



April, 1987
 Supersedes 41-060 T WE A
 pages 1-8, dated February 4, 1975
 E, D, C/41-000A

Selections from ANSI C37.2-1970

IEEE Device Numbers and Functions For Switchgear Apparatus

The devices in switching equipments are referred to by numbers, with appropriate suffix letters when necessary, according to the functions they perform

These numbers are based on a system adopted as standard for automatic switchgear by IEEE, and incorporated in American Standard C37.2-1970. This system is used in connection diagrams, in instruction books, and in specifications

Device Number	Definition and Function
1	Master Element is the initiating device, such as a control switch, voltage relay, float switch, etc., which serves either directly, or through such permissive devices as protective and time-delay relays to place an equipment in or out of operation
2	Time-delay starting, or closing relay is a device which functions to give a desired amount of time delay before or after any point of operation in a switching sequence or protective relay system, except as specifically provided by device functions 48, 62, and 79 described later.
3	Checking or interlocking relay is a device which operates in response to the position of a number of other devices, (or to a number of predetermined conditions), in an equipment, to allow an operating sequence to proceed, to stop, or to provide a check of the position of these devices or of these conditions for any purpose.
4	Master contactor is a device, generally controlled by device No. 1 or equivalent, and the required permissive and protective devices, that serve to make and break the necessary control circuits to place an equipment into operation under the desired conditions and to take it out of operation under other or abnormal conditions.

Device Number	Definition and Function
5	Stopping device is a control device used primarily to shut down an equipment and hold it out of operation. [This device may be manually or electrically actuated, but excludes the function of electrical lockout (see device function 86) on abnormal conditions.]
6	Starting circuit breaker is a device whose principal function is to connect a machine to its source of starting voltage.
7	Anode circuit breaker is one used in the anode circuits of a power rectifier for the primary purpose of interrupting the rectifier circuit if an arc back should occur.
8	Control power disconnecting device is a disconnective device – such as a knife switch, circuit breaker or pullout fuse block, used for the purpose of connecting and disconnecting the source of control power to and from the control bus or equipment. Note: Control power is considered to include auxiliary power which supplies such apparatus as small motors and heaters
9	Reversing device is used for the purpose of reversing a machine field or for performing any other reversing functions.
10	Unit sequence switch is used to change the sequence in which units may be placed in and out of service in multiple-unit equipments.
11	Reserved for future application.
12	Over-speed device is usually a direct-connected speed switch which functions on machine over-speed.

Device Number	Definition and Function
13	Synchronous-speed device , such as a centrifugal-speed switch, a slip-frequency relay, a voltage relay, an undercurrent relay or any type of device, operates at approximately synchronous speed of a machine.
14	Under-speed device functions when the speed of a machine falls below a predetermined value.
15	Speed or frequency, matching device functions to match and hold the speed or the frequency of a machine or of a system equal to, or approximately equal to, that of another machine, source or system.
16	Reserved for future application.
17	Shunting or discharge switch serves to open or to close a shunting circuit around any piece of apparatus (except a resistor), such as a machine field, a machine armature, a capacitor or a reactor. Note: This excludes devices which perform such shunting operations as may be necessary in the process of starting a machine by devices 6 or 42, or their equivalent, and also excludes device 73 function which serves for the switching of resistors
18	Accelerating or decelerating device is used to close or to cause the closing of circuits which are used to increase or to decrease the speed of a machine.
19	Starting-to-running transition contactor is a device which operates to initiate or cause the automatic transfer of a machine from the starting to the running power connection.
20	Electrically operated valve is an electrically operated, controlled or monitored valve in a fluid line. Note: The function of the valve may be indicated by the use of the suffixes, see Page 5



Device Number	Definition and Function	Device Number	Definition and Function	Device Number	Definition and Function
21	Distance relay is a device which functions when the circuit admittance, impedance or reactance increases or decreases beyond predetermined limits.	30	Annunciator relay is a nonautomatically reset device that gives a number of separate visual indications upon the functioning of protective devices, and which may also be arranged to perform a lockout function	39	Mechanical condition monitor is a device that functions upon the occurrence of an abnormal mechanical condition (except that associated with bearings as covered under device function 38), such as excessive vibration, eccentricity, expansion, shock, tilting, or seal failure.
22	Equalizer circuit breaker is a breaker which serves to control or to make and break the equalizer or the current-balancing connections for a machine field, or for regulating equipment, in a multiple-unit installation	31	Separate excitation device connects a circuit such as the shunt field of a synchronous converter, to a source of separate excitation during the starting sequence; or one which energizes the excitation and ignition circuits of a power rectifier.	40	Field relay functions on a given or abnormally low value or failure of machine field current, or on an excessive value of the reactive component of armature current in an ac machine indicating abnormally low field excitation.
23	Temperature control device functions to raise or to lower the temperature of a machine or other apparatus, or of any medium, when its temperature falls below, or rises above, a predetermined value. Note. An example is a thermostat which switches on a space heater in a switchgear assembly when the temperature falls to a desired value as distinguished from a device which is used to provide automatic temperature regulation between close limits and would be designated as 90T	32	Directional power relay is one which functions on a desired value of power flow in a given direction, or upon reverse power resulting from arc back in the anode or cathode circuits of a power rectifier	41	Field circuit breaker is a device which functions to apply, or to remove, the field excitation of a machine.
24	@Volts per hertz relay is a relay that functions when the ratio of voltage to frequency exceeds a pre-set value. The relay may have an instantaneous or inverse time characteristic.	33	Position switch makes or breaks contact when the main device or piece of apparatus, which has no device function number, reaches a given position.	42	Running circuit breaker is a device whose principal function is to connect a machine to its source of running or operating voltage. This function may also be used for a device, such as a contactor, that is used in series with a circuit breaker or other fault protecting means, primarily for frequent opening and closing of the circuit.
25	Synchronizing or synchronism-check device operates when two ac circuits are within the desired limits of frequency, phase angle or voltage, to permit or to cause the paralleling of these two circuits.	34	Master sequence device is a device such as a motor-operated multi-contact switch, or the equivalent, or a programming device, such as a computer, that establishes or determines the operating sequence of the major devices in an equipment during starting and stopping or during other sequential switching operations.	43	Manual transfer or selector device transfers the control circuits so as to modify the plan of operation of the switching equipment or of some of the devices.
26	Apparatus thermal device functions when the temperature of the shunt field or the armature winding of a machine, or that of a load limiting or load shifting resistor or of a liquid or other medium exceeds a predetermined value, or if the temperature of the protected apparatus, such as a power rectifier, or of any medium decreases below a predetermined value.	35	Brush-operating, or slip-ring-short-circuiting, device is used for raising, lowering, or shifting the brushes of a machine, or for short-circuiting its slip rings, or for engaging or disengaging the contacts of a mechanical rectifier.	44	Unit sequence starting relay is a device which functions to start the next available unit in a multiple-unit equipment on the failure or on the non-availability of the normally preceding unit.
27	Undervoltage relay is a device which functions on a given value of undervoltage.	36	Polarity or polarizing voltage device operates or permits the operation of another device on a predetermined polarity only or verifies the presence of a polarizing voltage in an equipment.	45	Atmospheric condition monitor is a device that functions upon the occurrence of an abnormal atmospheric condition, such as damaging fumes, explosive mixtures, smoke, or fire.
28	Flame detector is a device that monitors the presence of the pilot or main flame in such apparatus as a gas turbine or a steam boiler.	37	Undercurrent or underpower relay functions when the current or power flow decreases below a predetermined value.	46	Reverse-phase, or phase-balance, current relay is a relay which functions when the polyphase currents are of reverse-phase sequence, or when the polyphase currents are unbalanced or contain negative phase-sequence components above a given amount.
29	Isolating contactor is used expressly for disconnecting one circuit from another for the purposes of emergency operation, maintenance, or test.	38	Bearing protective device functions on excessive bearing temperature, or on other abnormal mechanical conditions, such as undue wear, which may eventually result in excessive bearing temperature.	47	Phase-sequence voltage relay functions upon a predetermined value of polyphase voltage in the desired phase sequence.



Device Number	Definition and Function	Device Number	Definition and Function	Device Number	Definition and Function
48	Incomplete sequence relay is a relay that generally returns the equipment to the normal, or off, position and locks it out if the normal starting, operating or stopping sequence is not properly completed within a predetermined time. If the device is used for alarm purposes only, it should preferably be designated as 48A (alarm)	57	Short-circuiting or grounding device is a primary circuit switching device that functions to short-circuit or to ground a circuit in response to automatic or manual means.	66	Notching or jogging device functions to allow only a specified number of operations of a given device, or equipment, or a specified number of successive operations within a given time of each other. It also functions to energize a circuit periodically or for fractions of specified time intervals, or that is used to permit intermittent acceleration or jogging of a machine at low speeds for mechanical positioning.
49	Machine, or transformer, thermal relay is a relay that functions when the temperature of a machine armature, or other load carrying winding or element of a machine, or the temperature of a power rectifier or power transformer (including a power rectifier transformer) exceeds a predetermined value.	58	Rectification failure relay is a device that functions if one or more anodes of a power rectifier fail to fire, or to detect an arc-back or on failure of a diode to conduct or block properly.	67	Ac directional overcurrent relay is a relay that functions on a desired value of ac overcurrent flowing in a predetermined direction.
50	Instantaneous overcurrent, or rate-of-rise relay is a relay that functions instantaneously on an excessive value of current, or on an excessive rate of current rise, thus indicating a fault in the apparatus of circuit being protected.	59	Overvoltage relay is a relay that functions on a given value of overvoltage.	68	Blocking relay is a relay that initiates a pilot signal for blocking of tripping on external faults in a transmission line or in other apparatus under predetermined conditions, or cooperates with other devices to block tripping or to block reclosing on an out-of-step condition or on power swings.
51	Ac time overcurrent relay is a relay with either a definite or inverse time characteristic that functions when the current in an ac circuit exceeds a predetermined value.	60	Voltage or Current balance relay is a relay that operates on a given difference in voltage, or current input or output of two circuits.	69	Permissive control device is generally a two-position, manually operated switch that in one position permits the closing of a circuit breaker, or the placing of an equipment into operation, and in the other position prevents the circuit breaker or the equipment from being operated.
52	Ac circuit breaker is a device that is used to close and interrupt an ac power circuit under normal conditions or to interrupt this circuit under fault or emergency conditions.	61	Reserved for future application.	70	Rheostat is a variable resistance device used in an electric circuit, which is electrically operated or has other electrical accessories, such as auxiliary, position, or limit switches.
53	Exciter or dc generator relay is a relay that forces the dc machine field excitation to build up during starting or which functions when the machine voltage has built up to a given value.	62	Time-delay stopping or opening relay is a time-delay relay that serves in conjunction with the device that initiates the shutdown, stopping, or opening operation in an automatic sequence.	71	Level switch is a switch which operates on given values, or on a given rate of change, of level.
54	Reserved for future application	63	Pressure switch is a switch which operates on given values or on a given rate of change of pressure.	72	Dc circuit breaker is used to close and interrupt a dc power circuit under normal conditions or to interrupt this circuit under fault or emergency conditions.
55	Power factor relay is a relay that operates when the power factor in an ac circuit rises above or below a predetermined value.	64	Ground protective relay is a relay that functions on failure of the insulation of a machine, transformer or of other apparatus to ground, or on flashover of a dc machine to ground. <small>Note This function is assigned only to a relay which detects the flow of current from the frame of a machine or enclosing case or structure of a piece of apparatus to ground, or detects a ground on a normally ungrounded winding or circuit. It is not applied to a device connected in the secondary circuit or secondary neutral of a current transformer, or in the secondary neutral of current transformers, connected in the power circuit of a normally grounded system</small>	73	Load-resistor contactor is used to shunt or insert a step of load limiting, shifting, or indicating resistance in a power circuit, or to switch a space heater in circuit, or to switch a light, or regenerative load resistor of a power rectifier or other machine in and out of circuit.
56	Field application relay is a relay that automatically controls the application of the field excitation to an ac motor at some predetermined point in the slip cycle.	65	Governor is the assembly of fluid, electrical, or mechanical control equipment used for regulating the flow of water, steam, or other medium to the prime mover for such purposes as starting, holding speed or load, or stopping.		



Device Number	Definition and Function	Device Number	Definition and Function	Device Number	Definition and Function
74	Alarm relay is a device other than an annunciator, as covered under device No. 30, which is used to operate, or to operate in connection with, a visual or audible alarm	83	Automatic selective control or transfer relay is a relay that operates to select automatically between certain sources or conditions in an equipment, or performs a transfer operation automatically.	91	Voltage directional relay is a relay that operates when the voltage across an open circuit breaker or contactor exceeds a given value in a given direction
75	Position changing mechanism is a mechanism that is used for moving a main device from one position to another in an equipment; as for example, shifting a removable circuit breaker unit to and from the connected, disconnected, and test positions.	84	Operating mechanism is the complete electrical mechanism or servo-mechanism, including the operating motor, solenoids, position switches, etc., for a tap changer, induction regulator or any similar piece of apparatus which has no device function number.	92	Voltage and power directional relay is a relay that permits or causes the connection of two circuits when the voltage difference between them exceeds a given value in a predetermined direction and causes these two circuits to be disconnected from each other when the power flowing between them exceeds a given value in the opposite direction.
76	Dc overcurrent relay is a relay that functions when the current in a dc circuit exceeds a given value.	85	Carrier or pilot-wire receiver relay is a relay that is operated or restrained by a signal used in connection with carrier-current or dc pilot-wire fault directional relaying.	93	Field changing contactor functions to increase or decrease in one step the value of field excitation on a machine.
77	Pulse transmitter is used to generate and transmit pulses over a telemetering or pilot-wire circuit to the remote indicating or receiving device.	86	Locking-out relay is an electrically operated hand, or electrically, reset relay that functions to shut down and hold an equipment out of service on the occurrence of abnormal conditions.	94	Tripping or trip-free relay functions to trip a circuit breaker, contactor, or equipment, or to permit immediate tripping by other devices; or to prevent immediate reclosure of a circuit interrupter, in case it should open automatically even though its closing circuit is maintained closed.
78	Phase angle measuring, or out-of-step protective relay is a relay that functions at a predetermined phase angle between two voltages or between two currents or between voltage and current.	87	Differential protective relay is a protective relay that functions on a percentage or phase angle or other quantitative difference of two currents or of some other electrical quantities.	95	Used only for specific applications on individual installations where none of the assigned numbered functions from 1 to 94 is suitable.
79	Ac reclosing relay is a relay that controls the automatic reclosing and locking out of an ac circuit interrupter.	88	Auxiliary motor or motor generator is one used for operating auxiliary equipment such as pumps, blowers, exciters, rotating magnetic amplifiers, etc.	96	
80	Flow Switch is a switch which operates on given values, or on a given rate of change, of flow.	89	Line switch is used as a disconnecting load-interrupter, or isolating switch in an ac or dc power circuit, when this device is electrically operated or has electrical accessories, such as an auxiliary switch, magnetic lock, etc.	97	
81	Frequency relay is a relay that functions on a predetermined value of frequency – either under or over or on normal system frequency – or rate of change of frequency.	90	Regulating device functions to regulate a quantity, or quantities, such as voltage, current, power, speed, frequency, temperature, and load, at a certain value or between certain (generally close) limits for machines, tie lines or other apparatus.	98	
82	Dc reclosing relay is a relay that controls the automatic closing and reclosing of a dc circuit interrupter, generally in response to load circuit conditions.			99	

Supervisory Control and Indication. A similar series of numbers, prefixed by the letters RE (for "remote") shall be used for the interposing relays performing functions that are controlled directly from the supervisory system. Typical examples of such device functions are: RE1, RE5, and RE94.

Note. The use of the "RE" prefix for this purpose in place of the former 200 series of numbers now makes it possible to obtain increased flexibility of the device function numbering system. For example, in pipeline pump stations, the numbers 1 through 99 are applied to device functions that are associated with the over-all station operation. A similar series of numbers, starting with 101 instead of 1, are used for those device functions that are associated with unit 1; a similar series starting with 201 for device functions that are associated with unit 2; and so on, for each unit in these installations.





Devices Performing More Than One Function

If one device performs two relatively important functions in an equipment so that it is desirable to identify both of these functions, this may be done by using a double function number and name such as:

50/ 51 Instantaneous and Time Overcurrent Relay.

Suffix Numbers

If two or more devices with the same function number and suffix letter (if used) are present in the same equipment, they may be distinguished by numbered suffixes as for example, 52X-1 52X-2 and 52X-3, when necessary.

Suffix Letters

Suffix letters are used with device function numbers for various purposes. In order to prevent possible conflict each suffix letter should have only one meaning in an individual equipment. All other words should use the abbreviations as contained in American Standard Z32.13-1950, or latest revision thereof, or should use some other distinctive abbreviation, or be written out in full each time they are used. The meaning of each single suffix letter, or combination of letters, should be clearly designated in the legend on the drawings or publications applying to the equipment. In cases where the same suffix (consisting of one letter or a combination of letters) has different meanings in the same equipment, depending upon the device function number with which it is used, then the complete device function number with its suffix letter or letters and its corresponding function name should be listed in the legend in each case, as follows: 90V, Voltage Regulator.

Lower case (small) suffix letters are used in practically all instances on electrical diagrams for the auxiliary, position, and limit switches. Capital letters are generally used for all other suffix letters.

The letters should generally form part of the device function designation, are usually written directly after the device function number, as for example, 52CS, 71W, or 49D. When it is necessary to use two types of suffix letters in connection with one function number, it is often desirable for clarity to separate them by a slanted line or dash, as for example, 20D/CS or 20D - CS

The suffix letters which denote parts of the main device, and those which cannot or need not form part of the device function designation, are generally written directly below the device function number on drawings, as for example,

$\frac{52}{CC}$ or $\frac{43}{A}$

Auxiliary Devices Separate Auxiliary Devices

X
Y - Auxiliary relay ●
Z
R - Raising relay
L - Lowering relay
O - Opening relay or contactor
C - Closing relay or contactor
CS - Control switch
CL - Auxiliary Relay, open (energized when main device is in open position)
OP - Auxiliary Relay, Open (energized when main device is in open position)
U - "Up" position-switch relay
D - "Down" position-switch relay
PB - Push button

● In the control of a circuit breaker with so-called X-Y relay control scheme, the X relay is the device whose main contacts are used to energize the closing coil or the device which in some other manner, such as by the release of stored energy, causes the breaker to close. The contacts of the Y relay provide the anti-pump feature for the circuit breaker.

Actuating Quantities

These letters indicate the **condition or electrical** quantity to which the device responds, or the medium in which it is located, such as:

A - Air, or Amperes or Alternating
C - Current
D - Direct or Discharge
E - Electrolyte
F - Frequency, or Flow or Fault
H - Explosive
J - Differential
L - Level, or Liquid
P - Power, or Pressure
PF - Power Factor
Q - Oil
S - Speed or Suction or Smoke
T - Temperature
V - Voltage, Volts, or Vacuum
VAR - Reactive Power
VB - Vibration
W - Water, or Watts

Main Devices

These letters denote the **location of the main device in the circuit**, or the type of circuit in which the device is used or the type of circuit or apparatus with which it is associated, when this is necessary, such as:

A - Alarm or Auxiliary Power
AN - Anode
B - Battery, or Blower, or Bus
BK - Brake
BL - Block (Valve)
BP - Bypass
BT - Bus Tie
C - Capacitor, or Condenser, Compensator, or Carrier Current or Case or Compressor
CA - Cathode
CH - Check (Valve)
D - Discharge (Valve)
E - Exciter
F - Feeder, or Field, or Filament, or Filter, or Fan
G - Generator, or Ground[Ⓢ]
H - Heater, or Housing
L - Line or Logic
M - Motor, or Metering
N - Network, or Neutral[Ⓢ]
P - Pump or Phase Comparison
R - Reactor, or Rectifier, or Room
S - Synchronizing or Secondary or Strainer or Sump or Suction (Valve)
T - Transformer, or Thyatron
TH - Transformer (high-voltage side)
TL - Transformer (low-voltage side)
TM - Telemeter
U - Unit

[Ⓢ] Suffix "N" is generally used in preference to "G" for devices connected in the secondary neutral of current transformers, or in the secondary of a current transformer whose primary winding is located in the neutral of a machine or power transformer, except in the case of transmission line relaying, where the suffix "G" is more commonly used for those relays which operate on ground faults.

WWW



Main Device Parts

These letters denote parts of the main device, divided in the two following categories:

1.) All parts, except auxiliary contacts, position switches, limit switches, and torque limit switches.

- BK – Brake
- C – Coil, or Condenser, or Capacitor
- CC – Closing Coil
- HC – Holding Coil
- M – Operating Motor
- MF – Fly-Ball Motor
- ML – Load-limit Motor
- MS – Speed adjusting, or Synchronizing, Motor
- S – Solenoid
- SI – Seal-in
- TC – Trip Coil
- V – Valve

2.) All auxiliary contacts and position and limit switches for such devices and equipment as circuit breakers, contactors, valves and rheostats and contacts of relays. These are designated as follows:

- a – Contact that is open when the main device is in the standard reference position, commonly referred to as the non-operated or deenergized position, and that closes when the device assumes the opposite position
- b – Contact that is closed when the main device is in the standard reference position, commonly referred to as the non-operated or deenergized position, and that opens when the device assumes the opposite position
- aa – Contact that is open when the operating mechanism of the main device is in the nonoperated position and that closes when the operating mechanism assumes the opposite position
- bb – Contact that is closed when the operating mechanism of the main device is in the nonoperated position and that opens when the operating mechanism assumes the opposite position

Standard reference positions of some typical devices are as follows:

Device	Standard Reference Position
Power Circuit Breaker	Main Contacts Open
Disconnecting Switch	Main Contacts Open
Load-break Switch	Main Contacts Open
Valve	Closed Position
Gate	Closed Position
Clutch	Disengaged Position
Turning Gear	Disengaged Position
Power Electrodes	Maximum Gap Position
Rheostat	Maximum Resistance Position
Adjusting Means●	Low or Down Position
Relay②	Deenergized Position
Contactors②	Deenergized Position
Relay (latched-in type)	See 2-9.7.2
Contactors (latched-in type)	Main Contacts Open
Temperature Relay③	Lowest Temperature
Level Detector③	Lowest Level
Flow Detector③	Lowest Flow
Speed Switch③	Lowest Speed
Vibration Detector③	Minimum Vibration
Pressure Switch③	Lowest Pressure
Vacuum Switch③	Lowest Pressure, i.e., Highest Vacuum

The simple designation "a" or "b" is used in all cases where there is no need to adjust the contacts to change position at any particular point in the travel of the main device or where the part of the travel where the contacts change position is of no significance in the control or operating scheme. Hence the "a" and "b" designations usually are sufficient for circuit breaker auxiliary switches.

Note: If several similar auxiliary switches are present on the same device, they should be designated numerically 1, 2, 3, etc. when necessary.

① These may be speed, voltage, current, load, or similar adjusting devices comprising rheostats, springs, levers, or other components for the purpose.

② These electrically operated devices are of the non-latched-in type, whose contact position is dependent only upon the degree of energization of the operating or restraining or holding coil or coils which may or may not be suitable for continuous energization. The deenergized position of the device is that with all coils deenergized.

③ The energizing influences for these devices are considered to be, respectively, rising temperature, rising level, increasing flow, rising speed, increasing vibration, and increasing pressure.

Other Switches

These letters cover all other distinguishing features or characteristics or conditions, which serve to describe the use of the device or its contacts in the equipment such as:

- A – Accelerating, or Automatic
- B – Blocking, or Back-up
- C – Close, or Cold
- D – Decelerating, Detonate, or Down, or Disengaged
- E – Emergency or Engaged
- F – Failure, or Forward
- H – Hot, or High
- HR – Hand Reset
- HS – High Speed
- L – Left, or Local, or Low, or Lower, or Leading
- M – Manual
- OFF – Off
- ON – On
- P – Polarizing
- R – Right, or Raise, or Reclosing, or Receiving, or Remote, or Reverse
- S – Sending, or Swing
- T – Test, or Trip, or Trailing
- TDC – Time-delay Closing
- TDO – Time-delay Opening
- U – Up





Representation of Device Contacts on Electrical Diagrams

On electrical diagrams the "b" contacts of all devices, including those of relays and those with suffix letters or percentage figures, should be shown as closed contacts, and all "a" contacts should be shown as open contacts. The use of the single letters "a" and "b" with the contact representation is generally superfluous on the diagrams. However, these letters are a convenient means of reference in the text of instruction books, articles, and other publications.

The opening or closing settings of the contacts, and auxiliary, position and limit switches, should, when necessary for the ready understanding of the operation of the devices in the equipment, be indicated on the elementary diagram for each such contact. In the case of relay contacts, this indication would consist of the numerical settings.

For those devices that have no de-energized or nonoperated position, such as manually-operated transfer or control switches (including those of the spring-return type) or auxiliary position indicating contacts on the housings or enclosures of a removable circuit breaker unit, the preferred method of representing these contacts is as an "a" switch. Each contact should, however, be identified on the elementary diagram as to when it closes.® For example, the contacts of the Manual-Automatic Transfer Switch, device function 43, which are closed in the automatic position, would be identified with the letter "A," and those that are closed in the manual position would be identified with the letter "M," and the auxiliary position switches on the housing 52H of a removable circuit breaker unit, which are closed when the unit is in the connected position, may be identified by the suffix letters "IN," and those which are closed when the unit is withdrawn from the housing may be identified by the suffix letters "OUT."

In the case of latched-in or hand-reset locking-out relays, which operate from protective devices to perform the shutdown of an equipment and to hold it out of service, the contacts should preferably be shown in the normal nonlocking-out position. In general, any devices, such as electrically-operated latched-in relays, which have no deenergized or nonoperated position, and have not been specifically covered in the above paragraphs should have their contacts shown in the position most suitable for the ready understanding of the operation of the devices in the equipment, and sufficient description should be present, as necessary, on the elementary diagram to indicate the contact operation ®

® This information should be included on that part of the elementary diagram, either with the device symbol or with the contacts in the circuit diagram itself, where most convenient for the ready understanding of the operation of the devices and equipment.



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Printed in U.S.A.

Westinghouse Electric Corporation
Relay and Telecommunications Division
Coral Springs, FL 33065