

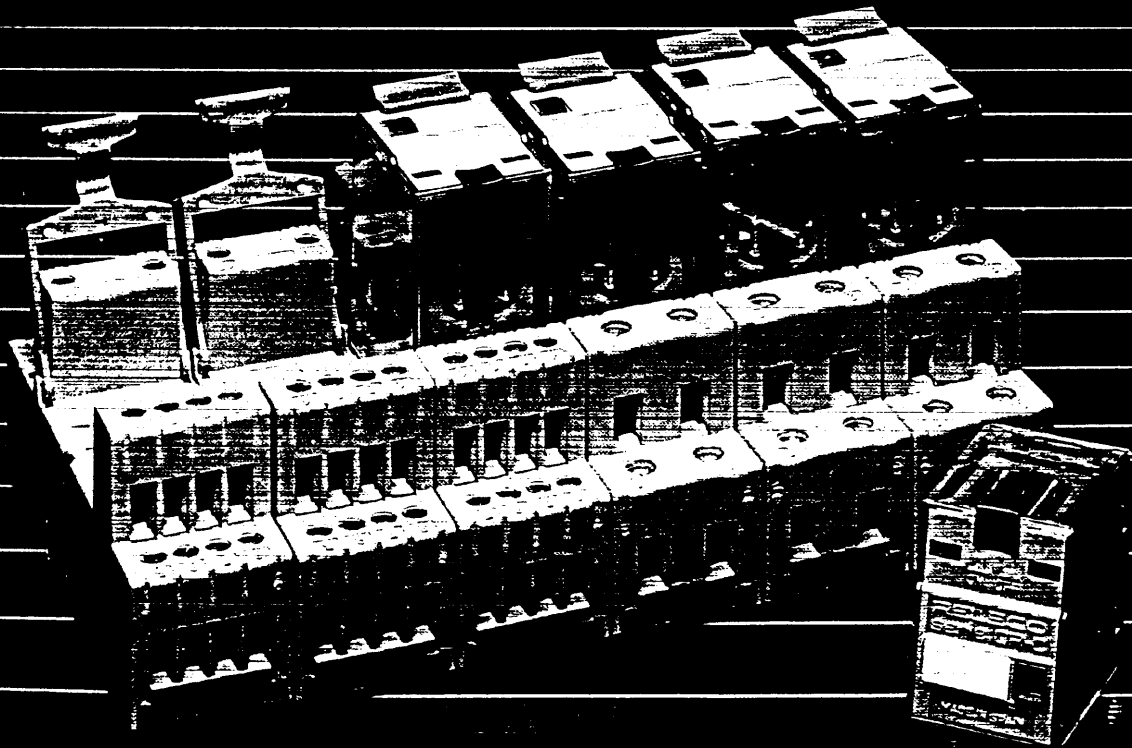
RELECO

Miniature Relays

QR-C Series

515-478-991

516-004-0072



Full Featured

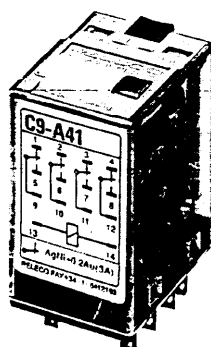
Releco QR-C Series

Miniature Power Relays C7

- plug in
- 2 pole
- 6 and 10 Amp contacts
- for AC, DC and AC/DC operation
- full featured
- pin dimension 4.8 x 0.5 mm
- PCB-version, pin dimension 2.0 x 0.5 mm

The Releco Miniature Relays are available in several versions and with various:

- Operating voltages
- Contact materials
- Coil features

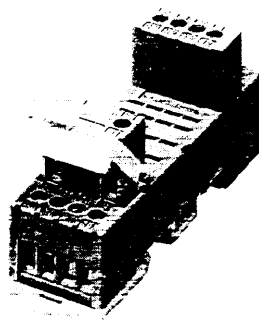


Miniature Relays C9

- plug in
- 2 and 4 pole
- 3 and 5 Amp contacts
- for AC, DC and AC/DC operation
- full featured
- pin dimension 2.6 x 0.5 mm
- PCB-version, pin dimension 1.2 x 0.5 mm

Miniature Relay Sockets S7 / S9

- 8 and 14 pin
- Finger proof (VGB-4)
- Universal mounting, DIN rail and panel
- High packing density
- Integrated clip with label
- Rail snap-on and release mechanism



This catalogue contains standard items only. For other versions and modifications, contact your nearest Releco Distributor.

Part Numbering Key

C9 - A 4 1 F P X / 24 VDC

Type of relay

- C7 = 2 pole
- C9 = 2 and 4 pole

Coil type

- A = Standard coil AC or DC
- B = AC/DC coil with bridge rectifier

Number and form of contacts

- 2 = 2 Pole (DPDT)
- 4 = 4 Pole (4PDT)

Nominal voltage (U_N)

- X = LED/Neon Indicator

Mounting Option

- P = Pins for PCB

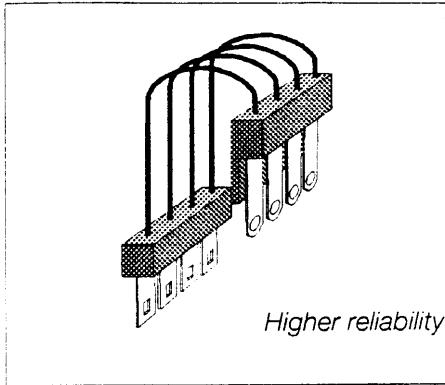
Coil features (additions to the coil)

- D = Free-Wheeling Diode
- F = Polarity- and Free-Wheeling Diode

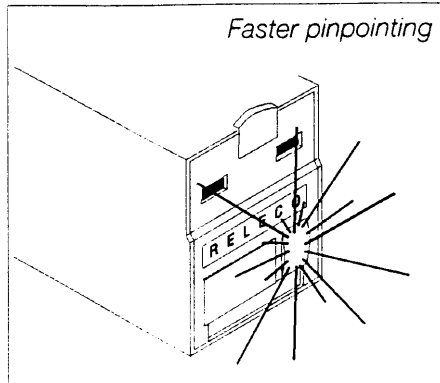
Contact materials

- 0 = AgCdO10 (standard on C7)
- 1 = AgNi10 + 0.2μ Au (GF, standard on C9)
- 2 = AgNi10 + 10μ Au (GP, C9 only)
- 8 = AgCdO10 + 10μ Au (GP, C7 only)
- 9 = AgCdO10 + 0.2μ Au (GF, C7 only)
- GP = Gold plated (5 or 10μ)
- GF = Gold flashed (0.2μ)

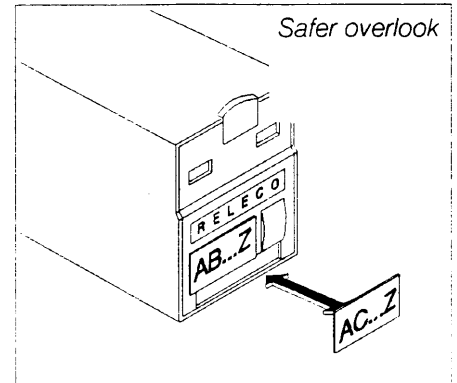
The IDM®-Concept



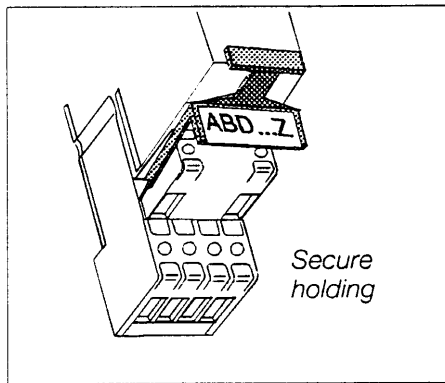
The flexible cables between the movable contact and its connection point, are welded using a newly developed cassette technology.



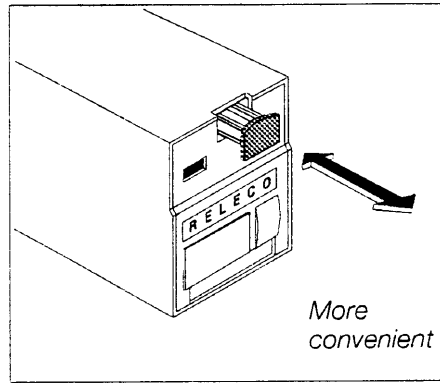
Two different status indicators; mechanical as standard, LED/Neon indicator is optional.



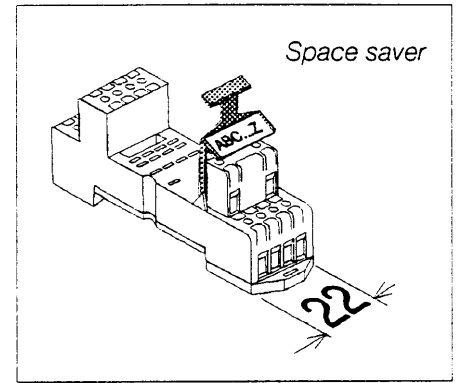
Integrated and interchangeable label on relay.



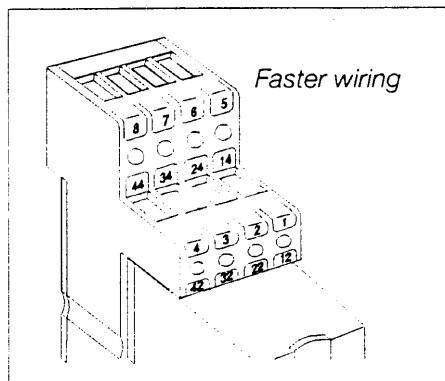
Relay Retaining Clip with integrated and interchangeable label.



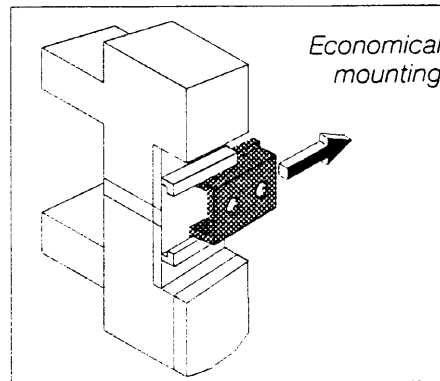
Colour coded Pull-To-Test-Button with manual latching function; red for AC-, blue for DC- and grey for AC/DC-coils. Black colour when no Pull-To-Test function.



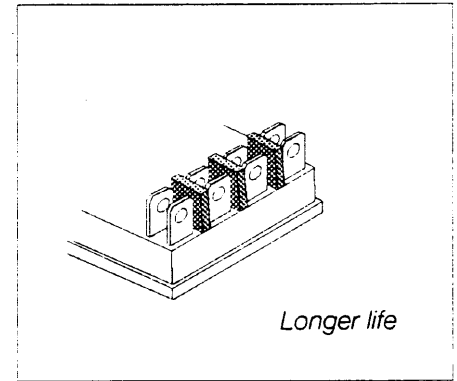
Socket width 22mm giving optimum packing density, both on panel and DIN-rail mounting.



Pin numbering on socket according to both DIN and IEC.



Sockets are as standard equipped with a bracket, allowing easy panel mounting. The bracket can be fixed with one screw to the panel, and will interlock into the socket aside.



Well dimensioned barriers as standard between contacts for maximum creepage distance and arc-protection.

Fast - easy - safe - convenient - economical - Full Featured for more profit!

General information

Ambient temperatures

Operating temperature: -20°C...+60°C

Storage temperature: -20°C...+100°C

Coil data

Coil resistance

The tolerance of the coil resistance will be within $\pm 10\%$ of the specified value at +20°C.

Coil temperature

The coils are designed to be permanently energized.

The coils are designed to withstand a permanent connection at a maximum ambient temperature of +60°C and $1.10 \times U_N$.

Coil "A"-version

Standard voltages

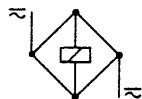
Vac: 24, 48, 115*, 230*

Vdc: 12, 24, 48, 110

Coil features

Coil B

Built-in rectifier bridge allows the coil to be energized in both AC and DC circuits. Acts also as a Free-Wheeling Diode with no polarity inconvenience. Increases release time approximately 3 times. Available for voltages up to 48 V.



e.g. Relay C7-B20/24VAC/DC

Table 1: Values for "A" coils at 20°C $\pm 10^\circ$

U_N Vac	R Ω	I mA	U_N Vdc	R Ω	I mA
6	10	250	6	40	150
12	40	125	12	160	75
24	160	63	24	640	37
48	640	31	48	2560	19
60	1000	25	60	4000	15
115*	3500	13	110	13440	8
230*	13800	6			

*115 Vac-Eurostandard 110 ... 120 Vac

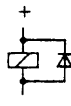
*230 Vac-Eurostandard 220 ... 240 Vac

Coil "B"-version

Standard voltages

Vac/dc: 6, 12, 24, 48

Other voltages upon request.



e.g. Relay C9-A41D/24VDC

Dielectric Strength

Values measured in accordance with IEC norms:

	C7	C9
Coil/contact	$\geq 2\,500$	$2\,500\,V_{rms}$
Coil/frame	$\geq 2\,500$	$2\,500\,V_{rms}$
Contact/contact	$\geq 2\,500$	$2\,000\,V_{rms}$
NO/NC	$\geq 1\,000$	$700\,V_{rms}$

Insulation resistance

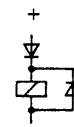
Higher than 1 500 M Ω ,
measured with 1 000 V DC between all live parts and the frame.

Materials

All materials being used are self extinguishing, such as: Polycarbonate (Lexan[®]), Polyphenyloxy (Noryl[®]) and Polybutylene terephthalate (Valox[®]). These are high performance materials for electrical equipment and withstand temperatures up to +130°C without deformation.

Code F (DC only)

Polarity and Free Wheeling Diodes. A second diode in series with the coil, protects against short-circuit in case of wrong polarity of power. The voltage applied to the coil decreases by 0.7 volts.



e.g. Relay C9-A41F/48VDC

Code D (DC only)

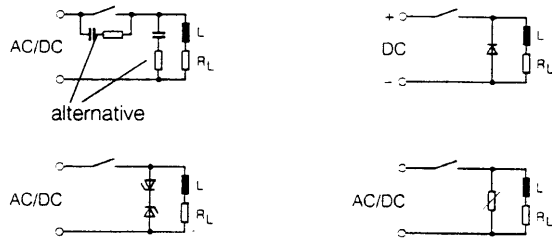
Free-Wheeling Diode. Connected in parallel with the coil. It is used when the relay is energized through semi-conductors in order to dampen the peaks of inverse polarity, generated in the coil when being switched-off. The release time increases approximately 4 times.

Table 2: Contact materials

Contact material	Application	Atmospheric reaction		Characteristics
		Oxidation	Sulphurous	
AgCdO10	Universal contact with good performance on inductive loads.	resistant	tarnished	Silver Cadmium contacts have low tendency to weld. Good wear off resistance with high loads. Arc extinguishing properties. Current switching range: 0.05...10A Voltage switching range: 24...250V Normal initial contact resistance: 50m Ω
Contact code 0				
AgNi10 + 0.2 μ Au (GF)	Low current and voltage with gold flashed protection.	resistant	resistant	The Silver Nickel alloy is harder than silver and has electrical conductivity and heat conditions near silver. Good properties in switching low and medium currents in DC. Low contact resistance. Gold-flash protects against sulphur contamination during the shelf life. Current switching range: 0.01...4A Voltage switching range: 12...150V Normal initial contact resistance: 20...30m Ω
Contact code 1				
AgCdO10+0.2 μ Au (GF)	Universal contact with gold flashed protection.	resistant	resistant	Silver Cadmium Oxide Gold Flashed is the same as a AgCdO10 contact but with gold flash protection against sulphur contamination during the shelf life.
Contact code 9				

Contact protection

Contact protection is recommended when switching reactive load. Here are four different principles of protection:



The values of R and C can be calculated with following:

$$C [\mu F] = \frac{(I_{max})^2 [A]}{10}$$

$$R [\Omega] > \frac{U [V]}{I_{max} \cdot R_L [\Omega]}$$

I_{max} as per table 3

Table 3: Maximum breaking capacity, DC (voltage vs. current)
in Amps. 1,2 or 3 contacts in series.

C7-A20	Resistive load		Inductive load L/R=30ms		
	Vdc	1C	2C	1C	2C
24		10	10	7	7
48		2	7	0.9	6
60		1.3	5	0.7	3.5
110		0.5	1.9	0.3	1.0
220		0.2	0.6	0.12	0.3

C9-A41	Resistive load			Inductive load L/R=30ms		
	Vdc	1C	2C	3C	1C	2C
24		3	3	3	0.9	1.5
48		1.5	2.6	3	0.6	1.0
60		1.2	2.0	3	0.5	0.8
110		0.6	1.1	1.7	0.25	0.4
220		0.3	0.5	0.9	0.15	0.22

Table 4: Electrical life, AC

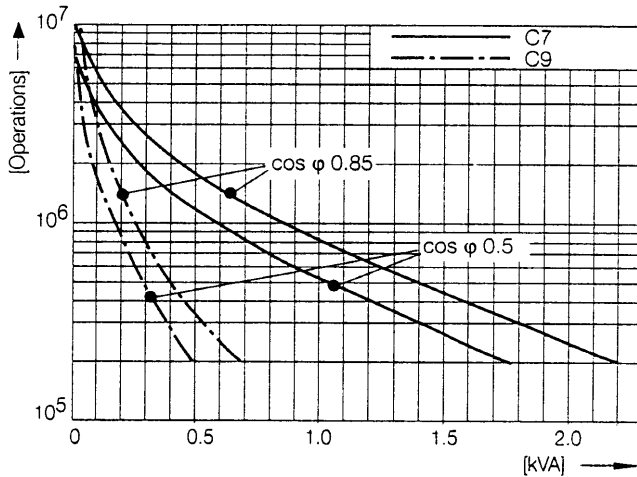


Table 5: Electrical life, DC

Values valid for relays without diodes in parallel with the coil.

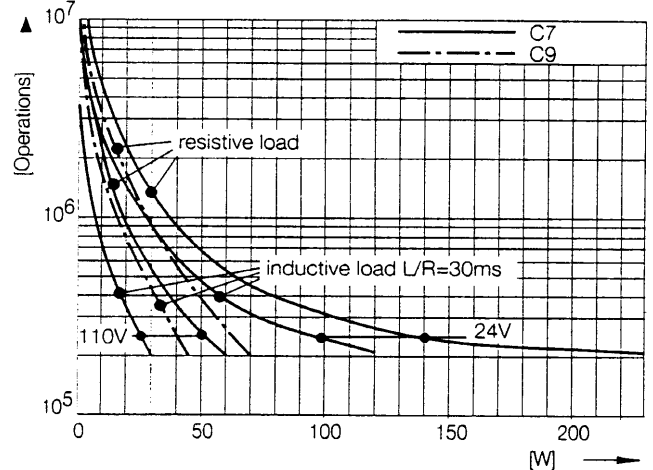


Table 6: Breaking capacity, DC - resistive load

Contacts in series, values valid for relays without diodes in parallel with the coil.

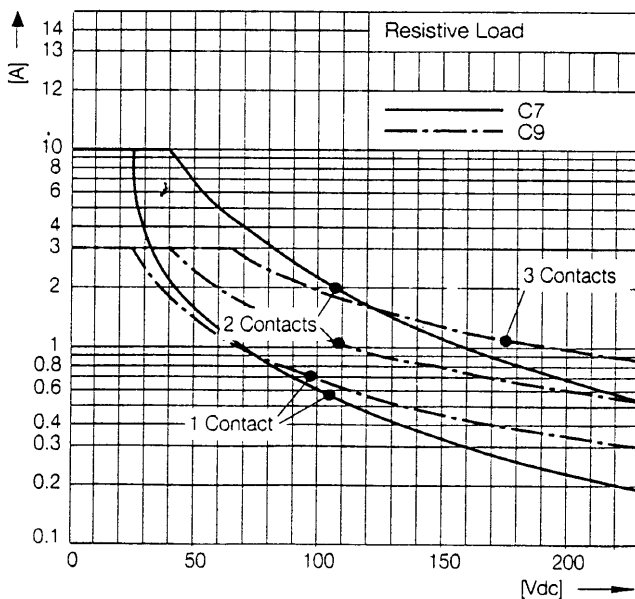
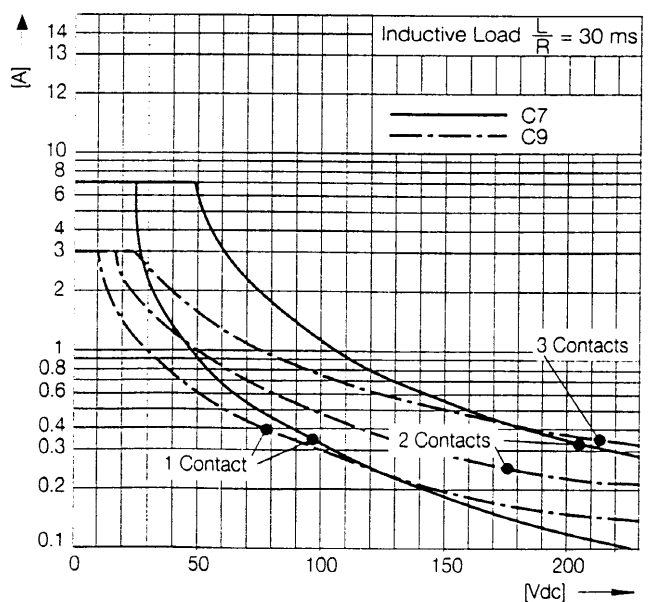


Table 7: Breaking capacity, DC - inductive load

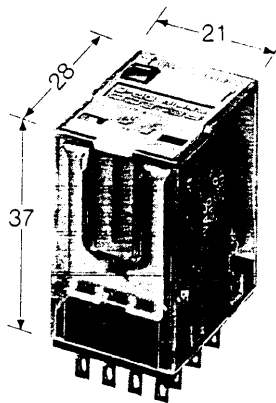
Contacts in series, values valid for relays without diodes in parallel with the coil.



QR-C

Miniature Power Relay,
plug-in mounting, 2 pole

Series C7-..



Type	C7-A20/24VAC	C7-A20X/24VAC	C7-A20/115VAC	C7-A20X/115VAC	C7-A20/230VAC	C7-A20X/230VAC	C7-A21/...	C7-A21X/...								
Nominal voltage	24 VAC		115* VAC		230* VAC		see page 4									
Contact	AgCdO10		AgCdO10		AgCdO10		AgNi10 + 0.2 μ Au									
	DPDT		DPDT		DPDT		DPDT									
Wiring diagram	<div><div><table><tr><td>1</td><td>2</td></tr><tr><td>3</td><td>4</td></tr><tr><td>5</td><td>6</td></tr><tr><td>7 A</td><td>8 B</td></tr></table></div><p>Bottom view</p></div>								1	2	3	4	5	6	7 A	8 B
1	2															
3	4															
5	6															
7 A	8 B															

Function		standard	standard	standard	standard
LED/Neon Indicator		-	-	-	-
Free-Wheeling Diode		-	-	-	-
Polarity- and Free-Wheeling Diode		-	-	-	-
Coil					
Coil operating voltage	[V]	0.8 ... 1.1 U _N	0.8 ... 1.1 U _N	0.8 ... 1.1 U _N	0.8 ... 1.1 U _N
Nominal power consumption	[VA/W]	1.5	1.5	1.5	1.5
Nominal current	[mA]	63 68	13 18	6 7	see page 4, table 1
Pull-in voltage	[V]	19.2	96	192	0.80 x U _N
Drop-out voltage	[V]	8.4	42	84	0.35 x U _N
Coil resistance (± 10 % tolerance)	[Ω]	160	3500	13800	see page 4, table 1
Contacts					
Max. switching current (resistive)	[A]	10	10	10	6
Peak inrush current (resist. 10ms)	[A]	30	30	30	18
Max. switching voltage	[VAC]	250	250	250	250
Max. switching load AC per contact at 50Hz	[VA]	2200	2200	2200	1500
Max. switching load DC per contact at 24V	[W]	240	240	240	180

General data

Operate time	≤ 10 msec
Release time (without Free-Wheeling Diode)	≤ 6 msec
Bounce time	2...5 msec
Contact pressure (NO/NC)	25 g / 20 g
Contact gap	0.45 mm
Insulation class in accordance with VDE 0110	Group C250
Test voltage 50 Hz 1 min	2500 V _{rms}
Insulation resistance	1500 MΩ
Maximum switching with 100 % load	1200 ops/h
Maximum switching with 50 % load	2000 ops/h
Minimum mechanical life	≥ 100 x 10 ⁶ ops
Ambient temperature	-20...+60°C
Dimensions	21 x 28 x 37 mm
Protection class (DIN 40 050)	IP40
Weight, avg.	34 g

*Eurostandard: 115VAC = 110...120 VAC; 230VAC = 220...240VAC

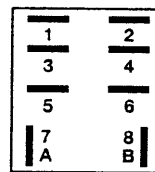
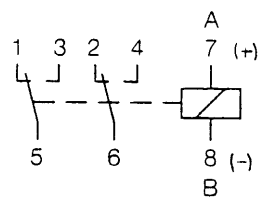
Contact materials

Contact materials	Standard	Code
AgCdO10		0
AgNi10 + 0.2µ Au		1
AgCdO10 + 10µ Au		8
AgCdO10 + 0.2µ Au		9

Approvals

	CSA
	UL
	SEV

C7-A20/12VDC C7-A20DX/12VDC	C7-A20X/12VDC C7-A20/24VDC	C7-A20DX/24VDC C7-A20FX/24VDC	C7-A20X/24VDC C7-A20/48VDC	C7-A20DX/48VDC C7-A20DX/110VDC	C7-A20X/110VDC C7-A21/... C7-A21DX/... C7-A21FX/... C7-A21X/...
12 VDC	24 VDC	24 VDC	48 VDC	110 VDC	see page 4
AgCdO10	AgCdO10	AgCdO10	AgCdO10	AgCdO10	AgNi10+ 0.2 µ Au
DPDT	DPDT	DPDT	DPDT	DPDT	DPDT

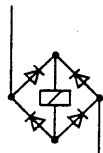


Bottom view

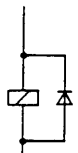
standard	standard	standard	standard	standard
- ✓ ✓ -	- ✓ ✓ ✓	- ✓ ✓ -	- ✓ ✓ -	- ✓ ✓ ✓
0.75...1.1 U _N 0.9 75 80 80	0.75...1.1 U _N 0.9 37 42 42 42	0.75...1.1 U _N 0.9 19 24 24	0.75...1.1 U _N 0.9 8 9 9	0.75...1.1 U _N 0.9 see page 4, table 1
9 1.2 160	18 2.4 640	36 4.8 2560	94 12.5 13440	0.75 x U _N 0.10 x U _N see page 4, table 1
10 30 250 2200 240	10 30 250 2200 240	10 30 250 2200 240	10 30 250 2200 240	6 18 250 1500 180

Coil features

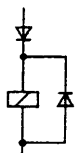
Coil type B



Code D

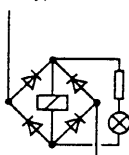


Code F

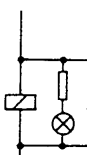


Coils with LED/Neon Indicator

Coil type B...X

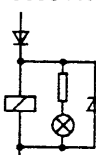


Code DX

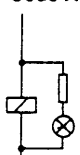


Max. 250 V

Code FX

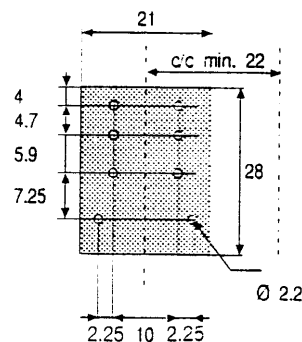


Code X



Max. 250 V

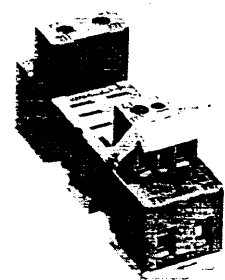
PCB mounting, direct soldering



All dimensions in mm

Socket

Recommended type:



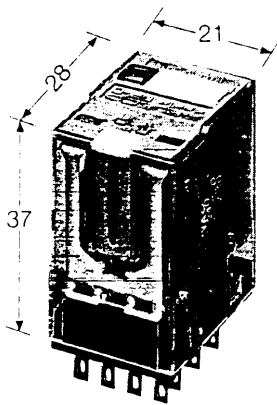
S7-B

Further information, see page 10...11

QR-C

Miniature 4 pole Relay,
plug-in mounting

Series C9-..



Type	C9-A41/24VAC	C9-A41X/24VAC	C9-A41/115VAC	C9-A41X/115VAC	C9-A41/230VAC	C9-A41X/230VAC	C9-A49/...	C9-A49X/...
Nominal voltage	24 VAC		115* VAC		230* VAC		see page 4	
Contact	AgNi10 + 0.2 µ Au		AgNi10 + 0.2 µ Au		AgNi10 + 0.2 µ Au		AgCdO10 + 0.2 µ Au	
	4PDT		4PDT		4PDT		4PDT	
Wiring diagram	<p style="text-align: center;">Bottom view</p>							

Function		standard	standard	standard	standard
LED/Neon Indicator	-	✓	✓	✓	✓
Free-Wheeling Diode	-	-	-	-	-
Polarity- and Free-Wheeling Diode	-	-	-	-	-
Coil					
Coil operating voltage [V]		0.8 ... 1.1 U _N	0.8 ... 1.1 U _N	0.8 ... 1.1 U _N	0.8 ... 1.1 U _N
Nominal power consumption [VA/W]		1.5	1.5	1.5	1.5
Nominal current [mA]		63 68	13 14	6 7	see page 4, table 1
Pull-in voltage [V]		19	96	192	0.80 x U _N
Drop-out voltage [V]		8.5	42	84	0.35 x U _N
Coil resistance (± 10 % tolerance) [Ω]		160	3500	13800	see page 4, table 1
Contacts					
Max. switching current (resistive) [A]		3	3	3	5
Peak inrush current (resist. 10ms) [A]		9	9	9	15
Max. switching voltage [VAC]		250	250	250	250
Max. switching load AC per contact at 50Hz [VA]		660	660	660	1500
Max. switching load DC per contact at 24V [W]		75	75	75	120

General data

Operate time	≤ 10 msec
Release time (without Free-Wheeling Diode)	≤ 3.5 msec
Bounce time	2...5 msec
Contact pressure (NO/NC)	20 g / 15 g
Contact gap	0.4 mm
Insulation class in accordance with VDE 0110	Group B60
Test voltage 50 Hz 1 min	2500 V _{rms}
Insulation resistance	1500 MΩ
Maximum switching with 100 % load	1200 ops/h
Maximum switching with 50 % load	2000 ops/h
Minimum mechanical life	≥ 100 x 10 ⁶ ops
Ambient temperature	-20...+60°C
Dimensions	21 x 28 x 37 mm
Protection class (DIN 40 050)	IP40
Weight, avg.	36 g

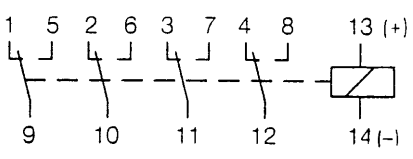
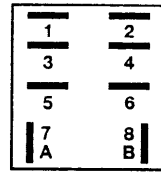
*Eurostandard: 115VAC = 110...120 VAC; 230VAC = 220...240VAC

Contact materials

	Code
AgNi10 + 0.2µ Au Standard	1
AgNi10 + 10µ Au	2
AgCdO10 + 0.2µ Au	9

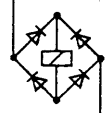
Approvals



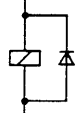
C9-A41/12VDC C9-A41DX/12VDC	C9-A41X/12VDC C9-A41/24VDC C9-A41DX/24VDC C9-A41FX/24VDC C9-A41X/24VDC	C9-A41/48VDC C9-A41DX/48VDC	C9-A41X/48VDC C9-A41/110VDC C9-A41DX/110VDC	C9-A41X/110VDC C9-A49/... C9-A49DX/... C9-A49FX/... C9-A49X/...	
12 VDC	24 VDC	48 VDC	110 VDC	see page 4	
AgNi10 + 0.2 µ Au	AgNi10 + 0.2 µ Au	AgNi10 + 0.2 µ Au	AgNi10 + 0.2 µ Au	AgCdO10 + 0.2 µ Au	
4PDT	4PDT	4PDT	4PDT	4PDT	
  <p>Bottom view</p>					
standard	standard	standard	standard	standard	
- ✓ -	- ✓ ✓ -	- ✓ -	- ✓ -	- ✓ ✓ ✓	
- ✓ -	- ✓ -	- ✓ -	- ✓ -	- ✓ -	
- - -	- - ✓ -	- - -	- - -	- - ✓ -	
0.75 ... 1.1 U _N 0.9	0.75 ... 1.1 U _N 0.9	0.75 ... 1.1 U _N 0.9	0.75 ... 1.1 U _N 0.9	0.75 ... 1.1 U _N 0.9	
75 80 80	37 42 42 42	19 24 24	8 9 9	see page 4, table 1	
9	18	36	94	0.75 x U _N	
1.2	2.4	4.8	12.5	0.10 x U _N	
160	640	2560	13440	see page 4, table 1	
3	3	3	3	5	
9	9	9	9	15	
250	250	250	250	250	
660	660	660	660	1500	
75	75	75	75	120	

Coil features

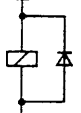
Coil type B



Code D

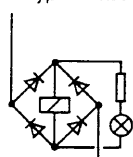


Code F

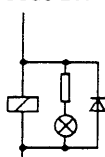


Coils with LED/Neon Indicator

Coil type B...X

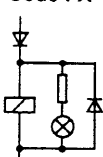


Code DX

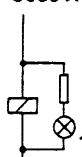


Max. 250 V

Code FX

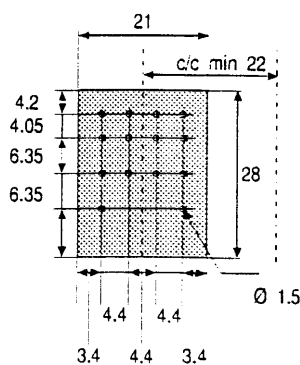


Code X



Max. 250 V

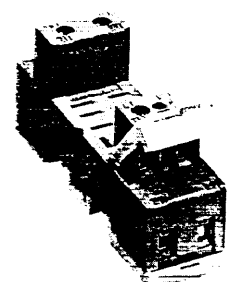
PCB mounting, direct soldering



All dimensions in mm

Sockets

Recommended type:

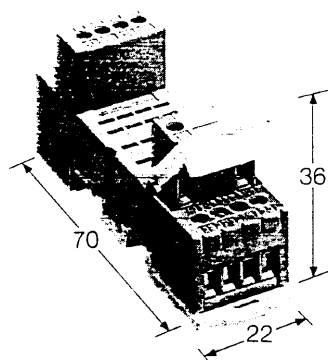


S9-B

Further information, see page 10...11

Sockets for Miniature Relays

Series S7 / S9



Type	S7-B	S9-B
Pin-out	2 pole, flat blade	4 pole, flat blade
Terminal Screws	2 levels	2 levels
Circuit diagram		
Data		
Wire inlets capacity:		
Solid wire	[n x mm ²] 2 x 1.5	2 x 1.5
Multi core	[n x mm ²] 2 X 1.0	2 x 1.0
Wire end ferrule	[n x mm ²] 2 x 0.75	2 x 0.75
Nominal Current	[A] 10	6
Max. Voltage	[V] 400	250
Dimensions:		
Width	[mm] 22	22
Length	[mm] 70 (76)	70 (76)
Height	[mm] 36	36

General data

Screw dimension, wire in-lets	M3/M2.3/M3
Fixing torque, wire in-lets screws	1.2 ... 1.5 Nm
Operating temperature max., at rated load.	+60 °C
Housing Material	Polyphenyloxide (Noryl®)
Housing Color	Blue
Female Contact Material	Hard brass
Mounting:	
Rail 35 x 7.5 (DIN 50 022)	✓
Rail 35 x 15 (DIN 50 022)	✓
Center hole	-
Center line holes	✓
Weight	43 g

Accessories

Hold-on clip (included in the socket)	S9-C
Label for socket	S9-BE

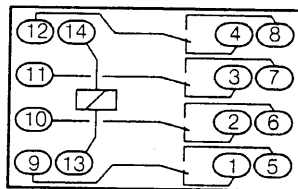
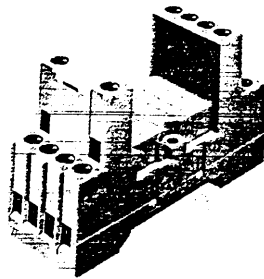
Approvals

	CSA
	UL
	SEV

S9-S

4 pole, flat blade

2 levels

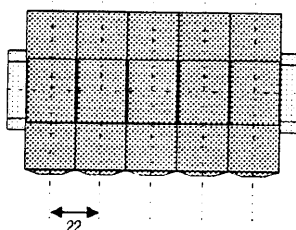


2 x 1.5
2 x 1.0
2 x 0.75
6
250

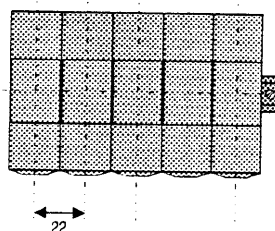
29
67
29

Mounting instructions for S7-B and S9-B

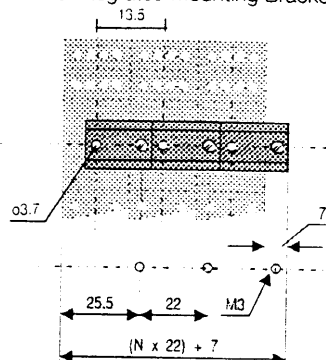
DIN rail



Surface

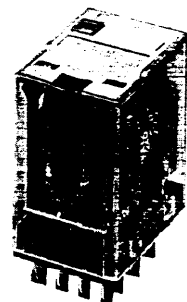


Drilling instructions when using
the Integrated Mounting Bracket



Relays

Recommended types:



Series C7/C9

Further information, see page 6...9

All dimensions in mm