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Finder 40.31.9.024.0000

Finder 40.31.9.024.0000 SPDT Relay User Manual

Model: 40.31.9.024.0000 | Manufacturer: Finder

1. INTRODUCTION

This manual provides essential information for the safe and effective use of the Finder 40.31.9.024.0000 SPDT (Single Pole Double Throw) Electromechanical Relay. This relay is designed for general-purpose power switching applications, featuring a 24VDC coil and a 10A contact rating at 250VAC. It is suitable for through-hole mounting in various industrial and electronic circuits.

2. SAFETY INFORMATION

WARNING: Electrical components can cause electric shock or fire if not handled correctly. Always observe the following safety precautions:

- Ensure power is disconnected before installation, wiring, or maintenance.
- Installation should only be performed by qualified personnel.
- Verify all connections are secure and correct according to the wiring diagram.
- Do not exceed the specified voltage and current ratings of the relay.
- Protect the relay from moisture, dust, and extreme temperatures.
- This product is RoHS compliant. Dispose of it according to local regulations at the end of its life cycle.

3. PRODUCT OVERVIEW

The Finder 40.31.9.024.0000 is a compact electromechanical relay from the 40 Series, designed for reliable switching in various control circuits. It features a single pole double throw (SPDT) contact configuration, allowing it to switch between two circuits. The relay operates with a 24VDC coil and can handle up to 10 Amps at 250VAC. Its through-hole mounting design makes it suitable for PCB integration.



Figure 3.1: Front view of the Finder 40.31.9.024.0000 SPDT Relay. This image shows the general appearance of the relay, typically a rectangular housing with pins extending from the bottom for PCB mounting.

4. TECHNICAL DIAGRAMS AND DIMENSIONS

Understanding the physical dimensions and pin configuration is crucial for proper installation and integration into your circuit board. The following diagram illustrates the relay's footprint, pin spacing, and overall dimensions.

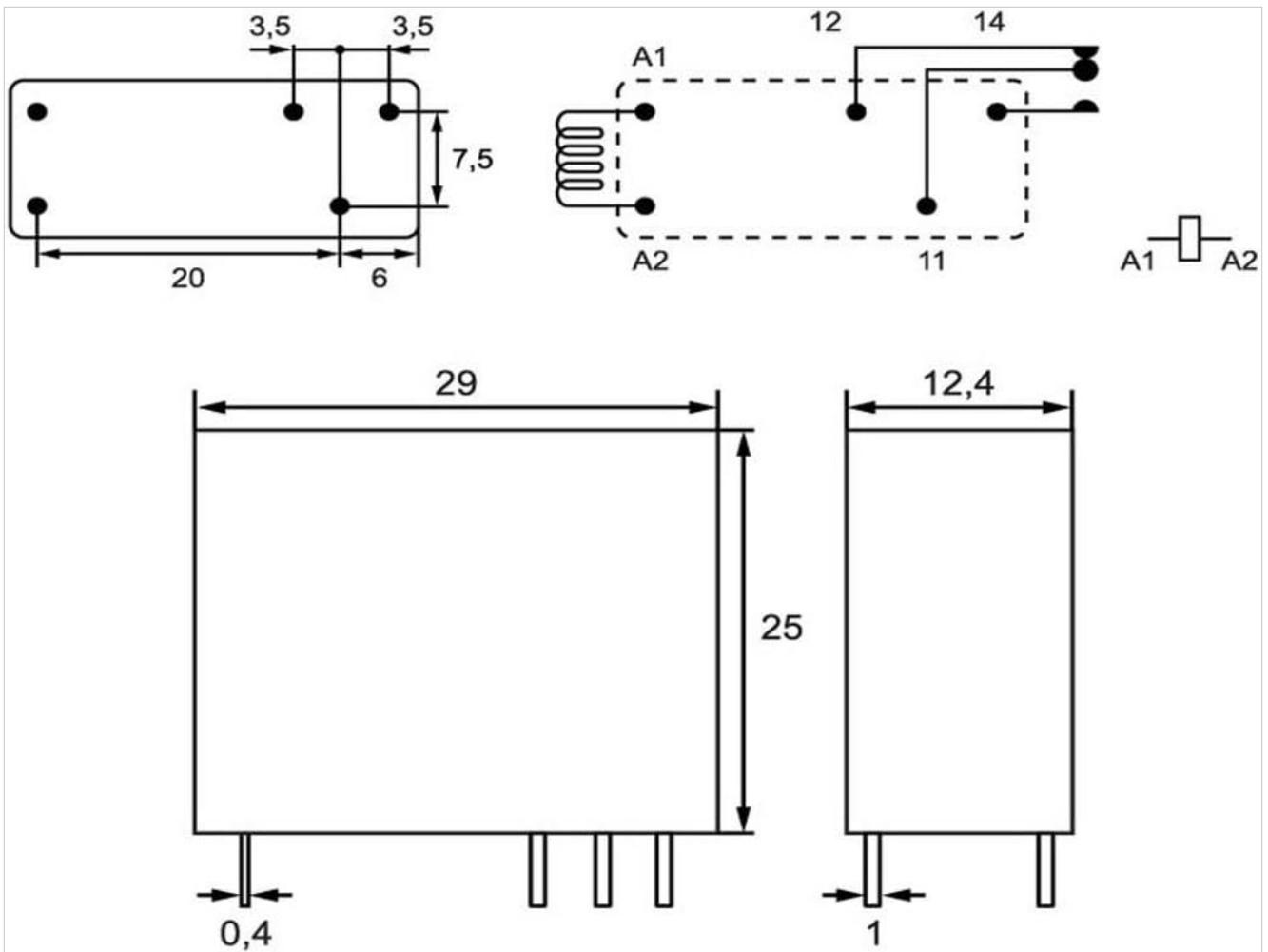


Figure 4.1: Technical drawing showing the dimensions and pinout of the Finder 40.31.9.024.0000 relay. The top-left diagram shows the bottom view with pin spacing (e.g., 3.5mm, 7.5mm, 20mm, 6mm). The top-right diagram illustrates the internal schematic with coil terminals A1, A2 and contact terminals 11 (common), 12 (normally closed), 14 (normally open). The bottom diagrams provide side and front views with overall dimensions (e.g., 29mm length, 25mm height, 12.4mm width, 0.4mm and 1mm pin thickness).

5. INSTALLATION

The Finder 40.31.9.024.0000 relay is designed for through-hole mounting on a Printed Circuit Board (PCB). Follow these steps for proper installation:

1. **Prepare the PCB:** Ensure the PCB has correctly sized holes and pad layouts matching the relay's pin configuration as shown in Figure 4.1.
2. **Insert the Relay:** Carefully align the relay pins with the corresponding holes on the PCB. Ensure the relay is oriented correctly.
3. **Solder Connections:** Solder each pin to its respective pad on the PCB. Use appropriate soldering techniques to ensure strong, reliable electrical and mechanical connections. The relay terminals are designed for soldering.
4. **Coil Connections:** Connect the 24VDC power supply to the coil terminals A1 and A2. Polarity is typically indicated on the relay or in the schematic (A1 positive, A2 negative for DC coils, but check specific markings).
5. **Contact Connections:** Connect the load circuits to the contact terminals:
 - **Terminal 11:** Common contact.
 - **Terminal 12:** Normally Closed (NC) contact. This contact is closed when the coil is de-energized.
 - **Terminal 14:** Normally Open (NO) contact. This contact is closed when the coil is energized.
6. **Verify Installation:** After soldering, visually inspect all connections for shorts, cold solder joints, or other defects.

6. OPERATION

The Finder 40.31.9.024.0000 relay operates by energizing its 24VDC coil. When the coil is energized, an electromagnetic field is created, which pulls the armature, causing the common contact (11) to switch from the Normally Closed (12) position to the Normally Open (14) position. When the coil is de-energized, the armature returns to its original state, and the common contact (11) reconnects with the Normally Closed (12) contact.

- **Coil Voltage:** Apply 24VDC to terminals A1 and A2 to activate the relay.
- **Contact Switching:** The relay provides a mechanical switch action, isolating the control circuit (coil) from the load circuit (contacts).
- **Load Capacity:** Ensure the switched load does not exceed 10 Amps at 250VAC. Exceeding these limits can damage the relay and connected equipment.

7. MAINTENANCE

The Finder 40.31.9.024.0000 relay is a sealed component and generally requires minimal maintenance. However, periodic inspection can help ensure its longevity and reliable operation:

- **Visual Inspection:** Regularly check for any signs of physical damage, discoloration, or overheating on the relay body and terminals.
- **Environmental Conditions:** Ensure the operating environment remains within specified temperature and humidity ranges. Protect the relay from excessive dust or corrosive atmospheres.
- **Connection Integrity:** Periodically verify that all soldered connections remain secure and free from corrosion.
- **Cleaning:** If necessary, gently clean the exterior of the relay with a dry, soft cloth. Do not use solvents or abrasive cleaners.

8. TROUBLESHOOTING

If the relay is not functioning as expected, consider the following troubleshooting steps:

- **Relay Not Activating:**
 - Check if the correct 24VDC is applied to coil terminals A1 and A2.
 - Verify coil current (nominal 27mA).
 - Inspect for open circuits in the coil wiring.
 - Ensure the power supply is functioning correctly.
- **Load Not Switching:**
 - Confirm the relay coil is activating (a faint click might be audible).
 - Check continuity across the contact terminals (11-12 and 11-14) when the coil is energized and de-energized.
 - Verify that the load circuit is correctly wired to the common (11) and desired NO (14) or NC (12) contacts.
 - Ensure the load current and voltage do not exceed the relay's contact ratings.
- **Overheating:**
 - This indicates excessive current or voltage. Immediately disconnect power.
 - Recheck all circuit parameters against the relay's specifications.

If issues persist after troubleshooting, consider replacing the relay or consulting a qualified technician.

9. SPECIFICATIONS

The following table summarizes the key electrical and mechanical specifications for the Finder 40.31.9.024.0000 relay. For detailed performance curves and additional characteristics, refer to the manufacturer's full datasheet (Figure 9.1 provides an overview of such data).

CARACTERÍSTICAS GENERALES

AISLAMIENTO

AISLAMIENTO según EN 61810-5	tensión nominal de aislamiento	V	250
	tensión nominal soportada a los impulsos	kV	3.6
	grado de contaminación		3 (1 conmutado) 2 (2 conmutados)
	categoría de sobretensión		III

INMUNIDAD

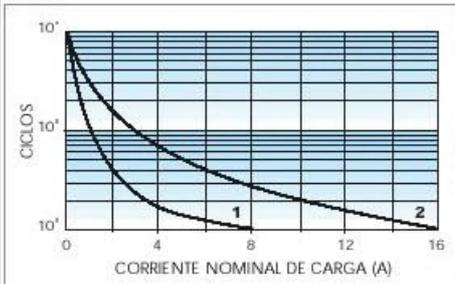
INMUNIDAD A LAS PERTURBACIONES CONDUCCIDAS	BURST (según EN 61000-4-4) nivel 4 (4 kV)
	SURGE (según EN 61000-4-5) nivel 3 (2 kV)

OTROS DATOS

RESISTENCIA A LA VIBRACION (10...55Hz): NA/NC	g/g	10/4 (1 contacto conmutado)	3/3 (2 contactos conmutados)
POTENCIA DISIPADA	en vacío	W	0.6
	con carga nominal	W	1.2 (40.31/51) 2 (40.61/52)
DISTANCIA DE MONTAJE ENTRE RELES EN UN CIRCUITO IMPRESO	mm	≥5	

CARACTERÍSTICAS DE LOS CONTACTOS

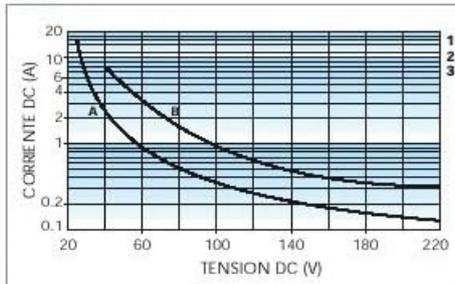
F 40



Vida eléctrica en función de la carga en AC1.

- 1 - Tipo 40.52 (8 A)
2 - Tipos 40.31 - 40.51 (10 A)
Tipo 40.61 (16 A)

H 40



Poder de corte para carga en DC1.

- 1 - Tipo 40.61 2 - Tipos 40.31 - 40.51 3 - Tipo 40.52

A - Carga aplicada en 1 contacto

B - Carga aplicada en 2 contactos en serie

- La vida eléctrica para cargas resistivas en DC1 que tengan valores de tensión y corriente bajo la curva es de $\geq 100 \times 10^3$ ciclos.
- Para las cargas DC13, la colocación de un diodo con polaridad invertida en paralelo con la carga permite obtener una vida eléctrica idéntica a la que se consigue con una carga en DC1.

Nota: aumentará el tiempo de desconexión.

CARACTERÍSTICAS DE LA BOBINA

VALORES DE LA VERSION DC (0.65 W standard)

Tensión nominal U_N	Codigo bobina	Campo de funcionamiento		Resistencia R	I nominal absorbida con U_N
		U_{min}	U_{max}		
V		V	V	Ω	mA
5	9.005	3.65	7.5	38	130
6	9.006	4.4	9	55	109
7	9.007	5.1	10.5	75	94
9	9.009	6.6	13.5	125	72
12	9.012	8.8	18	220	55
14	9.014	10.2	21	300	47
18	9.018	13.1	27	500	36
21	9.021	15.3	31.5	700	30
24	9.024	17.5	36	900	27
28	9.028	20.5	42	1200	23
36	9.036	26.3	54	2000	18
48	9.048	35	72	3500	14
60	9.060	43.8	90	5500	11
90	9.090	65.7	135	12500	7.2
110	9.110	80.3	165	18000	6.2

VALORES DE LA VERSION DC (0.5 W sensible)

Tensión nominal U_N	Codigo bobina	Campo de funcionamiento		Resistencia R	I nominal absorbida con U_N
		U_{min}^*	U_{max}^{**}		
V		V	V	Ω	mA
5	7.005	3.7	8.8	50	100
6	7.006	4.4	10.5	75	80
7	7.007	5.1	12.2	100	70
9	7.009	6.6	15.8	160	56
12	7.012	8.8	21	300	40
14	7.014	10.2	24.5	400	35
18	7.018	13.2	31.5	650	27.7
21	7.021	15.4	36.9	900	23.4
24	7.024	17.5	42	1200	20
28	7.028	20.5	49	1600	17.5
36	7.036	26.3	63	2600	13.8
48	7.048	35	84	4800	10
60	7.060	43.8	105	7200	8.4
90	7.090	65.7	157	16200	5.6
110	7.110	80.3	192	23500	4.7

* $U_{min} = 0.8 U_N$ para 40.61 ** $U_{max} = 1.5 U_N$ para 40.61

VALORES DE LA VERSION AC

Tensión nominal U_N	Codigo bobina	Campo de funcionamiento		Resistencia R	I nominal absorbida con U_N (50Hz)
		U_{min}	U_{max}		
V		V	V	Ω	mA
6	8.006	4.8	6.6	21	168
12	8.012	9.6	13.2	80	90
24	8.024	19.2	26.4	320	45
48	8.048	38.4	52.8	1350	21
60	8.060	48	66	2100	16.8
110	8.110	88	121	6900	9.4
120	8.120	96	132	9000	8.4
230	8.230	184	253	28000	5
240	8.240	192	264	31500	4.1

VALORES DE LA VERSION AC/DC (biestable)

Tensión nominal U_N	Codigo	Campo de funcionamiento		Resistencia R	I nominal absorbida con U_N	Resistencia de desconexión** R_{DC}
		U_{min}	U_{max}			
V		V	V	Ω	mA	Ω
5	6.005	4	5.5	23	215	37
6	6.006	4.8	6.6	33	165	62
12	6.012	9.6	13.2	130	83	220
24	6.024	19.2	26.4	520	40	910
48	6.048	38.4	52.8	2100	21	3600
110	6.110	88	121	11000	10	16500

** R_{DC} = Resistencia en DC, $R_{AC} = 1.3 \times R_{DC} - 1W$

Figure 9.1: Overview of Finder 40.31.9.024.0000 Relay Characteristics. This image displays several tables and graphs, including general characteristics (insulation, immunity), contact characteristics (current vs. operations, current vs. DC voltage), and detailed coil characteristics for DC, AC, and AC/DC versions, showing nominal voltage, resistance, and power consumption.

Parameter	Value
Model Number	40.31.9.024.0000
Contact Configuration	SPDT (Single Pole Double Throw)
Coil Voltage	24 VDC
Coil Current	27 mA
Coil Resistance	900 Ohm
Contact Current Rating	10 Amps
Maximum Switching Current	10 Amps (20A peak)
Contact Voltage VAC	250 VAC
Contact Material	Silver Nickel
Mounting Type	Through Hole (PCB Mount)
Relay Terminals	Solder
External Depth	29 mm
External Height	25 mm
External Width	12.4 mm
Nominal Operating Power	650 mW
RoHS Compliant	Yes
Item Weight	0.01 ounces (approx. 0.28 grams)

10. WARRANTY AND SUPPORT

This Finder relay is manufactured to high-quality standards. For specific warranty information, please refer to the terms and conditions provided by your point of purchase or contact Finder directly. Technical support and further documentation can typically be found on the official Finder website or through authorized distributors.