

Description

The E-T-A Solid State Remote Power Controller E-1072-210 complies with the EC Machinery Directive 98/37/EG and meets the requirements of EN60204 part 1 "Electrical equipment of machinery, safety of machinery" in ungrounded DC 24 V supply systems ("IT systems").

The E-1072-210 is a double pole electronic switching amplifier for magnetic valves (hydraulic and pneumatic mechanisms), magnetic brakes and magnetic couplings with rated voltage DC 24 V and a max. current rating of 1 A or 2 A. It combines true circuit breaker characteristics with additional diagnostic functions.

Why use the E-1072-2..

- for double pole switching of actuators (magnetic valves, magnetic brakes) in machinery and equipment
- for monitoring the electronic function of the loads and signal to the PLC
- for preventing a voltage dip of the DC 24 V output voltage in a switch-mode power supply, in the event of a short circuit, as a true 2 pole, remotely controllable electronic circuit breaker
- for protecting the cables of the load circuit
- for status signalling and for visually indicating load circuit faults (LEDs or RED trip button) via potential-free signal contacts
- for double-pole physical isolation of the load circuit – manually or electrically in the event of a failure (short circuit/overload)

Features

- Voltage rating DC 24 V (19.2...36 V)
- Current rating I_N max. 1 A or 2 A (min. load current 30 mA)
- Activates and monitors DC 24 V magnetic valves
- PLC controllable 2 pole remote power controller with physical isolation of control input
 - Switching output with integral current limitation to $2 \times I_N$
 - Disconnection of load in the event of short circuit or overload, followed by double pole physical isolation of load
 - Permanent wire break monitoring of load circuit
 - Group fault signalisation via relay contact "Err1"
 - Additional signal contact "Err2" when integral circuit breaker has tripped due to short circuit or overload in the load circuit
 - LED displays: LED green: OK
LED red: Error
LED yellow In/Ctrl (control current indication)
 - Integral reverse polarity protection and overload protection for control and load circuit
 - No back-up fuse required due to integral fail-safe element
 - Track-mountable, width 22.5 mm

Additional feature E-1072-210

- additional "status indication" relay output to facilitate confirmation to a PLC, for example, of activation and a load current > 30 mA.



E-1072-210

Technical Data ($T_U = 25^\circ\text{C}$, $U_S = \text{DC } 24\text{ V}$) ($T_U = \text{ambient temperature at } U_N$)

| | |
|--|---|
| Voltage rating U_N | DC 24 V |
| Operating voltage U_S | DC 19.2...36 V |
| Current rating I_N | max. 1 A or 2 A |
| Current consumption I_0 | typically 25 mA |
| ($U_{\text{Contr}} = "0"$) | |
| Power loss P_{max} ($I_N = 1\text{ A}$) | typically 1.6 W |
| Residual ripple for all voltages | max. 5 % (3 phase bridge) |
| Reverse polarity protection U_S integral -> fault release, LEDs not lighting | |
| | Caution: Ensure free travel of actuator button. |
| Insulation voltage | AC 500 V (control circuit, load circuit, fault indication "Err1" and "Err2") indication "BM" |
| Load Circuit | |
| Load output (term. 31-term. 32) | two pole switching output (minus and plus switching), MOS transistors |
| Max. load data | DC 24 V/1 A or 2 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 $I_N = 1\text{ A}$) | typically 0.8 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 1 s |
| Short-circuit current I_K | typically $2 \times I_N$ current limitaton |
| Trip time (upon I_K) | typically 300 ms at $I_N = 1\text{ A}$, 100 ms at $I_N = 2\text{ A}$, 2-pole isolation of load circuit after approx. 20 ms -> RED LED indicates, fault indication F "Err1" and "Err2" |
| Wire break monitoring | with the load switched on or off; RED LED "Error" lighted, group fault signalisation "Err1" ($U_{\text{Contr}} = "0"$) wire break threshold $R_{\text{load}} > 30\text{ k}\Omega$ ($U_{\text{Contr}} = "1"$) minimum current $I_{\text{load}} < 30\text{ mA}$ |
| Supervision of load circuit | with the load switched on, the load current is monitored via the two switching outputs GREEN LED indicates (OK signal), $I_{\text{load}} > 30\text{ mA}$ |
| Leakage current ($U_{\text{Contr}} = "0"$) | typically 1 mA |
| Free-wheeling circuitry | integral |
| Load current measurement (term. 33: +shunt/ term. 34: -shunt) | no isolation of load circuit required as a $I_N = 1\text{ A}$: $0.2\ \Omega/1\%$, $I_N = 2\text{ A}$: $0.1\ \Omega/1\%$ measuring shunt is integral with the device. Measurement by voltmeter terminal 33 - terminal 34 (200 mV = I_N) |
| Isolation of load circuit | 2-pole by relay contacts - by manual release of RED button - approx. 20 ms after electronic tripping due to overload or short circuit ("OFF") |

Technical Data (T_U = 25 °C, U_B = DC 24 V) (T_U = ambient temperature at U_N)

Control circuit

| | |
|---|--|
| Control "In/Ctrl" | internal low-level signal relay in control input (with integral free-wheeling diode) |
| Control voltage U | "0" : 0...2.4 V "1" : 18...32 V |
| Control current I | typically 5...10 mA |
| Switching frequency f _{max} | 10 Hz |
| Control signal (U _{Contr} "1") | "In/Ctrl" YELLOW LED lights with I _{Contr} flowing |
| Protection | reverse polarity protection (diode), overvoltage protection (varistor) |

Fault indication

| | |
|-------------------------|--|
| "Err1" | group fault signalisation potential-free relay contact N/O, (closed circuit principle) DC 30 V/5 mA...1 A relay contact "Err1" open |
| Fault indication "Err1" | <ul style="list-style-type: none"> - wire breakage in the load circuit - load current < 30 mA - other faults (ground fault in load circuit or internal fault) - overload/short circuit (= "Err2") - LED RED "Error" lighted - LED GREEN "O.K." not lighted - relay contact "Err1" closed |
| Signal delay "Err2" | typically 600 ms |
| Fault indication "Err2" | fault indication potential-free auxiliary contact, make contact N/O, DC 30 V/5 mA...1 A signal contact "Err2" closed <ul style="list-style-type: none"> - overload or short circuit in the load circuit - LED RED "Error" lighted - LED GREEN "O.K." not lighted - relay contact "Err1" open - auxiliary contact "Err2" closed - RED button "OFF" - reset required - 2-pole physical isolation in load circuit - manual release "OFF" - reverse polarity of U_S (LEDs not indicating) |

Option -210

| | |
|---------------|---|
| Function "BM" | with status indication "BM" potential-free relay contact DC 30 V / 5 mA...1 A relay contact closed, if I _{load} > 30 mA relay contact open, with wire breakage and after trip of circuit breaker |
|---------------|---|

General data

| | |
|--|---|
| Ambient Temperature | 0...+50 °C (without condensation) |
| Storage temperature | -20...+70 °C |
| Terminals | COMBICON MSTBO 2.5/4 1x2.5 mm ² max. 16-pole Some are double terminals -> loop-through possibility (continuous load max. 6 A) not required because of integral fail-safe element with VDE approval |
| Back-up protection for SSRPC | PA 66-FR |
| Housing material | symmetric rail to EN 50022-35 |
| Mounting | 3 g, to IEC 60068-2-6 test Fc |
| Vibration | IP20 housing |
| Degree of protection (IEC 529/DIN 40050) | IP20 terminals |
| EMC | emitted interference EN 50081-1 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

Type

| | |
|--|---|
| E-1072 | Solid State Remote Power Controller |
| | Version |
| 210 | with additional option: status indication |
| | Voltage rating of load |
| DC 24 V | |
| | Current rating |
| 1 A or 2 A | |
| E-1072 - 210 - DC 24 V - 1 A ordering example | |

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 |
| Indication | | | | | | |
| YELLOW LED "In/Ctrl" | 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 "Err1" (group fault) | closed | closed | open | open | open | open |
| auxiliary contacts "Err2" (circuit breaker) | open | open | closed | open | open | open |
| RED operating/reset button | ON | ON | OFF "OFF" | ON | ON | ON |
| relays contact "BM" indication option-210 | open | closed | open | open | open | open |
| Remark | available | I _{Load} : >30 mA < 1 A (or 2 A) | RED button to be reset | | I _{Load} : <30 mA | ground fault in load circuit or internal fault |

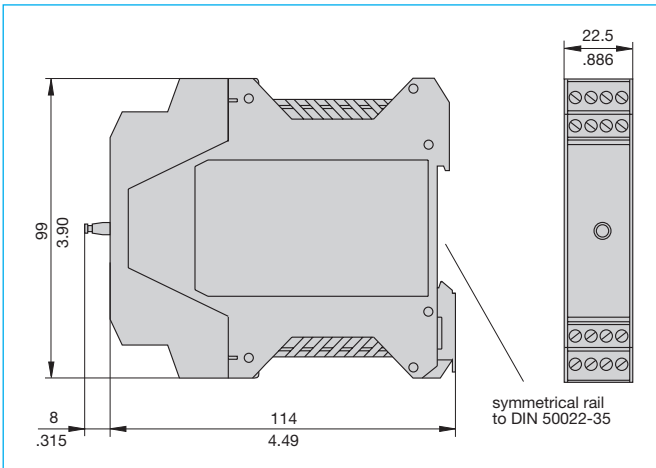
1 = LED lights
0 = LED does not light

Operating modes at:

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

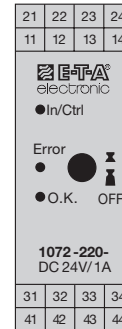
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Dimensions

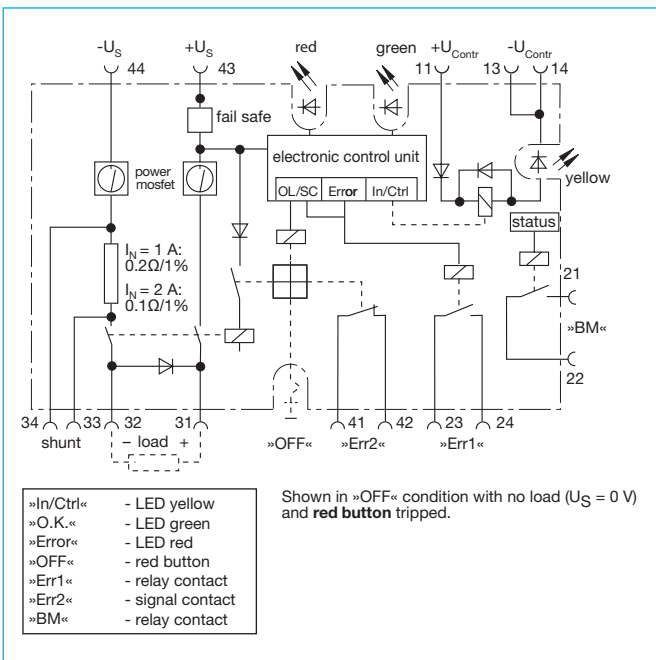


This is a metric design and millimeter dimensions take precedence ($\frac{\text{mm}}{\text{inch}}$)

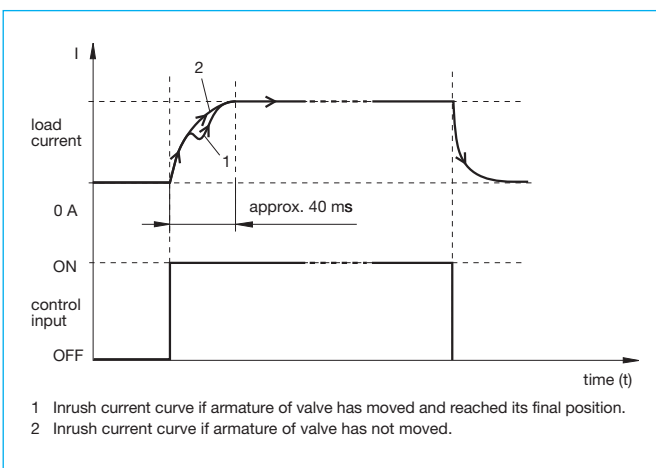
Connection diagram



Basic circuit diagram -210

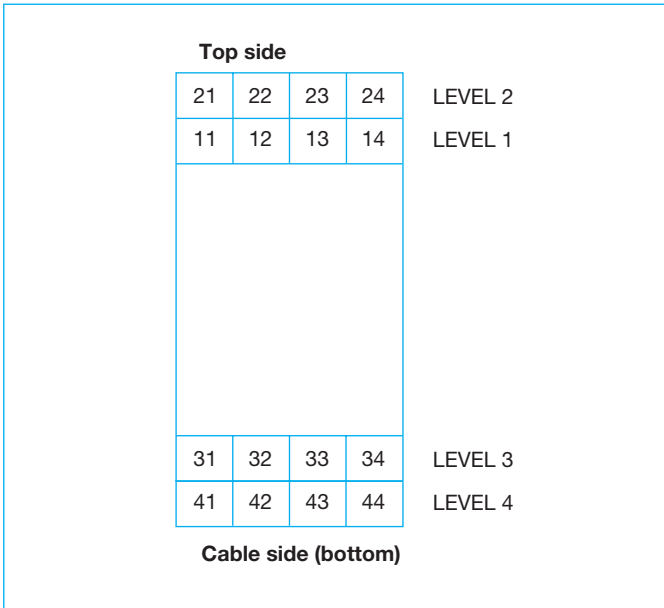


Inrush current curve magnetic valve

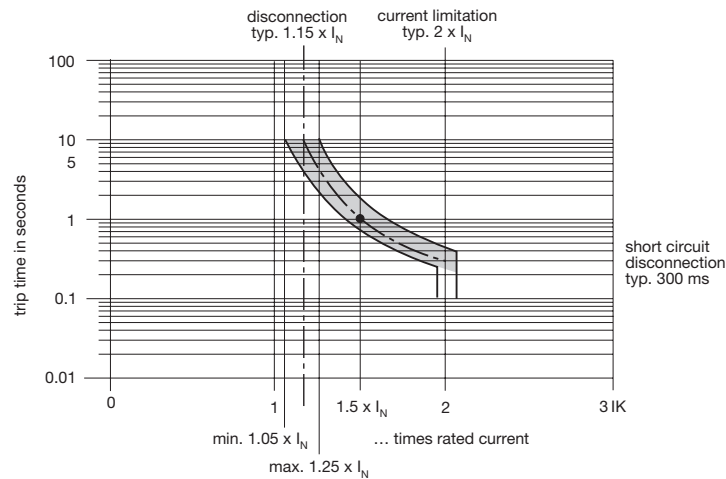


Terminal selection

| Level | Terminal | Remark |
|---------------------|----------|--|
| 1 | 11 | +U _{Contr} (Control voltage plus) |
| | 12 | not used |
| | 13 / 14 | -U _{Contr} (Control voltage minus) |
| DC 18...32 V | | |
| 2 | 21 | option-210: status indication "BM" (relay contact) Kl. 21 (+) |
| | 22 | (relay contact) Kl. 22 (-) |
| | 23 / 24 | "Err1" group fault signalisation (relay contact) |
| 3 | 31 | load (+) DC 24 V / 1 A (or 2 A) |
| | 32 | load (-) |
| | 33 / 34 | load current measurement by voltmeter I _N = 1 A: shunt 0.2 Ω/1 % I _N = 2 A: shunt 0.1 Ω/1 % shunt integral with device Kl. 33: shunt+ / Kl. 34: shunt- |
| 4 | 41 / 42 | "Err2" indication of fault circuit breaker (auxiliary contact) |
| | 43 | +U _S (operating voltage plus) DC 19.2...36 V |
| | 44 | -U _S (operating voltage minus) |
| | | |



Typical time/current characteristics (T_A = 25 °C)



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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.