

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 rating can be readily re-adjusted, from 60 A to 35 A for example. 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 -48VDC

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 3pcs 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



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

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: $0.5 \times I_N$ up to $I_N + 7$ A
Trip time	see time/current characteristics
Free-wheeling circuit	external free-wheeling diode recommended with inductive load

General data

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

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	1100 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:

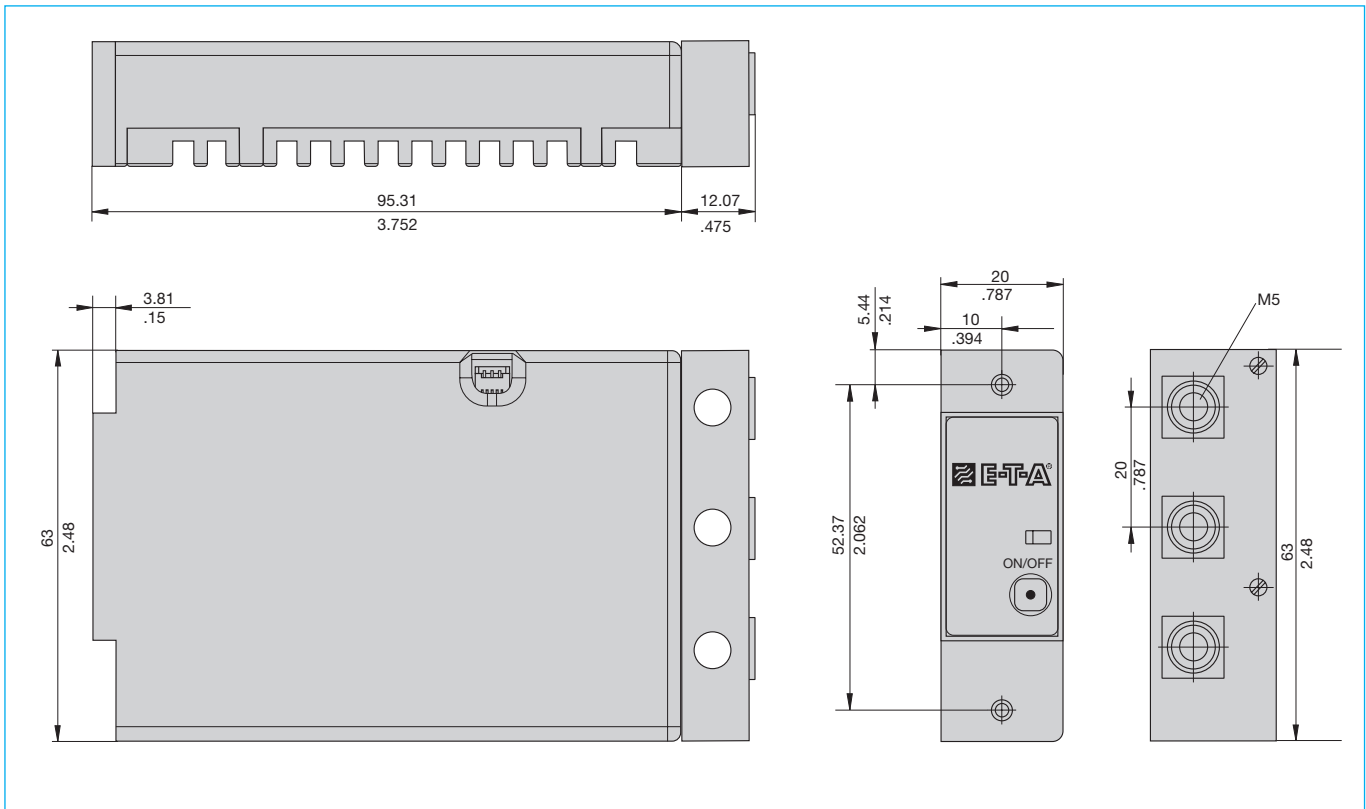
Type No.	ESS60	electronic circuit breaker
Design	T	
Version	100	standard
Operating voltage	DC-48 V	rated voltage
Current ratings	5 A, 10 A, 20 A, 30 A, 40 A, 50 A, 60 A	
Ordering example	ESS60 T - 100 - DC-48 V - 60 A	

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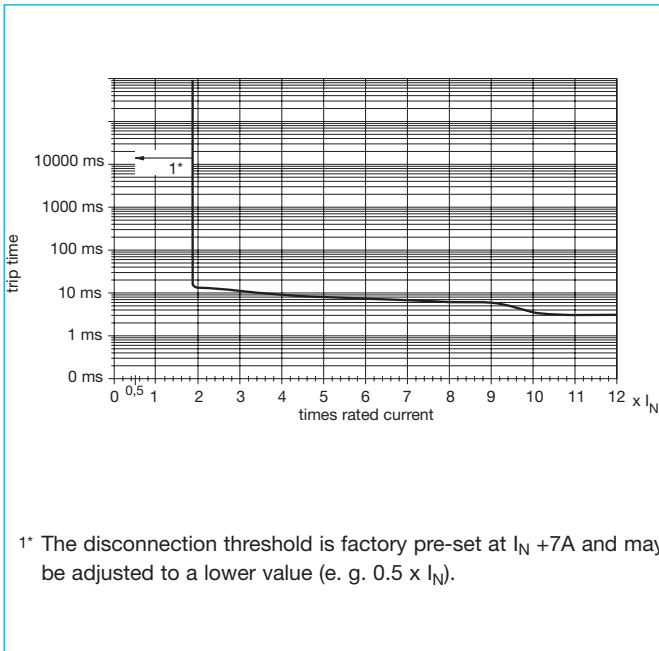
Type No.	ESS60T-BS	Bus circuit board
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Dimensions

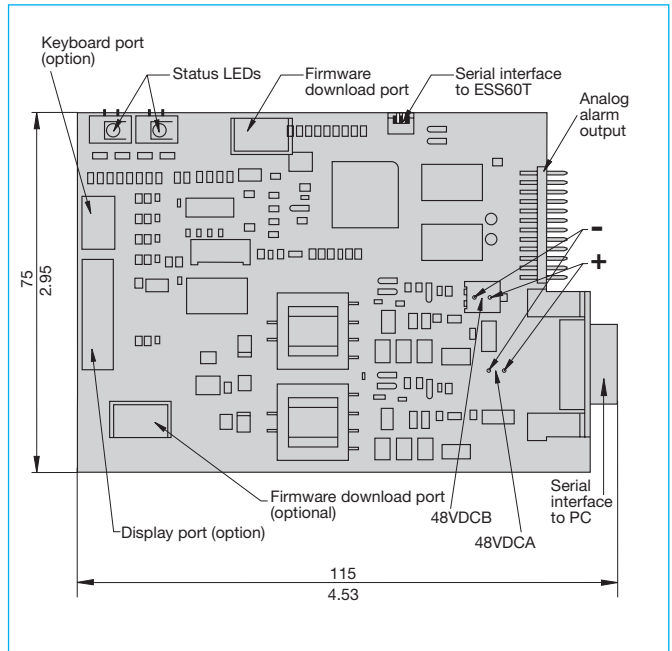


This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

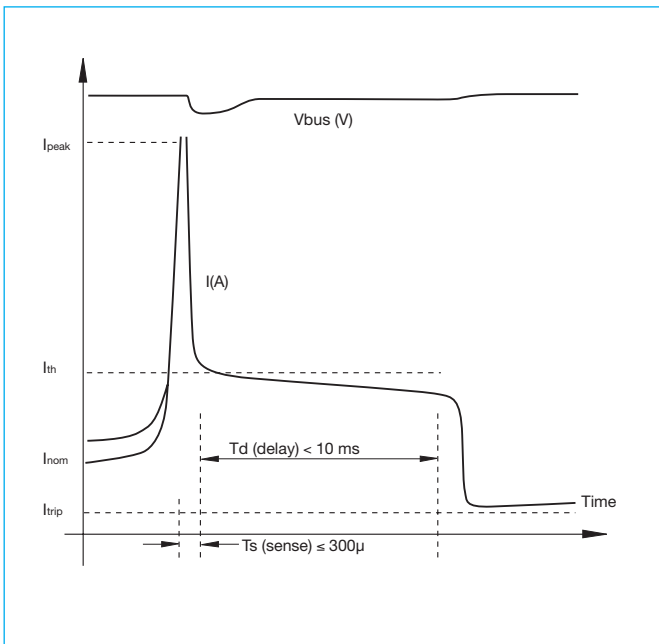
Time/current characteristic ($T_A = 25\text{ }^\circ\text{C}$)



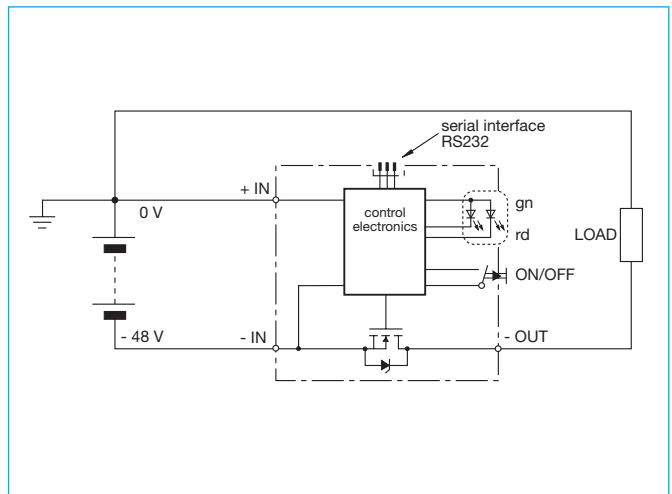
ESS60T – CTR Controller Module



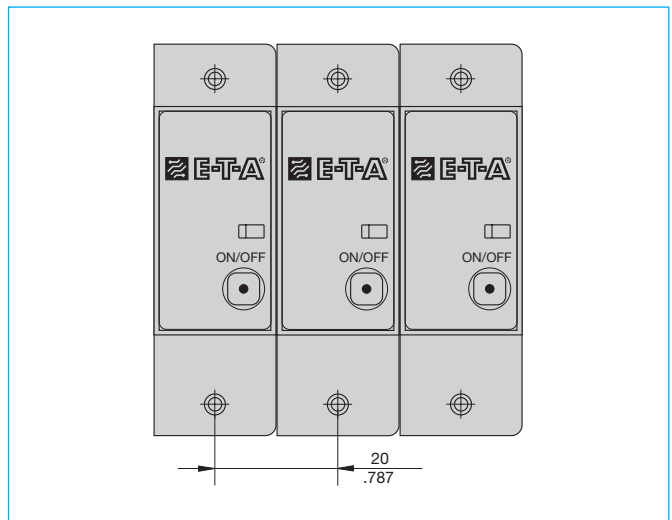
Typical carrier storage time curve ($T_A = 25\text{ }^\circ\text{C}$)



Schematic diagram

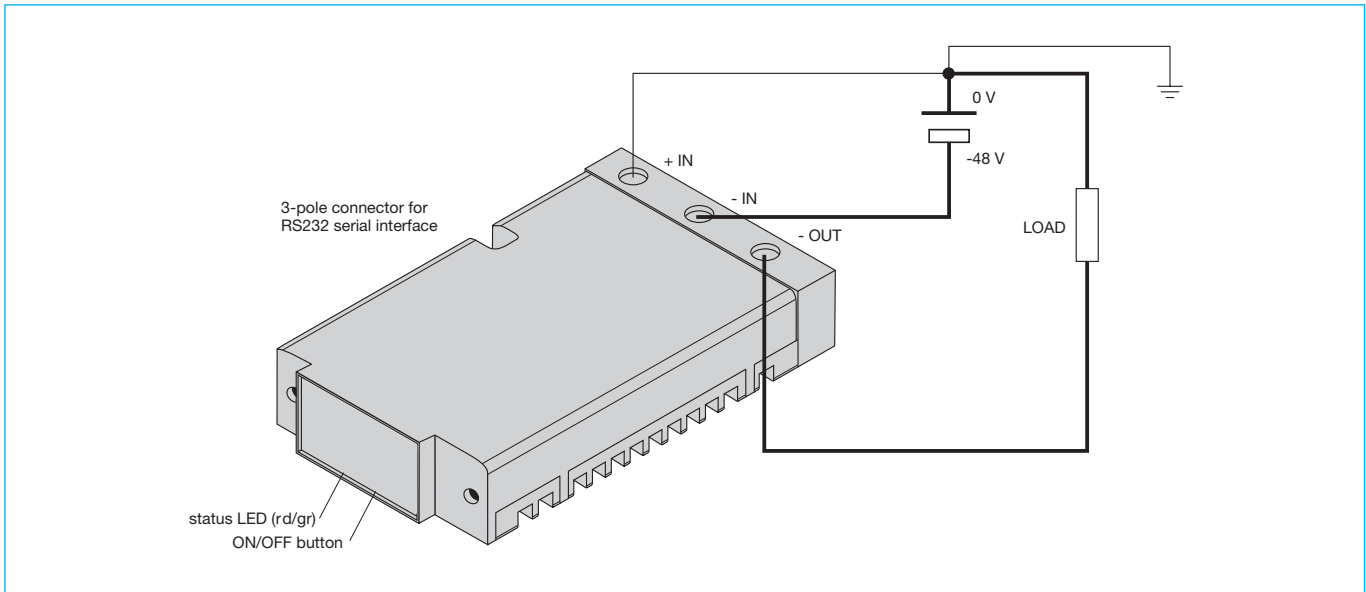


Mounting

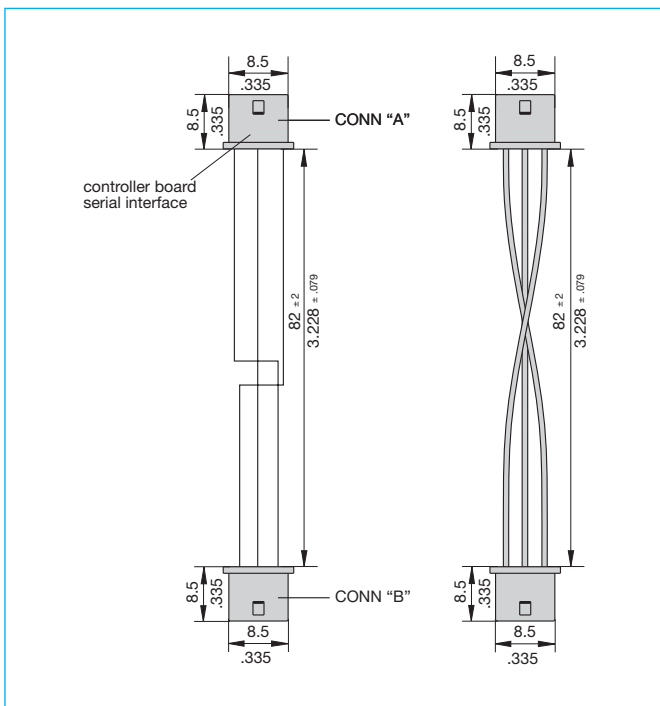


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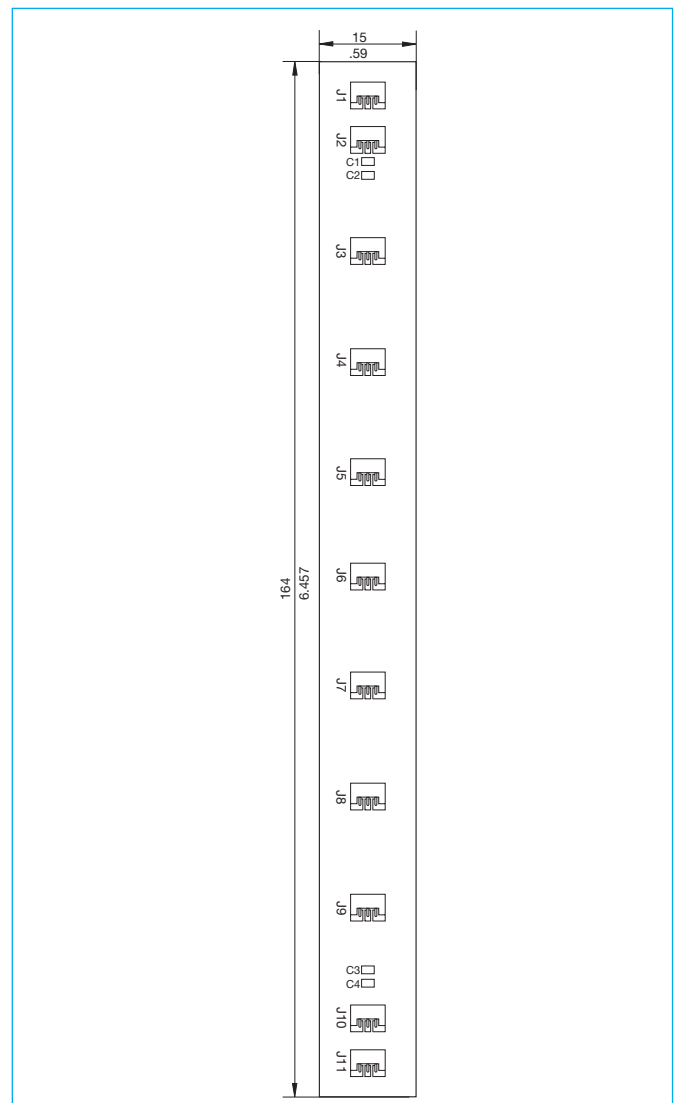
Connection diagram



Bus cable ESS60T-WI



Bus circuit board ESS60T-BS



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All dimensions without tolerances are for reference only. In the interest of improved design, performance and cost effectiveness the right to make changes in these specifications without notice is reserved. Product markings may not be exactly as the ordering codes. Errors and omissions excepted.