

Description

The E-T-A Solid State Remote Power Controller (SSRPC) E-1048-60. is an opto decoupled transistorised switching device providing both protection and signalisation. It may be used wherever safe switching and protection of resistive, inductive or lamp loads in DC voltage systems is required.

Typical applications

Automation

- interface module providing inexpensive power amplification at PLC outputs
- optimum protection of individual loads by monitoring the load circuit

Protection and control of

- motors
- solenoids
- lamps

Features

- Optimum load protection. Available in current ratings of 0.5 A; 1 A; 2 A; 4 A. No derating required over entire temperature range!
- Fast short-circuit limitation and disconnection
- Time/current dependent overload disconnection (simulating thermal-magnetic CBE trip curve)
- Remote control
- Fault indication: LED and signal output for overload/short-circuit signalisation, and wire break indication in the OFF condition (version -600) and in the OFF and ON condition (version -602)
- Physically isolated fault indication.
- Compact plug-in type

Ordering information

Type No.	
E-1048	Solid State Remote Power Controller
	Version
	600 wire break indication in OFF condition (standard)
	602 with permanent wire break monitoring
	Voltage rating
	DC 24 V DC 24 V (standard)
	Current ratings
	0.5 A
	1.0 A
	2.0 A
	4.0 A
E-1048 - 600 DC24 V 1.0 A	ordering example

Where remote control, wire break and LED indication is not required, please contact us for a thermal-magnetic circuit breaker (e.g. types 2210, 3600, 3900).



Technical data ($T_{\text{ambient}} = 25\text{ }^{\circ}\text{C}$; at U_N)

Load circuit

Voltage rating U_S	DC 24 V (18...36 V)
Current rating I_N	0.5 A; 1 A; 2 A; 4 A (other ratings to special order)
Closed-circuit current I_{Contr}	typically 0.3 mA
Min. load current	
Standard version:	$I_{\text{load}} > 1\text{ mA}$
wire break indication in OFF condition	
Option: wire break indication in OFF and ON condition	
wire break ind. in OFF cond.	$R_{\text{load}} > \text{typ. } 500\text{ k}\Omega$
wire break ind. in ON cond.	$I_{\text{load}} < \text{typ. } 130\text{ mA (0.5/1 A unit)}$ $I_{\text{load}} < \text{typ. } 500\text{ mA (2/4 A unit)}$
Voltage drop U_{DSmax}	0.15 V; 0.3 V; 0.1 V; 0.2 V
Switch-on/switch-off time $t_{\text{on}}/t_{\text{off}}$	typ. 300 μs /700 μs with resistive load
Overload disconnection	approx. $1.5 (\pm 0.3) \times I_N$ after approx. 100 ms
Short-circuit current (self-limiting)	max. 25 A (with 0.5 A and 1 A current ratings) max. 75 A (with 2 A and 4 A current ratings)
Short-circuit disconnection	< 250 μs

Control circuit

Voltage rating	DC 24 V
Voltage controlled input U_E	DC 0 V < low level < 5 V DC 8.5 V < high level < 36 V
Input current I_E	1...10 mA (8.5...36 V)
Max. switching frequency f_{max}	500 Hz
Reset time after short-circuit/overload disconnection	1 ms

Fault indication output F (opto coupler)

Voltage rating range	DC 5...36 V
Voltage rating range	DC 5...36 V
Max. load current	100 mA ($\Delta U < 2\text{ V}$), with reverse polarity protection
Error indication	output F+ / F- conductive - wire break in load circuit - after short-circuit/overload disconnection

Parallel connection possible, as leakage current < 10 μA

General data

Temperature range	0 $^{\circ}\text{C}$...+60 $^{\circ}\text{C}$
Insulation voltage (IEC 60664/VDE 0110)	2.5 kV_{rms}
Mass	28 g

Technical description

At the appropriate input level (>8.5 V), the opto decoupled input in the SSRPC will switch on a power transistor to connect the load to the plus pole of the load circuit supply (U_S).

The transistor will switch off when

- the control voltage (U_E) is removed
- there is a short-circuit/overload in the load circuit.

Status indication is provided by two LEDs (red and green).

Thermal-magnetic style overload protection occurs at approx. 1.5 times rated current. See time/current characteristic curves.

The SSRPC is fitted with blade terminals DIN 46244-A6.3-0.8 and is suitable for plug-in mounting with various E-T-A sockets (see Accessories).

Control circuit

ON condition:

If a voltage higher than 8.5 V is applied to the input terminals (-IN, +IN), the control current (from the PLC) will flow through the opto coupler. The output transistor will be conductive, the green LED will be lighted.

OFF condition:

A control voltage lower than 5 V will switch the output transistor off.

Load circuit

The load circuit switches depending on the control signal ("0" or "1"). It is electronically monitored for faults. In the event of a short-circuit the circuit is disconnected after max. 250 μ s whilst upon inadmissible overload it is disconnected according to the time/current curves shown.

Fault indication output

The fault indication circuit (F+, F-) is opto decoupled from the load and control circuit.

In the OFF condition, this circuit will provide wire break indication, with the transistor output being open.

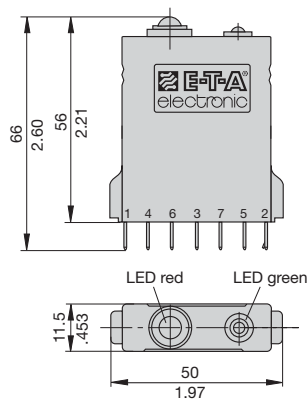
In the ON condition, the circuit will provide short-circuit and overload monitoring and indication.

Visual fault indication by red LED.

Status indication

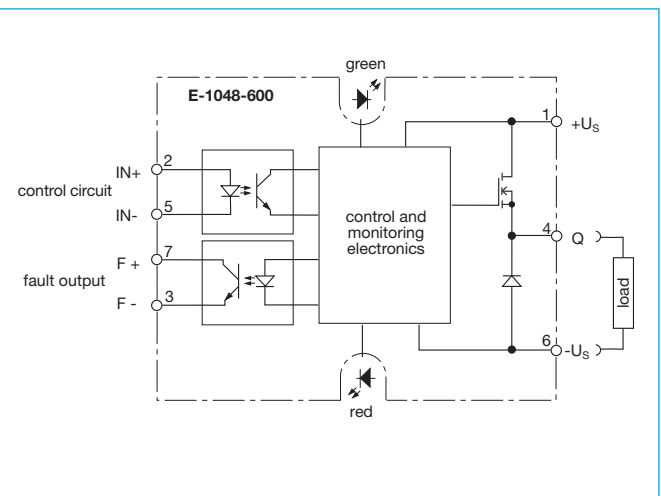
Status indication	Fault indication output (opto coupler)	LED	
		green	red
non-conductive, no duty		○	○
conductive, normal duty		⊗	○
overload or short circuit at the output (and with option wire break indication in ON condition)		⊗	⊗
wire break, in the OFF position		○	⊗

Dimensions



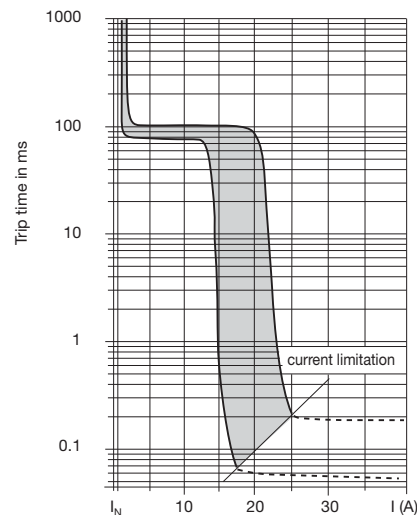
This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

Connection diagram

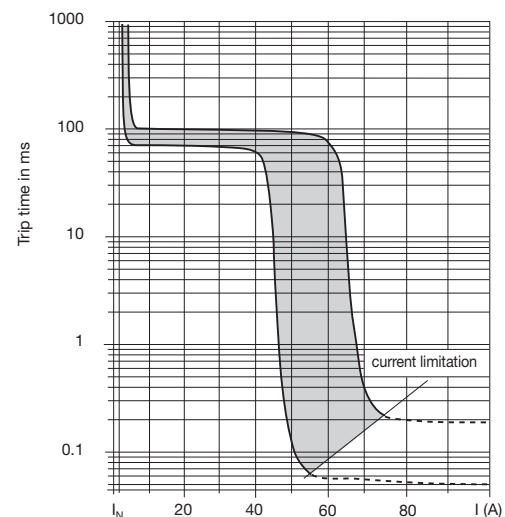


Typical time/current characteristics ($T_A = 25^\circ\text{C}$)

0.5 A and 1 A

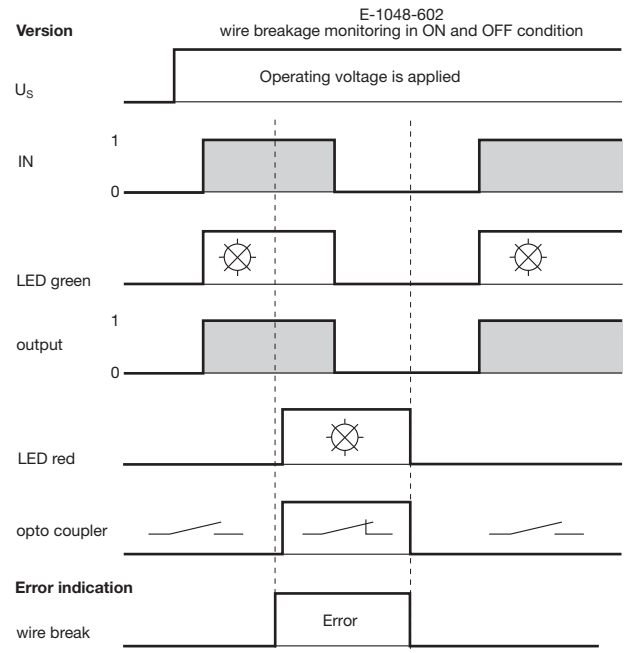
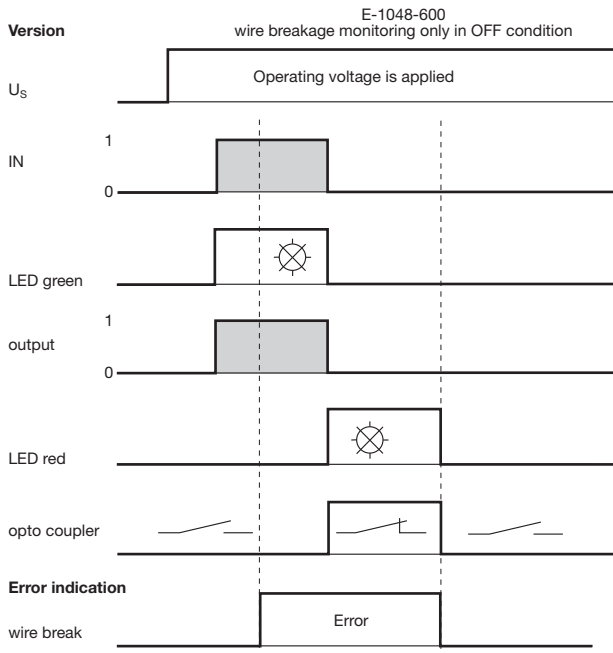


2 A and 4 A

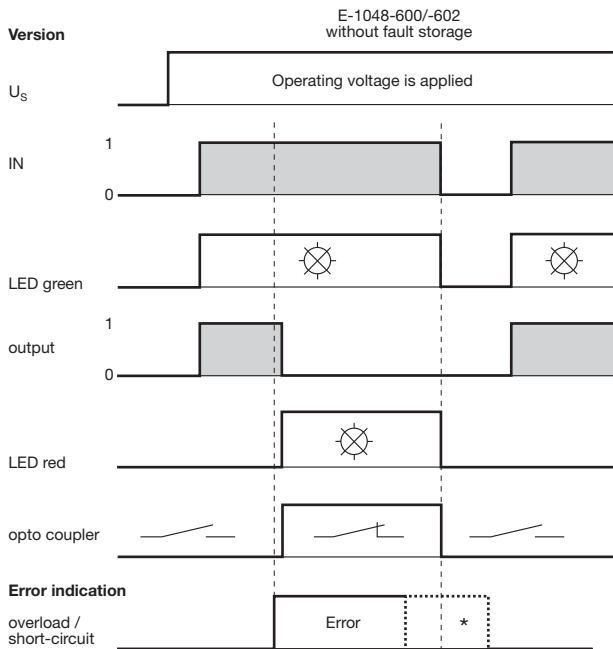


Functional diagrams E-1048-60.

Functional diagram E-1048-60. wire break indication



Functional diagram E-1048-60. overload /short-circuit indication



* Fault indication is reset when control voltage is switched off, whether the failure is still active or not.

1
0

IN = input set / output = switched through

LED lights

