ANSI / IEEE C37.2

RELAY DEVICE NUMBERS

Complete Reference — Device Numbers 1 through 94

Protection Relay Function Descriptions

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1 Master Element
Initiating device (control switch/relay) that places equipment in or out of operation directly or through permissive devices.

2 Time-Delay Starting/Closing Relay
Provides a time delay before or after any point of operation in a switching sequence or protective relay system.

3 Checking or Interlocking Relay
Operates in response to position of other devices to allow an operating sequence to proceed, stop, or provide a check.

4 Master Contactor
Makes and breaks the necessary control circuits to place equipment into operation under desired conditions.

5 Stopping Device
Control device used primarily to shut down equipment and hold it out of operation (manual or electrical).

6 Starting Circuit Breaker
Connects a machine to its source of starting voltage.

7 Rate-of-Change Relay
Operates when the rate of change of the measured quantity (pressure, temperature, frequency) exceeds a predetermined value.

8 Control Power Disconnecting Device
Connects and disconnects the source of control power to and from the control bus or equipment.

9 Reversing Device
Used for reversing a machine field or performing any other reversing function.

10 Unit Sequence Switch
Changes the sequence in which units may be placed in and out of service in multiple-unit equipment.

11 Multifunction Device
Performs three or more comparatively important functions that could only be designated by combining several device numbers.

12 Overspeed Device
Usually a direct-connected speed switch which functions on machine overspeed.

13 Synchronous-Speed Device
Operates at approximately synchronous speed of a machine (centrifugal switch, slip-frequency relay).

14 Underspeed Device
Functions when the speed of a machine falls below a predetermined value.

15 Speed/Frequency Matching Device
Matches and holds the speed or frequency of a machine or system equal to that of another source.

16 Data Communications Device
Used for remote monitoring, diagnostics, or data acquisition from protective relays and other IEDs.

17 Shunting or Discharge Switch
Opens or closes a shunting circuit around any piece of apparatus (except a resistor).

18 Accelerating/Decelerating Device
Closes or causes the closing of circuits to increase or decrease machine speed.

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19 Starting-to-Running Transition Contactor

Initiates or causes automatic transfer of a machine from starting to running power connection.

20 Electrically Operated Valve

Electrically operated, controlled, or monitored valve used in a fluid line (not Device 90).

21 Distance Relay

Functions when circuit impedance, admittance, or reactance changes beyond limits. Used for transmission line protection.

22 Equalizer Circuit Breaker

Controls equalizer or current-balancing connections for a machine field or regulating equipment.

23 Temperature Control Device

Raises or lowers the temperature of a machine, apparatus, or medium when it departs from a set value.

24 Volts per Hertz Relay (V/Hz)

Operates when the V/Hz ratio exceeds a preset value. Protects generators and transformers against overexcitation.

25 Synchronism-Check Relay

Permits paralleling of two AC circuits when frequency, phase angle, and voltage are within desired limits.

26 Apparatus Thermal Device

Functions when the temperature of protected apparatus exceeds a predetermined value (not rotating machinery).

27 Undervoltage Relay

Operates when input voltage is less than a predetermined value. Used for bus and motor UV protection.

28 Flame Detector

Monitors presence of the pilot or main flame in a furnace or boiler.

30 Annunciator Relay

Non-automatically reset device giving separate visual indications upon functioning of protective devices.

29 Isolating Contactor

Disconnects one circuit from another for purposes of emergency operation, maintenance, or test.

32 Directional Power Relay

Operates on a predetermined value of power flow in a given direction, or on reverse power (anti-motoring).

31 Separate Excitation Device

Connects a circuit to a source of separate excitation during the starting sequence.

34 Master Sequence Device

Establishes or determines the operating sequence of major devices (motor-operated multi-contact switch).

33 Position Switch

Makes or breaks contact when the main device or piece of apparatus reaches a given position.

36 Polarity or Polarizing Voltage Device

Operates on a predetermined polarity only, or verifies the presence of a polarizing voltage.

35 Brush-Operating/Slip-Ring Short-Circuiting

Raises, lowers, or shifts brushes of a machine, or short-circuits its slip rings.

38 Bearing Protective Device

Functions on excessive bearing temperature or other abnormal mechanical bearing conditions.

37 Undercurrent or Underpower Relay

Functions when current or power flow decreases below a predetermined value.

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39 Mechanical Condition Monitor
Functions on abnormal mechanical conditions such as excessive vibration, eccentricity, expansion, shock, or tilting.

40 Field Relay (Loss of Excitation)
Functions on low/failed field current or excessive reactive armature current. Loss-of-field protection.

41 Field Circuit Breaker
Applies or removes the field excitation of a machine.

42 Running Circuit Breaker
Connects a machine to its source of running voltage after reaching desired speed on starting connection.

43 Manual Transfer/Selector Device
Manually operated device that transfers control circuits to modify the plan of operation.

44 Unit Sequence Starting Relay
Starts the next available unit in multiple-unit equipment upon failure of the preceding unit.

45 Atmospheric Condition Monitor
Functions on abnormal atmospheric conditions such as damaging fumes, explosive mixtures, smoke, or fire.

46 Reverse-Phase/Phase-Balance Current Relay
Functions on reverse-phase sequence or when polyphase currents are unbalanced (negative-sequence current).

47 Phase-Sequence Voltage Relay
Functions on a predetermined value of negative-sequence voltage or phase-reversal.

48 Incomplete Sequence Relay
Returns equipment to off position and locks it out if the normal sequence is not completed in time.

49 Machine/Transformer Thermal Relay
Functions when the temperature of a winding or transformer exceeds a predetermined value. Thermal overload.

50 Instantaneous Overcurrent Relay
Functions instantaneously on an excessive current value. No intentional time delay.

51 AC Time Overcurrent Relay
Definite or inverse time characteristic relay for AC overcurrent protection. Most commonly applied OC relay.

52 AC Circuit Breaker
Closes and interrupts an AC power circuit under normal conditions, or interrupts under fault/emergency conditions.

53 Exciter or DC Generator Relay
Forces DC machine field excitation to build up during starting or functions when voltage reaches a given value.

54 Turning Gear Engaging Device
Causes the turning gear to engage or disengage the machine shaft.

55 Power Factor Relay
Operates when the power factor in an AC circuit rises above or drops below a predetermined value.

56 Field Application Relay
Automatically controls application of field excitation to an AC motor at a predetermined point in the slip cycle.

57 Short-Circuiting or Grounding Device
Short-circuits or grounds a circuit in response to automatic or manual means.

58 Rectification Failure Relay
Functions if power rectifier anodes fail to fire, or detects arc-back or failure of diodes to block.

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59 **Overvoltage Relay**
Operates when input voltage exceeds a predetermined value. Used for bus OV, generator OV, and neutral OV (59N).

60 **Voltage/Current Balance Relay**
Operates on a given difference in voltage or current input/output of two circuits. CT trouble detection.

61 **Density Switch or Sensor**
Operates on a given value or rate of change of gas density (e.g., SF6 gas pressure in circuit breakers).

62 **Time-Delay Stopping/Opening Relay**
Time-delay relay that serves in conjunction with a device initiating shutdown, stopping, or opening.

63 **Pressure Switch**
Operates on given pressure values or rate of change of pressure. Buchholz relay, sudden pressure relay.

64 **Ground Detector Relay**
Operates upon failure of insulation to ground. Includes stator ground (64S) and rotor ground (64R).

65 **Governor**
Fluid, electrical, or mechanical control equipment for regulating flow to the prime mover (starting, speed, load, stopping).

66 **Notching or Jogging Device**
Allows only a specified number of operations or successive operations within a given time. Starts-per-hour limit.

67 **AC Directional Overcurrent Relay**
Functions on a desired value of AC overcurrent flowing in a predetermined direction.

68 **Blocking Relay**
Initiates a pilot signal for blocking of tripping on external faults in a transmission line.

69 **Permissive Control Device**
Two-position manually operated switch that permits or prevents closing of a CB or placing equipment into operation.

70 **Rheostat**
Variable resistance device used in an electric circuit for regulating the operation of other devices.

71 **Level Switch**
Operates on given values or rate of change of level.

72 **DC Circuit Breaker**
Closes and interrupts a DC power circuit under normal conditions, or interrupts under fault/emergency conditions.

73 **Load-Resistor Contactor**
Shunts or inserts a step of load limiting, shifting, or indicating resistance in a power circuit.

74 **Alarm Relay**
Relay used to operate, or operate in connection with, a visual or audible alarm.

75 **Position Changing Mechanism**
Moves a removable CB unit to and from the connected, disconnected, and test positions.

76 **DC Overcurrent Relay**
Functions when the current in a DC circuit exceeds a given value.

77 **Telemetering Device**
Transmitter that generates and transmits an electrical signal representing a measured quantity to a remote location.

78 **Phase-Angle Measuring Relay**
Functions at a predetermined phase angle between voltages or currents. Out-of-step / pole-slip protection.

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79 AC Reclosing Relay
Controls automatic reclosing and locking out of an AC circuit interrupter for transmission/distribution lines.

80 Flow Switch
Operates on given values or rate of change of flow (liquid or gas).

81 Frequency Relay
Operates on underfrequency (81U), overfrequency (81O), or rate of change of frequency (81R). Load shedding.

82 DC Reclosing Relay
Controls automatic closing and reclosing of a DC circuit interrupter in response to load circuit conditions.

83 Automatic Selective Control/Transfer Relay
Automatically selects between certain sources or conditions, or performs a transfer operation.

84 Operating Mechanism
Complete electrical mechanism or servo-mechanism for a tap changer, regulator, or similar apparatus.

85 Carrier/Pilot-Wire Receiver Relay
Operated or restrained by a signal in carrier-current or DC pilot-wire fault directional relaying schemes.

86 Lockout Relay
Electrically operated hand-reset relay that shuts down and holds equipment out of service. Requires manual reset.

87 Differential Protective Relay
Functions on a percentage or phase angle difference of two currents. Types: 87T, 87G, 87B, 87M.

88 Auxiliary Motor or Motor Generator
Used for operating auxiliary equipment such as pumps, blowers, exciters, rotating magnetic amplifiers.

89 Line Switch
Disconnecting, load-interrupter, or isolating switch in an AC or DC power circuit.

90 Regulating Device
Regulates a quantity such as voltage, current, power, speed, frequency, temperature, or load.

91 Voltage Directional Relay
Operates when voltage across an open CB or contactor exceeds a given value in a given direction.

92 Voltage and Power Directional Relay
Permits or causes connection/disconnection of two circuits based on voltage difference and power direction.

93 Field-Changing Contactor
Increases or decreases, in one step, the value of field excitation on a machine.

94 Tripping or Trip-Free Relay
Trips a CB, contactor, or equipment, or prevents immediate reclosure if it opens automatically.