

FR - miniature relay



the FR-miniature relay

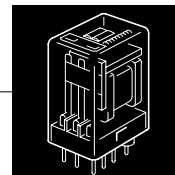
FR relays are available with three or four change-over contacts. They are used as fail-safe elements in industrial electronics, automation and control.

features

- large product range
- simple, robust construction
- high switching power
- extraordinary life time
- high contact force
- flexible installation
- contact spring in Beryllium bronze

applications

- devices of automation and control



type number key

FR 11 P 024 VDC

	options
	switching current: 4A contact material: AgCuNi (4A) AgCuNi+Au4-6µm
	coil voltage
	VDC = direct current VAC = alternating current
	standard voltage
	VAC: 024, 110, 230 V VDC: 024, 110
	PCB version
	relay version
	FR 11 FR 14

order samples

FR 11 P 024 VDC 4A

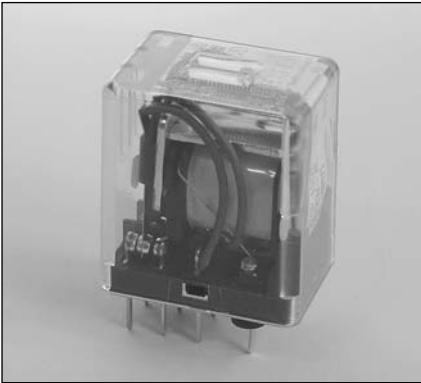
- 3 change-over contacts
- PCB version
- coil voltage 24VDC
- nominal switching current 4 A

FR 14 P 230 VAC 4A

- 4 change-over contacts
- PCB version
- coil voltage 230VAC
- nominal switching current 4A



FR 11P - miniature relay



Miniaturised PCB-relay with three change-over contacts for industrial electronics.

order numbers

PCB version FR11P.VDC/VAC

contact specifications

(see data sheet for curves)

contact material	AgCuNi
contact type	single contact
nominal switching capacity	250 VAC 4 A AC1 500 VA
electric life expectancy	app. 150'000 operations 250 VAC 2A AC1 (360 Schaltung/h)
inrush current max.	15A for 200 ms
switching current range	50 mA to 2A
switching power range	0,3VA(W) to 500VA

options

contact material AgCuNi
 AgCuNi+Au10µm
(see data sheet for contacts)

general data

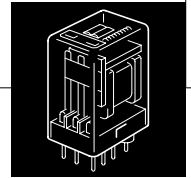
mechanic life expectancy	> 50 x 10 ⁶ operations
mechanical switching frequency	20 Hz
pull-in time	8 ms at DC / 3-9 ms at AC
release time	2,5 ms at DC / 4-12 ms at AC
bounce time normally open contact	3 ms at DC / 1-8 ms at AC
bounce time break contact	8 ms at DC / 3-16 ms at AC
shock resistance	AK: >10 g
test voltage, coil/contact	2'000 V _{eff}
test voltage, open contact	1'000 V _{eff}
insulation resistance	250 MΩ
weight	35 g
installation situation	any
ambient temperature	max. +60 °C

accessories

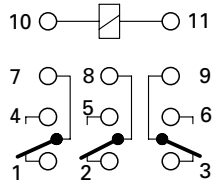
PCB socket ZB 87
metal clamp ZFR004

tests, instructions

certificates UL, CSA, VDE

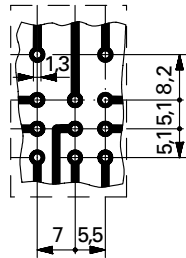


FR 11P



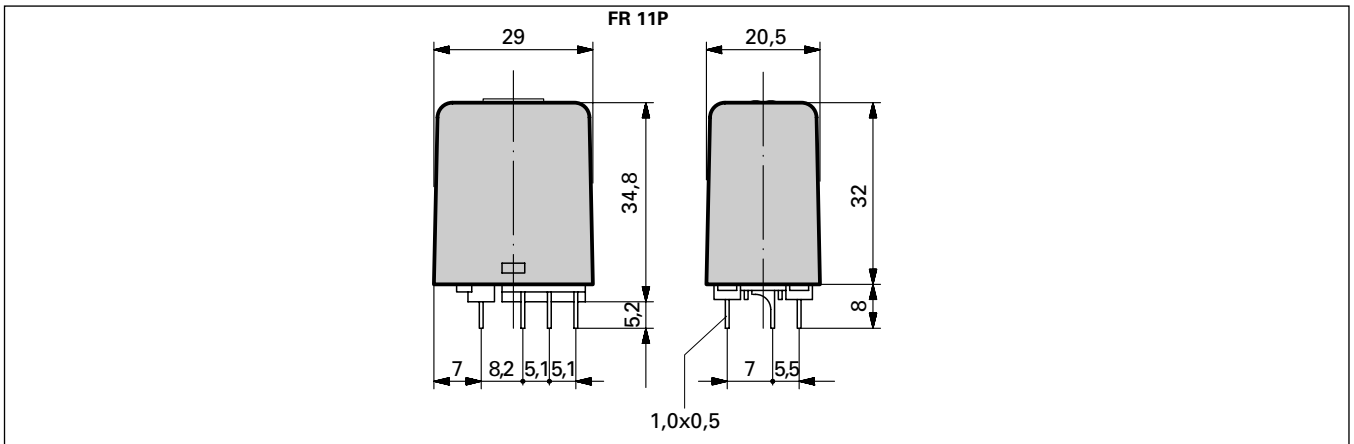
circuit diagram

FR 11P



drilling plan (view on solder side)

dimensions



coil specifications

standard coils for direct current
(other voltages on enquiry)

rated voltage VDC	pull-in voltage at 20 °C	reset voltage at 20 °C	nominal current mA	resistance Ohm at 20 °C	tolerance %
12	10,2	≥ 0,6	82,7	145	+/-10
24	20,4	≥ 1,2	41,3	580	+/-10
36	30,6	≥ 1,8	26,6	1'350	+/-10
48	40,8	≥ 2,4	22,8	2'100	+/-10
110	93,5	≥ 5,5	11,5	9'500	+/-15

standard coils for alternated current
(other voltages on enquiry)

VAC	pull-in voltage at 20 °C	reset voltage at 20 °C	nominal current mA	resistance Ohm at 20 °C	tolerance %
12	10,2	≥ 0,6	105	39	+/-10
24	20,4	≥ 1,2	51,6	165	+/-10
36	30,6	≥ 1,8	32,7	373	+/-10
48	40,8	≥ 2,4	26,0	650	+/-10
110	93,5	≥ 5,5	12,9	3'500	+/-15
220	187	≥ 11,0	6,1	14'500	+/-15
230	195	≥ 11,5	5,8	15'000	+/-15



FR 14P - miniature relay



Miniaturised PCB-relay with three change-over contacts for industrial electronics.

order numbers

PCB version FR14P.VDC/VAC

contact specifications

(see data sheet for curves)

contact material	AgCuNi
contact type	single contact
nominal switching capacity	250 VAC 4 A AC1 1000 VA
electric life expectancy	app. 200'000 operations 250 VAC 4A AC1 (360 operations/h)
inrush current max.	15A for 200 ms
switching current range	50 mA to 4A
switching power range	0,3VA to 1000VA

options

contact material AgCuNi
 AgCuNi+Au10µm
(see data sheet for contacts)

general data

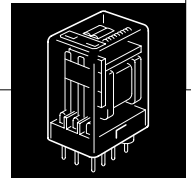
mechanic life expectancy	> 50 x 10 ⁶ operations
switching frequency mechanical	20 Hz
pull-in time	8 ms at DC / 3-9 ms at AC
release time	2,5 ms at DC / 4-12 ms at AC
bounce time normally open contact	3 ms at DC / 1-8 ms at AC
bounce time break contact	8 ms at DC / 3-16 ms at AC
shock resistance	AK: >10 g
test voltage, coil/contact	2'000 V _{eff}
test voltage, open contact	1'000 V _{eff}
insulation resistance	250 MΩ
weight	38 g
installation situation	any
ambient temperature	max. +60 °C

accessories

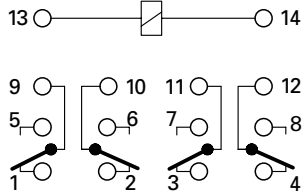
PCB socket ZB 107
metal clamp ZFR004

tests, instructions

certificates UL, CSA, VDE

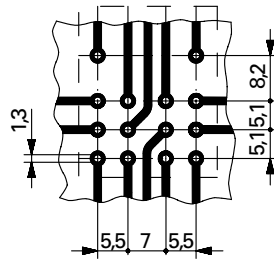


FR 14P



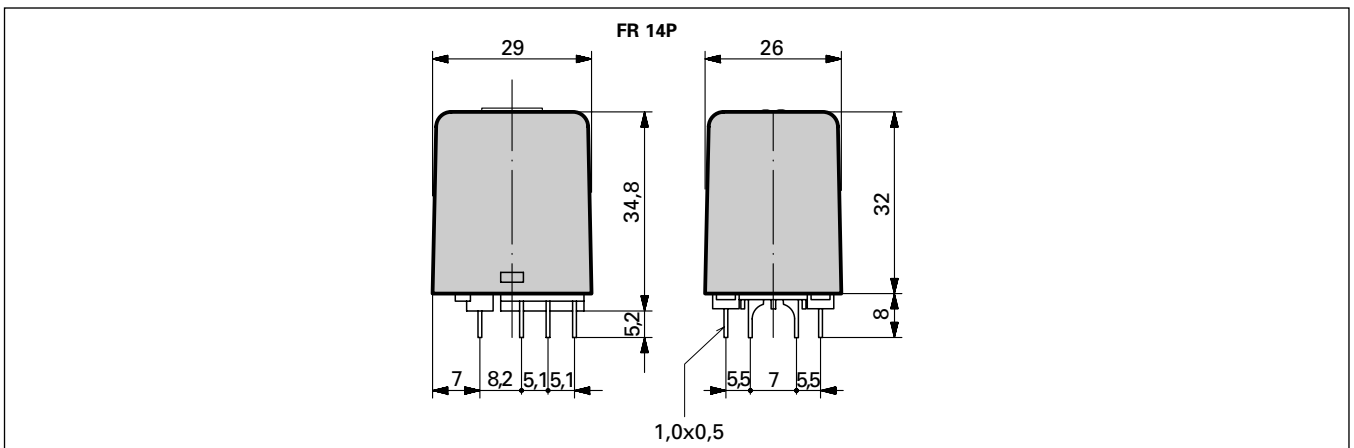
circuit diagram

FR 14P



drilling plan (view on solder side)

dimensions



coil specifications

standard coils for direct current
(other voltages on enquiry)

rated voltage VDC	pull-in voltage at 20 °C	reset voltage at 20 °C	nominal current mA	resistance Ohm at 20 °C	tolerance %
12	10,2	≥ 0,6	109	110	+/-10
24	20,4	≥ 1,2	52,1	460	+/-10
36	30,6	≥ 1,8	36,0	1'000	+/-10
48	40,8	≥ 2,4	28,2	1'700	+/-10
110	93,5	≥ 5,5	11,5	9'500	+/-15

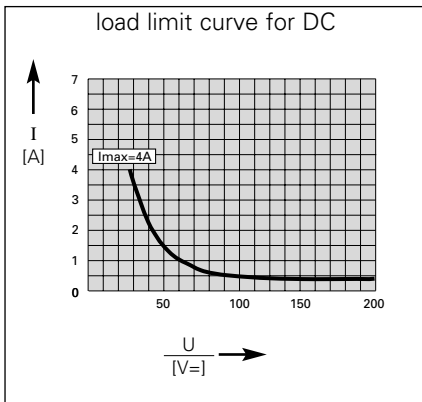
standard coils for alternated current
(other voltages on enquiry)

VAC	pull-in voltage at 20 °C	reset voltage at 20 °C	nominal current mA	resistance Ohm at 20 °C	tolerance %
12	10,2	≥ 0,6	148	30	+/-10
24	20,4	≥ 1,2	68,5	130	+/-10
36	30,6	≥ 1,8	46,7	300	+/-10
48	40,8	≥ 2,4	35,5	540	+/-10
110	93,5	≥ 5,5	16,4	2'900	+/-15
220	187	≥ 11,0	6,1	14'500	+/-15
230	195	≥ 11,5	5,8	15'000	+/-15



FR - contact specifications

AgCuNi 4A

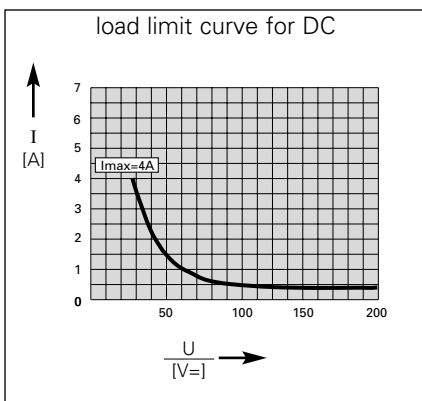


- resistive load

data valid for relay

contact material	FR 11 FR 14
contact type	AgCuNi (AgCu 1,88 Ni0,12)
nominal switching capacity	single contact
electric life expectancy	250VAC 4A AC1 1000VA
inrush current max.	app. 200'000 operations 250 VAC 4A AC1 (360 operations/h)
switching current range	15A for 200 ms
switching power range	50mA to 4A
	0,3VA to 1000VA

AgCuNi+Au 10µm



- resistive load

data valid for relay

contact material	FR 11 FR 14
contact type	AgCuNi+Au 10µm
nominal switching capacity	single contact
electric life expectancy	250VAC 2A AC1 500VA
inrush current max.	app. 100'000 operations 250 VAC 2A AC1 (360 operations/h)
switching current range	6A for 200 ms
switching power range	10mA to 2A
	0,06VA to 500VA

