

CONNECTION AND SETTING GUIDE

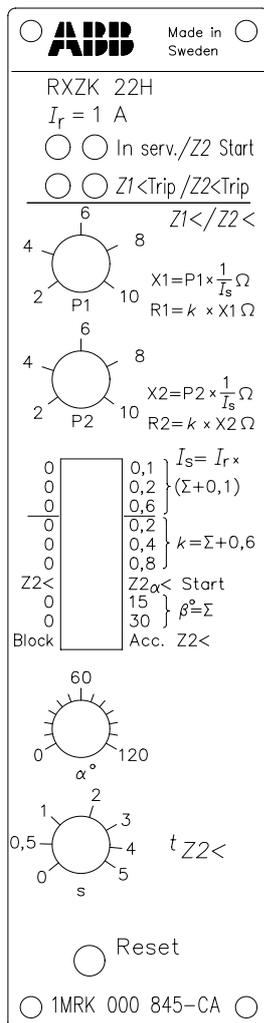


Fig. 1 Front layout

Rated current of the relay, I_r (available variants: 1 A or 5 A)

LED indicators:

- In serv. (green): indicates relay in service.
- Z2 Start (yellow): indicates operation of Z2< Start or operation of $Z2\alpha< \text{ Start}$ (no time delay).
- Z1< Trip (red): indicates operation of Z1< (no time delay).
- Z2< Trip (red): indicates operation of Z2< after the set time delay $t_{Z2<}$.

Potentiometer (P1) for setting of the reactive reach X1 for Zone 1.

Potentiometer (P2) for setting of the reactive reach X2 for Zone 2.

10-pole programming switch (S1) for setting of scale-constant and functions.

S1:1-3 switches set the scale constant I_s for calculation of X. I_s affects reach of both zones.

S1:4-6 switches set the scale constant k, the multiplier for R1 and R2.

S1: 7 switch determines the operation of the output relay 3. Z2< Start non-directional or $Z2\alpha< \text{ Start}$ directional.

S1:8-9 switches set the β angle for load discrimination of Z2< operation.

S1:10 switch determines the binary input Bin 1 function. Blocking of all functions except $Z2\alpha<$ or acceleration of Z2<.

Potentiometer (P3) determines the setting of the characteristic angle α° .

Potentiometer (P4) for setting of the time delay $t_{Z2<}$ for the function Z2<.

Reset push-button for LED. Also used to check the LED operation.

CONNECTION:

The RXZK 22H relay requires a dc-dc converter type RXTUG for auxiliary voltage supply $\pm 24 \text{ V}$. Connection of the voltage RL shall be made only when the binary input is used.

The relay is delivered with a short-circuiting connector RTXK for mounting on the rear of the terminal base. This connector will automatically short-circuit the current input when the relay is removed from its terminal base.

NOTE! The auxiliary voltage supply should be interrupted or the output circuits should be blocked to avoid the risk of unwanted alarm or tripping, before the relay is plugged into or withdrawn from its terminal base.

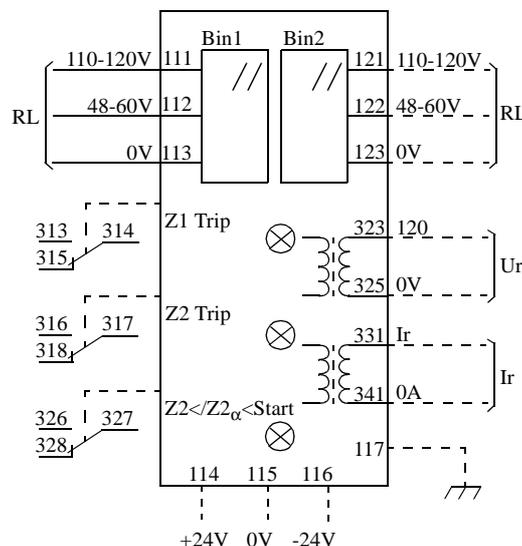


Fig. 2 Terminal diagram

SETTINGS:

All settings can be changed while the relay is in normal service. The relay needs a voltage above 10V for proper polarization of the directional function, maximum 250V. Rated voltage is 100V. The relay uses memory voltage in case the input voltage is below 10V during faults (short-circuits). Upon closing into a fault without prior voltage, the relay uses a non-directional circular characteristic. See type test documents 1MRK 509 006-TEN or User's Guide 1MRK509 006-UEN for further information. The characteristic of the relay is shown in fig. 3.

1. Setting of the scale-constant I_s .

The scale constant I_s is equal to the rated current I_r times the sum of the set value of the switches S1:1, S1:2 and S1:3 plus 0,1. The setting range is from 0,1 to $1,0 \times$ the rated current I_r .

2. Setting of the zone 1 under-impedance function (Z1<)

The setting range of the under-impedance function is expressed as $Z1 = jX1 + R1$ where $X1$ and $R1$ are set as follows:

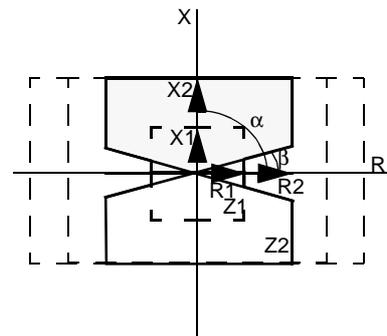


Fig. 3 Characteristic

2.1 Setting of the reactive reach (X1).

The operate value is set with potentiometer P1 according to the formula $X1 = P1 * 1/I_s$ (Ω). The setting range of P1 is 2-10, corresponding to 2-100 Ω , for $I_r = 1$ A and 0,4 - 20 Ω for $I_r = 5$ A.

2.2 Setting of the resistive reach (R1).

The operate value is set with the switches S1:4-6 according to the formula $R1 = k \cdot X1$ (Ω), where k is the sum of the switches S1:4, S1:5 and S1:6 plus 0,6 (range 0,6 to 2,0), corresponding to 1,2-200 Ω , for $I_r = 1$ A and 0,24 - 40 Ω for $I_r = 5$ A.

3. Setting of the zone 2 under impedance function (Z2<).

The setting range of the under-impedance function is expressed as $Z2 = jX2 + R2$. Both $X2$ and $R2$ must be larger than $X1$ and $R1$.

3.1 Setting of the reactive reach (X2).

The operate value is set with potentiometer P2 according to the formula $X2 = P2 * 1/I_s$ (Ω). The setting range of P2 is 2-10, corresponding to 2-100 Ω , for $I_r = 1$ A and 0,4 - 20 Ω for $I_r = 5$ A.

3.2 Setting of the resistive reach (R2).

The operate value is set according to the formula $R2 = k \cdot X2$ (Ω), where k is the same as for $R1$, corresponding to 1,2-200 Ω , for $I_r = 1$ A and 0,24 - 40 Ω for $I_r = 5$ A. Thus zone 2 receives the same ratio between the X and R setting as for zone 1.

4. Setting of the directional function $Z2_{\alpha<}$.

Set the programming switch S1:7 to "Z2<" for non-directional function or to " $Z2_{\alpha<}$ " for directional function.

5. Setting of the load discrimination area of $Z2_{\alpha<}$.

The angle β is settable by the sum of switches S1:8 and S1:9 to 0° , 15° , 30° and 45° .

6. Setting of the function of binary input Bin 1.

Bin 1 is used for blocking or acceleration functions according to the setting of switch S1:10

1. **Blocking** S1:10 in left position blocks all functions except $Z2_{\alpha<}$
2. **Acceleration $Z2_{\alpha<}$** S1:10 in right position enables instantaneous operation of $Z2_{\alpha<}$.

7. Setting of the characteristic angle.

The characteristic angle, α , is settable between 0° to 120° . The angle is adjusted with potentiometer P3.

8. Setting of the time delay $t_{Z2<}$.

The time delay $t_{Z2<}$ for zone 2 has definite-time characteristic. The setting is done with potentiometer P4. The setting range is 0 - 5 s.

9. The binary inputs.

There are two binary inputs (Bin 1 and Bin 2) on the relay. Bin 1 (terminals 111/112-113) is used for external blocking of all functions except $Z2_{\alpha<}$ or acceleration of the $Z2_{\alpha<}$ trip function to an instantaneous function on contact 317. Bin 2 (terminals 121/122-123) is used for resetting of the LED indicators. The functions are activated when a voltage RL is applied to the binary inputs.

INDICATION

There are four LED indicators. The trip indicators seal-in and are reset manually by the "Reset" push-button or electrically via the binary input, while the start indicator resets automatically when the relay resets. When the "Reset" push-button is depressed during normal operating conditions, all LEDs except "In serv." will light up. When connecting RXZK 22H to the auxiliary voltage, the relay performs a self test. The "In serv." LED is on, after performing the self test and when the relay is ready for operation. In case of a fault, the LEDs will start flashing.

TRIPPING AND START OUTPUTS

The RXZK 22H relay has two tripping outputs for the under-impedance functions ($Z1_{\alpha<}$ and $Z2_{\alpha<}$) and one output for the start $Z2_{\alpha<}/Z2_{\alpha<}$ function (non-directional or directional). Each output is provided with one change-over contact. All outputs reset automatically when the impedance increases to a value over the resetting level of the relay.

ESD

The relay contains electronic circuits which can be damaged if exposed to static electricity. Always avoid to touch the circuit board when the relay cover is removed during the setting procedure.