

## Description

In accordance with the CE marking of machinery to the EU Machinery Directive, the solid state remote power controller E-1072-128 complies with the requirements of the EN 60204 part 1 »Safety of Machinery - Electrical Equipment of Machines« para 9.4.3.1 in ungrounded DC 24 V supply systems (»IT systems«).

The E-1072-128 is a double pole solid state remote power controller for electromagnetic valves (solenoids), magnetic brakes and clutches with a rated voltage of DC 24 V and a max. current rating of 3 A. Besides a genuine circuit breaker function it offers additional diagnostic functions.

The SSRPC type E-1072-128 can be used as a replacement for the SSRPC version E-1071-128.

## Typical applications

- Double pole switching actuators in machines and systems (solenoids, magnetic brakes)
- Monitoring the electrical operability of loads and signalling to PLC
- Prevention of voltage dips in the event of a short circuit in the load circuit on the output voltage of a DC 24 V switch-mode power supply
- Protection of cables in the load circuit
- Visual status indication (LEDs and RED trip button) and failure indication via potential-free signal contacts
- Reliable double pole physical isolation or manual disconnection of the load circuit in the event of a failure

## Features and benefits

- rated voltage DC 24 V (19.2...36 V)
- rated current  $I_N$  max. 3 A (min. load current 30 mA)
- for controlling and monitoring of DC 24 V solenoids
- PLC-controllable double pole SSRPC, with physical isolation of control input
  - switching output with integral current limitation to  $2 \times I_N$ , prevents voltage dip of output voltage of a DC 24 V switch-mode power supply in the event of a failure (cf. E-T-A Electronic Circuit Protectors ESS20)
  - short circuit-and overload disconnection with subsequent double pole physical isolation of load
  - permanent wire break detection of load circuit
  - group failure indication via relay contact »Error«
  - additional signal contact »Err2«, when integral circuit breaker has tripped due to overload/short circuit in the load circuit
  - multi-colour LED indication:
    - LED green: OK signal »OK«
    - LED red: failure indication »Error«
    - LED yellow: control message »In/Ctrl«
  - integral protection against reverse polarity and overvoltage for control circuit and load circuit
  - back-up fuse is not required due to integral fail-safe element with VDE approval
  - track-mountable, width 22.5 mm
  - additional relay output »status indication« for signalling to PLC to indication activation and load current  $> 30$  mA.



**E-1072-128**

## Technical data ( $T_{\text{ambient}} = 25\text{ °C}$ , $U_S = \text{DC } 24\text{ V}$ )

Voltage rating $U_N$	DC 24 V
Operating voltage $U_S$	DC 19.2...36 V
Current rating $I_N$	max. 3 A
Current consumption $I_0$ ( $U_S = \gg 0\llcorner$ )	typically 25 mA
Power loss $P_{\text{max}}$ ( $I_N = 1\text{ A}$ )	typically 2.7 W
Residual ripple for all voltages	max. 5 % (3 phase bridge)
Reverse polarity protection $U_S$	integral -> fault release, LEDs not lighting <b>Caution:</b> Ensure free travel of actuator button.
Insulation voltage	AC 500 V (control circuit, load circuit, fault indication »Error« und »Err2«)
Status indication	»ON«
<b>Load Circuit</b>	
Load output (Kl. 3-Kl. 4)	two pole switching output (minus and plus switching), MOS transistors
Max. load data	DC 24 V/3 A (no derating over the entire temperature range!)
Min. load data	DC 24 V/50 mA wire break threshold 30 mA
Voltage drop at $I_N$ (with $I_N = 3\text{ A}$ )	typically 0.9 V
Switching times ( $t_{\text{on}}/t_{\text{off}}$ )	typically 1 ms (resistive load)
Overload disconnection	approx. $1.15 \times I_N$
Trip time ( $I_{\text{load}} = 1.5 \times I_N$ )	typically 70 ms
Short circuit current $I_K$	typically $2 \times I_N$ current limitaton
Trip time (at $I_K$ )	typically 60 ms at $I_N = 3\text{ A}$ , double pole disconnection of load circuit after 250 ms -> red LED lighted, failure indication »Error« and »Err2«
Wire break monitoring	with the load switched on or off RED LED "Error" lighted, group fault signalisation »Error« $U_{\text{Contr}} = "0"$ wire break threshold $R_{\text{load}} > 25\text{ k}\Omega$ ( $U_{\text{Contr}} = "1"$ ) minimum current $I_{\text{load}} < 30\text{ mA}$
Load current monitoring	with the load switched on, the load current is monitored via the two switching outputs. GREEN LED lighted (OK signal), when $I_{\text{load}} > 30\text{ mA}$

## Technische Daten ( $T_U = 25\text{ °C}$ , $U_B = \text{DC } 24\text{ V}$ )

Leakage current ( $U_{\text{Contr}} = "0"$ )	typically < 1 mA
Free-wheeling circuitry	integral
Load current measurement (term. S+: Shunt +/term. S-: Shunt-)	no isolation of load circuit required as a $I_N = 3\text{ A}$ : 0.1 $\Omega/1\%$ measuring shunt is integral with the device. Measurement by voltmeter terminal term. S+-Kl. S- (300 mV = $I_N$ )
Isolation of load circuit	2-pole by relay contacts <ul style="list-style-type: none"> <li>● by manual release of RED button</li> <li>● approx. 250 ms after electronic tripping due to overload or short circuit ("OFF")</li> </ul>
<b>Control circuit</b>	
Control "In/Ctrl"	internal low-level signal relay in control input (with integral free-wheeling diode)
Control current $U_{\text{Contr}}$	»0« : 0...2.4 V »1« : 18...32 V
Control voltage $I_{\text{Contr}}$	typically 5...10 mA
Switching frequency $f_{\text{max}}$	10 Hz
Control signal ( $U_{\text{Contr}} "1"$ )	"In/Ctrl" YELLOW LED lights with $I_{\text{Contr}}$ flowing
Protection	reverse polarity protection (diode), overvoltage protection (varistor)
<b>Fault indication</b>	
»Error«	group fault signalisation potential-free relay contact N/O, (closed circuit principle) DC 30 V/5 mA...1 A
Fault indication »Error«	<ul style="list-style-type: none"> <li>● relay contact "Error" open</li> <li>● wire breakage in the load circuit</li> <li>● load current &lt; 30 mA</li> <li>● other faults (ground fault in load circuit or internal fault)</li> <li>● overload/short circuit (= "Err2")</li> <li>● LED RED "Error" lighted</li> <li>● LED GREEN "O.K." not lighted</li> </ul>
Signal delay	typically 1 ms
»Err2«	fault indication potential-free auxiliary contact, make contact N/O, DC 30 V/5 mA...1 A
Fault indication "Err2"	<ul style="list-style-type: none"> <li>● signal contact "Err2" closed</li> <li>● overload or short circuit in the load circuit</li> <li>● LED RED "Error" lighted</li> <li>● LED GREEN "O.K." not lighted</li> <li>● relay contact "Error" open</li> <li>● RED button "OFF"</li> </ul>
	<ul style="list-style-type: none"> <li>● reset required</li> <li>● 2-pole physical isolation in load circuit</li> <li>● manual release "OFF"</li> </ul>
	<ul style="list-style-type: none"> <li>● reverse polarity of <math>U_S</math> (LEDs not indicating)</li> </ul>
»ON«	with status indication "ON" potential-free relay contact DC 30 V / 5 mA...1 A
Function »ON«	<ul style="list-style-type: none"> <li>● relay contact closed, if <math>I_{\text{load}} &gt; 30\text{ mA}</math></li> <li>● relay contact open, with wire breakage and after trip of circuit breaker</li> </ul>

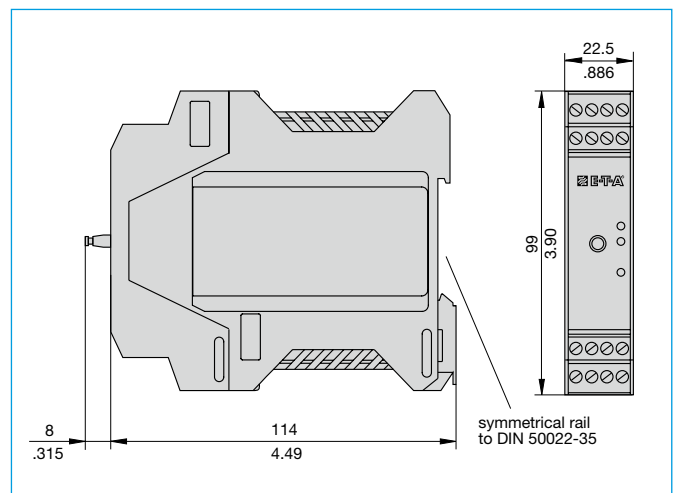
## Technische Daten ( $T_U = 25\text{ °C}$ , $U_B = \text{DC } 24\text{ V}$ )

<b>General data</b>	
Ambient Temperature	0...+50 °C (without condensation)
Storage temperature	-20...+70 °C
Terminals	COMBICON MSTBO 2.5/4 1 x 2.5 mm <sup>2</sup> max. 16-pole
Back-up fuse for SSRPC:	not required as it has an integral fail-safe element with VDE approval for equipment protection.
Housing material	PA 66-FR
Mounting	snapped onto symmetrical rail DIN 50022-35
Vibration	3 g, to IEC 60068-2-6 test Fc
Degree of protection	IP20 housing IP20 terminals
EMC EMC Directive, CE Logo	emitted interference EN 61000-6-3 interference suppression EN 61000-6-2
Mounting dimensions	22.5 x 99 x 122 mm (w x h x d)
Mass	approx. 130 g

## Ordering information

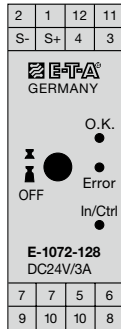
<b>Type</b>	
E-1072	Solid State Remote Power Controller
<b>Version</b>	
128	Voltage rating of load
	DC 24 V
	Current rating
	3 A
E-1072 - 128 - DC 24 V - 3 A	

## Dimensions

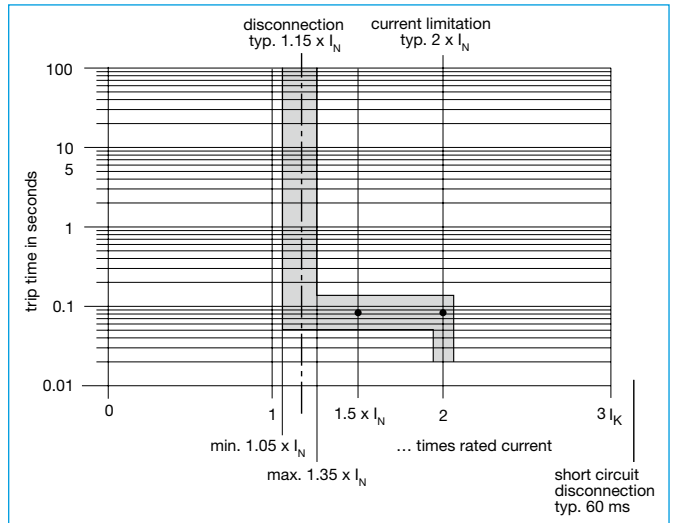


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## Connection diagram



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



## Status matrix

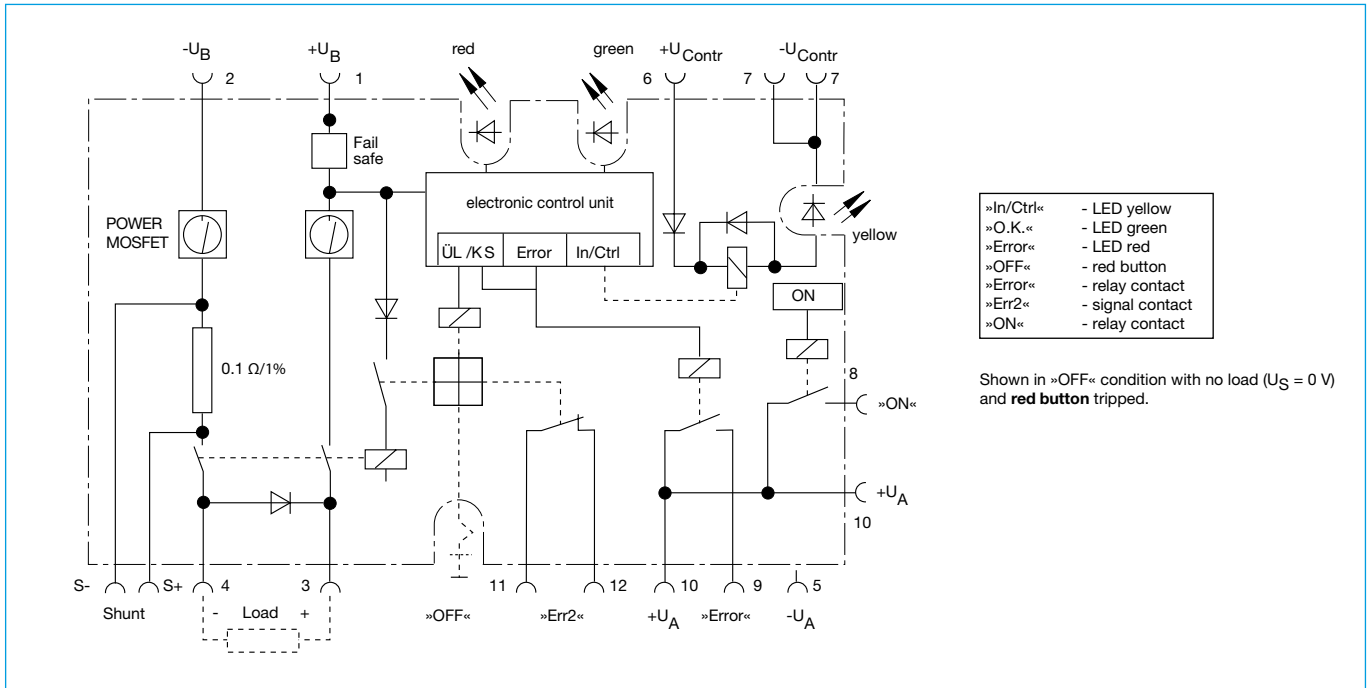
Operating status	Fault-free operation		Short circuit/overload in load circuit	Wire break in load circuit		Other faults
	«0»	«1»		«0»	«1»	
Control input	«0»	«1»	«1»	«0»	«1»	«0»
Load output	OFF 2-pole non-conductive	ON 2-pole conductive	OFF 2-pole non-conductive	OFF 2-pole non-conductive	ON 2-pole conductive	OFF 2-pole non-conductive
Load circuit isolated 2 pole (via relay contacts)	no	no	yes	no	no	no
<b>Indication</b>						
YELLOW LED "In/2Ctrl"	0	1	1	0	1	0
GREEN LED "O.K."	1	1	0	0	0	0
RED LED "Error"	0	0	1	1	1	1
relay contacts "Error" (group fault)	closed	closed	open	open	open	open
auxiliary contacts "Err2" (circuit breaker)	open	open	<b>closed</b>	open	open	open
RED reset button	ON	ON	OFF	ON	ON	ON
relays contact "ON" indication	open	closed	open	open	open	open
Remark	available	$I_{Load} > 30\text{ mA} < 3\text{ A}$	RED button to be reset		$I_{Load} < 30\text{ mA}$	ground fault in load circuit or internal fault

1 = LED lights  
0 = LED does not light

### Operating modes at:

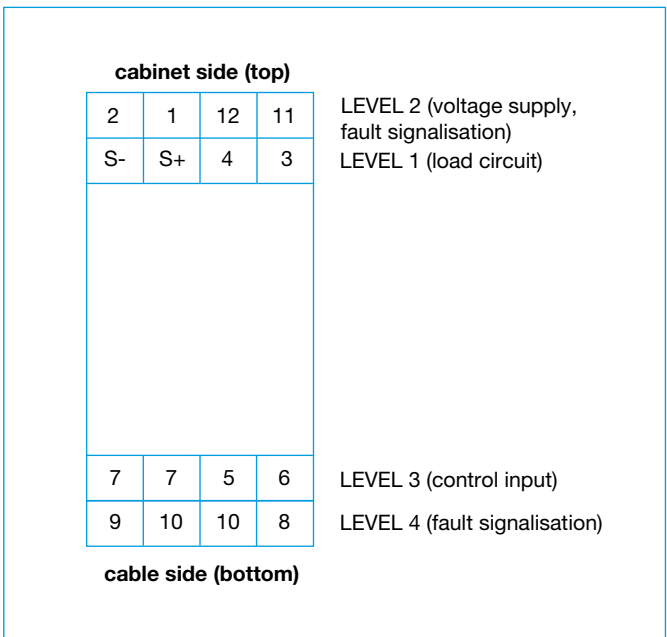
- reverse polarity: indication of fault "Err2"; LEDs not illuminated!
- manual release "OFF" (RED button in OFF position): indication of fault "Error" and "Err2", additionally lighted LED RED "Error".
- with  $U_S = 0\text{ V}$ : group fault signalisation »Err1« (closed circuit principle)

**Basic circuit diagram**



**Terminal selection**

Level	Terminal	Remark
3	6	+U <sub>Contr</sub> (Control voltage plus)
	5	-U <sub>A</sub>
	7/7	-U <sub>Contr</sub> (Control voltage minus)
4	8	ON, status indication (relay contact)
	9	Error, group fault signalisation (relay contact)
	10/10	Error/ON, one voltage supply +U <sub>A</sub>
1	3	Load (+)
	4	Load (-)
	S+/S-	load current measurement by voltmeter shunt integral with device Terminal S+: Shunt + Terminal S-: Shunt -
2	11/12	»Err2« indication of fault circuit breaker (auxiliary contact)
	1	+U <sub>S</sub> (operating voltage plus)
	2	-U <sub>S</sub> (operating voltage minus)



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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.