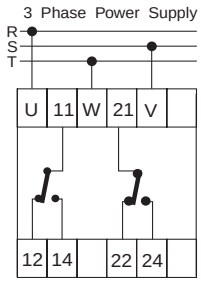
RHOMBERG

3 Phase Monitoring Relay - Phase Sequence, Failure, or Asymmetry Detection 1 C/O or 2 C/O

AP 430
AP 432

WIRING EXAMPLE

DPDT (2 C/O) version shown



A-LINE

Application Examples

- Detection of phase failure and phase reversal on voltage transformers of HT switchgear.
- Protection of 3 phase motors against single phasing.
- Overhead line supervision in rural areas.
- Protection against reverse phase sequence on forward and reverse operating machines.
- Protection against phase reversal on 3-phase compressor motors or on 3-phase fan motors.
- Detection of phase angle errors & unbalanced supply voltage
- Detection of loss of neutral (AP432 only).

ORDERING CODE

TYPE		SUPPLY VOLTAGE	AC/DC	RELAY CONTACTS
AP430	/	400	A	S

Note: AP432 acts as AP430 but also detects loss of Neutral

Technical Specification

Power Supply:
Supply voltage (phase-to-phase):
110, 190, 220, 380, 400-415, 525, 550 VAC ±20%

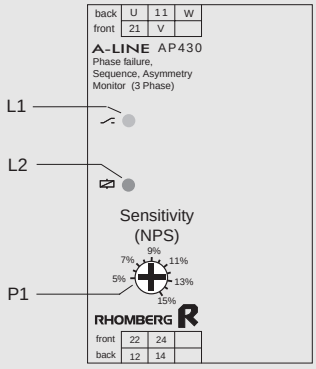
Response:
Time delay on trip: 1 second (approx.)
Time delay on recovery: 1 second (approx.)

Voltage Sensing:
Repetitive accuracy: 1%
Hysteresis : 2% fixed (relative to its supply voltage)

Relay output: 10 SPDT or 5A DPDT per contact

Note: Insensitive to regenerated EMF voltage.
Insensitive to balanced supply voltage variations.
High stability under harmonic distortion.

Description of Controls



L1: The yellow **"Relay ON"** LED illuminates when the relay is energised ie. the power supply is balanced and in the correct sequence, and switches off when the unit registers a fault condition.

L2: The green **"Power ON"** LED illuminates when power is supplied to the unit.

P1: The **Sensitivity** to the three phase voltage imbalance is adjusted on P1. The scale is calibrated in percentage negative-phase-sequence (NPS) voltage. For general applications, a setting of between 5% and 7% is recommended.

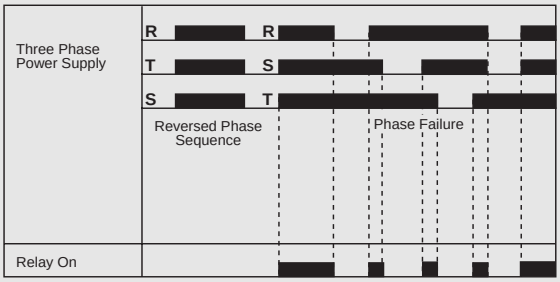
Fault Detection: When power is applied, the relay energises after approximately one second, provided all three phases are balanced and in the correct sequence. The relay will de-energise when any one of the following faults occur:
- reversal of phase sequence.
- excessive imbalance between phases.
- excessive phase angle error.
- failure of one or more phases ("single phasing")
- loss of neutral (AP432 only).

The relay will energise again when proper power supply conditions are established. Imbalance sensitivity, ie. percentage NPS voltage tolerance is adjustable between 5% and 15%.

Note: The unit will not react to a balanced under-voltage or over-voltage condition on all three phases. For over-/under- voltage protection refer to SP 231 or AP230.

Operational Diagrams

AP430 3-Phase Monitoring



AP432 3-Phase & Neutral Monitoring