

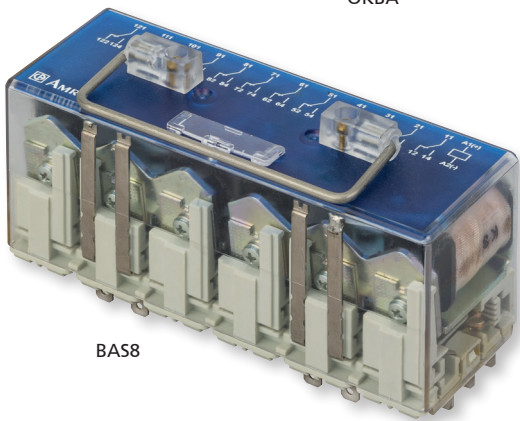
Instantaneous bistable (latching) relay - 4-8 contacts

1.04

OKBA • BAS8NB SERIES



OKBA



BAS8

OVERVIEW

- Plug-in instantaneous bistable relay
- Solid and rugged construction
- Considerable long-life
- Automatic de-energization following operation, energy saving
- Magnetic holding action
- Patent operating mechanism, designed to ensure high contact pressure (OKBA)
- Fitted with mechanical optical contact status indicator as standard (BAS8)
- 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

APPLICATIONS



Shipbuilding



Petroleum industry



Heavy industry



Power generation



Power distribution



Railway equipment



Rolling stock

DESCRIPTION

OKBA and BAS8NB 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 and BAS8NB relays 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, whereas the BAS8NB is configured with the two negative poles separate from one another, for greater flexibility of connection.

In the OKBA 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.

In the case of the BAS8NB relay, the magnetic holding action is produced by a permanent magnet, located centrally on a pivoted arm. The relay is equipped with two separate windings, each one of which enabling a change in status of the contacts when energized. When a winding is energized, it generates an electromagnetic field of strength sufficient to induce a movement of the pivoted arm toward one of the two operating positions (bistable). The arm is connected to a set of contacts, which will change position accordingly. Like all AMRA relays, OKBA and BAS8NB models 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	
BAS8NB	8	•

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

Coil data	BAS8NB	OKBA
Nominal voltages U_n ⁽¹⁾	DC: 24-36-48-72-96-110-125-132-144-220	AC: 24-48-110-127-220-230
Max. consumption at U_n ⁽²⁾ Version for rolling stock at U_n ⁽²⁾	6W	7W / VA (latch) 3.5W / VA (unlatch) ⁽³⁾ 12,5W (latch) 5,5W (unlatch)
Operating range Version for rolling stock	80...110% U_n DC : 70...125% U_n	80...115% U_n DC : 70...125% U_n
Type of duty	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: BAS8NB = 0W; OKBA = 0.6 W / VA.

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

Contact data	BAS8NB	OKBA
Number and type	8 SPDT, form C	4 SPDT, form C ⁽¹⁾
Current		
Nominal ⁽²⁾	10A	
Maximum peak (1 min) ⁽³⁾	20 A	
Maximum pulse (10 ms) ⁽³⁾	150 A	
Example of electrical life expectancy ⁽⁴⁾	0.5A - 110Vdc - L/R = 40ms : 10 ⁵ operations, 900 operations / hour	
Minimum load		
Standard contacts	500mW (20V, 20mA)	
Gold-plated contacts P4GEO ⁽⁵⁾	100mW (10V, 5mA)	
Gold-plated contacts P8 ⁽⁵⁾	50mW (5V, 5mA) (BAS8NB only)	
Maximum breaking voltage	250 Vdc / 300 Vac	350 Vdc / 440 Vac
Contact material	AgCu	AgCu
Operating time at U_n (ms) ⁽⁶⁾	DC - AC	
Pick-up (NO contact closing)	≤ 30	
Drop-out (NC contact closing)	≤ 40	

(1) Version with 8 SPDT 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) **P8**: gold-cobalt alloy (>5μ), knurled contact

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	> 1,000 MΩ
between open contact parts	> 1,000 MΩ	> 1,000 MΩ
Withstand voltage at industrial frequency		
between electrically independent circuits and between these circuits and ground	2 kV (1 min.) - 2.2kV (1 s)	2 kV (1 min.) - 2.2kV (1 s)
between open contact parts	1 kV (1 min.) - 1.1kV (1 s)	2 kV (1 min.) - 2.2kV (1 s)
between adjacent contacts	2.5 kV (1 min.) - 3 kV (1 s)	2 kV (1 min.) - 2.2kV (1 s)
Impulse withstand voltage (1.2/50μs - 0.5J)		
between electrically independent circuits and between these circuits and ground	5 kV	5 kV
between open contact parts	3 kV	5 kV

Mechanical specifications		BAS8NB	OKBA	
Mechanical life expectancy		10x10 ⁶ operations	20x10 ⁶ operations	
Maximum switching rate	Mechanical	900 operations/hour	900 operations/hour	
Degree of protection (with relay mounted)		IP40	IP20	
			4 SPDT	8 SPDT
Dimensions (mm)		120x45x50 ⁽¹⁾	45x45x109 ⁽¹⁾	92x45x109 ⁽¹⁾
Weight (g)		~ 800	~ 300	~ 620

(1) Output terminals excluded.

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 behaviour		to EN 60695-2-10

Standards and reference values	
EN 61810-1, EN 61810-2, IEC 61810-7 EN 60695-2-10 EN 61000 EN 60529	Electromechanical elementary relays Fire behaviour Electromagnetic compatibility 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 EN 50155 EN 61373 EN 45545-2 ASTM E162, E662	Electric equipment for rolling stock - General service conditions and general rules Electronic equipment used on rolling stock Shock and vibration tests, Cat 1, Class B Fire behaviour, Cat E10, Requirement R26, V0 Fire behaviour

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 (OKBA only)	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 (OKBA only)	P4GEO gold-plating of contacts + P2 coil tropicalization.
P6GEO (OKBA only)	P4GEO type gold-plating, but applied to contacts, contact terminals and output terminals + P2 coil tropicalization.
P8 (BAS8NB only)	Gold plating of contacts with gold-cobalt alloy, thickness ≥ 5μ, knurled fixed contact. This finish allows further improvement of the gold-plated contact performance compared to the treatment P4GEO.
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 (OKBA only)	IP40 protection with "6" handle or closure with screws.
8 contacts (OKBA only)	Version with 8 change-over contacts, obtained using 2 x 4 SPDT relay, coils connected in series.
LOW TEMPERATURE (OKBA, 4 SPDT only)	Minimum operating temperature -40 °C, only for Rolling stock version (option "L").



BAS8 NB Ordering scheme

Product code	Number of contacts	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Keying position ⁽³⁾
BAS8NB	8: SPDT	E: Energy F: Railway Fixed Equipment R: Railway Rolling Stock	1: Standard 2: Diode //	0: Standard 2: P2 8: P8	C: Vdc A: Vac 50 Hz	024 - 036 - 048 072 - 096 - 110 125 - 127 - 132 144 - 220 - 230	XXX

Example

BAS8NB	E	1	0	C	110	
BAS8NBE10-C110 - BAS8NB relay, ENERGY series, nominal voltage 110 Vdc						
BAS8NB	R	2	0	C	36	
BAS8NBR28-C036 - BAS8NB relay, ROLLING STOCK series, 36Vdc coil, with diode in parallel and P8 finish (gold-plated contacts)						



OKBA Ordering scheme

Product code	Number of contacts	Application ⁽¹⁾	Configuration A	Configuration B	Type of power supply	Nominal voltage (V) ⁽²⁾	Keying position ⁽³⁾
OKBA	4: SPDT ⁽⁴⁾ 8: 8 SPDT	E: Energy F: Railway Fixed Equipment R: Railway Rolling Stock	1: Standard 2: Diode //	0: Standard 2: P2 4: P4 GEO 5: P5 GEO 6: P6 GEO	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	C	144	
OKBAE10-C144 - OKBA relay, ENERGY series, nominal voltage 144 Vdc						
OKBA	8	E	1	2	C	024
OKBAE12-C024 - OKBA relay, ENERGY series, nominal voltage 24 Vdc, equipped with 8 contacts and P2 finish (tropicalization of coil)						

(1) ENERGY: all applications except for railway.

RAILWAYS, FIXED EQUIPMENT: application on fixed power systems and electrical railway traction. Construction according to RFI (FS Group) specification no. RFI DPRIM STF IFS TE 143 A, if applicable. For list of RFI compliant and type-approved products, consult dedicated catalogue "RAILWAY SERIES – RFI APPROVED".

RAILWAYS, ROLLING STOCK: excluding OKBA. Application on board rolling stock (rail-tram-trolley vehicles). Electrical specifications according to EN60077.

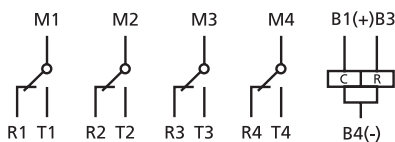
Also available is the STATIONS series, with ENEL approved material meeting LV15/LV16 specifications. For list of ENEL compliant and type-approved products, consult dedicated catalogue "STATIONS SERIES – LV15-LV16-LV20".

(2) Other values on request.

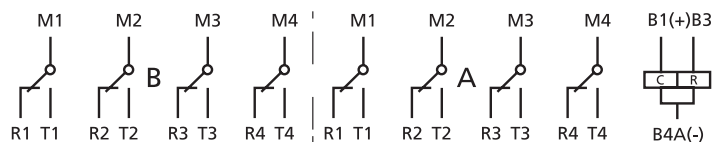
(3) Optional value. The positive mechanical keying is applied according to the manufacturer's model.

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

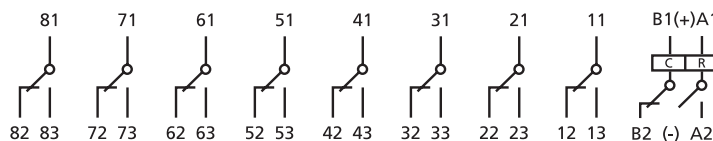
Wiring diagram



OKBA

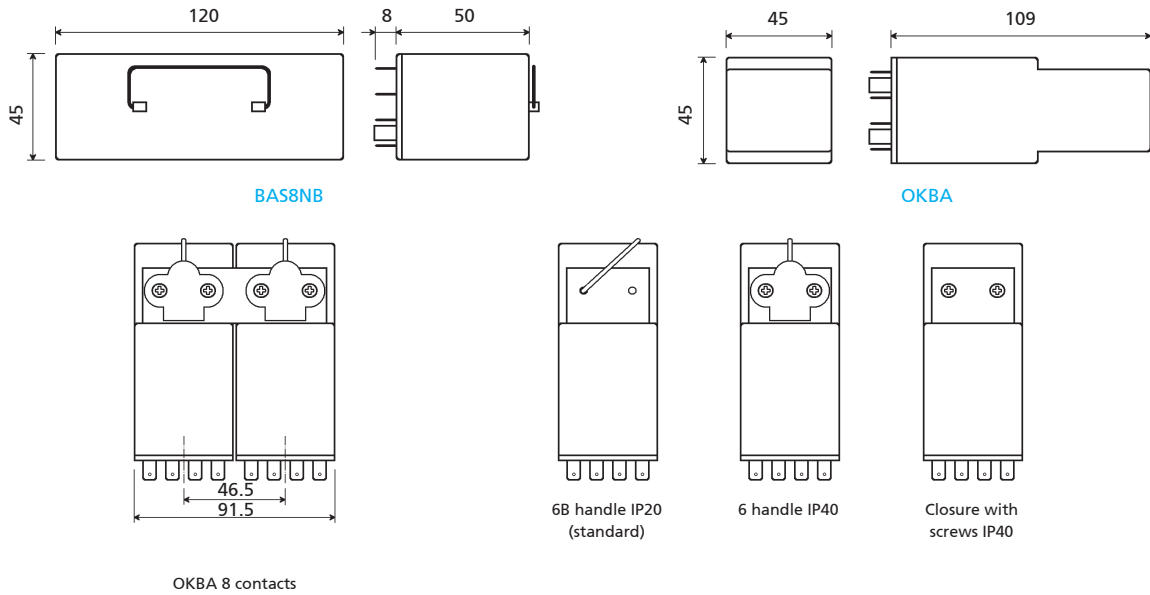


OKBA 8 contacts

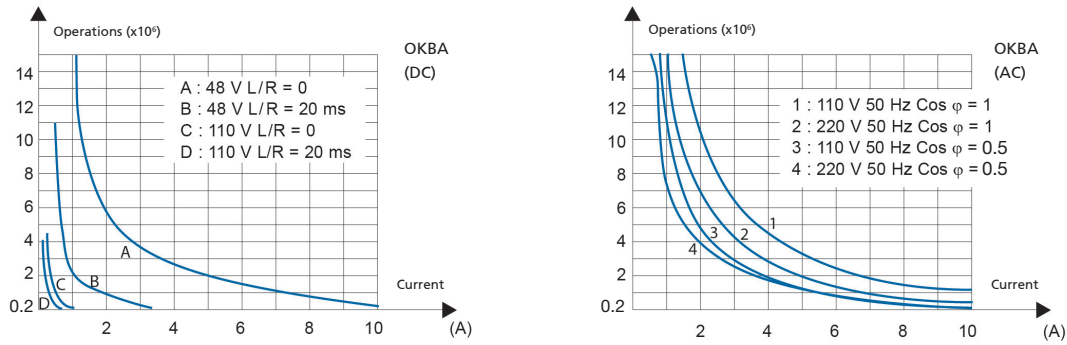


BAS8NB

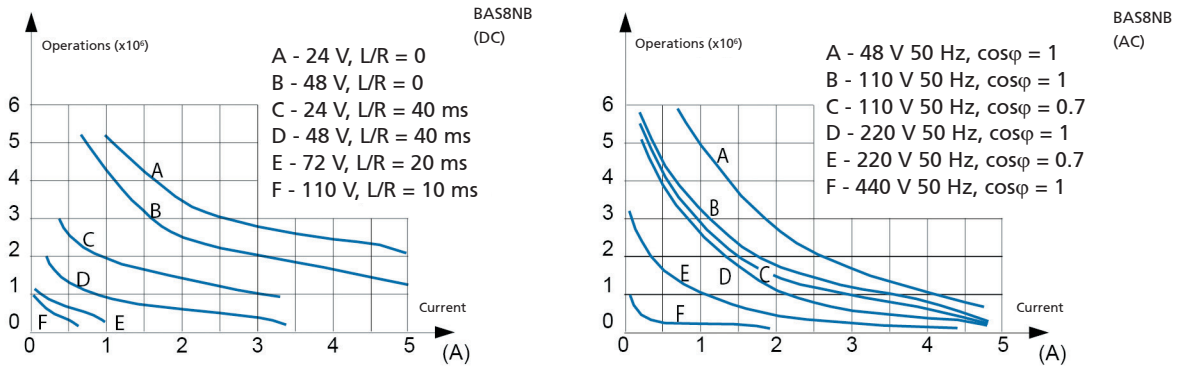
Dimensions



Electrical life expectancy



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



BAS8NB : Some examples of electrical life expectancy

48Vdc - 5 A - L/R 10 ms : 5 x 10⁵ operations
 80Vdc - 5 A - Resistive : 5 x 10⁵ operations
 110Vdc - 0.5 A - L/R 10 ms : 5 x 10⁵ operations

220Vdc - 0.2 A - L/R 10 ms : 10⁵ operations
 110Vac - 5 A - Cos φ = 0.7 : 5 x 10⁵ operations
 220Vac - 3 A - Cos φ = 0.7 : 5 x 10⁵ operations
 440Vac - 0.2 A - Resistive : 5 x 10⁵ operations

Sockets and retaining clips	OKBA, 4 SPDT ⁽¹⁾		BAS8NB	
Number of terminals (standard dimensions 5x0.8mm)	16	Retaining clip ⁽²⁾	48	Retaining clip ⁽²⁾
For wall or rail mounting				
Spring clamp, wall or DIN H35 rail mounting	PAIR160	RL48	PAIR480	RPB48
Screw, wall or DIN H35 rail mounting	48BIP20-I DIN	RL48	156IP20-I DIN	RPB48
Screw, wall mounting	48BL	RL48	-	
Double faston, wall mounting	48L	RL48	-	
For flush mounting				
Double faston (4.8 x 0.8 mm)	ADF2	RL48	ADF6	RPB48
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 centres 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.