Contactor Technical terms.

Term Definition

Altitude: Refers to the height of the site where the equipment is located, expressed in meters above the sea level.

Ambient Temperature: Temperature of the air surrounding the unit.

Auxiliary Circuit: All the conducting parts of a contactor, intended to be included in a circuit different from the main circuit and the control circuit of the contactor e.g. signalization, interlocking circuits etc.

Control Circuit: All the conducting parts of a contactor (other than the main circuit) included in a circuit used for the closing operation, or opening operation, or both, of the contactor.

Main Circuit: All the conducting parts of a contactor included in the circuit which it is designed to close or open.

Coil Operating Range: Expressed as a multiple of the rated control circuit voltage Uc for the lower and upper limits.

Cycle Duration: Total time of the on-load + off-load period.

Electrical Endurance: Number of on-load operating cycles (i.e. with current on the main contacts) a contactor can achieve, varies depending on the utilization category.

Mechanical Endurance: Number of off-load operating cycles (i.e. without current on the main contacts) a contactor can achieve.

Inching: Energizing a Motor once or repeatedly for short periods to obtain small movements of the driven mechanism.

Insulation class according to the VDE 0110 and NFC 20-040: Characterizes contactors suitability in accordance with environment and utilization conditions. A contactor can be classified depending on its own clearance and creepage distances in the insulation classes A, B, C, D which correspond to different insulation voltage values. The insulation class C is applicable to most of the industrial applications.

Intermittent Duty: Duty in which the main contacts of a contactor remain closed for periods of time insufficient to allow the contactor to reach thermal equilibrium, the current-carrying periods being separated by off-load periods of sufficient duration to restore equality of temperature with the cooling medium.

Mounting Positions Stated by the manufacturer: Please note restrictions when applicable.

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On-load Factor: Ratio of the current flow time to the total time of the cycle x 100.

Plugging: Stopping or reversing a Motor quickly by interchanging two supply leads whilst the motor is running.

Rated breaking capacity: Rated making capacity Value of r.m.s current a contactor can break or make at a fixed voltage value, within the conditions specified by the standards, depending on the utilization category.

Rated control circuit voltage Uc: Control voltage value for which the control circuit of the unit is sized.

Rated insulation voltage Ui: Voltage value which designates the unit and to which dielectric tests, clearance and creepage distances are referred.

Rated impulse withstand voltage U_{imp}: The highest peak value of an impulse voltage of prescribed form 1.2/50, which does not cause breakdown under specified conditions of test.

Rated operating current I_e :Current value stated by the manufacturer and taking into account the rated operating voltage U_e, the rated frequency, the rated duty, the utilization category, the electrical contact life and the type of the protective Enclosure.

Rated operating voltage Ue : Voltage value to which utilization characteristics of the contactor are referred, i.e. phase to phase voltage in 3 phase circuits.

Conventional thermal current Ith: Value of current the contactor can withstand with poles in closed position, in free air for an eight hour duty, without the temperature rise of its various parts exceeding the limits specified by the standards.

Resistance to shocks: Requirements applicable for instance to vehicles, crane operation or switchgear slide-in module systems. At the quoted permissible «g» values, contactors must not undergo a change in switching state and O/L relays must not trip.

Resistance to vibrations: Requirements applicable to all the vehicles, vessels and other similar transport systems. At the quoted amplitude and vibration frequency values, the unit must be capable to achieve the required duty.

Short-circuit protection co-ordination: Achieved by using back-up protection devices such as ABB Circuit Breakers, H.R.C. fuses or standard fuses. Co-ordination types a, b, c are defined in IEC 292-1 publication, VDE 0660, NFC 63-650 standards. Co-ordination types "1" and "2" are defined in IEC 947-4-1.

Type 1 co-ordination: There has been no discharge of parts beyond the enclosure. Damage to the contactor and the overload relay is acceptable.

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Type 2 co-ordination: No damage to the overload relay or other parts has occurred, except that welding of contactor or starter contacts is permitted, if they are easily separated.

Switching frequency: Number of operating cycles per hour.

Closing time: Time between energization of the coil until the moment the contacts of the first current path to be closed actually close.

Opening time: Time from the beginning of state causing breaking until the moment when the contacts of the last current path to be opened are open.

Minimal operation time: Shortest control duration to ensure complete closing or opening of a contactor.

Short time current permissible: Value of current which the contactor can withstand in closed position for a short time period and within specified conditions.

Time constant: Ratio of inductance to the resistance: L/R = mH/Ohm = ms.