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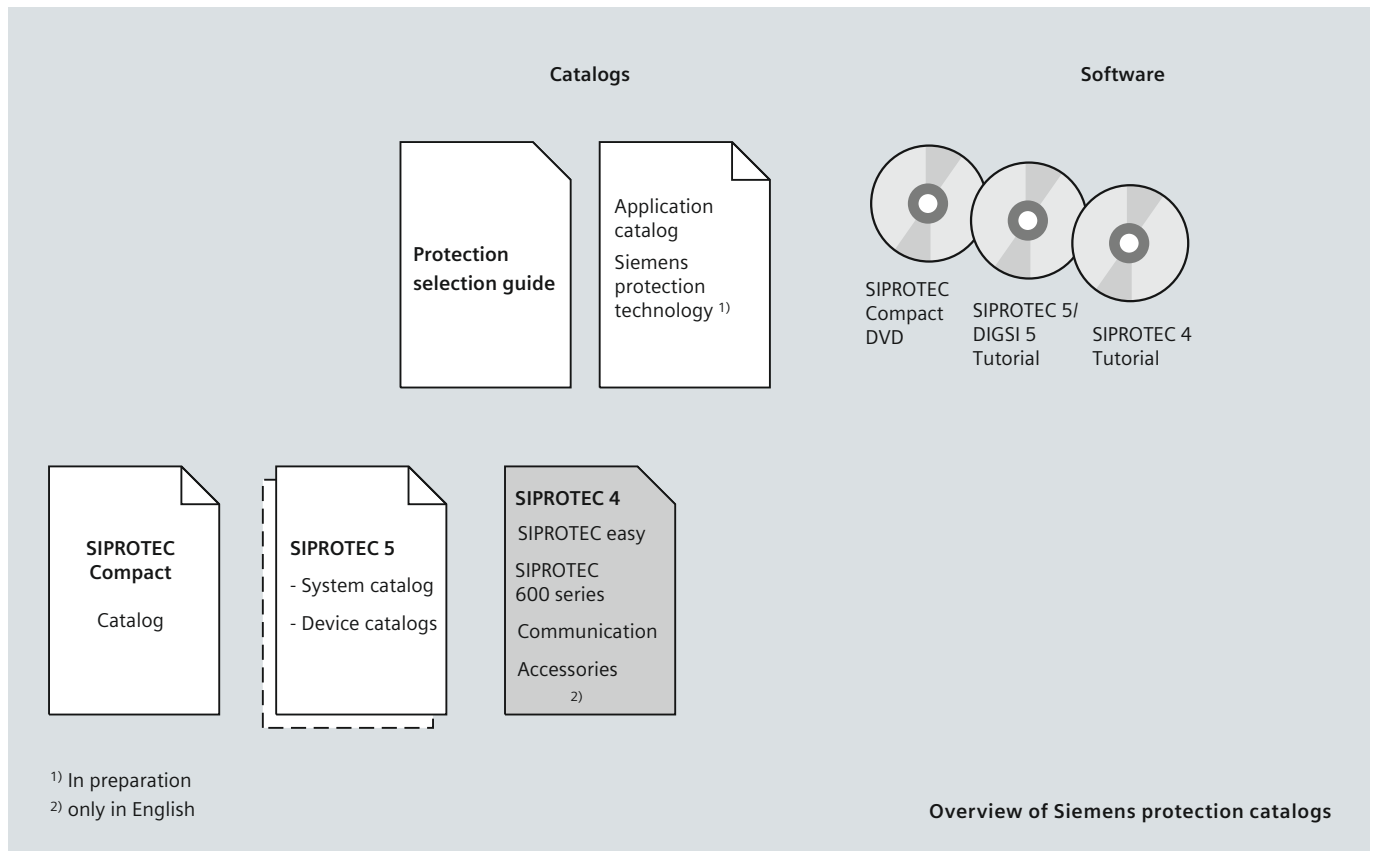
Protection Systems

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

Catalog SIP · Edition No. 6

Answers for infrastructure.

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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.

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

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Supersedes Catalog SIP · 2008

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Product Selection Page

Relay Functions

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Relay Selection Guide

1

ANSI	Device application		Device family	Bay controller					Breaker management		Synchronizing	Voltage and frequency protection		
	Functions	Abbr.		SIPROTEC 4			SIPROTEC 5		SIPROTEC 4	SIPROTEC 5		SIPROTEC 4	SIPROTEC 600 Series	SIPROTEC Compact
				Type	6MD61	6MD63	6MD66	6MD85 ¹⁾	6MD86 ¹⁾	7VK61		7VK87 ¹⁾	7VE6	7RW60
	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 3 rd harmonics	$V0 <, >_{(3^{rd} \text{ Harm.})}$		-	-	-	-	-	-	-	-	-	-	
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

More functions on page 1/8

Table continued on next page

Relay Selection Guide

1

ANSI	Device application			Distance protection							Line differential protection								
	Functions	Abbr.	Device family Type	SIPROTEC 4				SIPROTEC 5			SIPROTEC 600 Series		SIPROTEC Compact		SIPROTEC 4		SIPROTEC 5		
				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⁾	-	-	-	●	●	-	-	-	●	●	●	-	●	■	■	-	-	-	-	-
	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-
	■	■	-	-	■	■	■	■	-	■	■	■	■	■	■	■	■	■	■	■	-	-
	●	●	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-
	●	●	-	-	●	●	●	-	-	●	●	●	●	●	●	■	■	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	●	●	-	-	-	-	-
	■	■	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
	■	■	-	-	-	-	■	■	-	■	■	■	■	■	■	■	■	-	-	-	■	■
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	■	■	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	■	■	■	-	-
	● ¹⁾	● ¹⁾	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
	■	■	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	■	■	-	-	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	-	-
	■	■	-	-	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	-	-
	■	■	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	-	-
	■	■	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	■	■	-	-	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	■	■	-	-	-	-	-	-	-	-	-	-	-	●	-	-	-	-	-	-	-	-
	8	8	1	1	1	1	4	4	4	4	4	4	4	8	4	4	4	4	4	4	1	1
	-	-	-	-	-	-	-	-	● ¹⁾	-	-	-	-	-	-	-	-	-	-	-	-	-

Relay Selection Guide

1

ANSI	Device application			Bay controller					Breaker management		Syn-chronizing	Voltage and frequency protection	
	Functions	Abbr.	Device family Type	SIPROTEC 4			SIPROTEC 5		SIPROTEC 4	SIPROTEC 5	SIPROTEC 4	SIPROTEC 600 Series	SIPROTEC Compact
				6MD61	6MD63	6MD66	6MD85 ¹⁾	6MD86 ¹⁾	7VK61	7VK87 ¹⁾	7VE6	7RW60	7RW80
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	4
	Battery charger/-monitor		-	-	-	-	-	-	-	-	-	-	-

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

- 1) in preparation
- 2) via CFC