

Abstract

- Voltage-polarized
 Operating value constant within a wide polarizing voltage range
- Angle of maximum sensitivity 30°, current leading voltage; sensitivity down to 0.15 % of rated voltage
- 5 current ranges available providing a total setting range of 100 mA to 20 A
- Built-in medium- (trip-) duty output relay and hand-reset target
- Insensitive to dc offset



(830250)

Application

The RXPE 42 relay provides an instantaneous directional-overcurrent relay function. The overcurrent response is sensitive to the cosine of the angle between the measured current and the current at which maximum sensitivity is obtained. Because operation is virtually independent of the polarizing voltage magnitude, the relay is not a product relay in the conventional sense. The insensitivity to dc offset diminishes transient overreach.

The RXPE 42 has a characteristic angle of -30° (see Fig. 1). It is primarily used for directional-overcurrent phase-fault protection with the polarizing voltage connected in quadrature to the measured input current (at unity power factor position); i.e., current connection in one phase and voltage connection between the other two phases.

With RXPE 42 proper operation will be obtained for polarizing voltages down to 0.15 % of rated voltage when fault currents are 10 times the set value or higher.

Thus the relay operates correct even for adjacent 3-phase faults.

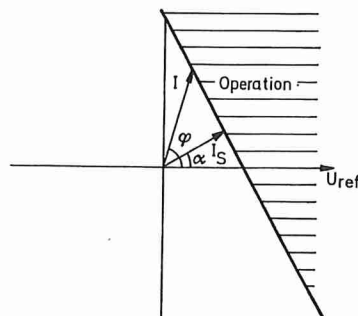


Fig. 1 RXPE 42 where $\alpha = -30^\circ$.
 Operates when $I \times \cos(\varphi + 30) \geq I_s$

Abstract

- Voltage-polarized
- Operating value constant within a wide polarizing voltage range
- Angle of maximum sensitivity 65°, current lagging voltage; sensitivity down to 1 % of rated voltage
- 6 current ranges available providing a total setting range of 10 mA to 12 A
- High-speed reed-type output relay

Application

The RXPE 47 relay provides an instantaneous directional-overcurrent relay function. The overcurrent response is uniquely sensitive to the cosine of the angle between the measured current and the current at which maximum sensitivity is obtained. Because operation is virtually independent of the polarizing voltage magnitude, the relay is not a product relay in the conventional sense. The insensitivity to dc offset diminishes transient overreach.

The RXPE 47 has a characteristic angle of +65° (see Fig. 1). RXPE 47 is primarily used for directional ground-fault detection on solidly grounded power systems, with the residual voltage used for polarizing and the residual current used as an operating quantity.

For low values of residual voltage, the relay's directional measuring properties are influenced by the presence of harmonics. The third harmonic content can be relatively high for CCVT's connected in broken delta. For proper operation the harmonic voltage should always be less than the lowest fundamental polarizing voltage required by the relay. If operation is required for fundamental residual polarizing voltages equal to or lower than existing harmonic voltages, a type RAEPA ground-fault relay is recommended. The RAEPA contains harmonic filtering which enables it to operate reliably for a fundamental voltage component equal to only 0.75 % of rated voltage with the simultaneous presence of a third harmonic voltage equal to 2% of rated voltage.

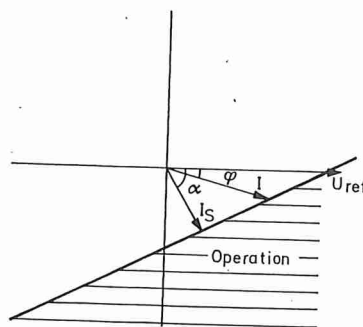
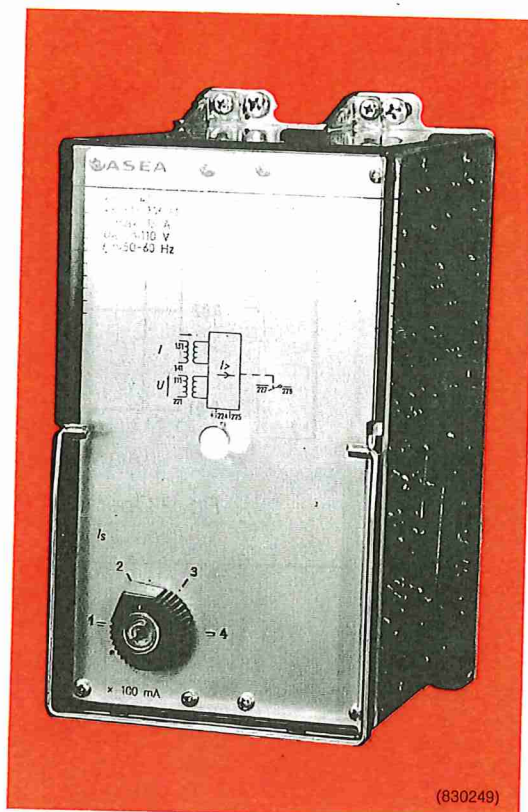


Fig. 1 RXPE 47 where $\alpha = +65^\circ$.
Operates when $I \times \cos(\varphi - 65) \geq I_s$

Design

The RXPE 47 is a static, single-phase, voltage polarized ac directional overcurrent relay module which measures the component of current that has a phase angle equal to the designed characteristic angle.

The relay consists mainly of 1 input auxiliary current transformer and 1 input voltage transformer (both providing isolation), a phase-sensitive circuit utilizing 2 full-wave diode bridge-rectifiers, low-pass filter which smooths the rectifier output, auxiliary-voltage regulator and potentiometer which provide an adjustable reference

voltage, and a level detector with an amplifier for driving a dry-reed output relay unit (no target). The operating value is continuously adjustable 1-4 times a scale factor.

A short-circuiting connector type RTXK is supplied with the relay module. This connector mounts on the rear of the terminal base (not supplied) and automatically short-circuits the current transformer secondary circuit when the relay is removed from the terminal base. The relay occupies four seats (4S 12C).

Type RXPE 40
0° directional overcurrent relay

Abstract

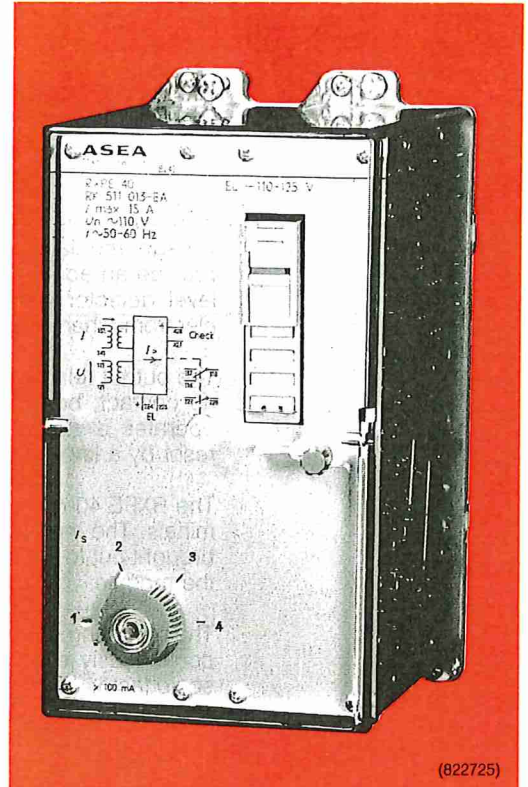
- Voltage-polarized
- Angle of maximum sensitivity: 0°, current in phase with voltage; sensitivity down to 0.6 % of rated voltage
- 7 current ranges available providing a total setting range of 3 mA to 12 A
- Low power consumption at operation down to 0.08 mVA in current circuit
- Built-in medium- (trip-) duty output relay and hand-reset target
- Insensitive to dc offset

Application

The RXPE 40 relay provides an instantaneous or time-delay directional overcurrent relay function. The overcurrent response is sensitive to the cosine of the angle between the measured current and the current at which maximum sensitivity is obtained. Because operation is virtually independent of the polarizing voltage magnitude, the relay is not a product relay in the conventional sense. The insensitivity to dc offset diminishes transient overreach.

The RXPE 40 has a 0° characteristic angle. Maximum sensitivity is obtained when the measured current I is in phase with the polarizing voltage U . For other phase angles, the relay operates when $I \times \cos \varphi \geq I_s$. Figure 1 shows the operating region for the relay.

Typical applications for the RXPE 40 relay include: directional ground-fault protection for measuring the resistive component of ground-fault current on systems with a neutral grounding resistor or reactor, directional protection for active or reactive power in three-phase symmetrically loaded systems, out-of-step protection for synchronous motors, reverse power protection for generators and transformers, and underexcitation protection for generators. In three-phase systems, maximum sensitivity can be obtained for the desired phase angle by suitable connection of the polarizing voltage input either directly to the phase voltages or via externally mounted resistive voltage dividers.



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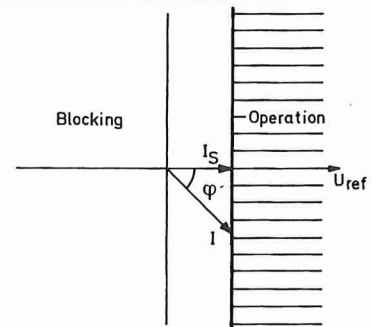


Fig. 1 RXPE 40, $\alpha = 0^\circ$, operates when $I \times \cos \varphi \geq I_s$.