BENDER Relay Board AK1010-3

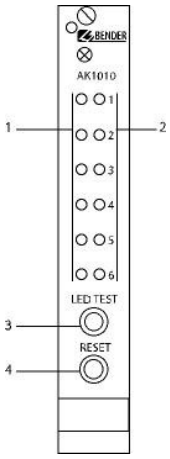
for use in automatic earth fault detection systems

1 LED green, indicates the activated circuit

2 LED red, indicates the set indicator memory

3 test button "LED-test"

4 reset button for the indicator memory



Product description

The relay change-over and fault indicator board AK1010-3 is an electronic device designed in Eurocard format, (dimensions 100 x 160 mm) for universal application.

Its function is to switch voltage or current signals to two common bus lines which can be connected to an evaluation system. The relays are equipped with an additional NC contact at one common bus line by which the non-activated current transformers can be short-circuited. The large switching range (max. 150 W) of the relays allows the unit to be used from minimal currents up to higher voltages. An electronic fault indicator memory enables a fault message to be stored as a function of the currently activated channel. The currently activated channel as well as the stored message are signalled by a LED indicator on the front panel.

The display elements and operator`s controls are incorporated in a front panel of the size 64, 40 mm (8 te). The device is connected via plug-in connectors according to DIN 41 612, type E 48.

Function

The six channels are selected by six control inputs. The control voltage is DC 24 V. In a multi-board system these can also be connected in a "bus configuration". One enable input "1 ... 6" per board optionally selects the individual board. A channel cannot be activated unless DC 24 V is applied to the enable input (or 0 V to the inverted input "$\overline{1 \ldots 6}$").

It should be noted that the board is enabled first before the required channel (1 ... 6) is switched on. When switching-off, the switching sequence must be reversed. The activation of individual channels or several channels simultaneously is possible depending on requirements.

The six indicator memories are set using the common input "Set". Feeding a positive voltage into this input sets the memory corresponding to the channel activated at that time. The alarm relays assigned to the memories have one common normally closed and normally open contact. The common input is individually accessible. This enables the indicator contacts to be used either as NC or NO contact. The built-in reset button or an external voltage-free contact allows the memories to be reset. The pulse duration of the "Set" and "Reset" inputs is not critical, but should be > 1 ms.

The built-in "Test" pushbutton enables all LEDs to be checked. The test is independent of the operating state of the board.

DIPL.-ING. W. BENDER GMBH & CO KG • P.O. BOX 1161 • D-35301 GRÜNBERG GERMANY • Phone: (+49) 6401 807-0 • FAX: (+49) 6401 807 259

Technical data AK1010-3

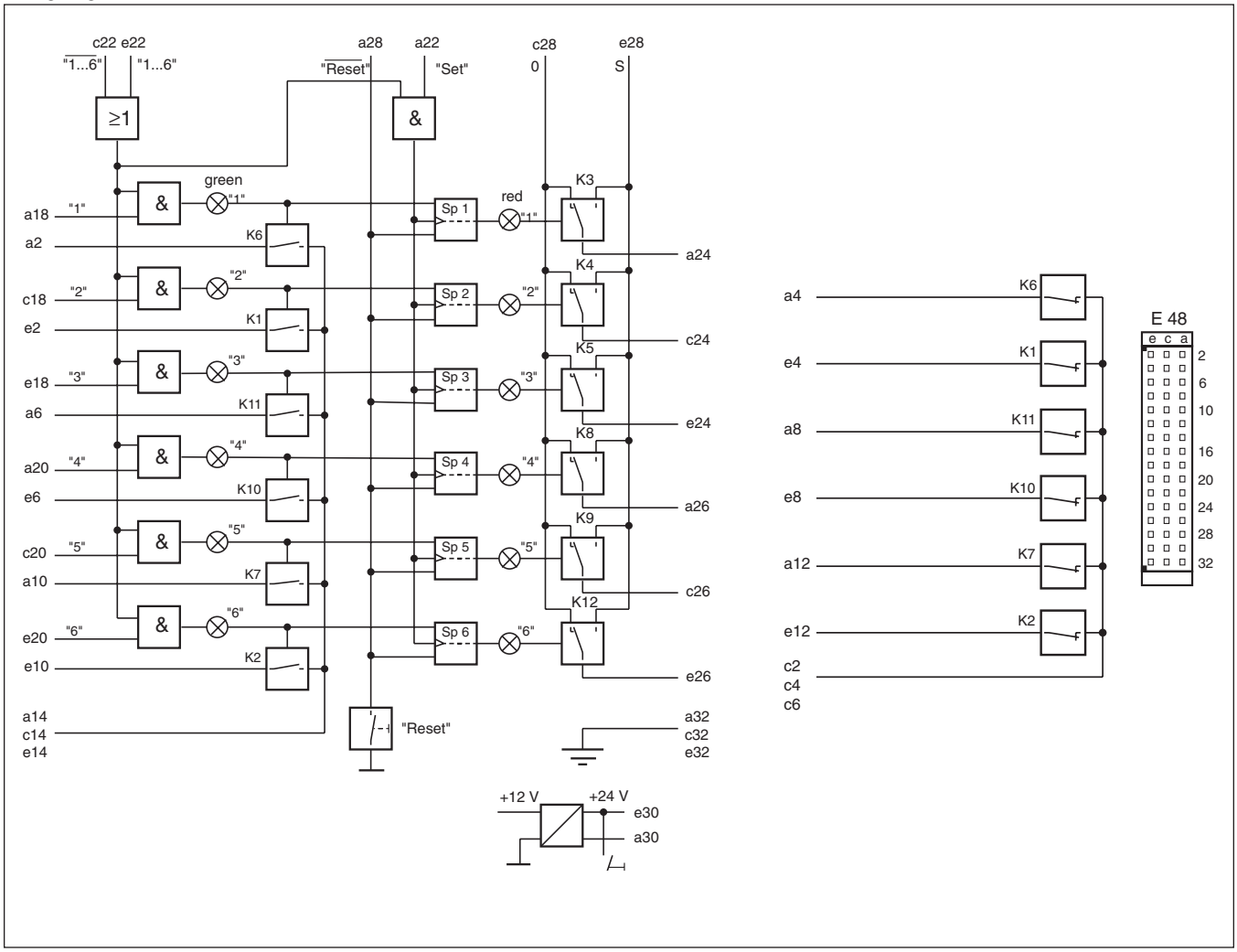
Supply voltage U_S	DC 24 V ± 20% max. 10% ripple
I_N max.	270 mA
Enable input "1 ... 6" (e22)	DC 24 V ± 20%
I max.	14 mA ± 20%
Enable input "1 ... 6" (c22)	< DC 2 V
I max.	- 0.7 mA
Input open U_O max.	28.8 V
Input "1 to 6" U_{AN}	DC 2 V
IA_N	75 µA
I max.	1.6 mA (24 V)
Input "Set" UA_N	DC 12 V
IAN	$_0$.6 mA
I max.	1.2 mA (24 V)
Input "Reset" UAB	$_<$ DC 2 V
I max.	- 0.6 mA
Input open UO max.	= US
Output relay circuit	
Insulation coordination acc. to DIN VDE 0110 T.1	
Rated insulation voltage	AC 250 V
Rated impulse withstand voltage/	
Pollution degree	4 kV/3
Rated voltage	250 V
Switching capacity	max. 150 W
Continuous current	2 A
Break capacity	
at DC 250 V and L/R = 0	0.25 A
Switching voltage	max. 300 V
	min. 0.2 V
Contact resistance	20 m
Mechanical endurance	5 x 10^7 switching operations
Alarm relay circuit	
Insulation coordination acc. to DIN VDE 0110 T.1	
Rated insulation voltage	AC 25 V
Rated impulse withstand voltage/	
Pollution degree	0.8 kV/3
Nominal insulation voltage	32 V
Rated voltage	24 V
Switching capacity	max. 60 W
Continuous current	2 A
Break capacity	
at DC 24 V and L/R = 0	2 A
Switching voltage	max. 28.8 V
	min. 0.1 V
Mechanical endurance	10^6 switching operations
Environmental conditions	
Ambient temperature	
during operation	-5°C ...+ 55°C / 268 K .... 328 K
Storage temperature range	-40°C ... + 90°C / 233 K ... 363 K
Connection	connectors acc. to DIN 41612, type E 48

Ordering details

Type	Rated voltage Un	Art. No.
AK1010-3	DC 24 V	B 980 357

continued on page 5.6/10.15 E

Wiring diagram



Key to wiring diagram

e22	Enable input "1 ... 6" , the board is activated at +24 V
c22	Enable input "1 ... 6", the board is activated at 0 V
a18	The relay contact between a2 and a14, c14, e14 closes and the contact between a4 and c2, c4, c6 opens when +24 V is applied to a18 and the board is enabled.
c18	The relay contact between e2 and a14, c14, e14 closes and the contact between e4 and c2, c4, c6 opens when +24 V is applied to c18 and the board is enabled.
e18	The relay contact between a6 and a14, c14, e14 closes and the contact between a8 and c2, c4, c6 opens when +24 V is applied to e18 and the board is enabled.
a20	The relay contact between e6 and a14, c14, e14 closes and the contact between e8 and c2, c4, c6 opens when +24 V is applied to a20 and the board is enabled.
c20	The relay contact between a10 and a14, c14, e14 closes and the contact between a12 and c2, c4, c6 opens when +24 V is applied to c20 and the board is enabled.
e20	The relay contact between e10 and a14, c14, e14 closes and the contact between e12 and c2, c4, c6 opens when +24 V is applied to e20 and the board is enabled.
a14 c14,e14	Common connection for the internal switching relays assigned to the control inputs "1 ... 6" (first contact set).
c2, c4, c6	Common connection for the internal switching relays assigned to the control inputs "1 ... 6" (second contact set).
a22	Set input for fault alarm. A positive voltage pulse activates the memory corresponding to the control inputs activated at that time.
a28	Reset input for fault alarm. A voltage of 0 V resets all six of fault indicator memories.