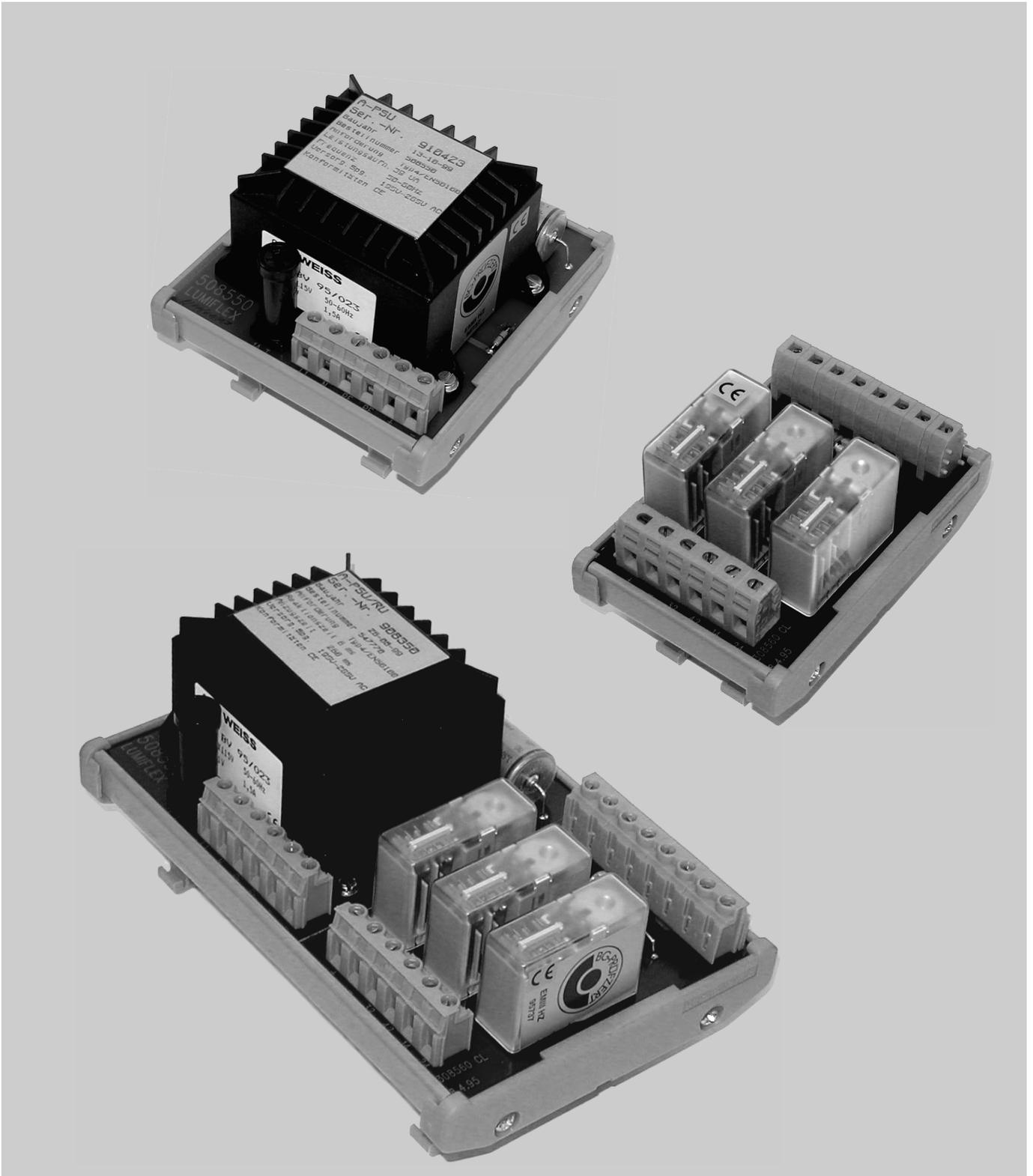




## A-PSU, A-RU, A-PSU/RU

### AC Power Supply Unit and Relays Unit for AREAL Connecting and Operation Instructions



## 1. Description of components

The AREAL Safety Light Grid provides failsafe semiconductor outputs designed to switch ground-based loads with 24 V DC and a current of 0.3 A. The A-RU Relay Unit is needed, when potential-free contacts are required between the AREAL and the safety related inputs of the machine interface. A-RU meets the requirements of the safety category 4, according to EN 954-1 respectively EN 50100.

The A-RU provides two independent make contacts (OSSDs = Output signal switching devices) and two positively driven break contacts, each of them related to one of the make contacts. It is equipped with feed back circuits for monitoring the down-stream relays.

The A-PSU Power Supply Unit is available at two types, 230 V AC or 115 V AC. It contains a transformer for safe galvanic separation according to VDE 551. A-PSU serves exclusively for the 24 V supply of the AREAL Safety Light Grid and the A-RU Relay Unit.

Both, A-PSU and A-RU are available separately. They operate independently of each other.

## 2. Application requirements and intended use

A-RU and A-PSU are designed for use inside an electronic cabinet or connecting box only. Their enclosure rating equals IP 20. The selected electronic cabinet respectively the connecting box must meet IP 54 minimum.

A-PSU serves exclusively for the supply of 1 AREAL and 1 A-RU. None of any additional load ought to be connected.

To avoid welding of the switching output contacts, fuses 6 A (slow) must be connected in series.

If A-RU and the subsequent external relays are located in different housings, the possibility of cross-shortages must be considered. To avoid cross-shortages, single shielded connecting cables must be used. The shields have to be connected to 0 V. The AREAL provides a cross-shortage monitoring function. Therefore, single shielded cables are not needed between AREAL and A-RU.

To reduce immoderate relay contact abrasion, interference suppression parallel to the coils of the subsequent external relays must be applied.

## 3. Safety instructions

The relays unit A-RU is self monitoring. It complies with category 4 according to EN 50100 and EN 954-1. The A-RU is designed as a two-channel system. The safety function remains effective if one component fails. At each on/off cycle of the light grid, the appropriate opening and closing of the relays is checked.

Using A-RU and A-PSU, the application requirements (item 2) and the complying safety of machinery regulations must be considered. Authorities responsible for occupational safety provide appropriate information. Only experts are allowed to fit and connect A-RU or A-PSU.

## 4. Function

After switching-on mains it is checked, whether the internal relays K1 and K2 and the subsequent external relays are switched-off. Only if the normally closed monitoring contacts of these positively driven relays are in their initial position, K3 changes to the on-state. The A-RU is then prepared for switching on. As soon as the safety related outputs of AREAL are switching on, K1 and K2 are changing to the on-state and hold these positions. K3 falls back to its off-state. Thus, the two separate output circuits are switching on.

The integrated start/restart interlock function of AREAL is available at request. Please consider the relating safety advices stated in the Fitting and Operating instructions of AREAL. Activating the safeguarding function of AREAL lets K1 and K2 fall back in their off-state, interrupting the two separate output circuits.

## 5. Dimensions and Fitting

A-PSU power supply unit and A-RU relay unit are built into a common housing for rail mounting: Length 165 mm, width 110 mm and height 83 mm (measured from the upper edge of the rail). To mount the housing, hang the upper backwards slot onto the rail. Snap the lower springs onto the rail with slight pressure. For dismounting, pull the springs slightly downwards.

## 6. Electrical Connections

The connecting terminal allows for wire gauges up to 2.5 mm<sup>2</sup>. Figure 1 and 2 show the connections. The 0 Ω resistor close to the transformer serves for potential equality between 0 V and PE of A-PSU (VDE 0160).

In order to avoid welding of the relay contacts, external fuses of 6 A (slow) must be connected in series. Between the terminal pins Y1 and Y2, the potential-free positively driven break contacts of the subsequent external relays can be inserted. If the external relay monitoring function is not needed, Y1 and Y2 must be bridged.

- 1) Circuit-breaker according to VDE 57100 § 601
  - 2) Feedback circuit for monitoring the subsequent external relays
  - 3) Auxilliary normally closed contacts to be used in combination with the two normally open contacts only. Thus, both of the auxilliary normally closed contacts must be connected in parallel.
  - 4) If both, A-RU and the subsequent external relays are not in the same cabinet, the possibility of cross-shortages must be avoided using suitable cables.
  - 5) Normally closed contacts of the subsequent external relays
- a without restart interlock  
 b Control voltage of downstream relays or release circuit  
 c Power supply  
 d AREAL AC power supply unit A-PSU  
 e AREAL relays unit A-RU  
 f Subsequent external relays or a switch-off circuit

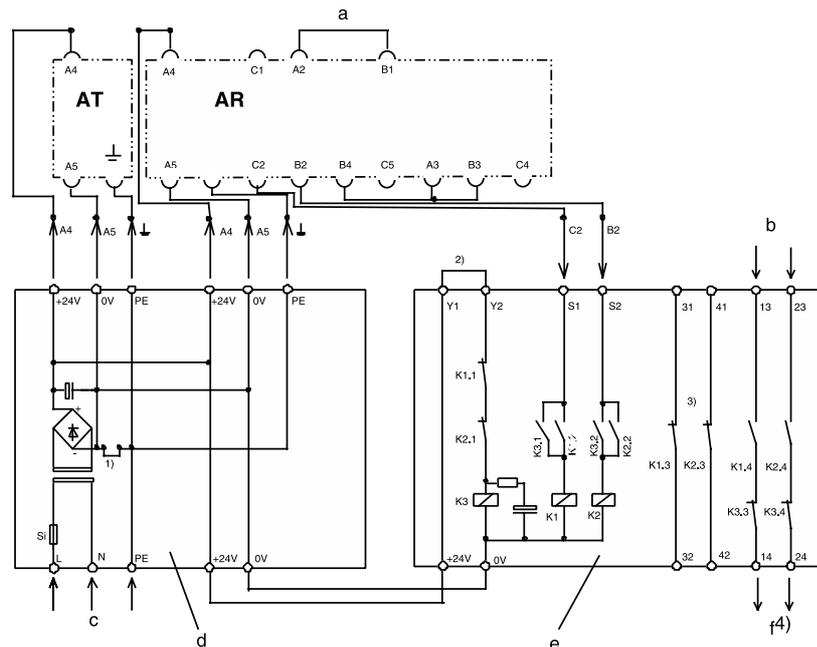


Fig. 1 Connecting diagram AREAL with A-PSU/A-RU, type of operation: "without restart interlock"

- 1) Circuit-breaker according to VDE 57100 § 601
  - 2) Feedback circuit for monitoring the subsequent external relays
  - 3) Auxilliary normally closed contacts to be used in combination with the two normally open contacts only. Thus, both of the auxilliary normally closed contacts must be connected in parallel.
  - 4) If both, A-RU and the subsequent external relays are not in the same cabinet, the possibility of cross-shortages must be avoided using suitable cables.
  - 5) Normally closed contacts of the subsequent external relays
- a start/restart  
b Control voltage of downstream relays or release circuit  
c Power supply  
d AREAL AC power supply unit A-PSU  
e AREAL relays unit A-RU  
f Subsequent external relays or a switch-off circuit

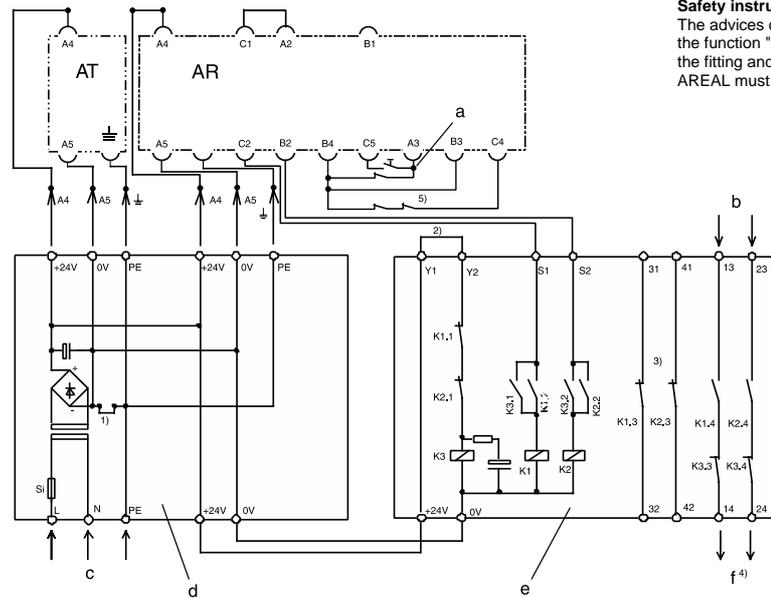


Fig. 2 Connecting diagram AREAL with A-PSU/A-RU, type of operation: "with restart interlock"

## 7. Technical Data

### A-PSU

Supply voltage	230 V, respectively 115 V, +/- 15 % in each case
Frequency	50..60 Hz
Power consumption	39 VA
Type of fuse	1 A (slow)
Requirements for design	Category 4 acc. EN 954-1 and EN 50100-1

### A-RU

Response time (switch-off delay)	< 6 ms
Switch-on delay	< 260 ms
Operation mode	"Guard" with automatic start
Type of operation	With/without external relays monitoring
Electrical connection	Terminal by screws up to 2,5 mm <sup>2</sup>
Switching outputs	2 potential-free make contacts, 1 potential-free break contact
Indication outputs	2 potential-free break contacts (only available if the break contact is not used for switching the safety related circuit)
Maximum power switched	250 V AC, 6 A max
Electrical durability	230 V AC, 6 A - 120 000 switching events 230 V, 2 A - 250 000 switching events
Mechanical durability	1 x 10 <sup>7</sup> switching events
Electrical protection rating	I
Enclosure rating	IP 20
Ambient temperature	- 10 .. + 50 °C
Storage temperature	- 20 .. + 70 °C
Interference immunity	acc. to IEC 801, Intensity IV

## 8. Order numbers

A-PSU/A-RU	547770
A-PSU, 230 V	547771
A-PSU, 115 V	547773
A-RU	547772