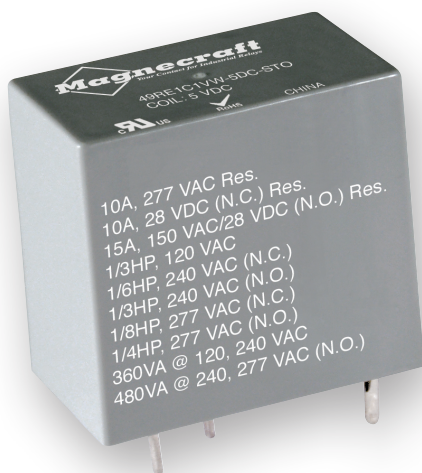
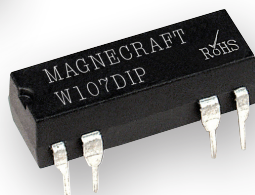
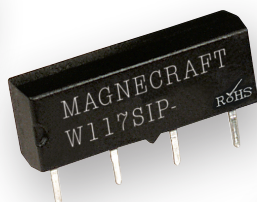
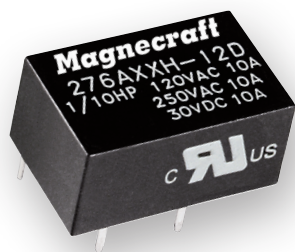


# Magnecraft® Printed Circuit Board & Reed Relays

Catalog  
**2010**



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Built in small industry-standard packages, the Magnecraft line of printed circuit board (PCB) relays is ideal for a variety of applications.

### Key Features

- Space-saving package design
- Single and double pole switching
- Ratings range from 0.25 to 20 A
- Sealed for wash-down process
- Wave solderable



117SIP



107DIP



171DIP



172DIP



49



276

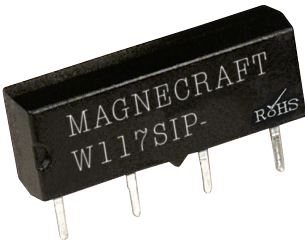


976

| Series | Style                   | Contact Configuration | Output Current Range (A) | Output Voltage Range   | Minimum Switching Requirement (mA) | Response Time (ms) | Page |
|--------|-------------------------|-----------------------|--------------------------|------------------------|------------------------------------|--------------------|------|
| 117SIP | Miniature reed relay    | SPST                  | 0.25–0.35                | 120 Vac,<br>200 Vdc    | 10                                 | 0.45               | 4    |
| 107DIP | Miniature reed relay    | SPST                  | 0.25–0.35                | 120 Vac,<br>100 Vdc    | 10                                 | 1                  | 7    |
| 171DIP | Miniature reed relay    | SPST; DPST            | 0.25–0.35                | 60–120 Vac,<br>100 Vdc | 10                                 | 1                  | 10   |
| 172DIP | Miniature reed relay    | SPDT; DPDT            | 0.25–0.35                | 60 Vac,<br>100 Vdc     | 10                                 | 1                  | 13   |
| 49     | Electromechanical relay | SPDT                  | 3–10                     | 120–277 Vac,<br>28 Vdc | 100                                | 25                 | 16   |
| 276    | Electromechanical relay | SPST; SPDT            | 7–10                     | 240 Vac,<br>30 Vdc     | 100                                | 10                 | 19   |
| 976    | Electromechanical relay | SPST; DPDT            | 5–20                     | 240 Vac,<br>30–48 Vdc  | 100                                | 10                 | 22   |

Description

Magnecraft® PCB & Reed Relays  
117SIP  
SPST, 0.35 A (AC); 0.25 A (DC)



117SIP

Description

The 117SIP reed relays are uniquely designed in a standard style in-line package capable of switching up to 0.35 A (AC); 0.25 A (DC).

| Feature                                         | Benefit                                                      |
|-------------------------------------------------|--------------------------------------------------------------|
| Small size                                      | Saves space on a PC board                                    |
| High shock resistance (50 g-n)                  | Helps avoid damage in harsh conditions                       |
| Industry standard pin spacing                   | Designed for simple routing on PC board                      |
| Can withstand a lead-free solder reflow process | Meets industry standards                                     |
| RoHS Compliant                                  | Meets industry standards for RoHS compliant reflow processes |

| Rated Output Current     | Contact Configuration    | Input Voltage (Vdc) | Coil Resistance (Ω) | Wiring Diagram | Standard Part Number |
|--------------------------|--------------------------|---------------------|---------------------|----------------|----------------------|
| 0.35 A (AC); 0.25 A (DC) | SPST-NO                  | 5                   | 500                 | A              | 117SIP-1             |
|                          |                          | 12                  | 1000                | A              | 117SIP-3             |
|                          | SPST-NC                  | 5                   | 500                 | B              | 117SIP-22            |
|                          | SPST-NO w/clamping diode | 5                   | 500                 | C              | 117SIP-6             |
|                          | SPST-NC w/clamping diode | 5                   | 500                 | D              | 117SIP-18            |

Part Number Explanation

117

SIP

-

23

Series:  
107  
117  
171  
172

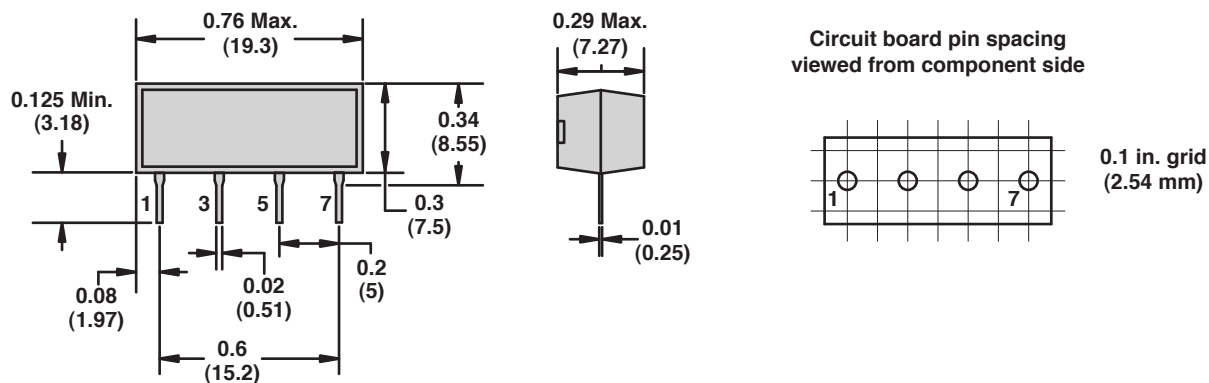
Type:  
SIP = Single in-line pins  
DIP = Dual in-line pins

Number:  
Arbitrary

## Specifications (UL 508)

| Part Number 117SIP                             | Specifications           |
|------------------------------------------------|--------------------------|
| <b>Input Characteristics</b>                   |                          |
| Input Voltage Range                            | 5–24 Vdc                 |
| Operating Range (% of Nominal)                 | 80%–110%                 |
| Average Power Consumption                      | 0.29 W                   |
| Drop-out Voltage Threshold                     | 10%                      |
| <b>Output Characteristics</b>                  |                          |
| Contact Configuration                          | SPST-NO; SPST-NC         |
| Contact Materials                              | Ruthenium                |
| Output Current Load                            | 0.35 A (AC); 0.25 A (DC) |
| Output Voltage Range                           | 120 Vac; 200 Vdc         |
| Output Load Wattage                            | 10 W                     |
| Minimum Switching Requirement                  | 1 mA                     |
| <b>General Characteristics</b>                 |                          |
| Electrical Life (Operations at rated current)  | 200,000 operations       |
| Mechanical Life (Unpowered)                    | 1,000,000,000 operations |
| Operating Time (Response time)                 | 1 ms                     |
| Dielectric Strength (Between coil and contact) | 500 V(rms)               |
| Dielectric Strength (Between poles)            | 500 V(rms)               |
| Dielectric Strength (Between contacts)         | 200 V(rms)               |
| Storage Temperature Range                      | -40–105 °C (-40–221 °F)  |
| Operating Temperature Range                    | -40–85 °C (-40–185 °F)   |
| Vibration Resistance (Operational)             | 20 g-n, 10–2000 Hz       |
| Shock Resistance                               | 50 g-n                   |
| Weight                                         | 1 g (0.035 oz)           |
| Agency Approvals                               | RoHS                     |

Dimensions: Inches (Millimeters)



Wiring Diagrams

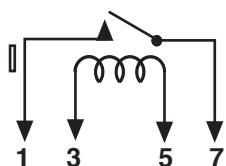


Figure A  
SPST-NO Without diode

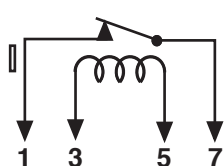


Figure B  
SPST-NC Without diode

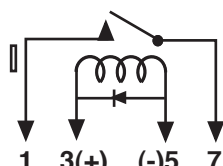


Figure C  
SPST-NO With diode

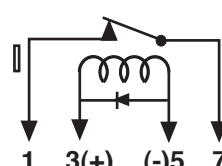


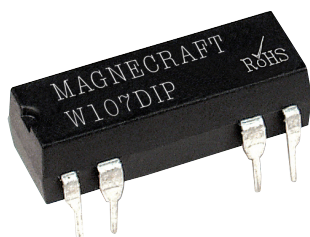
Figure D  
SPST-NC With diode

## Description

# Magnecraft® PCB & Reed Relays

107DIP

SPST-NO, 0.35 A (AC); 0.25 A (DC)



107DIP

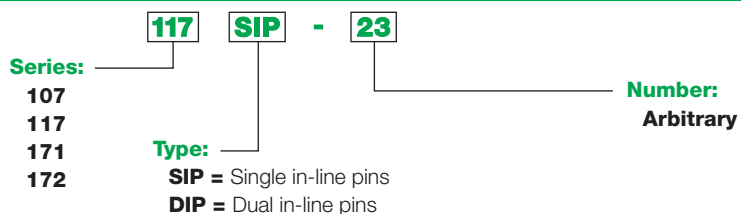
## Description

The 107DIP reed relays are uniquely designed in a standard style dual in-line package capable of switching up to 0.35 A (AC); 0.25 A (DC).

| Feature                                         | Benefit                                                      |
|-------------------------------------------------|--------------------------------------------------------------|
| Small size                                      | Saves space on a PC board                                    |
| High shock resistance (50 g-n)                  | Helps avoid damage in harsh conditions                       |
| Industry standard pin spacing                   | Designed for simple routing on PC board                      |
| Can withstand a lead-free solder reflow process | Meets industry standards                                     |
| RoHS Compliant                                  | Meets industry standards for RoHS compliant reflow processes |

| Rated Output Current     | Contact Configuration    | Input Voltage (Vdc) | Coil Resistance (Ω) | Wiring Diagram | Standard Part Number |
|--------------------------|--------------------------|---------------------|---------------------|----------------|----------------------|
| 0.35 A (AC); 0.25 A (DC) | SPST-NO                  | 5                   | 500                 | E              | 107DIP-1             |
|                          |                          | 12                  | 1000                | E              | 107DIP-3             |
|                          | SPST-NO w/clamping diode | 5                   | 500                 | F              | 107DIP-5             |
|                          |                          | 12                  | 1000                | F              | 107DIP-7             |

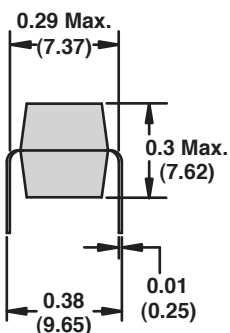
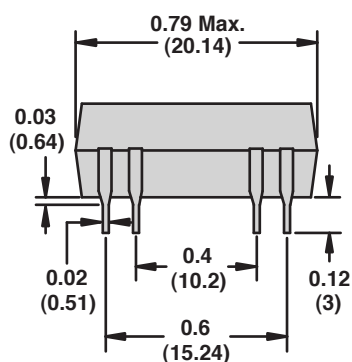
## Part Number Explanation



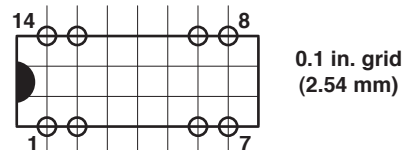
## Specifications (UL 508)

| Part Number 107DIP                             | Specifications           |
|------------------------------------------------|--------------------------|
| <b>Input Characteristics</b>                   |                          |
| Input Voltage Range                            | 5–24 Vdc                 |
| Operating Range (% of Nominal)                 | 80%–110%                 |
| Average Power Consumption                      | 0.29 W                   |
| Drop-out Voltage Threshold                     | 10%                      |
| <b>Output Characteristics</b>                  |                          |
| Contact Configuration                          | SPST-NO                  |
| Contact Materials                              | Ruthenium                |
| Output Current Load                            | 0.35 A (AC); 0.25 A (DC) |
| Output Voltage Range                           | 120 Vac; 100 Vdc         |
| Output Load Wattage                            | 10 W                     |
| Minimum Switching Requirement                  | 1 mA                     |
| <b>General Characteristics</b>                 |                          |
| Electrical Life (Operations at rated current)  | 200,000 operations       |
| Mechanical Life (Unpowered)                    | 1,000,000,000 operations |
| Operating Time (Response time)                 | 1 ms                     |
| Dielectric Strength (Between coil and contact) | 1000 V(rms)              |
| Dielectric Strength (Between poles)            | 1000 V(rms)              |
| Dielectric Strength (Between contacts)         | 200 V(rms)               |
| Storage Temperature Range                      | -40–105 °C (-40–221 °F)  |
| Operating Temperature Range                    | -40–85 °C (-40–185 °F)   |
| Vibration Resistance (Operational)             | 20 g-n, 10–2000 Hz       |
| Shock Resistance                               | 50 g-n                   |
| Weight                                         | 1 g (0.035 oz)           |
| Agency Approvals                               | RoHS                     |

## Dimensions: Inches (Millimeters)



Circuit board pin spacing  
viewed from component side



## Wiring Diagrams

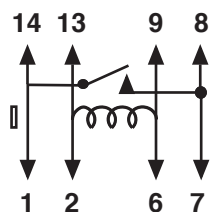


Figure E  
SPST-NO Without diode

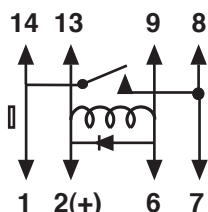


Figure F  
SPST-NO With diode

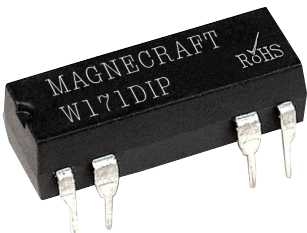
Description

Magnecraft® PCB & Reed Relays

171DIP

SPST, 0.35 A (AC); 0.25 A (DC)

DPST-NO, 0.35 A (AC); 0.25 A (DC)



171DIP

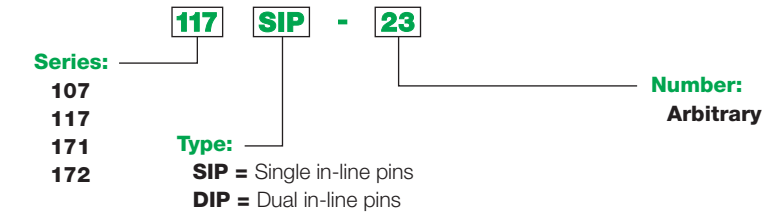
Description

The 171DIP reed relays are uniquely designed in a standard style dual in-line package capable of switching up to 0.35 A (AC); 0.25 A (DC).

| Feature                                         | Benefit                                                      |
|-------------------------------------------------|--------------------------------------------------------------|
| Small size                                      | Saves space on a PC board                                    |
| High shock resistance (50 g-n)                  | Helps avoid damage in harsh conditions                       |
| Industry standard pin spacing                   | Designed for simple routing on PC board                      |
| Can withstand a lead-free solder reflow process | Meets industry standards                                     |
| RoHS Compliant                                  | Meets industry standards for RoHS compliant reflow processes |

| Rated Output Current     | Contact Configuration    | Input Voltage (Vdc) | Coil Resistance (Ω) | Wiring Diagram | Standard Part Number |
|--------------------------|--------------------------|---------------------|---------------------|----------------|----------------------|
| 0.35 A (AC); 0.25 A (DC) | SPST-NO                  | 5                   | 500                 | G              | 171DIP-2             |
|                          |                          | 12                  | 1000                | G              | 171DIP-4             |
|                          | SPST-NO w/clamping diode | 5                   | 500                 | H              | 171DIP-7             |
|                          |                          | 24                  | 2200                | H              | 171DIP-10            |
|                          | SPST-NC                  | 5                   | 500                 | I              | 171DIP-12            |
|                          |                          | 12                  | 1000                | I              | 171DIP-14            |
|                          | SPST-NC w/clamping diode | 5                   | 500                 | J              | 171DIP-17            |
|                          | DPST-NO                  | 5                   | 200                 | K              | 171DIP-21            |
|                          |                          | 12                  | 500                 | K              | 171DIP-23            |
|                          | DPST-NO w/clamping diode | 5                   | 200                 | L              | 171DIP-25            |
|                          |                          | 12                  | 500                 | L              | 171DIP-27            |
|                          |                          | 24                  | 2200                | L              | 171DIP-28            |

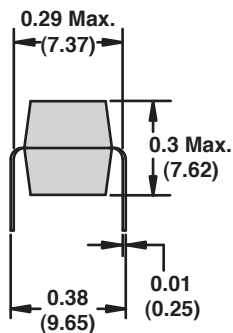
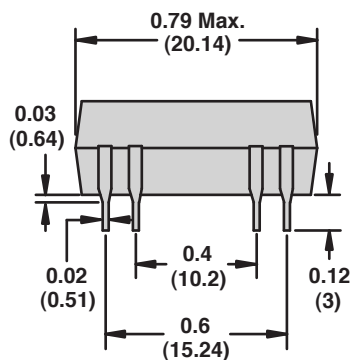
Part Number Explanation



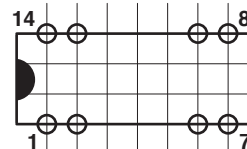
## Specifications (UL 508)

| Part Number 171DIP                             | Specifications                         |
|------------------------------------------------|----------------------------------------|
| <b>Input Characteristics</b>                   |                                        |
| Input Voltage Range                            | 5–24 Vdc                               |
| Operating Range (% of Nominal)                 | 80%–110%                               |
| Average Power Consumption                      | 0.29 W                                 |
| Drop-out Voltage Threshold                     | 10%                                    |
| <b>Output Characteristics</b>                  |                                        |
| Contact Configuration                          | SPST-NO; SPST-NC; DPST-NO              |
| Contact Materials                              | Ruthenium                              |
| Output Current Load                            | 0.35 A (AC); 0.25 A (DC)               |
| Output Voltage Range                           | 60 Vac (SPST); 120 Vac (DPST); 100 Vdc |
| Output Load Wattage                            | 10 W                                   |
| Minimum Switching Requirement                  | 1 mA                                   |
| <b>General Characteristics</b>                 |                                        |
| Electrical Life (Operations at rated current)  | 200,000 operations                     |
| Mechanical Life (Unpowered)                    | 1,000,000,000 operations               |
| Operating Time (Response time)                 | 1 ms                                   |
| Dielectric Strength (Between coil and contact) | 1000 V(rms)                            |
| Dielectric Strength (Between poles)            | 1000 V(rms)                            |
| Dielectric Strength (Between contacts)         | 200 V(rms)                             |
| Storage Temperature Range                      | -40–105 °C (-40–221 °F)                |
| Operating Temperature Range                    | -40–85 °C (-40–185 °F)                 |
| Vibration Resistance (Operational)             | 20 g-n, 10–2000 Hz                     |
| Shock Resistance                               | 50 g-n                                 |
| Weight                                         | 1 g (0.035 oz)                         |
| Agency Approvals                               | RoHS                                   |

**Dimensions: Inches (Millimeters)**



Circuit board pin spacing  
viewed from component side



0.1 in. grid  
(2.54 mm)

**Wiring Diagrams**

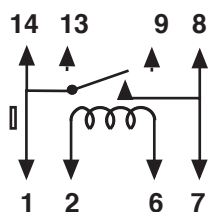


Figure G

SPST-NO Without diode

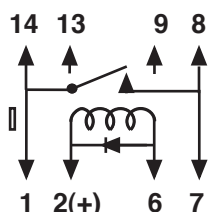


Figure H

SPST-NO With diode

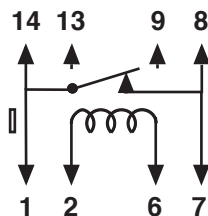


Figure I

SPST-NC Without diode

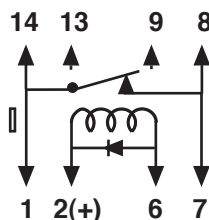


Figure J

SPST-NC With diode

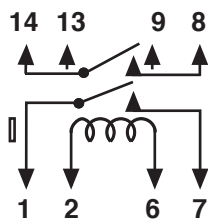


Figure K

DPST-NO Without diode

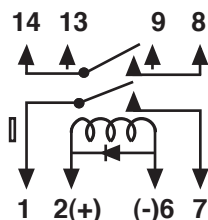


Figure L

DPST-NO With diode

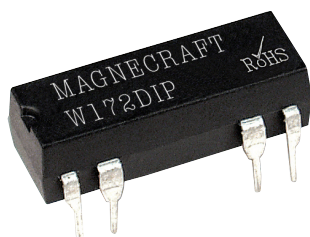
## Description

# Magnecraft® PCB & Reed Relays

172DIP

SPDT, 0.35 A (AC); 0.25 A (DC)

DPDT, 0.35 A (AC); 0.25 A (DC)



172DIP

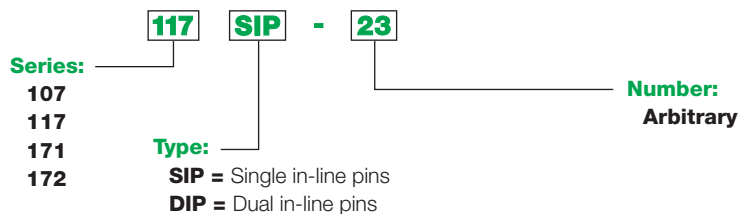
## Description

The 172DIP reed relays are uniquely designed in a standard style dual in-line package capable of switching up to 0.35 A (AC); 0.25 A (DC).

| Feature                                         | Benefit                                                      |
|-------------------------------------------------|--------------------------------------------------------------|
| Small size                                      | Saves space on a PC board                                    |
| High shock resistance (50 g-n)                  | Helps avoid damage in harsh conditions                       |
| Industry standard pin spacing                   | Designed for simple routing on PC board                      |
| Can withstand a lead-free solder reflow process | Meets industry standards                                     |
| RoHS Compliant                                  | Meets industry standards for RoHS compliant reflow processes |

| Rated Output Current     | Contact Configuration | Input Voltage (Vdc) | Coil Resistance (Ω) | Wiring Diagram | Standard Part Number |
|--------------------------|-----------------------|---------------------|---------------------|----------------|----------------------|
| 0.35 A (AC); 0.25 A (DC) | SPDT                  | 5                   | 200                 | M              | 172DIP-1             |
|                          |                       |                     |                     | O              | 172DIP-31            |
|                          |                       |                     |                     | P              | 172DIP-141           |
|                          |                       | 12                  | 1000                | M              | 172DIP-3             |
|                          |                       |                     |                     | O              | 172DIP-33            |
|                          |                       |                     |                     | P              | 172DIP-145           |
|                          | SPDT w/clamping diode | 5                   | 200                 | N              | 172DIP-5             |
|                          |                       |                     |                     | Q              | 172DIP-147           |
|                          |                       | 12                  | 1000                | N              | 172DIP-7             |
|                          |                       |                     |                     | Q              | 172DIP-149           |
|                          |                       | 24                  | 2200                | N              | 172DIP-8             |
|                          |                       |                     |                     | Q              | 172DIP-150           |
|                          | DPDT                  | 12                  | 266                 | R              | 172DIP-19            |
|                          | DPDT w/clamping diode | 5                   | 46                  | S              | 172DIP-21            |
|                          |                       | 12                  | 266                 | S              | 172DIP-23            |

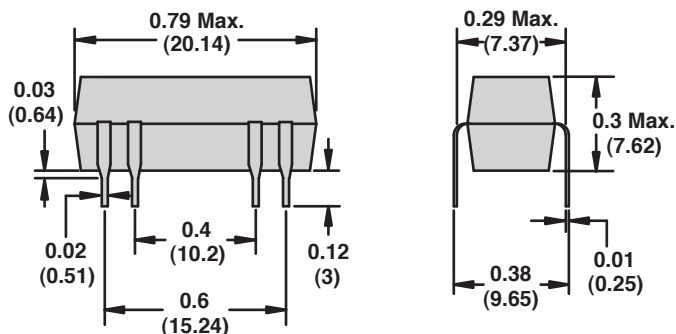
## Part Number Explanation



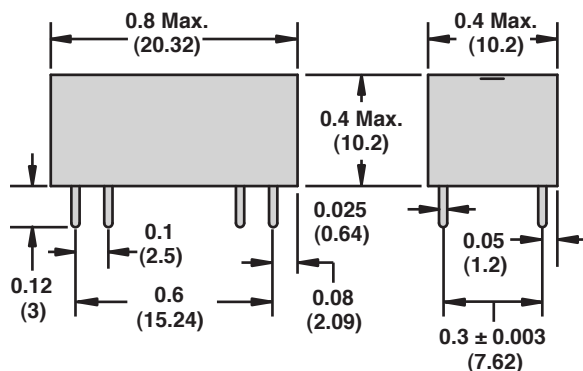
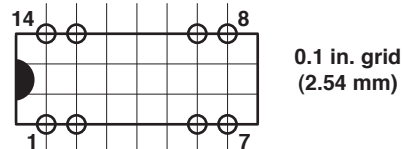
## Specifications (UL 508)

| Part Number 172DIP                             | Specifications           |
|------------------------------------------------|--------------------------|
| <b>Input Characteristics</b>                   |                          |
| Input Voltage Range                            | 5–24 Vdc                 |
| Operating Range (% of Nominal)                 | 80%–110%                 |
| Average Power Consumption                      | 0.29 W                   |
| Drop-out Voltage Threshold                     | 10%                      |
| <b>Output Characteristics</b>                  |                          |
| Contact Configuration                          | SPDT; DPDT               |
| Contact Materials                              | Ruthenium                |
| Output Current Load                            | 0.35 A (AC); 0.25 A (DC) |
| Output Voltage Range                           | 60 Vac; 100 Vdc          |
| Output Load Wattage                            | 5 W                      |
| Minimum Switching Requirement                  | 1 mA                     |
| <b>General Characteristics</b>                 |                          |
| Electrical Life (Operations at rated current)  | 200,000 operations       |
| Mechanical Life (Unpowered)                    | 1,000,000,000 operations |
| Operating Time (Response time)                 | 1 ms                     |
| Dielectric Strength (Between coil and contact) | 1000 V(rms)              |
| Dielectric Strength (Between poles)            | 1000 V(rms)              |
| Dielectric Strength (Between contacts)         | 150 V(rms)               |
| Storage Temperature Range                      | -40–105 °C (-40–221 °F)  |
| Operating Temperature Range                    | -40–85 °C (-40–185 °F)   |
| Vibration Resistance (Operational)             | 20 g-n, 10–2000 Hz       |
| Shock Resistance                               | 50 g-n                   |
| Weight                                         | 1 g (0.035 oz)           |
| Agency Approvals                               | RoHS                     |

Dimensions: Inches (Millimeters)



Circuit board pin spacing  
viewed from component side



Wiring Diagrams

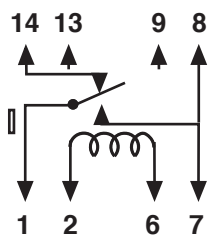


Figure M  
SPDT Without diode

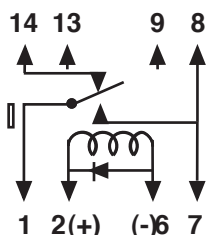


Figure N  
SPDT With diode

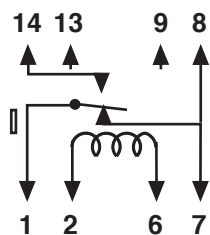


Figure O  
SPDT Without diode

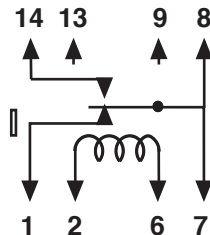


Figure P  
SPDT Without diode

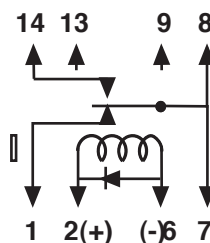


Figure Q  
With diode

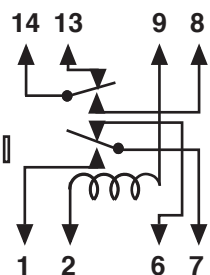


Figure R  
DPDT Without diode

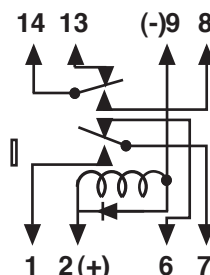


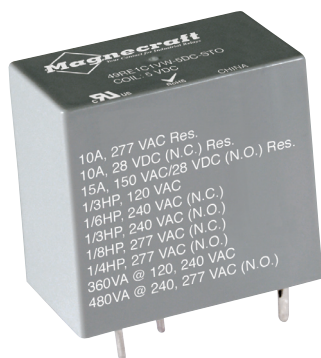
Figure S  
DPDT With diode

## Description

# Magnecraft® PCB & Reed Relays

49

SPDT, 3 to 10 A



49

## Description

The 49 series enclosed printed circuit board relays are used to switch resistive and inductive loads in industrial applications.

| Feature                                                 | Benefit                                                                      |
|---------------------------------------------------------|------------------------------------------------------------------------------|
| Small size                                              | Enables relay to be used in smaller applications by saving space on PC board |
| Rated up to 10 A                                        | Higher switching capacity expands range of potential applications            |
| TV3 rating                                              | Makes it ideal for appliance use                                             |
| Tungsten, ballast and motor ratings (10 A version only) | Approved for use with inductive loads                                        |
| Multiple footprint configurations                       | Fits a variety of applications and increases functionality and ease of use   |

| Rated Output Current (A) | Contact Configuration | Input Voltage (Vdc) | Coil Resistance (Ω) | Style                                      | Standard Part Number |
|--------------------------|-----------------------|---------------------|---------------------|--------------------------------------------|----------------------|
| 3                        | SPDT                  | 3                   | 90                  | Narrow footprint                           | 49RE1C1VG-3DC-SIL    |
|                          |                       | 5                   | 235                 | Narrow footprint                           | 49RE1C1VG-5DC-SIL    |
|                          |                       | 12                  | 1350                | Narrow footprint                           | 49RE1C1VG-12DC-SIL   |
|                          |                       |                     | 1640                | Wide footprint                             | 49RE1C2VF-12DC-SIL   |
| 5                        | SPDT                  | 5                   | 235                 | Narrow footprint                           | 49RE1C1VG-5DC-STO    |
|                          |                       | 6                   | 410                 | Wide footprint                             | 49RE1C2VF-6DC-STO    |
|                          |                       | 12                  | 1350                | Narrow footprint                           | 49RE1C1VG-12DC-STO   |
|                          |                       | 18                  | 3000                | Narrow footprint                           | 49RE1C1VG-18DC-STO   |
|                          |                       | 24                  | 5400                | Narrow footprint                           | 49RE1C1VG-24DC-STO   |
| 10                       | SPDT                  | 5                   | 235                 | Narrow footprint with top mounting bracket | 49R1C4VG-5DC-STO     |
|                          |                       | 5                   | 100                 | Narrow footprint                           | 49RE1C1VW-5DC-STO    |
|                          |                       | 12                  | 600                 | Narrow footprint                           | 49RE1C1VW-12DC-STO   |
|                          |                       | 24                  | 2400                | Narrow footprint                           | 49RE1C1VW-24DC-STO   |

## Part Number Explanation

**Series:** 49

**Footprint:**  
**RE1C1** = Narrow footprint  
**RE1C2** = Wide footprint  
**R1C4** = Narrow footprint with top mounting bracket

**Output Current Load:**  
**VG** = 3 A or 5 A (RE1C1) or 10 A (R1C4)  
**VF** = 3 A or 5 A (RE1C2)  
**VW** = 10 A (RE1C1 or R1C4)

**Coil Voltage:**  
**3DC** = 3 Vdc  
**5DC** = 5 Vdc  
**6DC** = 6 Vdc  
**12DC** = 12 Vdc  
**18DC** = 18 Vdc  
**24DC** = 24 Vdc

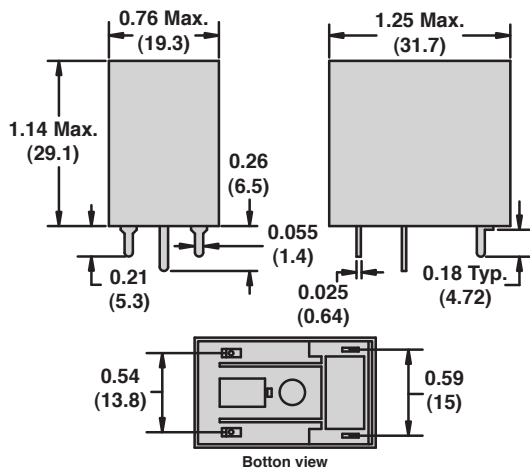
**Contact Material:**  
**SIL** = Fine silver  
**STO** = Silver tin oxide

## Specifications (UL 508)

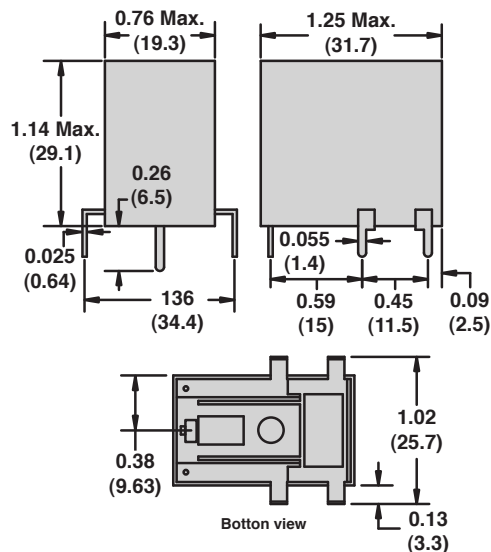
| Part Number                                    |                 | 49 Relay 3 A                                                       | 49 Relay 5 A               | 49 Relay 10 A                                                                                           |
|------------------------------------------------|-----------------|--------------------------------------------------------------------|----------------------------|---------------------------------------------------------------------------------------------------------|
| Input Characteristics                          |                 |                                                                    |                            |                                                                                                         |
| Input Voltage Range                            |                 | NO: 3–24 Vdc;<br>NC: 5–24 Vdc                                      | 3–24 Vdc                   |                                                                                                         |
| Operating Range (% of Nominal)                 |                 | 75%–110%                                                           |                            |                                                                                                         |
| Average Power Consumption                      |                 | 0.11 W                                                             |                            |                                                                                                         |
| Drop-out Voltage Threshold                     |                 | 10%                                                                |                            |                                                                                                         |
| Output Characteristics                         |                 |                                                                    |                            |                                                                                                         |
| Contact Configuration                          |                 | SPDT                                                               |                            |                                                                                                         |
| Contact Materials                              |                 | Fine Silver                                                        | Silver Tin Oxide           |                                                                                                         |
| Contact Ratings                                | General Purpose | 3 A @ 120 Vac                                                      | 5 A @ 120 Vac              | 10 A @ 240 Vac                                                                                          |
|                                                | Resistive       | NO: 15 A @ 150 Vac 50/60 Hz,<br>15 A @ 28 Vdc;<br>NC: 3 A @ 28 Vdc | NO/NC: 5 A @ 28 Vdc        | NO: 15 A @ 150 Vac 50/60 Hz,<br>15 A @ 28 Vdc;<br>NC: 10 A @ 277 Vac 50/60 Hz,<br>10 A @ 28 Vdc         |
|                                                | Motor           | N/A                                                                | N/A                        | NO: 1/3 hp @ 120/240 Vac, 1/4 hp @ 277 Vac;<br>NC: 1/3 hp @ 120 Vac, 1/6 hp @ 240 Vac, 1/8 hp @ 277 Vac |
|                                                | Tungsten        | N/A                                                                | N/A                        | NC: 2 A @ 120 Vac                                                                                       |
|                                                | Ballast         | N/A                                                                | N/A                        | NO/NC: 1.7 A @ 277 Vac                                                                                  |
|                                                | TV-3            | N/A                                                                | N/A                        | 120 Vac                                                                                                 |
|                                                | Pilot Duty      | N/A                                                                | B300: 360 VA @ 120/240 Vac | B300: 360 VA @ 120/240 Vac;<br>480 VA @ 240/277 Vac (NO)                                                |
| Minimum Switching Requirement                  |                 | 100 mA                                                             |                            |                                                                                                         |
| General Characteristics                        |                 |                                                                    |                            |                                                                                                         |
| Electrical Life (Operations @ rated current)   |                 | 100,000 operations                                                 |                            |                                                                                                         |
| Mechanical Life (Unpowered)                    |                 | 10,000,000 operations                                              |                            |                                                                                                         |
| Response Time                                  |                 | 25 ms                                                              |                            |                                                                                                         |
| Dielectric Strength (Between coil and contact) |                 | 2500 V(rms)                                                        | 2500 V(rms)                | 1500 V(rms)                                                                                             |
| Dielectric Strength (Between contacts)         |                 | 500 V(rms)                                                         | 500 V(rms)                 | 500 V(rms)                                                                                              |
| Storage Temperature Range                      |                 | -40–85 °C (-40–185 °F)                                             |                            |                                                                                                         |
| Operating Temperature Range                    |                 | -40–55 °C (-40–131 °F)                                             |                            |                                                                                                         |
| Vibration Resistance (Operational)             |                 | 3 g-n, 10–55 Hz                                                    |                            |                                                                                                         |
| Shock Resistance                               |                 | 10 g-n                                                             |                            |                                                                                                         |
| Weight                                         |                 | 42 g (1.48 oz)                                                     |                            |                                                                                                         |
| Available Footprint Styles                     |                 | RE1C1 & RE1C2                                                      | RE1C1, RE1C2 & R1C4        | RE1C1 & R1C4                                                                                            |
| Agency Approvals                               |                 | UR (E258297), RoHS                                                 |                            |                                                                                                         |

## Dimensions: Inches (Millimeters)

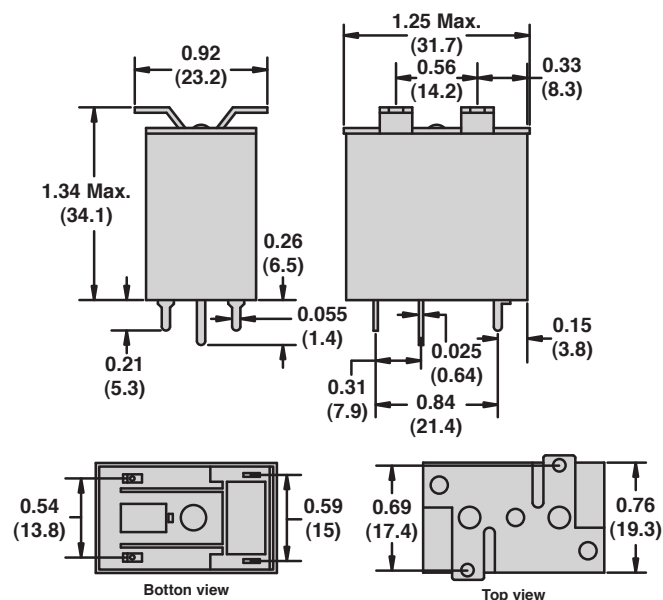
Narrow footprint style (RE1C1)



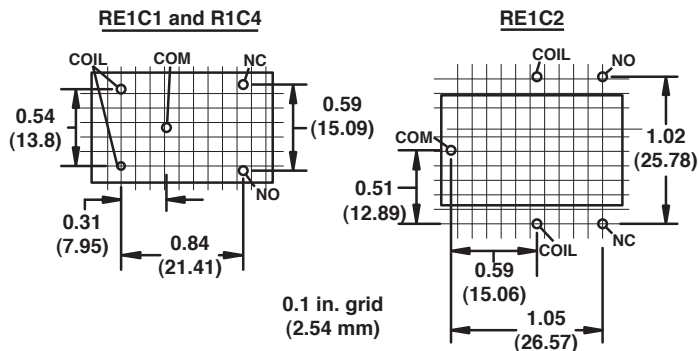
Wide footprint style (RE1C2)



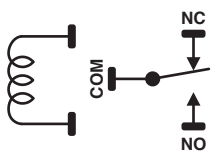
Top mounting bracket style (R1C4)



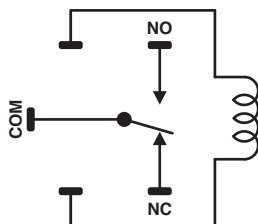
Circuit board pin spacing  
viewed from component side on PCB board



## Wiring Diagrams



Style RE1C1 & R1C4

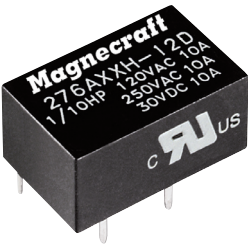


Style RE1C2

# Description

# Magnecraft® PCB & Reed Relays

276  
SPST, 10 A  
SPDT, 7 A



276

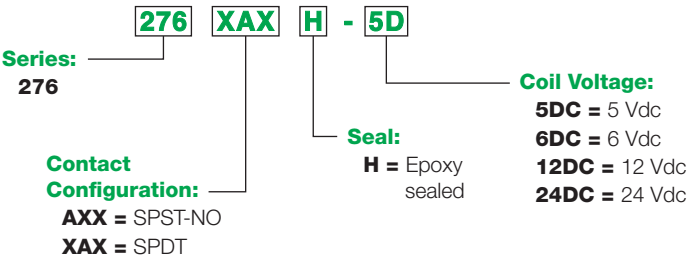
## Description

The 276 series relays offer high switching capacity in a small package.

| Feature                         | Benefit                                                                           |
|---------------------------------|-----------------------------------------------------------------------------------|
| High current switching capacity | Enables the relay to switch up to 10 A                                            |
| HP rated                        | UL approved to switch up to 1/10 hp                                               |
| Low-profile design              | Uses less than 12.7 mm <sup>2</sup> (0.5 in <sup>2</sup> ) of space on a PC board |
| Small footprint                 | Saves valuable space on a printed circuit board                                   |
| Epoxy sealed                    | Allows the relay to be washed after assembly                                      |

| Rated Output Load (A) | Contact Configuration | Input Voltage (Vdc) | Coil Resistance (Ω) | Standard Part Number |
|-----------------------|-----------------------|---------------------|---------------------|----------------------|
| 7                     | SPDT                  | 5                   | 125                 | 276XAXH-5D           |
|                       |                       | 12                  | 720                 | 276XAXH-12D          |
|                       |                       | 24                  | 2880                | 276XAXH-24D          |
| 10                    | SPST-NO               | 5                   | 125                 | 276AXXH-5D           |
|                       |                       | 12                  | 720                 | 276AXXH-12D          |

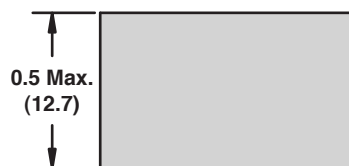
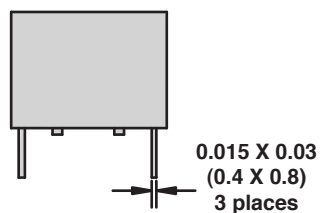
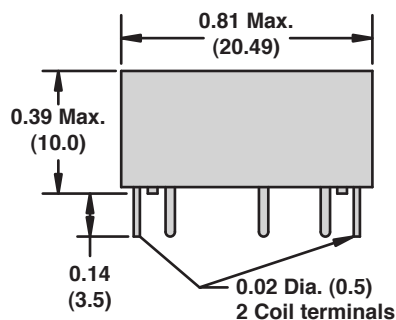
## Part Number Explanation



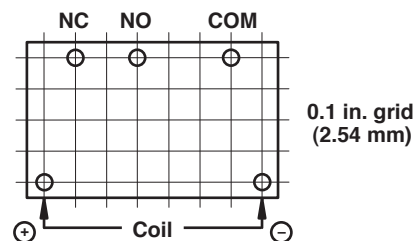
### Specifications (UL 508)

| Part Number                                    | 276XAX                                                        | 276AXX                                                         |
|------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|
| Input Characteristics                          |                                                               |                                                                |
| Input Voltage Range                            | 3–24 Vdc                                                      |                                                                |
| Operating Range (% of Nominal)                 | 80%–110%                                                      |                                                                |
| Average Power Consumption                      | 0.2 W                                                         |                                                                |
| Drop-out Voltage Threshold                     | 10%                                                           |                                                                |
| Output Characteristics                         |                                                               |                                                                |
| Contact Configuration                          | SPDT                                                          | SPST-NO                                                        |
| Contact Materials                              | Silver Alloy                                                  |                                                                |
| Output Current Load                            | 7 A                                                           | 10 A                                                           |
| Maximum Output Voltage                         | 7 A @ 240 Vac 50/60 Hz;<br>7 A @ 30 Vdc;<br>1/10 hp @ 120 Vac | 10 A @ 240 Vac 50/60 Hz;<br>10 A @ 30 Vdc;<br>1/6 hp @ 120 Vac |
| Minimum Switching Requirement                  | 100 mA                                                        |                                                                |
| General Characteristics                        |                                                               |                                                                |
| Electrical Life (Operations at rated current)  | 100,000 operations                                            |                                                                |
| Mechanical Life (Unpowered)                    | 5,000,000 operations                                          |                                                                |
| Operating Time (Response time)                 | 10 ms                                                         |                                                                |
| Dielectric Strength (Between coil and contact) | 2000 Vac                                                      |                                                                |
| Dielectric Strength (Between contacts)         | 1000 Vac                                                      |                                                                |
| Storage Temperature Range                      | -40–85 °C (-40–185 °F)                                        |                                                                |
| Operating Temperature Range                    | -40–70 °C (-40–158 °F)                                        |                                                                |
| Vibration Resistance (Operational)             | 1.5 g-n, 10–55 Hz                                             |                                                                |
| Shock Resistance                               | 20 g-n                                                        |                                                                |
| Weight                                         | 5.5 g (0.19 oz)                                               |                                                                |
| Agency Approvals                               | UR (E43641), RoHS                                             |                                                                |

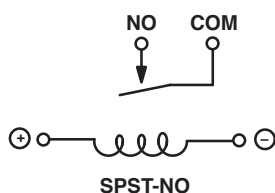
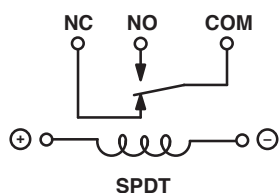
Dimensions: Inches (Millimeters)



Circuit board pin spacing  
viewed from component side



Wiring Diagrams



### Description

# Magnecraft® PCB & Reed Relays

976

SPDT, 12 to 20 A

DPDT, 5 A



976

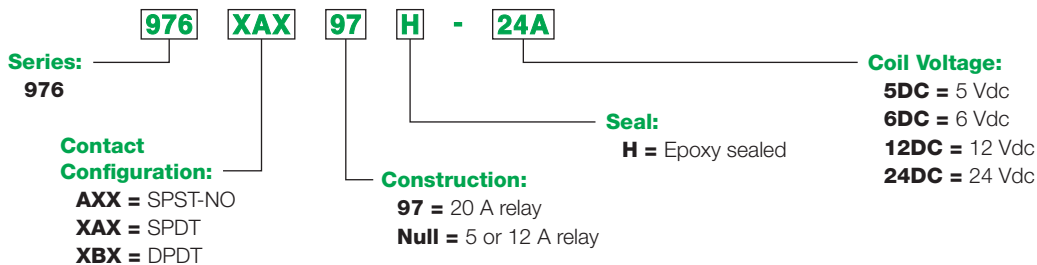
### Description

The 976 series enclosed printed circuit board relays are used to switch resistive and inductive loads in industrial applications.

| Feature                         | Benefit                                      |
|---------------------------------|----------------------------------------------|
| High current switching capacity | Enables the relay to switch up to 20 A       |
| AC coil voltages available      | Expands application use                      |
| 8 mm coil to contact clearance  | Meets international standards                |
| Epoxy sealed                    | Allows the relay to be washed after assembly |

| Rated Output Current (A) | Contact Configuration | Input Voltage    | Coil Resistance (Ω) | Standard Part Number |
|--------------------------|-----------------------|------------------|---------------------|----------------------|
| 5                        | DPDT                  | 12 Vdc           | 270                 | 976XBXH-12D          |
|                          |                       | 24 Vac 50/60 Hz  | 250                 | 976XBXH-24A          |
|                          |                       | 24 Vdc           | 1100                | 976XBXH-24D          |
|                          |                       | 120 Vac 50/60 Hz | 5600                | 976XBXH-120A         |
|                          |                       | 240 Vac 50/60 Hz | 22000               | 976XBXH-240A         |
| 12                       | SPDT                  | 24 Vac 50/60 Hz  | 250                 | 976XAXH-24A          |
|                          |                       | 24 Vdc           | 1100                | 976XAXH-24D          |
|                          |                       | 120 Vac 50/60 Hz | 5600                | 976XAXH-120A         |
|                          |                       | 240 Vac 50/60 Hz | 22000               | 976XAXH-240A         |
| 20                       | SPDT                  | 24 Vac 50/60 Hz  | 250                 | 976XAX97H-24A        |
|                          |                       | 24 Vdc           | 1100                | 976XAX97H-24D        |
|                          |                       | 120 Vac 50/60 Hz | 5600                | 976XAX97H-120A       |

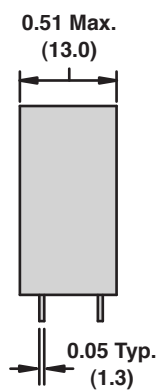
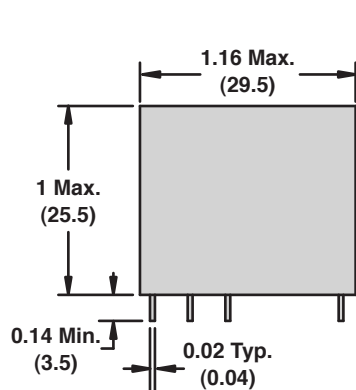
## Part Number Explanation



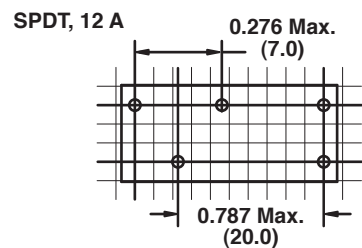
## Specifications (UL 508)

| Part Number                                    | 976XAX97H                                                                        | 976XAXH                                                                                         | 976XBXH                                 |
|------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------|
| Input Characteristics                          |                                                                                  |                                                                                                 |                                         |
| Input Voltage Range                            | 6–240 Vac;<br>3–110 Vdc                                                          |                                                                                                 |                                         |
| Operating Range (% of Nominal)                 | 85%–110%                                                                         |                                                                                                 |                                         |
| Average Consumption                            | 1.2 VA;<br>0.53 W                                                                |                                                                                                 |                                         |
| Drop-out Voltage Threshold                     | 30% AC;<br>10% DC                                                                |                                                                                                 |                                         |
| Output Characteristics                         |                                                                                  |                                                                                                 |                                         |
| Contact Configuration                          | SPDT                                                                             | SPDT                                                                                            | DPDT                                    |
| Contact Materials                              | Silver Alloy                                                                     |                                                                                                 |                                         |
| Output Current Load                            | 20 A                                                                             | 12 A                                                                                            | 5 A                                     |
| Maximum Switching Voltage                      | 300 V                                                                            |                                                                                                 |                                         |
| Output Voltage Range                           | 20 A @ 125 Vac 50/60 Hz;<br>16 A @ Vac 50/60 Hz;<br>20 A @ 30 Vdc; 10 A @ 48 Vdc | NO: 12 A @ 240 vac 50/60 Hz,<br>12 A @ 30 Vdc;<br>NC: 10 A @ 240 Vac 50/60 Hz,<br>10 A @ 30 Vdc | 5 A @ 240 Vac 50/60 Hz;<br>5 A @ 30 Vdc |
| General Characteristics                        |                                                                                  |                                                                                                 |                                         |
| Electrical Life (Operations at Rated Current)  | 100,000 operations                                                               |                                                                                                 |                                         |
| Mechanical Life (Unpowered)                    | 10,000,000 operations                                                            |                                                                                                 |                                         |
| Operating Time (Response time)                 | 15 ms                                                                            |                                                                                                 |                                         |
| Dielectric Strength (Between coil and contact) | 5000 V(rms)                                                                      |                                                                                                 |                                         |
| Dielectric Strength (Between contacts)         | 1000 V(rms)                                                                      |                                                                                                 |                                         |
| Storage Temperature Range                      | -40–85 °C (-40–185 °F)                                                           |                                                                                                 |                                         |
| Operating Temperature Range                    | -40–55 °C (-40–131 °F)                                                           |                                                                                                 |                                         |
| Vibration Resistance (Operational)             | 3 g-n, 10-55 Hz                                                                  |                                                                                                 |                                         |
| Shock Resistance                               | 10 g-n                                                                           |                                                                                                 |                                         |
| Weight                                         | 17 g (0.6 oz)                                                                    |                                                                                                 |                                         |
| Agency Approvals                               | UR (E191122), TUV, RoHS                                                          |                                                                                                 |                                         |

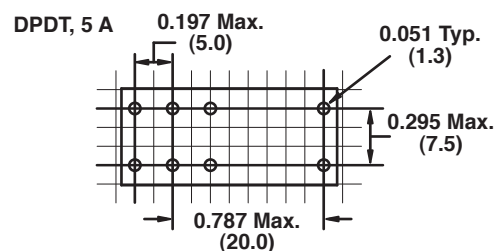
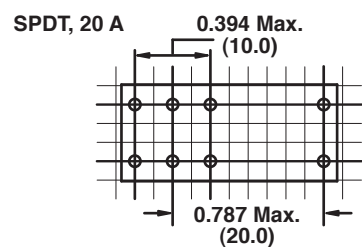
Dimensions: Inches (Millimeters)



Circuit board pin spacing  
viewed from component side



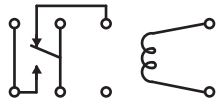
0.1 in. grid  
(2.54 mm)



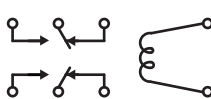
Wiring Diagrams



SPDT, 12 A



SPDT, 20 A



DPDT, 5 A

## Introduction

Printed circuit board (PCB) relays are compact relay devices used for power management in control system designs which require the relay to be mounted directly on the printed circuit board. They are used in applications where the relay must be small enough to be mounted on a printed circuit board. They must be easy to manufacture with the same machinery used in the printed circuit board line.

## How Electromechanical PCB Relays Work

Electromechanical PCB relays consist of a coil, armature and contacts (see figure below). When power is applied to the coil, the resulting magnetic field causes the armature to move and the contacts to open or close.

### Advantages

- Higher contact ratings than reed relays and smaller than traditional plug-in relays
- A wider range of form, fit and function than reed relays
- UL recognized to meet industry standards for product safety and compliance

## How Reed Relays Work

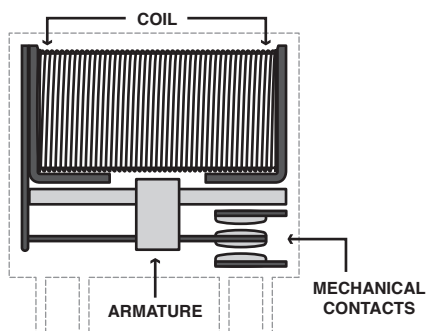
Reed relays consist of a coil wrapped around a sealed glass tube containing the reeds and contacts (see figure below). When power is applied to the coil, the resulting magnetic field causes the reeds to move and the contacts to close (1).

### Advantages

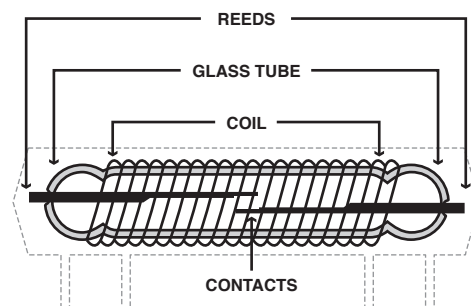
- Highly reliable due to longer mechanical and electrical life than electromechanical relays
- Can switch about ten times faster than an electromechanical relay with similar ratings
- Small, industry standard packaging which does not require unique machinery to populate

### Electromechanical PCB Relays vs. Reed Relays

Typical Electromechanical PCB Relay



Typical Reed Relay



(1) Note that it is important to keep reed relays at a proper distance from each other because of the possibility of magnetic-interaction between them. Proper magnetic shielding must be used to contain stray magnetic fields. When installing reed relays into equipment, be aware of the devices in the equipment which can produce magnetic fields. Position the relays as far away as possible from any stray magnetic fields, and shield them to prevent false operations. A general rule is to space reed relays no closer together than 0.5 inches.

## Applications

The Magnecraft PCB relay offer consists of reed relays ideal for applications requiring fast, reliable low-level switching capability in a very small package, and electromechanical PCB relays ideal for applications requiring higher ratings than reed relays and a smaller package than traditional plug-in relays.

### Typical Examples of PCB and Reed Relay Applications



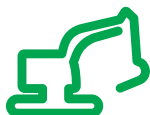
#### Automotive

*Anti-lock brake systems, cruise control, doors, power steering, power windows, sunroofs*



#### Electronics & Communication

*Cellular phones, computers, copiers, microphones, radio transmitters, speakers*



#### Construction & Security

*Conveyor belts, elevators, emergency lamps, hoists, lifts, security alarms*



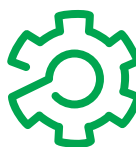
#### HVAC & Refrigeration

*Air conditioners, blowers, compressors, motorized ducts/vents, refrigerators, space heaters*



#### Domestic Appliances

*Coffee machines, dish washers, food processors, microwaves, ovens, stoves, vacuum cleaners, washing machines*



#### Industrial Automation

*Human/machine interfaces, motion controllers, PLCs, power supplies, solder/wave reflow systems, variable speed drives*

## The Magnecraft Range of Printed Circuit Board and Reed Relays

Printed circuit board and reed relays are compact devices used for high power and low level applications that require printed circuit board assembly.

## Selecting a Printed Circuit Board or Reed Relay

The list below is an example of the specifications to look for when selecting a printed circuit board or reed relay.

|                        |       |
|------------------------|-------|
| Input voltage:         | _____ |
| Coil resistance:       | _____ |
| Contact rating:        | _____ |
| Contact configuration: | _____ |
| Mounting style:        | _____ |

Use the catalog specifications or online parametric search to determine a recommended part number ([www.magnecraft.com](http://www.magnecraft.com)).

The Magnecraft website ([www.magnecraft.com](http://www.magnecraft.com)) was designed to enable users to easily find the proper relay to fit design requirements and to help simplify and shorten workflow.

## Easily find the proper relay to fit design requirements

### ■ Online Catalog

Find the right product by choosing specifications compare products side-by-side and view technical specifications, 2D and 3D drawings and associated accessories.

### ■ Cross Reference Search

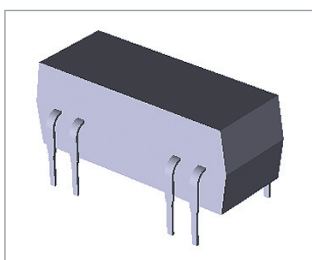
Search our comprehensive database to identify by manufacturer and part number, and link directly to part specifications.

### ■ 3D CAD Library

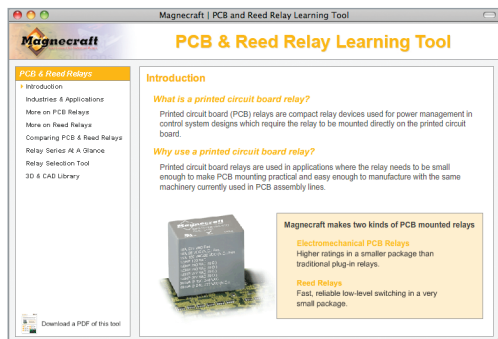
View, email, download or insert a file directly into your open CAD software pane and select from 18 different file formats.

### ■ Order Free Samples

Magnecraft offers free samples as a courtesy to individuals and companies evaluating our products in their designs and applications. Sample orders are subject to approval.



3D Models



PCB & Reed Relay Learning Tool

## Simplify and shorten workflow

### ■ Interactive Tools

View interactive learning tools such as our PCB & Reed Relay Learning Tool which helps you learn more about Magnecraft's electromechanical PCB relays and reed relays, including industries and applications, principles of operation and advantages of using each type of relay.

### ■ Distributor Inventory Search

Search authorized distributors' current Magnecraft inventory and buy online. (Buy online not available for all distributors).







**Schneider Electric USA, Inc.**

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The information and dimensions in this catalog are provided for the convenience of our customers. While this information is believed to be accurate, Schneider Electric reserves the right to make updates and changes without prior notification and assumes no liability for any errors or omissions.

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