Data Bulletin

Glossary of Circuit Breaker Terms

Class 0600

Retain for future use.

accessory = An electrical or mechanical device that performs a secondary or minor function apart from overcurrent protection.

accessory cover = A removable cover on the front of a circuit breaker behind which are mounted the trip unit and all electrical accessories.

adjustable rating plug = A component which plugs into the trip unit, establishing the ampere rating of the circuit breaker

AIC = Amperes interrupting capacity.

AIR = See *amperes interrupting rating*.

alarm switch (bell alarm) = See *overcurrent trip switch*.

ambient temperature rating = Temperature at which the continuous current rating (handle rating) of a circuit breaker is based; the temperature of the air immediately surrounding the circuit breaker which can affect the thermal (overload) tripping characteristics of thermal-magnetic circuit breakers. Electronic trip circuit breakers, however, are insensitive to normal (-10° to 50°C) ambient conditions.

ammeter (local current meter) = A module that mounts directly to the circuit breaker trip unit and reports RMS phase and ground-fault current values as seen by the trip unit. Current values are displayed one phase at a time.

ampacity = The current, in amperes, that a conductor or circuit breaker can carry continuously under the conditions of use without exceeding its temperature rating.

ampere = The equivalent of one coulomb per second or the steady current produced by one volt applied across a resistance of one ohm.

amperes interrupting rating = The highest current at rated voltage that an overcurrent protective device is intended to interrupt under specified test conditions (NEC).

ANCE (National Association of Standardization and Cerfication for the Electrical Sector) = The standards and certification agency accredited by the Mexican government.

ANSI® = American National Standards Institute.

automatic molded case switch = A switch with construction similar to a molded case circuit breaker except that the switch opens only instantaneously at a non-adjustable trip point calibrated to protect only the molded case switch itself.

auxiliary switch = A switch mechanically operated by the main device for signaling, interlocking, or other purposes.

bell alarm = A mechanically-operated switch used to indicate the main contact position of a circuit breaker, which indicates when a circuit breaker has tripped. Also see *overcurrent trip switch*.

BPFE = See *electrical closing push button*.

branch circuit = The circuit between the final overcurrent device protecting the circuit and the outlet(s).

BCM = See *circuit breaker communications module*.

Canadian Standards Association® (CSA®) = Canadian product safety testing and certification organization.

carriage= See *cradle*.

CCM = See *cradle communication module*.

CD = See *cell switch*.

CDM = See *mechanical operation counter*.

CE = See *cell switch*.

cell switch = A switch which indicates the position of a drawout circuit breaker in relation to the cradle.

- **CD** = Disconnected position cell switch.
- **CE** = Connected position cell switch.
- **CT** = Test position cell switch.

CH = A spring-charged contact inside of the spring charging motor on insulated-case and low-voltage power circuit breakers.

charging handle= See *spring charging handle*.

circuit breaker = A device designed to open and close a circuit by non-automatic means and to open the circuit automatically on an overcurrent without damage to itself when properly applied within its rating.

circuit breaker communications module (BCM) = A module which, when installed in a circuit breaker, receives and transmits information on the communication network.

circuit breaker frame = (1) The circuit breaker housing which contains the current carrying components, the current sensing components, and the tripping and operating mechanism. (2) That portion of an interchangeable trip molded case circuit breaker remaining when the interchangeable trip unit is removed.

close button = A button for manually closing the main contacts after the closing springs are charged.

close button cover = A cover which fits over the close button and blocks access to it. Access to the close button may be permitted through the use of a tool or rod inserted through a small hole in the front of the close button cover.

closing coil (shunt close) = A coil which closes the circuit breaker electrically using an external voltage source when a specified voltage is applied across the coil.

coil clearing switch = A mechanically-operated switch in series with the coil of a shunt trip device which breaks the coil current when the circuit breaker opens.

communication network = A network allowing the flow of information between electrical components, comprised of programmable controller interface units, protocol software and modems.

conductor = A substance or body that allows a current of electricity to pass continuously along it.

continuous current rating (handle rating) (ampere rating) = The designated RMS alternating or direct current in amperes which a device or assembly will carry continuously in free air without tripping or exceeding temperature limits.

continuous load = A load where the maximum current on the circuit is expected to continue.

cradle communications module (CCM) = An external module which allows addressing of the cradle and retention of the address when the drawout circuit breaker is in the disconnected position and which is used to transmit information about the position of the circuit breaker in the cradle to the communication network.

cradle compartment = A compartment containing all connectors, shields, adapters, barriers, spreaders, shutters, keys and interlocking devices for a drawout circuit breaker.

CSA® = See *Canadian Standards Association.*

CT = Current transformer. See also *cell switch*.

current path (of a circuit breaker) = The current-carrying conductors within a circuit breaker between, and including, line and load terminations.

current transformer (current sensor) (CT) = An instrument to measure current, encircling a conductor carrying the current to be measured or controlled.

demand metering = The metering of power or current demand seen by a circuit breaker. It is calculated over a fixed or sliding time window that can be programmed from five to 60 minutes. Depending on the contract signed with the power supplier, specific programming makes it possible to avoid or minimize the cost of overrunning the subscribed power. Maximum demand values are systematically stored and time stamped.

disconnecting contacts = See *main disconnecting contacts* and *secondary disconnecting contacts*.

drawout circuit breaker = An assembly of a circuit breaker and a supporting structure (cradle) so constructed that the circuit breaker is supported and can be moved to either the main circuit connected or disconnected position without removing connections or mounting supports.

drawout mechanism = A mechanism which engages the drawout cradle assembly and draws the circuit breaker into or out of the switchboard. The drawout mechanism includes the drawout mechanism shaft, drawout levering device arms and a drawout position indicator.

drawout position indicator = An indicating means which shows the position of the circuit breaker in the drawout structure.

drawout access cover (drawout shaft cover) = A shutter which allows or restricts access to the drawout shaft.

electrical closing push button (BPFE) = A push button used to electrically close a circuit breaker using a shunt close with communication option. This takes into account all safety functions that are part of the control and monitoring system of the installation.

electrical operator (motor operator) = An electrical device used to open and close a circuit breaker or switch and reset a circuit breaker. See also *spring charging motor*.

electronic trip circuit breaker = A circuit breaker which uses current sensors and electronic circuitry to sense, measure and respond to current levels.

fixed-mounted circuit breaker = A circuit breaker so mounted that it cannot be removed without removing primary and sometimes secondary connections and/or mounting supports.

frame size = The largest ampere rating available in a group of circuit breakers of similar physical configuration.

frequency = The number of cycles per second for an alternating current system.

frequency rating = The range of frequencies within which a product can be applied.

ground fault = An unintentional current path, through ground, back to the source.

ground-fault delay = The length of time the circuit breaker trip unit will delay before initiating a trip signal to the circuit breaker after a ground fault has been detected.

ground-fault module = An electronic accessory used in combination with thermal-magnetic circuit breakers to provide branch circuit ground-fault protection and ground-fault indication.

ground-fault pickup = The level of ground-fault current at which the trip system begins timing.

handle rating = Continuous current rating.

IDMTL = Long-time delay curve which can be varied in slope to enhance selectivity.

IEC® = International Electrotechnical Commission.

IEEE® = Institute of Electrical and Electronics Engineers.

Ig = See *ground-fault pickup.*

Ii = See *instantaneous pickup.*

In = See *sensor rating.*

individually-mounted circuit breaker = A circuit breaker so mounted that it cannot be removed without removing primary and sometimes secondary connections and/or mounting supports.

instantaneous pickup = The current level at which the circuit breaker will trip with no intentional time delay.

instantaneous trip = A qualifying term indicating that no delay is purposely introduced in the tripping action of the circuit breaker during short-circuit conditions.

insulated case circuit breaker (ICCB) = UL Standard 489 Listed non-fused molded case circuit breakers which utilize a two-step stored energy closing mechanism, electronic trip system and drawout construction.

integral ground-fault protection for equipment = Equipment ground-fault protection on grounded neutral systems provided by components internal to the circuit breaker.

interchangeable trip unit = A trip unit which can be interchanged by a user among circuit breaker frames of the same design.

interrupting rating = The highest current at rated voltage available at the incoming terminals of the circuit breaker. When the circuit breaker can be used at more than one voltage, the interrupting rating will be shown on the circuit breaker for each voltage level. The interrupting rating of a circuit breaker must be equal to or greater than the available short-circuit current at the point at which the circuit breaker is applied to the system.

inverse time = A qualifying term indicating there is purposely introduced a delay in the tripping action of the circuit breaker, which delay decreases as the magnitude of the current increases.

Ir = See *long-time pickup.*

Isd = See *short-time pickup.*

I^2t = See *let-through current.*

I^2 t IN (I^2 t ON) = An inverse time delay characteristic.

I^2 t OUT (I^2 t OFF) = A constant time delay characteristic.

latch check switch = A mechanically-operated switch which senses if the trip latch is reset.

let-through current = The peak current (measured in amperes) which passes through an overcurrent protective device during an interruption.

let-through I^2t = An expression related to energy (measured in ampere-squared seconds) which passes through an overcurrent protective device during an interruption.

LI = A combination of adjustable trip functions including long-time ampere rating, long-time delay, and instantaneous pickup.

lifting adapter = A device used with a crane, chain block or an optional lifting mechanism supplied with switchgear for removing and installing a drawout circuit breaker or fuse truck.

LIG = A combination of adjustable trip functions including long-time ampere rating, long-time delay, instantaneous pickup, ground-fault pickup and ground-fault delay.

limit switch = A switch mechanically operated by a device.

local current meter = An ammeter installed as part of the trip unit.

long-time ampere rating = An adjustment which, in combination with the installed rating plug, establishes the continuous current rating of a full-function electronic trip circuit breaker.

long-time delay = The length of time the circuit breaker will carry a sustained overcurrent (greater than the long-time pickup) before initiating a trip signal.

long-time pickup = The current level at which the circuit breaker long-time delay function begins timing.

low voltage power circuit breaker (LVPCB) = A circuit breaker tested to the ANSI C37 Standards with a two-step stored-energy mechanism, an electronic trip system, and drawout construction.

LS = A combination of adjustable trip functions including long-time ampere rating, long-time delay, short-time pickup, short-time delay and a defeatable instantaneous pickup.

LSG = A combination of adjustable trip functions including long-time ampere rating, long-time delay, short-time pickup, short-time delay, defeatable instantaneous pickup, ground-fault pickup and ground-fault delay.

LSI = A combination of adjustable trip functions including long-time ampere rating, long-time delay, short-time pickup, short-time delay and defeatable instantaneous pickup.

LSIG = A combination of adjustable trip functions including long-time ampere rating, long-time delay, short-time pickup, short-time delay, defeatable instantaneous pickup, ground-fault pickup and ground-fault delay.

main disconnecting contacts = Spring-loaded and self-aligning contact on the rear of a drawout circuit breaker that provide positive electrical contact when the circuit breaker is in the connected position.

MASTERPACT® = The family of universal power circuit breakers including insulated case circuit breakers and low-voltage power circuit breakers.

MCH = See *spring-charging motor.*

MDGF = Modified differential ground-fault system.

manual charging handle = A manually-operated handle which charges the circuit breaker closing springs.

mechanical operation counter (CDM) = A mechanical device which indicates the total number of circuit breaker operating cycles.

MICROLOGIC® = The family of electronic trip systems available on molded case circuit breakers, insulated case circuit breakers and low-voltage power circuit breakers.

miniature circuit breaker (MCB) = A small circuit breaker which is assembled as an integral unit in a supportive and enclosed housing of insulating material, rated 150 A or less and used in 120 V, 120/240 V, 240 V and 480Y/277 V ac systems and dc systems up to 125 Vdc.

MN = See *undervoltage release.*

MODBUS® communication network = A communication network comprised of programmable controller interface units, protocol software and modems.

molded case circuit breaker (MCCB) = A circuit breaker which is assembled as an integral unit in a supportive and enclosed housing of insulating material, generally 20 to 3000 A in size and used in systems up to 600 Vac and 500 Vdc.

motor circuit protector = A recognized component of construction similar to a circuit breaker except with no thermal elements so that it provides short-circuit protection only.

MX = See *shunt trip.*

National Association of Standardization and Cerfication for the Electrical Sector = See *ANCE.*

neutral current transformer = A current transformer which encircles the neutral conductor; required on circuit breakers with ground-fault protection, when applied on a grounded system.

NMX® (Norma Mexicana X) = Listing mark indicating certification to non-mandatory Mexican safety standards.

NOM = Listing mark indicating certification to mandatory Mexican safety standards

OF = See *auxiliary switch.*

open/closed indicator = An indicating means which displays the position (open or closed) of the main contacts.

operating mechanism = An internal mechanical system which opens and closes the circuit breaker contacts.

OTS = Overcurrent trip switch (alarm switch, bell alarm). A mechanical switch that operates when the circuit breaker is tripped by the trip system.

overcurrent = Any current in excess of the rated continuous current of equipment or the ampacity of a conductor.

overcurrent mechanism = An internal mechanical system which trips the circuit breaker during an overcurrent.

overcurrent trip element = A device which detects an overcurrent and transmits the energy necessary to open the circuit automatically (UL only).

overcurrent trip switch (SDE) = A mechanically-operated switch which indicates when a circuit breaker has tripped due to overcurrent conditions.

overload delay = The length of time the circuit breaker will carry a sustained low-level overcurrent before initiating a trip signal.

peak current sensing = A method of determining the current by means of detecting the current peaks.

peak let-through current = The maximum peak current flowing in a circuit during an overcurrent condition.

PF = A switch used to indicate a circuit breaker is ready to close.

phase barrier = A barrier which provides phase-to-phase or phase-to-ground isolation.

POWERLOGIC® = The family of electronic circuit monitoring systems available on molded case circuit breakers, insulated case circuit breakers and low-voltage power circuit breakers.

POWER-ZONE® = The family of low-voltage and medium-voltage switchgear.

programmable contact module (M6C and M2C) = A programmable module which indicates the type of fault and the instantaneous and delayed threshold overruns. It may be programmed with instantaneous return to the initial state, without return to the initial state, or with return to the initial state following a delay.

primary disconnect contacts = An electrical plug-on connector in the main current path between the drawout components and the cradle mounted in the switchboard or switchgear.

push-to-close button = A button for manually closing the main contacts after the closing springs are charged.

push-to-open button = A button for manually opening the circuit breaker.

push-to-trip button = A button for manually tripping the circuit breaker.

racking device shutter = See *drawout shaft cover*.

racking interlock = An interlock to prevent racking of a drawout circuit breaker when the enclosure door is open by not allowing the racking crank to be inserted into the circuit breaker.

rating plug = A component which plugs into the full-function electronic trip unit, establishing the maximum continuous current rating of the circuit breaker.

remote reset after fault (RES) = A component which resets the overcurrent trip switch (SDE) and the mechanical operator after tripping.

RES = See *remote reset after fault*.

residual ground-fault sensing = A means of providing equipment ground-fault protection utilizing sensors on each individual phase.

restraint interface module (RIM) = A component which allows zone-selective interlocking communication between Square D full-function electronic trip systems, add-on ground-fault modules and zero-sequence ground-fault relays.

RIM = Restraint interface module.

RMS = Root-mean-square.

RMS current sensing = A method of determining the true RMS current of sinusoidal and non-sinusoidal waveforms by sampling the current waveform a number of times per cycle, then calculating the true RMS value.

safety shutter = A device that closes to block access to the main disconnects when the circuit breaker is in the disconnected, test or withdrawn position.

SDE = See *overcurrent trip switch.*

secondary disconnect contacts = An electrical plug-on connector in the secondary (control) circuit between a drawout circuit breaker and its cradle in the switchboard or switchgear.

sensor = The current sensing element within the circuit breaker which provides the sensing function for that circuit breaker.

sensor plug = A component used with the MICROLOGIC trip system to set the sensor size of a circuit breaker.

sensor size = Maximum ampere rating possible for a specific circuit breaker, based on the size of the current sensor inside the circuit breaker. Sensor size is less than or equal to frame size.

SGR = Source ground return system.

short-circuit delay (STD) = The length of time the circuit breaker will carry a short circuit (current greater than the short-circuit pickup) before initiating a trip signal.

short-circuit pickup = The current level at which the circuit breaker short-circuit delay function begins timing.

short-time delay = The length of time the circuit breaker will carry a short circuit (current greater than the short-time pickup) before initiating a trip signal.

short-time pickup = The current level at which the circuit breaker short-time delay function begins timing.

shunt close (closing coil) (XF) = An accessory which closes the circuit breaker from a remote location using an external voltage source.

shunt trip (MX) = An accessory which trips the circuit breaker from a remote location using an external voltage source.

spring-charging handle = A handle located on the front of the circuit breaker used to manually charge the stored energy mechanism.

spring charging motor = A motor which electrically charges the stored energy closing spring(s).

STD = Short-time delay.

stored energy mechanism (SEM) = A spring mechanism that is compressed or “charged” and then released or “discharged” to close the circuit breaker.

terminal block = The connections for control wiring.

tg = See *ground-fault delay.*

thermal imaging = A trip unit function that accurately maps the heating and cooling effects of load behavior on rated conductors to provide thermal protection without nuisance tripping.

thermal-magnetic circuit breaker = A general purpose term for circuit breakers that use bimetals and electromagnetic assemblies to provide both thermal and magnetic overcurrent protection.

thermal memory = Provides continuous temperature rise status of the wiring for a period of time both before and after the device trips. This allows the circuit breaker to respond to a series of overload conditions which would otherwise go undetected.

tr = See *long-time delay.*

tsd = See *short-time delay.*

two-step stored energy mechanism = See *stored energy mechanism*.

transformer = A static device with primary winding, connected in series with the conductor (bus) carrying the current to be measured or controlled within the switchgear.

trip button = See *push-to-trip button*.

trip curve = A graphical representation of the response of a circuit breaker to current over a period of time.

trip indicator = A module that mounts directly to the circuit breaker trip unit that displays whether the circuit breaker tripped due to an overload, a short-circuit or a ground-fault condition.

trip indicator reset = A button on the trip indicator module used to reset the trip indicator.

trip system = A system which consists of a MICROLOGIC trip unit and current transformers.

trip unit = A programmable device which measures and times current flowing through the circuit breaker and initiates a trip signal when appropriate.

UL® = See *Underwriters Laboratories Inc.*

undervoltage trip release (MN, UVR) = An accessory which trips the circuit breaker automatically when the monitored circuit voltage falls below a predetermined percentage of its specified value.

Underwriters Laboratories Inc.® (UL®) = An independent, not-for-profit standards development, product safety testing and certification organization.

unit-mount circuit breaker = A circuit breaker mounted such that it cannot be removed without removing primary and sometimes secondary connections or mounting supports.

withstand rating = The level of RMS symmetrical current that a circuit breaker can carry with the contacts in a closed position for a stated period of time–usually stated in cycles.