

# 199 Power Relays

## GENERAL SPECIFICATIONS



DPDT



SPDT



SPST-DM

| PART NUMBERS                                  |                          | 199AX, 199X, 199AMX <sup>1</sup> ,<br>199MX <sup>1</sup> , 199ABX <sup>2</sup> ,<br>199BX <sup>2</sup> | 199ADX, 199DX,<br>199ADYX, 199DYX,<br>199ADB <sup>3</sup> X <sup>2</sup> , 199DBX <sup>2</sup> | 199P <sup>3,4</sup> , 199AP <sup>3,4</sup>                               | 199ADE, 199DE,<br>199ADBE <sup>2</sup> , 199DBE <sup>2</sup>               |
|-----------------------------------------------|--------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------------|
| CONTACT CHARACTERISTICS                       |                          |                                                                                                        |                                                                                                |                                                                          |                                                                            |
| Number and type of contacts                   |                          | SPST, SPDT, DPST, DPDT                                                                                 | SPST-DM, SPST-DB                                                                               | DPDT, SPDT                                                               | SPST-DM                                                                    |
| Contact material                              |                          | AgSnO                                                                                                  |                                                                                                |                                                                          |                                                                            |
| Thermal (carrying) current rating             |                          | 40 A                                                                                                   |                                                                                                | 50 A                                                                     |                                                                            |
| Maximum switching voltage                     |                          | 600 V(rms)                                                                                             |                                                                                                |                                                                          |                                                                            |
| Rated Switching current at voltage            | Resistive                | 40 A at 300 VAC;<br>5 A at 480 VAC;<br>5 A at 600 VAC;<br>40 A at 28 VDC                               | 40 A at 300 VAC;<br>12 A at 480 VAC;<br>10 A at 600 VAC;<br>40 A at 28 VDC                     | 50 A at 300 VAC;<br>5 A at 480 VAC;<br>5 A at 600 VAC;<br>50 A at 28 VDC | 50 A at 300 VAC;<br>12 A at 480 VAC;<br>10 A at 600 VAC;<br>50 A at 28 VDC |
|                                               | Motor                    | 2 HP at 120 to 600 VAC                                                                                 |                                                                                                |                                                                          |                                                                            |
|                                               | Tungsten                 | 15 A at 120 VAC                                                                                        |                                                                                                |                                                                          |                                                                            |
|                                               | Pilot duty               | A600                                                                                                   |                                                                                                |                                                                          |                                                                            |
| Minimum switching requirement                 |                          | 1 A at 5 VAC/VDC                                                                                       |                                                                                                |                                                                          |                                                                            |
| COIL CHARACTERISTICS                          |                          |                                                                                                        |                                                                                                |                                                                          |                                                                            |
| Voltage range                                 |                          | 6 to 600 VAC; 6 to 250 VDC                                                                             |                                                                                                |                                                                          |                                                                            |
| Operating range (% of Nominal)                |                          | 85% to 110% (AC); 80% to 110% (DC) <sup>a</sup>                                                        |                                                                                                |                                                                          |                                                                            |
| Average power consumption (Maximum)           |                          | 10 VA; 4 W                                                                                             |                                                                                                |                                                                          |                                                                            |
| Drop-out voltage threshold                    |                          | 10% (AC/DC)                                                                                            |                                                                                                |                                                                          |                                                                            |
| PERFORMANCE CHARACTERISTICS                   |                          |                                                                                                        |                                                                                                |                                                                          |                                                                            |
| Electrical life (IEC 60947-1)                 | Rated resistive load     | Please refer to Table 3                                                                                |                                                                                                |                                                                          |                                                                            |
| Operating time (response time)                |                          | 30 ms                                                                                                  |                                                                                                |                                                                          |                                                                            |
| Dielectric strength                           | Between coil and contact | 2200 V                                                                                                 | 2200 V                                                                                         | 2200 V                                                                   | 2200 V                                                                     |
|                                               | Between poles            | 2200 V                                                                                                 | N/A                                                                                            | 2200 V                                                                   | N/A                                                                        |
|                                               | Between open contacts    | 1600 V                                                                                                 | 2200 V                                                                                         | 1600 V                                                                   | 2200 V                                                                     |
| ENVIRONMENT                                   |                          |                                                                                                        |                                                                                                |                                                                          |                                                                            |
| Product certifications                        |                          | UL, CSA, CE, RoHS                                                                                      |                                                                                                |                                                                          |                                                                            |
| Ambient temperature range (around the device) |                          | -55 to +100 °C (Storage)                                                                               |                                                                                                |                                                                          |                                                                            |
|                                               |                          | -55 to +55 °C (Operation)                                                                              |                                                                                                |                                                                          |                                                                            |
| Termination <sup>3</sup>                      |                          | 10 (5.3) AWG (mm²)                                                                                     |                                                                                                |                                                                          |                                                                            |
| Terminal tightening torque                    |                          | 11 to 15 in-lb (1.2 to 1.7 Nm)                                                                         |                                                                                                |                                                                          |                                                                            |
| Weight                                        |                          | 227 to 312 g (8 to 11 oz)                                                                              |                                                                                                |                                                                          |                                                                            |

<sup>1</sup> For auxiliary switch ratings, please refer to Table 1.

<sup>2</sup> For ratings with blowout magnet, please refer to Table 2.

<sup>3</sup> For UL listed installations, proper wire rating and terminations required.

<sup>4</sup> Recommended ring, fork, or box wire termination.

<sup>5</sup> Recommended mounting positions: horizontal or vertical (not upside down).

**Table 1: Auxiliary Switch Ratings**

| AUXILIARY SWITCH RATINGS              |         |
|---------------------------------------|---------|
| Resistive Load 120/250 VAC (50/60 Hz) | 10 A    |
| Motor Load 125/250 VAC (50/60 Hz)     | 0.25 HP |
| Tungsten Load 125 VAC (50/60 Hz)      | 3 A     |

**Table 2: Additional DC Ratings with Blowout Magnets**

| RELAY VOLTAGE | RATING W/BLOWOUT MAGNET |
|---------------|-------------------------|
| 110 VDC       | 20 A                    |
| 220 VDC       | 8 A                     |
| 325 VDC       | 4 A                     |
| 500 VDC       | 2 A                     |

**Table 3: Contact Ratings & Electrical Endurance (per IEC 60947-1, 60947-4-1)**

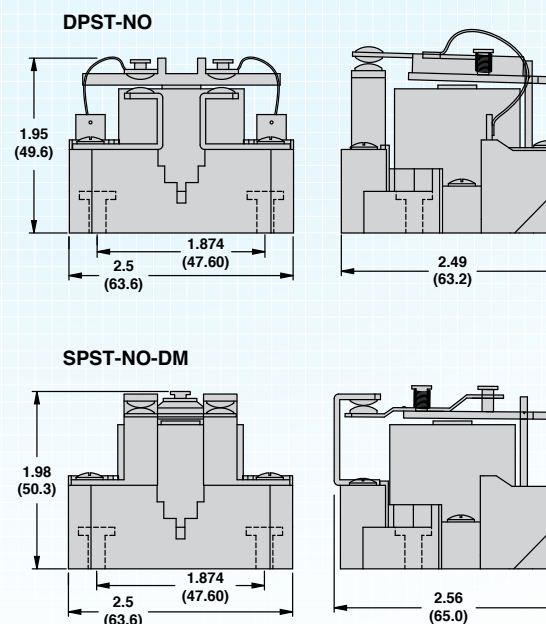
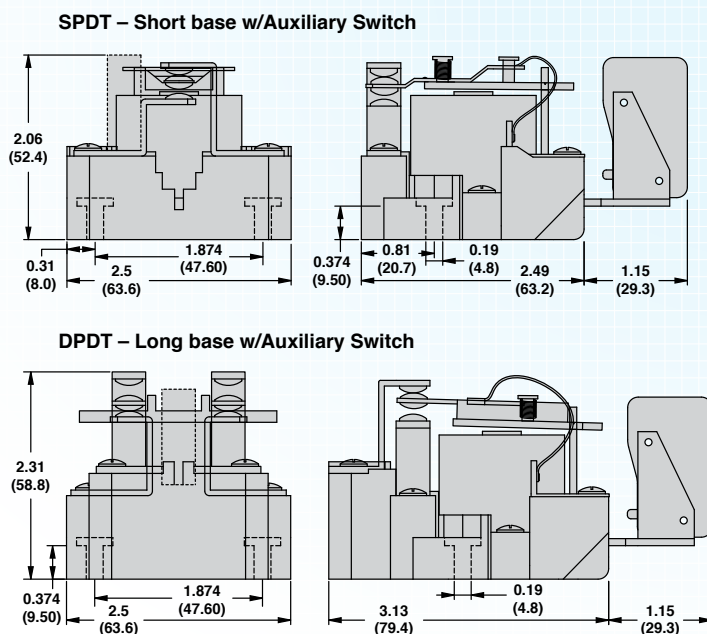
| CURRENT/HORSEPOWER RATINGS | LOAD VOLTAGE | FREQUENCY | LOAD TYPE  | ESTIMATED ELECTRICAL ENDURANCE | SEE NOTE(S) |
|----------------------------|--------------|-----------|------------|--------------------------------|-------------|
| <b>AC LOAD</b>             |              |           |            |                                |             |
| 50 A                       | 300 V        | 50/60 Hz  | Resistive  | 25,000 cycles                  | 1, 4        |
| 40 A                       |              |           |            | 50,000 cycles                  | 2, 4        |
| 2 HP                       | 120 to 600 V |           | Motor      | 50,000 cycles                  | 3, 4        |
| 15 A                       | 120 V        |           | Tungsten   | 20,000 cycles                  | 4, 5        |
| A600                       | ---          | ---       | Pilot Duty | 100,000 cycles                 | 4           |
| <b>DC LOAD</b>             |              |           |            |                                |             |
| 40 A                       | 28 V         | DC        | Resistive  | 100,000 cycles                 | 4           |
| 20 A                       | 110 V        |           |            |                                |             |
| 8 A                        | 220 V        |           |            |                                |             |
| 4 A                        | 325 V        |           |            |                                |             |
| 2 A                        | 500 V        |           |            |                                |             |

## Notes:

- 50 A rating refer to models with pressure wire connectors only.
- Resistive AC load ratings are based on a power factor of 0.85 to 1.0.
- Motor horsepower ratings are based on a power factor of 0.4 to 0.5, and an initial inrush current not in excess of six times the full load current.
- All ratings are based on applying the rated nominal power to the relay coil in such a manner as to provide a "clean" make and break, and does not result in any contact chatter or multiple actuation of the contacts.
- The tungsten rating is based on cold filament inrush current not exceeding 15 times the rated steady state lamp current.

## RELAY DIMENSIONS

shown in inches (millimeters)



## RELAY WIRING DIAGRAMS

