

Product Details and Certifications

Cross Reference RA Part Number: 193-T1DC90P A

 Product: **193-T1DC90P**

Description: T1 MCS Overload Relay, IEC, Bimetallic, 72.0-90.0A



Representative Photo Only (actual product may vary based on configuration sections)

OVERLOAD DATA

| | |
|-----------------------------|------------------------|
| Bulletin Number | 193-IEC Overload Relay |
| Overload Relay Type | Biometric |
| Full Load Current Range (A) | 72.0-90.0A |

CONTACTOR DATA

| | |
|-------------------|---------|
| Phases | 3 Phase |
| Separate Mounting | Yes |

CERTIFICATIONS AND APPROVALS

UL
IEC
CSA
CE

IEC Overload Relays & Modular Protection System

Product Overview

Overload Relays

| Bulletin | 193-ED | 193-EE | 193-EC1 | 193-EC2/EC3 | 193-EC5 | 193-EC4 |
|---|-----------------------------------|-----------------------------------|------------------------------|-----------------------------------|------------|----------------------------------|
| Type | E1 Plus Electronic Overload Relay | E1 Plus Electronic Overload Relay | E3 Electronic Overload Relay | E3 Plus Electronic Overload Relay | | E3 Plus Current Monitoring Relay |
| Rated Current (Range) | 0.1...45 A | 0.1...800 A | 0.4...5000 A | | | |
| NEMA Operating Voltage, Nominal | — | 600V | 600V | | | |
| IEC Operating Voltage, Nominal | 690V | 690/1000V | 690/1000V | | | |
| Overload Type | Electronic Overload | Electronic Overload | Microprocessor-Based | | | |
| Trip Class (Fixed) | 10 | — | — | | | |
| Trip Class (Adjustable) | — | 10, 15, 20, 30 | 5...30 | | — | |
| Ambient Temperature Compensated | ✓ | ✓ | ✓ | | — | |
| Reset Type | Manual Only | Automatic and Manual | Automatic and Manual | | | |
| Adjustment Range | 5:1 | 5:1 | 5:1 | | | |
| Phase Loss | 3 s | 3 s | Adjustable Delay | | | — |
| Ground (Earth) Fault | — | Optional | — | Sensitive | Sensitive | Sensitive |
| Overcurrent (Jam) Detection | — | Optional | ✓ | ✓ | ✓ | — |
| Stall Detection | — | — | ✓ | ✓ | ✓ | — |
| Underload Detection | — | — | ✓ | ✓ | ✓ | — |
| Current Imbalance | — | — | ✓ | ✓ | ✓ | — |
| PTC Thermistor Monitoring | — | Optional | — | ✓ | — | — |
| Warning Settings | — | — | ✓ | ✓ | ✓ | ✓ |
| N.C. Trip Contact | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| N.O. Alarm Contact | ✓ | ✓ | — | — | — | — |
| No. of Outputs | — | — | 1 | 2 | 2 | 2 |
| No. of Inputs | — | — | 2 | 4 | 6 | 4 |
| ODVA (DeviceNet) Conformance | — | Optional | ✓ | ✓ | ✓ | ✓ |
| Variable Frequency Drive (VFD) Compatible | — | — | ✓ | ✓ | ✓ | ✓ |
| Product Selection | Page 2-208 | Page 2-208 | Page 2-222 | Page 2-222 | Page 2-222 | Page 2-222 |

2

Overload Relays & Modular Protection System

| Bulletin | 193-K | 193-T1 | 825-P |
|---|---------------------------|----------------------|-------------------------------|
| Type | Bimetallic Overload Relay | | Modular Protection System |
| Rated Current (Range) | 0.1...12.5 A | 0.1...90 A | 0.5...5000 A |
| Operating Voltage, Nominal | 600V | | 120...240V AC/DC, 24...48V DC |
| Overload Type | Bimetallic | | Microprocessor based |
| Trip Class (Fixed) | 10 | 10 | — |
| Ambient Temperature Compensated | ✓ | ✓ | ✓ |
| Reset Type | Automatic and Manual | Automatic and Manual | Automatic and Manual |
| Adjustment Range | 1.5:1 | 1.5:1 | — |
| Phase Loss | Normal Sensing | Normal Sensing | Adjustable delay |
| N.C. Trip Contact | ✓ | ✓ | ✓ |
| N.O. Alarm Contact | ✓ | ✓ | ✓ |
| Variable Frequency Drive (VFD) Compatible | ✓ | ✓ | ✓ |
| Product Selection | Page 2-246 | Page 2-249 | Page 2-260 |

Bulletin 193-T1
Bimetallic Overload Relays
 Product Selection

Thermal Overload Relays

| For Use With* | Setting Range [A]‡ | Max. Back-up fuse [A] | | | Cat. No. |
|---|--------------------|-------------------------------|------------|-------------------|--------------------|
| | | gL/gG | | UL Class K5 | |
| | | 50 kA, 690V AC | | 5 kA, 600V AC | |
| | | IEC/EN 60947-4-1 Coordination | | | |
| | | Type 1 | Type 2 | UL 508 | |
| 100-C09...100-C23 | 0.1...0.16 | 50 | — | 1 | 193-T1AA16 |
| | 0.16...0.25 | 50 | — | 1 | 193-T1AA25 |
| | 0.25...0.40 | 50 | 2 | 1 | 193-T1AA40 |
| | 0.35...0.50 | 50 | 2 | 2 | 193-T1AA50 |
| | 0.45...0.63 | 50 | 2 | 2 | 193-T1AA63 |
| | 0.55...0.80 | 50 | 4 | 3 | 193-T1AA80 |
| | 0.75...1.0 | 50 | 4 | 3 | 193-T1AB10 |
| | 0.90...1.3 | 50 | 6 | 4 | 193-T1AB13 |
| | 1.1...1.6 | 50 | 6 | 5 | 193-T1AB16 |
| | 1.4...2.0 | 50 | 10 | 8 | 193-T1AB20 |
| | 1.8...2.5 | 50 | 16 | 10 | 193-T1AB25 |
| | 2.3...3.2 | 50 | 16 | 12 | 193-T1AB32 |
| | 2.9...4.0 | 50 | 16 | 15 | 193-T1AB40 |
| | 3.5...4.8 | 50 | 16 | 15 | 193-T1AB48 |
| | 4.5...6.3 | 50 | 20 | 20 | 193-T1AB63 |
| 5.5...7.5 | 50 | 25 | 25 | 193-T1AB75 | |
| 7.2...10 | 50 | 25 | 35 | 193-T1AC10 | |
| 9.0...12.5 | 50 | 35 | 50 | 193-T1AC12 | |
| 100-C12...100-C23 | 11.3...16 | 50 | 35 | 60 | 193-T1AC16 |
| 100-C16...100-C23 | 15...20 | 80 | 40 | 80 | 193-T1AC20 |
| | 17.5...21.5 | 80 | 50 | 80 | 193-T1AC21 |
| 100-C23 | 21...25 | 80 | 50 | 100 | 193-T1AC25 |
| 100-C30...100-C37 | 15...20 | 80 | 40 | 80 | 193-T1BC20 |
| | 17.5...21.5 | 80 | 50 | 80 | 193-T1BC21 |
| | 21...25 | 80 | 50 | 100 | 193-T1BC25 |
| | 24.5...30 | 100 | 63 | 100 | 193-T1BC30 |
| | 29...36 | 125 | 63 | 125 | 193-T1BC36 |
| 100-C37 | 33...38 | 125 | 63 | 150 | 193-T1BC38 |
| 100-C43 | 17...25 | 100 | 50 | 100 | 193-T1CC25 |
| | 24.5...36 | 125 | 80 | 125 | 193-T1CC36 |
| | 35...47 | 160 | 100 | 175 | 193-T1CC47 |
| 100-C60...100-C97 | 35...47 | 160 | 100 | 175 | 193-T1DC47 |
| | 45...60 | 200 | 125 | 250§ | 193-T1DC60 |
| 100-C72...100-C97 | 58...75 | 200 | 125 | 300§ | 193-T1DC75 |
| 100-C85...100-C97 | 72...90 | 250 | 160 | 350§ | 193-T1DC90 |
| | 35...47 | 160 | 100 | 175 | 193-T1DC47P |
| Separate mounting required (Panel-mounted device) | 45...60 | 200 | 125 | 250§ | 193-T1DC60P |
| | 58...75 | 200 | 125 | 300§ | 193-T1DC75P |
| | 72...90 | 250 | 160 | 350§ | 193-T1DC90P |
| | | | | | |

* Bulletin 193-T1 overload relays shall not be used with 100-C09...100-C43 conventional DC coil-controlled contactors. Use electronic controlled DC coil versions.

‡ To select the setting range for use in Y-Δ Starters, multiply the rated operating current of the motor by a factor of 0.58.



‡ For motors with service factor of 1.15 or greater, use motor nameplate full load current. For motors with service factor of 1.0, use 90% of the motor nameplate full load current.

§ Max. Back-up fuse [A], UL Class K5, 10 kA, 600V AC



Marking System

Uniform labeling materials for contactors, motor starting equipment, timing relays, and circuit breakers

| | Description | Pkg. Quantity* | Cat. No. |
|---|--|----------------|----------|
|  | Label Sheet 105 self-adhesive paper labels each, 6 x 17 mm | 10 | 100-FMS |
|  | Marking Tag Sheet 160 perforated paper labels each, 6 x 17 mm, to be used with a transparent cover | 10 | 100-FMP |
| | Transparent Cover To be used with marking tag sheets | 100 | 100-FMC |

* Must be ordered in multiples of package quantities.

Thermal Overload Relays








Main Circuits

| Cat. No. | | 193-T1... | |
|--|------------------|-------------|---------|
| Rated isolation voltage U_i | | 690V AC | |
| Rated impulse withstand voltage U_{imp} (between main poles and between main poles and auxiliary circuits) | | 6kV AC | |
| Rated impulse withstand voltage U_{imp} (between auxiliary circuits) | | 4kV AC | |
| Rated operating voltage U_e | IEC | 690V AC | 440V DC |
| | UL, CSA | 600V AC | |
| Rated frequencies | | [Hz] | 50/60 |
| Operational frequencies | | DC...400 Hz | |
| Power dissipation | 193-T1A, 193-T1B | up to 0.4 A | 7 W |
| | | 0.5...36 A | 6 W |
| | | 38 A | 12 W |
| | 193-T1C | 25...47 A | 12 W |
| | 193-T1D | 47...90 A | 18 W |

Control Circuits

| Cat. No. | | 193-T1... | |
|--|------------|-----------|------|
| Rated operating current I_e | | | |
| AC-15 | 24V | [A] | 4 |
| | 240V | [A] | 2 |
| | 400V | [A] | 1.6 |
| | 690V | [A] | 0.15 |
| DC-13 | 24V | [A] | 2 |
| | 110V | [A] | 0.4 |
| | 220V | [A] | 0.25 |
| | 440V | [A] | 0.08 |
| Thermal Current I_{th} | | 5 | |
| Short-circuit withstand, Fuse | IEC, gL/gG | [A] | 6 |
| Short-circuit withstand, circuit breaker \leq 1 kA prospective short-circuit-current | | [A] | 4 |
| Min. contact load for reliable operation | | 15V, 2 mA | |
| UL Rating | | A600/Q300 | |

Terminations

| Cat. Nos. | Main Circuits | | | | | | Control Circuits | Remote Reset | | |
|---|---|---------------------------------|--|-------------|-------------|---|---|--------------|-------------|-------------|
| | 193-T1A... | 193-T1BC20... T1BC25 | 193-T1BC30... T1BC38 | 193-T1C... | 193-T1D... | 193-T1APM | 193-T1... all | 193-T1R... | | |
| Wiring cross section Terminal type |  | |  | | |  |  | | | |
| Terminal screws | M4 | M4 | M4 | M5 | M6 | M4 | M3.5 | M3.5 | | |
|  | Fine stranded with ferrule | 1 conductor [mm ²] | 1.5...4 | 1.5...4 | 2.5...10 | 2.5...16 | 10...35 | 1.5...10 | 1...2.5 | |
| | | 2 conductors [mm ²] | 1.5...4 | 1.5...4 | - | - | - | - | 1...4 | - |
|  | Solid or coarse stranded | 1 conductor [mm ²] | 1.5...6 | 1.5...6 | 2.5...16 | 2.5...25 | 10...35 | 1.5...16 | 1...2.5 | |
| | | 2 conductors [mm ²] | 1.5...6 | 1.5...6 | - | - | - | - | 1...4 | - |
|  | | 1 conductor [AWG] | No. 16...10 | No. 14...10 | No. 10...6 | No. 10...6 | No. 8...1 | No. 16...6 | No. 18...12 | No. 16...12 |
| | | 2 conductors [AWG] | No. 16...10 | No. 14...10 | - | - | - | - | No. 18...12 | - |
| Recommended torque | [N•m] | 1.5 ... 2.2 | 1.5 ... 2.2 | 2.5 ... 3.5 | 2.5 ... 3.5 | 4.5 ... 6 | 1.8...2.8 | 1.2 | 1.2 | |
| | [lb•in] | 13 ... 20 | 13 ... 20 | 22 ... 31 | 22 ... 31 | 40 ... 53 | 16...25 | 10.6 | 10.6 | |
| Pozidrive screwdriver No. | Size | 2 | 2 | 2 | 2 | - | 2 | 2 | 2 | |
| Slotted screwdriver | [mm] | 0.8 x 5.5 | 0.8 x 5.5 | 0.8 x 5.5 | 0.8 x 5.5 | - | 0.8 x 5.5 | 0.8 x 5.5 | 0.8 x 5.5 | |
| Hexagon socket screw | Size | - | - | - | - | 4 | - | - | - | |

Bimetallic Overload Relays

Specifications

193-T1R Remote Reset

| Operating Limits | | |
|-------------------------|----------------------|--------------------------------|
| Maximum Command Impulse | | 5s |
| AC 50/60 Hz | Pick-up [$x U_s$] | 0.8...1.1 |
| | Drop-out [$x U_s$] | |
| DC | Pick-up [$x U_s$] | 0.7...1.25 |
| | Drop-out [$x U_s$] | |
| Coil Consumption | | |
| AC 50/60 Hz | Pick-up [VA/W] | |
| | Hold-in [VA/W] | |
| DC | Pick-up [W] | 17 (24, 110, 125V) 25 (48V) |
| | Hold-in [W] | 17 (24, 110, 125V) 25 (48V) |

General

| Cat. No. | | 193-T1... | |
|---|---|--------------------------------------|--------------|
| Type of Overload Relay | Bimetallic, Ambient Compensated, Phase Loss Sensitive | | |
| Trip Rating (ultimate tripping current) | 120% FLA | | |
| Phase loss sensitivity: Trip rating at phase loss | 115% FLA | | |
| Trip Class | IEC/EN 60947-4-1 | 193-T1A/-T1B | 193-T1C/-T1D |
| | UL | 10A | 10 |
| Reset Mode | Automatic or Manual | | |
| Test release | Manual release of auxiliary contacts | | |
| Trip indication | By means of a flag visible through an opening in the relay front | | |
| Compensation temperature range | -20...+60 °C (-4...+140 °F) | | |
| Climatic Conditions | Release Tolerance at -20 °C | 1.05...1.4 $x I_n$ | |
| | Storage Temperature Range | -55...+80 °C (-67...+176 °F) | |
| | Operating Temperature Range | -20...+60 °C (-4...+140 °F) | |
| | Air moisture (Storage/Operating) (per IEC/EN 60068-2-6), service | 5...95% rel.humidity, non-condensing | |
| Vibration | IEC/EN 61373 (vibration railways) | category 1, class B | |
| | IEC/EN 60092-504 (vibration ships), service (per IEC/EN 68000-2-27), transport | 0.7 g, all axes, 2...200 Hz | |
| Shock | IEC/EN 60068-2-27 (Shock half-sinus), service | 30 g | |
| | IEC/EN 61373 (shock railways) | 11 ms > 5 g all axes | |
| Max. Altitude | 2000 m | | |
| Pollution Degree | 3 | | |
| Degree of Protection, with wires connected | IP2X | | |
| Approximate Weight (unpacked) | 193-T1A, 193-T1B | 0.16...25 A | 0.115 kg |
| | 193-T1B | 30...38 A | 0.155 kg |
| | 193-T1C | 25...47 A | 0.330 kg |
| | 193-T1D | 47...90 A | 0.360 kg |
| | 193-T1...P | 47...90 A | 0.415 kg |
| Standards | IEC/EN 60497-1, -4-1, -5-1, UL508, CSA C22.2 No.14 | | |
| Certifications | CE, cULus | | |