

Description

The ESS60T remotely controllable electronic circuit breaker has been designed for the protection and monitoring of systems in the telecommunications industry. It is designed for the negative switching of loads in -48 V DC power supply systems, which is common practice in telecomms applications. Overcurrent protection is by means of electronic current limitation with electronic load disconnection, to reliably prevent electronic sub-assemblies and load lines from being destroyed through overload or short circuit. The limitation of high currents in the event of short circuits avoids the danger of voltage dips and subsequent system crashes.

Major applications include the power distribution systems of exchange and transmission installations as well as mobile telephone base stations. The ESS60T, which is available in ratings from 5 A to 60 A, would typically be installed 19" racks. The device is programmable via its integral serial interface and its overcurrent threshold can be readily adjusted (e. g. for 60 A rated variant) from 67 A (rated current + 7 A) down to $0.5 \times 67 \text{ A} = 33.5 \text{ A}$. Furthermore undervoltage thresholds can be set up for every load circuit to facilitate a priority based load shedding capability in the event of a failure of the AC power supply (power management for the battery buffer).

ESS60T – CTR Controller Module

ESS60T-CTR is a single board controller-module for remote-control of ESS60T electronic circuit breaker via a RS232 or similar serial communication port. The controller-module is likewise powered from ESS60T -48 V DC

A proprietary protocol embedded in ESS60T firmware is used for communicating between ESS60T-CTR and ESS60T via the serial communication port from a PC host system. A menu-driven "Breaker" OS SW facilitates convenient remote parameter/status reading, trip-level setting etc.

A single ESS60T-CTR module can support up to 22 ESS60T with ESS60T-BS (Bus-Strip) and connecting 3-way ESS60T-WI (Wire) hardware.

Additionally a Demokit comprising all of the above elements and 3 pcs ESS60T-5A is further available for familiarising (application concept debugging) with ESS60T remote power-management capabilities.

Features

- Protection of capacitive loads (see table "Current rating, voltage drop, load capacity")
- Active current limitation during switch-on of capacitive loads and in the event of overload or short circuit
- Electronic disconnection curve, no physical isolation
- Variable current ratings, adjustable by means of integral serial interface
- Manual ON/OFF button (push-push actuation)
- Width per unit only 20 mm
- LED visual status indication
- Resettable, either manually or remotely controlled via serial interface



ESS60T

Technical Data

Operating data

| | |
|---|--|
| Operating voltage U_B | DC -48 V (-36...-60 V) |
| Current rating I_N | 5 A / 10 A / 20 A / 30 A 40 A / 50 A / 60 A |
| Current consumption I_0 | typically 30 mA |
| Trip current | 7 A over I_N (factory pre-set) |
| Status indication | <ul style="list-style-type: none"> ● bicolour LED, <ul style="list-style-type: none"> - GREEN: unit is ON - RED: overload or short circuit - OFF: off condition |
| Undervoltage monitoring | factory pre-set: DC -36 V programmable: DC -36...-48 V |
| Overvoltage protection | factory pre-set: typically DC -65 V |
| Serial interface RS232 (for connection to controller board) | 3-pole interface connector <ul style="list-style-type: none"> ● for programming <ul style="list-style-type: none"> - the overcurrent threshold - the undervoltage monitoring ● for remote switch on and off ● remote reset of the load circuit |

Load circuit

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|-----------------------------|--|
| Load output | power MOSFET switching output (minus switching), no physical isolation |
| Max. installation density | up to 22 poles side by side <ul style="list-style-type: none"> ● natural air convection with vertical installation ● min. air flow 1m/s with horizontal installation |
| Voltage drop at I_N | see table "Current rating, voltage drop, load capacity" |
| Disconnection with overload | programmable via serial interface: $0.5 \times (I_N + 7 \text{ A})$ up to $I_N + 7 \text{ A}$ |
| Trip time | see time/current characteristics |
| Free-wheeling circuit | external free-wheeling diode recommended with inductive load |

General data

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|------------------------------------|---|
| Ambient temperature | -25 °C...+55 °C (-13...+131°F) without moisture condensation, (natural convection) |
| Storage temperature | -40 °C...+85 °C (-40...+185°F) |
| Back-up fuse for ESS60T | <u>not required</u> as it has integral additional fuse protection |
| Typical power dissipation at I_N | ESS60T-10 A: 0.8 W ESS60T-60 A: 10 W |
| Screw terminals | M5 |
| Housing material | plastic/with aluminium heat sink |
| Mounting method | front panel mounting/19" rack mounting |

Technical Data

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|--|---|
| Protection class | housing: IP30 DIN 40050, terminals: IP00 DIN 40050 |
| EMC requirements (EMC directive, CE logo) | emitted interference: EN 61000-6-3 Class B immunity: EN 61000-6-2 Class A |
| Insulation voltage | 1,100 V _{rms} (housing terminals) DC 500 V (interface power connection) |
| Humidity | 0...95 % RH without condensation |
| Approvals (pending) | meets the requirements of EN 60950, UL 60950, CAN/CSA-C22.2 no. 60950 meets the requirements of UL1077, CAN/CSA no. 235 approved to cCSAus, Kema, CE |
| Dimensions | 20 x 63 x 107.38 mm |
| Mass | approx. 230 g (10 A unit) |

Table: Current rating, voltage drop, load capacity

| | rated current I _{nom} (A) | overload (factory pre-set) I _{th} (A) | Typical voltage - drop(mV) at rated current | max. capacitive load (μF) |
|-------------|---------------------------------------|--|---|---------------------------------|
| ESS60T-5 A | 5 A | 12 A | 80 | 1,000 |
| ESS60T-10 A | 10 A | 17 A | 80 | 2,000 |
| ESS60T-20 A | 20 A | 27 A | 105 | 3,000 |
| ESS60T-30 A | 30 A | 37 A | 120 | 4,000 |
| ESS60T-40 A | 40 A | 47 A | 135 | 6,000 |
| ESS60T-50 A | 50 A | 57 A | 130 | 8,000 |
| ESS60T-60 A | 60 A | 67 A | 160 | 10,000 |

Ordering Information:

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|-------------------|---|----------------------------|
| Type No. | ESS60 | electronic circuit breaker |
| Design | T | |
| Version | 100 | standard |
| Operating voltage | DC-48 V | rated voltage |
| Current ratings | 5 A, 10 A, 20 A, 30 A, 40 A, 50 A, 60 A | |
| Ordering example | ESS60 T - 100 - DC-48 V - 60 A | |

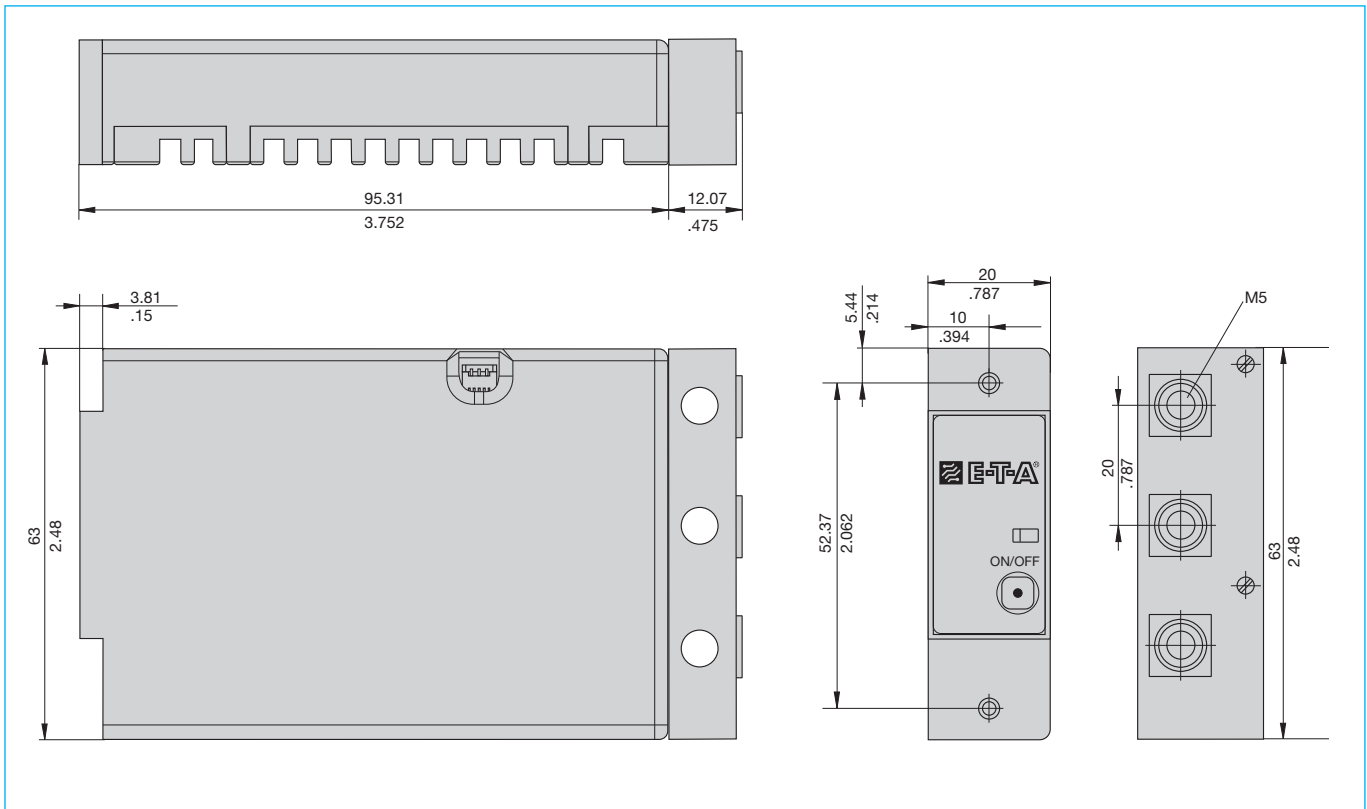
| | | |
|----------|------------|-------------------|
| Type No. | ESS60T-CTR | Controller Module |
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| Type No. | ESS60T-WI | Bus cable (1 per ESS60T) |
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|----------|-----------|-------------------|
| Type No. | ESS60T-BS | Bus circuit board |
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Dimensions



This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)