Basler Electric
Common IEEE Device Numbers

Number	Name	Description
21	Distance Relay	Functions when the circuit impedance or a component of impedance increases or decreases beyond predetermined limits.
24	Volts Per Hertz Relay	Functions with time delay (inverse, step or definite time) for overexcitation conditions as evidenced by Volts/Hertz.
25	Sync-Check Relay	Functions on desired limits of delta frequency, phase angle, and voltage of two ac circuits.
25A	Automatic Synchronizing Relay	Acts to bring two ac circuits within desired limits of frequency, phase angle, and voltage, then initiates the paralleling of these two circuits.
27	Undervoltage Relay	Functions on a given value of undervoltage.
27N	Ground Fault Undervoltage Relay	Functions on a given value of third harmonic.
32	Power Relay	Functions on a desired value of power flow in a given direction.
36	Polarity or Polarizing Voltage Device	Operates another device on a predetermined polarity only or verifies the presence of a polarizing voltage.
37	Undercurrent Relay	Functions on a given value of undercurrent.
40	Loss of Field Relay	Functions on a given value of dc field current.
41	Field Breaker	Applies and removes the field excitation of a machine.
43	Manual Selector Switch	Used to control circuit operation.
46	Phase Balance Current Relay	Functions on a given degree of unbalance between polyphase currents.
46N	Negative Sequence Overcurrent Relay	Functions when the polyphaser currents contain negative sequence components above a given value.
47	Phase Sequence Voltage Relay	Functions on a given value of polyphase voltage in the desired phase sequence.
47N	Negative Sequence Voltage Relay	Functions on a given value of the negative sequence component of the polyphaser voltage.
48	Incomplete Sequence Relay	Announces an incomplete sequence if the motor starts, but does not reach running state before the time interval expires.
49	Thermal Relay	Functions when the temperature of a machine, transformer, or other load-carrying winding exceeds a given value.
49RTD	Resistance Temperature Detector Relay	Provides over/under temperature protection for applications when a remote RTD module is connected.
49TC	Thermal Curve Relay	Models the thermal capacity in a motor to provide thermal protection.
50	Instantaneous Overcurrent Relay	Functions without intentional time delay when the current exceeds a given value.
50BF	Breaker Failure Relay	Functions when current continues to flow after the monitored breaker should have interrupted a fault.

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Number	Name	Description
51	Time Overcurrent Relay	Functions with a definite or inverse time characteristic when the current exceeds a given value.
51TF	Transformer Monitor	Implements a through-fault counter which allows the user to schedule wear-based maintenance instead of time-based maintenance.
52	AC Circuit Breaker	Closes and interrupts an ac power circuit.
55	Power Factor Relay	Functions when the power factor falls below a given value.
57	Short-Circuiting or Ground Device	Primary circuit switching device that functions to short-circuit or ground a circuit in response to automatic or manual means.
59	Overvoltage Relay	Functions as a given value of overvoltage.
59N	Ground Fault Overvoltage Relay	Functions on a given value of overvoltage at the fundamental frequency.
60	Voltage Balance Relay	Functions on a quantitative voltage difference between two circuits.
62	Time-Delay Stopping or Opening Relay	Time-delay relay that serves in conjunction with the device that initiates the shutdown, stopping, or opening operation in an automatic sequence or protective relay system.
63	Pressure Switch	Operates on given values, or on a given rate of change, of pressure.
64	Ground Protective Relay	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.
64G	Stator Ground Relay	Provides ground protection for 100% of the stator winding by using 27X in Vx Third Harmonic mode and 59X in Vx Fundamental mode.
66	Starts Per Time Interval Relay	Blocks the motor from starting when the user-defined number of starts per time interval is exceeded.
67	AC Directional Overcurrent Relay	Functions on a desired value of ac overcurrent flowing in a predetermined direction.
68	Blocking Relay	Initiates a pilot signal for blocking of tripping on external faults in a transmission line or in other apparatus under predetermined condition, or cooperates with other devices to block tripping or to block re-closing on an out-of-step condition or on power savings.
69	Permissive Control Device	Two-position, manually-operated switch that, in one position, permits the closing of a circuit breaker or the placing of equipment into operation, and in the other position prevents the circuit breaker or the equipment from being operated.
72	DC Circuit Breaker	Circuit breaker used to close and interrupt a dc power circuit under normal conditions or to interrupt this circuit under fault or emergency conditions.

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Number	Name	Description
74	Alarm Relay	Relay other than an annunciator used to operate a visual or audible alarm.
76	DC Overcurrent Relay	Functions when the current in a dc circuit exceeds a given value.
78	Phase-Angle Measuring or Out-of-Step Protective Relay	Functions at a pre-determined phase angle between two voltages, between two currents or between a voltage and current.
78OOS	Out of Step Relay	Detects out-of-step conditions by monitoring the rate of impedance change as viewed at the generator terminals.
78V	Vector Jump Relay	Protects the generator by disconnecting it from the grid when a loss of mains or mains failure occurs.
79	AC Reclosing Relay	Controls the automatic reclosing and locking out of an ac circuit interrupter.
81	Frequency Relay	Functions on a predetermined value of frequency (either under or over or on normal system frequency) or rate of change of frequency.
82	DC Reclosing Relay	Controls the automatic reclosing and locking out of a dc circuit interrupter.
83	Automatic Selective Control or Transfer Relay	Operates to select automatically between certain sources or conditions in equipment, or performs a transfer operation automatically.
85	Carrier or Pilot-Wire Receiver Relay	Operated or restrained by a signal used in connection with carrier-current or d-c pilot-wire fault directional relaying.
86	Lock-Out Relay	Electrically operated hand, or electrically reset relay or device that functions to shut down or hold equipment out of service upon the occurrence of abnormal conditions.
87	Differential Protective Relay	Functions on a percentage or phase angle or other quantitative difference of two currents or of some other electrical quantities.
87N	Neutral Current Differential Relay	Provides sensitive differential protection from phase-to-ground faults in the Y-connected winding.
91	Voltage Directional Relay	Operates when the voltage across an open circuit breaker or contactor exceeds a given value in a given direction.
92	Voltage and Power Directional Relay	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.
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 if it should open automatically even though its closing circuit is maintained closed.

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Number	Name	Description
101	Breaker Control Switch	Provides manual control of a circuit breaker or switch without using physical switches or interposing relays.

Basler Electric serves the electric power industry with solid state relays for feeder, transmission, bus, transformer, generator and motor protection for any application. Designed to operate in harsh electrical environments, meeting or exceeding ANSI/IEEE and IEC standards, Basler utility grade and industrial grade relays offer high accuracy, low burden, flexibility, and low maintenance.

Basler's microprocessor based relays combine multifunction protection with control, metering, data acquisition, and networked communications.

Basler's retrofit relays provide a direct “plug and play” replacement for many obsolete designs and other Basler relays fit into the cutouts of older electromechanical relays.

For more information on the functions provided in Basler BE1 Numerical relays, please visit https://www.basler.com/SiteMap/Products/Protective-Relay-Systems/

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