## Specifications

## Ratings

## Coil Ratings

| Rated voltage |  | Rated current |  | Coil resistance | Must operate voltage | Must release voltage | Max. voltage | Power consumption |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | 50 Hz | 60 Hz |  |  |  |  |  |
| AC | 6 V | 443 mA | 385 mA | 3.1 ת | 80\% max. of rated voltage | $30 \%$ min. of rated voltage at 60 Hz $25 \%$ min. of rated voltage at 50 Hz | $110 \%$ of rated voltage | Approx. 2.3 VA at 60 Hz <br> Approx. 2.7 VA at 50 Hz |
|  | 12 V | 221 mA | 193 mA | $13.7 \Omega$ |  |  |  |  |
|  | 24 V | 110 mA | 96.3 mA | $48.4 \Omega$ |  |  |  |  |
|  | 100 V | 26.6 mA | 23.1 mA | $760 \Omega$ |  |  |  |  |
|  | 110 V | 24.2 mA | 21.0 mA | $932 \Omega$ |  |  |  |  |
|  | 200 V | 13.3 mA | 11.6 mA | 3,160 $\Omega$ |  |  |  |  |
|  | 220 V | 12.1 mA | 10.5 mA | 3,550 $\Omega$ |  |  |  |  |
|  | 230 V | 10.0 mA | 11.5 mA | 4,250 $\Omega$ |  |  |  |  |
|  | 240 V | 11.0 mA | 9.6 mA | 4,480 $\Omega$ |  |  |  |  |
| DC | 6 V | 224 mA |  | $26.7 \Omega$ |  | $15 \%$ min. of rated voltage |  | Approx. 1.4 W |
|  | 12 V | 112 mA |  | $107 \Omega$ |  |  |  |  |
|  | 24 V | 55.8 mA |  | $430 \Omega$ |  |  |  |  |
|  | 48 V | 28.1 mA |  | 1,710 $\Omega$ |  |  |  |  |
|  | 100 V | 13.5 mA |  | 7,390 $\Omega$ |  |  |  |  |
|  | 110 V | 12.3 mA |  | 8,960 $\Omega$ |  |  |  |  |
|  | 125 V | 10.8 mA |  | 11,576 $\Omega$ |  |  |  |  |

Note: 1. The rated current and coil resistance are measured at a coil temperature of $23^{\circ} \mathrm{C}$ with tolerances of $+15 \% /-20 \%$ for AC rated current and $\pm 15 \%$ for DC coil resistance.
2. Performance characteristic data are measured at a coil temperature of $23^{\circ} \mathrm{C}$.
3. The maximum voltage is one that is applicable instantaneously to the Relay coil at $23^{\circ} \mathrm{C}$ and not continuously.
4. For DC-operated Relays with the LED indicator built-in, add an LED current of approx. 5 mA to the rated current.

## Contact Ratings

| Load |  | Resistive load $(\cos \phi=1)$ | Inductive load $(\cos \phi=0.4)$ |
| :---: | :---: | :---: | :---: |
| Contact mechanism |  | Single |  |
| Contact material |  | AgSnIn |  |
| Rated load | NO | 10 A, 250 VAC 10A, 30 VDC | 7 A, 250 VAC |
|  | NC | $\begin{aligned} & 5 \mathrm{~A}, 250 \text { VAC } \\ & 5 \mathrm{~A}, 30 \mathrm{VDC} \end{aligned}$ |  |
| Rated carry current |  | 10 A |  |
| Max. switching voltage |  | 250 VAC, 250 VDC |  |
| Max. switching current |  | 10 A |  |
| Max. switching power | NO | 2,500 VA/300 W |  |
|  | NC | 1,250 VA/150 W |  |

## Characteristics

| Contact resistance | $100 \mathrm{~m} \Omega$ max. |
| :---: | :---: |
| Operate time | AC: 20 ms max. DC: 30 ms max. |
| Release time | $20 \mathrm{~ms} \mathrm{max}$. (40 ms max. for built-in Diode Relays) |
| Max. operating frequency | Mechanical: 18,000 operations/h Electrical: 1,800 operations/h (under rated load) |
| Insulation resistance | $100 \mathrm{M} \Omega \mathrm{min}$. (at 500 VDC ) |
| Dielectric strength | 2,500 VAC $50 / 60 \mathrm{~Hz}$ for 1 min between coil and contacts <br> 1,000 VAC $50 / 60 \mathrm{~Hz}$ for 1 min between contacts of same polarity and terminals of the same polarity <br> 2,500 VAC $50 / 60 \mathrm{~Hz}$ for 1 min between current-carrying parts, non-current-carrying parts, and opposite polarity |
| Insulation method | Basic insulation |
| Impulse withstand voltage | 4.5 kV between coil and contacts (with $1.2 \times 50 \mu \mathrm{~s}$ impulse wave) <br> 3.0 kV between contacts of different polarity (with $1.2 \times 50 \mu \mathrm{~s}$ impulse wave) |
| Pollution degree | 3 |
| Rated insulation voltage | 250 V |
| Vibration resistance | Destruction: 10 to 55 to $10 \mathrm{~Hz}, 0.75-\mathrm{mm}$ single amplitude (1.5-mm double amplitude) Malfunction: 10 to 55 to $10 \mathrm{~Hz}, 0.5-\mathrm{mm}$ single amplitude (1.0-mm double amplitude) |
| Shock resistance | Destruction: $1,000 \mathrm{~m} / \mathrm{s}^{2}$ (approx. 100 G ) Malfunction: $100 \mathrm{~m} / \mathrm{s}^{2}$ (approx. 10 G ) |
| Endurance | Mechanical: 5,000,000 operations min. (at 18,000 operations/h under rated load) Electrical: 100,000 operations h. (at 1,800 operations/h under rated load) |
| Failure rate $P$ level (reference value) | 10 mA at 1 VDC |
| Ambient temperature | Operating: -40 to $60^{\circ} \mathrm{C}$ (with no icing or condensation) |
| Ambient humidity | Operating: 5\% to 85\% |
| Weight | Approx. 90 g |

Note: 1. The values given above are initial values.
2. P level: $\lambda_{60}=0.1 \times 10^{-6} /$ operation
3. Ambient temperature of models with LED indicator is -25 to $60^{\circ} \mathrm{C}$.

## Approved Standards

## UL508 (File No. E41515) © $7 \mathrm{I}_{\text {us }}$

| Coil ratings | Contact ratings |  | Operations |
| :--- | :--- | :--- | :--- |
| 6 to 110 VDC <br> 6 to 240 VAC | N.O. <br> contact | $10 \mathrm{~A}, 250 \mathrm{~V} \mathrm{AC} \mathrm{50/60} \mathrm{~Hz} \mathrm{(Resistive)}$ <br> $10 \mathrm{~A}, 30 \mathrm{~V} \mathrm{DC} \mathrm{(Resistive)}$ <br> $7 \mathrm{~A}, 250 \mathrm{~V} \mathrm{AC} \mathrm{50/60} \mathrm{~Hz} \mathrm{(General} \mathrm{Use)}$ | 100,000 |
|  | N.C. <br> contact | $10 \mathrm{~A}, 250 \mathrm{~V} \mathrm{AC} \mathrm{50/60} \mathrm{~Hz} \mathrm{(Resistive)}$ <br> $10 \mathrm{~A}, 30 \mathrm{~V} \mathrm{DC} \mathrm{(Resistive)}$ <br> $7 \mathrm{~A}, 250 \mathrm{~V} \mathrm{AC} \mathrm{50/60} \mathrm{~Hz} \mathrm{(General} \mathrm{Use)}$ | 100,000 |

CSA Standard: CSA C22.2 No. 14 (File No. LR35535)

| Coil ratings | Number of Poles | Contact ratings | Operations |
| :---: | :---: | :---: | :---: |
|  | 2 | $10 \mathrm{~A}, 250 \mathrm{~V} \mathrm{AC}$ (Resistive) <br> $10 \mathrm{~A}, 30 \mathrm{~V}$ DC (Resistive) <br> 7 A, 250 V AC (General Use) | 100,000 |
| 6 to 125 VDC <br> 6 to 240 VAC | 3 | $\begin{aligned} & \hline 10 \mathrm{~A}, 250 \mathrm{~V} \text { AC (Resistive) } \\ & \text { Same Polarity } \\ & 10 \mathrm{~A}, 30 \mathrm{~V} \text { DC (Resistive) } \\ & \text { Same Polarity } \\ & 7 \text { A, } 250 \mathrm{~V} \mathrm{AC} \text { (General Use) } \\ & \text { Same Polarity } \\ & \hline \end{aligned}$ | 100,000 |

IEC Standard/TÜV Certification: IEC61810-1 (Certification No. R50104853) $\triangle$

| Coil ratings | Contact ratings |  | Operations |
| :---: | :---: | :---: | :---: |
| $\begin{aligned} & 6,12,24,48, \\ & 100,110 \text { VDC } \end{aligned}$ | N.O. contact | $10 \mathrm{~A}, 250 \mathrm{~V}$ AC $50 / 60 \mathrm{~Hz}$ (Resistive) <br> $10 \mathrm{~A}, 30 \mathrm{~V}$ DC (Resistive) <br> 7 A, 250 V AC $50 / 60 \mathrm{~Hz}$ (General Use) | 100,000 |
| $\begin{aligned} & 110,200,220, \\ & 240 \text { VAC } \end{aligned}$ | N.C. contact | 5 A, 250 V AC $50 / 60 \mathrm{~Hz}$ (Resistive) <br> 5 A, 30 V DC (Resistive) <br> 7 A, 250 V AC $50 / 60 \mathrm{~Hz}$ (General Use) | 100,000 |

Note: When Relays are mounted on the PF083A-E or PF113A-E, the maximum carrying current is 9 A .

## Engineering Data

## Reference Data

## Maximum Switching Power



Rated Carry Current vs. Ambient Rated Temperature


Note: The lower limit of the ambient operating temperature for models with built-in operation indicators is $-25^{\circ} \mathrm{C}$.

