

# Parallel connection of relay protection voltages



## AI Overview

Connecting relays in parallel to share voltage or current is generally not recommended due to unequal current distribution and high risk of relay failure.

**Key Considerations**

**Current Sharing Issues:** When relays are connected in parallel, the current may not divide equally because each relay has slightly different contact resistance. The relay with the lowest resistance will carry more current, potentially exceeding its rated capacity and causing overheating or failure ( ).

**Failure Risks:** If one relay fails or cannot energize, the remaining relay(s) will carry the full current, increasing the likelihood of contact welding or damage. This is particularly critical in protective relaying circuits where reliability is essential ( ).

**Voltage and Arc Concentration:** During switching, the interrupting arc may concentrate on a single relay, especially if the relays do not operate simultaneously. This can lead to premature contact wear or failure ( ).

**Protective Measures:** To mitigate risks, it is recommended to:

- Use relays with a current rating significantly higher than the expected load.
- Install fuses or current sensors in series with each relay to prevent overcurrent.
- Ensure simultaneous operation of relays to minimize uneven voltage or current stress ( ).

**Practical Guidance:** Standards such as NFPA 79 advise against paralleling relay contacts to increase ampacity, except under very specific conditions where the relays are not switching current but merely holding a voltage ( ).

**Alternative Approaches:** Instead of paralleling relays, consider:

- Using a single relay with a higher voltage or current rating.
- Employing solid-state relays or contactors designed for higher loads.
- Designing the protection scheme to distribute load across separate circuits rather than paralleling contacts.

In summary, while parallel connection of relays may seem like a way to increase capacity, it introduces signific...

## Article Content

Protection Relay:Types, wiring diagram and working principle.

Protection relay is an electromechanical monitoring safety device which senses fault and provide trip signal to the breaker as per set value in LT and HT panel. The Protection devices is over current

Combining Relay Outputs

Relay outputs for Senva products can be joined together in series, in parallel, or a combination of both to create more advanced logic. This can be used to create redundancy for critical applications or add

Do all relays need a diode in parallel with the coil?

I often see circuits with relays and diodes like this: Note the diode D1 in parallel with RLY1, at reverse polarity to the driving voltage V1. Per my research, the reason is that the relay coil is

Can two relays be connected in series or parallel?

To prevent this, it is necessary to use a relay with a rating that has a margin in excess of the circuit current, or install a current sensor or fuse in the current line of each relay to prevent

Fundamentals of Modern Protective Relaying

Instrument Transformers • Supply accurately scaled current and voltage quantities for measurement while insulating the relay from the high voltage and current of the power system.

Series vs. Parallel Surge Protective Devices (SPDs)

When designing and installing power distribution systems, engineers and contractors select surge protective devices (SPDs) to protect electrical

Power System Protective Relays: Principles & Practices

Cross polarization: (protective relaying) The polarization of a relay for directionality using some proportion of the voltage from a healthy (unfaulted) phase(s). One example of this is quadrature

Protective Relays

Protect critical components in your power system with a wide range of SEL protective relays covering applications and use cases from low to high-voltage protection.

Vage Retransfer vs. Paralleling | Dual Bus System Protection

Understanding the distinction between Voltage Retransfer and Voltage Paralleling is crucial as they address different problems in power systems, primarily applied in busbar protection

### Feeder Protection Relay: A Comprehensive Guide

A feeder protection relay is a device that protects power system feeders from various types of faults, such as short circuits, overloads, ground faults, and broken conductors. A feeder is a

8 typical transformer protection schemes with correctly selected relays

Protection schemes and relays selection This technical article shows application hints for typical transformer protection schemes where SIPROTEC 4 relays are used. Some of applications

### Relays Part 4: The Protective Relay Basic Theory

The protective relays communicate through codes that have different meanings such as the current protection codes and the voltage protection codes. Protective relays are tested through

CURRENT, VOLTAGE, DIRECTIONAL, CURRENT (OR VOLTAGE)

3 CURRENT, VOLTAGE, DIRECTIONAL, CURRENT (OR VOLTAGE)-BALANCE, AND DIFFERENTIAL RELAYS Chapter 2 described the operating principles and characteristics of the basic relay

Mutual Impedance in Parallel Lines – Protective Relaying and Fault ...

Protective relaying considerations for preventing overreach and loss of directionality under certain power system operating conditions are illustrated and discussed. The paper illustrates

Technical professionals provide easy-to-understand explanations of

Technical professionals explain in detail the unknowns when using PCB power relays with high current and high voltage, such as counter-electromotive force of coils, holding voltage application circuits,

### Solid State Relay Parallel and DC Operation

Vishay solid state relay (SSR) outputs can be wired in parallel enabling the user to benefit from lower on-resistance and higher load currents for AC/DC switching applications.

### Protective Relay Basics Part 2

Part 1: Protective relay compared to low voltage circuit breaker. Review fundamental concepts, components, and terminology using the electromechanical overcurrent relay as a foundation.

## Fundamentals of Modern Protective Relaying

A primary motor protective element of the motor protection relay is the thermal overload element and this is accomplished through motor thermal image modeling. This model must account for thermal

### UNIT 1 PROTECTIVE RELAYS

PROTECTIVE RELAYS PROTECTIVE RELAYING Requirement of Protective Relaying  
Zones of protection, primary and backup protection Essential qualities of Protective Relaying Classification of

### BASIC RELAYS

De-spiking Diode Relays diode in the reverse-biased position is connected in parallel with the relay coil. As there is no flow of current due to such a connection, an open circuit of the relay will cause the

Practical handbook for relay protection engineers | EEP

Relay protection circuitry This handbook covers the code of practice in protection circuitry including standard lead and device numbers, mode of connections at terminal strips, colour codes in

### CHAPTER-3

In some cases, local backup protection is justified. Local backup consists of two sets of independent primary protection and breaker-failure relaying. Ideally, this should include two independent sets of

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