

American Standard
for
**RELAYS ASSOCIATED WITH
POWER SWITCHGEAR**

APPROVED
American Standards Association
October 29, 1937
Reaffirmed May 14, 1945



SPONSOR
Electrical Standards Committee

**AMERICAN ENGINEERING AND
INDUSTRIAL STANDARDS**

Published by
AMERICAN STANDARDS ASSOCIATION
70 East Forty-fifth Street
New York 17, N. Y.



PRINTED IN U. S. A.

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FOREWORD

This standard relates only to relays of types directly associated with power switchgear. It does not cover relays of types designed primarily for industrial control, excitation or governor regulating, telephone, telegraph, traffic signal, or similar purpose.

This is the first American Standard approved as a result of the work of the sectional committee on Power Switchgear—C37. The organizations represented on this sectional committee, and the names of their representatives, are as follows:

<i>Organization Represented</i>	<i>Name of Representative</i>
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The basis of this standard was the August, 1931, report (No. 23) on Standards for Relays published by the American Institute of Electrical Engineers. This report was later revised by the Institute and was then submitted to the American Standards Association, the Electrical Standards Committee of which referred this report to Sectional Committee C37 in April, 1936. Subsequent work on this project has been carried on by the Relay Subcommittee of Sectional Committee C37. The personnel of this subcommittee is as follows:

R. N. CONWELL, *Chairman*
L. N. CRICHTON
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The definitions contained in this standard are based on the latest information made available by the American Standards Association Sectional Committee on Electrical Definitions—C42, and its subcommittee. Most of the definitions were obtained from the final report of Chairman H. E. Ruggles of C42 Subcommittee No. 3-A on Switching Equipment Definitions.

Other American Standards now in course of preparation by the Sectional Committee on Power Switchgear cover automatic stations, oil circuit breakers, metal-clad switchgear, air switches, and air circuit breakers.

AMERICAN STANDARD FOR RELAYS ASSOCIATED WITH POWER SWITCHGEAR

SCOPE

1.001 SCOPE. These standards cover all relays directly associated with power switchgear.

SERVICE CONDITIONS

1.002 USUAL SERVICE CONDITIONS. Relays and relaying devices conforming with these standards shall be suitable for operating:

- (a) When and where the ambient temperature is not less than 20 C below zero not greater than 40 C above zero.
- (b) Where the altitude does not exceed 3,300 feet (1000 meters).

1.003 UNUSUAL SERVICE CONDITIONS. The use of relays or relaying devices in ambient temperatures below 20 C below zero, or above 40 C above zero, or at altitudes greater than 3,300 feet (1000 meters) shall be considered as special applications. There are further unusual conditions which, where they exist, shall be brought to the attention of those responsible for the application, manufacture and operation of the relays. Relays for use in such cases may require special construction. Among such unusual conditions are:

- (a) Exposure to damaging fumes
- (b) Exposure to excessive moisture
- (c) Exposure to excessive dust
- (d) Exposure to abrasive dust
- (e) Exposure to steam
- (f) Exposure to excessive oil vapor
- (g) Exposure to explosive mixtures of dust or gases
- (h) Exposure to salt air
- (i) Exposure to abnormal vibration, shocks or tilting
- (j) Exposure to weather or dripping water
- (k) Exposure to unusual transportation or storage conditions

- (l) Exposure to extreme temperature or sudden change in temperature
- (m) Unusual space limitations
- (n) Unusual operating duty
- (o) Unusual insulation requirements

DEFINITIONS

Definitions given herein apply specifically to the relays or relaying devices treated in this section. The more common types of relays are listed and defined below in the following paragraphs. These names may be combined to define relays which fulfill two or more definitions.

The qualifying terms, listed after these definitions, will frequently be used in addition as part of the nomenclature.

GENERAL

1.004 RELAY. A relay is a device which is operative by a variation in its electrical or physical conditions to effect the operation of other devices in an electric circuit.

CLASSES

1.005 AUXILIARY RELAY. An auxiliary relay is a relay which operates in response to the opening or closing of its operating circuit to assist another relay or device in the performance of a function.

1.006 CONTROL RELAY. A control relay is a relay which functions to initiate or to permit the next desired operation in a control circuit or scheme.

1.007 PROTECTIVE RELAY. A protective relay is a relay, the principal function of which is to protect service from interruption or to prevent or limit damage to apparatus.

1.008 REGULATING RELAY. A regulating relay is a relay which operates because of a de-

parture from predetermined limits of a quantity and which functions through supplementary equipment to restore the quantity within these limits.

RELAYS

1.009 ALARM RELAY (SIGNAL ALARM). An alarm relay is a relay which operates an audible or visible signal to attract attention to some action automatically performed, or to some condition that requires attention.

1.010 BELL ALARM RELAY. (See Alarm Relay, 1.009).

1.011 BALANCED RELAY. (See Differential Relay, 1.017).

1.012 BALANCED-CURRENT RELAY. (See Differential Relay, 1.017).

1.013 CLOSING RELAY. A closing relay is a form of auxiliary relay used with an electrically operated device to control the closing and opening of the operating circuits of the device so that the main operating current does not pass through the control switch or other initiating device.

1.014 CURRENT RELAY. A current relay is a relay which functions at a predetermined value of current. It may be an over-current relay, an under-current relay or a combination of both.

1.015 CURRENT BALANCE RELAY. (See Differential Relay, 1.017).

1.016 CURRENT DIRECTIONAL RELAY—(REVERSE CURRENT RELAY). A current directional relay is a relay which functions in conformance with the direction of current.

1.017 DIFFERENTIAL RELAY. A differential relay is a relay which functions by reason of the difference between two quantities of the same nature, such as current, voltage, etc.

1.018 DIRECTIONAL RELAY. A directional relay is a relay which functions in conformance with the direction of power, voltage, current, phase rotation, etc.

1.019 DIRECTIONAL OVER-CURRENT RELAY.

A directional over-current relay is an over-current unit and a power directional unit combined to function on a predetermined fault location and value of current.

1.020 DISTANCE RELAY. A distance relay is a protective relay, the operation of which is a function of the distance between the relay and the point of fault.

1.021 FAULT DETECTOR RELAY. A fault detector relay is a relay which functions without need of discrimination in the event of a fault upon the system.

1.022 FLOW RELAY. A flow relay is a relay which functions at a predetermined flow of gas or liquid.

1.023 FREQUENCY RELAY. A frequency relay is a relay which functions at a predetermined value of frequency. It may be an over-frequency relay, an under-frequency relay, or a combination of both.

1.024 GROUND RELAY. A ground relay is a protective relay which functions in case of a fault to ground. (See also Zero Phase-Sequence Relay, 1.063).

1.025 IMPEDANCE RELAY. An impedance relay is a form of distance relay, the operation of which is a function of the impedance of the circuit between the relay and the fault.

1.026 LOCKING RELAY. A locking relay is a relay which renders some other relay or device inoperative under predetermined conditions.

1.027 NEGATIVE PHASE-SEQUENCE RELAY. A negative phase-sequence relay is a relay which functions in conformance with the negative phase-sequence component of the current, voltage or power of the circuit.

1.028 NETWORK RELAY. A network relay is a form of voltage, power or other type of relay, for specific use in the protection and control of alternating-current low voltage networks.

1.029 NETWORK MASTER RELAY. A network