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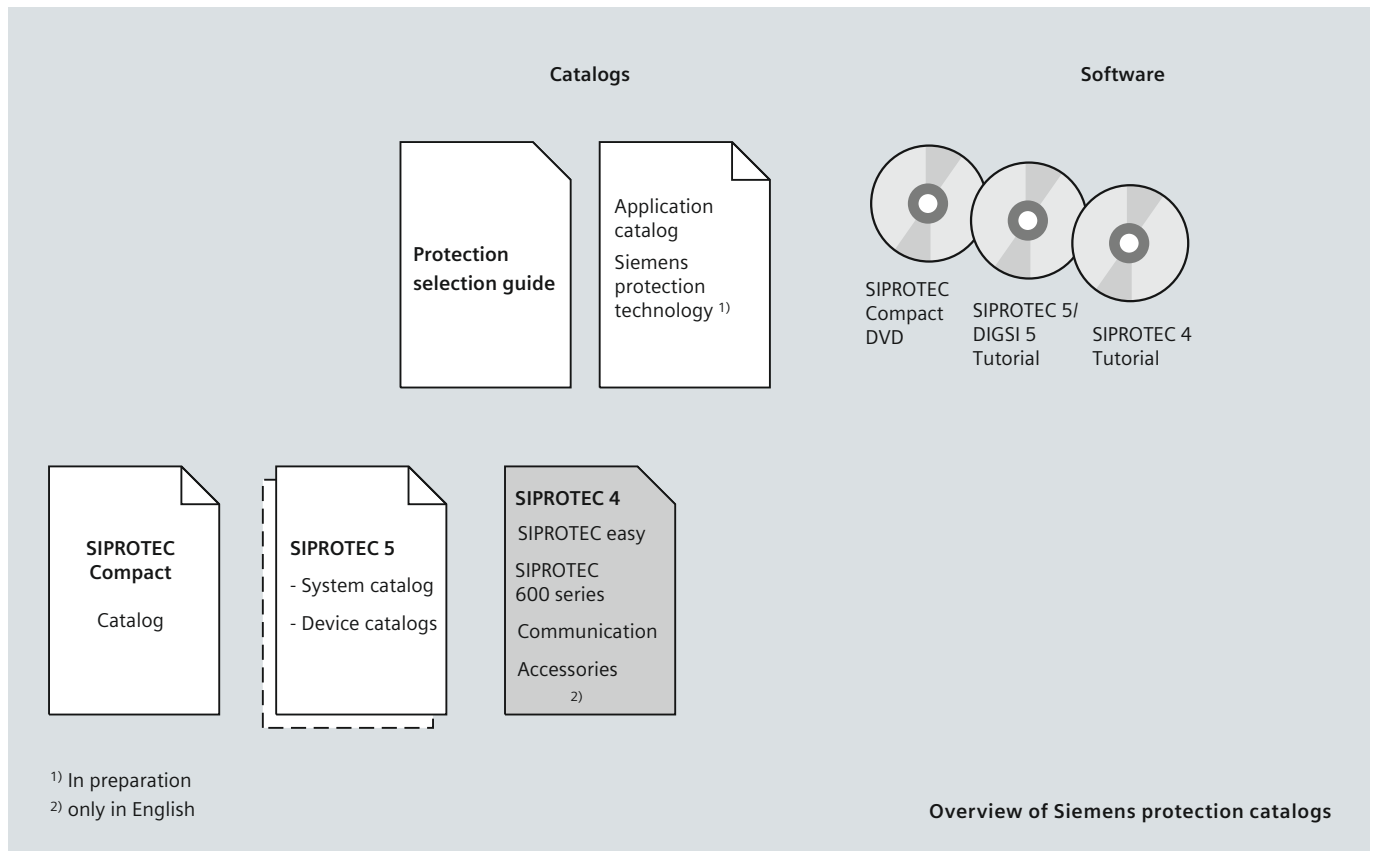
SIPROTEC 4, SIPROTEC easy, SIPROTEC 600 Series, Communication, Accessories

Catalog SIP · Edition No. 6

Answers for infrastructure.

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Overview of Siemens protection catalogs

1) In preparation
2) only in English

SIPROTEC 4, SIPROTEC series 600, SIPROTEC easy, communication and accessories:
This catalog describes the features of the device series SIPROTEC 4, SIPROTEC series 600 and SIPROTEC easy, as well as their devices. In further chapters, the accessories of the complete SIPROTEC family for communication, auxiliary relays and test equipment are described.

Application catalog – Siemens protection technology:
This catalog gives an overview of the features for the complete Siemens protection system family, and describes typical protection applications and communication solutions. Furthermore it contains practical configuring aids for, e.g., instrument transformer layouts.

Protection selection guide:
The selection guide offers an overview of the device series of the Siemens protection devices, and a device selection table.

SIPROTEC Compact catalog:
The SIPROTEC Compact catalog describes the features of the SIPROTEC Compact series and presents the available devices and their application possibilities.

SIPROTEC 5 catalogs:
The system catalog describes the features of the SIPROTEC 5 system. The SIPROTEC 5 device catalogs describe device-specific features such as scope of functions, hardware and application.

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SIPROTEC 4, SIPROTEC easy, SIPROTEC 600 Series, Communication, Accessories

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Supersedes Catalog SIP · 2008

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Product Selection

Relay Functions *1*/2

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Relay Selection Guide

			Distance protection							Line differential protection						
			SIPROTEC 4				SIPROTEC 5			SIPROTEC 600 Series	SIPROTEC Compact	SIPROTEC 4		SIPROTEC 5		
ANSI	Functions	Abbr.	7SA522	7SA61	7SA63	7SA64	7SA84 [1]	7SA86 [1]	7SA87 [1]	7SD60	7SD80	7SD610	7SD5	7SD84 [1]	7SD86 [1]	7SD87 [1]
	Protection functions for 3-pole tripping	3-pole	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Protection functions for 1-pole tripping	1-pole	●	●	●	●	–	–	■	–	–	●	●	–	–	■
14	Locked rotor protection	$I> + V<$	–	–	–	–	–	–	–	–	–	–	–	–	–	–
21	Distance protection	$Z<$	■	■	■	■	■	■	■	–	–	–	●	–	–	–
FL	Fault locator	FL	■	■	■	■	■	■	■	–	–	●	■	■	■	■
24	Overexcitation protection	V/f	–	–	–	–	–	–	–	–	–	–	–	–	–	–
25	Synchrocheck, synchronizing function	Sync	●	●	●	●	●	●	●	–	–	–	–	●	●	●
27	Undervoltage protection	$V<$	●	●	●	●	●	●	●	–	●	●	●	●	●	●
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ Harm.)}$	–	–	–	–	–	–	–	–	–	–	–	–	–	–
32	Directional power supervision	$P>, P<$	■	■	■	■	●	●	●	–	–	■	■	●	●	●
37	Undercurrent, underpower	$I<, P<$	–	–	–	–	–	–	–	–	–	–	–	–	–	–
38	Temperature supervision	$\theta>$	–	–	–	–	–	–	–	–	–	–	–	–	–	–
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	$I2>$	–	–	–	–	●	●	●	–	–	–	–	●	●	●
47	Phase-sequence-voltage supervision	LA, LB, LC	■	■	■	■	■	■	■	–	–	–	–	■	■	■
48	Start-time supervision	I^2_{start}	–	–	–	–	–	–	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t	–	■	■	■	●	●	●	–	■	■	■	●	●	●
50	Definite time-overcurrent protection	$I>$	■	■	■	■	■	■	■	●	■	■	■	■	■	■
50Ns	Sensitive ground-current protection	$I_{Ns}>$	●	●	●	●	●	●	●	–	–	–	●	●	●	●
50L	Load-jam protection	$I>_L$	–	–	–	–	–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	●	●	●	●	●	●	●	–	■	■	●	●	●	●
51	Inverse time-overcurrent protection	I_P	■	■	■	■	■	■	■	–	■	■	■	■	■	■
55	Power factor	$\cos \varphi$	■	■	■	■	■	■	■	–	–	■	■	■	■	■
59	Overvoltage protection	$V>$	●	●	●	●	●	●	●	–	●	●	●	●	●	●
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	–	–	–	–	–	–	–	–	–	–	–
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	–	–	–	–	–	–	–	–	–	–	–	–
67	Directional overcurrent protection	$I>, < (V,I)$	●	●	●	●	●	●	●	–	●	■	–	●	●	●

■ = basic   ● = optional (additional price)   – = not available

1) in preparation
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	Combined line differential and distance protection		Overcurrent and feeder protection/ feeder automation													Generator and motor protection			Transformer protection			Busbar protection	
	SIPROTEC 5		SIPROTEC easy		SIPROTEC 600 Series		SIPROTEC Compact			SIPROTEC 4				SIPROTEC 5		SIPROTEC Compact	SIPROTEC 4		SIPROTEC 4			SIPROTEC 600 Series	SIPROTEC 4
	7SL86[1]	7SL87[1]	7SJ45	7SJ46	7SJ600	7SJ602	7SJ80	7SJ81	7SC80[1]	7SJ61	7SJ62	7SJ63	7SJ64	7SJ86[1]	7SK80	7UM61	7UM62	7UT612	7UT613	7UT63	7SS60	7SS52
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	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	–	■	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	■	–
	–	–	–	–	–	–	–	–	–	●	●	●	●	–	■	●	●	–	–	–	–	–
	■	■	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
	■	■	–	–	–	–	●	–	●	–	●	●	●	●	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	●	●	–	–
	●	●	–	–	–	–	●	–	●	–	●	–	●	●	–	–	–	–	–	–	–	–
	●	●	–	–	–	–	●	–	●	–	●	●	●	●	●	■	■	–	●	●	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
	●	●	–	–	–	–	●	–	●	–	●	–	●	●	●	●	●	–	●	●	–	–
	–	–	–	–	–	■	■	■	–	■	■	●[2]	■	●[2]	■	●	●	–	–	–	–	–
	–	–	–	–	●	–	–	–	–	●	●	●	●	–	■	●	●	●	●	●	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
	●	●	–	–	■	■	■	■	–	■	■	■	■	■	●	●	●	■	■	■	–	–
	■	■	–	–	–	–	●	–	–	■	■	■	■	■	●	■	■	■	■	–	–	–
	–	–	–	–	–	–	–	–	–	●	●	●	●	–	■	●	●	–	–	–	–	–
	●	●	–	–	■	■	■	■	–	■	■	■	■	■	■	●	●	●	●	●	–	–
	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	–	●
	●	●	–	–	–	●	●	●	–	●	●	●	●	–	●	■	■	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	●	●	●	●	–	■	–	–	–	–	–	–	–
	●	●	–	–	■	■	■	■	–	■	■	■	■	●	■	–	–	●	●	●	–	■
	■	■	■	■	■	■	●	–	■[1]	■	■	■	■	■	■	●	●	●	●	●	–	●
	■	■	–	–	–	●	–	●	–	●	■[2]	●	■[2]	●	●	●	●	■	■	■	–	–
	●	●	–	–	–	●	●	●	–	●	●	●	●	●	●	●	●	–	●	●	–	–
	–	–	–	–	–	–	–	–	–	●	–	●	–	–	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	■	■	–	–	–	–	–
	–	–	–	–	–	●	–	–	–	●	●	●	●	–	■	●	●	–	–	–	–	–
	●	●	–	–	–	–	●	–	●	–	●	●	●	●	●	■	■	–	–	–	–	–

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Relay Selection Guide

ANSI	Functions	Abbr.	Device family Type	SIPROTEC 4 6MD61	6MD63	6MD66	SIPROTEC 5 6MD85[1]	6MD86[1]	SIPROTEC 4 7VK61	SIPROTEC 5 7VK87[1]	SIPROTEC 4 7VE6	SIPROTEC 600 Series 7RW60	SIPROTEC Compact 7RW80
				Bay controller					Breaker management		Synchronizing	Voltage and frequency protection	
	Protection functions for 3-pole tripping	3-pole		–	–	–	●	●	■	■	●	■	■
	Protection functions for 1-pole tripping	1-pole		–	–	–	–	–	■	■	–	–	–
14	Locked rotor protection	$I> + V<$		–	–	–	–	–	–	–	–	–	–
21	Distance protection	$Z<$		–	–	–	–	–	–	–	–	–	–
FL	Fault locator	FL		–	–	–	–	–	–	–	–	–	–
24	Overexcitation protection	V/f		–	–	–	–	–	–	–	–	●	●
25	Synchrocheck, synchronizing function	Sync		–	–	●	●	■	●	■	■	–	●
27	Undervoltage protection	$V<$		–	–	–	●	●	●	●	●	■	■
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\,Harm.)}$											
32	Directional power supervision	$P>, P<$		–	–	–	●	●	–	●	–	–	–
37	Undercurrent, underpower	$I<, P<$		–	–	–	–	–	–	–	–	–	–
38	Temperature supervision	$\theta>$		–	–	–	–	–	–	–	–	–	–
40	Underexcitation protection	$1/X_D$		–	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	$I2>$		–	–	–	–	–	–	–	–	–	–
47	Phase-sequence-voltage supervision	LA, LB, LC		–	–	–	–	–	–	–	–	■	■
48	Start-time supervision	I^2_{start}		–	–	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t		–	–	–	–	–	–	–	–	–	–
50	Definite time-overcurrent protection	$I>$		–	–	–	●	●	●	●	–	–	–
50Ns	Sensitive ground-current protection	$I_{Ns}>$		–	–	–	–	–	–	●	–	–	–
50L	Load-jam protection	$I>_L$		–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP		–	–	●	–	●	■	■	–	–	–
51	Inverse time-overcurrent protection	I_P		–	–	–	●	●	●	●	–	–	–
55	Power factor	$\cos \varphi$		–	–	–	–	–	–	–	–	–	–
59	Overvoltage protection	$V>$		–	–	–	●	●	●	●	●	■	■
59R, 27R	Rate-of-voltage-change protection	dV/dt		–	–	–	–	–	–	–	–	–	■
64	Sensitive ground-fault protection (machine)			–	–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t		–	–	–	–	–	–	–	–	–	–
67	Directional overcurrent protection	$I>, < (V,I)$		–	–	–	●	●	–	●	–	–	–

■ = basic   ● = optional (additional price)   – = not available

1) in preparation
2) via CFC
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Relay Selection Guide

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	Device application			Distance protection							Line differential protection						
			Device family	SIPROTEC 4				SIPROTEC 5			SIPROTEC 600 Series	SIPROTEC Compact	SIPROTEC 4		SIPROTEC 5		
ANSI	Functions	Abbr.	Type	7SA522	7SA61	7SA63	7SA64	7SA84 [1]	7SA86 [1]	7SA87 [1]	7SD60	7SD80	7SD610	7SD5	7SD84 [1]	7SD86 [1]	7SD87 [1]
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral	$I_N>, \angle\ (V,I)$		●	●	●	●	● [1]	● [1]	● [1]	–	–	–	●	● [1]	● [1]	● [1]
68	Power-swing blocking	$\Delta Z/\Delta t$		●	●	●	●	●	●	●	–	–	–	●	–	–	–
74TC	Trip-circuit supervision	TCS		■	■	■	■	■	■	■	–	■	■	■	■	■	■
78	Out-of-step protection	$\Delta Z/\Delta t$		●	●	●	●	●	●	●	–	–	–	●	–	–	–
79	Automatic reclosing	AR		●	●	●	●	●	●	●	–	●	●	●	●	●	●
81	Frequency protection	$f<, f>$		●	●	●	●	●	●	●	–	●	●	●	●	●	●
	Vector-jump protection	$\Delta\varphi_U>$		–	–	–	–	–	–	–	–	–	–	–	–	–	–
81LR	Load restoration	LR		–	–	–	–	–	–	–	–	–	–	–	–	–	–
85	Teleprotection			■	■	■	■	■	■	■	■	■	■	■	–	–	–
86	Lockout			■	■	■	■	■	■	■	–	■	■	■	■	■	■
87	Differential protection	ΔI		–	–	–	–	–	–	–	■	■	■	■	■	■	■
87N	Differential ground-fault protection	ΔI_N		–	–	–	–	–	–	–	■	■	–	–	–	–	–
	Broken-wire detection for differential protection			–	–	–	–	–	–	–	–	–	■	■	■	■	■
90V	Automatic voltage control			–	–	–	–	–	–	–	–	–	–	–	–	–	–
PMU	Synchrophasor measurement	PMU		–	–	–	–	● [1]	● [1]	● [1]	–	–	–	–	● [1]	● [1]	● [1]
	Further functions																
	Measured values			■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Switching-statistic counters			■	■	■	■	■	■	■	–	■	■	■	■	■	■
	Logic editor			■	■	■	■	■	■	■	–	■	■	■	■	■	■
	Inrush-current detection			–	–	–	–	■	■	■	●	■	■	■	■	■	■
	External trip initiation			■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Control			■	■	■	■	■	■	■	–	■	■	■	■	■	■
	Fault recording of analog and binary signals			■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Monitoring and supervision			■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Protection interface, serial			●	●	●	●	●	●	●	–	■	■	■	■	■	■
	No. Setting groups			4	4	4	4	8	8	8	–	4	4	4	8	8	8
	Battery charger/-monitor			–	–	–	–	–	–	–	–	–	–	–	–	–	–

■ = basic   ● = optional (additional price)   – = not available

1) in preparation
2) via CFC

	Combined line differential and distance protection		Overcurrent and feeder protection/feeder automation												Generator and motor protection			Transformer protection			Busbar protection	
	SIPROTEC 5		SIPROTEC easy		SIPROTEC 600 Series		SIPROTEC Compact			SIPROTEC 4				SIPROTEC 5	SIPROTEC Compact	SIPROTEC 4		SIPROTEC 4			SIPROTEC 600 Series	SIPROTEC 4
	7SL86 [1]	7SL87 [1]	7SJ45	7SJ46	7SJ600	7SJ602	7SJ80	7SJ81	7SC80 [1]	7SJ61	7SJ62	7SJ63	7SJ64	7SJ86 [1]	7SK80	7UM61	7UM62	7UT612	7UT613	7UT63	7SS60	7SS52
	●[1]	●[1]	–	–	–	●	●	–	–	–	●	●	●	–	●	■	■	–	–	–	–	–
	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
	■	■	–	–	■	■	■	■	–	■	■	■	■	■	■	■	■	■	■	■	–	–
	●	●	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–
	●	●	–	–	●	●	●	–	–	●	●	●	●	●	–	–	–	–	–	–	–	–
	●	●	–	–	–	–	●	–	●	–	●	●	●	●	●	■	■	–	●	●	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	●	●	–	–	–	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	■	■	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
	■	■	–	–	–	–	■	■	–	■	■	■	■	■	■	–	–	–	–	–	■	–
	■	■	–	–	–	–	–	–	–	–	–	–	–	–	–	–	■	■	■	■	■	■
	–	–	–	–	●	●	●	–	–	●	●	●	●	–	–	●	●	●	●	●	–	–
	■	■	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	■	■	■	–	–
	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	●[1]	●[1]	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
	■	■	–	–	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	–	■
	■	■	–	–	–	–	■	■	■	■	■	■	■	■	■	■	■	■	■	■	–	–
	■	■	–	–	–	–	■	■	■	■	■	■	■	■	■	■	■	■	■	■	–	■
	■	■	–	–	–	–	■	■	■	■	■	■	■	■	■	–	●	■	■	■	–	–
	■	■	–	–	■	■	■	■	■	■	■	■[2]	■	■	■	■	■	■	■	■	–	–
	■	■	–	–	–	–	■	■	■	■	■	■	■	■	■	■	■	■	■	■	–	■
	■	■	–	–	■	■	■	■	■	■	■	■	■	■	■	–	–	■	■	■	■	■
	■	■	–	–	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	■	■	–	–	–	–	–	–	–	–	–	–	–	●	–	–	–	–	–	–	–	–
	8	8	1	1	1	1	4	4	4	4	4	4	4	8	4	4	4	4	4	4	1	1
	–	–	–	–	–	–	–	–	●[1]	–	–	–	–	–	–	–	–	–	–	–	–	–

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Relay Selection Guide

ANSI	Functions	Abbr.	Type	6MD61 SIPROTEC 4	6MD63	6MD66	6MD85 [1]	6MD86 [1] SIPROTEC 5	7VK61 SIPROTEC 4	7VK87 [1] SIPROTEC 5	7VE6 SIPROTEC 4	7RW60 SIPROTEC 600 Series	7RW80 SIPROTEC Compact
				Bay controller					**Breaker management**		**Synchronizing**	**Voltage and frequency protection**	
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral	$I_N>, \angle\ (V,I)$		–	–	–	–	–	–	–	–	–	–
68	Power-swing blocking	$\Delta Z/\Delta t$		–	–	–	–	–	–	–	–	–	–
74TC	Trip-circuit supervision	TCS		–	–	–	■	■	■	■	■	■	■
78	Out-of-step protection	$\Delta Z/\Delta t$		–	–	–	–	–	–	–	–	–	–
79	Automatic reclosing	AR		–	–	●	–	●	■	■	–	–	–
81	Frequency protection	$f<, f>$		–	–	–	●	●	–	●	●	■	■
	Vector-jump protection	$\Delta\varphi_U>$		–	–	–	–	–	–	–	●	–	●
81LR	Load restoration	LR		–	–	–	–	–	–	–	–	–	●
85	Teleprotection			–	–	–	–	–	–	–	–	–	–
86	Lockout			–	–	–	–	–	■	■	–	–	■
87	Differential protection	ΔI		–	–	–	–	–	–	–	–	–	–
87N	Differential ground-fault protection	ΔI_N		–	–	–	–	–	–	–	–	–	–
	Broken-wire detection for differential protection			–	–	–	–	–	–	–	–	–	–
90V	Automatic voltage control			–	–	–	–	–	–	–	–	–	–
PMU	Synchrophasor measurement	PMU		–	–	–	●[1]	●[1]	–	●[1]	–	–	–
	Further functions												
	Measured values			●	■	■	■	■	■	■	■	■	■
	Switching-statistic counters			■	■	■	■	■	■	■	■	–	■
	Logic editor			–	■	■	■	■	■	■	■	–	■
	Inrush-current detection			–	–	–	●	●	–	■	–	–	–
	External trip initiation			–	–	–	–	–	■	■	●	●	■
	Control			■	■	■	■	■	■	■	■	–	■
	Fault recording of analog and binary signals			■	■	●	■	■	■	■	■	■	■
	Monitoring and supervision			■	■	■	■	■	■	■	■	■	■
	Protection interface, serial			–	–	–	●	●	–	●	–	–	–
	No. Setting groups			4	4	4	8	8	4	8	4	1	4
	Battery charger/-monitor			–	–	–	–	–	–	–	–	–	–

■ = basic   ● = optional (additional price)   – = not available

1) in preparation
2) via CFC

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