



RELAYS

INSTANTANEOUS BISTABLE (LATCHING) RELAYS - 4 TO 8 CONTACTS

OKBA SERIES

USER SECTORS



Power generation



Nuclear



Power transmission



Rolling Stock



Fixed railway installations



Shipbuilding



Petroleum industry



Heavy industry



OKBA

PRODUCT ADVANTAGES

- Plug-in instantaneous bistable relay
- Solid and rugged construction
- Long life expectancy
- Automatic de-energization following operation, energy saving
- Magnetic holding action
- Patent operating mechanism, designed to ensure high contact pressure
- Magnetic arc blow-out standard
- Independent and self-cleaning contacts
- Pulsed or permanent power supply, a.c. or d.c.
- Excellent shock and vibration resistance
- Wide range of sockets
- Retaining clip for secure locking of relay on socket
- Transparent cover, pull-out handle
- Positive mechanical keying for relay and socket

DESCRIPTION

OKBA bistable relays are electromechanical devices having two stable states controlled by two distinct power inputs. There are many possible applications: these relays are used mainly because they are able to maintain the status assumed after the last switching operation, even in event of a power outage occurring - in short, they have a guaranteed "memory" capability. Given their superior **reliability** and **durability**, these components are capable of filling roles that call for a high level of responsibility; in effect, they are used in environments where continuous duty is an essential requirement (e.g. electrical transformer stations and continuous cycle manufacturing processes).

OKBA relay are equipped with a mechanism (electronic or mechanical, depending on the model) that **cuts off the power supply** to the coil leads after the switching operation; this means that power consumption can be **reduced to zero, while maintaining the required operating position**. The OKBA has a common negative pole and is configured with the two negative poles separate from one another, for greater flexibility of connection.

In this model the core of a monostable relay is replaced by a special element made of magnetic material, which magnetizes when the relay is operated. In the event of a power outage, the magnet is able to hold the contacts in the operating position with a force on the **armature of 10N**. The magnet is demagnetized by a de-energize winding, which generates a magnetic field opposite to that of the energize winding, and allows the relay contacts to return to their initial position. The release winding forms part of the same coil that incorporates the latch winding. Available in versions with 4 or 8 change-over contacts.

Like all our relays, OKBA model are assembled, calibrated and tested, individually and manually, as part of a sequential manufacturing process in which each step of production is tested automatically during the course of the subsequent step.

Models	Number of contacts	Rolling stock application
OKBA	4	•
OKBA8	8	

FOR CONFIGURATION OF PRODUCT CODE, SEE "ORDERING SCHEME" TABLE

Coil specifications	
Nominal voltages Un ⁽¹⁾	DC: 24, 36, 48, 72, 110, 125, 132, 144, 220 AC: 24, 48, 110, 127, 220, 230
Max. consumption at Un ⁽²⁾ Version for rolling stock at Un ⁽²⁾	7W / VA (latch) 3.5W / VA (unlatch) ⁽³⁾ 12,5W (latch) 5,5W (unlatch)
Operating range	80...115% Un DC: 70...125% Un
Version for rolling stock	Continuous

Minimum control pulse 100 ms.

(1) Other values on request.

(2) At the moment of the relay being switched. De-energization occurs after 100 ms approx. Power consumption with relay energized: OKBA = 0.6 W / VA.

(3) For versions with 8 contacts, double the value.

Contact specifications	
Number and type	4 CO, form C ⁽¹⁾
Current	Nominal ⁽²⁾ 10A Maximum peak (1 min) ⁽³⁾ 20 A Maximum pulse (10 ms) ⁽³⁾ 150 A
Exemple de durée de vie électrique ⁽⁴⁾	0.5 A - 110 Vdc - L/R = 40 ms: 10 ⁵ operations, 900 operations / hour
Minimum load	Standard contacts 500 mW (20 V, 20 mA) Gold-plated contacts P4GEO ⁽⁵⁾ 100 mW (10 V, 5 mA)
Maximum breaking voltage	350 Vdc / 440 Vac
Contact material	AgCu
Operating time at Un (ms) ⁽⁶⁾	DC - AC Pick-up (NO contact closing) ≤ 30 Drop-out (NC contact closing) ≤ 40

(1) Version with 8 CO contacts available.

(2) On all contacts simultaneously, reduction of 30%.

(3) The max. peak and pulse currents are those currents that can be handled, for a specified time, by the contact. They do not refer to steady or interrupted currents.

(4) For other values, see electrical life expectancy curves.

(5) Specifications of gold-plated contacts on new relay

a) Plating material: **P4 GEO**: gold-nickel alloy (>6μ)

b) When the gold-plated contact is subject to heavy loads, it will be degraded on the surface. In such case, the characteristics of the standard contact should be taken into consideration. This does not impair relay operation.

(6) Unless specified otherwise, the operating time signifies until stabilization of the contact (including bounces).

Insulation	
Insulation resistance (at 500Vdc)	
between electrically independent circuits and between these circuits and ground	> 1,000 MΩ
between open contact parts	> 1,000 MΩ
Withstand voltage at industrial frequency	
between electrically independent circuits and between these circuits and ground	2 kV (1 min) - 2.2 kV (1 s)
between open contact parts	2 kV (1 min) - 2.2 kV (1 s)
between adjacent contacts	2 kV (1 min) - 2.2 kV (1 s)
Impulse withstand voltage (1.2/50μs - 0.5J)	
between electrically independent circuits and between these circuits and ground	5 kV
between open contact parts	5 kV

Mechanical specifications		OKBA	
Mechanical life expectancy		20x10 ⁶ operations	
Maximum switching rate	Mechanical	900 operations/hour	
Degree of protection (with relay mounted)		IP20	
		4 CO	8 CO
Dimensions (mm)		45x45x109 ⁽¹⁾	92x45x109 ⁽¹⁾
Weight (g)		~ 300	~ 620

(1) Excluding output terminals

Environmental specifications		
Operating temperature	Standard	-10 to +55°C
	Version for railways, rolling stock	-25 to +70°C
Storage and shipping temperature		-25 to +70°C
Relative humidity		Standard: 75% RH - Tropicalized: 95% RH
Resistance to vibrations		1g - 10 to 50 Hz
Resistance to shock		3g
Fire behavior		to EN 60695-2-10

Standards and reference values	
EN 61810-1, EN 61810-2, IEC 61810-7	Electromechanical elementary relays
EN 60695-2-10	Fire behavior
EN 50082-2	Electromagnetic compatibility
EN 60529	Degree of protection provided by enclosures

Unless otherwise specified, the products are designed and manufactured according to the requirements of the above-mentioned European and International standards.
In accordance with EN 61810-1, all items of technical data are referred to ambient temperature 23 °C, atmospheric pressure 96kPa and 50% humidity.
Tolerance for coil resistance, nominal electrical input and nominal power is ±7%.

Railways, rolling stock - Standards	
EN 60077	Electric equipment for rolling stock - General service conditions and general rules
EN 50155	Electronic equipment used on rolling stock
EN 61373	Shock and vibration tests, Cat 1, Class B
EN 45545-2	Fire behavior, Cat E10, Requirement R26, V0
ASTM E162, E662	Fire behavior

Configurations - Options	
P2	Tropicalization of the coil with epoxy resin for use with 95% RH (@ T 50 °C). This treatment also protects the coil against corrosion which could occur by combination of the humidity with certain chemical agents, such as those found in acid atmospheres (typical of geothermal power stations) or saline atmospheres.
P4GEO	Gold plating of contacts with gold-nickel alloy, thickness ≥ 6μ. This treatment ensures long-term capacity of the contact to conduct lower currents in harsh ambient conditions such as acid atmospheres (typical of geothermal power stations) or saline atmospheres.
P5GEO	P4GEO gold-plating of contacts + P2 coil tropicalization.
P6GEO	P4GEO type gold-plating, but applied to contacts, contact terminals and output terminals + P2 coil tropicalization.
FLYBACK DIODE	Polarized component connected in parallel with the coil (type 1N4007 or BYW56 for rolling stock version) designed to suppress overvoltages generated by the coil when de-energized.
IP40	IP40 protection with "6" handle or closure with screws.
8 contacts	Version with 8 change-over contacts, obtained using 2 x 4 CO relays, coils connected in series.
LOW TEMPERATURE (OKBA, 4 CO only)	Minimum operating temperature -40 °C, only for Rolling stock version (option "L").



OKBA Ordering scheme

Product code	Number of contacts	Application ⁽¹⁾	Configuration A	Configuration B	Label	Type of power supply	Nominal voltage (V) ⁽²⁾	Keying position ⁽³⁾
OKBA	4: 4 CO ⁽⁴⁾ 8: 8 CO	E: Energy / Railway Fixed Equipment R: Railway Rolling Stock	1: Standard 2: Diode //	0 : Standard 2 : P2 4 : P4 GEO 5 : P5 GEO 6 : P6 GEO	F	C: Vdc A: Vac 50 Hz	024 - 036 - 048 072 - 096 - 110 125 - 127 - 132 144 - 220 - 230	XXX L: Low temperature

Example

OKBA		E	1	0	F	C	144	
OKBAE10F-C144 - OKBA relay, ENERGY series, nominal voltage 144 Vdc								
OKBA	8	E	1	2	F	C	024	
OKBA8E12F-C024 - OKBA relay, ENERGY series, nominal voltage 24 Vdc, equipped with 8 contacts and P2 finish (tropicalization of coil)								

(1) E = ENERGY: all applications, except for railways rolling stock.

Suitable on energy production, transport and distribution plants, railways fixed equipment, petrolchemical and heavy industry.

R = RAILWAYS, ROLLING STOCK: Application on board rolling stock (rail-tram-trolley vehicles). Electrical characteristics according to EN60077.

Available also the product series:

RAILWAYS, FIXED EQUIPMENT: Approved and conforming relays and products to RFI (FS Group) specification no. RFI DPRIM STF IFS TE 143 A

For the list of RFI approved and conforming products, consult dedicated catalog "RAILWAY SERIES – RFI APPROVED".

STATIONS: ENEL approved material meeting LV15/LV16 specifications.

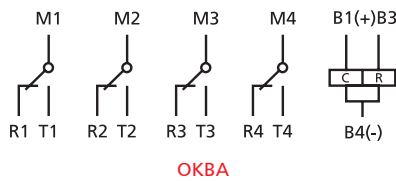
For the list of ENEL approved and conforming products, consult the dedicated catalog "STATIONS SERIES – LV15-LV16-LV20".

(2) Other values on request.

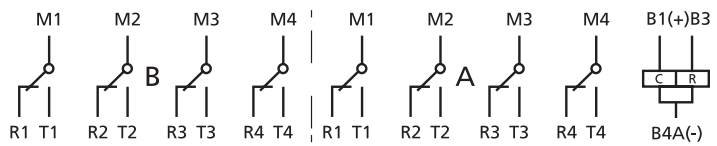
(3) Optional value. The positive mechanical keying is applied according to the manufacturer's model.

(4) For the standard version with 4 contacts, the field must be left empty.

Wiring diagram

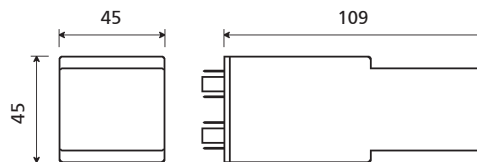


OKBA

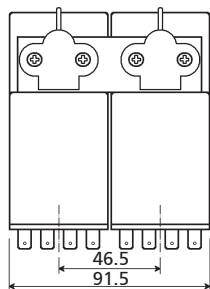


OKBA 8 contacts

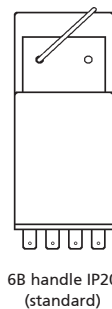
Dimensions



OKBA



OKBA 8 contacts



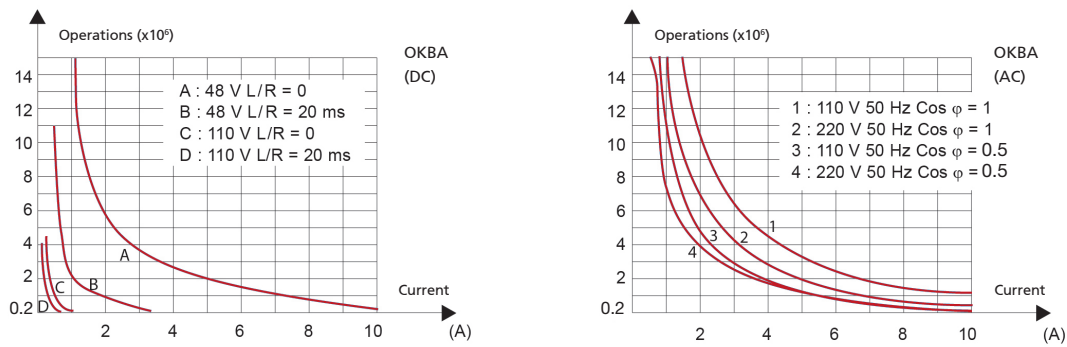
6B handle IP20
(standard)



6 handle IP40



Closure with
screws IP40



OKBA: other examples of electrical life expectancy available on the technical data sheet of the OK series relay (OKSFC model)

Sockets and retaining clips	OKBA, 4 CO ⁽¹⁾	
Number of terminals (standard dimensions 5x0.8mm)	16	Retaining clip ⁽²⁾
For wall or rail mounting		
Spring clamp, wall or DIN H35 rail mounting	PAIR160	RL48
Screw, wall or DIN H35 rail mounting	48BIP20-I DIN	RL48
Screw, wall mounting	48BL	RL48
Double faston, wall mounting	48L	RL48
For flush mounting		
Double faston (4.8 x 0.8 mm)	ADF2	RL48
Screw	43IL ⁽³⁾	RL43
For mounting on PCB		
	65	RL43

(1) For version with 8 contacts, assume 2 sockets respectively for each relay. In this instance, the mounting distance between centers of the sockets must be 45 mm.

The ADF socket cannot be used.

(2) Assume 2 clips for relays with 8 contacts.

(3) Insert the clip before fastening the socket to the panel.

For more details, see specifications of mounting accessories.

Mounting tips

The preferred mounting position is on the wall, with the relay positioned horizontally in the reading direction on the nameplate.

These bistable relays are equipped with automatic de-energization. When mounting, accordingly, there is no need for them to be spaced apart as they do not draw power continuously and therefore will not overheat.

For safe and secure operation, it is advisable to use retaining clips.

No special maintenance is required.

Condensation can form inside the relay when powered up and the outside ambient temperature is cold; this is quite normal and does not affect the operation of the relay. The plastic materials of the relay do not possess hygroscopic properties.