SEVERNAYA ZARIA

СЕВЕРНАЯ ЗАРЯ

HIGH-REL RELAYS' MANUFACTURER #1 IN RUSSIA

Bangalore
February 2020

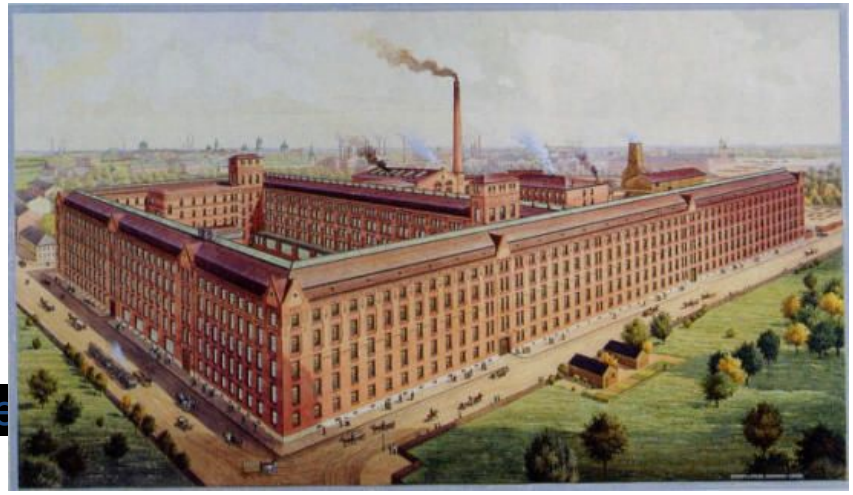
Briefly about us

- Severnaya Zaria today is a **leading** Russian high-rel **relays manufacturer**, science-production complex, combining special purpose relays' **research, design, production and testing**.

- The **mission** of Severnaya Zaria is to **support** global competitiveness of the Russian **space, aerospace and military** industry by providing them with modern, high quality commutation equipment (**relays**).

Company history

In **1897** Mr. Lars Magnus Ericsson, owner of "**LM Ericsson&Co**", telephone equipment manufacturing company from Stockholm, opens in Saint-Petersburg first telephone factory in Russia. Initially there were employed 200 people and they've produced 12 000 telephones and 100 stations in several years. Though relays used at that moment were imported from Sweden. Business grew fast and in 1915 more than 3000 employees were working in the factory, producing annually more than 60 000 telephones and around 1000 stations.



After the revolution, in **1919** factory was nationalized, and in **1922** got it's new name - **Krasnaya Zaria** (Red Dawn).

Within several years company started to produce own design relays, with significant influence of LME's heritage. Company was intensively cooperating with major technical universities in Saint-Petersburg – LETI, LEIS, LPI etc. In **1935** internal R&D department was established.

After the WW II in **1945-1950** company is involved in design and production of special purpose relays for aviation and military equipment, it becomes country's center for relays technology – studies isolation and constructive materials, alloys, coatings etc. Company contributes to development of missile technologies and space exploration by providing high quality miniature hermetically sealed relays to Russian space industry.

In **1974** special relays design and production of Krasnaya Zaria departments were separated as an independent enterprise called **Severnaya Zaria** (Nothern Dawn).

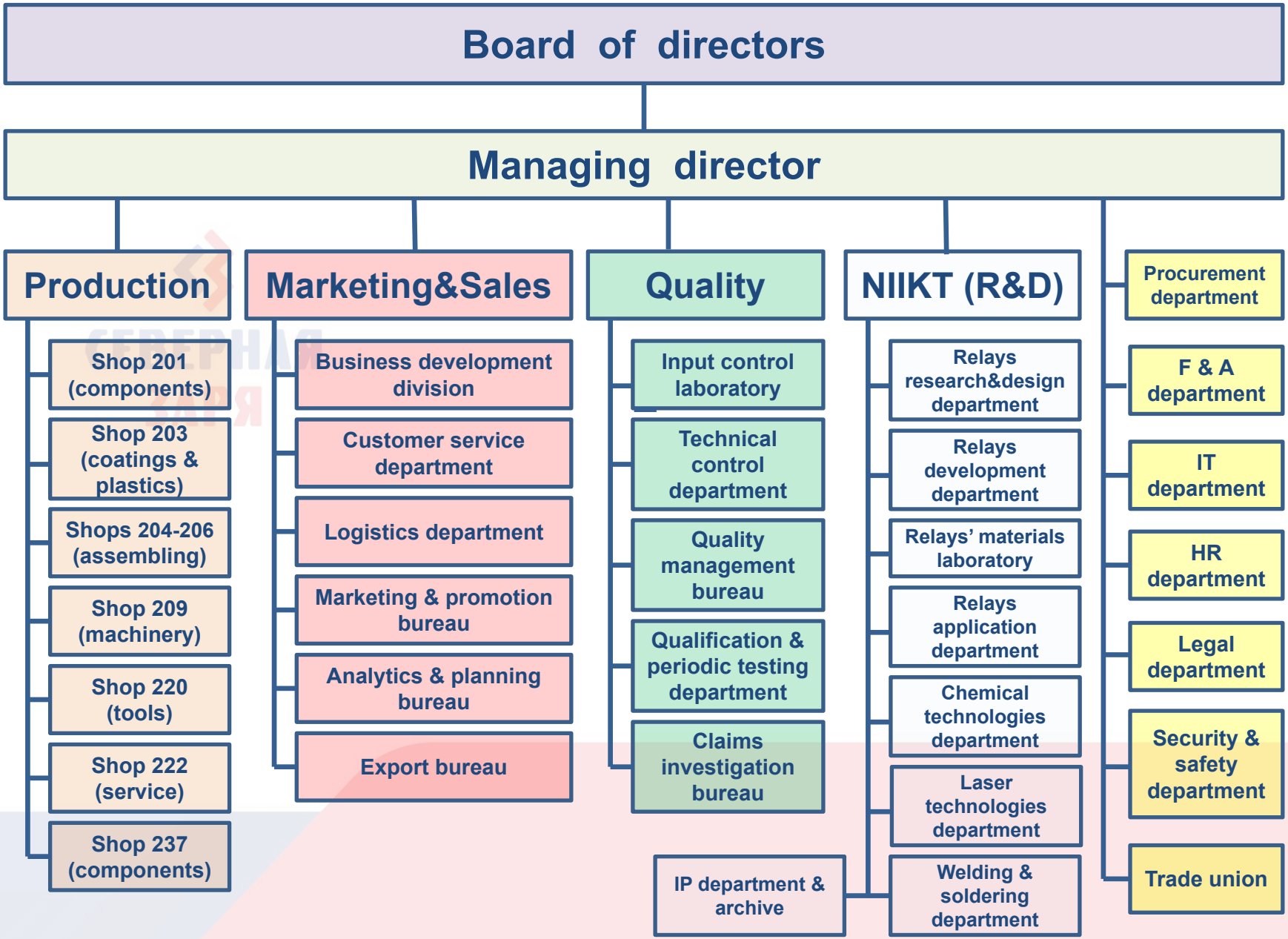
Company facts

- Full **name** – NPK Severnaya Zaria, Joint Stock Company
- 60% state **owned**, 40% privately **owned**
- **Founded** in 1974, parent company in 1897
- **Location** - St. Petersburg, Russian Federation
- **Staff** – 1370 employees
- **Product range** – 61 types of relays, more than 300 versions
- Market **share** – around 60% of Russian special relays market
- Main **products** – high-end electromagnetic relays, commutation assemblies, testing and special technological equipment
- Key **markets** – space, aerospace, marine, military, energy, transport etc.

Our most valuable customers

Pavel **Vinogradov** – Russian astronaut, 7 times worked in open space (38.5 hours by 2014), oldest (59 y.o.) ever man in open space.

Company Structure



Qulity assurance system

Severnaya Zaria's quality management system **complies** with GOST R ISO 9001-2015, GOST RV 0015-002-2012, ES RD 009-2014 and consists of 69 internal standards, covering all processes and procedures within relay lifetime. Every type has it's own dedicated QAP (quality assurance program).

Every 2 to 4 months (depending on the type) **periodical tests** are performed, including lifetime tests, resource tests, mechanical tests (shock, vibration, linear acceleration), critical electrical tests etc.

3-level quality control system:

- Internal production (shop level) control
- Technical control department (factory level)
- Independent government auditors (industry level)

Some critical parameters (contact resistance, operate/release voltage/current/time, bounce time) are controled up to **30 times** at ambient temperatures -60º…+125ºC during production cycle.

AS A RESULT ⇨ QUALITY CLAIMS LESS THAN 0.009% OF PRODUCTION

Sales structure by industry





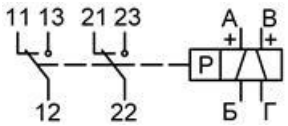
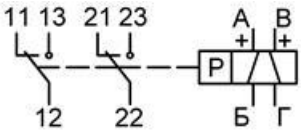
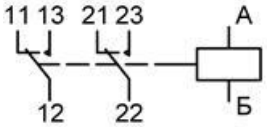
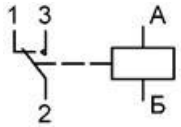
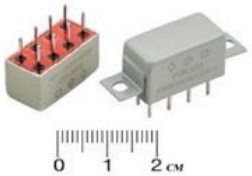
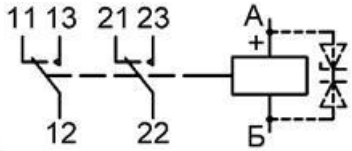
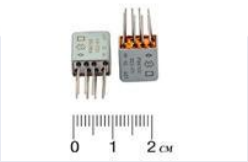
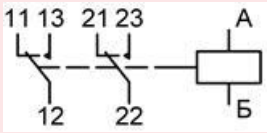




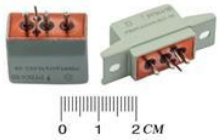
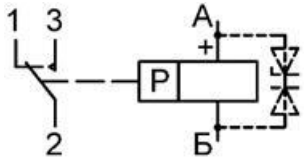





Product range overview (subminiature relays 2 to 10 grams)

	**Polarized *bistable (latching)*** **DC Coil Voltage: 3V; 4V; 6,3V; 12V; 15V; 27V; up to 100V on request** **RPS45; RPS45-1**	2 PDT@1-2 A 	Designed in 1971 as modernization of Bronson relays, production started in 1973 (1982-1983 for version "-1" with planar pins). First subminiature polarized relay. For space applications (small size/weight, energy saving).
	**Polarized *bistable (latching)*** **DC Coil Voltage: 6V; 15V; 18V; 27V; up to 100V on request** **RPS46; RPS46-1**	2 PDT@1 A 	Even more miniature version of RPS45, designed in 1973 and stared production in 1975 (1988-2004 for version "-1" with planar pins). Widely used in nuclear applications.
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 4V; 5V; 6V; 12V; 18V; 27V** **REK60; REK61**	2 PDT@0,5-1 A 	Designed in 1994 as modernization of old (1970) RES60 relays, production started in 1998 (1997-1999 for REK61 and REK63-1 with planar pins). For space equipment control systems (small size/weight).
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 6V; 12V; 18V; 27V** **REK63; REK63-1**	1 PDT@1 A 	
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 6V; 12V; 27V** **REK103**	2 PDT@2 A 	Designed in 2015 as modernization of LEACH W260 series, production started in 2018. Fully welded low-height relay based on modern materials and technologies. For aviation and space applications . Optionally diod-stabilitron.
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 3V; 4V; 5V; 6,3V; 12V; 15V; 27V** **REK100; REK100-1**	2 PDT@0,5-1 A 	Designed in 2019 as modernization of old (1973) RES80/REK80 relays, production will be started in 2020. Fully welded relay based on modern materials and technologies. For space equipment control systems (small size/weight).

Product range overview (subminiature relays below 20 grams)

<table>
<tr>
<td>  </td>
<td>Polarized monostable
(non-latching)
DC Coil voltage: 12V; 27V
RPK41</td>
<td>1 PDT@10 A
  </td>
<td rowspan="4">Designed in 1992 as modernization of LEACH aviation relays, production started in 1995.
Fully welded relays based on modern materials and technologies.
For aviation, military and space applications .
Optionally diod-stabilitron (RPK41, 43,44).</td>
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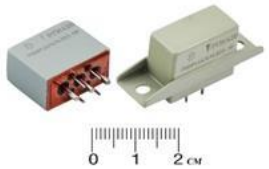
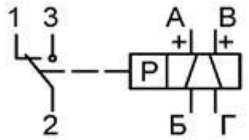
<td>  </td>
<td>Polarized bistable (latching)
DC Coil Voltage: 12V; 27V; up to 100V on request
RPK42</td>
<td>1 PDT@10 A
  </td>
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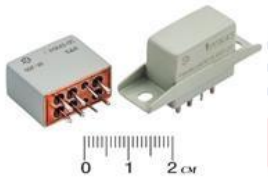
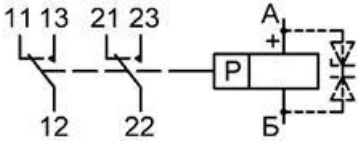
<td>  </td>
<td>Polarized monostable
(non-latching)
DC Coil voltage: 12V; 27V
RPK43</td>
<td>2 PDT@5 A
  </td>
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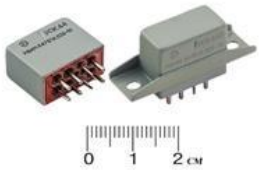
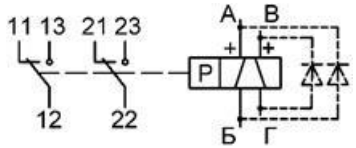
<td>  </td>
<td>Polarized bistable (latching)
DC Coil Voltage: 12V; 27V; up to 100V on request
RPK44</td>
<td>2 PDT@5 A
  </td>
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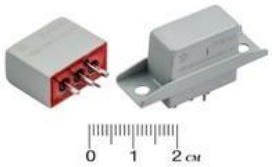
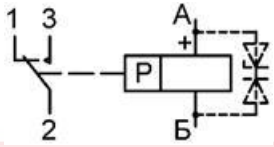
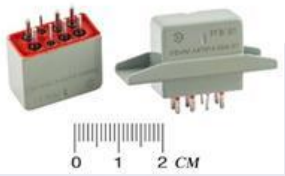
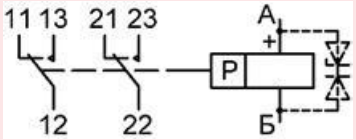
<td>  </td>
<td>Polarized monostable
(non-latching)
DC Coil voltage: 27V
(Pickup\hold voltage: 12,5V\8V min)
RPK80</td>
<td>1 PDT@10 A
  </td>
<td rowspan="2">Designed in 2008 specially to satisfy specific aviation requirement of low battery operation (from 18V DC at “cold” coil), production started in 2010.
Fully welded relays based on modern materials and technologies.
For aviation, military and civil.
Optionally diod-stabilitron .</td>
</tr>
<tr>
<td>  </td>
<td>Polarized monostable
(non-latching)
DC Coil voltage: 27V
(pickup\hold voltage: 12,5V\8V min)
RPK81</td>
<td>2 PDT@5 A
  </td>
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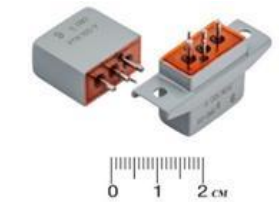
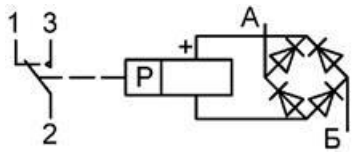
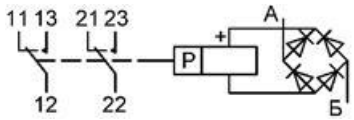
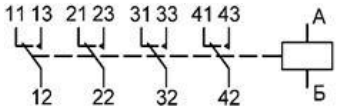
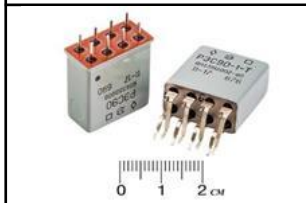
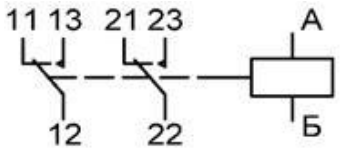
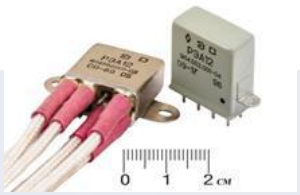
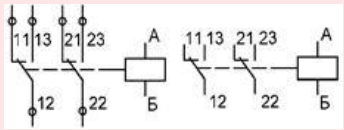
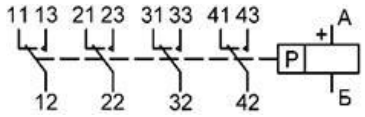
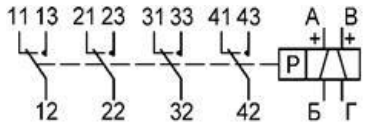
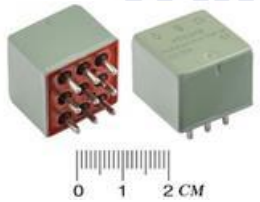
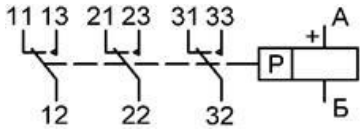
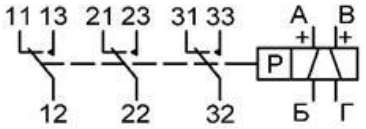
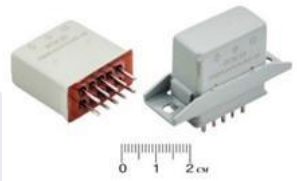
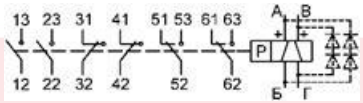
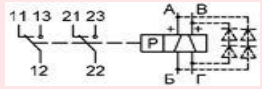
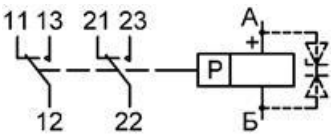
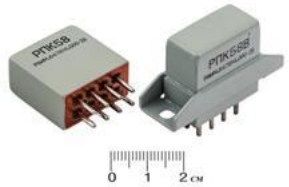
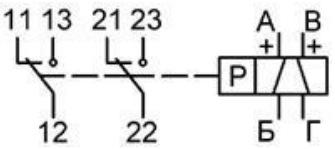
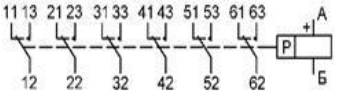
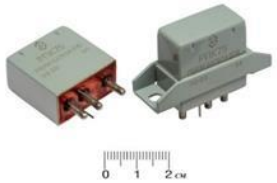
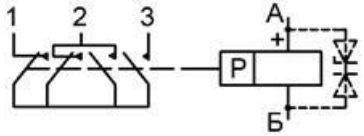
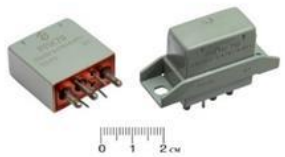
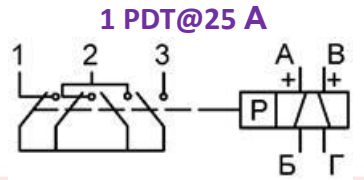
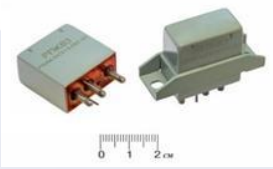
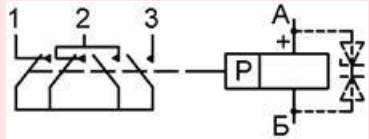
Product range overview (subminiature relays below 20 grams)

	Polarized *monostable (non-latching)* AC Coil voltage: 400 Hz, 115V AC **RPK100-U**	1 PDT@10 A 	Designed in 2005 specially for specific coil voltage – 115V AC 400 Hz (aviation, marine), production started in 2008. Has built-in rectifier. Fully welded relays based on modern materials and technologies. For aviation, marine and other applications requiring 115V AC coil control voltage.
	Polarized *monostable (non-latching)* AC Coil voltage: 400 Hz, 115V AC **RPK101-U**	2 PDT@5 A 	
	Nonpolarized *monostable (non-latching)* DC Coil voltage: 6V; 12V; 24V; 27V **REK93**	4 PDT@2 A 	Designed in 2001 as development of old (1974) RES90 relay, production started in 2004. 2 contacts added to 2 already existed, giving totally 4, which is highly appreciated by designers, using them as power+signal contacts. Fully welded relay based on modern materials and technologies. For space, military, aviation applications.
	Nonpolarized *monostable (non-latching)* DC Coil voltage: 6V; 12V; 18V; 27V; 48V; 100V **RES90; RES90-1**	2 PDT@2-3 A 	Old time-proven relay designed in 1974, put in production in 1976. Version with planar pins added in 2006. For use in outdated design in space, military, aviation applications, where changes are difficult or expensive.
	Nonpolarized *monostable (non-latching)* DC Coil voltage: 27V **High frequency** (up to 1000 MHz, up to 25 W) **REA12**	2 PDT@1 A 	One of few HF relays types in the range, was designed in 1978 and put in production in 1982. For use in military, aviation, marine applications at frequencies up to 1 GHz and switched power up to 25W. Extremely wide range of switched currents – from 1 nanoampere to 1 ampere!

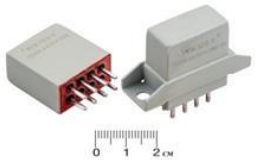
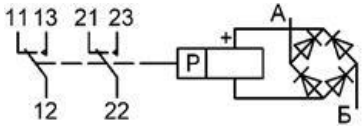
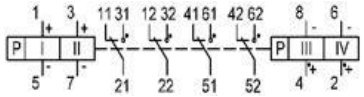
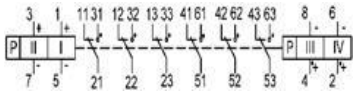
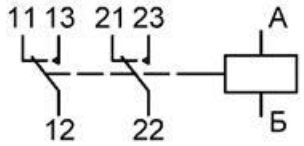
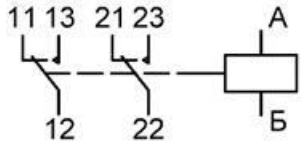
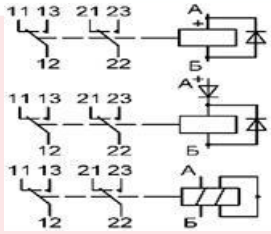
Product range overview (miniature relays 25 to 55 grams)

	Polarized *monostable (non-latching)* DC Coil voltage: 12V; 27V **RPK45**	4 PDT@5 A 	Designed in 1992 as modernization of LEACH aviation relays, production started in 1996. Fully welded relays based on modern materials and technologies. For aviation, military and space applications .
	Polarized *bistable (latching)* DC Coil Voltage: 12V; 27V; up to 100V on request **RPK46**	4 PDT@5 A 	
	Polarized *monostable (non-latching)* DC Coil voltage: 12V; 27V **RPK47**	3 PDT@10 A 	
	Polarized *bistable (latching)* DC Coil Voltage: 12V; 27V; up to 100V on request **RPK48**	3 PDT@10 A 	
	Polarized *bistable (latching)* DC Coil Voltage: 27V; up to 100V on request Versions: - with 2 PDT power contacts + 2 NO, 2 NC signal contacts; - with 2 PDT power contacts **RPK30**	2 PDT + (2 NO, 2 NC)@10 A  2 PDT@10 A 	Designed in 1989 for use in space equipment with long life (satellites, spacecrafts), production started in 2001. 2 versions of numerous contacts (signal+power) are highly appreciated by designers as well as quite high (10A) current of power contacts.. Fully welded relay based on modern materials and technologies. For space, military, aviation applications. Optionally diod-stabilitron .

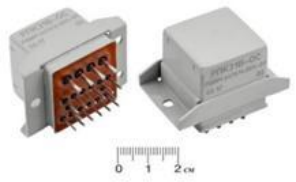
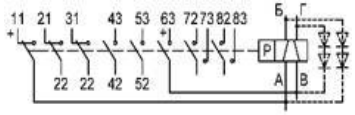
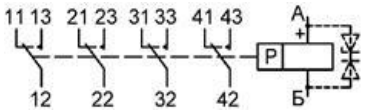
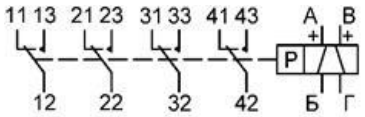
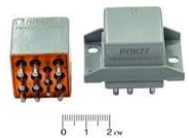
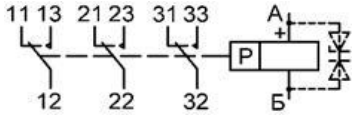
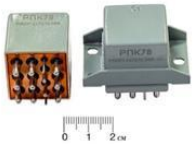
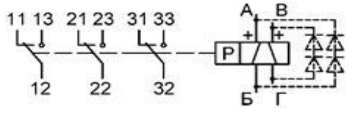
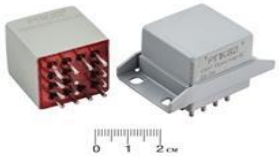
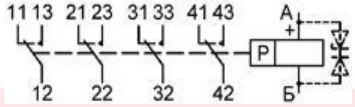
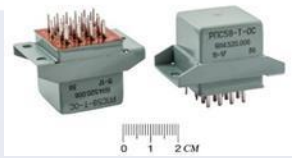
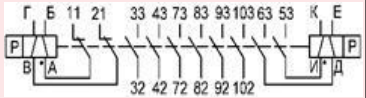
Product range overview (miniature relays 25 to 55 grams)

	**Polarized *monostable (non-latching)*** **DC Coil voltage: 12V; 27V** **RPK57**	**2 PDT@10 A** 	Designed in 1996 as modernization of LEACH aviation relays, production started in 2000. Fully welded relays based on modern materials and technologies. For aviation, military and space applications . Optionally diod-stabilitron (RPK57).
	**Polarized *bistable (latching)*** **DC Coil Voltage: 12V; up to 100V on request; 27V; up to 100V on request** **RPK58**	**2 PDT@10 A** 	
	**Polarized *monostable (non-latching)*** **DC Coil voltage: 6V; 12V; 24V; 27V** **RPK67**	**6 PDT@2 A** 	Designed in 2003 as sucessor of very old (1956) and popular RES8 relay, production started in 2005. 6 contacts are highly appreciated by designers. Fully welded relay based on modern materials and technologies. For nuclear, military, marine applications.
	**Polarized *monostable (non-latching)*** **DC Coil voltage: 12V; 27V** **RPK75**	**1 PDT@25 A** 	Designed in 1999 as modernization of LEACH relays, production started in 2002. Fully welded relays based on modern materials and technologies. Most powerful (25A!) relay in range For aviation, military and space applications . Optionally diod-stabilitron (RPK75).
	**Polarized *bistable (latching)*** **DC Coil Voltage: 12V; 27V; up to 100V on request** **RPK76**	**1 PDT@25 A** 	
	**Polarized *monostable (non-latching)*** **DC Coil voltage: 27V** (Pickup\hold voltage: 12,5V\8V min) **RPK83**	**1 PDT@25 A** 	Designed in 2008 as modernization of RPK75 for aviation specially to satisfy specific aviation requirement of low battery operation (from 18V DC at “cold” coil), production started in 2010. Optionally diod-stabilitron.

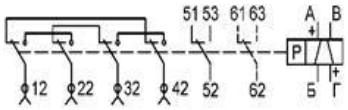
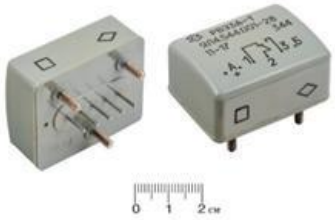
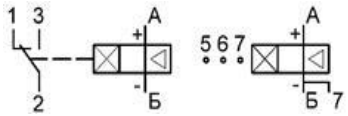
Product range overview (miniature relays 25 to 55 grams)

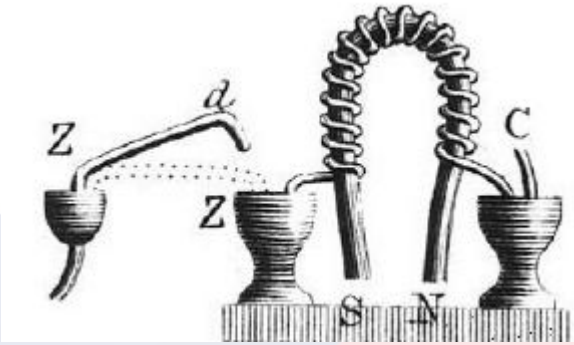
	**Polarized *monostable (non-latching)*** **AC Coil voltage: 400 Hz, 115V AC** **RPK103-U**	**2 PDT@10 A** 	Designed in 2015 specially for specific coil voltage – 115V AC 400 Hz, production started in 2019. Has built-in rectifier. Fully welded relays based on modern materials and technologies. For aviation, marine and other applications.
	**Polarized *bistable (latching)*** **DC Coil Voltage: 6V; 12V; 27V** **RPS34**	**4 PDT@3 A** 	Designed in 1965 basing at own patented unique technology – armature fixed on the bar spring, (zero friction), extremely high sensitivity and long life as a result. Production started in 1967. Another specific feature – 2 pairs of equal coils, enabling logical AND control function. 4 or 6 contacts are also highly appreciated by designers. Specially designed for complicated control systems of satellites and spacecrafts, but quite widely used in other applications as well due to their unique design and parameters.
	**Polarized *bistable (latching)*** **DC Coil Voltage: 6V; 12V; 27V** **RPS36**	**6 PDT@3 A** 	
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 6V; 12V; 24V; 27V; 60V** (DC coil with nominal voltage ON **100 000 hours** allowed) **REK24**	**2 PDT@3 A** 	Another sample of unique design was realized in 1980 and started production in 1982 – relay for high depth underwater applications (was used in equipment installed under La Manche). Coil can stay connected to the voltage up to 100 000 hour continuously without heat aging!
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 12V; 27V** **REK84**	**2 PDT@5 A** 	Designed in 1997-1999, production started in 1999-2000. Fully welded relays based on modern materials and technologies. Common use relays for demanding applications – space, military, marine, aviation etc. REK94 in addition to diod-stabilitron has several rare options – second diode for wrong polarity protection and bifilar winding, allowing to eliminate self induction EMF without semiconductor component (diod-stabilitron), which is highly appreciated in intensive radiation environment.
	**Nonpolarized *monostable (non-latching)*** **DC Coil voltage: 12V; 27V; 60V** **REK94**	**2 PDT@3 A** 	

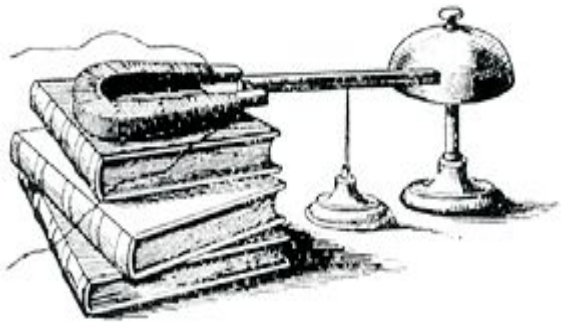
Product range overview (small-size relays below 90 grams)

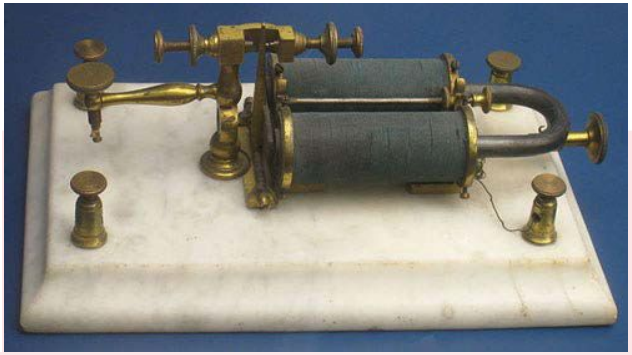
	**Polarized *bistable (latching)*** **DC Coil Voltage: 27V; up to 100V on request** 2 NO power contacts + 2 NO, 2 NC signal contacts + 1 NO, 1 NC contacts to switch coil ON\OFF **RPK31**	**2 NO + (2 NO, 2 NC) + (1 NO, 1 NC)@25 A** 	One more sample of unique design done in 1989 and started production in 1997 – relay was specially designed for RC"Progress" (is used in Soyus spacecraft as well). Has a lot of different contacts, including coil commutation, allowing energy saving with continuous control voltage.
	**Polarized *monostable (non-latching)*** **DC Coil voltage: 12V; 27V** **RPK59**	**4 PDT@10 A** 	Designed in 1994 as modernization of LEACH series 1 relays, production started in 1999. Fully welded relays based on modern materials and technologies. For aviation, military and space applications . Optionally diod-stabilitron (RPK59). RPK59 has a version with special frame in order to substitute old popular relay REN33.
	**Polarized *bistable (latching)*** **DC Coil Voltage: 12V; 27V; up to 100V on request** **RPK60**	**4 PDT@10 A** 	
	**Polarized monostable *(non-latching)*** **DC Coil voltage: 6V; 12V; 27V** **RPK77**	**3 PDT@25 A** 	Designed in 2019 as modernization of LEACH aviation relays, production to start in 2020. Fully welded relays based on most modern materials and technologies. For commutation up to 25A in 3-phase circuits in aviation, military, marine and space applications. Optionally diod-stabilitron (RPK77).
	**Polarized *bistable (latching)*** **DC Coil Voltage: 6V; 12V; 27V; up to 100V on request** **RPK78**	**3 PDT@25 A** 	
	**Polarized *monostable (non-latching)*** **DC Coil voltage: 27V** (Pickup\hold voltage: 12,5V\8V min) **RPK82**	**4 PDT@10 A** 	Designed in 2008 specially to satisfy specific aviation requirement of low battery operation (from 18V DC at "cold" coil), production started in 2010. Modern materials and technologies. Optionally diod-stabilitron .
	**Polarized *bistable (latching)*** **DC Coil Voltage: 27V; up to 100V on request** 4 NO power contacts + 2 NO signal contacts + 2 NO, 2 NC contacts to switch coil ON\OFF **RPS58**	**4 NO + 2 NO + (2 NO, 2 NC)@10A** 	Designed in 1975 specially for RC"Progress", production started in 1967.Has a lot of different contacts, including coil commutation, allowing energy saving with continuous control voltage. Another specific feature – 2 pairs of equal coils, enabling logical AND control function.

Product range overview (high power HF relay, time delay relay)

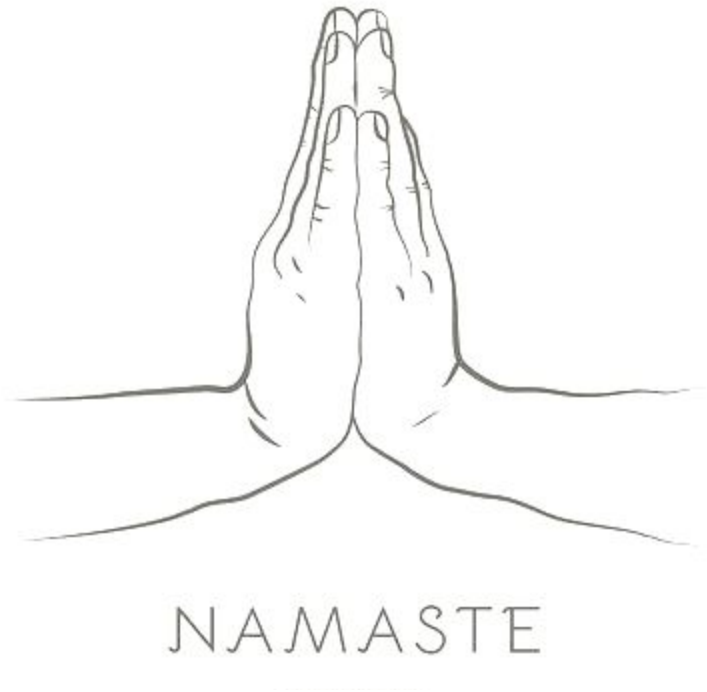
	**Polarized *bistable (latching)*** **DC Coil Voltage: 27V** **High power** (up to 1,5 kW) high frequency (up to 100 MHz) **RPA13**	**4 PDT + (1 PDT or 2 PDT)@4,3 A** 	Another one of few HF relays types in the range, was designed in 1979 and put in production in 1982. Has both HF and signal contacts, HF contacts can switch up to 1,5 kW at frequencies up to 100 mHz. For use in military, aviation, marine and other special applications (for example, jammers).
	**DC Coil Voltage: 27V** **Delay range from 0,05 to 900 sec.** **Contact or contactless (solid state)** **RVE3A** **(weight from 60 to 70 grams);** **RVE3B** **(weight up to 40 grams)**	**1 PDT@1 A 1 NO@0,15 A** 	Two only types represent line of time delay relays. RVE3A (metallic housing) was designed in 1987 and in the same year put in production, whereas RVE3B (plastic housing) was designed in 1991 and production started in 1993. Both types can have electromagnetic or solid state relay at the output. Fixed delays vary from 0.05 to 900 sec. and are programmed at the factory during production. For use in military, aviation, marine and other applications.







THANK YOU FOR ATTENTION !



You are welcome to ask questions)

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