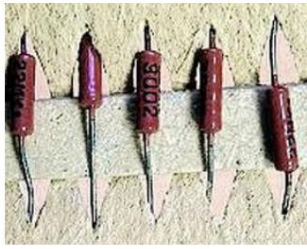


## RESISTORS

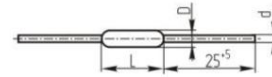
## KVM, KIM, KLM



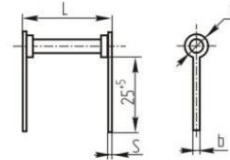
KVM



WHO



KLM



Fixed non-wire resistors KVM, KIM, KLM are designed to work in circuits direct and alternating current.

Resistors are manufactured in a climatic version suitable for operation only in areas with a temperate and cold climate (normal version).

Depending on the design features, resistors are divided into three types:

KBM - composite evacuated,

KIM - composite insulated small-sized, KLM - composite, varnished.

**Note.** KIM-0.05 resistors are allowed to be manufactured with a lead length of 20mm.

Type (kind) resistor	$L$	$D$	$d$	$b$	$s$	Weight, g, no more
KVM	$41 \pm 2$	$5^{+0,5}_{-0,2}$	$0,5 \pm 0,1$	-	-	2,4
KIM-0.05	3,8-0,6	1,8-0,4	$0,3 \pm 0,1$	-	-	0,1
KIM-0.125	8,0-1,3	2,5-0,6	$0,5 \pm 0,1$	-	-	0,2
KLM-a	$29^{+1,0}_{-0,7}$	$7 \pm 5$	-	2,0-0,25	$0,4 \pm 0,0$ 5	3,2
KLM-b	$25^{+1,0}_{-0,6}$	$5,5 \pm 0,4$				1,6

An example of writing a resistor in the design documentation:

Resistor KVM-120  $G \pm 10\%$  OZHO.467.080 TU

Resistor KYM-0.05-10  $\ddot{y} \pm 10\%$   $\ddot{y}\ddot{y}$ .467.080 TU

Recording order: after the word "Resistor", the abbreviated designation of the type (type for KIM, KLM resistors), nominal resistance (Ohm, kOhm, MOhm, GOhm), permissible deviation (%) and technical specification number are indicated.

TERMS OF USE

Ambient temperature

Kind resistor	Rated resistance	Ambient temperature, °C	
		from	to
KVM	15 Mÿ to 1000 Gÿ	—60	+85
KIM-0.05	From 10 Ohm to 1 MOhm		+ 125
	From 1.1 to 5.6 Mÿ		+ 100
KIM-0.125	From 27 Ohm to 100 kOhm		+ 125
	110 Mÿ to 1 Gÿ		+ 100
KLM	10 Mÿ to 10 Gÿ		+ 100
	15 to 1000 Gÿ		+ 70

Relative humidity of the ambient air at temperatures up to 25 ° C up to 98%. Atmospheric pressure up to 1 10-1 mm Hg. Art.

Mechanical loads

Type resis stands	Vibration		Multiple hits		Linnaeus nye loads	Vibration		Multiple hits		Linnaeus nye loads
	Diapa zones frequencies, Hz	Maxi small faster we, g	Maxi small faster we, g	duration ness hits, ms	Linnaeus noe mustache roots, g	Diapa zone cha hundred, Hz	Maxi little noe mustache crusts we, g	Maxi small faster we, g	Dly Tel ness hits, ms	Linnaeus noe mustache roots, g
when attached to the body						when fastening for conclusions				
KVM, KLM	1—1000 7,5		35	2—10	150	1—80 2,5		12	2—15	25
WHO --		—	—	—	—	1 — 1000 7,5		35	2—10 150	

## MAIN SPECIFICATIONS

### 1. Rated resistances ranging from 15 M $\Omega$ to 1000 G $\Omega$

correspond to the following rows of GOST 2825-87:

E24 - for KIM resistors,

E12 — « »KVM,

E6 — “ ”KLM.

### 2. Rated power dissipation, limits of nominal resistances and permissible deviations from nominal resistance

Kind resistor	Rated power dissipation, W	Nominal resistance limits	Permissible deviation from nominal resistance, %
KVM	—	15 M $\Omega$ to 10 G $\Omega$	$\pm 2$ , $\pm 5$ , $\pm 10$ $\pm 20$
		12 to 100 G $\Omega$ 120 to 1000 G $\Omega$	$\pm 5$ , $\pm 10$ , $\pm 20$ $\pm 10$ , $\pm 20$
KIM-0.05	0,05	From 10 Ohms to 1 M $\Omega$ From 1.1 to 5.6 M $\Omega$	$\pm 5$ , $\pm 10$ , $\pm 20$ $\pm 10$ , $\pm 20$
KIM-0.125	0,125	27 $\Omega$ to 100 M $\Omega$ 110 M $\Omega$ to 1 G $\Omega$	$\pm 5$ , $\pm 10$ , $\pm 20$ $\pm 10$ , $\pm 20$
KLM-a	—	10 M $\Omega$ to 10 G $\Omega$ 15 to 100 G $\Omega$	$\pm 5$ , $\pm 10$ , $\pm 20$ $\pm 10$ , $\pm 20$
KLM-b	—	150 to 1000 G $\Omega$	$\pm 10$ , $\pm 20$

### 3. Temperature coefficient of resistance (TCR) of resistors per 1°C in the temperature range

Resistor type	TKS, %, no more, in the temperature range	
	from minus 60 up to +20° $\Omega$	from +20° $\Omega$ to upper temperature values ambient air
KVM, KIM, KLM are nominal resistance up to 10 G $\Omega$	+1000 -2000 $\cdot 10^{-4}$	$\pm 20 \cdot 10^{-2}$
KLM with nominal resistance over 10 G $\Omega$	+1500 -2500 $\cdot 10^{-4}$	$\pm 25 \cdot 10^{-2}$

### 4. Noise level of CMM resistors with nominal resistance:

from 10 to 91 k $\Omega$ ..... not more than 5  $\mu$ V/V

» 100 to 910 k $\Omega$ ..... no more than 10  $\mu$ V/V

» 1 to 10 M $\Omega$  ..... no more than 15 -  $\mu$ V/V

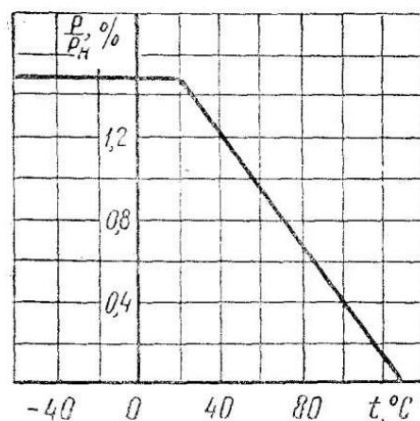
5. Limiting operating voltage of direct or alternating (peak value) current for resistors:

KVM, KIM-0.05 ..... 100V

KIM-0.125..... 200V

KLM..... 300V

6. Dependence of the allowable power of the electrical load (as a percentage of the rated power dissipation) for CMM resistors on the ambient temperature specified in the conditions operation, at atmospheric pressure 630-800 mm Hg. Art.



$P$  is the allowable power of the electrical load, W;  $P_n$  - rated power dissipation, W.

7. Change in resistance after exposure of resistors in a chamber with relative air humidity up to +25° ÿ

Type (kind) of resistor	holding time	Change resistance, %, no more
KVM	Within 1 hour in normal climatic conditions	±5
KIM-0.125 with nominal resistance up to 9.1 Mÿ	Within 5 hours under normal climatic conditions	±15
KIM-0.05 with nominal resistance up to 0.91 Mÿ		
KLM with rated resistance up to 6.8 Gÿ		±20
KIM-0.125 with nominal resistance up to 9.1 Mÿ	For 1 hour in a desiccator with a moisture-absorbing substance	±20
KIM-0.05 with nominal resistance up to 0.91 Mÿ		±15
KLM with rated resistance up to 6.8 Gÿ		±20
Other resistors	for 5 hours in a desiccator with desiccant	±20

Fig. 8. Change in resistance after testing resistors for accelerated aging and holding them for 1 hour in a desiccator with a desiccant

Type (kind) of resistor	Ambient temperature, °C	Electrical load	Less resistance, %, no more
KLM up to 10 GΩ	125-5	—	+ 5 –20
KLM 10 GΩ or more	85±3	—	+ 5 –20
KVM			+ 5 –15
KIM-0.05 up to 510 kΩ	70±-3	Voltage corresponding to 150% of rated power, but not more than 100 V	+ 5 –15
KIM-0.125 up to 510 kΩ	70±3	Voltage corresponding to the rated power dissipation, but not more than 200 V	+5 –15
KIM 510 kΩ and more	Corresponding to the maximum temperature specified in operating conditions	—	+ 5 –15

## 9. Changing the resistance of resistors depending on the change in voltage

Type (kind) of resistor	Rated resistance	Resistance change, %, no more
KVM	15 MΩ to 100 GΩ	±5
	120 to 1000 GΩ	+ 5 –10
KIM-0.125	From 27 Ohm to 1000 MOhm	+ 5 –20
KLM-a, KLM-b	10 MΩ to 1000 GΩ	+ 5 –15

## 10. Change in resistance after testing resistors for resistance to change

temperatures and keeping them for 1 hour in a desiccator with a moisture-absorbing substance:

for resistors

KIM-0.05 to 1 MΩ,

KIM-0.125 up to 10 MΩ,

KLM up to 10 GΩ and KVM..... no more than ±5%

+5

for other resistors ..... no more

–10%

**11. Change in resistance after exposure to mechanical loads specified in the conditions**

**Operation..... no more than  $\pm 5\%$**

**12. Distance to the soldering point of the wire to the resistor leads:**

**KVM, KLM ..... no more than 5— 6 mm**

**KIM ..... no more than 3 mm**

**13. Change in resistance after soldering..... no more than  $\pm 5\%$**

**14. Tensile force directed along the axis..... 1 kgf**

**15. Change in resistance after exposure to tensile force,..... no more than  $\pm 5\%$**

**16. Minimum operating time for resistors:**

**KIM..... 5 000 h**

**KVM..... 10,000 hours**

**KLM..... 5,000 h**

**17. Changing the resistance of resistors during the minimum operating time .... no more than  $\pm 30\%$**

**18. Preservation of resistors in the supplier's packaging in spare parts, as well as those mounted in equipment  
when stored in a heated warehouse ..... 19. Change 12 years  
in resistance during the shelf life no more than.....  $\pm 25\%$**