

## ***FR - miniature relay***



### ***the FR-miniature relay***

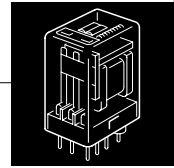
FR relays are available with three or four change-over contacts. They are used as fail-safe elements in industrial electronics, automation and control.

#### ***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 .....**

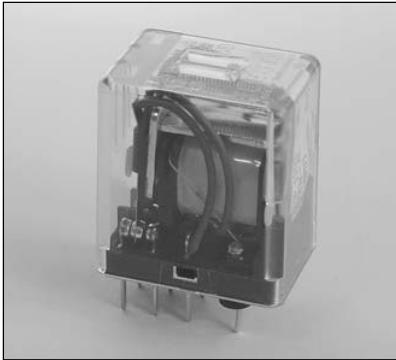
	<b>options</b>
	switching current: 4A contact material: AgCuNi (4A) AgCuNi+Au4-6µm
	<b>coil voltage</b>
	VDC = direct current VAC = alternating current
	<b>standard voltage</b>
VAC: 024, 110, 230 V VDC: 024, 110	
<b>PCB version</b>	
<b>relay version</b>	
FR 11 FR 14	

**order samples**

- |                           |   |
|---------------------------|---|
| <b>FR 11 P 024 VDC 4A</b> | <ul style="list-style-type: none"><li>- 3 change-over contacts</li><li>- PCB version</li><li>- coil voltage 24VDC</li><li>- nominal switching current 4 A</li></ul> |
| <b>FR 14 P 230 VAC 4A</b> | <ul style="list-style-type: none"><li>- 4 change-over contacts</li><li>- PCB version</li><li>- coil voltage 230VAC</li><li>- nominal switching current 4A</li></ul> |



# 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

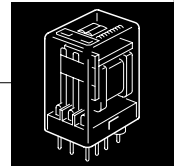
mechanic life expectancy	> 50 x 10 <sup>6</sup> operations
mechanical switching frequency	20 Hz
pull-in time	8 ms at DC / 3-9 ms at AC
release time	2,5 ms at DC / 4-12 ms at AC
bounce time normally open contact	3 ms at DC / 1-8 ms at AC
bounce time break contact	8 ms at DC / 3-16 ms at AC
shock resistance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

## accessories

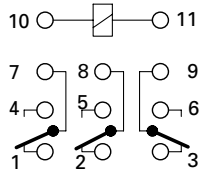
PCB socket                      ZB 87  
metal clamp                    ZFR004

## tests, instructions

certificates                    UL, CSA, VDE

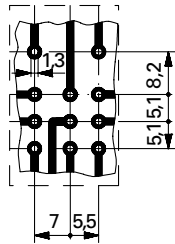


FR 11P



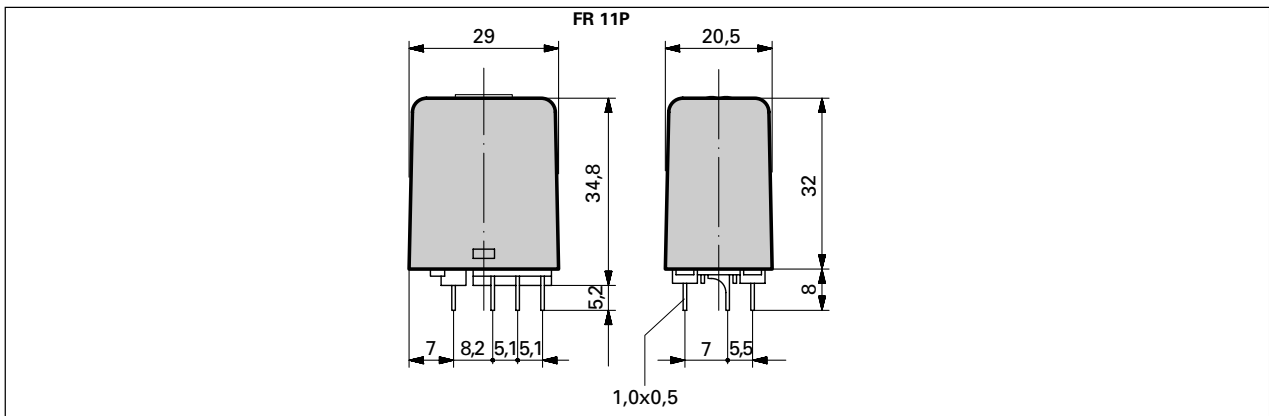
circuit diagram

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

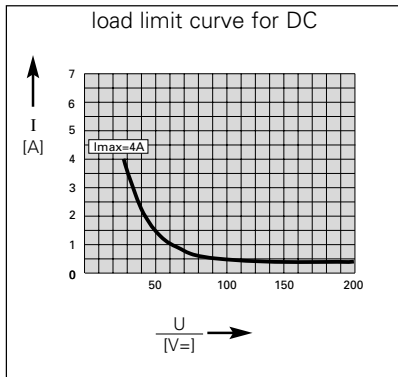
standard coils for alternated current  
(other voltages on enquiry)

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 - contact specifications

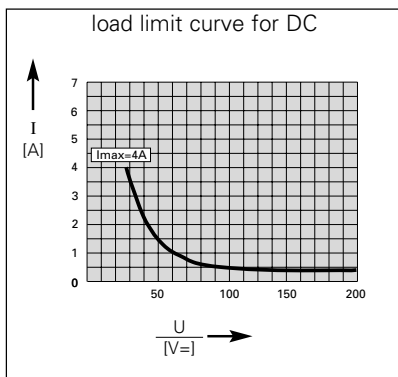
## AgCuNi 4A



- resistive load

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

## AgCuNi+Au 10µm



- resistive load

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