Select the right relay for the right application

Reduction of contact erosion when switching DC loads

Increased contact gaps, double make contacts, and arc blow-out magnets to reduce contact erosion (burn offs).

Compared with standard contacts, the reliability can be remarkably increased when using customized contacts for switching DC loads with breakaway sparks.
Increased contact caps, double make contacts and blow out magnets are causing a longer distance for the electric arc. Electric arcs are extinguished quickly and increase significant the lifetime of the contacts.

Suitable relays for this application

Series	Type	Base	Contacts	Gap	Extras	DC-1 rating	
MRC	C2-G2x			1.7 mm		1.2 A	110 V DC
	C3-G3x			1.7 mm		1.2 A	110 V DC
	C3-M1x		Ma	2x 1.7 mm ≥ 3 mm	Double make contacts; Blow out magnet	10 A	220 V DC
	C3-X1x			2x 1.7 mm ≥ 3 mm	Double make contacts	7 A	110 V DC
	C4-X2x			2x 1.7 mm ≥ 3 mm	Double make contacts	7 A	110 V DC
	C5-G3x			1.7 mm		1.2 A	110 V DC
	C5-X1x			1.7 mm ≥ 3 mm	Double make contact	7 A	110 V DC
	C5-M1x		Ma	2x 1.7 mm ≥ 3 mm	Double make contacts; Blow out Mmagnet	10 A	220 V DC
	C5-M2x		Ma	2x 1.7 mm	Blow out magnet	7 A	110 V DC
QRC	C7-G2x			1.5 mm		0.8 A	110 V DC
	C7-X1x			2x 1.5 mm	Double make contacts	6 A	110 V DC
IRC	C10-G1x			1.0 mm		10 A	30 V DC
	C12-G2x			1.0 mm		5 A	30 V DC
DIN	CMC1	DIN 14 mm	2x		Adjustable start and breaking ramps	10 A	24 V DC

Contacts for high inrush current

Tungsten contacts have a higher melting point that help resist high power peaks and protect main contacts

High power peaks during switch-on of electrical loads, for example when switching power supplies and ballasts can lead to welding of the contacts. Early make tungsten contacts resist high inrush currents and avoid contact welding.

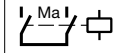
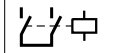
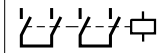
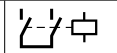
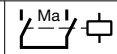
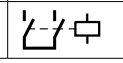
Suitable relays for this applicationn

Series	Type	Base	Contacts	Extras	AC-1 rating	
QRC	C7-W1x			Tungsten early make contact; Inrush current 2.5 ms 500 A	10 A	250 V AC
DIN	CHI14	DIN 17.5 mm		W / $AgSnO_2$ contact for high inrush currents up to 800 A	16 A	250 V AC
	CIM14	DIN 17.5 mm		W / $AgSnO_2$ contact for high inrush currents up to 800 A	16 A	250 V AC
	RIC...	DIN			20...63 A	400 V AC
	RAC...	DIN			20...25 A	400 V AC
	RBC...	DIN			20...32 A	400 V AC

Safe separation of power circuits

Relays with increased contact distance of at least 3 mm allow safe separations in power circuits of high voltage currents and increase the protection degree from potentially lethal currents.

Suitable relays for this application

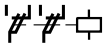
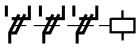
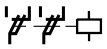
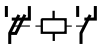
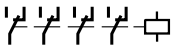
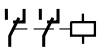
Serie	Type	Base	Contacts	Gap	Extras	AC-1 rating	
MRC	C3-M1x			2x 1.7 mm ≥ 3 mm	Double make contacts; Blow out magnet	10 A	250 V AC
	C3-X1x			2x 1.7 mm ≥ 3 mm	Double make contacts	10 A	250 V AC
	C4-X2x			2x 1.7 mm ≥ 3 mm	Double make contacts	10 A	250 V AC
	C5-X1x			≥ 3 mm	Double make contacts	16 A	400 V AC
	C5-M1x			≥ 3 mm	Double make contacts; Blow out magnet	16 A	400 V AC
QRC	C7-X1x			2x 1.5 mm ≥ 3 mm	Double make contacts	10 A	250 V AC

Reliable switching of low power signals

Twin contacts increase reliable switching by factors of 10 to 100 times. 10 µ hard gold plated contacts help to avoid contact oxidation. Together this allows reliable switching of very low level signals through the contacts.

Low level voltages in analogue circuits and signal voltages <10V/5 mA are not easily able to overcome contact resistances. Twin contacts increase contact reliability and gold contacts avoid contact oxidations and are especially suitable to switch low power signal loads.

Suitable relays for this application

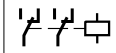
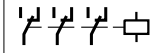
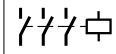
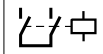
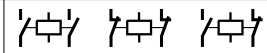
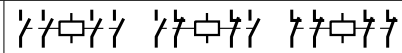
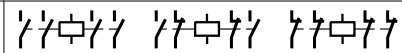
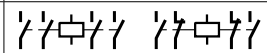
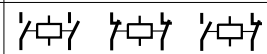
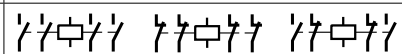
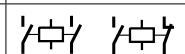
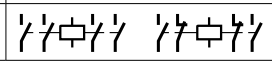
Serie	Type	Base	Contacts	Extras	Min. rating	
MRC	C2-T22x			Twin contacts, 10 µ gold plated	1 mA	5 V DC
	C3-T32x			Twin contacts, 10 µ gold plated	1 mA	5 V DC
QRC	C7-T22x			Twin contacts, 10 µ gold plated	1 mA	5 V DC
	C7-H23			1 power & 1 signal contact 2 µ gold plated	5 mA	5 V DC
	C9-A42x			Contacts, 10 µ gold plated	5 mA	5 V DC
IRC	C10-T13x			Twin contacts, 3 µ gold plated	1 mA	5 V DC
	C10-GT13x			Twin contacts, 3 µ gold plated	1 mA	5 V DC
	C12-A22x			Contacts, 3 µ gold plated	5 mA	5 V DC
	CSS-N			NPN Solide state	1 mA	…48 V DC
	CSS-P			PNP Solide state	1 mA	…48 V DC

Efficient switching of high voltages high currents

Heavy duty relays are designed to switch high currents. Due to their relatively small dimensions and lower cost, these relays are more economical then contactors. Therefore control panels can be optimized for high power switching.

Heavy duty relays save space in the panel and cost less than contactors. They can be used for switching higher currents, for example electrical heaters up to 16 A at 400 V AC.

Suitable relays for this application

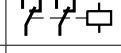
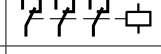
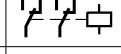
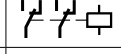
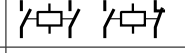
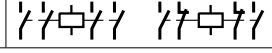
Series	Type	Base	Contacts	Gap	AC-1 rating	
MRC	C5-A2x				16 A	400 V AC
	C5-A3x				16 A	400 V AC
	C5-G3x			1.7 mm	16 A	400 V AC
	C5-X1x			> 3 mm	16 A	400 V AC
QRC	C7-A1x				16 A	250 V AC
RIC	RIC20	DIN 17.5 mm			20 A	400 V AC
	RIC25	DIN 35 mm			25 A	400 V DC
	RIC40	DIN 54.5 mm			40 A	400 V AC
	RIC63	DIN 54.5 mm			63 A	400 V AC
RAC	RAC20	DIN 17.5 mm			20 A	400 V AC
	RAC25	DIN 34 mm			25 A	400 V AC
RBC	RBC20	DIN 18 mm			20 A	400 V AC
	RBC32	DIN 35 mm			32 A	400 V AC

Switching with a pulse

Change the ON/OFF status of a latching relay (remanence relay) with a single pulse. The switching status remains stable also in the case of power failure.

The switching status of a latching relay is changed with a single input pulse although permanent connection is also possible. The contacts remain in position even after the “on” coil is de-energized. This guarantees that the relay status remains in position until such time that a control signal is applied to the “off” coil. A stepping relay provides an alternative for pulse switching and latching.
Latching relays help to save power dissipation, what is especially impontant when a hot environment is expected or when a high number of relays are mounted close with each other in a control cabinet.

Suitable relays for this application

Series	Type	Base	Contacts	Extras	Max. contact rating	
MRC	C3-R2x		 Rem.	Remanence (Latching) relay	10 A	250 V AC
	C4-R3x		 Rem.	Remanence (Latching) relay	10 A	250 V AC
	C5-R2x		 Rem.	Remanence (Latching) relay	10 A	400 V AC
QRC	C9-R2x		 Rem.	Remanence (Latching) relay	5 A	120 V AC
DIN	RBC20	DIN 18 mm		Bistable installation contactor	20 A	400 V AC
DIN	RBC32	DIN 35 mm		Bistable installation contactor	32 A	400 V AC

Max. life time and highest number of switching cycles

Long Life relays are relays of robust mechanical structure with 5 times longer life cycles compared to standard relays. Unlimited switching cycles are reached with solid state relays.

The Long Life Relays with a more robust design provide a 5 times longer service life. Standard relays are designed for 10 to 20 million mechanical switching cycles. For periodical switching frequencies in the second or minute range, the standard relays reach their life cycle within a few months. The long life relays are specially designed for frequent switching applications.

Suitable relays for this application

Serie	Type	Base	Contacts/Outputs	Extras	Max. contact rating	
MRC C20 C30	C21			> 10^8 mechanical operations	10 A	250 V AC
	C22			> 10^8 mechanical operations, twin contacts	5 A	250 V AC
	C31			> 10^8 mechanical operations	10 A	250 V AC
	C31			> 10^8 mechanical operations, twin contacts	5 A	250 V AC
CSS	CSS-I			Solide state AC (unlimited ops.)	3 A	250 V AC
	CSS-Z			Solide state AC (unlimited ops.)	3 A	250 V AC
	CSS-N			Solide state DC (unlimited ops.) NPN	6 A	48 V DC
	CSS-P			Solide state DC (unlimited ops.) PNP	6 A	48 V DC
CRINT	CRINT-C1x5	DIN 6.2 mm		Solide state DC (unlimited ops.)	2 A	24 V DC
	CRINT-C1x8	DIN 6.2 mm		Solide state AC (unlimited ops.)	1 A	240 V AC
DIN	CMC1	DIN 14 mm	2x	Adjustable start and breaking ramps	16 A	24 V DC
	CMC15/16	DIN 14 mm	2x	Adjustable start and breaking ramps and speed	10 A	24 V DC

Blinking relays

Blinking relays with integrated solid state outputs have a virtually unlimited life time independent from the switching cycles. Specially appropriate for blinking functions in intervals of seconds or minutes.

Blinking in second or minute intervals with permanent repetitions wear standard mechanical relays in a short time. A standard relay will reach the limit of its designed life time within weeks or months. Special blinking relays with integrated semi conductor contacts provide the alternative for such applications.

Suitable relays for this application

Series	Type	Base	Contacts/Outputs	Extras	Max. contact rating	
CIM	CIM1	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	16 A	250 V AC
	CIM2	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	16 A	250 V AC
	CIM12	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	2 A	250 V AC
	CIM22	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	2 A	250 V AC
	CIM13	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	5 A	30 V DC
	CIM23	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	5 A	30 V DC
	CIM14	DIN 17.5 mm		Time range adjusttable 0.6 s - 60 h	16 A	250 V AC

Impulse shaping (Extending short pulses)

Pulse shaper of the series CPF extend or shorten input pulses for accurate further processing by PLC's.

PLC's or other control circuits are often not able to process fast and short pulses. The pulses are conditioned with CPF pulse formers for further processing by PLC's. Fast revolution speeds and distance measurements as well as "Namur" sensor signals are conditioned with the CPF type relays for further processing.

Suitable relays for this application

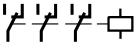
Series	Type	Base	Contacts	Trigger and Outputs times	Max. contact rating	
DIN	**CPF11**	DIN 17.5 mm		Input 1 - 5 ms; Output 5 - 60 ms	2 A	32 V DC
	CIM1x	DIN 17.5 mm		Input min. 20 ms; Output 50 ms - 60 h	16 A	250 V AC
	CIM2x	DIN 17.5 mm		Input min. 20 ms; Output 50 ms - 60 h	16 A	250 V AC
	CIM3x	DIN 17.5 mm		Input min. 20 ms; Output 50 ms - 60 h	16 A	250 V AC
	CM3	DIN 17.5 mm		Input min. 35 ms; Output 50 ms - 60 h	5 A	250 V AC
	CRV4	DIN 13 mm		Input min. 35 ms; Output 50 ms - 60 h	6 A	250 V AC
	CSV4	DIN 13 mm		Input min. 20 ms; Output 8 ms - 10 h	1.5 A	24 V DC
CS	**CS2**			Input min. 50 ms; Output 50 ms - 60 h	8 A	250 V AC
	CS3			Input min. 50 ms; Output 50 ms - 60 h	6 A	250 V AC

Energy saving with the same switching capacity

Relays with sensitive coils have considerably less power consumption than standard relays. This allows up to 90% energy saving with practically identical switching capcity

Relays with sensitive coils have improved and more effective magnetic circuits than coils of standard relays. The result is a considerably reduced coil current compared to a standard relay but with an almost identical switching capacity per contact. This means lower power consumption and therefore more economical operating and less heat. Under some circumstances, the user can provide a smaller power supply and save costs.

Suitable relays for this application

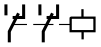
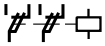
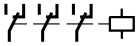
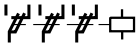
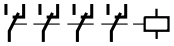
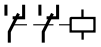
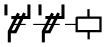
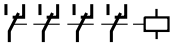
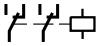
Series	Type	Base	Contacts	Sensitive coil	AC-1 contact rating	
MRC	**C3-S1x**			Nominal power 250 mW	6 A	250 V AC
	C3-E2x			Nominal power 500 mW	6 A	250 V AC
	C3-N3x			Nominal power 800 mW	6 A	250 V AC
QRC	**C9-E2x**			Nominal power 800 mW	5 A	250 V AC

Protection against aggressive environment

A 10 µ hard gold plating of the contacts is an effective way to protect the contacts against oxidation caused by aggressive gases.

Aggressive gases may develop in sewage plants, chemical plants, or in the steel production. Conducting failures may occur on relays with standard silver nickel contacts because of contact surface oxidation. 10 µ hard gold plated contacts are especially suitable in such environments and improve the contact reliability.

Suitable relays for this application

Series	Type	Base	Contacts	Extras	AC-1 contact rating	
MRC	C2-A28			Contacts 10 µ gold plated	10 A	250 V AC
	C2-T22			Twin contacts, 10 µ gold plated	6 A	250 V AC
	C3-A38			Contacts 10 µ gold plated	10 A	250 V AC
	C3-T32			Twin contacts, 10 µ gold plated	6 A	250 V AC
	C3-S18			Contacts 10 µ gold plated	6 A	250 V AC
	C4-A48			Contacts 10 µ gold plated	10 A	250 V AC
QRC	C7-A28			Contacts 10 µ gold plated	10 A	250 V AC
	C7-T22			Twin contacts, 10 µ gold plated	6 A	250 V AC
	C9-A48			Contacts 10 µ gold plated	5 A	250 V AC
IRC	C10-A18			Contacts 3 µ gold plated	10 A	250 V AC
	C10-GT13			Twin contacts, 3 µ gold plated	6 A	250 V AC
	C10-T13			Twin contacts, 3 µ gold plated	6 A	250 V AC
	C12-A22			Contacts 3 µ gold plated	5 A	250 V AC
	C12-G22			Twin contacts, 3 µ gold plated	5 A	250 V AC

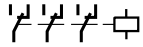
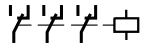
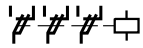
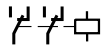
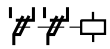
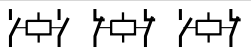
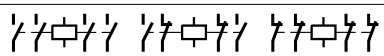
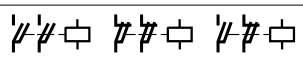
Relays according to Railway standard (increased shock and vibration resistance)

Relays as per Railway standard EN50155/EN60077/EN61373 are more suitable for applications with shock and vibration and have a higher degree of surge protection. Many of these railway relays also comply to additional fire protection standards, have lower inflammability and develop less toxic smoke and gases in case of fire.

Relays specially developed to comply with railway standards are designed for higher vibration, shock and surge values and allow higher tolerance in the voltage supply. Some of these relays additionally comply to special fire protection standards in regard to inflammability and the development of toxic smoke and gases in fire accidents.

Although specially designed for railway applications these relays are also suitable for other industrial applications where increased product safety is required.

Suitable relays for this application

Series	Type	Base	Contacts	Railway standard	Max. contact rating	
MRC	R3-N3x			EN 60077-1-2/99, EN 61373/99	6 A	250 V AC
Long Life	C31			EN 50155, Fire protection NF F16-101/102	10 A	250 V AC
	C32			EN 50155, Fire protection NF F16-101/102	6 A	250 V AC
QRC	R7-A2x			EN 60077-1-2/99, EN 61373/99	10 A	250 V AC
	R7-T2x			EN 60077-1-2/99, EN 61373/99	6 A	250 V AC
CIM	CIM1R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	16 A	250 V AC
	CIM12R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	2 A	250 V AC
	CIM13R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	5 A	30 V DC
	CIM2R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	16 A	250 V AC
	CIM22R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	2 A	250 V AC
	CIM23R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	5 A	30 V DC
	CIM3R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	16 A	250 V AC
	CIM32R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	2 A	250 V AC
	CIM33R	DIN 17.5 mm		EN 50155, Fire protection NF F16-101/102	5 A	30 V DC
RIC	RIC20	DIN 17.5 mm		EN 50155	20 A	400 V AC
	RIC25	DIN 35 mm		EN 50155	25 A	400 V AC
	RIC-AUX	DIN 8 mm		EN 50155	6 A	400 V AC