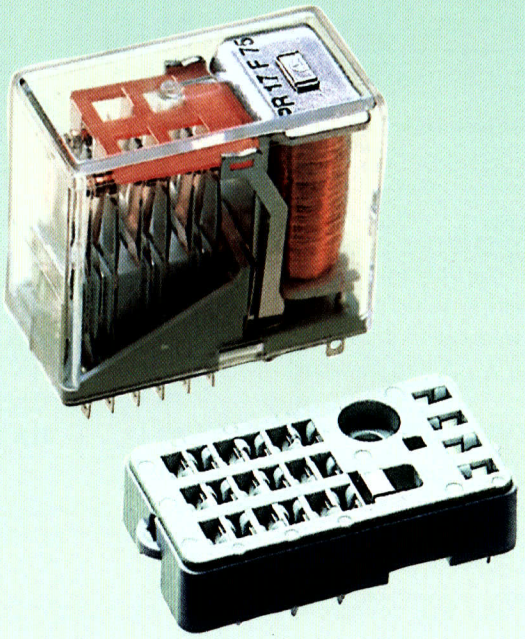
IREL

Miniature relay

PR 15, 16, 17



Contact sets with different contact configurations
Single or bifurcated contacts
Solder pins, plug-in versions or PCB versions
Accessories / sockets
The relays comply with the IEC 61810-1

Application

PR 15, PR 16 and PR 17 are neutral, monostable miniature DC relays. Their high operating reliability, perfect electrical and mechanical characteristics and standard dimensions enable widely and efficiently use in signalling equipment, telephony, in digital and measuring equipment, in automation, and many other fields. Two of their best features are the small consumption and an extremely wide voltage and temperature range of operation.

Design

The PR 15, PR 16 and PR 17 miniature relays are electromagnetic units using an identical magnet system with different contact sets.

The PR 15, PR 16 and PR 17 differ in size but the height and the width of this types are equal. The relays have transparent plastic dust cover providing easy inspection. The contacts can be operated manually by inserting a needle through the aperture in the base and pressing the armature against the magnet core.

The relays comply with the IEC 61810-1.

Installation

The types PR 15, PR 16 and PR 17 miniature relays, fitted with flat contact legs may be positioned directly on either metal or insulation surfaces through earthing screws M2.3, 4.5 mm long, projecting from the base. The normal way of installation is by using a special socket in which the relays are kept reliable by locking springs. Printed wiring types (T) of this relays can be soldered directly to printed circuits (PCB). The contact pins are arranged in a 2.5 mm standard pattern as shown in the printed wiring sockets drawings.

Versions of relays

The size of a relay is established by the type of contact set. As for the technical details, please refer to the tables herein, including the main electrical and mechanical characteristics of the individual version of miniature relays as well as the winding details. The individual rated values (such as attraction time, mechanical life, etc.) were measured at a standard voltage.

Versions of relays (P, R, S. T, K) with double contact rivets enable reliable switching operation also at very small contact load.

Sockets and installation parts

The relay PR 15, PR 16 and PR 17 may use two types of sockets, a printed wiring type and a soldering type. Printed wiring sockets are directly soldered to the boards with the contact pins arranged in a 2.5 mm standard pattern (see drawing).

The relays are kept in position by stainless steel locking springs.

Type designations

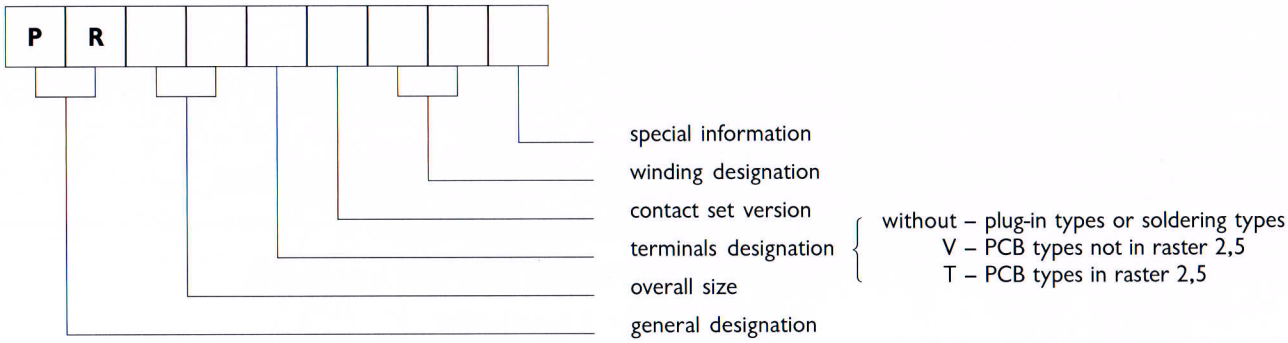
Relay types	Soldering sockets	Printed wiring sockets	Locking springs
PR 15	TLK 1115	TLK 1215	421-505-404
PR 16	TLK 1116	TLK 1216	421-506-434
PR 17	TLK 1117	TLK 1217	421-507-256

Ordering details

When ordering, please specify the relay type designation and winding designation from the tables.

Ordering example: (e. g. PR15-TE07)

Key:



Technical data

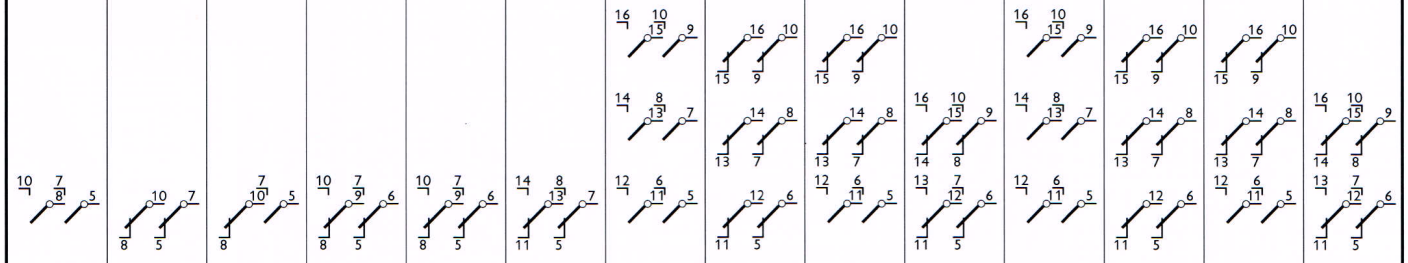
	Type of relay		PR 15-E PR 15-TE	PR 16-G PR 16-TG	PR 16-H PR 16-TH	PR 16-K PR 16-TK	PR 16-L PR 16-TL	PR 17-F	PR 17-Z	PR 15-A PR 15-TA	PR 15-B PR 15-TB	PR 15-D PR 15-TD	PR 16-C PR 16-TC	PR 15-M	PR 15-P PR 15-TP	PR 16-R PR 16-TR	PR 16-S PR 16-TS	PR 16-T PR 16-TT	PR 16-U PR 16-TU
Coil data at 20 °C	Min. energising to operate relay	amp. turns	80	120	120	120	120	130	130	100	120	110	120	155	125	150	155	145	180
	Min. energising at which attracted armature drops[1]	amp. turns	15	15	15	15	30	35	35	10	10	15	15	35	15	25	20	25	25
	Min. operating power for different windings[1]	mW	100–140	210–310	210–310	210–310	220–320	290–410	290–410	150–210	210–310	175–250	210–310	440–620	250–360	345–490	420–570	330–460	510–730
	Rated power for different windings[2]	W	0.5	0.65	0.65	0.65	0.65	0.80	0.90	0.55	0.65	0.60	0.65	1.0	0.65	0.75	0.80	0.80	1.1
	Max. operating power	W	2																
	Energising voltage range for different windings	V	0.64–110	0.6–110	0.6–110	0.6–110	0.4–110	0.75–145	0.75–145	0.5–110	0.6–110	0.55–110	0.6–110	0.92–145	0.64–110	0.78–110	0.83–110	0.77–110	0.94–110
Contact data	Contact material		0.2 µm – gold coated silver																
	Contact version		single									single		double					
	Max. operating voltage	V	100									220		100					
	Max. allowed cont. current	A	2									5		2					
	Break power[3]	W	30							to 30 V : 100; 30 V–50 V : 80; 50 V–220 V : 50				30					
	Min. load		1 mA, 100 mV																
	Contact resistance (measured at terminals)	mΩ	50 to 100 depending on the contact version																
General details	Max. ambient temperature	°C	80	70	70	70	70	70	70	80	70	70	70	60	60	50	50	50	40
	Max. allowed winding temperature	°C	130																
	Test voltage between	two contacts	V_{rms}, 50 Hz	500						1000				500					
		contact and core	V_{rms}, 50 Hz	500						1000				500					
		winding and core	V_{rms}, 50 Hz	500						500				500					
	Mechanical life		operations	approx. 10^7															
	Insulation resist. between	two contacts	Ω	more than 10^9															
		contact and core	Ω	more than 10^9															
		winding and core	Ω	more than 10^9															
	Max. operating frequency of relay (min load)	operat. sec.	50												10				
	Make time, including contact rebounce, ar ref. voltage, approx.	msec.	13	10	10	10	10	18	18	10	10	10	10	10	10	10	10	10	10
	Break time approx.	msec.	8	8	8	8	8	15	15	8	8	8	8	8	8	8	8	8	8
	Weight, approx.	g	20	25	25	25	25	30	30	20	20	20	25	30	20	25	25	25	25

[1] applies to min. operate voltage

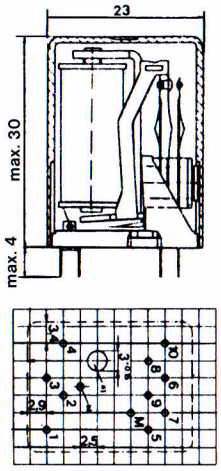
[2] applies to ref. voltage Uref = $\frac{U_{min} + U_{max}}{2}$

[3] applies to the ohmic and inductance load only if the contact arc is quenched

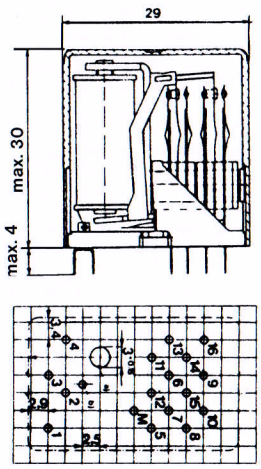
Coil and contact details for PR15, PR16

Type of relay			PR 15					PR 16									
Contact set version			A	B	D	E	P	C	G	H	K	L	R	S	T	U	
Contact current			5A	5A	5A	2A	2A	5A	2A	2A	2A	2A	2A	2A	2A	2A	
Winding details			Voltage operating range at 20° C														
Desig-nation	Resistance (Ω)	No. of turns	Min. voltage $U_{min.}$ [4] (V dc)														Max. voltage $U_{max.}$ [4] (V dc)
00	20900±3140	32700	77	95	86	61	99	95					122	128	133	150	190
01	7600±1140	20700	43	53	47	34	55	53					68	71	66	86	110
02	3200±480	13400	29	36	32	23	37	36					45	48	44	56	70
03	1700±255	9900	21	26	23	16	26	26					32	35	32	40	50
04	890±89	7300	13.5	17	15	11	18	17					22	22	21	27	38
05	530±53	5800	10.5	13	11.5	8.2	13	13					16	17.5	16	20	30
06	325±33	4450	8.4	10	9.3	6.6	10.5	10					13	14	13	16	23
07	220±22	3700	6.8	8.5	7.5	5.3	8.7	8.5					10.5	11.5	10.5	13	20
08	150±15	3100	5.5	7	6.1	4.4	7.1	7					8.6	9.1	8.4	10.5	16
09	110±11	2700	4.6	5.6	5.1	3.7	5.8	5.6					7.2	7.6	7.0	8.9	13
10	58±5.8	1900	3.5	4.3	3.8	2.7	4.4	4.3					5.5	5.8	5.4	6.7	10
11	28±2.8	1350	2.3	3	2.6	1.8	3	3					3.7	3.8	3.5	4.6	7
12	18±1.8	1100	1.9	2.4	2.1	1.5	2.4	2.4					2.9	3.2	2.9	3.6	5.5
13	15±1.5	1020	1.67	2	1.85	1.3	2.1	2					2.6	2.8	2.6	3.2	5.2
14	9.5±0.95	840	1.26	1.6	1.4	1	1.62	1.6					2.0	2.1	1.93	2.5	4.2
15	6.8±0.68	720	1.08	1.4	1.19	0.9	1.37	1.4					1.65	1.8	1.65	2.0	3.5
16	5.1±0.51	640	0.9	1.1	0.99	0.7	1.14	1.1					1.40	1.5	1.38	1.7	3.1
17	1.5±0.15	340	0.5	0.6	0.55	0.4	0.64	0.6					0.78	0.83	0.77	0.94	1.7
Contact designation [5]			1 1	2 2	2 1	21 21	21 21	21 21	1–1–1 1–1–1	2–2–2 2–2–2	2–2–1 2–2–1	21–21 21–21	1–1–1 1–1–1	2–2–2 2–2–2	2–2–1 2–2–1	21–21 21–21	
Contact symbol Numbers correspond sockets designation																	

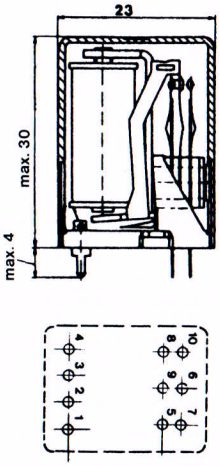
PR 15 T



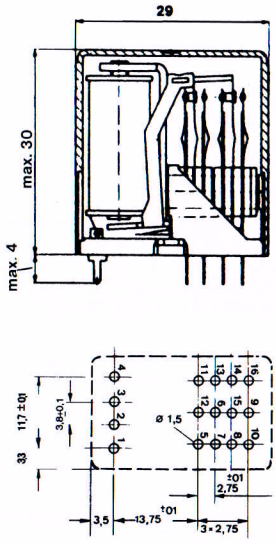
PR 16 T



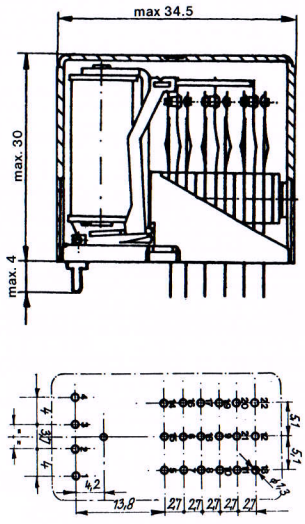
PR 15 V



PR 16 V



PR 17 V



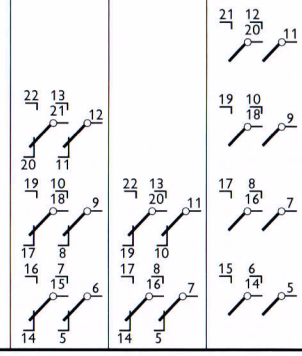
Coil terminals at the relays and sockets:

Single winding coils: start 4, end 1

Double winding coils: start 3, end 2 (winding I)

start 4, end 1 (winding II)

Coil and contact details for PR 17

Type of relay			PR 17			
Contact set version			F	M	Z	
Contact current			2 A	5 A	2 A	
Winding details			Voltage operating range at 20° C			
Desig-nation	Resistance (Ω)	No. of turns	Min. voltage U_{min} [4] (V dc)			Max. voltage $U_{max.}$ [4] (V dc)
70	25000 ± 3750	34000	118	145	118	240
71	9200 ± 1380	22000	66	81	66	145
72	3800 ± 570	14100	43	52	43	94
73	1900 ± 285	10400	29	35	29	66
74	1050 ± 105	7600	21	26	21	50
75	630 ± 63	6100	15.5	19	15.5	39
76	390 ± 39	4650	13	20	13	31
77	270 ± 27	3900	10.5	13	10.5	25.5
78	185 ± 18.5	3300	8.1	10	8.1	21.5
79	130 ± 13	2800	7.0	8.5	7.0	18
80	94 ± 9.4	2300	6.2	7.5	6.2	15
81	70 ± 7.0	2000	5.3	6.4	5.3	13
82	33 ± 3.3	1400	3.5	4.3	3.5	9.0
83	22 ± 2.2	1130	4.5	4.0	3.3	7.3
84	18 ± 1.8	1050	2.6	3.2	2.6	6.6
85	10.5 ± 1.05	816	1.9	2.4	1.9	5.1
86	6.6 ± 0.66	635	1.55	1.9	1.55	4.0
87	5.4 ± 0.54	590	1.35	1.65	1.35	3.6
88	1.75 ± 0.18	348	0.75	0.95	0.75	2.1
Contact designation [5]			21–21–21 21–21–21	21–21 21–21	1–1–1–1 1–1–1–1	
Contact symbol Numbers correspond with sockets designations						

[4] The operating voltage limit $U_{min.}$ and $U_{max.}$ depend on the ambient temperature in accordance with:

$U_{min.\,(t)} = K_1 \times U_{min.}\,(20^0\,C)$

$U_{max.\,(t)} = K_2 \times U_{max.}\,(20^0\,C)$

Coeff. \ t	20° C	30° C	40° C	50° C	60° C	70° C	80° C
K_1	1.0	1.05	1.09	1.13	1.17	1.215	1.255
K_2	1.0	0.93	0.86	0.79	0.705	0.615	0.5

t = ambient temperature

K_1 K_2 = factors

$U_{min.}$ = min. voltage at ambient temperature t

$U_{max.}$ = max. voltage at ambient temperature t

[5] Where:

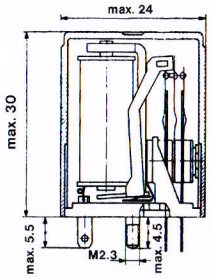
1 = make contact

2 = break contact

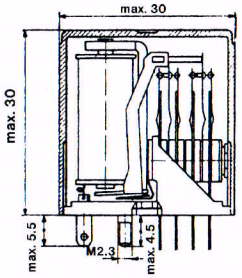
21 = change-over contact

Mechanical dimensions
(max. width of relay 19 mm)

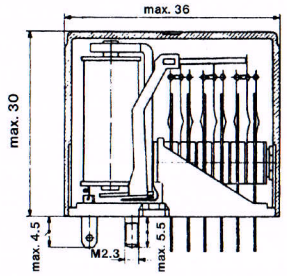
PR 15



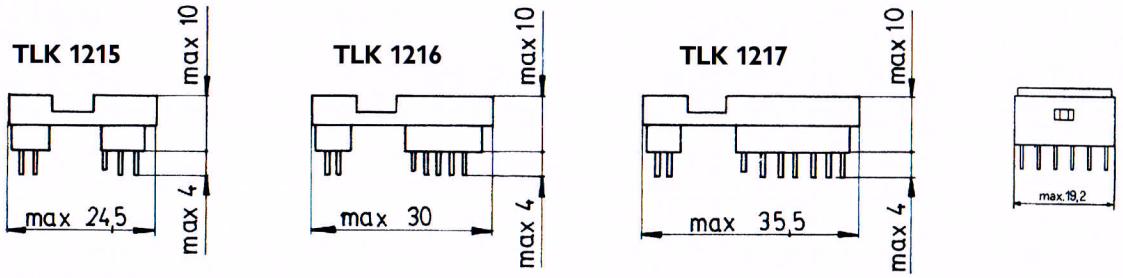
PR 16



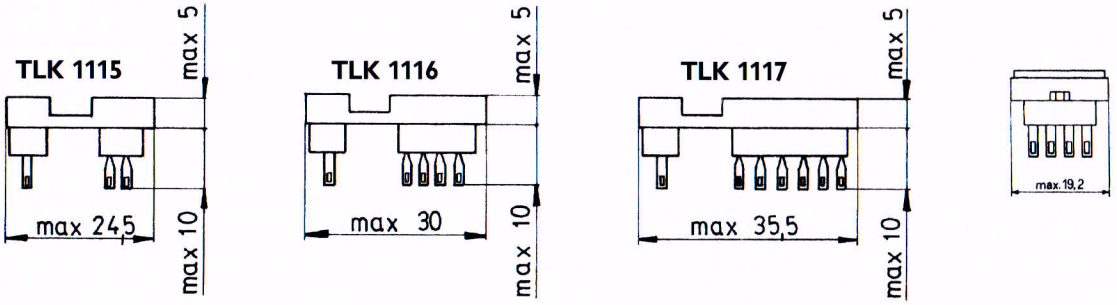
PR 17



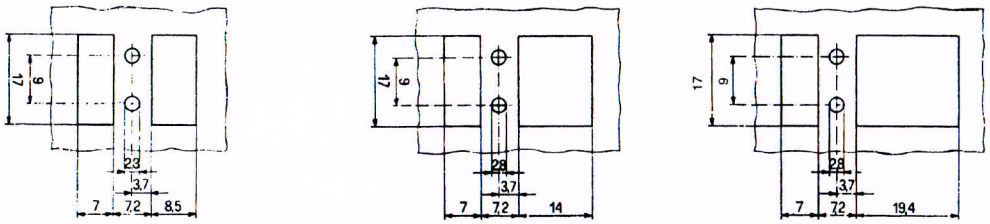
Printed wiring sockets:



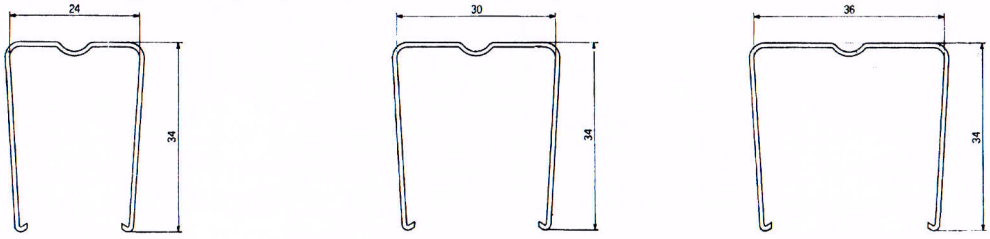
Soldering sockets:



Apertures for relay sockets:



Relay fastening springs:



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IREL 20 A 0902

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