-		25±5°	860	not less than 30 min.
	-	1,7		25±5°	760	not more than 30 min.
	-	1,75		Minus 60	760	not more than 30 min.
CП-10, CП-15	1,0	-		Plus 70 Minus 60	760 41±2	not less than 1 hour.
CП-20, CП-25	-	1,6		25±5°	760	not more than 30 min.
CП-30, CП-40	-	1,7		Minus 60	760	not more than 1 hour.

Ordnance Factory Project Hyderabad.

NUMBER TY/6.512.001-81

SHEET 16 OF 42

I-(32)

1.3.13. Rated value of climatic factors are as per GOST 15150-69 and GOST 15543-70, in this:

a) atmospheric pressure is from 760 to 41mm of mercury column;

b) ambient temperature is from -60 to +70°C;

c) relative humidity of ambient air is upto 98% at temperature +40°C.

d) effect of cyclic changes of ambient temperature is from +80 upto -60°C;

e) environment must be unexplosive, not containing significant amount of dust, must not have aggressive gases and fumes in concentrations, corrosing metals and insulation;

f) formation of hoar frost and dew;

g) absence of direct sun light.

1.315. Characteristics of reliability of fuses and protection units should be not less than the values, specified below;

a) mean time to first failure (MTFF) Tcp - 100 hrs;

b) specified life Tp - 1500 hours.

c) Service life for fuses ГП Tсл - 3.5 years.

for fuses ГПВ and

protection units ТСл - 4 years.

d) retention life for ГП $T_с$ - 1.5 year

for ВЗ and ГПВ$T_с$ - 2 years.

1.4. Complete set.

1.4.1. A complete set of fuses indludes;

a) Fuse - 1 pc;
b) "Technical inscription and instruction on operation.

Fuses СП, ПВ and protection units "ОДХ" - 141.014.ТО according to order, not more than 1 pc for 150000 fuses.

1.4.2. A complete set of protection units includes:

a) protection unit - 1pc.
b) ~~xxxxxxxx~~ Technical inscription and instruction on operation. Fuses СП...ПВ and protection units Б3; according to order, not more than 1pc for 1000 protection units.

1.5. Marking.

1.5.2. Following should be indicated on the fuse caps:

a) rated current, in Amps;
b) Last two digits of year.

1.5.3. On the base of protection units should be indicated:

a) type;
b) Last two digits of year.
c) rated voltage.

1.5.4. Following should be indicated on the label fixed to the box.

a) type of fuses or protection units.

b) date of production.

c) Number of fuses or protection units.

d) trade mark or name of manufacturer.

e) guarantee period of fuses or protection units;

f) rated current in Amps for fuses rated voltage in volts for fuses and protection units;.

g) technical inspection stamp;

h) No. of present specification.

i) guarantee storage life;.

j) During export of fuses on the label should be indicated;

a) type of fuses or protection units.

b) number of fuses or protection units.

c) year of production.

d) weight of fuses or protection units.

e) technical inspection stamp.

1.6. Packing.

1.6.1. Fuses and protection units are not subjected to preservation.

1.6.3. Packing of fuses and protection units is carried out as per GOST 23216-78. Storage conditions and transportation and permissible retention period are indicated in section "5 "Transportation and storage" of the present specification.

1.6.4. Combination of types and modification of the transit containers wit internal packing is as per GOST 23216-78.

1.6.4.1. Type of packing KY-2.

ТЭ-2 / BY-11Б -1 at that junctions and joints of boxes are allowed without sealing up.

1.6.5. For export all requirements of GOST 10.65-72 should be met.

1.6.6. Internal package and transit container should be manufactured on the drawings of the manufacturer.

2. Safety requirements

2.1. Safety requirements for design of fuses and protection units should conform to GOST 12.2.007.6.75 and GOST 12,1.004-76.

3. Acceptance rules.

3.1. Rules of acceptance and requirements for ensuring and checking the quality of fuses and protection units during production should comply with precise definitions and additions laid down in the present section.

3.2. Acceptance Tests.

3.2.1. Size of a batch, presented to acceptance test should be minimum 2000 pcs and maximum 5000 pcs for fuses and minimum 500 and maximum 5000 pcs for protection units of each type.

Notes:-

1. Owe mutual agreement, the size of a batch can be changed.

2. Fuses and protection units with marking of previous year are allowed to the acceptance for the first quarter of the following year.

3.2.2. Testing is carried out on the schedule of continuous checking and single stage random checking.

3.2.3. For all types of fuses, testing is carried out on the volume and sequence specified in table 5.

Table 5

Group of testing	Description of checking and testing	Points of specification		Volume of selection in pcs from batch
		Requirements	Methods	Technical control
ПСІ	1. Visual inspection	1.1	4.1	
	2. Checking for marking, overall and mounting dimensions			
	3. Checking for the value of ohmic resistance of fuses.			
	4. Checking for the strength of fixing of the fuse caps			

Group of testing	Description of checking and testing	Points of specification		Volume of selection in pcs from batch	
		Requirements	Methods	Technical control	
ПС2	I. Checking of fuses by the conventional fusing and non-fusing currents	1.3.10	4.10	70	10

Notes: 1. Testing on group ПС2 is carried out for fuses and protection units, undergone successfully testing on group ПС1.

2. Checking for fixing strength of caps is carried out without damping of the fuses.

3. Testing on group ПС2 of cable 5 is carried out at load values, corresponding to temperature of 25±5° as per table 4 and for fuses (СП-10 to СПА0) at +70°C for IN and at 25±5° - for 1;6IN.

4. Testing on point 3 of group ПС1 on fuses of type ПВ is carried out on sample of fuses, making up 10% of a batch with acceptance number 0.

3.2.4. Tests on group MC1 are carried out by the technical inspection on the schedule of complete control ~~for~~ on 500 samples with acceptance No, equal to 1% as per point 1, equal to 0 as per point 2,3, equal to 3% as per point 4.

Testing on group MC2 is carried out on sampling of 10 pcs with acceptance No. equal to 0.

3.3. Periodic tests

3.3.1. Periodic tests are carried out on all fuses or protection units with representative sample in quantity of 23pcs of each type with acceptance number equal to 0.

3.3.2. Testing is carried out once a year in quantity and sequence specified in table 6.

Table. 6.

Test group	Description of testing	Points in the specification: Requirements	Points in the specification: Methods	Representative sample, in pcs.
П1	Testing on groups ПС1			23
П2	1. Checking for the mass	1.2.3.	4.3	
	2. Testing on strength during transportation	1.3.12	4.23	23
П3	1. Checking for thickness and quality of anti-corrosive coating	1.3.6	4.5	2
П4	Testing for heating of protection units	1.3.7	4.7	2
П5	1. Testing of fuses by conventional non-fusing and conventional fusing currents:	1.3.10	4.10	
	a) at temperature 25±5°			
	СП-1			
	1,25 Iн			2
	1,60 Iн			2
	2,00 Iн			2
	СП-2 Iн			
	1,25 Iн			3
	2,00 Iн			3
	СП-5			
	1.20 Iн			3
	1,70 Iн			3
	СП-10-40			6
	1.60 Iн			

25

Test group	Description of testing	Points in the specification: Requirements	Points in the specification: Methods	Representative sample, in pcs.
	IIB-2 ÷ IIB-1000AC			6
	1,0Ø			3
	1,50			3
	2. Checking for the strength of cap fixing of fuses Ctl.	1.3.5	4.4	6
II6	1. Testing by conventional non-fusing current at temp. +70°C	1.3.10	4.10	2
	2. Testing for heat-stability	1.3.13	4.14	
II7	1. Testing by conventional fusing current fusing current at temp -60°C	1.3.10	4.10	2
	2. Testing for cold endurance	1.3.13	4.15	
II8	1. Testing by conventional nonfusing current at temp. -60°C and atmospheric pressure of 41mm Hg column	1.3.10	4.10	
	2 Testing for resistance against low pressure	1.3.13	4.19	2.
	Testing for cut off			

Test group	Description of testing	Points in the specification		Representative sample, in pcs.
		Requirements	Methods	
II8	3. Testing for cut-off capacity of fuses	1.2.2	4.11	2
	4. Checking for electrical insulation strength of fuses C 1, C 2	1.3.8	4.9	
	5. Checking for time-current characteristic	1.3.11	4.12	15
II9	1. Testing for resistance against cyclic temperature variation	1.3.13	4.16	5
	2. Testing for resistance against formation of hoar, frost and dew	1.3.13	4.17	
	3. Testing for moisture resistance.	1.3.13	4.18	
	4. Checking of the electrical insulation strength of protection units.	1.3.8	4.9	
	5. Checking of the insulation resistance of protection units.	1.3.9	4.8	
	6. Checking of the strength of fuse caps fixing.	1.3.5	4.4	
III0	1. Testing for vibration resistance.		4.20	2
	2. Testing for vibration strength.		4.21	
	3. Testing for impact strength.	1.3.12	4.22	
	4. Testing for effect of linear loads		4.24	

Note 1. Testing on point 4, Group П10 of table 6 is carried out once in two years.

2. Testing for cold endurance, heat stability and stability against low pressure is combined with testing of fuses by conventional nonfusing current and conventional fusing current in accordance with requirements of table 4.

3. Before testing on point 6 of group П9, fuses should have break in a circuit when switching-off the overload current.

4. The sequence of test may be changed on mutual consent.

5. Testing on point 4 of Group П8 is carried out once in 10 years.

3.3.3. In case periodic test results are found unsatisfactory, a commission is set up to find out the reason for defects of fuses and protection units. On the basis of the findings a report is made which includes the results of analysis, character of defects, preventive measures to eliminate the above defects in production and conclusions of commission. The report is approved by the Chief Erginеer of the plant.

3.3.4. Дх Duplicate periodic tests are carried out on double number of specimens.

3.3.5. If during analysis of defects it is found out that character of defects is the result of indiscriminate mode of testing or of careless handling of the tested fuses or protection units, then the test results are considered as ineffective.

4. Test Procedures

4.1. Visual inspection is carried out as per GOST 2933-74.

4.2. Overall and mounting dimensions are checked as per GOST 2933-74.

Checking result is considered satisfactory if dimensions comply with drawing specified in appendix 2.

4.3. Weight of fuses is checked as per GOST 2933-74.

Checking result is considered as satisfactory if the weight of fuses and protection units does not exceed the value, indicated in the drawing of appendix 2.

4.4. Strength of fuse caps fixing is checked on a special device on twisting of caps around the axis of fuse. Torque is applied to the testing fuses, gradually increasing upto 1Nm, after which the load is gradually removed.

Fixing of caps of fuses СП is checked on a special device, providing gradually increasing force of not less than 30N in axial direction of fuse.

During acceptance tests, the strength of adhesive joint of СП caps is checked manually by twisting.

Checking result is considered satisfactory if caps of fuses ПВ and СП are not twisted and not moved along the tube under specified conditions. Presence of not more than 3% of fuses which do not meet this requirements is allowed.

4.5. Thickness and quality of corrosion proof coating are checked as per GOST 9.302-79.

If the thickness of coating conform to the requirements of drawing, the result of checking is considered satisfactory.

4.6. Checking for ohmic resistance of fuses is carried out as per GOST 2933-74.

Checking result is considered satisfactory if the resistance of fuses comply with table 2.

4.7. Testing for heating is carried out at temperature of 25 ±5° as per GOST 2933-74 with wires specified in point 4.10 and under conditions laid down in point 1.3.7.

Before testing, fuse 7B is inserted and removed 100 times from protection unit.

Determination of increase in temperature is carried out by the method of thermocouple as per GOST 2933-74.

Protection units are considered to have withstood the test if the increase in temperature is not exceeding the value indicated in point 1.3.7.

4.8. Checking of insulation resistance of protection units 3-20 and 3-30 is carried out as per GOST 2933-74 after keeping protection units in the heat and moisture chamber for 48 hours. Insulation resistance should be minimum 2 M.ohm in this test.

4.9. Testing of insulation electrical strength of protection units, fuses CП-1 and CП-2 is carried out in AC supply 50c/s frequency as per GOST 2933-74.

Protection units are tested after damping in conformity with directive of the point 4.18. Applied voltage is gradually increased from 0 to V test with a rate of increase; admissible by voltmeter reading; and held for one minute. Then the voltage is brought down slowly upto 0v.

Protection units and fuses CП-1 and CП-2 are considered to have withstood the test, if there are not breaking down or spark over of insulation along surface at the moment of checking.

4.10. Testing by conventional fusing and nonfusing current as specified in point 1.3.10 is carried out in DC voltage not exceeding 30v by connecting them in the mains with the aid of corresponding units and panels on test beds.

Selection of current carrying ~~xx~~ wires section is carried out as per table 7.

Table 7

Type of fuses	Section in mm^2	Type of fuses	Section in mm^2
IIB-2, CII-1, CII-2	0,35	CII-30, IIB-30	4,0
CII-5	0,5	CII-40, IIB-40	6,0
CII-10, IIB-6, IIB-10	0,75	IIB-50, IIB-60AC	10,0
CII-15	1,0	IIB-80AC	16,0
CII-20, IIB-20	1,5	IIB-100AC	25,0
CII-25	2,5		

Fuses are considered to have withstood the test if the fusing and nonfusing currents conform to the requirements laid down in point 1.3.10 and there is no mastic flow, melting of solder, burning of contacts, deformation or other defects, effecting operation of fuses.

4.11. Testing for cut off capacity of fuses CII-1 and CII-2 is done in AC supply, 3Ø, 400c/s with voltage 208v.

Fuses of range CII and IIB are tested in AC at voltage 30v for not more than3 m.sec.

Testing for cut off capacity is done under normal climatic conditions.

Fuses are considered to have withstood the test if during the test, blasts, burning of contacts and flame are not observed. Presence of fine cracks or glass is not a reason for rejection.

4.12. Time current chracteristic should be checked as per oscillograms, obtained during the test for cut off capacity and as per points indicated in table 4.

Fuses are considered to have withstood the test, if during test the obtained ~~during time test~~ points of chracteristics conform to those specified in technical specification.

4.13. While conducting tests under effects of climatic factors, following errors are permitted in keeping to the modes.

a) high and low temperatures within the limits of $\pm 3^{o}C$.

b) high relative humidity within the limits of $\pm 3\%$.

c) low atmospheric pressure within limits of $\pm 5\%$.

4.14. Testing for heat stability is carried out under load by the rated current. Fuses and protection units are placed in a thermostat, temperature in which is raised to $+70^{o}C$ and held there for one hour ~~xxxx~~ under this temperature.

Fuses are considered to have withstood the test if, during the test the main supply is not disconnected and there is no mastic flow, melting of solder, burning of contacts, corrosion and other defects, effecting normal operation of fuses.

4.15. Testing for cold endurance.

4.16. Testing for endurance on cyclic changes in medium temperature from limit low to limit high.

Soaking time in chambers is 1 hour.

Fuses and protection units are considered to have withstood the test if, during visual inspection and checking all the presence of electrical main, there are no defects effecting normal operation.

4.17. Testing for endurance against the effect of hoar frost and dew is carried out in the following conditions. Fuses and protection units are kept in thermal pressure chamber and held them at a temperature of -20° for 2 hours in switched off condition.

After the expiry of this time fuses and protection units are taken out of the thermal-pressure chamber and held at normal climatic conditions for atleast two hours.

Fuses and protection units are considered to have withstood the test if, during visual inspection and checking on the presence of the circuit, there is no corrosion and any other defects.

4.18. Testing for moisture resistance is carried out in the heat and moisture chamber. Fuses or protection units are placed in the chamber in non-working condition and temperature is raised to plus 40°C.

After heating of fuses or protection units, humidity in the chamber is raised to 95%. Fuses or protection units are held in the chamber for 2 days. Then they are held in normal climatic conditions for 6 hours.

Fuses or protection units are considered to have withstood the test if during visual inspection corrosion and other defects, effecting normal operation of fuses and units are not detected and insulation resistance correspond to points ~~4.3.9.~~ 1.3.9.

Checking for electrical strength and insulation resistance is carried out not later than 5 minutes after taking out from the chamber.

4.19. Testing for stability against lower pressure is carried out in the thermal-pressure chamber at temperature $-60^{\circ}C$ and pressure 41mm of mercury column under load as per table 4.

Fuses and protection units are considered to have withstood the test if parameters conform to table 4.

4.20. Testing for vibration resistance is carried out at normal climatic conditions on vibration testing machine with single component vibration in two mutually perpendicular positions of samples under test.

Testing of fuses and protection units is carried out under load equal to 0.8 to 1.0 of rated current, at vibration with frequency of 10,20,30,40,50,60,70,80 Hertz with acceleration of 4g.

Vibration time for each fixed frequency should be of minimum 2min.

Fuses and protection units are considered to have withstood the test, if, during the test, false operation, resonant effect and mechanical damage are not observed.

4 .21. Testing for vibration strength is carried out under specified in the item 4.20 conditions on frequency of 50 Hertz for 28 hours. Fuses and protection units are considered to have withstood the test, if when testing there is no cut-off of the circuit and mechanical damage is not visually checked.

4.22. Testing for impact strength and impact resistance. During tests fuses and protection units should be under load equal to 0.8 to 1.0 of rated current.

Note:- Fuses ПВ-60АС to ПВ-100АС during tests for vibration resistance, vibration strength and impact strength are under a load, equal to 0.8 to 1.0 of rated current, at the end of the testing for 8 min

4.23. Testing for strength during transportation. Number of impacts in each value of acceleration is as follows:

a) 5000 impacts at acceleration of 15g;

b) 15000 impacts at acceleration of 10g;

Frequency is 40-80 impacts per minute. ~~Duration~~ Duration of impact pulse 5-10 m.sec. Transport container is filled additionally with any other articles upto full filling.

4.24. Testing for linear acceleration.
Fuses and protection units are set on a centrifugal table in horizontal position without current load.

4.25. Accuracy class of electric measuring instruments being used should be not less than 0.5 for measuring of insulation resistance and not lower than classes 1.5 for measuring of electrical strength.

4.26. Equipment and test equipment being used during test should have certificate conforming their serviceability.

4.27. List of equipment, required for checking and testing of fuses and protection units, are given in the appendix-4.

5. Transportation and Storage.

5.1. Transportation and storage conditions of fuses and protection units and permissible storage period before putting into operation should conform to those specified in table 8.

Table 8

Type of supply	Designation of transportation conditions		Designation of conditions of storage as per GOST 15150-69	Permissible storage period in supplier's packing, excluding year of production, in years
	under mechanical factors as per GOST 23216-78	under climatic factors, such as storage conditions 15150-69		
for domestic supply	C	2 (C)	I (У)	Fuses СП -1.5, Fuses ПВ & БВ-2
for export to the countries, with temperate climate	C	2 (C)	I (У)	Fuses ПС -1.5, Fuses ПВ and БЗ - 2.

5.2. Manufacturer should carry out shipment of fuses and protection units within two months of their production.

61 Instruction for operations

6.1. Fuses and protection units are operated in conformity with requirements of the present ~~xxx~~ specification and instruction "Technical description and instruction for operation. Fuses ОП, ПВ and protection units БЗ" ОД Х 141.014 ТО.

APPENDIX I

List of documents referred to in the present specifications

Designation of document	Description of document
GOST 5.526-70	Laboratory balance B 0-200[illegible]a. Requirements for quality of the certified products.
GOST 5.697-70	Impact device type С4-1. Requirements for quality of the certified products.
GOST 5.2030-73	Thermal pressure chamber type КТх -К-0.025-65/155. Requirements for quality of the certified products.
GOST 9.302-79	Common system of protection from corrosion and ageing. Metallic and non-metallic inorganic coatings. Acceptance rules and test procedures.
GOST 10.65-72	Wooden boxes for products to be supplied for export. Types. Dimensions of parts. General technical specification.

List of

documents referred to in the present specifications

Designation of document.	Description of document
GOST 5.526-70	Laboratory balance BHO-200 M-1a. quality of the certified products
GOST 5.697-70	Impact device type CY-1. Requirements for quality of the certified products.
GOST 5.2030-73	Thermal pressure chamber type KT x 6-K-0. 025-65/155 Requirements for quality of the certified products.
GOST 9.302-79	Common system of protection from corrosion and ageing. Metallic and non metallic inorganic coatings. Acceptance rules and test procedures.
GOST 10.65-72	Wooden boxes for products to be supplied for export. Types, Dimensions of parts. General technical specification.

Cont: →

APPENDIX I

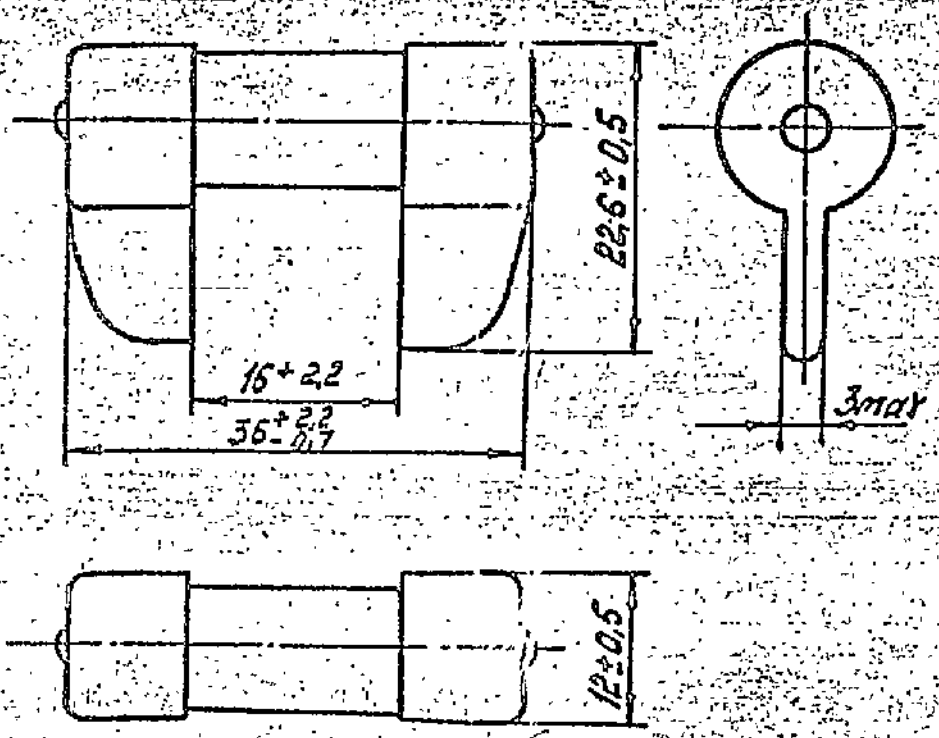
LIST OF DOCUMENTS REFFERED TO THE PRESENT SPECIFICATIONS.

Designation of document	Description of document
GOST 12.1.004-76	System of standards of industrial safety. Fire safety. General requirements.
GOST 12.2.007-6-75	System of standards of industrial safety. Electrical switch gears to a voltage upto 1000v. Safety requirements.
GOST 2933-74	Electrical apparatus to a voltage upto 1000v. Test methods.
GOST 3309-75	Time-piece and wall balance clock, mechanical General specification.
GOST 5072-79	Stop watch mechanical. Technical specification.
GOST 8042-78	Electric transducer. Instrument shunt specification.
GOST 8711-78	Ammeters and voltmeters. General specifications.
GOST 519632-67	DC motors of capacity from 0.13 to 200kw. Main parameters and dimensions. Technical requirements.
GOST 10370-71	Heat and cold chamber, heat cold and pressure chambers; heat, cold and moisture chamber-types and main parameters.
GOST 10765-75	Selenium semi-conductor devices, main parameters.
GOST 15150-69	Machines, devices and other industrial articles. Versions for different climatic regions. Category, operating conditions, storage and transportation in areas having effects of climatic factors of environment.
GOST 15543-70	Electrical engineering products. Versions for different climatic regions. Operating conditions in area having effect of climatic factors of environment.
GOST 23216-78	Electrical engineering products. Storage, transportation, preservation, packing-general requirements and test proeedures.
OST 16.0.800.210-75	Electrical Engineering articles to be supplied for export. General technical requirements.

Приложение 2

SH 4-0/47

Габаритные, установочные, присоединительные размеры, масса предохранителей и блоков защиты.



APPENDIX 2.

Overall, mounting, connecting dimensions, weight of fuses and protection units.

Weight 10g (not exceeding)

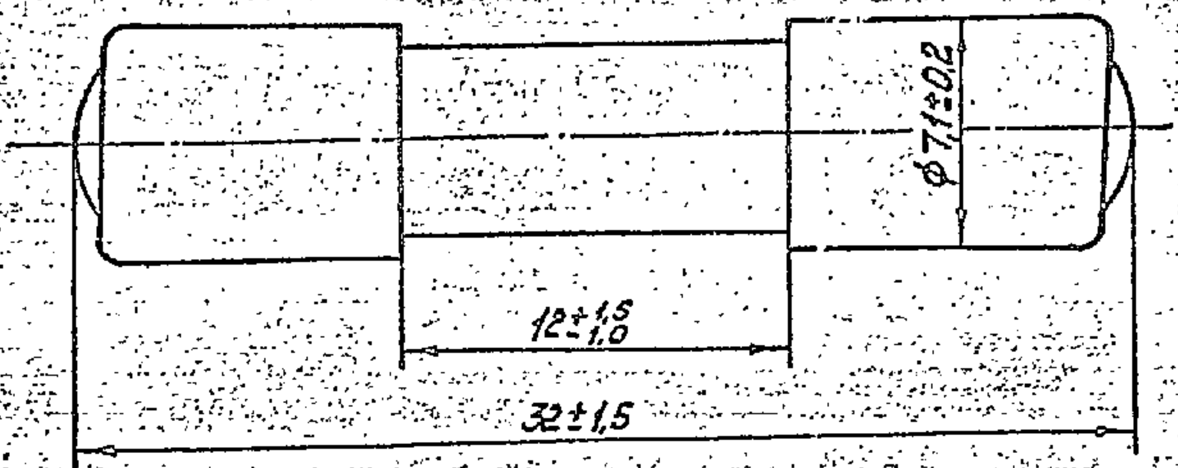
Drg.1. Fuses of type B-24 - B-50.

Масса 10г не более

Рис.1. Предохранители типа ПВ-2 ÷ ПВ-50.

Инв. № подл. | Подпись и дата | 27.05.82 | Взам. инв. № | Инв. № дубл. | Подпись и дата

ПМ-583

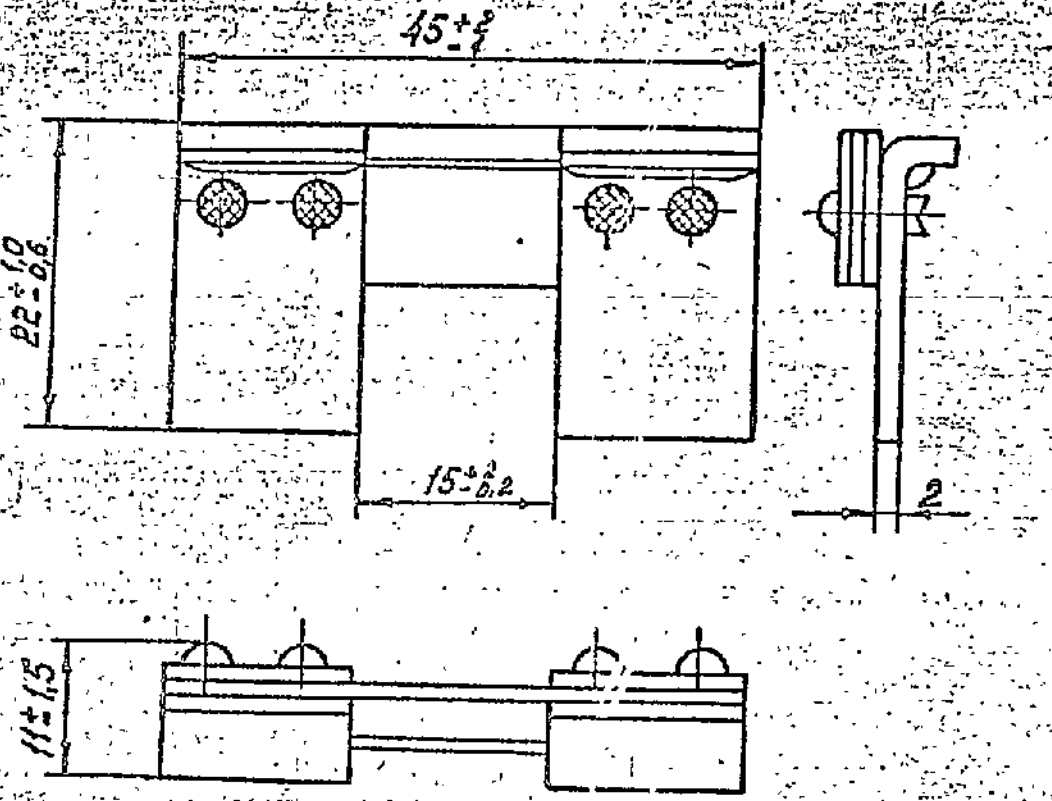


Weight not exceeding 3.. gm.

Fig.2.Fuses of type C-1; C-40

Масса 3,3г не более

Рис.2.Предохранители типа СП-1÷СП-40.

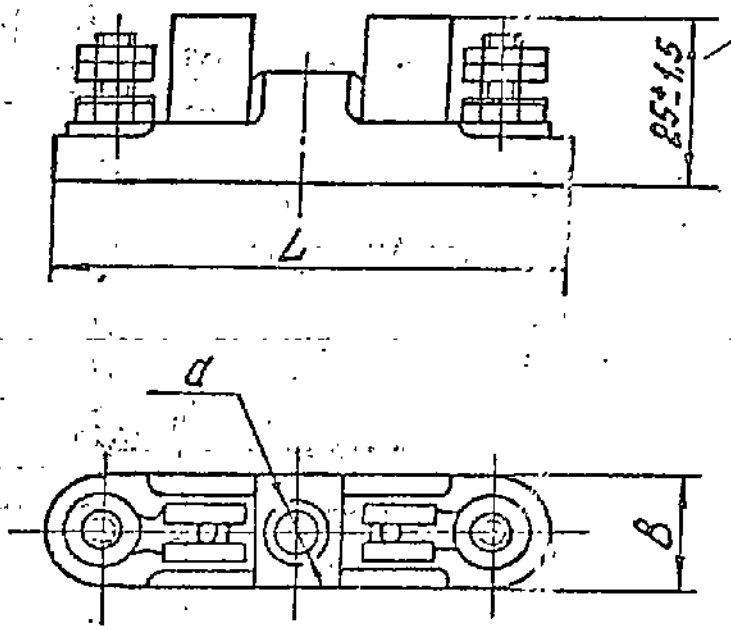


Масса 21г не более

Рис. 3. Предохранители типа ПВ-60АС ÷ ПВ-100АС

Weight not exceeding 21 gm

Fig. 3. Fuses of type B-60AC to B-100AC



Тип блока защиты	Размеры, мм			Масса, г не более
	L	B	d	
Б3-20	63±0,8	16±0,5	4,2+0,3	30
Б3-30	80±1	18±0,6	4,5+0,3	52

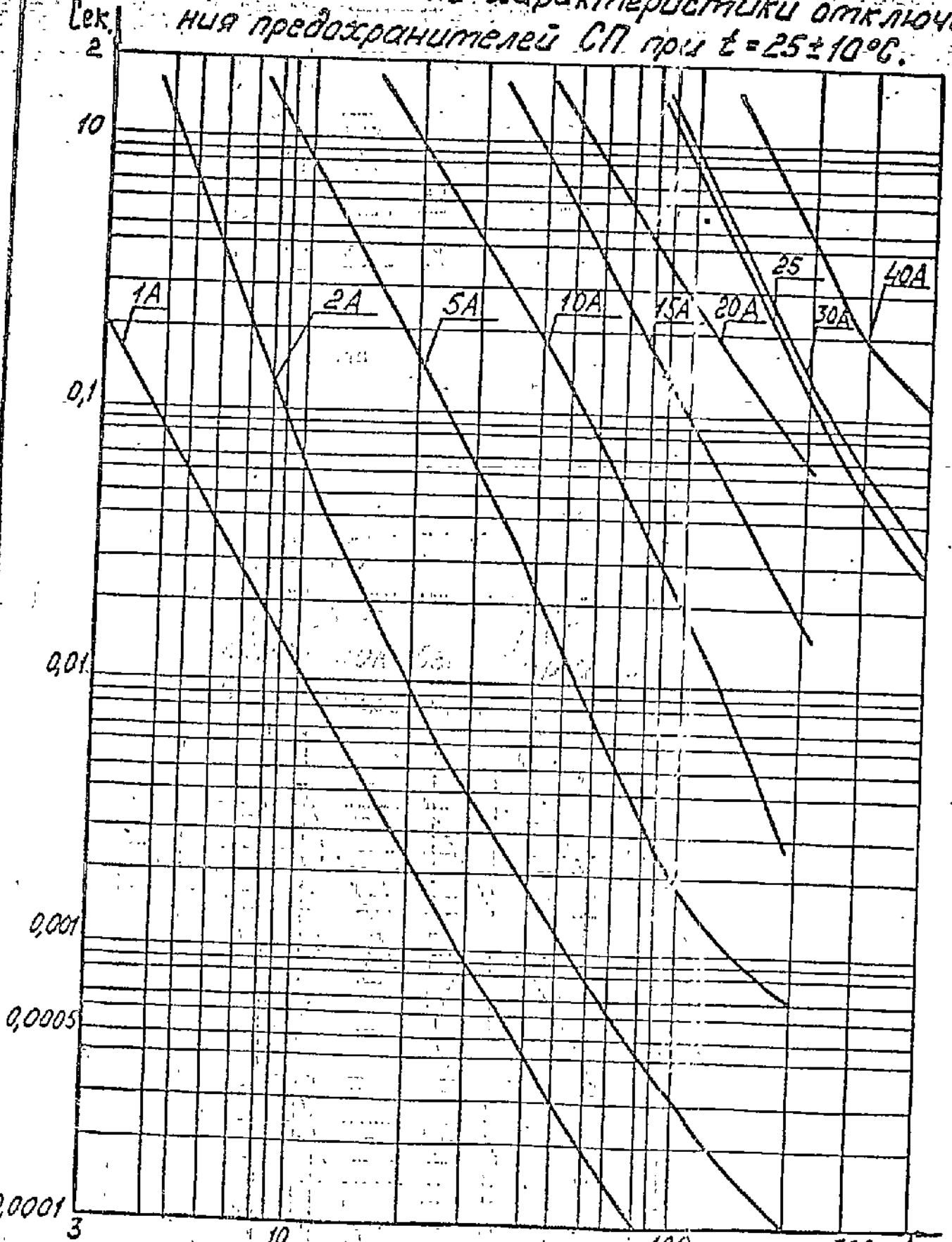
Type of Protection units	Dimensions inmm.			Weight in gm, not exceeding
	L	B	D	
3-20	63±0.8	16±0.5	4.2±0.3	30
3-30	80±1	18	4.5±0.3	52

Рис. 4. Блоки защиты типа Б3-20, Б3-30.

Fig. 4. Protection units 3-20, 3-30.

Приложение 3

Время-токовые характеристики отключения предохранителей СП при t = 25±10°С.



Time current characiristics of cuffing off of fuses C at t= 25+10°C.

Рис.1

Time current characteristic of cut off of fuses of type B at t=25± 10°C.

Продолжение
Continuation.

Время-токовые характеристики отключения предохранителей ПВ при t = 25±10°С.

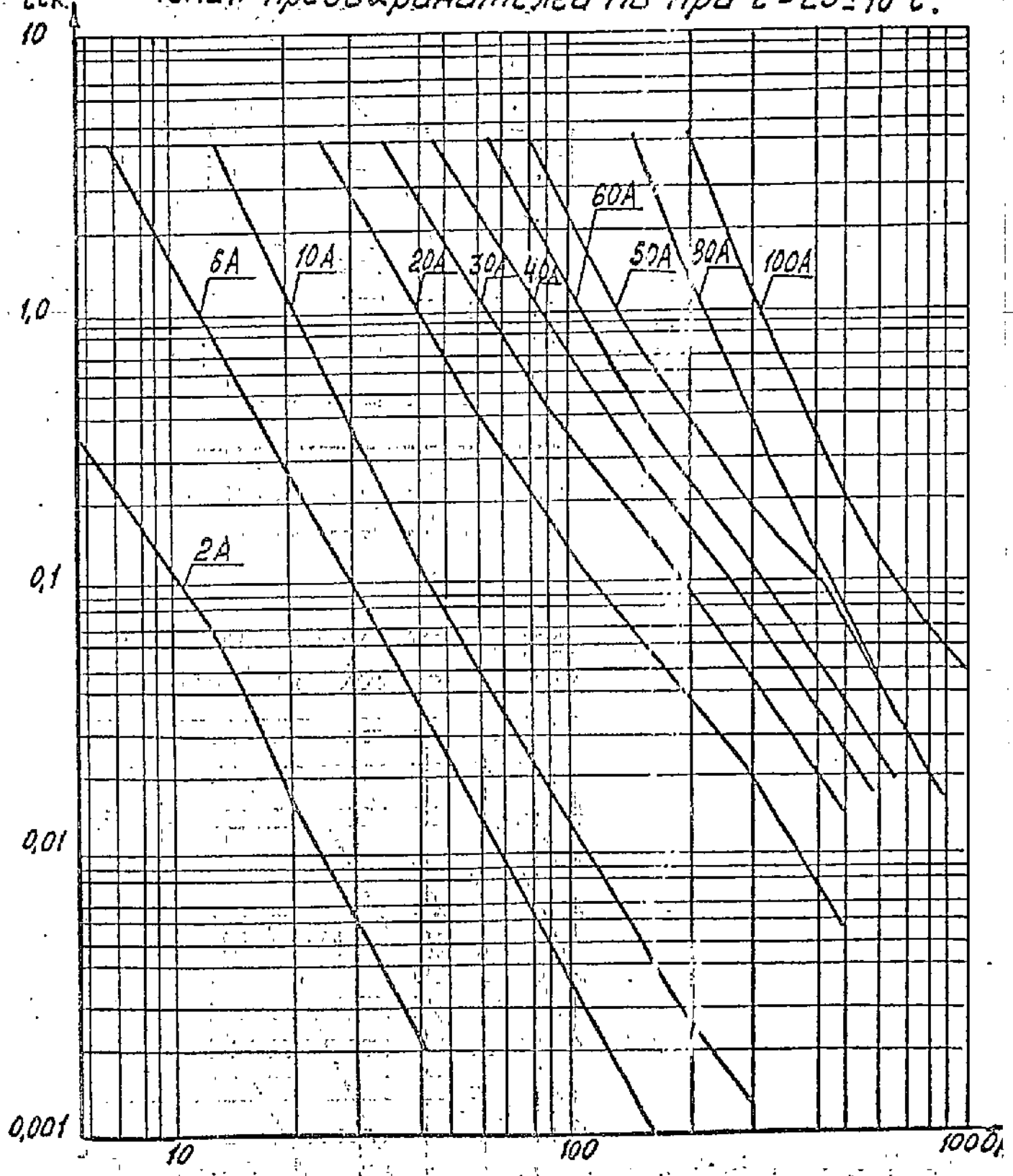


Рис. 2

List of equipments, required for checking and testing of fuses and protection units

Description	Accuracy class	Standards and specifications for equipments or instruments
1. Ammeter type M104, M253	0,5	OCT 8711-78
2. Voltmeter type M015,M106,M153	0,5	OCT 8711-78
3. Vibration testing device of electro-dynamic type BY5/500.		683.00.00.00 TY
4. Industrial balance of type BΠΤ0.200Γ-Ia		OCT 5.526-70
5. Selenium rectifier. BИАИ-3000		OCT 10765-75
6. DC motor type ΠΡ-600, AИA-1500 AИA 3000		OCT 9632-67
7. Selenium rectifier BCA-5,BCA-6M		OCT 10763-75
8. High frequency unit type BΠЛ -30		
9. Thermal-pressure chamber typeKTxБK-0,025-65/155		OCT 5.2030-73
10. Heat and moisture chamber type TBK-2A		OCT 10390-71
11. Stop watch		OCT 5072-79 E
12. Impact testing bed, model CY-1		CTY 16 ΝΛ 97-62.
13. Clocks		OCT 3309-75
14. Shunts (Electric)	0,5	OCT 8042-78
15. Centrifuge		1.430.009 TY

Note: Other types of equipment and instruments may be used if they provide quality checking of fuses in conformity with requirements of the present specification.

—x—

No:85055/OFPM/DS/87-88

Notification No.59

Date: 01.05.87.

NOTIFICATION OF AMENDMENTS TO SPECIFICATIONS

The following Corrections/Amendments are now required to be carried out in the documents as below:

Documents details :TY16-522.001-82

OFPM Regn.No. : I 1321

Details of amendments:-

Sl.No. Details

1. Ref : page No.5 of 47, point 1.1, 4th line

Insert : И TAK - To read as И TAK 646114.002
И TAK 646214.003
И TAK 646214.002
И TAK 646314.001

2. Ref : page 6 of 47, Table 1, Head line, First-column

Delete : 'USES'

Add : "FUSES" To read as - Standard version of fuses and protection units

3. Ref : page No. 9 of 47; Note- column, 2nd point 2nd line

Delete : П B-30 to П B-100A

Insert : П B-2 + П B-20A, Б3-30 with fuses П B-30 to П B-100A.

4. Ref : page No.9 of 47, Table against - Not less than 10 times the value of rated current.

Delete : 0.6 - 1.6

Add : 0.6 - 1.5

Contd.2/-

...105 | Spen (Amdt.