An Introduction to Relay Definitions And Terminology

The following definitions include terminology and nomenclature in common use in the relay industry. They have been compiled using information from the IEEE and the National Association of Relay Manufacturers. In instances where different terms are used synonymously, one has been defined and others have been cross-referenced to it. When the phrase "sometimes used for" is employed, a preference is implied for the terminology following the phrase, when "same as" is used; no strong preference is inferred.

**Air Gap.** - Sometimes used for Contact Separation or for Magnetic Air Gap.

**All-or-nothing relay.** - An electrical relay, which is intended to be energised by a quantity whose value is either, higher than that at which it picks up or lower than that at which it drops out.

**Ampere-Turns.** - The product of the number of turns in a magnetic coil and the rms current in amperes passing through the coil.

**Armature.** - Hinged or pivoted moving part of the magnetic circuit of an electromagnetic relay. Sometimes used in a general sense to mean any moving part which actuates contacts in response to a change in coil current.

**Armature Contact.** - Sometimes used for Movable Contact.

**Armature Relay.** - A relay operated by an electromagnet which, when energised, causes an armature to be attracted to a fixed pole (or poles).

**Auxiliary Relay.** - A relay, which operates in response to opening and closing of its operating circuit to assist another relay or device in performance of a function. For example a measuring relay, for the purpose of providing higher rated contacts or introducing a time delay.

**Back Contacts.** - Same as Normally Closed Contacts. Sometimes used for the stationary contact of single-pole normally closed contacts.

**Backstop.** - The part of a relay, which limits movement of the armature away from the pole piece or core.

**Backup Relaying.** - Supplementary relaying designed to operate if a primary relay should malfunction or a circuit breaker fails to operate. Back-up relaying usually disconnects more of the power system than just the part
with the faulty element as this is necessary in order to remove the abnormal condition and to minimize effect on the remainder of the system.

**Back-up protection.** - A protective system intended to supplement the main protection in case the latter should be ineffective, or to deal with faults in those parts of the power system that are not readily included in the operating zones of the main protection.

**Bar Relay.** - A relay so designed that a bar actuates several contacts simultaneously.

**Biased relay.** - A relay in which the characteristics are modified by the introduction of some quantity other than the actuating quantity, and which is usually in opposition to the actuating quantity.

**Break-before-make Contacts.** - Contacts which interrupt one circuit before establishing another.

**Break Contact.** - Same as Back Contact,

**Break Delay.** - Sometimes used for Release Time.

**Bridging.** - Bridging is a term used to describe a contact transfer in which the movable contact touches the normally open contact before leaving the normally closed contact during the transfer action, thus never completely opening the circuit of the movable contact.

**Brush.** - Sometimes used for Wiper.

**Burden.** - The loading imposed by the circuits of the relay on the energizing power source or sources, expressed as the product of voltage and current (volt-amperes, or watts if d.c.) for a given condition, which may be either at ‘setting’ or at rated current or voltage. The rated output of measuring transformers, expressed in VA, is always at rated currant or voltage and it is important, in assessing the burden imposed by a relay, to ensure that the value of burden at rated current is used.

**Characteristic angle.** - The angle between the vectors representing two of the energizing quantities applied to a relay and used for the declaration of the performance of the relay.
Characteristic curve.- The curve showing the operating value of the characteristic quantity corresponding to various values or combinations of the energizing quantities.

Characteristic quantity.- A quantity, the value of which characterizes the operation of the relay, for example, current for an overcurrent relay, voltage for a voltage relay, phase angle for a directional relay, time for an independent time delay relay, impedance for an impedance relay.

Characteristic impedance ratio (C.I.R.).- The maximum value of the System Impedance Ratio up to which the relay performance remains within the prescribed limits of accuracy.

Chatter. - A sustained rapid opening and closing of contacts caused by variations in the coil current, mechanical vibration and shock or other causes.

Check protective system.- An auxiliary protective system intended to prevent tripping due to inadvertent operation of the main protective system.

Clapper Relay. - Sometimes used for Armature Relay.

Close-differential Relay. - Sometimes used for Marginal Relay.

Coil. - A magnetic or thermal winding to which energy is supplied to activate the relay.

Conjunctive test.- A test on a protective system including all relevant components and ancillary equipment appropriately interconnected. The test may be parametric or specific.

a. Parametric conjunctive test. A test to ascertain the range of values that may be assigned to each parameter when considered in combination with other parameters, while still complying with the relevant performance requirements.

b. Specific conjunctive test. A test to prove the performance for a particular application, for which definite values are assigned to each of the parameters.

Contact Arrangement. - Contact arrangement refers to the combination of different basic contact forms to make up the entire relay switching structure.

Contact Bounce. - Uncontrolled making and breaking of contact when relay contacts are moved to the closed position.

Contact follow. - The distance two contacts travel together after just touching.
**Contact Gap.** - Same as Contact Separation.

**Contact Nomenclature.** - Each movable contact of a relay constitutes a pole of the relay. A combination of stationary contact and a movable contact which are engaged when the coil is unenergised is referred to as back, break, form B, or normally closed contacts and is abbreviated **NC**. A combination of stationary contact and movable contact, which are engaged when the coil is energised is referred to as front, make, form A, or normally open contacts and is abbreviated **NO**. A combination of two stationary contacts and a movable contact which engages one of them when the coil is energised and engages the other when the coil is unenergised is called transfer, form C, or double-throw contacts and is abbreviated **DT**. Contrasted with double-throw contacts, NO and NC contacts are called single-throw contacts, abbreviated **ST**. A combination in which a movable contact simultaneously makes and simultaneously breaks connection between two stationary contacts is called double-break contacts and is abbreviated **DB**. For normally open contacts, this combination may be called double-make contacts.

Relay contact notations are given in the following order:
1. Poles
2. Throws
3. Normal Position
4. DB, if double-break or double-make contacts

Examples: **SPST NO DB** designates single-pole, single-throw, normally open, double-break contacts. All contacts are single break except when noted as double-break (DB). Relays having several sets of differently functioning contacts will have the contact forms listed in alphabetical order of their letter symbols. Example: 1A2B refers to SPST NO contacts and DPST NC contacts. For a relay on which the moving contact engages more than two stationary contacts during its cycle of operation, the contact arrangement is described as MPNT, where M is the number of poles and N is the number of throws, e.g., **8P 20T**.

**Contact Over travel.** - Sometimes used for Contact Follow.

**Contact Separation.** - Maximum distance between mating relay contacts when the contacts are in the open position.

**Contact Spring.** - A current-carrying spring to which contacts are fastened.
Contacts. - Current-carrying ports of a relay, which engages or disengages to make or break electrical circuits.

Contactor. - Sometimes used for a relay with heavy-duty contacts.

Continuity-transfer Contacts. - Same as Make-before-break Contacts.

Continuous-duty Relay. - A relay, which may be energised with, rated coil voltage or current at rated contact load for a period of 3 hours or more without failure and without exceeding specified temperature requirements.

Current Balance Relay. - Relay that allows tripping whenever there is an abnormal change in the division of current between two circuits. Current Rating—See Rated Coil Current and Rated Contact Current.

Current Relay. - A relay which is designed to operate at a particular rated coil current rather than at a given rated coil voltage.

Cycle Timer. - A controlling mechanism, which opens or closes contacts according to a preset cycle.

Dependent time measuring relay. - A measuring relay for which times depend, in a specified manner, on the value of the characteristic quantity.

Deenergise. - To deenergize a relay is to disconnect the relay coil from its power source.

Definite-purpose Relay. - A readily available relay which has some electrical or mechanical feature, which distinguishes it from a general-purpose relay. Types of definite purpose relays are interlock, selector, stepping, sequence, latch-in and time-delay.

Delay Relay. - A relay that is intentionally designed for a time delay between energizing or deenergizing instant and the time that the relay contacts open or close.

Differential relay. - A relay having multiple windings which functions when voltage, current, or power difference between windings reaches a predetermined value.

Directional Relay. - A relay that allows tripping for current flow in one direction only.

Discrimination.- The ability of a protective system to distinguish between power system conditions for which it is intended to operate and those for which it is not intended to operate.
Double-break Contacts. - A combination in which a movable contact simultaneously makes and simultaneously breaks connection between two stationary contacts is called double-break contacts and is abbreviated DB.
- See also Contact Nomenclature.

Double-wound Coil. - A double-wound coil is a winding consisting of two parts wound on the same core.

Double-wound Coil. - A double-wound coil is a winding consisting of two parts wound on the same core.

Drop-out/pick-up ratio.- The ratio of the limiting values of the characteristic quantity at which the relay resets and operates. This value is sometimes called the differential of the relay

Drop-out or Drop-out Values. - Drop-out current, voltage, or power is the maximum value for which contacts of a previously energised relay will always assume their unenergised positions.

Duty Cycle. - Rated working time of a device compared to its idle time.

Earth fault protective system.- A protective system which is designed to respond only to faults to earth.

Earthing transformer.- A three-phase transformer intended essentially to provide a neutral point to a power system for the purpose of earthing.

Effective range.- The range of values of the characteristic quantity or quantities, or of the energizing quantities to which the relay will respond and satisfy the requirements concerning it, in particular those concerning precision.

Effective setting.- The ‘setting’ of a protective system including the effects of current transformers. The effective setting can be expressed in terms of primary current or secondary current from the current transformers and is so designated as appropriate.

Electrical relay.- A device designed to produce sudden predetermined changes in one or more electrical circuits after the appearance of certain conditions in the electrical circuit or current controlling it.

NOTE: The term ‘relay’ includes all the ancillary equipment calibrated with the device.
Electromechanical relay.- An electrical relay in which the designed response is developed by the relative movement of mechanical elements under the action of a current in the input circuit.

Electric Reset. - A qualify term applied to a relay indicating that following an operation its contacts must be reset electrically to their original positions.

Electromagnetic Relay. - A relay whose operation involves use of a magnetic field, which is produced by an electromagnet.

Electrostatic Spring Shields. - Metallic shields between two relay springs to minimize capacitance between them.

Enclosed Relay. - A relay, which has both coil and contacts, protected from the surrounding medium by a cover that is not airtight.

Energise. - To energize a relay is to apply rated voltage to its coil. Extension Spring-Same as Restoring Spring.

Energising quantity.- The electrical quantity, either current or voltage, which alone or in combination with other energizing quantities, must be applied to the relay to cause it to function.

Fast-operate Relay. - A high-speed relay specifically designed for short operate time but not short release time.

Fast-operate, Fast-release Relay. - A high-speed relay specifically designed for both short operate time and short release time.

Fast-operate, Slow-release Relay. - A relay specifically designed for short release time but not short operate time.

Fast-release Relay. - A high-speed relay specifically designed for short release time but not short operate time.

Fixed Contacts. - Stationary contacts of a relay which are engaged and disengaged by moving contacts to make or break circuits.

Flight Time. - Sometimes used for Transfer Time.

Follow-through Contacts. - Contacts, which have contact, follow.

Frame. - The structure on which the coil and contact assembly are mounted.

Front Contacts. - Sometimes used for the stationary contact of single-pole normally open contacts. (See also Contact Nomenclature).
**Front Contacts.** - Same as Normally Open Contacts.

**Gasket-sealed Relay.** - An airtight relay, the sealing of which involves the use of a gasket, which is not bonded to the other sealing material.

**General-purpose Relay.** - A readily available relay, which has design, construction, operational characteristics, and ratings such that it is adaptable to a wide variety of uses.

**Hand-reset.** - A qualifying term applied to a relay indicating that following an operation the contacts must be reset manually to their original positions.

**Header.** - The part of a hermetically sealed relay through which electrical terminals pass.

**Hermetically Sealed Relay.** - An airtight relay the sealing of which involves fusing or soldering but does not use a gasket.

**High-speed Relay.** - A relay specifically designed for short operates time, release time, or both.

**Hold Values.** - The hold current, voltage, or power is the minimum value for which contacts of a previously energised relay will always maintain their energised positions.

**Homing.** - Homing is a qualifying term applied to a stepping relay indicating that wipers, upon completion of an operational cycle, are stepped around or back to the start position.

**Hum.** - Hum, as applied to relays, is the sound caused by mechanical vibration resulting from alternating current flowing in the coil.

**Impregnated Coils.** - Coils, which have been permeated with phenolic or similar varnish to protect them from mechanical vibration, handling, fungus, and moisture.

**Independent time measuring relay.** - A measuring relay, the specified time for which can be considered as being independent, within specified limits, of the value of the characteristic quantity.

**Inductive Winding.** - An inductive winding, as contrasted with a noninductive winding, as a coil having an inductance.

**Instantaneous relay.** - A relay which operates and resets with no intentional time delay.
NOTE: All relays require some time to operate; it is possible, within the above definition, to discuss the operating time characteristics of an instantaneous relay.

**Instrument Relay.** - A relay, the operation of which depends upon principles employed in electrical measuring instruments such as the electrodynamometer, iron-vane and D'Arsonval.

**Interlock relay.** - A relay composed of two or more coils with their armatures and associated contacts so arranged that freedom of one armature to move or its coil to be energised is dependent upon position of the armature.

**Intermittent-duty Relay.** - A relay, which must be deenergised at occasional or periodic intervals to avoid excessive temperature.

**Inverse time delay relay.** - A dependent time delay relay having an operating time which is an inverse function of the electrical characteristic quantity.

**Inverse time relay with definite minimum time.** (I.D.M.T.) - An inverse time relay having an operating time that tends towards a minimum value with increasing values of the electrical characteristic quantity.

**Knee-point voltage.**
That sinusoidal e.m.f. applied to the secondary terminals of a current transformer which, when increased by 10%, causes the exciting current to increase by 50%.

**Latch-in Relay.** - A relay having contacts, which lock in, either the energised or deenergised position until reset either manually or electrically.

**Level.** - As applied to a stepping relay, the term level is used to denote one bank or series of contacts.

**Level Contact.** - Sometimes used for Movable Contact.

**Looking Relay.** - Sometimes used for Latch-in Relay.

**Low-capacitance Contacts.** - A type of contact construction providing low intercontact capacitance.

**Main protection.** - The protective system which is normally expected to operate in response to a fault in the protected zone.

**Make Contact.** - Same as Front Contact.
**Magnetic Air Gap.** - A magnetic air gap is a nonmagnetic portion of a magnetic circuit.

**Magnetic Freezing.** - The sticking of a relay armature to the core, after deenergisation, due to residual magnetism of the core.

**Magnetic Switch.** - Sometimes used for Relay.

**Make-before-break Contacts.** - Double-throw contacts so arranged that moving contact establish a new circuit before disrupting the old one.

**Make Delay.** - Sometimes used for operate Time.

**Marginal Relay.** - A relay, which functions in response to, predetermined changes in the value of coil current or voltage.

**Measuring relay.** - An electrical relay intended to switch when its characteristic quantity, under specified conditions and with a specified accuracy attains its operating value.

**Mercury-contact Relay.** - A relay in which the contacting medium is mercury.

**Motor-driven Relay.** - A relay, which is actuated by rotation of the shaft of some type of motor, for example, a shaded-pole, induction-disk, or hysteresis motor.

**Movable Contact.** - A contact which, when the relay is energised or deenergised, is mechanically displaced to engage or disengage one or more stationary contacts.

**Multiple-break Contacts.** - Contacts so arranged that, when they open, the circuit be interrupted in two or more places.

**Multiple Pile-ups.** - An arrangement of contact springs which is composed of two or more separate pile-ups.

**Multiple Stack.** - Same as Multiple Pile-ups.

**Neutral Relay.** - A neutral relay, in contrast to a polarised relay, is a relay in which the movement of the armature is independent of direction of flow of current through the relay coil.

**Non-bridging.** - A term used to describe a contact transfer in which the movable contact leaves one contact before touching the next.
Non-homing. - A qualifying term applied to a stepping relay indicating that wipers, upon completion of an operational cycle, do not return to the home position, but are at rest on the last used set of contacts.

Non-inductive Windings. - A type of winding in which the magnetic fields produced by two parts of the winding cancel each other and provide a non-inductive resistance.

Non-magnetic Shim. - A non-magnetic material attached to the armature or core of a relay to prevent iron-to-iron contact in an energised relay.

Non-operate Value. - The non-operate voltage, current, or power is the maximum value for which contacts of a previously deenergised relay will always maintain their deenergised positions.

Normal Position. - Deenergised position, open or closed, of contacts due to spring tension or gravity.

Normal Sequence of Operation. - The sequence in which all normally closed contacts open before closure of normally open contacts of the assembly.

Normal-speed Relay. - A relay in which no attempt has been made either to increase or decrease the operate time or the release time.

Normally Closed Contacts. - A combination of a stationary contact and movable contact, which are engaged when the coil is deenergised.

Normally Open Contacts. - A combination of a stationary contact and a movable contact which are not engaged when the coil is deenergised.

Notching relay. - A relay which switches in response to a specific number of applied impulses.

Off-limit Contacts. - Contacts on a stepping relay used to indicated when the wiper has reached the limiting position on its arc and must be returned to normal before the circuit can function again.

Off-normal Contacts. - Stationary contacts on a homing stepping relay used to indicate when the wiper is not in the starting position.

Operate Time. - If a relay has only normally closed contacts, its operate time is the longest time interval given by definition (a) below. If a relay has normally open contacts (regardless of whether or not it has normally closed contacts) its operate time is the longest time interval given by definition (b).
Operate Time for Normally closed Contacts. - Operate time for normally closed contacts is total elapsed time from the instant the coil is energised until contacts have opened; i.e., contact current is zero.

(b) Operate Time for Normally Open Contacts. - Operate time for normally open contacts is total elapsed time from the instant the coil is energised until contacts are closed and all contact bounce has ceased.

Operating time characteristic. - The curve depicting the relationship between different values of the characteristic quantity applied to a relay and the corresponding values of operating time.

Operating Value. - Voltage, Current, or Power is the minimum value for which contacts of a previously deenergised relay will always assume their energised position.

Operating Frequency. - The rated a-c frequency of the supply voltage at which the relay coil is designed to operated.

Overload Relay. - A relay, which is specifically designed to operate when its coil current reaches a predetermined value above normal.

Overshoot time. - The overshoot time is the difference between the operating time of the relay at a specified value of the input energising quantity and the maximum duration of the value of input energising quantity which, when suddenly reduced to a specific value below the operating level, is insufficient to cause operation.

Over Voltage Relay. - A relay, which is specifically designed to operate when its coil voltage reaches a predetermined value above normal.

Partially Enclosed Relay. - A relay which has either contacts or coil (but not both) protected from the surrounding medium by a cover that is not airtight.

Partially Sealed Relay. - A relay which has either contacts or coil (but not both) sealed.

Pick-up. - A relay is said to ‘pick-up’ when it changes from the un-energized position to the energized position.

Pick-up Values. - Pick-up voltage, current, or power is the minimum value for which contacts of a previously deenergised relay will always assume their energised position.

Pile-up. - A set of contact arms, assemblies, or springs placed one on top of the other with insulation between them.
Pilot channel. - A means of interconnection between relaying points for the purpose of protection.

Plunger Relay. - A relay operated by energizing an electromagnetic coil which in turn operates a movable core or plunger by solenoid action.

Polarised Relay. - A relay which is dependent upon the polarity of the energizing current to operate.

Pole Face. - The pole face is the part of the magnetic structure on the end of the core nearest the armature.

Protective gear. - The apparatus, including protective relays, transformers and ancillary equipment, for use in a protective system.

Protective relay. - A relay designed to initiate disconnection of a part of an electrical installation or to operate a warning signal, in the case of a fault or other abnormal condition in the installation. A protective relay may include more than one unit electrical relay and accessories.

Protective scheme. - The coordinated arrangements for the protection of one or more elements of a power system. A protective scheme may comprise several protective systems. Protective system. - A combination of protective gear designed to secure, under predetermined conditions, usually abnormal, the disconnection of an element of a power system, or to give an alarm signal, or both.

Protected zone. - The portion of a power system protected by a given protective system or a part of that protective system.

Pull-in Values. - Same as Pick-up Values.
Pull-on Values. - Sometimes used for Pick-up Values.

Ratchet Relay. - A stepping relay actuated by an armature-driven ratchet.

Rated Coil Current. - Steady-state coil current at which the relay is designed to operate.

Rated Coil Voltage. - Coil voltage at which the relay is designed to operate.

Rated Contact Current. - Current, which the contacts are designed to carry for their rated life.

Rating. - The nominal value of an energising quantity which appears in the designation of a relay. The nominal value usually corresponds to the CT and VT secondary ratings.
**Relay.** - A device which is operated by variation in conditions of one electric circuit to affect operation of other devices in the same or other electric circuits by either opening circuits or closing circuits or both.

**Release Factor.** - Ratio, expressed in percent, of drop-out current to rated current or the analogous voltage ratio.

**Release Time.** - If a relay has only normally open contacts, its release time is the longest time interval given by definition (a) below. If a relay has normally closed contacts (regardless of whether or not it has normally open contacts) its operate time is the longest time interval given by definition (b).

(a) **Release Time for Normally Open Contacts.** - Release time for normally open contacts is total elapsed time from the instant the coil current starts to drop from its rated value until contacts have opened, i.e., contact current is zero.

(b) **Release Time for Normally closed Contacts.** - Release time for normally closed contacts is total time from the instant the coil current starts to drop from its rated value until contacts are closed and all contact bounce has ceased.

**Release Values.** - Release current, voltage, or power is the maximum value for which contacts of a previously energised relay will always assume their unenergised positions.

**Repeating Timer.** - A timing device, which upon completion of one operating cycle continues to repeat automatically until excitation is removed.

**Resetting value.** - The limiting value of the characteristic quantity at which the relay returns to its initial position.

**Residual current.** - The algebraic sum, in a multi-phase system, of all the line currents.

**Residual voltage.** - The algebraic sum, in a multi-phase system, of all the line-to-earth voltages.

**Residual Gap.** - Length of the magnetic air gap between the pole-face center and nearest point on the armature when the armature is in the energised position.

**Residual Pins or Screws.** - Nonmagnetic pins or screws attached to either the armature or core of a relay to prevent the armature from directly contacting the magnetic core.

**Residual Setting.** - Value of the residual gap obtained by the use of an adjustable residual screw.
Residual Shim. - Same as Non-magnetic Shim.

Restoring Spring. - A spring, which moves the armature to and holds it in the normal position when the relay is deenergised.

Retractile Spring. - Sometimes used for Restoring Spring.

Rotary Relay. - Sometimes used for Motor-driven Relay.

Rotary Stepping Relay. - Same as Stepping Relay.

Rotary Stepping Switch. - Same as Stepping Relay.

Sealed Relay. - A relay, which has both, coil and contacts enclosed in an airtight cover.

Self-cleaning Contacts. - Sometimes used for Wiping Contacts.

Selector Relay. - A relay capable or automatically selecting one or more circuits from a number of circuits.

Setting. - The limiting value of a ‘characteristic’ or ‘energising’ quantity at which the relay is designed to operate under specified conditions. Such values are usually marked on the relay and may be expressed as direct values, percentages of rated values, or multiples.

Sequence Control. - Automatic control of a series of operations in a predetermined order.

Sequence Relay. - A relay, which controls two or more sets of contacts in a definite, predetermined sequence.

Shading Coil. - Sometimes used for Shading Ring.

Shading Ring. - A shorted turn surrounding a portion of the pole of an alternating current magnet, causing a delay of change of magnetic flux in that part, thereby preventing contact chatter.

Slave Relay. - Sometimes used for Auxiliary Relay.

Slow-operate, Fast-release Relay. - Relays specifically designed for long operate time and short release time.

Slow-operate Relay. - A slow-speed relay which has been specifically designed for long operate time but not for long release time.

Slow-operate, Slow-release Relay. - A slow-speed relay specifically designed for both long operate time and long release time.
**Slow-release Relay.** - A slow-speed relay specifically designed for long release time, but not for long operate time.

**Slow-speed Relay.** - Relays specifically designed for long operate time, release time, or both.

**Slug.** - A highly conductive sleeve placed over the core to aid in retarding the establishing or decay of Flux within the magnetic path.

**Solenoid Relay.** - Sometimes used for a Plunger Relay.

**Solid State Relays.** - Relays that use various low-power components - diodes, transistors, and thyristors, and associated resistor and capacitors. These components are designed into logic units used in many ways.

**Special-purpose Relay.** - A relay, which has an application, that requires special features, which are not characteristic of conventional general-purpose or definite-purpose relays.

**Specified duty Relay.** - A relay which is designed to function with a specified duty cycle but which might not be suitable for other duty cycles.

**Spring Buffer.** - A bearing member made of insulating material, which transmits motion of the armature to the movable contact and from one movable contact to another in the same pile-up. Spring Pile-up.-Same as Pile-up.

**Spring Stud.** - Same as Spring Buffer.

**Stability.** - The quality whereby a protective system remains inoperative under all conditions other than those for which it is specifically designed to operate.

**Stability limits.** - The r.m.s. value of the symmetrical component of the through fault current up to which the protective system remains stable.

**starting relay.** - A unit relay which responds to abnormal conditions and initiates the operation of other elements of the protective system.

**static relay.** - An electrical relay in which the designed response is developed by electronic, magnetic, optical or other components without mechanical motion. It should be noted though that few static relays have a fully static output stage. to trip directly from thyristors for example. By far the majority of static relays have attracted armature output elements to provide metal-to-metal contacts, which remain the preferred output medium in general.
Stationary Contact. - A contact member which is rigidly fastened to the relay frame and which is not moved as a direct result of energizing or deenergizing the relay.

Stepping Relay. - A relay whose contacts are stepped to successive positions as the coil is energised in pulses. Some stepping relays may be stepped in either direction. (The Stepping Relay is also called a Rotary Stepping Switch or a Rotary Stepping Relay.)

System impedance ratio (S.I. R.).- The ratio of the power system source impedance to the impedance of the protected zone.

Telephone-type Relay.- Sometimes used for an armature relay with an end-mounted coil and spring pile-up contacts mounted parallel to the long axis of the relay coil.

Tension Spring. - Sometimes used for Restoring Spring.

Thermal Relay. - A relay, which is operated by the heating effect caused by electric current flow.

Through fault current. - The current flowing through a protected zone to a fault beyond that zone.

Time delay.- A delay intentionally introduced into the operation of a relay system.

Time-delay Relay or Time-lag Relay. - A relay in which a delayed action in operation or resetting is purposely introduced.

Timing Relay. - A motor-driven or Electronically time-delay relay.

Transfer Time or Transit Time. - Total elapsed time between breaking one set of contacts and making of another set of contacts.
(a) Transfer Time on Operate. - Transfer time on operate is total elapsed time from the instant the normally closed contacts start to open until the normally open contacts are closed and all contact bounce has ceased.
(b) Transfer Time on Release. - Transfer time on release is total elapsed time from the instant the normally open contacts start to open until the normally closed contacts are closed and all contact bounce has ceased.

Trip Values. - Trip voltage, current, or power is rated value at which a bistable-polarised relay will transfer from one contact to another.

Under current Relay. - A relay specifically designed to function when its coil current falls below a predetermined value.
**Under voltage Relay.** - A relay specifically designed to function when its coil voltage falls below a predetermined value.

**Unenclosed Relay.** - A relay, which does not have its contacts or coil, protected from the surrounding medium by a cover.

**Unit electrical relay.** - A single relay, which can be used alone or in combinations with others.

**Unit protection.** - A protection system, which is designed to operate only for abnormal conditions within a clearly defined zone of the power system.

**Unrestricted protection.** - A protection system which has no clearly defined zone of operation and which achieves selective operation only by time grading. The above is a summary of principal relay terms and definitions in current British and international practice.

**Winding.** - A magnetic or thermal winding to which energy is supplied to activate the relay.

**Wiper.** - A moving contact on a stepping relay. Wiping Contacts.-Contacts designed to have some relative motion during the interval from the instant of touching until completion of closing motion.

**Wiping Contacts.** - Contacts designed to have some relative motion during the interval from the instant of touching until completion of the closing motion.

The above is a summary of principal relay terms and definitions in current British and international practice. It is not complete and further reference should be made to the following standards.

- B.S. 5311 :1976 A.C. Circuit Breakers of Voltage above 1 kV
- B.S. 3941 :1982 Voltage Transformers.
- B.S. 4727~1971 Relay and Measurement Terminology (Part II)is. 47i7: 1971 Terms Particular to Power (Part 2) Engineering
- B.S. 3939:1966-78 Graphical Symbols for Electrical Equipments
- IEC 50 (446): 1983 International Electro technical