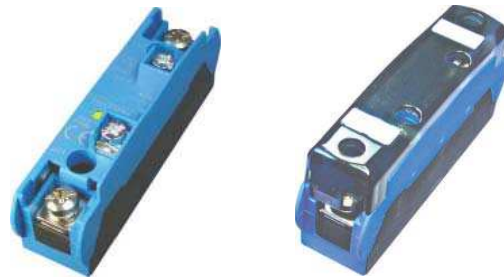


FEATURES/BENEFITS

- New High Efficiency Back-to-Back Thyristors for long lifetime expectancy
- Zero-cross models designed for resistive loads; (-16 Model suitable for most type of loads)
- Input protection and control LED standard
- IP20 protective plastic cover
- Designed in conformity with EN60947-4-3 (IEC947-4-3) and EN60950/VDE0805 (Reinforced Insulation)



| Part No. | Load Voltage | Load Current | Control Voltage | Switch Type |
|------------|--------------|--------------|-----------------|-------------|
| DH24D12 | 12-280 Vac | 12A | 3-32 Vdc | Zero Cross |
| DH24D25 | 12-280 Vac | 25A | 3-32 Vdc | Zero Cross |
| DH24D25-16 | 12-275 Vac | 25A | 3-32 Vdc | Zero Cross |
| DH24D35 | 12-280 Vac | 35A | 3-32 Vdc | Zero Cross |
| DH24D50 | 12-280 Vac | 50A | 3-32 Vdc | Zero Cross |
| DH48D35 | 24-600 Vac | 35A | 3.5-32 Vdc | Zero Cross |
| DH48D50 | 24-600 Vac | 50A | 3.5-32 Vdc | Zero Cross |

NOTES

- 1) Line Voltage (nominal): 24 = 240 Vac; 48 = 480 Vac
- 2) Switch Type: D = Zero-cross turn-on

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

INPUT (CONTROL) SPECIFICATIONS

| | Min | Max | Units |
|--------------------------------|-----|-----|-------|
| Input Voltage Range | | | |
| DH24 | 3 | 32 | V |
| DH48 | 3.5 | 32 | V |
| Input Current Range | | | |
| All Relays | | 14 | mA |
| Must Turn-Off Voltage | 2.0 | | Vdc |
| Reverse Voltage Protection (D) | | 32 | V |
| Clamping Voltage (D) | | 36 | V |
| Input Immunity (EN61000-4-4) | | 2 | kV |
| Input Immunity (EN61000-4-5) | | 2 | kV |

CONTROL CHARACTERISTICS

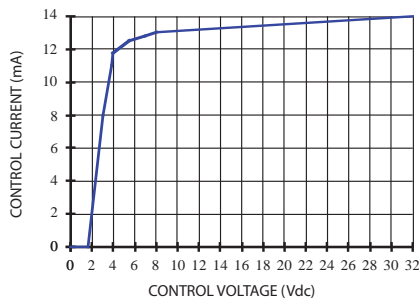


Figure 1

TYPICAL APPLICATION

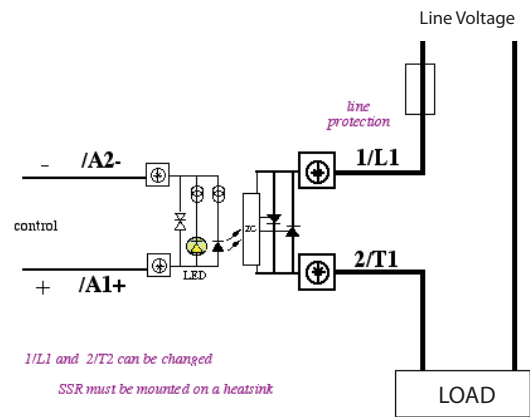
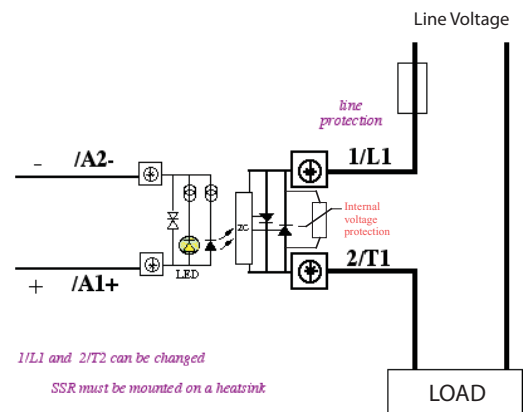


Figure 2a — DH Relays



Typical application:
Motors, lamps, heaters,....

Figure 2b — Models with -16 option only

ELECTRICAL SPECIFICATIONS
(+25°C ambient temperature unless otherwise specified)

OUTPUT (LOAD) SPECIFICATIONS

| | Min | Max | Units |
|--|--|------|-------------------|
| Operating Range | | | |
| DH24 | 12 | 280 | Vac |
| DH24D25-16 | 12 | 275 | Vac |
| DH48 | 12 | 600 | Vac |
| Peak Voltage (VDR Clamping) | | | |
| DH24 | | 600 | V _{peak} |
| DH48 | | 1200 | V _{peak} |
| Load Current Range (Resistive) | | | |
| 12 output current | .005 | 12 | Arms |
| 25 output current | .005 | 25 | Arms |
| 35 output current | .005 | 35 | Arms |
| 50 output current | .005 | 50 | Arms |
| Maximum Surge Current Rating (Non-Repetitive) | | | |
| 12 output current | | 120 | A |
| 25 output current | | 250 | A |
| 35 output current | | 420 | A |
| 50 output current | | 580 | A |
| On-State Voltage Drop | | 0.85 | V |
| Output Power Dissipation (Max) | | | |
| 12 output current | $0.9 \times 0.85 \times I + 0.035 \times I^2$ | | W |
| 25 output current | $0.9 \times 0.85 \times I + 0.016 \times I^2$ | | W |
| 35 output current | $0.9 \times 0.85 \times I + 0.0095 \times I^2$ | | W |
| 50 output current | $0.9 \times 0.85 \times I + 0.0075 \times I^2$ | | W |
| Zero-Cross Window (Typical) | | ±20 | Vac |
| Off-State Leakage Current | | 1 | mA |
| Turn-On Time (60 Hz) | | 8.3 | ms |
| Turn-Off Time (60 Hz) | | 8.3 | ms |

ELECTRICAL SPECIFICATIONS (continued)
(+25°C ambient temperature unless otherwise specified)

OUTPUT (LOAD) SPECIFICATIONS

| | Min | Max | Units |
|--|-----|-------------------------------|------------------|
| Off-State dv/dt | | 500 | V/μs |
| Maximum di/dt (Non-Repetitive) | | 50 | A/μs |
| Operating Frequency | 0.1 | 800 | Hz |
| I²t for fuse matching (<10ms) | | | |
| 12 output current | | 78 | A ² s |
| 25 output current | | 340 | A ² s |
| 35 output current | | 882 | A ² s |
| 50 output current | | 1680 | A ² s |
| Junction-Case Thermal Resistance | | | |
| 12 output current | | 2.5 | °C/W |
| 25 output current | | 1.8 | °C/W |
| 35 output current | | 0.9 | °C/W |
| 50 output current | | 0.75 | °C/W |
| Conducted Immunity Level | | | |
| IEC/EN61000-4-4 (bursts) | | | |
| All Relays | | 2kV criterion A | |
| IEC/EN61000-4-5 (surge) | | | |
| All Relays | | 2kV criterion B | |
| | | 2kV criterion A on -16 models | |

| GENERAL SPECIFICATIONS (+25°C ambient temperature unless otherwise specified) | | | |
|--|----------|------|-------|
| ENVIRONMENTAL SPECIFICATIONS | | | |
| | Min | Max | Units |
| Operating Temperature | | | |
| 25A output current | -40 | +80 | °C |
| Storage Temperature | | | |
| 25A output current | -55 | +125 | °C |
| Ambient Humidity | 40 to 85 | | % |
| Input-Output Isolation | 4000 | | Vrms |

| | | |
|--|------------|------|
| Output-Case Isolation | | |
| 25A output current | 4000 | Vrms |
| 50A output current | 4000 | Vrms |
| Insulation Resistance @500Vdc | | |
| | 1000 | MΩ |
| Rated Impulse Voltage | | |
| | 4000 | V |
| Vibration (10-55 Hz according to CE168) | | |
| | 1.5 | mm |
| Shock (according to CD168) | | |
| | 30 | g |
| Housing Material | | |
| | PA6 UL94V0 | |
| Baseplate | | |
| | Aluminum | |

MECHANICAL SPECIFICATION

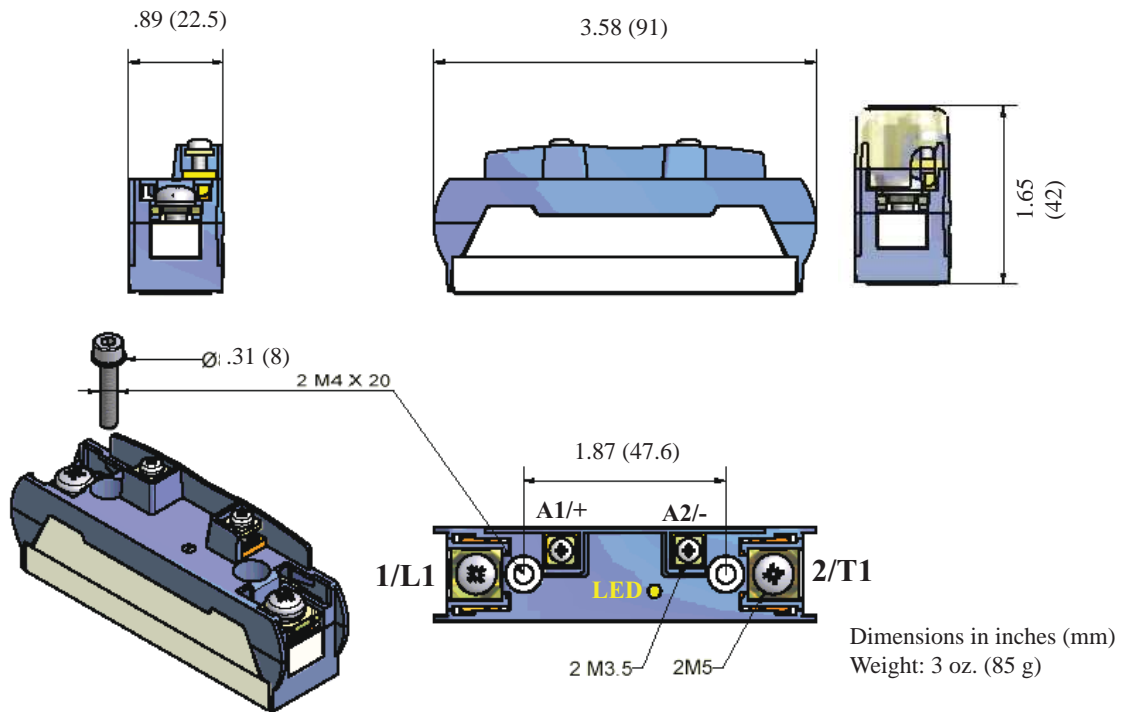


Figure 3

SURGE CURRENT

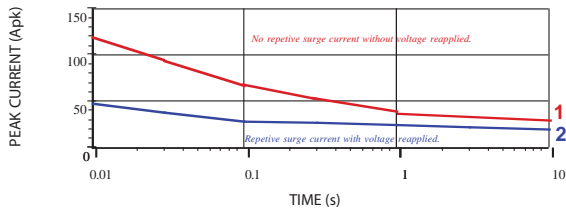


Figure 4a — 12A output current

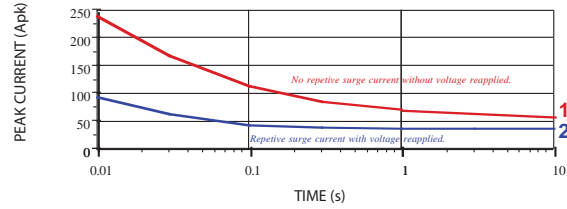


Figure 4b — 25A output current

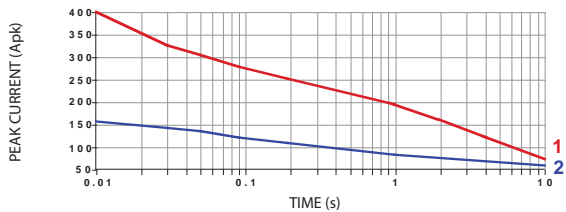


Figure 4c — 35A output current

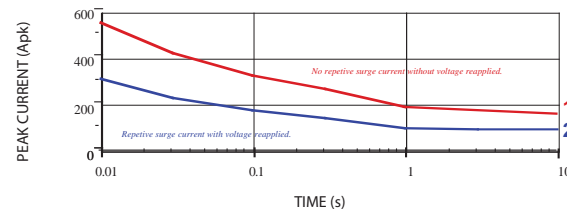


Figure 4d — 50A output current

THERMAL CURVES

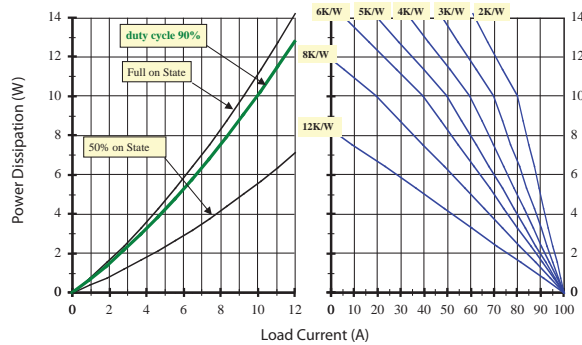


Figure 5a — 12A output power

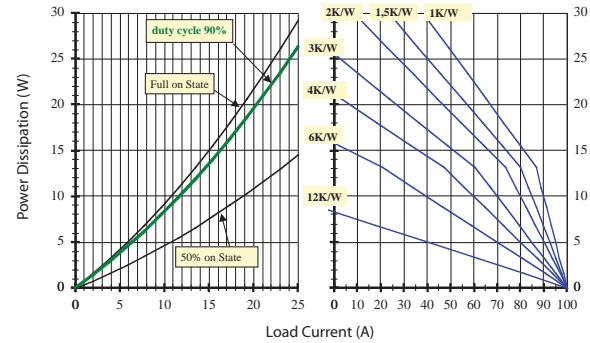


Figure 5b — 25A output power

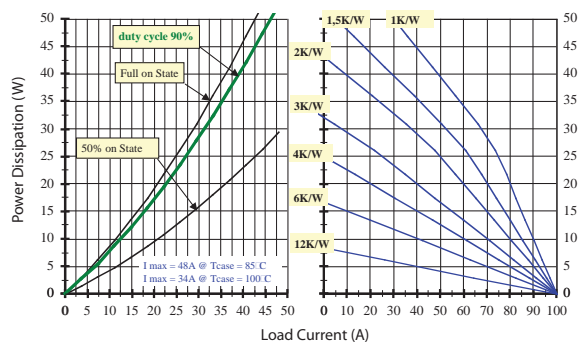


Figure 5c — 35A output power

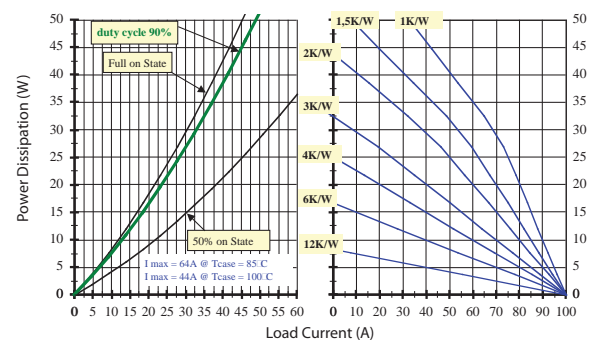

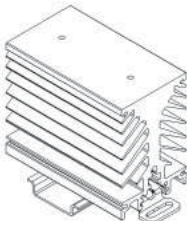

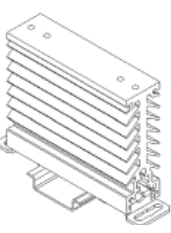


Figure 5d — 50A output power

12°C/W corresponds to a relay without heat sink
6°C/W corresponds to a relay mounted on a DIN-rail adaptor (Teledyne P/N DL12)

HEAT MANAGEMENT

| Number of Wires | | | |
|---|---|--|---|
| FW151 | | FW131 | |
| 2-2.5 °C/W Heatsink | | 3 °C/W Heatsink | |
|  |  |  |  |

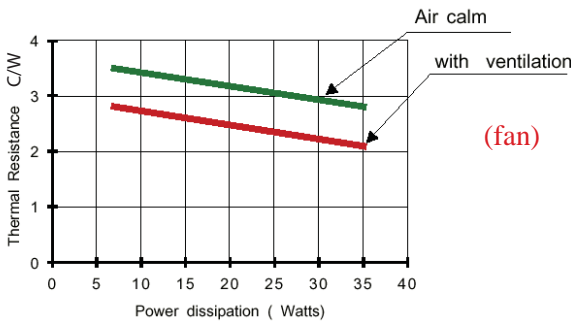


Figure 6a

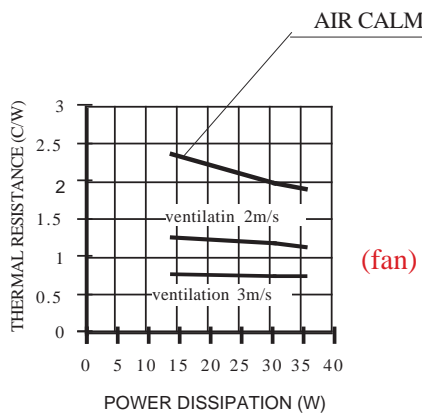


Figure 6b

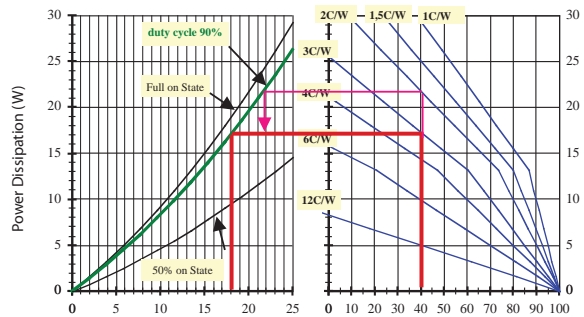


Figure 7a - Load Current (12A Model)

Example 1: 23A @ 40 °C, Recommended Heatsink: 3 °C/W
Example 2: 32A @ 40 °C, Recommended Heatsink: 2 °C/W

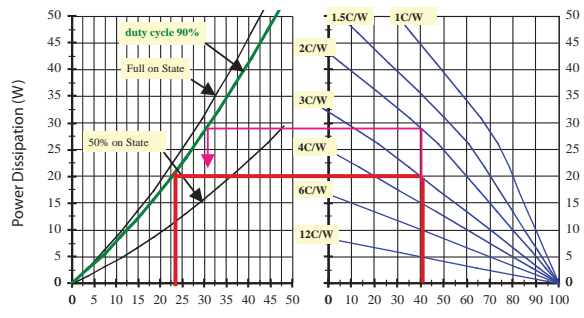


Figure 7b - Load Current (25A Model)

Example 1: 18A @ 40 °C, Recommended Heatsink: 3 °C/W
Example 2: 22A @ 40 °C, Recommended Heatsink: 2 °C/W

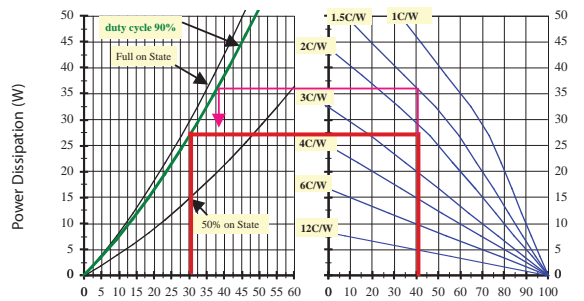

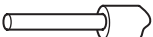
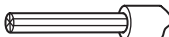
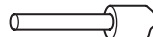
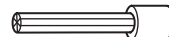
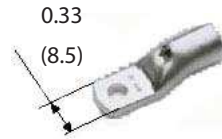


Figure 7c - Load Current (35A & 50A Model)


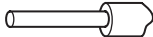

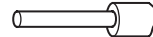

Example 1: 30A @ 40 °C, Recommended Heatsink: 1.5 °C/W
Example 2: 38A @ 40 °C, Recommended Heatsink: 2.2 °C/W

CONTROL WIRING

| Number of Wires | | | | Screwdriver Type | Recommended Torque |
|---|---|---|---|---|--------------------|
| 1 | | 2 | | | |
| Solid (no ferrule) | Fine Stranded (with ferrule) | Solid (no ferrule) | Fine Stranded (with ferrule) |  | N.m |
|  |  |  |  | | |
| AWG18...AWG14 | AWG18...AWG14 | AWG18...AWG14 | AWG18...AWG14 | Pozidriv 2 | 1.2 |



POWER WIRING

| Number of Wires | | | | Screwdriver Type | Recommended Torque |
|---|---|---|---|---|--------------------|
| 1 | | 2 | | | |
| Solid (no ferrule) | Fine Stranded (with ferrule) | Solid (no ferrule) | Fine Stranded (with ferrule) |  | N.m |
|  |  |  |  | | |
| AWG16...AWG8 | AWG16...AWG10 | AWG16...AWG8 | AWG16...AWG10 | Pozidriv 2 | 2 |