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Perfect protection – smallest space

The SIPROTEC Compact device range redefines protection technology

Answers for energy.

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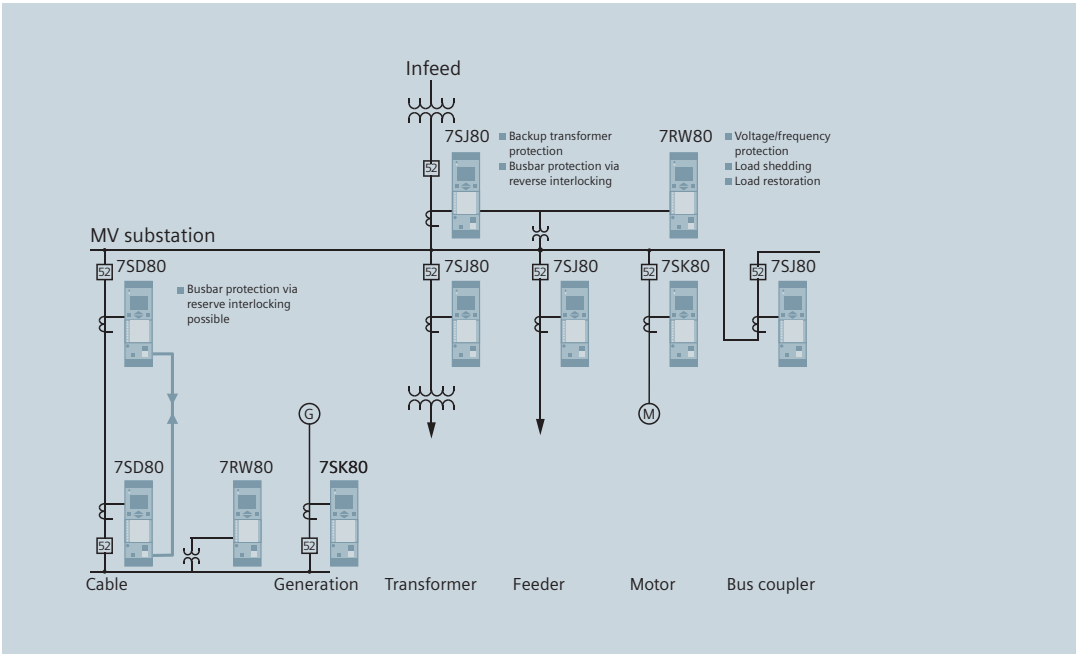
SIPROTEC Compact is the ideal solution for almost every protection application



Simple yet comprehensive, safe, and reliable

Perfectly suited for protection in distribution systems and industry, with minimal space requirement

SIPROTEC Compact devices provide a comprehensive range of functions in a surprisingly compact and space-saving housing.

Whether as main or as backup protection, a single SIPROTEC Compact device provides protection functionality for every conceivable fault. And it can do even more – it supports the control, automation, and monitoring functions in the substation.

Simple to operate and highly flexible

The proven concept behind the SIPROTEC Compact range of devices allows efficient and safe operation. The devices can be parameterized completely with the DIGSI 4 parameterization tool. The six-line display and eight LEDs indicate all operating states. The new freely programmable function keys can be integrated in the application by the user. With the programmable logic (CFC) and flexible protection functions the device can be adapted to meet the individual requirements in terms of protection for a broad range of applications. Exchangeable communications interfaces will meet future standards, thereby providing security of investment.

The comprehensive experience of the market leader in a single device

The SIPROTEC Compact range stands for the cumulative experience of millions of successfully operating Siemens systems. They are based on the SIPROTEC 4 range, which has been used in countless systems and applications worldwide to date.

Cutting-edge hardware

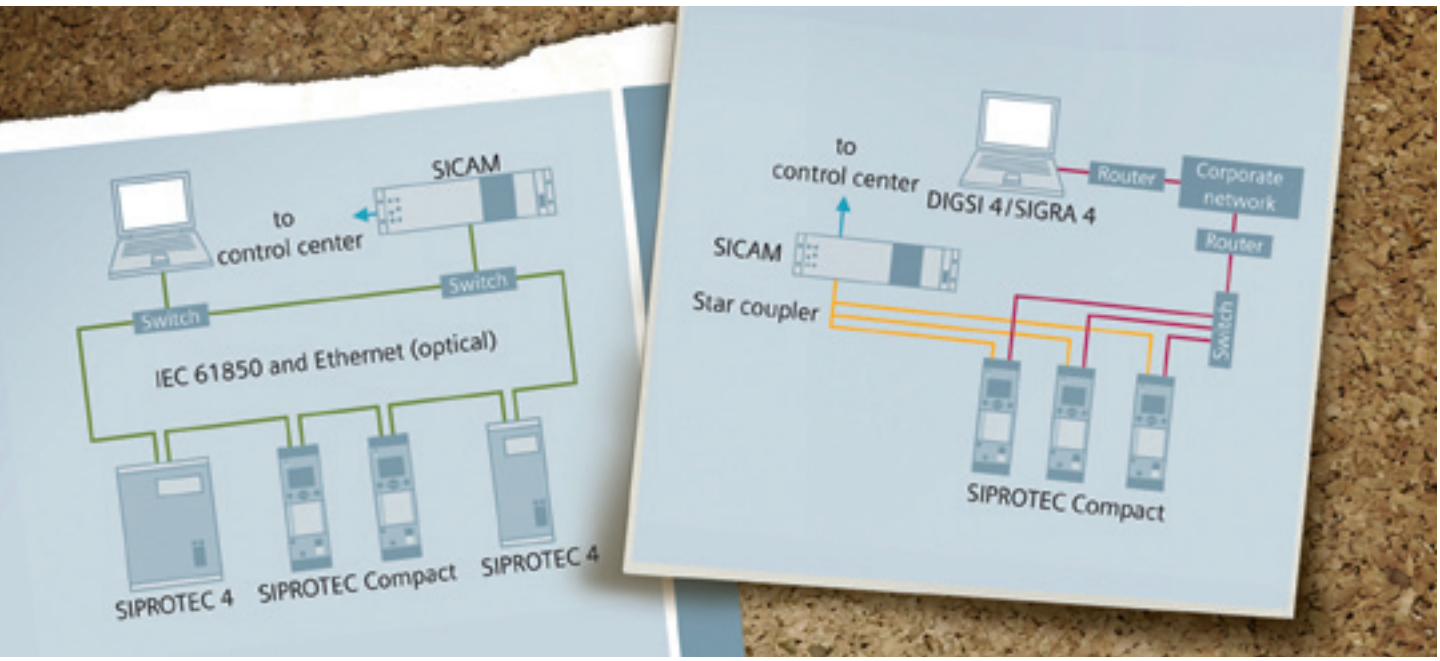
Pluggable terminal blocks make the installation and retrofitting of all voltage and current connections a breeze. No special tools are required, and settings and adaptations are done via software parameters.

SIPROTEC Compact at a glance: the SIPROTEC Compact device range

- Compact design
- Simple installation without special tools
- Six-line display
- Eight freely assignable LEDs
- Nine freely parameterizable function keys
- Pluggable current and voltage terminal blocks
- Front-mounted USB interface
- Battery can be exchanged from the front panel
- Two interfaces for remote access
- Programmable logic (CFC) and flexible protection functions
- Binary input voltage threshold adjustable with DIGSI
- Current transformer rated secondary current
- (1 A/5 A) adjustable with DIGSI

Optical loop and IEC 61850

Parallel operation of control and service connections



A strong communicator

Much more than a protection device

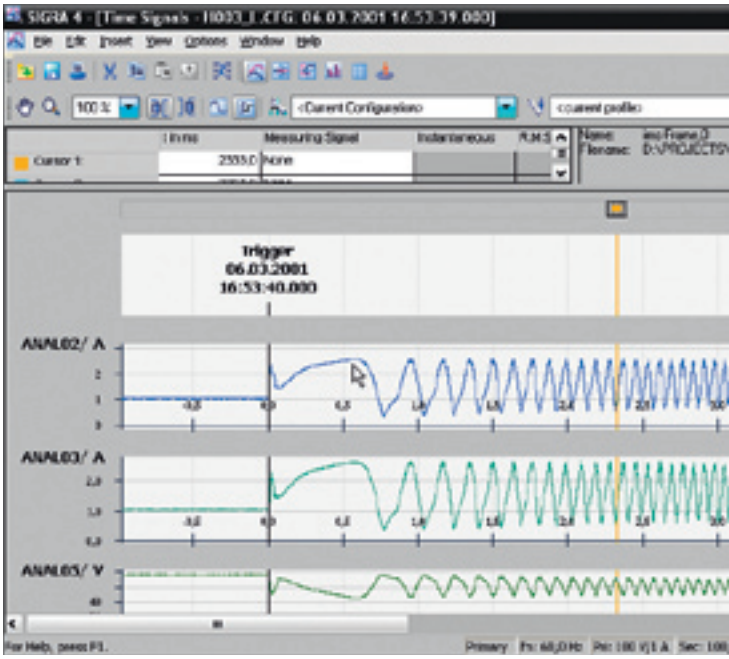
In addition to protection functions, SIPROTEC Compact devices also support control, monitoring, and automation processes. The comprehensive range of features along with communications interfaces ensure that the devices can be fully integrated in the centralized control, supporting control, and service communication. In addition, it provides for connections to be made with other devices, for example via an optical loop according to IEC 61850 with other SIPROTEC 4 devices.

Communications interfaces:

- Interface:
  - IEC 61850
  - IEC 60870-5-103
  - PROFIBUS DP
  - DNP 3.0
  - MODBUS RTU
- Ethernet interface for DIGSI 4 or for optical protection interfaces for differential protection
- Front-mounted USB interface

Features of Ethernet interface for IEC 61850:

- IEC 61850 with integrated redundancy (electrical or optical)
- Peer-to-peer communication between devices via Ethernet (IEC 61850 GOOSE)
- Millisecond-precise synchronization via Ethernet with SNTP
- Optional optical IEC 61850 loop configuration of SIPROTEC 4 and SIPROTEC Compact devices
- Ethernet services that can be deactivated



Intuitive user interface with really easy operation

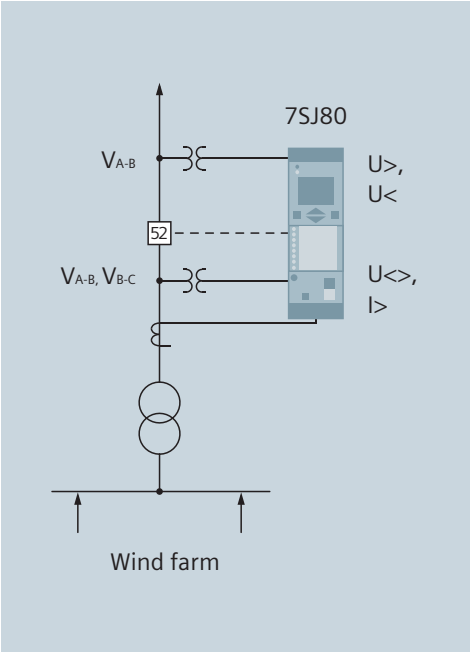
DIGSI 4 is the application software on the user's PC for the interface with SIPROTEC devices providing all the related functionality. DIGSI 4 is specifically developed for industrial and utility applications, making the parameterization and evaluation of SIPROTEC devices really easy.

The PC software is downward-compatible and provides a user-friendly and intuitive user interface. The interface allows tasks to be carried out simply and conveniently, from the parameterization and commissioning of devices to the analysis and documentation of system disturbances. A powerful analysis tool supports quick fault-finding and also provides important information for maintenance cycles.

For a broad range of users, DIGSI 4 has already become an established name in the business.

DIGSI 4 at a glance:

- Mapping of all substation topology types
- Import and export of parameter sets
- Flexible and intuitive application of user-defined logic with a logic editor (CFC) – no prior programming knowledge is necessary
- Precise fault analysis and visualization using SIGRA
- Routing of inputs and outputs with a visually clear matrix (no dialog boxes)
- Intelligent plausibility checks avoid wrong inputs and settings
- Test and diagnostics functions
- Direct interface with the device via a serial interface or from remote via modem
- Integrated IEC 61850 station configurator

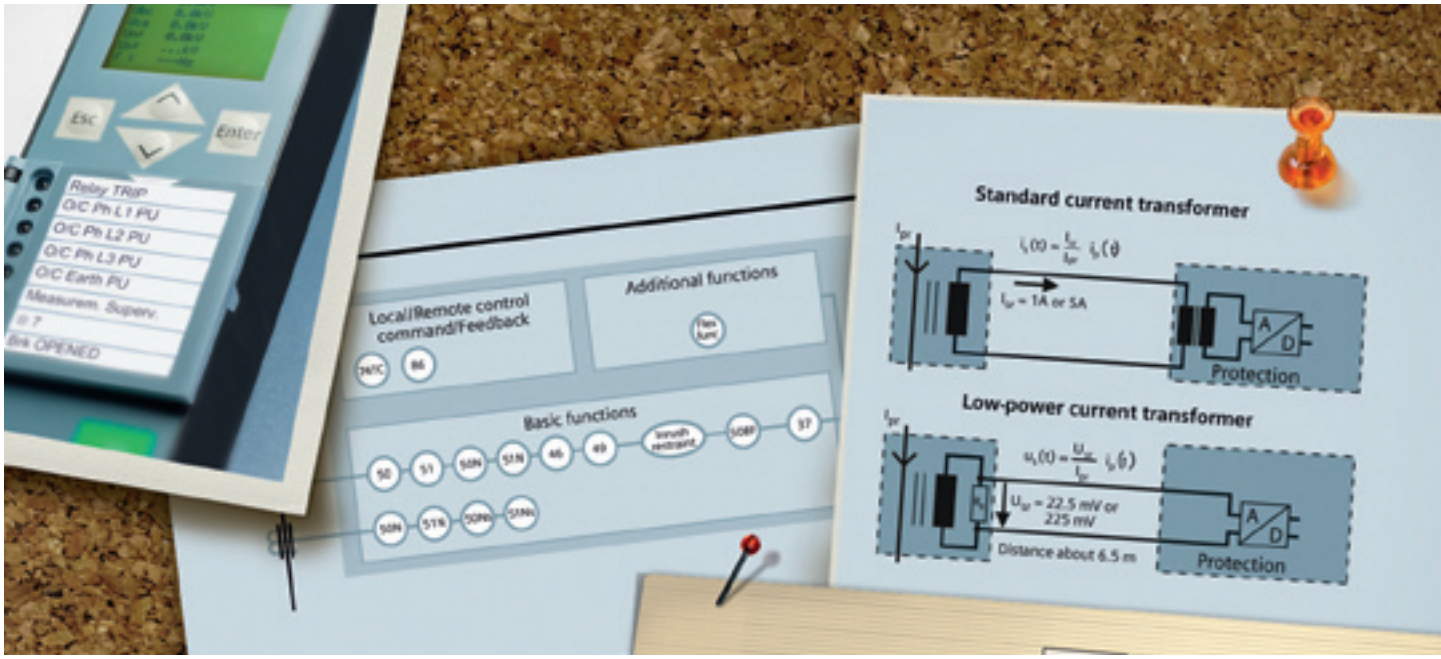


Time-overcurrent protection 7SJ80

The SIPROTEC Compact 7SJ80 can be used for the line protection of high and medium-voltage networks that have a solid, resistance, isolated, or compensated neutral grounding. The 7SJ80 can be used as a backup protection device for transformer differential relays.

Highlights:

- Multifunction protection in a compact housing
- Flexible protection functions for the utmost adaptability
- Ideally suited to energy distribution and industrial networks



Time-overcurrent protection 7SJ81 for connecting to low-power current transformers

SIPROTEC Compact 7SJ81 makes the advantages of low-power current transformers available.

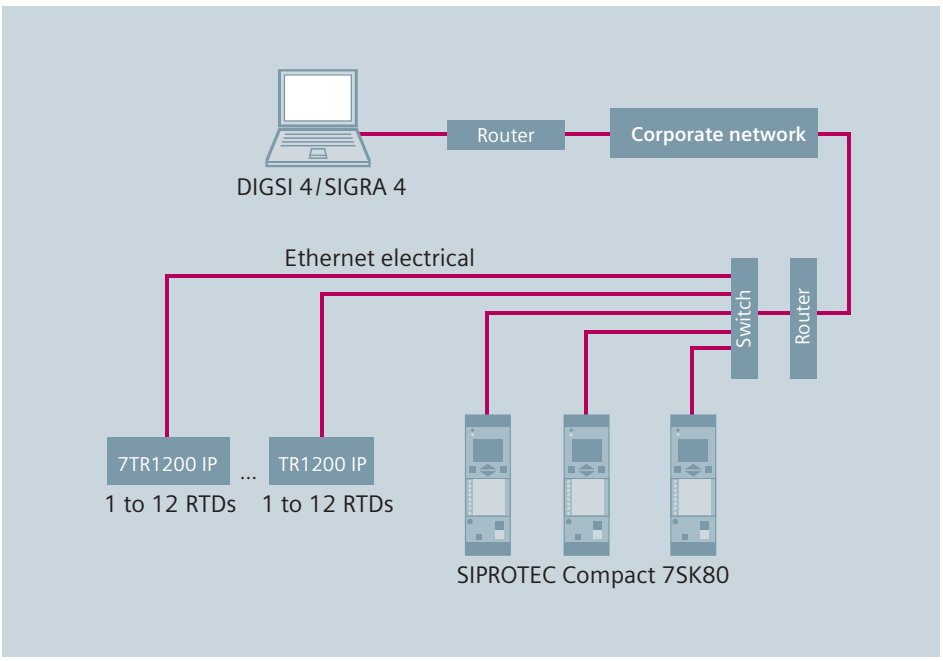
The device provides four low-power current transformer inputs along with the required protection and control functions.

Since low-power current transformers cover a very broad range of primary nominal current while operating almost without saturation, cost-efficient and safe system solutions can be created.

Highlights

- Savings in terms of spares and logistics because only a few low-power current transformer types cover the complete range of conventional transformers while providing protection and measurement CT functionality
- High operational safety, since low-power current transformers can be operated with short circuit and open circuit on the secondary side
- Minimal device size of the transformer core, making it ideal for compact switchgear systems in energy distribution and industrial applications
- Linear and almost no saturation up to short-circuit current
- Reduction of current transformer types thanks to a high dynamic range and a high precision level
- In the event of an increase in branch nominal current there is no need for replacement of CT thanks to high, linear transmission range

External temperature detection



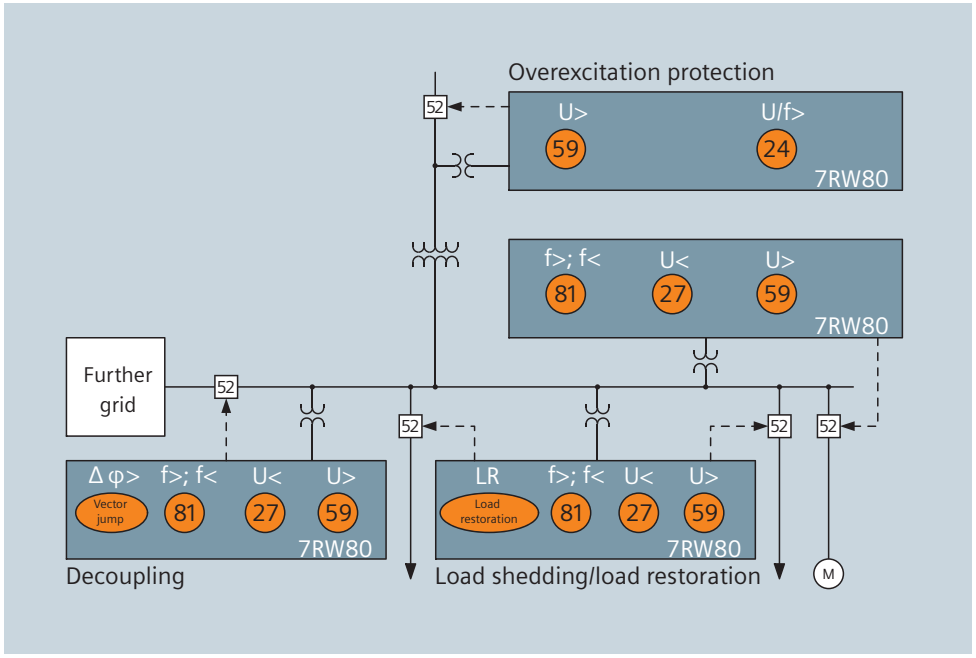
Motor protection 7SK80

The SIPROTEC Compact 7SK80 is a multifunctional motor protection device that has been developed for the protection of asynchronous motors. The 7SK80 can be used as a backup protection for transformer differential relays.

Highlights:

- Highly compact motor protection relay
- Five integrated inputs for connecting temperature sensors (RTDs)
- Up to 12 temperature sensors (RTDs) can be connected via a serial-coupled thermobox
- Overload protection with thermal model and memory function
- Optimum protection of asynchronous motors of all sizes

Line branch with load shedding to protect the entire network from overload

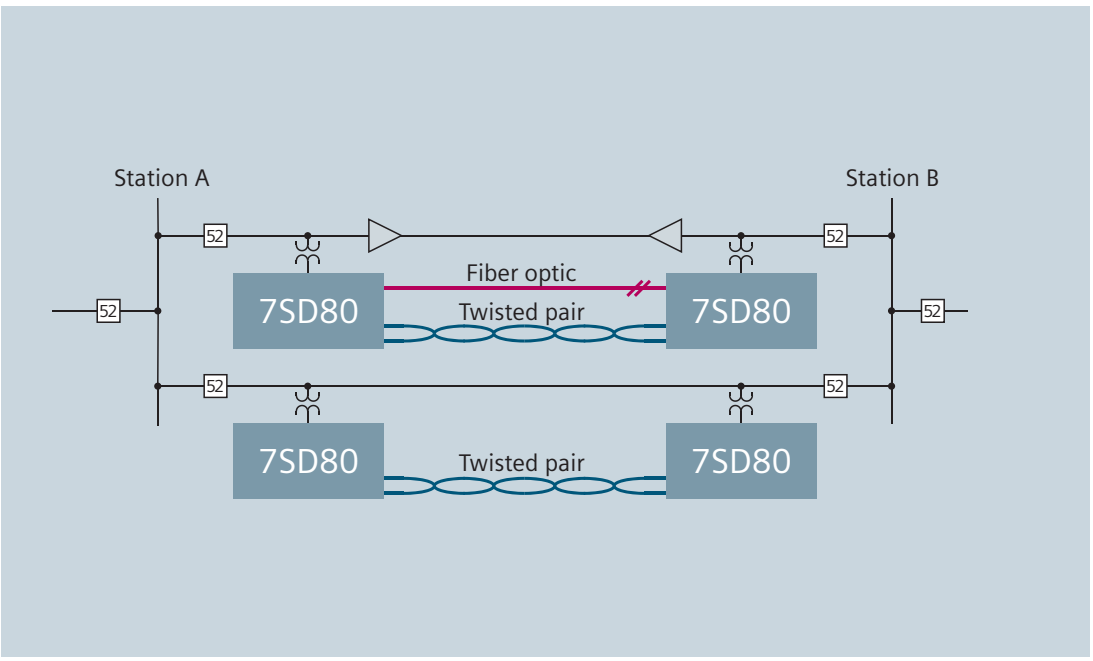


Voltage and frequency protection 7RW80

The SIPROTEC Compact 7RW80 has been designed especially for energy distribution applications, for use on transformers, and on electrical machines. It can detect deviations from the permitted voltage or frequency and provides overexcitation protection. The device can also be used for decoupling networks or for load shedding in the event of hazardous network breakdowns arising as a result of impermissibly high frequency drops. The integrated load connection function enables the network to be restored automatically, once the required network frequency has been reestablished.

Highlights:

- Ideally suitable for decentralized generation
- Network decoupling
- Load shedding
- Load restoration
- Undervoltage/overvoltage and underfrequency/ overfrequency
- Protection/monitoring
- Undervoltage/overvoltage protection, underfrequency/ overfrequency protection, and overexcitation protection for generators and transformers
- Vector surge



Line differential protection 7SD80

The SIPROTEC Compact 7SD80 line differential protection device can be used for the selective protection of lines in medium-voltage networks with all types of neutral point grounding. For protection data exchange the differential protection uses the integrated two-wire (twisted pair) and FO interfaces in the device. Therefore the 7SD80 can be adapted to existing fibre-optical or copper communication lines which makes it future proof for new investments.

The integrated time-overcurrent protection can be directional or non-directional. This allows for the application of protection concepts such as reverse interlocking in meshed networks or emergency mode protection in the event of communication failure.

The 7SD80 is perfectly tailored to networks with distributed generation.

Highlights:

- Differential protection for all types of network and neutral point grounding
- Safe recognition of high and low-resistance faults
- Efficient protection concepts with powerful additional functions
- Optimal use of the existing infrastructure with different media for protection-data interface
- Optional redundant protection-data interface
- Transfer of circuit-breaker inter-tripping and further binary signals to the opposite end

Functions at a glance

ANSI	Function	Abbr.	7SJ80	7SJ81	7SK80	7RW80	7SD80
	Protection functions for 3-pole tripping	3-pole	x	x	x	x	x
14	Locked rotor protection	I> + V<			x		
21FL	Fault locator	FL	o				
24	Overexcitation protection	V/f				o	
27	Undervoltage protection	V<	o		o	x	o
32F	Forward power supervision	P>, P<	o		o		
32R	Reverse power	P>, P<	o		o		
37	Undercurrent	I<	x	x	x		
38	Temperature supervision				x		
46	Negative-sequence protection	I2>	x	x	x		
47	Phase-sequence-voltage supervision	V_A, V_B, V_C	o		o		
48	Start-time supervision	I^2_{start}			x		
49	Thermal overload protection	I^2t	x	x	x		x
50	Instantaneous overcurrent	I>	x	x	x		x
50N	Instantaneous overcurrent, ground	I_E>	x	x	x		x
50BF	Breaker failure protection		x	x	x		x
51	Inverse time overcurrent	I_P	x	x	x		x
51N	Inverse time overcurrent, ground	I_{Ep}	x	x	x		x
51M	Load-jam protection				x		
55	Power factor	cos φ	o		o		o
59	Overvoltage protection	V>	o		o	x	o
59N	Overvoltage protection, zero sequence system	V0>	o		o	x	o
66	Restart blocking function	I^2t			x		
67	Time-overcurrent protection, directional		o				o
67N	Ground-fault protection, directional		o		o		o
67Ns	Sensitive ground-fault protection		o		o		
74TC	Trip-circuit supervision		x	x	x	x	x
79	Automatic reclosing function	AR	o				o
81O	Over-frequency protection	f>	o		o	x	o
81U	Under-frequency protection	f<	o		o	x	o
81R	Rate-of-frequency-change protection	df/dt	o		o	x	
	Vector jump protection	Δφ>				o	
	Rate-of-voltage-change protection	dV/dt				x	
	Load restoration					o	
86	Lockout		x	x	x	x	x
87L	Differential protection, line	ΔI					x
	Switching statistic counters		x	x	x	x	x
	CFC		x	x	x	x	x
	Inrush detection		x	x	x		
	External trip initiation		x	x	x	x	x
	Control		x	x	x	x	x
	Fault recording		x	x	x	x	x
	Monitoring and supervision		x	x	x	x	x
	Protection interface, serial						x

X: Standard function o: Option

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