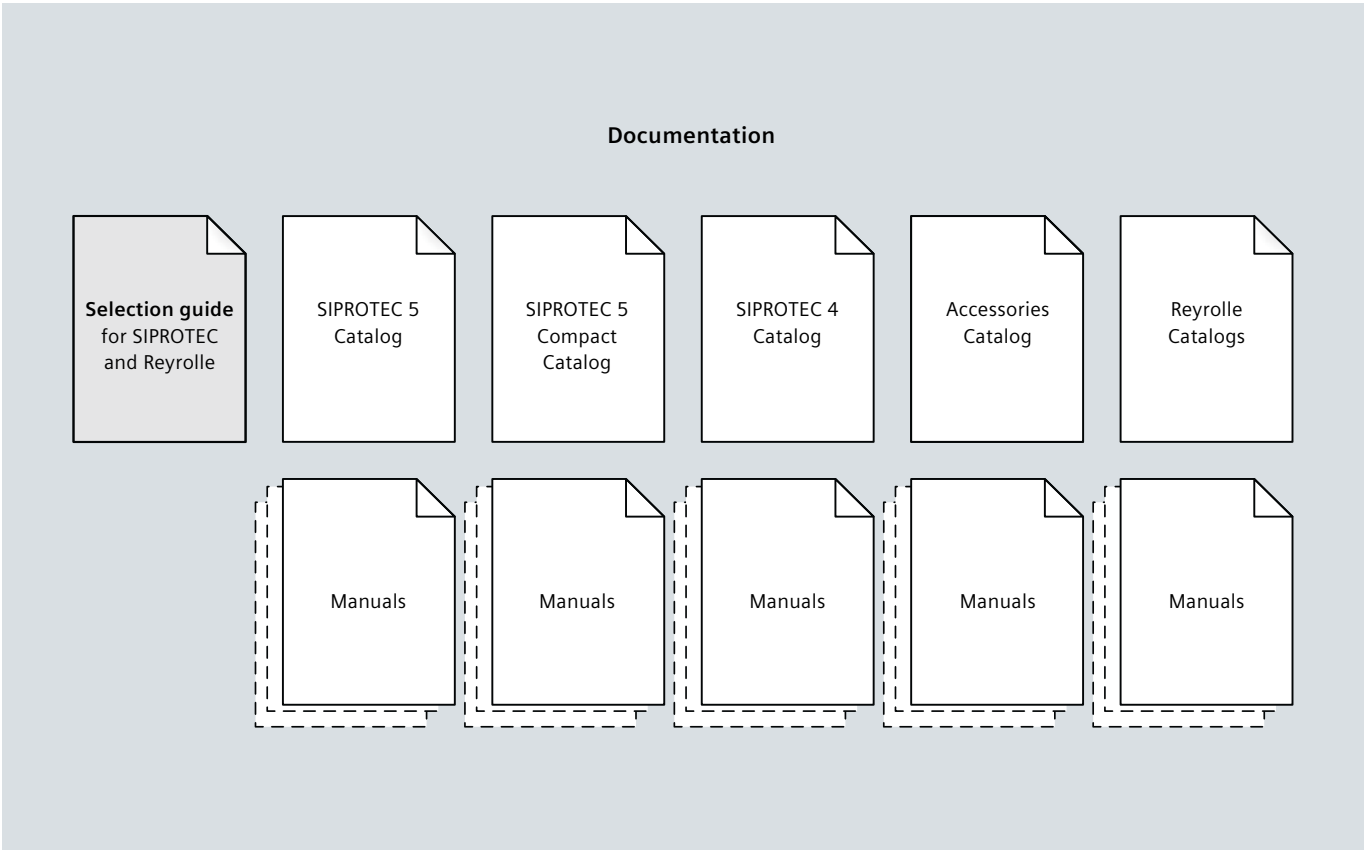
SIEMENS

Selection Guide for SIPROTEC and Reyrolle

Catalog • Edition 7

siemens.com/protection

Overview of Siemens Protection Catalogs



Selection Guide for SIPROTEC and Reyrolle

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

SIPROTEC 5 catalog

The catalog describes the features of the SIPROTEC 5 system and device specific features such as scope of functions, hardware and applications.

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 4 catalog

This catalog describes the features of the device series SIPROTEC 4.

Accessories catalog

This catalog describes the accessories for protection, power quality and substation automation devices.

Reyrolle catalogs

The Reyrolle catalogs describe the features such as scope of functions, hardware and applications.

Manuals

The manuals describe, among others, the operation, installation and the technical data of the devices.

Selection Guide for SIPROTEC and Reyrolle

Edition 7

Invalid: Edition 6

www.siemens.com/protection

	Page
Protection Devices	
SIPROTEC Device Series	4
SIPROTEC 5	5
SIPROTEC Compact	6
SIPROTEC 4	7
Reyrolle	8
Device specific overview of the areas of application	9
Overview, Relay Selection Table	
Part 1 Functions	10 to 18
Part 2 Functions (continued)	20 to 28
Part 3 Further Functions Hardware Feature	30 to 38
Part 4 Communication	40 to 48
Legal Notice	
	49

MANAGEMENT SYSTEM CERTIFICATION

DNV·GL

ISO 9001 = ISO 14001

OHSAS 18001

The products and systems described in this catalog are manufactured and sold according to a certified management system (acc. to ISO 9001, ISO 14001 and BS OHSAS 18001).

Protection Devices

SIPROTEC Device Series

Solutions for today's and future power supply systems – for more than 100 years

With the SIPROTEC device series, Siemens is the world market leader in digital protection technology. Profit from the experience out of an installed base of more than 1.65 million protection devices and therein >500,000 with IEC 61850.

SIPROTEC has established itself on the energy market for decades as a powerful and complete system family of numerical protection relays and bay controllers from Siemens.

SIPROTEC protection relays from Siemens can be consistently used throughout all applications in medium and high voltage. With SIPROTEC, operators have their systems firmly and safely under control, and have the basis to implement cost-efficient solutions for all duties in modern, intelligent and "smart" grids. Users can combine the units of the different SIPROTEC device series at will for solving manifold duties – because SIPROTEC stands for continuity, openness and future-proof design.

As the innovation driver and trendsetter in the field of protection systems for over 100 years, Siemens helps system operators to design their grids in an intelligent, ecological, reliable and efficient way, and to operate them economically. As a pioneer, Siemens has decisively influenced the development of numerical protection systems (fig. 2). The first application went into operation in Würzburg, Germany, in 1977. Consistent integration of protection and control functions for all SIPROTEC devices was the innovation step in the 90ies. After release of the communication standard IEC 61850 in the year 2004, Siemens was the first manufacturer worldwide to put a system with this communication standard into operation.

Fig. 1 Siemens SIPROTEC devices

How can system operators benefit from this experience?

- Proven and complete applications
- Easy integration into your system
- Highest quality of hardware and software
- Excellent operator friendliness of devices and tools
- Easy data exchange between applications
- Extraordinary consistency between product- and system-engineering
- Reduced complexity by easy operation
- Siemens as a reliable, worldwide operating partner.

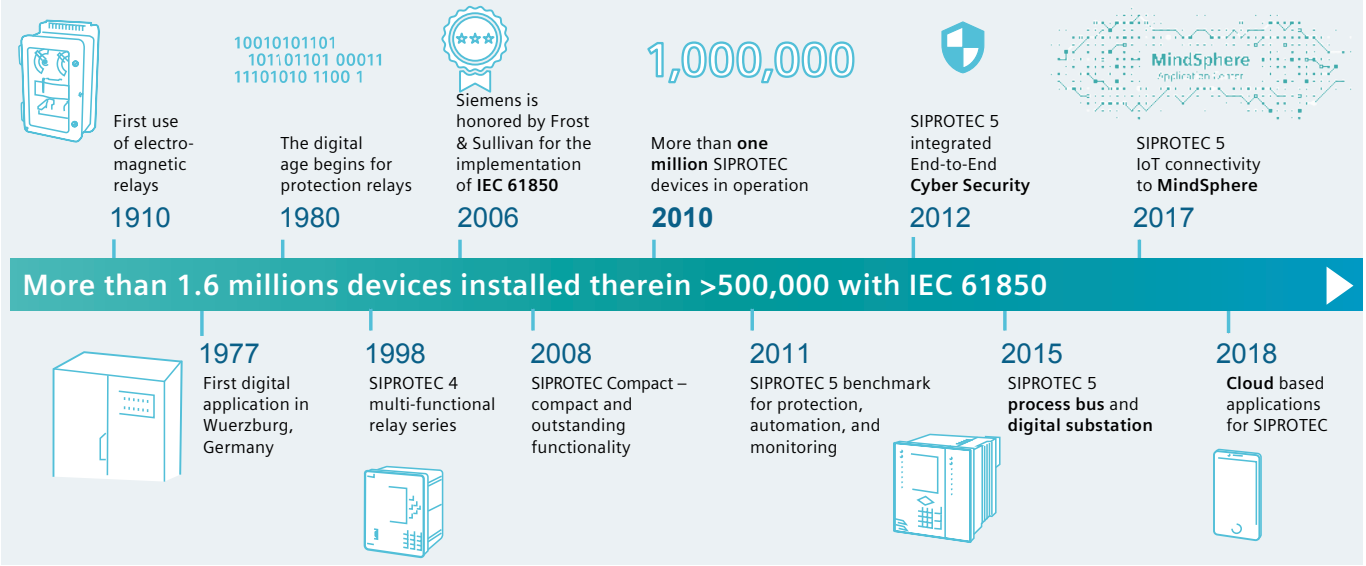


Fig. 2 SIPROTEC – Synonym for the world's leading protection technology

SIPROTEC 5 – the benchmark for protection, automation and monitoring

The SIPROTEC 5 series is based on the long field experience of the SIPROTEC device series, and has been especially designed for the new requirements of modern high-voltage systems. For this purpose, SIPROTEC 5 is equipped with extensive functionalities and device types. With the holistic and consistent engineering tool DIGSI 5, a solution has also been provided for the increasingly complex processes, from the design via the engineering phase up to the test and operation phase.

Thanks to the high modularity of hardware and software, the functionality and hardware of the devices can be tailored to the requested application and adjusted to the continuously changing requirements throughout the entire life cycle.

Besides the reliable and selective protection and the complete automation function, SIPROTEC 5 offers an extensive database for operation and monitoring of modern power supply systems. Synchrophasors (PMU), power quality data and extensive operational equipment data are part of the scope of supply.

- Powerful protection functions guarantee the safety of the system operator's equipment and employees
- Individually configurable devices save money on initial investment as well as storage of spare parts, maintenance, expansion and adjustment of your equipment
- Arc protection, detection of transient ground fault and process bus simply integrable and retrofittable
- Clear and easy-to-use of devices and software thanks to user-friendly design
- Increase of reliability and quality of the engineering process
- Extensive cyber security functionality, such as role-based access control (RBAC), protocolling security-related events or signed firmware
- High operational safety due to the consistent safety implementations
- Highest availability even under extreme environmental conditions by "conformal coating" (coating)
- Integrated switch for low-cost and redundant optical and electrical Ethernet rings
- Redundancy protocols RSTP, PRP and HSR for maximum availability
- Efficient operating concepts by flexible engineering of IEC 61850 Edition 2
- Comprehensive database for monitoring of modern power grid systems, also with IoT cloud connection
- Optimal smart automation platform for transmission grids based on integrated synchrophasor measurement units (PMU) and power quality functions

The SIPROTEC 5 devices have a basic housing width of 1/3 x 19", and are flexibly expandable except of 7xx82.

Fig. 3 SIPROTEC 5 – modular hardware

Fig. 4 SIPROTEC 5 – rear view

Fig. 5 Application in the high-voltage system

SIPROTEC Compact

SIPROTEC Compact –
Maximum protection-minimum space

Reliable and flexible protection for energy distribution and industrial systems with minimum space requirements. The devices of the SIPROTEC Compact family offer an extensive variety of functions in a compact and thus space-saving 1/6 x 19" housing. The devices can be used as main protection in medium-voltage applications or as back-up protection in high-voltage systems.

SIPROTEC Compact provides suitable devices for many applications in energy distribution, such as the protection of feeders, lines or motors. Moreover, it also performs tasks such as system decoupling, load shedding, load restoration, as well as voltage and frequency protection.

The SIPROTEC Compact series is based on millions of operational experience with SIPROTEC 4 and a further-developed, compact hardware, in which many customer suggestions were integrated. This offers maximum reliability combined with excellent functionality and flexibility.

- Simple installation by means of pluggable current and voltage terminal blocks
- Thresholds adjustable via software (3 stages guarantee a safe and reliable recording of input signals)
- Easy adjustment of secondary current transformer values (1 A/5 A) to primary transformers via DIGSI 4
- Quick operations at the device by means of 9 freely programmable function keys
- Clear overview with six-line display
- Easy service due to buffer battery replaceable at the front side
- Integration in the communication network by means of two further communication interfaces
- Integrated switch for low-cost and redundant optical Ethernet rings
- Ethernet redundancy protocols RSTP, PRP and HSR for highest availability
- Highest availability even under extreme environmental conditions by "conformal coating" (coating)
- Reduction of wiring between devices by means of cross-communication via Ethernet (IEC 61850 GOOSE)
- Time synchronization to the millisecond via Ethernet with SNTP for targeted fault evaluation
- Adjustable to the protection requirements by means of "flexible protection functions"
- Comfortable engineering and evaluation via DIGSI 4.

Fig. 6 SIPROTEC Compact

Fig. 7 SIPROTEC Compact – rear view

Fig. 8 Feeder Protection SIPROTEC 7SC80 with HMI

SIPROTEC 4 – the proven, reliable and future-proof protection for all applications

SIPROTEC 4 represents a worldwide successful and proven device series with more than 1 million devices in field use.

Due to the homogenous system platform, the unique engineering program DIGSI 4 and the great field experience, the SIPROTEC 4 device family has gained the highest appreciation of users all over the world. Today, SIPROTEC 4 is considered the standard for numerical protection systems in all fields of application.

SIPROTEC 4 provides suitable devices for all applications from power generation and transmission up to distribution and industrial systems.

SIPROTEC 4 is a milestone in protection systems. The SIPROTEC 4 device series implements the integration of protection, control, measuring and automation functions optimally in one device. In many fields of application, all tasks of the secondary systems can be performed with one single device. The open and future-proof concept of SIPROTEC 4 has been ensured for the entire device series with the implementation of IEC 61850.

- Proven protection functions guarantee the safety of the systems operator's equipment and employees
- Comfortable engineering and evaluation via DIGSI 4
- Simple creation of automation solutions by means of the integrated CFC
- Targeted and easy operation of devices and software thanks to user-friendly design
- Powerful communication components guarantee safe and effective solutions
- Maximum experience worldwide in the use of SIPROTEC 4 and in the implementation of IEC 61850 projects
- Future-proof due to exchangeable communication interfaces and integrated CFC
- Integrated switch for low-cost and redundant optical and electrical Ethernet rings
- Ethernet redundancy protocols RSTP, PRP and HSR.

Fig. 9 SIPROTEC 4

Fig. 10 SIPROTEC 4 – rear view

Fig. 11 SIPROTEC 4 in power plant application

Reyrolle

Reyrolle – Solutions for distribution grids

Reyrolle has been synonymous with electrical protection devices in the sectors of sub-transmission, distribution and industrial applications for decades. Historically, Reyrolle relays, initially sold mainly in traditional markets, are now sold worldwide as part of the Siemens protection network.

Since the aquisition by Siemens, Reyrolle has been driving product innovations – based on a strong focus on market, customer and technology. Worldwide established brand names such as "Solkor" and "Argus" demonstrate this. But there is more: A wide range of Reyrolle products has determined technological firsts in the market.

The comprehensive range of Reyrolle products provides the total protection requirements of distribution markets – ranging from overcurrent protection via transformer protection and voltage control to a full spectrum of auxiliary and trip relays. The portfolio includes many famous products such as "Argus", "Duobias", "Solkor", "Rho", etc.

To serve specific needs in industrial applications, a range of proven products such as "Argus overcurrent", "Solkor line differential" and "Rho motor protection devices" is offered.

Fig. 12 Front view
Reyrolle 7SR210 Argus

Fig. 13 Front view
Reyrolle 7SR45 Argus

Through successive generations, Reyrolle numerical products have been developed to increase value to system operators. This increase in value is the result of consistent development:

- Ease-of-use as a principle – our withdrawable product solutions allow flexible, easy operation through high user friendliness.
- One size fits all – the 4U housing height and the latest generation of numerical products features 1A/5A CT Input, and some models are provided with universal DC supplies.
- Learn once, know all – the new product generation provides a similar look and feel as earlier products. If Reyrolle numerical devices have been previously used, there is a high consistency in both programming and interrogation.
- With Reydisp Evolution, a comprehensive software support toolkit for relay setting, fault interrogation and general system information is provided. It is backward-compatible with all previous Reyrolle numerical devices.
- IEC 61850 communication interface option.

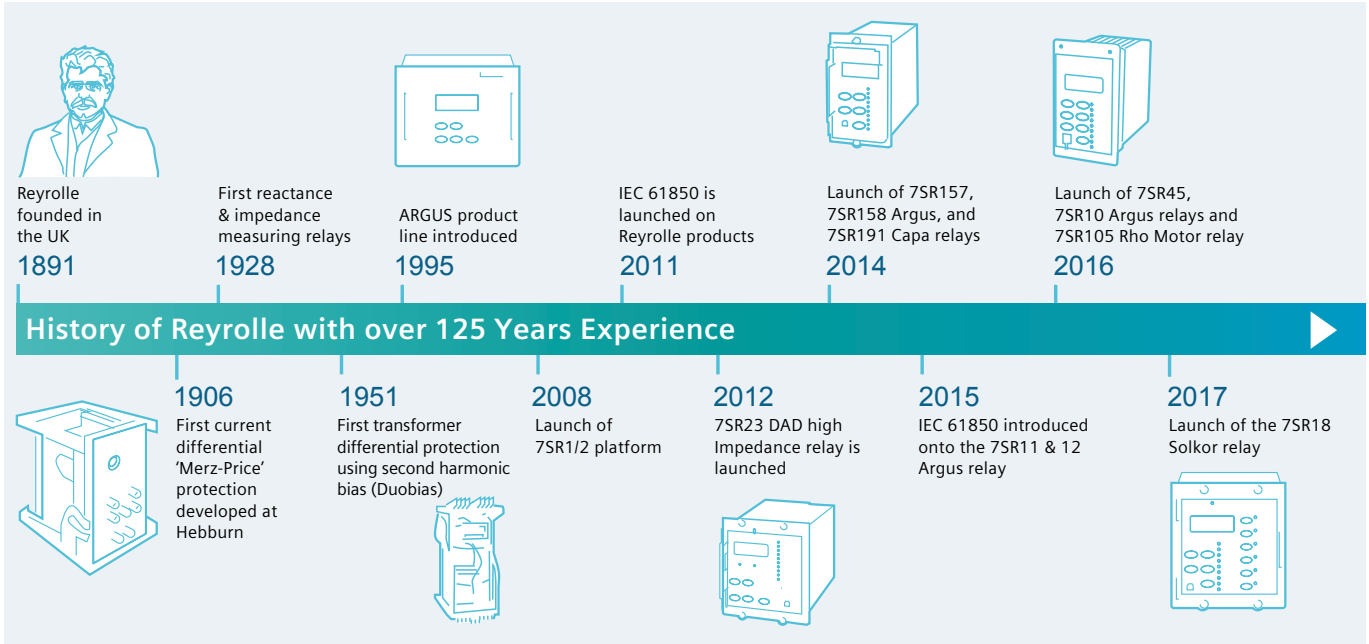


Fig. 14 Reyrolle – Responsible, excellent, innovative

Device specific overview of the areas of application

Apart from the application possibilities for the various types of the modern and versatile type series SIPROTEC 5 and SIPROTEC Compact, the table below also shows the well-proven types of the SIPROTEC 4 and Reyrolle devices.

Available digital device types for SIPROTEC 5, SIPROTEC Compact, SIPROTEC 4 and Reyrolle

Main functions	SIPROTEC 5	SIPROTEC Compact	SIPROTEC 4	Reyrolle
Overcurrent and feeder protection				
Overcurrent protection with PMU [1] and control	7SJ82/85	7SJ80/81	7SJ61/62/63/64/66	7SR10/11/12/21/22
Self/dual powered overcurrent protection				7SR45
Line protection				
Distance protection with PMU[1] and control	7SA82/86/87		7SA61/63/64	
Line differential protection with PMU[1] and control	7SD82/86/87	7SD80	7SD610, 7SD5	7SR18 Solkor
Line differential and distance protection with PMU[1] and control	7SL82/86/87		7SD5	
Breaker management with PMU [1] and control	7VK87		7VK61	
Overcurrent protection for lines with PMU [1]	7SJ86			
Transformer differential protection				
Transformer differential protection with PMU [1], control and monitoring	7UT82/85/86/87		7UT612/613/63	7SR242 Duobias
Motor protection				
Motor protection with PMU[1] and control	7SK82/85	7SK80/81	7SJ61/62/63/64/66	7SR105 Argus, 7SR17 Argus
Generator protection				
Generator protection with PMU [1] and control	7UM85		7UM61/62	
Synchronizing				
Synchrocheck and synchronizing				7SR157 Argus
Synchronizing with balancing commands (paralleling device)	7VE85		7VE61/63	
Busbar protection				
Centralized busbar protection	7SS85		7SS52	
Bay controller				
Bay controller for control/interlocking tasks with PMU [1], monitoring and protection functions [1]	6MD85/86		6MD63/66	
Fault recorder				
Fault recorder, fault recorder with power quality recordings and fault recorder with PMU	7KE85			
Voltage and frequency protection				
Applicable for system decoupling, load shedding and load restoration		7RW80		7SR158 Argus
Distribution automation				
Protection and automation for overhead lines		7SC80		7SR224 Argus
Capacitor bank protection				
Capacitor bank protection	7SJ82 /85			7SR191 Capa
High impedance protection				
High impedance protection				7SR23 DAD
High speed busbar transfer				
High speed busbar transfer			7VU68	

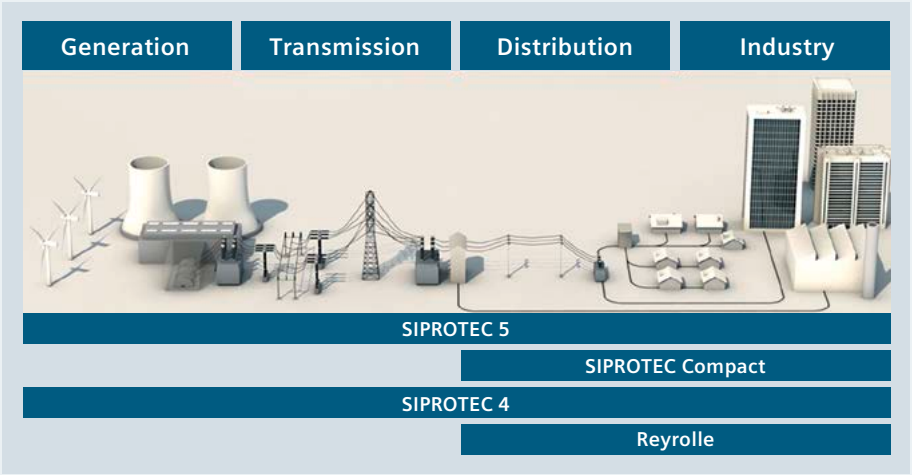
[1] Optional for SIPROTEC 5

Overview, Relay Selection Table

Functions

Part 1

Siemens Protection Portfolio for all areas of application



Definition of device types based on designation

The devices are easily identified with the aid of a five-digit abbreviation code. The first digit (6 or 7) stands for the classification. The two letters (XX) describe the functionality and the last two digits (YY) identify typical properties.

Overview of the main functions	
	Main functions ↓ XX; Distinguishing features ↓ YY Classification → 6 or 7 XX YY
XX	Main functions
SIPROTEC devices	
KE	Fault recorder
MD	Bay controller
RW	Voltage and frequency protection
SA	Distance protection
SC	Feeder protection
SD	Line differential protection
SJ	Overcurrent protection
SK	Motor protection
SL	Line differential and distance protection
SS	Busbar protection
UM	Generator protection
UT	Transformer protection
VE	Paralleling device
VK	Breaker management
VU	High speed busbar
Reyrolle devices	
SR	New numerical protection
PG	Electromechanical protection

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Distance protection							Line differential protection		
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SA82**	**7SA86**	**7SA87**	**7SA522**	**7SA61**	**7SA63**	**7SA64**	**7SD82**	**7SD86**	**7SD87**
	Functions											
	Protection functions for 3-pole tripping	3-pole	■	■	■	■	■	■	■	■	■	■
	Protection functions for 1-pole tripping	1-pole	–	–	■	●	●	●	●	–	–	■
14	Locked rotor protection	I> + n<	–	–	–	–	–	–	–	–	–	–
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	■	■	■	■	■	■	■	–	–	–
21T	Impedance protection for transformers	Z<	●	●	●	–	–	–	–	–	–	–
24	Overexcitation protection	V/f	–	–	–	–	–	–	–	–	–	–
25	Synchrocheck, synchronizing function	Sync	●	●	●	●	●	●	●	●	●	●
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
27	Undervoltage protection	V<	●	●	●	●	●	●	●	●	●	●
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ harm.)}$	–	–	–	–	–	–	–	–	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	●	●	●	●	●	●	●	●	●	●
32	Directional power supervision	P<>, Q<>	●	●	●	■	■	■	■	●	●	●
32	Power Plant Disconnection	dP/dt<	–	–	–	–	–	–	–	–	–	–
37	Undercurrent protection, underpower	I<, P<	●	●	●	●	●	●	●	●	●	●
38	Temperature supervision	θ>	●	●	●	●	●	●	●	●	●	●
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	I2>	●	●	●	–	–	–	–	●	●	●
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	●	●	●	–	–	–	–	●	●	●
47	Phase-sequence-voltage supervision	L1, L2, L3	■	■	■	■	■	■	■	■	■	■
47	Overvoltage protection, negative-sequence system	V2>	●	●	●	●	●	●	●	●	●	●
48	Starting-time supervision	I^2_{start}	–	–	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t	●	●	●	–	●	■	■	●	●	●
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	–	–	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	■	■	■	■	■	■	■	■	■	■
SOTF	Instantaneous tripping at switch onto fault		■	■	■	■	■	■	■	■	■	■
AFD	Arc-protection		●	●	●	–	–	–	–	●	●	●
50Ns	Sensitive ground-current protection	I_{Ns}>	●	●	●	●	●	●	●	●	●	●
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	●	●	●	–	–	–	–	●	●	●
	Intermittent ground-fault protection	IIE>	●	●	●	●	●	●	●	●	●	●
50EF	End fault protection	EFP	–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	●	●	●	●	●	●	●	●	●	●
50RS	Circuit-breaker restrike protection	CBRS	●	●	●	–	–	–	–	●	●	●
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	■	■	■	■	■	■	■	■	■	■
50L	Load-jam protection	$I>_L$	–	–	–	–	–	–	–	–	–	–
51C	Cold load pickup		–	–	–	–	–	–	–	■	■	■
51V	Voltage dependent overcurrent protection	t=f(I)+V<	●	●	●	●	●	●	●	●	●	●
55	Power factor	cos φ	■ 2)	■ 2)	■ 2)	■ 2)	■ 2)	■ 2)	■ 2)	■ 2)	■ 2)	■ 2)
59	Overvoltage protection	V>	●	●	●	●	●	●	●	●	●	●
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	–	–	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	●	●	●	●	●	●	●	●	●	●
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	–	–	–	–	–	–	–
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	–	–	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		■	■	■	■	■	■	■	■	■	■
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Line differential protection					Combined line differential and distance protection			High impedance protection	
		Device series	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	Reyrolle	Reyrolle
ANSI	**Function**	**Abbr.**	**7SD80**	**7SD610**	**7SD5**	**7PG2111**	**7SR18**	**7SL82**	**7SL86**	**7SL87**	**7SR23**	**7PG23**
	Functions											
	Protection functions for 3-pole tripping	3-pole	■	■	■	■	■	■	■	■	■	■
	Protection functions for 1-pole tripping	1-pole	–	●	●	–	–	–	–	■	■	–
14	Locked rotor protection	I> + n<	–	–	–	–	–	–	–	–	–	–
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	–	–	●	–	–	■	■	■	–	–
21T	Impedance protection for transformers	Z<	–	–	–	–	–	●	●	●	–	–
24	Overexcitation protection	V/f	–	–	–	–	–	–	–	–	–	–
25	Synchrocheck, synchronizing function	Sync	–	–	●	–	–	●	●	●	–	–
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
27	Undervoltage protection	V<	●	●	●	–	–	●	●	●	–	–
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ harm.)}$	–	–	–	–	–	–	–	–	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	–	–	–	–	–	●	●	●	–	–
32	Directional power supervision	P<>, Q<>	–	●	■	–	–	●	●	●	–	–
32	Power Plant Disconnection	dP/dt<	–	–	–	–	–	–	–	–	–	–
37	Undercurrent protection, underpower	I<, P<	–	–	–	–	■	●	●	●	–	–
38	Temperature supervision	θ>	–	–	–	–	–	●	●	●	–	–
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	I2>	–	–	–	–	■	●	●	●	–	–
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	–	–	–	–	■	●	●	●	–	–
47	Phase-sequence-voltage supervision	L1, L2, L3	–	■	■	–	–	■	■	■	–	–
47	Overvoltage protection, negative-sequence system	V2>	●	●	●	–	–	●	●	●	–	–
48	Starting-time supervision	I^2_{start}	–	–	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t	■	■	■	–	■	●	●	●	–	–
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	–	–	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	■	■	■	●	■	■	■	■	–	–
SOTF	Instantaneous tripping at switch onto fault		■	■	■	–	■	■	■	■	–	–
AFD	Arc-protection		–	–	–	–	–	●	●	●	–	–
50Ns	Sensitive ground-current protection	I_{Ns}>	–	–	●	–	–	●	●	●	■	■
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	–	–	–	–	–	●	●	●	–	–
	Intermittent ground-fault protection	IIE>	–	–	–	–	–	●	●	●	–	–
50EF	End fault protection	EFP	–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	■	●	■	–	■	●	●	●	–	–
50RS	Circuit-breaker restrike protection	CBRS	–	–	–	–	–	●	●	●	–	–
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	■	■	■	–	■	■	■	■	–	–
50L	Load-jam protection	$I>_L$	–	–	–	–	–	–	–	–	–	–
51C	Cold load pickup		–	–	–	–	■	■	■	■	–	–
51V	Voltage dependent overcurrent protection	t=f(I)+V<	–	–	–	–	–	●	●	●	–	–
55	Power factor	cos φ	–	■ 2)	■ 2)	–	–	■ 2)	■ 2)	■ 2)	–	–
59	Overvoltage protection	V>	●	●	●	–	–	●	●	●	–	–
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	–	–	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	●	●	●	–	–	●	●	●	–	–
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	–	–	–	–	–	–	–
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	–	–	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		●	●	■	–	–	■	■	■	–	–
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection									
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4
ANSI	**Function**	**Abbr.**	**7SJ82**	**7SJ85**	**7SJ86**	**7SJ80**	**7SJ81**	**7SJ61**	**7SJ62**	**7SJ63**	**7SJ64**	**7SJ66**
	Functions											
	Protection functions for 3-pole tripping	3-pole	■	■	■	■	■	■	■	■	■	■
	Protection functions for 1-pole tripping	1-pole	–	–	–	–	–	–	–	–	–	–
14	Locked rotor protection	I> + n<	–	–	–	–	–	●	●	●	●	●
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	–	–	–	–	–	–	–	–	–	–
21T	Impedance protection for transformers	Z<	–	–	–	–	–	–	–	–	–	–
24	Overexcitation protection	V/f	●	●	–	–	–	–	–	–	–	–
25	Synchrocheck, synchronizing function	Sync	●	●	●	●	–	–	●	–	●	●
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–
27	Undervoltage protection	V<	●	●	●	●	●	–	●	●	●	●
27TN/59TN	Stator ground fault 3rd harmonics	V0<,>(3rd harm.)	–	–	–	–	–	–	–	–	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	●	●	●	●	–	–	●	–	●	●
32	Directional power supervision	P<>, Q<>	●	●	●	●	●	–	●	–	●	●
32	Power Plant Disconnection	dP/dt<	–	–	–	–	–	–	–	–	–	–
37	Undercurrent protection, underpower	I<, P<	■	■	■	■	■	■	■	■ 2)	■	■
38	Temperature supervision	θ>	●	●	●	–	–	●	●	●	●	●
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	I2>	■	■	■	■	■	■	■	■	■	■
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	■	■	■	■	■	■	■	■	■	■
47	Phase-sequence-voltage supervision	L1, L2, L3	■	■	■	●	●	■	■	■	■	■
47	Overvoltage protection, negative-sequence system	V2>	●	●	●	●	●	–	●	●	●	●
48	Starting-time supervision	I^2_{start}	–	–	–	–	–	●	●	●	●	●
49	Thermal overload protection	θ, I^2t	■	■	■	■	■	■	■	■	■	■
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	–	–	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	■	■	■	■	■	■	■	■	■	■
SOTF	Instantaneous tripping at switch onto fault		■	■	■	■	■	■	■	■	■	■
AFD	Arc-protection		●	●	●	–	–	–	–	–	–	–
50Ns	Sensitive ground-current protection	I_{Ns}>	■	■	■	●	●	●	●	●	●	●
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	●	●	●	–	–	–	–	–	–	–
	Intermittent ground-fault protection	IIE>	●	●	●	■	–	●	●	–	●	●
50EF	End fault protection	EFP	–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	●	●	●	■	■	■	■	■	■	■
50RS	Circuit-breaker restrike protection	CBRS	●	●	●	–	–	–	–	–	–	–
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	■	■	■	■	■	■	■	■	■	■
50L	Load-jam protection	$I>_L$	–	–	–	–	–	●	●	●	●	●
51C	Cold load pickup		■	■	■	■	■	■	■	■	■	■
51V	Voltage dependent overcurrent protection	t=f(I)+V<	●	●	●	●	–	–	■	–	■	■
55	Power factor	cos φ	■ 2)	■ 2)	■ 2)	●	●	–	●	■ 2)	●	●
59	Overvoltage protection	V>	●	●	●	●	●	–	●	●	●	●
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	●	●	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	●	●	●	●	●	–	■	■	■	■
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	●	–	–	●	–	●	●
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	●	●	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		■	■	■	●	●	–	■	■	■	■
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	–	–	–	●	●	●	●	●

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

				Overcurrent and feeder protection							Feeder automation		Generator and motor protection				
		Device series	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	SIPROTEC Compact	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact
ANSI	**Function**	**Abbr.**	**7SR10**	**7SR11**	**7SR12**	**7SR45**	**7SR191**	**7SR210**	**7SR220**	**7SC80**	**7SR224**	**7SK82**	**7SK85**	**7UM85**	**7SK80**	**7SK81**
	Functions															
	Protection functions for 3-pole tripping	3-pole	■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Protection functions for 1-pole tripping	1-pole	–	–	–	–	–	–	–	●	●	–	–	–	–	–
14	Locked rotor protection	I> + n<	–	–	–	–	–	–	–	–	–	■	■	●	■	■
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
21T	Impedance protection for transformers	Z<	–	–	–	–	–	–	–	–	–	–	–	●	–	–
24	Overexcitation protection	V/f	–	–	–	–	–	–	–	–	–	●	●	●	–	–
25	Synchrocheck, synchronizing function	Sync	–	–	–	–	–	–	●	●	●	●	●	●	–	–
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–	–	–	–	●	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–	–	–	–	–
27	Undervoltage protection	V<	–	–	■	–	●	–	■	●	■	●	●	●	●	●
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ harm.)}$	–	–	–	–	–	–	–	–	–	–	–	●	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	–	–	–	–	–	–	–	–	–	●	●	●	–	–
32	Directional power supervision	P<>, Q<>	–	–	■	–	–	–	■	●	–	●	●	●	●	●
32	Power Plant Disconnection	dP/dt<	–	–	–	–	–	–	–	–	–	–	–	●	–	–
37	Undercurrent protection, underpower	I<, P<	■	■	■	–	■	■	■	■	–	■	■	●	■	■
38	Temperature supervision	θ>	–	–	–	–	–	–	–	–	–	●	●	●	■	■
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–	–	–	–	●	–	–
46	Unbalanced-load protection	I2>	■	●	●	–	■	■	■	■	■	■	■	■	■	■
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	■	●	●	–	■	■	■	■	■	■	■	■	■	■
47	Phase-sequence-voltage supervision	L1, L2, L3	–	–	■	–	–	–	■	●	■	■	■	■	●	●
47	Overvoltage protection, negative-sequence system	V2>	–	–	■	–	–	–	■	●	■	●	●	●	●	●
48	Starting-time supervision	I^2_{start}	–	–	–	–	–	–	–	–	–	■	■	■	■	■
49	Thermal overload protection	θ, I^2t	■	●	●	–	■	■	■	■	■	■	■	■	■	■
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–	–	–	–	■	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–	–	■	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–	–	■	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	–	–	–	–	–	–	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	■	■	■	■	■	■	■	■	■	■	■	■	■	■
SOTF	Instantaneous tripping at switch onto fault		–	■	■	■	–	■	■	■	■	■	■	●	■	■
AFD	Arc-protection		–	●	●	–	–	■	■	–	–	●	●	●	–	–
50Ns	Sensitive ground-current protection	I_{Ns}>	■	●	●	–	–	■	■	■	■	■	■	●	●	●
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	–	–	–	–	–	–	–	–	–	●	●	–	–	–
	Intermittent ground-fault protection	IIE>	–	–	–	–	–	–	–	–	–	● 1)	● 1)	● 1)	■	–
50EF	End fault protection	EFP	–	–	–	–	–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	■	■	■	–	■	■	■	■	■	●	●	●	■	■
50RS	Circuit-breaker restrike protection	CBRS	–	–	–	–	–	–	–	–	–	●	●	●	–	–
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	■	■	■	■	■	■	■	■	■	■	■	■	■	■
50L	Load-jam protection	$I>_L$	–	–	–	–	–	–	–	–	–	■	■	●	■	■
51C	Cold load pickup		■	■	■	–	■	■	■	■	■	■	■	●	■	■
51V	Voltage dependent overcurrent protection	t=f(I)+V<	–	–	■	–	–	–	■	●	■	●	●	●	●	–
55	Power factor	cos φ	–	–	■	–	–	–	■	●	■	■ 2)	■ 2)	■ 2)	●	●
59	Overvoltage protection	V>	–	–	■	–	●	–	■	●	■	●	●	■	●	●
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	–	–	–	–	■	–	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	–	–	■	–	●	–	■	●	■	●	●	■	●	●
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	–	–	–	–	●	–	–	–	–	●	–
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	–	–	–	–	■	–	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		–	–	–	–	–	–	■	●	■	■	■	■	●	●
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	■	–	–	–	–	–	–	■	■	●	■	■

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Generator and motor protection				Transformer protection							
		Device series	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	Reyrolle
ANSI	**Function**	**Abbr.**	**7UM61**	**7UM62**	**7SR105**	**7SR17**	**7UT82**	**7UT85**	**7UT86**	**7UT87**	**7UT612**	**7UT613**	**7UT63**	**7SR242**
	Functions													
	Protection functions for 3-pole tripping	3-pole	■	■	■	■	■	■	■	■	■	■	■	■
	Protection functions for 1-pole tripping	1-pole	–	–	–	–	–	–	–	–	–	–	–	–
14	Locked rotor protection	I> + n<	●	●	■	■	–	–	–	–	–	–	–	–
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	–	●	–	–	–	●	●	●	–	–	–	–
21T	Impedance protection for transformers	Z<	–	–	–	–	–	–	–	–	–	–	–	–
24	Overexcitation protection	V/f	■	■	–	–	–	●	●	●	–	●	●	●
25	Synchrocheck, synchronizing function	Sync	–	–	–	–	–	●	●	●	–	–	–	–
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–	–	–	–	–
27	Undervoltage protection	V<	■	■	–	●	–	●	●	●	–	●	●	●
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ harm.)}$	–	●	–	–	–	–	–	–	–	–	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	–	–	–	–	–	●	●	●	–	–	–	–
32	Directional power supervision	P<>, Q<>	■	■	–	●	–	●	●	●	–	●	●	–
32	Power Plant Disconnection	dP/dt<	–	–	–	–	–	●	●	●	–	–	–	–
37	Undercurrent protection, underpower	I<, P<	●	●	■	■	–	–	–	–	–	–	–	●
38	Temperature supervision	θ>	●	●	●	●	●	●	●	●	●	●	●	–
40	Underexcitation protection	$1/X_D$	●	●	–	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	I2>	●	●	■	■	●	●	●	●	●	●	●	■
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	■	■	–	■	●	●	●	●	●	●	●	■
47	Phase-sequence-voltage supervision	L1, L2, L3	■	■	–	●	■	■	■	■	■	■	■	–
47	Overvoltage protection, negative-sequence system	V2>	●	●	–	–	–	●	●	●	–	●	●	–
48	Starting-time supervision	I^2_{start}	●	●	■	■	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t	■	■	■	■	■	■	■	■	■	■	■	●
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–	–	–	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–	–	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	●	●	●	●	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	■	■	■	■	■	■	■	■	■	■	■	●
SOTF	Instantaneous tripping at switch onto fault		■	■	–	–	■	■	■	■	■	■	■	–
AFD	Arc-protection		–	–	–	–	●	●	●	●	–	–	–	–
50Ns	Sensitive ground-current protection	I_{Ns}>	■	■	■	■	●	●	●	●	–	–	–	–
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	–	–	–	–	–	●	●	●	–	–	–	–
	Intermittent ground-fault protection	IIE>	–	–	–	–	–	–	–	–	–	–	–	–
50EF	End fault protection	EFP	–	–	–	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	●	■	■	■	●	●	●	●	●	●	●	■
50RS	Circuit-breaker restrike protection	CBRS	–	–	–	–	●	●	●	●	–	–	–	–
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	■	■	■	■	■	■	■	■	■	■	■	●
50L	Load-jam protection	$I>_L$	–	–	■	■	–	–	–	–	–	–	–	–
51C	Cold load pickup		–	–	–	–	–	–	–	–	–	–	–	–
51V	Voltage dependent overcurrent protection	t=f(I)+V<	■	■	–	–	–	–	–	–	–	–	–	–
55	Power factor	cos φ	●	●	–	●	●	●	●	●	■	■	■	–
59	Overvoltage protection	V>	■	■	–	●	–	●	●	●	–	●	●	●
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	–	–	–	–	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	■	■	–	●	–	●	●	●	–	●	●	–
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	–	–	–	–	–	–	–	–	–
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	–	–	–	–	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		●	■	–	–	–	●	●	●	–	–	–	–
64	Sensitive ground-fault protection (machine)		■	■	–	■	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	●	●	■	■	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Busbar protection		Bay controller					Merging Unit
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SS85**	**7SS52**	**6MD85**	**6MD86**	**6MD61**	**6MD63**	**6MD66**	**6MU805**
	Functions									
	Protection functions for 3-pole tripping	3-pole	■	■	●	●	–	–	–	–
	Protection functions for 1-pole tripping	1-pole	●	–	–	●	–	–	–	–
14	Locked rotor protection	I> + n<	–	–	–	–	–	–	–	–
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	–	–	–	–	–	–	–	–
21T	Impedance protection for transformers	Z<	–	–	–	–	–	–	–	–
24	Overexcitation protection	V/f	–	–	–	–	–	–	–	–
25	Synchrocheck, synchronizing function	Sync	–	–	●	■	–	–	●	–
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	–	–	–	–	–	–
27	Undervoltage protection	V<	●	–	●	●	–	–	–	–
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ harm.)}$	–	–	–	–	–	–	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	–	–	–	–	–	–	–	–
32	Directional power supervision	P<>, Q<>	–	–	●	●	–	–	–	–
32	Power Plant Disconnection	dP/dt<	–	–	–	–	–	–	–	–
37	Undercurrent protection, underpower	I<, P<	–	–	–	–	–	–	–	–
38	Temperature supervision	θ>	–	–	■	■	–	–	–	–
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	I2>	–	–	●	●	–	–	–	–
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	–	–	●	●	–	–	–	–
47	Phase-sequence-voltage supervision	L1, L2, L3	–	–	–	–	–	–	–	–
47	Overvoltage protection, negative-sequence system	V2>	●	–	–	–	–	–	–	–
48	Starting-time supervision	I^2_{start}	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t	–	–	■	■	–	–	–	–
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	●	●	●	■	–	–	–	–
SOTF	Instantaneous tripping at switch onto fault		–	–	–	–	–	–	–	–
AFD	Arc-protection		–	–	●	●	–	–	–	–
50Ns	Sensitive ground-current protection	I_{Ns}>	–	–	–	–	–	–	–	–
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	–	–	–	–	–	–	–	–
	Intermittent ground-fault protection	IIE>	–	–	–	–	–	–	–	–
50EF	End fault protection	EFP	●	■	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	●	■	–	●	–	–	●	–
50RS	Circuit-breaker restrike protection	CBRS	–	–	–	–	–	–	–	–
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	●	●	–	–	–	–	–	–
50L	Load-jam protection	$I>_L$	–	–	–	–	–	–	–	–
51C	Cold load pickup		–	–	–	–	–	–	–	–
51V	Voltage dependent overcurrent protection	t=f(I)+V<	–	–	–	–	–	–	–	–
55	Power factor	cos φ	–	–	–	–	–	–	–	–
59	Overvoltage protection	V>	●	–	●	●	–	–	–	–
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	●	–	–	–	–	–	–	–
59R, 27R	Rate-of-voltage-change protection	dV/dt	●	–	–	–	–	–	–	–
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		–	–	–	–	–	–	–	–
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Breaker management		Synchronizing			High speed busbar transfer	Voltage and frequency protection		Fault Recorder
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 4	Reyrolle	SIPROTEC 4	SIPROTEC Compact	Reyrolle	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7VK87**	**7VK61**	**7VE85**	**7VE6**	**7SR157**	**7VU683**	**7RW80**	**7SR158**	**7KE85**
	Functions										
	Protection functions for 3-pole tripping	3-pole	■	■	■	●	■	■	■	■	–
	Protection functions for 1-pole tripping	1-pole	■	■	–	–	–	–	–	–	–
14	Locked rotor protection	I> + n<	–	–	–	–	–	–	–	–	–
21/21N	Distance protection	Z<, V< / I>/∠(V,I)	–	–	–	–	–	–	–	–	–
21T	Impedance protection for transformers	Z<	–	–	–	–	–	–	–	–	–
24	Overexcitation protection	V/f	–	–	–	–	–	–	●	–	–
25	Synchrocheck, synchronizing function	Sync	■	●	■	■	■	■	●	–	–
25	Synchronizing function 1 channel design with balancing commands	Sync	–	–	–	–	–	–	–	–	–
25	Synchronizing function 1.5 channel design w. balancing commands	Sync	–	–	●	■	–	–	–	–	–
25	Synchronizing function 2 channel design w. balancing commands	Sync	–	–	●	■	–	–	–	–	–
27	Undervoltage protection	V<	●	●	●	●	–	–	■	■	–
27TN/59TN	Stator ground fault 3rd harmonics	$V0<,>_{(3rd\ harm.)}$	–	–	–	–	–	–	–	–	–
	Undervoltage-controlled reactive power protection	Q>/V<	–	–	–	–	–	–	–	–	–
32	Directional power supervision	P<>, Q<>	●	–	–	–	–	–	–	–	–
32	Power Plant Disconnection	dP/dt<	–	–	●	–	–	–	–	–	–
37	Undercurrent protection, underpower	I<, P<	–	–	–	–	–	–	–	–	–
38	Temperature supervision	θ>	–	–	–	–	–	–	–	–	–
40	Underexcitation protection	$1/X_D$	–	–	–	–	–	–	–	–	–
46	Unbalanced-load protection	I2>	–	–	–	–	–	–	–	–	–
46	Negative-sequence system overcurrent protection	I2>, I2/I1>	–	–	–	–	–	–	–	–	–
47	Phase-sequence-voltage supervision	L1, L2, L3	–	–	●	–	■	■	■	■	–
47	Overvoltage protection, negative-sequence system	V2>	●	●	–	–	–	–	■	–	–
48	Starting-time supervision	I^2_{start}	–	–	–	–	–	–	–	–	–
49	Thermal overload protection	θ, I^2t	–	–	–	–	–	–	–	–	–
49F	Field winding overload protection	I^2t	–	–	–	–	–	–	–	–	–
49FCG	Rotor overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–
49SCG	Stator overload protection with cold gas temperature	θ>, I^2t	–	–	–	–	–	–	–	–	–
49H	Hot spot calculation	θ_h, I^2t	–	–	–	–	–	–	–	–	–
50/50N	Definite time-overcurrent protection	I>	●	●	●	–	–	■	–	–	–
SOTF	Instantaneous tripping at switch onto fault		■	■	●	■	–	■	■	–	–
AFD	Arc-protection		●	–	–	–	–	–	–	–	–
50Ns	Sensitive ground-current protection	I_{Ns}>	●	–	–	–	–	–	–	–	–
50Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral via 3I0 pulse pattern detection	IN-pulse	–	–	–	–	–	–	–	–	–
	Intermittent ground-fault protection	IIE>	–	–	–	–	–	–	–	–	–
50EF	End fault protection	EFP	–	–	–	–	–	–	–	–	–
50BF	Circuit-breaker failure protection	CBFP	■	■	●	–	–	–	–	–	–
50RS	Circuit-breaker restrike protection	CBRS	●	–	●	–	–	–	–	–	–
51/51N	Inverse time-overcurrent protection	I_P, I_{Np}	●	●	●	–	–	–	–	–	–
50L	Load-jam protection	$I>_L$	–	–	●	–	–	–	–	–	–
51C	Cold load pickup		■	–	–	–	–	–	–	–	–
51V	Voltage dependent overcurrent protection	t=f(I)+V<	–	–	–	–	–	–	–	–	–
55	Power factor	cos φ	■ 2)	–		–	–	–	–	–	–
59	Overvoltage protection	V>	●	●	●	●	■	–	■	■	–
	Peak overvoltage protection, 3-phase, for capacitors	V> cap.	–	–	–	–	–	–	–	–	–
59N	Overvoltage protection, zero-sequence system	V0>	●	●	–	–	■	–	■	■	–
59R, 27R	Rate-of-voltage-change protection	dV/dt	–	–	–	–	–	–	■	–	–
60C	Current-unbalance protection for capacitor banks	I_{unbal}>	–	–	–	–	–	–	–	–	–
60FL	Measuring-voltage failure detection		■	■	●	–	–	–	–	–	–
64	Sensitive ground-fault protection (machine)		–	–	–	–	–	–	–	–	–
66	Restart inhibit	I^2t	–	–	–	–	–	–	–	–	–

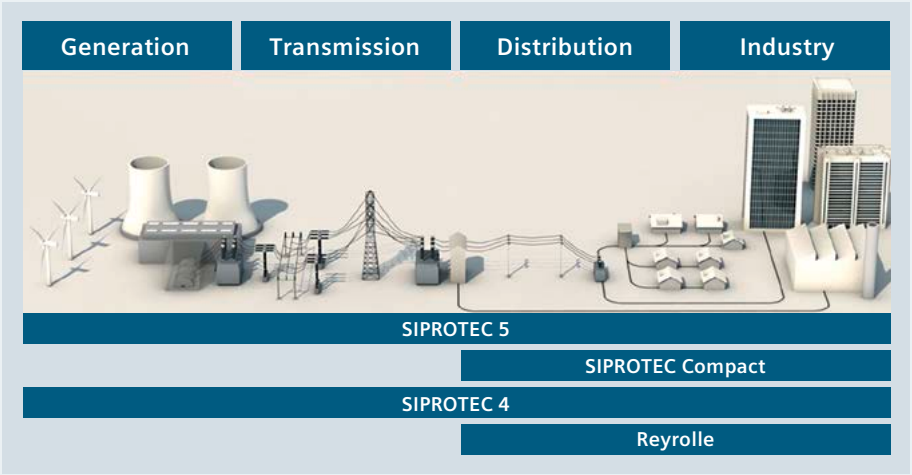
Relay Selection Table to be continued on the following pages

Overview, Relay Selection Table

Functions (continued)

Part 2

Siemens Protection Portfolio for all areas of application



Definition of device types based on designation

The devices are easily identified with the aid of a five-digit abbreviation code. The first digit (6 or 7) stands for the classification. The two letters (XX) describe the functionality and the last two digits (YY) identify typical properties.

Overview of the main functions	
	Main functions ↓ XX; Distinguishing features ↓ YY Classification → 6 or 7 XX YY
XX	Main functions
SIPROTEC devices	
KE	Fault recorder
MD	Bay controller
RW	Voltage and frequency protection
SA	Distance protection
SC	Feeder protection
SD	Line differential protection
SJ	Overcurrent protection
SK	Motor protection
SL	Line differential and distance protection
SS	Busbar protection
UM	Generator protection
UT	Transformer protection
VE	Paralleling device
VK	Breaker management
VU	High speed busbar
Reyrolle devices	
SR	New numerical protection
PG	Electromechanical protection

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Distance protection							Line differential protection		
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SA82**	**7SA86**	**7SA87**	**7SA522**	**7SA61**	**7SA63**	**7SA64**	**7SD82**	**7SD86**	**7SD87**
	Functions (continued)											
67	Directional time-overcurrent protection, phase	I>,I_P ∠ (V,I)	●	●	●	■ 2)	■ 2)	■ 2)	■ 2)	●	●	●
67N	Directional time-overcurrent protection for ground-faults	I_N>, I_{NP} ∠ (V,I)	●	●	●	●	●	●	●	●	●	●
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	I_{Ns}>, ∠ (V,I)	●	●	●	●	●	●	●	●	●	●
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	G_0>, B_0>	●	●	●	–	–	–	–	●	●	●
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	V_0>, ∠ ($V_{harm.}$,$I_{harm.}$)	●	●	●	–	–	–	–	●	●	●
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	●	●	●	–	–	–	–	●	●	●
	Directional intermittent ground fault protection	IIEdir>	–	–	–	–	–	–	–	–	–	–
68	Power-swing blocking	ΔZ/Δt	●	●	●	●	●	●	●	–	–	–
74TC	Trip-circuit supervision	TCS	■	■	■	■	■	■	■	■	■	■
78	Out-of-step protection	ΔZ/Δt	●	●	●	●	●	●	●	–	–	–
79	Automatic reclosing	AR	●	●	●	●	●	●	●	●	●	●
81	Frequency protection	f<, f>	●	●	●	●	●	●	●	●	●	●
81U	Under Frequency Load Shedding	f<(UFLS)	●	●	●	–	–	–	–	●	●	●
81R	Rate-of-frequency-change protection	df/dt	●	●	●	–	–	–	–	●	●	●
	Vector-jump protection	$\Delta\varphi_U$>	●	●	●	–	–	–	–	●	●	●
81LR	Load restoration	LR	–	–	–	–	–	–	–	–	–	–
85	Teleprotection		■	■	■	■	■	■	■	–	–	–
86	Lockout		■	■	■	■	■	■	■	■	■	■
87G	Differential protection, generator	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, transformer	ΔI	–	–	–	–	–	–	–	●	●	●
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	–	–	–	–	–	–
87B	Differential protection, busbar	ΔI	–	–	–	–	–	–	–	–	–	–
87B	Bus Coupler Differential Protection	ΔI	–	–	–	–	–	–	–	–	–	–
	Cross stabilization		–	–	–	–	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	–	–	–	–	–	–	–	–	–
87L	Differential protection, line	ΔI	–	–	–	–	–	–	–	■	■	■
87C	Differential protection, capacitor bank	ΔI	–	–	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	–	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	–	●	●	–	–	–	–	–	●	●
87N	Differential ground-fault protection	ΔI_N	●	●	●	●	●	●	●	●	●	●
	Broken-wire detection for differential protection		–	–	–	–	–	–	–	■	■	■
90V	Automatic voltage control 2 winding transformer		●	●	●	–	–	–	–	●	●	●
90V	Automatic voltage control 3 winding transformer		●	●	●	–	–	–	–	●	●	●
90V	Automatic voltage control grid coupling transformer		●	●	●	–	–	–	–	●	●	●
90V	Automatic voltage control for parallel transformer		●	●	●	–	–	–	–	●	●	●
FL	Fault locator	FL	■	■	■	■	■	■	■	■	■	■
PMU	Synchrophasor measurement	PMU	●	●	●	–	–	–	–	●	●	●

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Line differential protection					Combined line differential and distance protection			High impedance protection	
		Device series	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	Reyrolle	Reyrolle
ANSI	**Function**	**Abbr.**	**7SD80**	**7SD610**	**7SD5**	**7PG2111**	**7SR18**	**7SL82**	**7SL86**	**7SL87**	**7SR23**	**7PG23**
	Functions (continued)											
67	Directional time-overcurrent protection, phase	I>,I_P ∠ (V,I)	●	●	–	–	●	●	●	●	–	–
67N	Directional time-overcurrent protection for ground-faults	I_N>, I_{NP} ∠ (V,I)	●	●	●	–	●	●	●	●	–	–
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	I_{Ns}>, ∠ (V,I)	–	–	●	–	–	●	●	●	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	G_0>, B_0>	–	–	–	–	–	●	●	●	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	V_0>, ∠ ($V_{harm.}$,$I_{harm.}$)	–	–	–	–	–	●	●	●	–	–
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	–	–	–	–	–	●	●	●	–	–
	Directional intermittent ground fault protection	IIEdir>	–	–	–	–	–	–	–	–	–	–
68	Power-swing blocking	ΔZ/Δt	–	–	●	–	–	●	●	●	–	–
74TC	Trip-circuit supervision	TCS	■	■	■	–	■	■	■	■	■	–
78	Out-of-step protection	ΔZ/Δt	–	–	●	–	–	●	●	●	–	–
79	Automatic reclosing	AR	●	●	●	–	●	●	●	●	–	–
81	Frequency protection	f<, f>	●	●	●	–	–	●	●	●	–	–
81U	Under Frequency Load Shedding	f<(UFLS)	–	–	–	–	–	●	●	●	–	–
81R	Rate-of-frequency-change protection	df/dt	●	–	–	–	–	●	●	●	–	–
	Vector-jump protection	$\Delta\varphi_U$>	–	–	–	–	–	●	●	●	–	–
81LR	Load restoration	LR	–	–	–	–	–	–	–	–	–	–
85	Teleprotection		■	■	■	●	■	■	■	■	–	–
86	Lockout		■	■	■	–	■	■	■	■	■	–
87G	Differential protection, generator	ΔI	–	–	–	–	–	–	–	–	■	–
87T	Differential protection, transformer	ΔI	–	●	●	–	–	●	●	●	–	–
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	–	–	–	–	–	–
87B	Differential protection, busbar	ΔI	–	–	–	–	–	–	–	–	■	–
87B	Bus Coupler Differential Protection	ΔI	–	–	–	–	–	–	–	–	–	–
	Cross stabilization		–	–	–	–	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	–	–	–	–	–	–	–	–	–
87L	Differential protection, line	ΔI	■	■	■	■	■	■	■	■	–	–
87C	Differential protection, capacitor bank	ΔI	–	–	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	–	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	–	–	–	–	–	●	●	●	■	–
87N	Differential ground-fault protection	ΔI_N	■	●	●	–	–	●	●	●	■	■
	Broken-wire detection for differential protection		■	■	■	–	–	■	■	■	–	–
90V	Automatic voltage control 2 winding transformer		–	–	–	–	–	●	●	●	–	–
90V	Automatic voltage control 3 winding transformer		–	–	–	–	–	●	●	●	–	–
90V	Automatic voltage control grid coupling transformer		–	–	–	–	–	●	●	●	–	–
90V	Automatic voltage control for parallel transformer		–	–	–	–	–	●	●	●	–	–
FL	Fault locator	FL	–	■	■	–	–	■	■	■	–	–
PMU	Synchrophasor measurement	PMU	–	–	–	–	–	●	●	●	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection									
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4
ANSI	**Function**	**Abbr.**	**7SJ82**	**7SJ85**	**7SJ86**	**7SJ80**	**7SJ81**	**7SJ61**	**7SJ62**	**7SJ63**	**7SJ64**	**7SJ66**
	Functions (continued)											
67	Directional time-overcurrent protection, phase	I>,I_P ∠ (V,I)	●	●	●	●	●	–	●	●	●	●
67N	Directional time-overcurrent protection for ground-faults	I_N>, I_{NP} ∠ (V,I)	●	●	●	●	●	–	●	●	●	●
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	I_{Ns}>, ∠ (V,I)	●	●	●	●	●	–	●	●	●	●
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	G_0>, B_0>	●	●	●	–	–	–	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	V_0>, ∠ ($V_{harm.}$,$I_{harm.}$)	●	●	●	–	–	–	–	–	–	–
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	●	●	●	–	–	–	–	–	–	–
	Directional intermittent ground fault protection	IIEdir>	●	●	–	●	–	–	●	–	●	●
68	Power-swing blocking	ΔZ/Δt	–	–	–	–	–	–	–	–	–	–
74TC	Trip-circuit supervision	TCS	■	■	■	■	■	■	■	■	■	■
78	Out-of-step protection	ΔZ/Δt	–	–	–	–	–	–	–	–	–	–
79	Automatic reclosing	AR	●	●	●	●	●	●	●	●	●	●
81	Frequency protection	f<, f>	●	●	●	●	●	–	●	●	●	●
81U	Under Frequency Load Shedding	f<(UFLS)	●	●	●	–	–	–	–	–	–	–
81R	Rate-of-frequency-change protection	df/dt	●	●	●	●	●	–	●	–	●	●
	Vector-jump protection	$\Delta\varphi_U$>	●	●	●	–	–	–	–	–	–	–
81LR	Load restoration	LR	–	–	–	–	–	–	–	–	–	–
85	Teleprotection		–	–	●	–	–	–	–	–	–	–
86	Lockout		■	■	■	■	■	■	■	■	■	■
87G	Differential protection, generator	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, transformer	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	–	–	–	–	–	–
87B	Differential protection, busbar	ΔI	–	–	–	–	–	–	–	–	–	–
87B	Bus Coupler Differential Protection	ΔI	–	–	–	–	–	–	–	–	–	–
	Cross stabilization		–	–	–	–	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	–	–	–	–	–	–	–	–	–
87L	Differential protection, line	ΔI	–	–	–	–	–	–	–	–	–	–
87C	Differential protection, capacitor bank	ΔI	●	●	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	●	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	–	–	–	–	–	–	–	–	–	–
87N	Differential ground-fault protection	ΔI_N	●	●	–	●	–	●	●	●	●	●
	Broken-wire detection for differential protection		–	–	–	–	–	–	–	–	–	–
90V	Automatic voltage control 2 winding transformer		●	●	–	–	–	–	–	–	–	–
90V	Automatic voltage control 3 winding transformer		●	●	–	–	–	–	–	–	–	–
90V	Automatic voltage control grid coupling transformer		●	●	–	–	–	–	–	–	–	–
90V	Automatic voltage control for parallel transformer		●	●	–	–	–	–	–	–	–	–
FL	Fault locator	FL	●	●	●	●	●	–	●	●	●	●
PMU	Synchrophasor measurement	PMU	●	●	●	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection							Feeder automation		Generator and motor protection				
		Device series	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	SIPROTEC Compact	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact
ANSI	**Function**	**Abbr.**	**7SR10**	**7SR11**	**7SR12**	**7SR45**	**7SR191**	**7SR210**	**7SR220**	**7SC80**	**7SR224**	**7SK82**	**7SK85**	**7UM85**	**7SK80**	**7SK81**
	Functions (continued)															
67	Directional time-overcurrent protection, phase	I>,I_P ∠ (V,I)	–	–	■	–	●	–	■	●	■	●	●	■	–	–
67N	Directional time-overcurrent protection for ground-faults	I_N>, I_{NP} ∠ (V,I)	–	–	■	–	●	–	■	●	■	●	●	●	●	●
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	I_{Ns}>, ∠ (V,I)	–	–	■	–	–	–	■	●	■	●	●	●	●	●
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	G_0>, B_0>	–	–	–	–	–	–	–	–	–	●	●	●	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	V_0>, ∠ ($V_{harm.}$,$I_{harm.}$)	–	–	–	–	–	–	–	–	–	●	●	–	–	–
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	–	–	–	–	–	–	–	–	–	●	●	–	–	–
	Directional intermittent ground fault protection	IIEdir>	–	–	–	–	–	–	–	–	–	●	●	–	●	–
68	Power-swing blocking	ΔZ/Δt	–	–	–	–	–	–	–	–	–	–	–	–	–	–
74TC	Trip-circuit supervision	TCS	■	■	■	–	■	■	■	■	■	■	■	■	■	■
78	Out-of-step protection	ΔZ/Δt	–	–	–	–	–	–	–	–	–	–	–	●	–	–
79	Automatic reclosing	AR	●	●	●	–	–	●	●	●	■	●	●	–	–	–
81	Frequency protection	f<, f>	–	–	■	–	–	–	■	●	■	●	●	■	●	●
81U	Under Frequency Load Shedding	f<(UFLS)	–	–	–	–	–	–	–	–	–	●	●	●	–	–
81R	Rate-of-frequency-change protection	df/dt	–	–	–	–	●	–	–	●	–	●	●	●	●	●
	Vector-jump protection	$\Delta\varphi_U$>	–	–	–	–	–	–	–	–	–	●	●	●	–	–
81LR	Load restoration	LR	–	–	–	–	–	–	–	–	–	–	–	–	–	–
85	Teleprotection		–	–	–	–	–	–	–	–	–	–	–	–	–	–
86	Lockout		■	■	■	■	■	■	■	■	■	■	■	■	■	■
87G	Differential protection, generator	ΔI	–	–	–	–	–	–	–	–	–	–	–	●	–	–
87T	Differential protection, transformer	ΔI	–	–	–	–	–	–	–	–	–	–	–	●	–	–
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87B	Differential protection, busbar	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87B	Bus Coupler Differential Protection	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Cross stabilization		–	–	–	–	–	–	–	–	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	–	–	–	–	–	–	–	–	–	●	●	–	–
87L	Differential protection, line	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87C	Differential protection, capacitor bank	ΔI	–	–	–	–	■	–	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	–	–	–	–	–	–	–	–	–	–	–	–	–	–
87N	Differential ground-fault protection	ΔI_N	–	●	●	–	–	■	■	■	■	–	–	●	–	–
	Broken-wire detection for differential protection		–	–	–	–	–	–	–	–	–	–	–	–	–	–
90V	Automatic voltage control 2 winding transformer		–	–	–	–	–	–	–	–	–	●	●	–	–	–
90V	Automatic voltage control 3 winding transformer		–	–	–	–	–	–	–	–	–	●	●	–	–	–
90V	Automatic voltage control grid coupling transformer		–	–	–	–	–	–	–	–	–	●	●	–	–	–
90V	Automatic voltage control for parallel transformer		–	–	–	–	–	–	–	–	–	●	●	–	–	–
FL	Fault locator	FL	–	–	–	–	–	–	■	●	■	●	●	–	–	–
PMU	Synchrophasor measurement	PMU	–	–	–	–	–	–	–	–	–	●	●	●	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Generator and motor protection				Transformer protection							
		Device series	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	Reyrolle
ANSI	**Function**	**Abbr.**	**7UM61**	**7UM62**	**7SR105**	**7SR17**	**7UT82**	**7UT85**	**7UT86**	**7UT87**	**7UT612**	**7UT613**	**7UT63**	**7SR242**
	Functions (continued)													
67	Directional time-overcurrent protection, phase	I>,I_P ∠ (V,I)	■	■	–	●	–	●	●	●	–	–	–	–
67N	Directional time-overcurrent protection for ground-faults	I_N>, I_{NP} ∠ (V,I)	■	■	–	●	–	●	●	●	–	–	–	–
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	I_{Ns}>, ∠ (V,I)	■	■	–	●	–	●	●	●	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	G_0>, B_0>	–	–	–	–	–	●	●	●	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	V_0>, ∠ ($V_{harm.}$,$I_{harm.}$)	–	–	–	–	–	●	●	●	–	–	–	–
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	–	–	–	–	–	–	–	–	–	–	–	–
	Directional intermittent ground fault protection	IIEdir>	–	–	–	–	●	●	●	●	–	–	–	–
68	Power-swing blocking	ΔZ/Δt	–	●	–	–	–	–	–	–	–	–	–	–
74TC	Trip-circuit supervision	TCS	■	■	■	■	■	■	■	■	●	■	■	■
78	Out-of-step protection	ΔZ/Δt	–	●	–	–	–	–	–	–	–	–	–	–
79	Automatic reclosing	AR	–	–	–	–	–	–	–	–	–	–	–	–
81	Frequency protection	f<, f>	■	■	–	●	–	●	●	●	–	●	●	●
81U	Under Frequency Load Shedding	f<(UFLS)	–	–	–	–	–	●	●	●	–	–	–	–
81R	Rate-of-frequency-change protection	df/dt	●	●	–	–	–	●	●	●	–	–	–	–
	Vector-jump protection	$\Delta\varphi_U$>	●	●	–	–	–	●	●	●	–	–	–	–
81LR	Load restoration	LR	–	–	–	–	–	–	–	–	–	–	–	–
85	Teleprotection		–	–	–	–	–	–	–	–	–	–	–	–
86	Lockout		■	■	■	■	●	●	●	●	■	■	■	■
87G	Differential protection, generator	ΔI	–	■	–	–	●	●	●	●	■	■	■	–
87T	Differential protection, transformer	ΔI	–	■	–	–	■	■	■	■	■	■	■	■ (2w)
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	●	●	●	●	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	●	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	●	●	●	●	–	–	–	–
87B	Differential protection, busbar	ΔI	–	–	–	–	–	–	–	–	■	■	■	–
87B	Bus Coupler Differential Protection	ΔI	–	–	–	–	–	–	–	–	–	–	–	–
	Cross stabilization		–	–	–	–	–	–	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	■	–	–	●	●	●	●	■	■	■	–
87L	Differential protection, line	ΔI	–	–	–	–	–	●	●	●	■	■	■	–
87C	Differential protection, capacitor bank	ΔI	–	–	–	–	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	–	–	–	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	–	–	–	–	–	● 1)	● 1)	● 1)	–	–	–	–
87N	Differential ground-fault protection	ΔI_N	●	●	–	■	●	●	●	●	●	●	●	–
	Broken-wire detection for differential protection		■	■	–	–	–	–	–	–	■	■	■	–
90V	Automatic voltage control 2 winding transformer		–	–	–	–	–	●	●	●	–	–	–	–
90V	Automatic voltage control 3 winding transformer		–	–	–	–	–	●	●	●	–	–	–	–
90V	Automatic voltage control grid coupling transformer		–	–	–	–	–	●	●	●	–	–	–	–
90V	Automatic voltage control for parallel transformer		–	–	–	–	–	●	●	●	–	–	–	–
FL	Fault locator	FL	–	–	–	–	–	–	–	–	–	–	–	–
PMU	Synchrophasor measurement	PMU	–	–	–	–	–	●	●	●	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Busbar protection		Bay controller					Merging Unit
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SS85**	**7SS52**	**6MD85**	**6MD86**	**6MD61**	**6MD63**	**6MD66**	**6MU805**
	Functions (continued)									
67	Directional time-overcurrent protection, phase	$I>, I_P \angle (V,I)$	–	–	●	●	–	–	–	–
67N	Directional time-overcurrent protection for ground-faults	$I_N>$, $I_{NP} \angle (V,I)$	–	–	–	–	–	–	–	–
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	$I_{Ns}>, \angle (V,I)$	–	–	–	–	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	$G_0>$, $B_0>$	–	–	–	–	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	$V_0>, \angle (V_{harm.}, I_{harm.})$	–	–	–	–	–	–	–	–
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	–	–	–	–	–	–	–	–
	Directional intermittent ground fault protection	IIEdir>	–	–	–	–	–	–	–	–
68	Power-swing blocking	ΔZ/Δt	–	–	–	–	–	–	–	–
74TC	Trip-circuit supervision	TCS	●	–	■	■	–	–	–	–
78	Out-of-step protection	ΔZ/Δt	–	–	–	–	–	–	–	–
79	Automatic reclosing	AR	–	–	–	●	–	–	●	–
81	Frequency protection	f<, f>	●	–	●	●	–	–	–	–
81U	Under Frequency Load Shedding	f<(UFLS)	–	–	●	●	–	–	–	–
81R	Rate-of-frequency-change protection	df/dt	●	–	–	–	–	–	–	–
	Vector-jump protection	$\Delta\varphi_U>$	–	–	–	–	–	–	–	–
81LR	Load restoration	LR	–	–	–	–	–	–	–	–
85	Teleprotection		●	–	–	–	–	–	–	–
86	Lockout		■	–	■	■	–	–	–	–
87G	Differential protection, generator	ΔI	–	–	–	–	–	–	–	–
87T	Differential protection, transformer	ΔI	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	–	–	–	–
87B	Differential protection, busbar	ΔI	■	■	–	–	–	–	–	–
87B	Bus Coupler Differential Protection	ΔI	●	–	–	–	–	–	–	–
	Cross stabilization		●	●	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	–	–	–	–	–	–	–
87L	Differential protection, line	ΔI	–	–	–	–	–	–	–	–
87C	Differential protection, capacitor bank	ΔI	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	■	■	–	–	–	–	–	–
87N	Differential ground-fault protection	ΔI_N	–	–	–	–	–	–	–	–
	Broken-wire detection for differential protection		■	–	–	–	–	–	–	–
90V	Automatic voltage control 2 winding transformer		–	–	●	●	–	–	–	–
90V	Automatic voltage control 3 winding transformer		–	–	●	●	–	–	–	–
90V	Automatic voltage control grid coupling transformer		–	–	●	●	–	–	–	–
90V	Automatic voltage control for parallel transformer		–	–	●	●	–	–	–	–
FL	Fault locator	FL	–	–	–	–	–	–	–	–
PMU	Synchrophasor measurement	PMU	–	–	●	●	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Breaker management		Synchronizing			High speed busbar transfer	Voltage and frequency protection		Fault Recorder
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 4	Reyrolle	SIPROTEC 4	SIPROTEC Compact	Reyrolle	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7VK87**	**7VK61**	**7VE85**	**7VE6**	**7SR157**	**7VU683**	**7RW80**	**7SR158**	**7KE85**
	Functions (continued)										
67	Directional time-overcurrent protection, phase	I>,I_P ∠ (V,I)	●	–	–	–	–	–	–	–	–
67N	Directional time-overcurrent protection for ground-faults	I_N>, I_{NP} ∠ (V,I)	–	–	–	–	–	–	–	–	–
67Ns	Dir. sensitive ground-fault detection for systems with resonant or isolated neutral	I_{Ns}>, ∠ (V,I)	–	–	–	–	–	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with admittanz method	G_0>, B_0>	–	–	–	–	–	–	–	–	–
67Ns	Sensitive ground-fault detection for systems with resonant or isolated neutral with phasor measurement of 3rd or 5th harmonic	V_0>, ∠ ($V_{harm.}$,$I_{harm.}$)	–	–	–	–	–	–	–	–	–
67Ns	Transient ground-fault function, for transient and permanent ground faults in resonant-grounded or isolated networks	W0p,tr>	■ 1)	–	–	–	–	–	–	–	–
	Directional intermittent ground fault protection	IIEdir>	–	–	–	–	–	–	–	–	–
68	Power-swing blocking	ΔZ/Δt	–	–	–	–	–	–	–	–	–
74TC	Trip-circuit supervision	TCS	■	■	●	■	■	–	■	■	–
78	Out-of-step protection	ΔZ/Δt	–	–	–	–	–	–	–	●	–
79	Automatic reclosing	AR	■	■	–	–	–	–	–	–	–
81	Frequency protection	f<, f>	●	–	●	●	■	–	■	■	–
81U	Under Frequency Load Shedding	f<(UFLS)	●	–	–	–	–	–	–	–	–
81R	Rate-of-frequency-change protection	df/dt	–	–	●	●	–	–	■	■	–
	Vector-jump protection	$\Delta\varphi_U$>	–	–	●	●	–	–	●	–	–
81LR	Load restoration	LR	–	–	–	–	–	–	●	–	–
85	Teleprotection		–	–	–	–	–	–	–	–	–
86	Lockout		■	■	–	–	■	–	■	■	–
87G	Differential protection, generator	ΔI	–	–	–	–	–	–	–	–	–
87T	Differential protection, transformer	ΔI	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (single core)	ΔI	–	–	–	–	–	–	–	–	–
87T	Differential protection, Phase angle regulating transformer (two core)	ΔI	–	–	–	–	–	–	–	–	–
87T	Differential protection, Special transformers	ΔI	–	–	–	–	–	–	–	–	–
87B	Differential protection, busbar	ΔI	–	–	–	–	–	–	–	–	–
87B	Bus Coupler Differential Protection	ΔI	–	–	–	–	–	–	–	–	–
	Cross stabilization		–	–	–	–	–	–	–	–	–
87M	Differential protection, motor	ΔI	–	–	–	–	–	–	–	–	–
87L	Differential protection, line	ΔI	–	–	–	–	–	–	–	–	–
87C	Differential protection, capacitor bank	ΔI	–	–	–	–	–	–	–	–	–
87V	Voltage differential protection, capacitor bank	ΔV	–	–	–	–	–	–	–	–	–
87STUB	Stub differential protection	ΔI	–	–	–	–	–	–	–	–	–
87N	Differential ground-fault protection	ΔI_N	●	–	–	–	–	–	–	–	–
	Broken-wire detection for differential protection		–	–	–	–	–	–	–	–	–
90V	Automatic voltage control 2 winding transformer		–	–	–	–	–	–	–	–	–
90V	Automatic voltage control 3 winding transformer		–	–	–	–	–	–	–	–	–
90V	Automatic voltage control grid coupling transformer		–	–	–	–	–	–	–	–	–
90V	Automatic voltage control for parallel transformer		–	–	–	–	–	–	–	–	–
FL	Fault locator	FL	●	–	–	–	–	–	–	–	–
PMU	Synchrophasor measurement	PMU	●	–	–	–	–	–	–	–	●

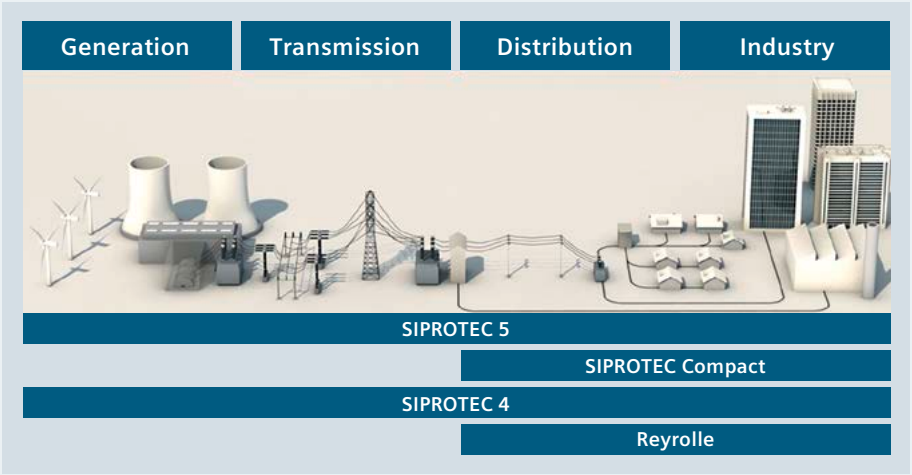
Relay Selection Table to be continued on the following pages

Overview, Relay Selection Table

Further Functions
Hardware Feature

Part 3

Siemens Protection Portfolio for all areas of application



Definition of device types based on designation
The devices are easily identified with the aid of a five-digit abbreviation code. The first digit (6 or 7) stands for the classification. The two letters (XX) describe the functionality and the last two digits (YY) identify typical properties.

Overview of the main functions	
	Main functions ↓ XX; Distinguishing features ↓ YY Classification → 6 or 7 XX YY
XX	Main functions
SIPROTEC devices	
KE	Fault recorder
MD	Bay controller
RW	Voltage and frequency protection
SA	Distance protection
SC	Feeder protection
SD	Line differential protection
SJ	Overcurrent protection
SK	Motor protection
SL	Line differential and distance protection
SS	Busbar protection
UM	Generator protection
UT	Transformer protection
VE	Paralleling device
VK	Breaker management
VU	High speed busbar
Reyrolle devices	
SR	New numerical protection
PG	Electromechanical protection

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Distance protection							Line differential protection		
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SA82**	**7SA86**	**7SA87**	**7SA522**	**7SA61**	**7SA63**	**7SA64**	**7SD82**	**7SD86**	**7SD87**
	Further Functions											
	Measured values		■	■	■	■	■	■	■	■	■	■
	Switching-statistic counters		■	■	■	■	■	■	■	■	■	■
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	■	■	■	–	–	–	–	■	■	■
	Logic editor		■	■	■	■	■	■	■	■	■	■
	Inrush-current detection		■	■	■	–	–	–	–	■	■	■
	External trip initiation		■	■	■	■	■	■	■	■	■	■
	Control		■	■	■	■	■	■	■	■	■	■
	High Speed busbar transfer function		–	–	–	–	–	–	–	–	–	–
	Fault recording of analog and binary signals		■	■	■	■	■	■	■	■	■	■
	Extended fault recording		–	–	–	–	–	–	–	–	–	–
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–	–	–
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–	–	–
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–	–	–
TR	Trend recorder	TR	–	–	–	–	–	–	–	–	–	–
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–	–	–
	Sequence of events recorder	EFR	–	–	–	–	–	–	–	–	–	–
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–	–	–
	Frequency tracking groups (from V7.8)		■	■	■	–	–	–	–	■	■	■
	Cyber Security: Role-based access control (from V7.8)		●	●	●	–	–	–	–	●	●	●
	Monitoring and supervision		■	■	■	■	■	■	■	■	■	■
	Protection interface, serial		●	●	●	●	●	●	●	■	■	■
	No. Setting groups		8	8	8	4	4	4	4	8	8	8
	Changeover of setting group		■	■	■	■	■	■	■	■	■	■
	Circuit breaker test		■	■	■	■	■	■	■	■	■	■
	Hardware Feature											
	Hardware quantity structure expandable	I/O	–	■	■	–	–	–	–	–	■	■
	Binary Inputs (max)		11/23	31 3)	31 3)	24	33	33	33	11/23	31 3)	31 3)
	Binary Outputs (max) incl. Life contact		9/16	46 3)	46 3)	44	34	34	34	9/16	46 3)	46 3)
	Internal RTD Inputs (max)		–	–	–	–	–	–	–	–	–	–
	Transducer inputs (0 – 20 mA) (max.)		8	12	12	–	–	–	–	8	12	12
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–	–	–
	Analog measured value outputs (0 – 20 mA) (max.)		–	–	–	–	2	2	2	–	–	–
	Current Inputs (max)		4	8 3)	8 3)	4	4	4	4	4	8 3)	8 3)
	Voltage Inputs (max)		4	8 3)	8 3)	4	4	4	4	4	8 3)	8 3)
	Low Power CT Inputs		–	–	–	–	–	–	–	–	–	–
	Low Power VT Inputs		–	–	–	–	–	–	–	–	–	–
	Case (x19 ")		1/3	1/3–2/1	1/3–2/1	1/2; 1/1	1/3–1/1	1/2; 1/1	1/2; 1/1	1/3	1/3–2/1	1/3–2/1
	Size (x E)		–	–	–	–	–	–	–	–	–	–
	Small Display (lines)		8	8	8	4	4	–	–	8	8	8
	Large, graphical Display (Pixel)		320x240	320x240	320x240	–	–	240x120	240x120	320x240	320x240	320x240
	Push Buttons		9	9	9	4	4	4	4	9	9	9
	Key Switch		–	●	●	■	–	■	■	–	●	●
	LEDs (max.)		16	82	82	16	9/16	16	16	16	82	82
	Conformal Coating		■	■	■	–	–	–	–	■	■	■
	Pluggable terminal blocks		■	■	■	–	–	–	–	■	■	■
	PSU Variants		DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-125 DC 110-250/ AC 115-230	DC 24-48; DC 60-125 DC 110-250/ AC 115-230	DC 24-48; DC 60-125 DC 110-250/ AC 115-230	DC 24-48; DC 60-125 DC 110-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Line differential protection					Combined line differential and distance protection			High impedance protection	
		Device series	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	Reyrolle	Reyrolle
ANSI	**Function**	**Abbr.**	**7SD80**	**7SD610**	**7SD5**	**7PG2111**	**7SR18**	**7SL82**	**7SL86**	**7SL87**	**7SR23**	**7PG23**
	Further Functions											
	Measured values		■	■	■	–	■	■	■	■	■	–
	Switching-statistic counters		■	■	■	–	■	■	■	■	■	–
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	–	–	–	–	■	■	■	■	■	–
	Logic editor		■	■	■	–	■	■	■	■	■	–
	Inrush-current detection		■	■	■	–	■	■	■	■	–	–
	External trip initiation		■	■	■	–	■	■	■	■	■	–
	Control		■	■	■	–	■	■	■	■	■	–
	High Speed busbar transfer function		–	–	–	–	–	–	–	–	–	–
	Fault recording of analog and binary signals		■	■	■	–	■	■	■	■	■	–
	Extended fault recording		–	–	–	–	–	–	–	–	–	–
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–	–	–
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–	–	–
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–	–	–
TR	Trend recorder	TR	–	–	–	–	–	–	–	–	–	–
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–	–	–
	Sequence of events recorder	EFR	–	–	–	–	1000	–	–	–	5000	–
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–	–	–
	Frequency tracking groups (from V7.8)		–	–	–	–	–	■	■	■	–	–
	Cyber Security: Role-based access control (from V7.8)		–	–	–	–	–	●	●	●	–	–
	Monitoring and supervision		■	■	■	–	■	■	■	■	■	–
	Protection interface, serial		■	■	■	–	–	■	■	■	–	–
	No. Setting groups		4	4	4	–	4	8	8	8	8	–
	Changeover of setting group		■	■	■	–	■	■	■	■	■	–
	Circuit breaker test		■	■	■	–	■	■	■	■	–	–
	Hardware Feature											
	Hardware quantity structure expandable	I/O	–	–	–	–	■	–	■	■	■	–
	Binary Inputs (max)		3/7	7	24	–	6	11/23	31 3)	31 3)	19	–
	Binary Outputs (max) incl. Life contact		6/9	6	33	3	8	9/16	46 3)	46 3)	16	3
	Internal RTD Inputs (max)		0	0	0	–	–	–	–	–	–	–
	Transducer inputs (0 – 20 mA) (max.)		0	0	0	–	–	8	12	12	–	–
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–	–	–
	Analog measured value outputs (0 – 20 mA) (max.)		0	0	0	–	–	–	–	–	–	–
	Current Inputs (max)		4	4	4	3	4	4	8 3)	8 3)	4	1
	Voltage Inputs (max)		3	4	4	–	3	4	8 3)	8 3)	–	–
	Low Power CT Inputs		–	–	–	–	–	–	–	–	–	–
	Low Power VT Inputs		–	–	–	–	–	–	–	–	–	–
	Case (x19 ")		1/6	1/3	1/2; 1/1	–	–	1/3	1/3–2/1	1/3–2/1	–	–
	Size (x E)		–	–	–	E6	E6	–	–	–	E6, E8	E3
	Small Display (lines)		6	4	4	–	4	8	8	8	4	–
	Large, graphical Display (Pixel)		–	–	–	–	–	320x240	320x240	320x240	–	–
	Push Buttons		9	4	4	–	11	9	9	9	5	–
	Key Switch		–	–	–	–	–	–	●	●	–	–
	LEDs (max.)		10	9	16	–	10/18	16	82	82	19	–
	Conformal Coating		■	–	–	–	–	■	■	■	–	–
	Pluggable terminal blocks		■	–	–	–	–	■	■	■	–	–
	PSU Variants		DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-125 DC 110-250/ AC 115-230	DC 24-48; DC 60-125 DC 110-250/ AC 115-230	–	AC 115-230; DC 24-250	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	AC 115-230; DC 24-250	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection									
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4
ANSI	**Function**	**Abbr.**	**7SJ82**	**7SJ85**	**7SJ86**	**7SJ80**	**7SJ81**	**7SJ61**	**7SJ62**	**7SJ63**	**7SJ64**	**7SJ66**
	Further Functions											
	Measured values		■	■	■	■	■	■	■	■	■	■
	Switching-statistic counters		■	■	■	■	■	■	■	■	■	■
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	■	■	■	–	–	–	–	–	–	–
	Logic editor		■	■	■	■	■	■	■	■	■	■
	Inrush-current detection		■	■	■	■	■	■	■	■	■	■
	External trip initiation		■	■	■	■	■	■	■	■ 2)	■	■
	Control		■	■	■	■	■	■	■	■	■	■
	High Speed busbar transfer function		–	–	–	–	–	–	–	–	–	–
	Fault recording of analog and binary signals		■	■	■	■	■	■	■	■	■	■
	Extended fault recording		–	–	–	–	–	–	–	–	–	–
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–	–	–
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–	–	–
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–	–	–
TR	Trend recorder	TR	–	–	–	–	–	–	–	–	–	–
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–	–	–
	Sequence of events recorder	EFR	–	–	–	–	–	–	–	–	–	–
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–	–	–
	Frequency tracking groups (from V7.8)		■	■	■	–	–	–	–	–	–	–
	Cyber Security: Role-based access control (from V7.8)		●	●	●	–	–	–	–	–	–	–
	Monitoring and supervision		■	■	■	■	■	■	■	■	■	■
	Protection interface, serial		●	●	●	–	–	–	–	–	–	–
	No. Setting groups		8	8	8	4	4	4	4	4	4	4
	Changeover of setting group		■	■	■	■	■	■	■	■	■	■
	Circuit breaker test		■	■	■	–	–	–	–	–	–	–
	Hardware Feature											
	Hardware quantity structure expandable	I/O	–	■	■	–	–	–	–	–	–	–
	Binary Inputs (max)		11/23	59 3)	23 3)	3/7/11 1)	3/7	3/8/11	8/11	37	48	36
	Binary Outputs (max) incl. Life contact		9/16	33 3)	24 3)	6/9/6 1)	6/9	5/9/7	9/7	19	26	24
	Internal RTD Inputs (max)		–	–	–	–	–	–	–	–	–	–
	Transducer inputs (0 – 20 mA) (max.)		8	12	12	–	–	–	–	2	–	–
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–	–	–
	Analog measured value outputs (0 – 20 mA) (max.)		–	–	–	–	–	–	–	–	–	–
	Current Inputs (max)		4	4 3)	4 3)	4	–	4	4	4	4	4
	Voltage Inputs (max)		4	4 3)	4 3)	0/3	–	–	3/4	3	4	4
	Low Power CT Inputs		–	–	–	–	4	–	–	–	–	–
	Low Power VT Inputs		–	–	–	–	0/3	–	–	–	–	–
	Case (x19 ")		1/3	1/3–2/1	1/3–2/1	1/6	1/6	1/3; 1/2	1/3; 1/3	1/2; 1/1	1/3–1/1	1/3; 1/2
	Size (x E)		–	–	–	–	–	–	–	–	–	–
	Small Display (lines)		8	8	8	6	6	4	4	–	–	8
	Large, graphical Display (Pixel)		320x240	320x240	320x240	–	–	240x120	240x120	240x120	240x120	240x128
	Push Buttons		9	9	9	9	9	4	4	4	4	4
	Key Switch		–	●	●	–	–	–	–	■	■	–
	LEDs (max.)		16	82	82	10	10	9	9	16	16	16
	Conformal Coating		■	■	■	■	–	–	–	–	–	–
	Pluggable terminal blocks		■	■	■	■	■	–	–	–	–	–
	PSU Variants		DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 110-250, AC 115-230

Overview, Relay Selection Table

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

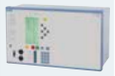
1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection							Feeder automation		Generator and motor protection				
		Device series	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	SIPROTEC Compact	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact
ANSI	**Function**	**Abbr.**	**7SR10**	**7SR11**	**7SR12**	**7SR45**	**7SR191**	**7SR210**	**7SR220**	**7SC80**	**7SR224**	**7SK82**	**7SK85**	**7UM85**	**7SK80**	**7SK81**
	Further Functions															
	Measured values		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Switching-statistic counters		■	■	■	–	■	■	■	■	■	■	■	■	■	■
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	■	■	■	–	■	■	■	■	■	■	■	■	–	–
	Logic editor		■	■	■	–	■	■	■	■	■	■	■	■	■	■
	Inrush-current detection		■	■	■	–	–	■	■	■	■	■	■	■	■	■
	External trip initiation		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Control		■	●	■	–	■	■	■	■	■	■	■	■	■	■
	High Speed busbar transfer function		–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Fault recording of analog and binary signals		■	■	■	–	■	■	■	■	■	■	■	■	■	■
	Extended fault recording		–	–	–	–	–	–	–	–	–	–	–	–	–	–
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–	–	–	–	–	–	–
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–	–	–	–	–	–	–
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–	–	–	–	–	–	–
TR	Trend recorder	TR	–	–	–	–	–	–	–	–	–	–	–	–	–	–
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Sequence of events recorder	EFR	1000	1000	1000	● 1)	1000	5000	5000	1000	5000	–	–	–	–	–
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Frequency tracking groups (from V7.8)		–	–	–	–	–	–	–	–	–	■	■	■	–	–
	Cyber Security: Role-based access control (from V7.8)		–	–	–	–	–	–	–	–	–	●	●	●	–	–
	Monitoring and supervision		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	Protection interface, serial		–	–	–	–	–	–	–	–	–	●	●	●	–	–
	No. Setting groups		2	4	4	1	4	8	8	16	8	8	8	8	4	4
	Changeover of setting group		■	■	■	–	■	■	■	■	■	■	■	■	■	■
	Circuit breaker test		–	–	–	–	–	–	–	–	–	■	■	■	–	–
	Hardware Feature															
	Hardware quantity structure expandable	I/O	–	■	■	■	■	■	■	■	■	■	■	■	–	–
	Binary Inputs (max)		6	6	6	2/4 1)	6	19	13	20	43	11/23	27 3)	27 3)	3/7	3/7
	Binary Outputs (max) incl. Life contact		6	8	8	2/4 1)	8	16	14	16	30	9/16	17 3)	17 3)	6/9	6/9
	Internal RTD Inputs (max)		–	–	–	–	–	–	–	–	–	–	–	–	5	5
	Transducer inputs (0 – 20 mA) (max.)		–	–	–	–	–	–	–	–	–	8	12	12	–	–
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Analog measured value outputs (0 – 20 mA) (max.)		–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Current Inputs (max)		4	4	4	4	4	4	5	4	4	4	4 3)	4 3)	4	–
	Voltage Inputs (max)		–	–	3	–	3	–	4	6	6	4	4 3)	4 3)	0/3	–
	Low Power CT Inputs		–	–	–	–	–	–	–	3	–	–	–	–	–	4
	Low Power VT Inputs		–	–	–	–	–	–	–	6	–	–	–	–	–	0/3
	Case (x19 ")		–	–	–	–	–	–	–	–	–	1/3	1/3–2/1	1/3–2/1	1/6	1/6
	Size (x E)		4	E4, E6	E4, E6	E4	E4, E6	E6, E8	E6, E8	–	E10, E12	–	–	–	–	–
	Small Display (lines)		4	4	4	2	4	4	4	6	4	8	8	8	6	6
	Large, graphical Display (Pixel)		–	–	–	–	–	–	–	–	–	320x240	320x240	320x240	–	–
	Push Buttons		7	5	5	7	5	11	11	10	17	9	9	9	9	9
	Key Switch		–	–	–	–	–	–	–	–	–	–	●	●	–	–
	LEDs (max.)		10	10	10	9	10	19	19	32	19	82	82	82	10	10
	Conformal Coating		–	–	–	–	–	–	–	–	–	■	■	■	–	–
	Pluggable terminal blocks		■	–	–	–	–	–	–	■	–	■	■	■	■	■
	PSU Variants		DC 24-60; AC/DC 60-240	AC115-230; DC 24-250	AC115-230; DC 24-250	–	DC 24-60; AC/DC 60-240	AC115-230; DC 24-250	AC115-230; DC 24-250	DC 24-48; DC 60-250/ AC 115-232	AC115-230; DC 24-250	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Generator and motor protection				Transformer protection							
		Device series	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	Reyrolle
														
ANSI	**Function**	**Abbr.**	**7UM61**	**7UM62**	**7SR105**	**7SR17**	**7UT82**	**7UT85**	**7UT86**	**7UT87**	**7UT612**	**7UT613**	**7UT63**	**7SR242**
	Further Functions													
	Measured values		■	■	■	■	■	■	■	■	■	■	■	■
	Switching-statistic counters		■	■	■	■	■	■	■	■	■	■	■	■
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	–	–	■	■	■	■	■	■	–	–	–	–
	Logic editor		■	■	■	■	■	■	■	■	■	■	■	■
	Inrush-current detection		–	●	–	–	■	■	■	■	■	■	■	■
	External trip initiation		■	■	■	■	■	■	■	■	■	■	■	■
	Control		■	■	■	■	■	■	■	■	■	■	■	■
	High Speed busbar transfer function		–	–	–	–	–	–	–	–	–	–	–	–
	Fault recording of analog and binary signals		■	■	■	■	■	■	■	■	■	■	■	■
	Extended fault recording		–	–	–	–	–	–	–	–	–	–	–	–
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–	–	–	–	–
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–	–	–	–	–
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–	–	–	–	–
TR	Trend recorder	TR	–	–	–	–	–	–	–	–	–	–	–	–
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–	–	–	–	–
	Sequence of events recorder	EFR	–	–	1000	1000	–	–	–	–	–	–	–	5000
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–	–	–	–	–
	Frequency tracking groups (from V7.8)		–	–	–	–	–	■	■	■	■	–	–	–
	Cyber Security: Role-based access control (from V7.8)		–	–	–	–	–	●	●	●	●	–	–	–
	Monitoring and supervision		■	■	■	■	■	■	■	■	■	■	■	■
	Protection interface, serial		–	–	–	–	●	■	■	■	–	–	–	–
	No. Setting groups		2	2	2	4	8	8	8	8	4	4	4	8
	Changeover of setting group		■	■	■	■	■	■	■	■	■	■	■	■
	Circuit breaker test		■	–	–	–	■	■	■	■	–	–	–	–
	Hardware Feature													
	Hardware quantity structure expandable	I/O	–	–	–	■	–	■	■	■	–	–	–	■
	Binary Inputs (max)		15	15	6	6	7 [3)]	19 [3)]	23 [3)]	27 [3)]	3	5	29	19
	Binary Outputs (max) incl. Life contact		20	21	6	8	7 [3)]	23 [3)]	34 [3)]	38 [3)]	5	9	25	14
	Internal RTD Inputs (max)		–	–	6 [1)]	8 [1)]	–	–	–	–	–	–	–	–
	Transducer inputs (0 – 20 mA) (max.)		–	–	–	–	8	12	12	12	–	–	–	–
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–	–	–	–	–
	Analog measured value outputs (0 – 20 mA) (max.)		–	4	–	–	–	–	–	–	–	–	–	–
	Current Inputs (max)		4	8	4	4	8 [3)]	8 [3)]	12 [3)]	20 [3)]	7	11	14	8
	Voltage Inputs (max)		4	4	–	3	0 [3)]	0 [3)]	4 [3)]	4 [3)]	–	4	0/4	1
	Low Power CT Inputs		–	–	–	–	–	–	–	–	–	–	–	–
	Low Power VT Inputs		–	–	–	–	–	–	–	–	–	–	–	–
	Case (x19 ")		1/3; 1/2	1/2; 1/1	–	–	1/3	1/3–2/1	1/3–2/1	1/3–2/1	1/3	1/2	1/1	–
	Size (x E)		–	–	4	E4, E6	–	–	–	–	–	–	–	E8, E10
	Small Display (lines)		4	4	4	4	8	8	8	8	4	4	–	4
	Large, graphical Display (Pixel)		–	240x120	–	–	320x240	320x240	320x240	320x240	–	–	240x120	–
	Push Buttons		4	4	7	5	9	9	9	9	4	4	4	5
	Key Switch		–	–	–	–	–	●	●	●	–	–	■	–
	LEDs (max.)		9	9/16	10	10	16	82	82	82	9	16	16	27
	Conformal Coating		–	–	–	–	–	■	■	■	–	–	–	–
	Pluggable terminal blocks		–	–	■	–	■	■	■	■	–	–	–	–
	PSU Variants		DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-60; AC/DC 60-240	AC 115-230; DC 24-250	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	AC 115-230; DC 24-250

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Busbar protection		Bay controller					Merging Unit
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SS85**	**7SS52**	**6MD85**	**6MD86**	**6MD61**	**6MD63**	**6MD66**	**6MU805**
	Further Functions									
	Measured values		■	■	■	■	●	■	■	–
	Switching-statistic counters		■	–	■	■	■	■	■	–
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	■	–	■	■	–	–	–	–
	Logic editor		■	■	■	■	–	■	■	■
	Inrush-current detection		–	–	■	■	–	–	–	–
	External trip initiation		■	■	–	–	–	–	–	–
	Control		■	–	■	■	■	■	■	■
	High Speed busbar transfer function		–	–	–	–	–	–	–	–
	Fault recording of analog and binary signals		■	■	■	■	–	–	●	■
	Extended fault recording		–	–	–	–	–	–	–	–
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–
TR	Trend recorder	TR	–	–	–	–	–	–	–	–
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–
	Sequence of events recorder	EFR	–	–	–	–	–	–	–	–
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–
	Frequency tracking groups (from V7.8)		–	–	■	■	–	–	–	■
	Cyber Security: Role-based access control (from V7.8)		●	–	●	●	–	–	–	●
	Monitoring and supervision		■	■	■	■	■	■	■	■
	Protection interface, serial		●	–	●	●	–	–	–	–
	No. Setting groups		8	1	8	8	4	4	4	4
	Changeover of setting group		■	–	■	■	■	■	■	■
	Circuit breaker test		■	■	■	■	–	–	–	–
	Hardware Feature									
	Hardware quantity structure expandable	I/O	■	■	■	■	–	–	–	–
	Binary Inputs (max)		15 3)	972	59 3)	443 3)	80	37	65	12
	Binary Outputs (max) incl. Life contact		15 3)	370	33 3)	80 3)	54	21	45	8
	Internal RTD Inputs (max)		–	–	–	–	–	–	–	–
	Transducer inputs (0 – 20 mA) (max.)		12	–	12	12	2	2	2	–
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–
	Analog measured value outputs (0 – 20 mA) (max.)		–	–	–	–	–	–	–	–
	Current Inputs (max)		80	192	4 3)	8 3)	4	4	3	4
	Voltage Inputs (max)		16	–	4 3)	8 3)	3	3	4	4
	Low Power CT Inputs		–	–	–	–	–	–	–	–
	Low Power VT Inputs		–	–	–	–	–	–	–	–
	Case (x19 ")		1/2-1/1; 2x1/1 1); 1/1	1/3–1/1	1/3–2/1	1/3–2/1	1/2; 1/1	1/2; 1/1	1/1	–
	Size (x E)		–	–	–	–	–	–	–	–
	Small Display (lines)		8	4	8	8	–	–	–	●
	Large, graphical Display (Pixel)		320x240	–	320x240	320x240	240x120	240x120	240x120	–
	Push Buttons		9	196	9	9	4	4	4	●
	Key Switch		●	–	●	●	–	■	■	–
	LEDs (max.)		82	898	82	82	16	16	16	32
	Conformal Coating		■	–	■	■	–	–	–	–
	Pluggable terminal blocks		■	–	■	■	–	–	–	■
	PSU Variants		DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Breaker management		Synchronizing			High speed busbar transfer	Voltage and frequency protection		Fault Recorder
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 4	Reyrolle	SIPROTEC 4	SIPROTEC Compact	Reyrolle	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7VK87**	**7VK61**	**7VE85**	**7VE6**	**7SR157**	**7VU683**	**7RW80**	**7SR158**	**7KE85**
	Further Functions										
	Measured values		■	■	■	■	■	■	■	■	■
	Switching-statistic counters		■	■	■	■	■	–	■	■	–
	Circuit breaker wear monitoring	ΣIx, I^2t, 2P	■	–	–	–	–	–	–	–	–
	Logic editor		■	■	■	■	■	■	■	■	■
	Inrush-current detection		■	–	–	–	–	–	–	–	–
	External trip initiation		■	■	■	●	■	–	■	■	–
	Control		■	■	■	■	■	–	■	■	–
	High Speed busbar transfer function		–	–	–	–	–	■	–	–	–
	Fault recording of analog and binary signals		■	■	■	■	■	■	■	■	■
	Extended fault recording		–	–	–	–	–	–	–	–	■
FSR	Fast-scan recorder	FSR	–	–	–	–	–	–	–	–	■
SSR	Slow-scan recorder	SSR	–	–	–	–	–	–	–	–	■
CR	Continuous recorder	CR	–	–	–	–	–	–	–	–	■
TR	Trend recorder	TR	–	–	–	–	–	–	–	–	■
PQR	Power Quality recordings (functionalities)	PQR	–	–	–	–	–	–	–	–	●
	Sequence of events recorder	EFR	–	–	–	–	1000	–	–	1000	■
ExTrFct	Extended trigger functions	ExTrFct	–	–	–	–	–	–	–	–	●
	Frequency tracking groups (from V7.8)		■	–	■	–	–	–	–	–	■
	Cyber Security: Role-based access control (from V7.8)		●	–	●	–	–	–	–	–	●
	Monitoring and supervision		■	■	■	■	■	■	■	■	■
	Protection interface, serial		●	–	●	–	–	–	–	–	–
	No. Setting groups		8	4	8	4	4	4	4	4	–
	Changeover of setting group		■	■	■	■	■	■	■	■	■
	Circuit breaker test		■	–	■	–	–	–	–	–	–
	Hardware Feature										
	Hardware quantity structure expandable	I/O	■	–	■	–	–	–	–	–	■
	Binary Inputs (max)		31 3)	20	27 3)	6/14	6	17	3/7	6	43 3)
	Binary Outputs (max) incl. Life contact		46 3)	19	17 3)	10/18	8	19	6/9	8	33 3)
	Internal RTD Inputs (max)		–	–	–	–	–	–	–	–	–
	Transducer inputs (0 – 20 mA) (max.)		12	–	12	–	–	–	–	–	32 3)
	Transducer inputs (0 – 10 V) (max.)		–	–	–	–	–	–	–	–	32
	Analog measured value outputs (0 – 20 mA) (max.)		–	–	in preparation	4	–	–	–	–	–
	Current Inputs (max)		8 3)	4	4 3)	–	–	8	–	–	36
	Voltage Inputs (max)		8 3)	4	4 3)	6	3	8	3	3	40
	Low Power CT Inputs		–	–	–	–	–	–	–	–	–
	Low Power VT Inputs		–	–	–	–	–	–	–	–	–
	Case (x19 ")		1/3–2/1	1/3–1/2	1/3–2/1	1/3;1/2	–	1/1	1/6	–	1/3–1/1
	Size (x E)		–	–	–	–	E4, E6	–	–	E4, E6	–
	Small Display (lines)		8	4	8	4	4	–	6	4	8
	Large, graphical Display (Pixel)		320x240	–	320x240	240x120	–	240x120	–	–	320x240
	Push Buttons		9	4	9	4	5	4	9	5	9
	Key Switch		●	–	●	–	–	–	–	–	–
	LEDs (max.)		82	9/16	82	9/16	10	16	10	10	82
	Conformal Coating		■	–	■	–	–	–	–	–	■
	Pluggable terminal blocks		■	–	■	–	–	–	■	–	■
	PSU Variants		DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-60; DC 88-250/115V	DC 24-48; DC 60-250/ AC 115-230	DC 24-48; DC 60-250/ AC 115-230	DC 24-60; DC 88-250/115V	DC 24-48; DC 60-250/ AC 115-230

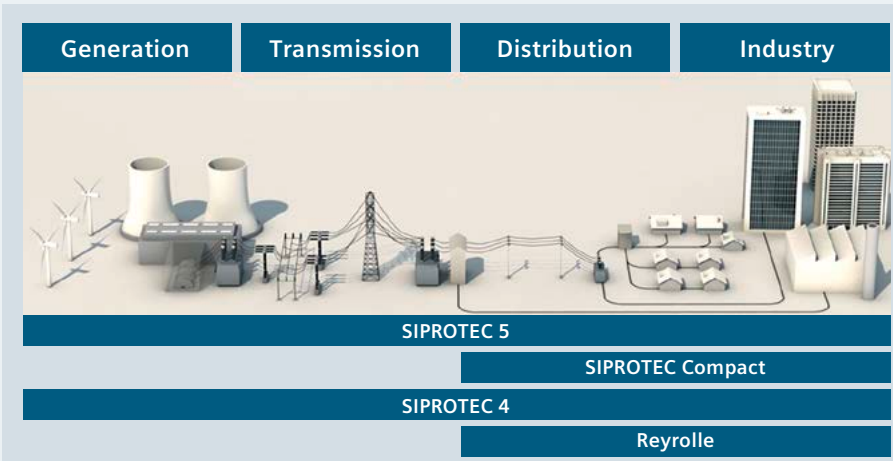
Relay Selection Table to be continued on the following pages

Overview, Relay Selection Table

Communication

Part 4

Siemens Protection Portfolio for all areas of application



Definition of device types based on designation

The devices are easily identified with the aid of a five-digit abbreviation code. The first digit (6 or 7) stands for the classification. The two letters (XX) describe the functionality and the last two digits (YY) identify typical properties.

Overview of the main functions	
	Main functions ↓ XX; Distinguishing features ↓ YY Classification → 6 or 7 XX YY
XX	Main functions
SIPROTEC devices	
KE	Fault recorder
MD	Bay controller
RW	Voltage and frequency protection
SA	Distance protection
SC	Feeder protection
SD	Line differential protection
SJ	Overcurrent protection
SK	Motor protection
SL	Line differential and distance protection
SS	Busbar protection
UM	Generator protection
UT	Transformer protection
VE	Paralleling device
VK	Breaker management
VU	High speed busbar
Reyrolle devices	
SR	New numerical protection
PG	Electromechanical protection

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Distance protection							Line differential protection		
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SA82**	**7SA86**	**7SA87**	**7SA522**	**7SA61**	**7SA63**	**7SA64**	**7SD82**	**7SD86**	**7SD87**
	Communication											
	Front User Interface		■	■	■	■	■	■	■	■	■	■
	IEC 60870-5-101		–	–	–	–	–	–	–	–	–	–
	IEC 60870-5-103		●	●	●	●	●	●	●	●	●	●
	IEC 60870-5-104		●	●	●	–	–	–	–	●	●	●
	Profibus FMS, Slave		–	–	–	●	●	●	●	–	–	–
	Profibus DP, Slave		–	–	–	●	●	●	●	–	–	–
	Modbus TCP		●	●	●	–	–	–	–	●	●	●
	Modbus RTU Slave		–	–	–	–	–	–	–	–	–	–
	PROFINET I/O		●	●	●	–	–	–	–	●	●	●
	DNP3 serial		●	●	●	●	●	●	●	●	●	●
	DNP3 TCP		●	●	●	–	–	–	–	●	●	●
	IEC 61850-8-1		●	●	●	●	●	●	●	●	●	●
	IEC 61850-9-2		●	●	●	–	–	–	–	–	●	●
	DIGSI		■	■	■	●	●	●	●	■	■	■
	RTD-unit connection		●	●	●	–	–	–	–	●	●	●
	20 mA unit connection		●	●	●	–	–	–	–	●	●	●
	Protection Interface (PI)		●	●	●	●	●	●	●	●	●	●
	Synchrophasor (IEEE C37.118)		●	●	●	–	–	–	–	●	●	●
	Redundancy Protocols		●	●	●	●	●	●	●	●	●	●
	RSTP (Ethernet ring redundancy)		●	●	●	●	●	●	●	●	●	●
	PRP V1 (Parallel Redundancy Protocol)		●	●	●	●	●	●	●	●	●	●
	HSR (High available Seamless Ring configuration)		●	●	●	●	●	●	●	●	●	●
	Further Ethernet protocols on Ethernet modules		●	■	■	●	●	●	●	●	■	■
	Time Synchronisation		■	■	■	■	■	■	■	■	■	■
	IEEE 1588 C37.238 profile (PSRC - profile)		●	●	●	–	–	–	–	●	●	●
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Line differential protection					Combined line differential and distance protection			High impedance protection	
		Device series	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	Reyrolle	Reyrolle
ANSI	**Function**	**Abbr.**	**7SD80**	**7SD610**	**7SD5**	**7PG2111**	**7SR18**	**7SL82**	**7SL86**	**7SL87**	**7SR23**	**7PG23**
	Communication											
	Front User Interface		■	■	■	–	■	■	■	■	■	–
	IEC 60870-5-101		–	–	–	–	–	–	–	–	–	–
	IEC 60870-5-103		●	●	●	–	■	●	●	●	■	–
	IEC 60870-5-104		–	–	–	–	–	●	●	●	–	–
	Profibus FMS, Slave		–	●	●	–	–	–	–	–	–	–
	Profibus DP, Slave		●	●	●	–	–	–	–	–	–	–
	Modbus TCP		–	–	–	–	–	●	●	●	–	–
	Modbus RTU Slave		●	●	–	–	■	–	–	–	■	–
	PROFINET I/O		–	–	–	–	–	●	●	●	–	–
	DNP3 serial		●	●	●	–	■	●	●	●	■	–
	DNP3 TCP		–	–	–	–	–	●	●	●	–	–
	IEC 61850-8-1		●	●	●	–	●	●	●	●	●	–
	IEC 61850-9-2		–	–	–	–	–	●	●	●	–	–
	DIGSI		●	●	●	–	–	■	■	■	–	–
	RTD-unit connection		–	–	–	–	–	●	●	●	–	–
	20 mA unit connection		–	–	–	–	–	●	●	●	–	–
	Protection Interface (PI)		–	●	●	–	■	●	●	●	–	–
	Synchrophasor (IEEE C37.118)		–	–	–	–	–	●	●	●	–	–
	Redundancy Protocols		●	●	●	–	●	●	●	●	●	–
	RSTP (Ethernet ring redundancy)		●	●	●	–	●	●	●	●	●	–
	PRP V1 (Parallel Redundancy Protocol)		●	●	●	–	●	●	●	●	●	–
	HSR (High available Seamless Ring configuration)		●	●	●	–	●	●	●	●	●	–
	Further Ethernet protocols on Ethernet modules		●	●	●	–	–	■	■	■	–	–
	Time Synchronisation		●	●	●	–	●	■	■	■	■	–
	IEEE 1588 C37.238 profile (PSRC - profile)		–	–	–	–	–	●	●	●	–	–
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection									
		Device series	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4
ANSI	**Function**	**Abbr.**	**7SJ82**	**7SJ85**	**7SJ86**	**7SJ80**	**7SJ81**	**7SJ61**	**7SJ62**	**7SJ63**	**7SJ64**	**7SJ66**
	Communication											
	Front User Interface		■	■	■	■	■	■	■	■	■	■
	IEC 60870-5-101		–	–	–	–	–	–	–	–	–	–
	IEC 60870-5-103		●	●	●	●	●	●	●	●	●	●
	IEC 60870-5-104		●	●	●	●	–	–	–	–	–	–
	Profibus FMS, Slave		–	–	–	–	–	●	●	●	●	–
	Profibus DP, Slave		–	–	–	●	●	●	●	●	●	–
	Modbus TCP		●	●	●	●	–	–	–	–	–	–
	Modbus RTU Slave		–	–	–	●	●	●	●	●	●	●
	PROFINET I/O		●	●	●	●	–	●	●	–	●	–
	DNP3 serial		●	●	●	●	●	●	●	●	●	–
	DNP3 TCP		●	●	●	●	–	●	●	–	●	–
	IEC 61850-8-1		●	●	●	●	●	●	●	●	●	●
	IEC 61850-9-2		–	●	●	–	–	–	–	–	–	–
	DIGSI		■	■	■	●	●	●	●	●	●	●
	RTD-unit connection		●	●	●	–	–	●	●	●	●	●
	20 mA unit connection		●	●	●	–	–	●	●	●	●	●
	Protection Interface (PI)		●	●	●	–	–	–	–	–	–	–
	Synchrophasor (IEEE C37.118)		●	●	●	–	–	–	–	–	–	–
	Redundancy Protocols		●	●	●	●	●	●	●	●	●	–
	RSTP (Ethernet ring redundancy)		●	●	●	●	●	●	●	●	●	●
	PRP V1 (Parallel Redundancy Protocol)		●	●	●	●	●	●	●	●	●	●
	HSR (High available Seamless Ring configuration)		●	●	●	●	●	●	●	●	●	–
	Further Ethernet protocols on Ethernet modules		●	●	●	●	●	●	●	●	●	●
	Time Synchronisation		■	■	■	●	●	■	■	■	■	■
	IEEE 1588 C37.238 profile (PSRC - profile)		●	●	●	–	–	–	–	–	–	–
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Overcurrent and feeder protection							Feeder automation		Generator and motor protection				
		Device series	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	Reyrolle	SIPROTEC Compact	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC Compact	SIPROTEC Compact
ANSI	**Function**	**Abbr.**	**7SR10**	**7SR11**	**7SR12**	**7SR45**	**7SR191**	**7SR210**	**7SR220**	**7SC80**	**7SR224**	**7SK82**	**7SK85**	**7UM85**	**7SK80**	**7SK81**
	Communication															
	Front User Interface		■	■	■	■	■	■	■	■	■	■	■	■	■	■
	IEC 60870-5-101		–	–	–	–	–	–	–	–	●	–	–	–	–	–
	IEC 60870-5-103		■	■	■	–	■	■	■	–	■	●	●	●	●	●
	IEC 60870-5-104		–	–	–	–	–	–	–	●	–	●	●	●	●	–
	Profibus FMS, Slave		–	–	–	–	–	–	–	–	–	–	–	–	–	–
	Profibus DP, Slave		–	–	–	–	–	–	–	–	–	–	–	–	●	●
	Modbus TCP		–	–	–	–	–	–	–	–	–	●	●	●	●	–
	Modbus RTU Slave		■	■	■	–	■	■	■	–	■	–	–	–	●	●
	PROFINET I/O		–	–	–	–	–	–	–	●	–	●	●	●	●	–
	DNP3 serial		■	■	■	–	■	■	■	●	■	●	●	●	●	●
	DNP3 TCP		–	–	–	–	–	–	–	●	–	●	●	●	●	–
	IEC 61850-8-1		–	–	–	–	–	●	●	●	●	●	●	●	●	●
	IEC 61850-9-2		–	–	–	–	–	–	–	–	–	–	●	●	–	–
	DIGSI		–	–	–	–	–	–	–	●	–	■	■	■	●	●
	RTD-unit connection		–	–	–	–	–	–	–	–	–	●	●	●	●	●
	20 mA unit connection		–	–	–	–	–	–	–	–	–	●	●	●	–	●
	Protection Interface (PI)		–	–	–	–	–	–	–	–	–	●	●	●	–	–
	Synchrophasor (IEEE C37.118)		–	–	–	–	–	–	–	–	–	●	●	●	–	–
	Redundancy Protocols		–	●	●	–	● 1)	●	●	●	●	●	●	●	●	●
	RSTP (Ethernet ring redundancy)		–	●	●	–	● 1)	●	●	●	●	●	●	●	●	●
	PRP V1 (Parallel Redundancy Protocol)		–	●	●	–	● 1)	●	●	●	●	●	●	●	●	●
	HSR (High available Seamless Ring configuration)		–	●	●	–	● 1)	●	●	●	●	●	●	●	●	●
	Further Ethernet protocols on Ethernet modules		–	–	–	–	–	–	–	●	–	●	●	●	●	●
	Time Synchronisation		■	■	■	–	■	■	■	●	■	■	■	■	■	■
	IEEE 1588 C37.238 profile (PSRC - profile)		–	–	–	–	–	–	–	–	–	●	●	●	–	–
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	●	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Generator and motor protection				Transformer protection							
		Device series	SIPROTEC 4	SIPROTEC 4	Reyrolle	Reyrolle	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	Reyrolle
ANSI	**Function**	**Abbr.**	**7UM61**	**7UM62**	**7SR105**	**7SR17**	**7UT82**	**7UT85**	**7UT86**	**7UT87**	**7UT612**	**7UT613**	**7UT63**	**7SR242**
	Communication													
	Front User Interface		■	■	■	■	■	■	■	■	■	■	■	■
	IEC 60870-5-101		–	–	–	–	–	–	–	–	–	–	–	–
	IEC 60870-5-103		●	●	■	■	●	●	●	●	●	●	●	■
	IEC 60870-5-104		–	–	–	–	●	●	●	●	–	–	–	–
	Profibus FMS, Slave		–	–	–	–	–	–	–	–	●	●	●	–
	Profibus DP, Slave		●	●	–	–	–	–	–	–	●	●	●	–
	Modbus TCP		–	–	–	–	●	●	●	●	–	–	–	–
	Modbus RTU Slave		●	●	■	■	–	–	–	–	●	●	●	■
	PROFINET I/O		–	–	–	–	●	●	●	●	–	–	–	–
	DNP3 serial		●	●	■	■	●	●	●	●	●	●	●	■
	DNP3 TCP		–	–	–	–	●	●	●	●	–	–	–	–
	IEC 61850-8-1		●	●	–	–	●	●	●	●	●	●	●	●
	IEC 61850-9-2		–	–	–	–	–	●	●	●	–	–	–	–
	DIGSI		●	●	–	–	■	●	●	●	●	●	●	–
	RTD-unit connection		●	●	–	●	●	●	●	●	●	●	●	–
	20 mA unit connection		●	●	–	–	●	●	●	●	●	●	●	–
	Protection Interface (PI)		–	–	–	–	●	●	●	●	–	–	–	–
	Synchrophasor (IEEE C37.118)		–	–	–	–	●	●	●	●	–	–	–	–
	Redundancy Protocols		●	●	–	● [1]	●	●	●	●	●	●	●	●
	RSTP (Ethernet ring redundancy)		●	●	–	● [1]	●	●	●	●	●	●	●	●
	PRP V1 (Parallel Redundancy Protocol)		●	●	–	● [1]	●	●	●	●	●	●	●	●
	HSR (High available Seamless Ring configuration)		●	●	–	● [1]	●	●	●	●	●	●	●	●
	Further Ethernet protocols on Ethernet modules		●	●	–	–	●	●	●	●	●	●	●	–
	Time Synchronisation		■	■	■	■	■	■	■	■	■	■	■	■
	IEEE 1588 C37.238 profile (PSRC - profile)		–	–	–	–	●	●	●	●	–	–	–	–
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	–	–	–	–	–

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Busbar protection		Bay controller					Merging Unit
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 5	SIPROTEC 4	SIPROTEC 4	SIPROTEC 4	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7SS85**	**7SS52**	**6MD85**	**6MD86**	**6MD61**	**6MD63**	**6MD66**	**6MU805**
	Communication									
	Front User Interface		■	■	■	■	■	■	■	■
	IEC 60870-5-101		–	–	–	–	–	–	–	–
	IEC 60870-5-103		●	●	●	●	●	●	●	–
	IEC 60870-5-104		●	–	●	●	–	–	–	–
	Profibus FMS, Slave		–	–	–	–	●	●	●	–
	Profibus DP, Slave		–	–	–	–	●	●	●	–
	Modbus TCP		–	–	●	●	–	–	–	–
	Modbus RTU Slave		–	–	–	–	●	●	–	–
	PROFINET I/O		●	–	●	●	–	–	–	–
	DNP3 serial		●	–	●	●	–	●	●	–
	DNP3 TCP		●	–	●	●	–	–	–	–
	IEC 61850-8-1		●	●	●	●	●	●	●	■
	IEC 61850-9-2		●	–	●	●	–	–	–	■
	DIGSI		●	●	●	●	●	●	●	■
	RTD-unit connection		–	–	●	●	–	–	●	–
	20 mA unit connection		–	–	●	●	–	–	●	–
	Protection Interface (PI)		●	–	●	●	–	–	–	–
	Synchrophasor (IEEE C37.118)		●	–	●	●	–	–	–	–
	Redundancy Protocols		●	●	●	●	●	●	●	■
	RSTP (Ethernet ring redundancy)		●	●	●	●	●	●	●	■
	PRP V1 (Parallel Redundancy Protocol)		●	●	●	●	●	●	●	■
	HSR (High available Seamless Ring configuration)		●	●	●	●	●	●	●	■
	Further Ethernet protocols on Ethernet modules		●	●	●	●	●	●	●	■
	Time Synchronisation		■	■	■	■	■	■	■	■
	IEEE 1588 C37.238 profile (PSRC - profile)		●	–	●	●	–	–	–	–
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	●

Overview, Relay Selection Table

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

1) in preparation
2) via CFC
3) = IO number of a standard variant (increased configuration available using the SIPROTEC 5 system) / number of current and voltage inputs up to 40

			Breaker management		Synchronizing			High speed busbar transfer	Voltage and frequency protection		Fault Recorder
		Device series	SIPROTEC 5	SIPROTEC 4	SIPROTEC 5	SIPROTEC 4	Reyrolle	SIPROTEC 4	SIPROTEC Compact	Reyrolle	SIPROTEC 5
ANSI	**Function**	**Abbr.**	**7VK87**	**7VK61**	**7VE85**	**7VE6**	**7SR157**	**7VU683**	**7RW80**	**7SR158**	**7KE85**
	Communication										
	Front User Interface		■	■	■	■	■	■	■	■	■
	IEC 60870-5-101		–	–	–	–	–	–	–	–	–
	IEC 60870-5-103		●	●	●	●	■	●	●	■	–
	IEC 60870-5-104		●	–	●	–	–	–	–	–	–
	Profibus FMS, Slave		–	●	–	–	–	–	–	–	–
	Profibus DP, Slave		–	●	–	●	–	●	●	–	–
	Modbus TCP		●	–	●	–	–	–	–	–	–
	Modbus RTU Slave		–	–	–	●	■	●	●	■	–
	PROFINET I/O		●	–	●	–	–	–	–	–	–
	DNP3 serial		●	●	●	●	–	●	●	–	–
	DNP3 TCP		●	–	●	–	–	–	–	–	–
	IEC 61850-8-1		●	●	●	●	–	●	●	–	■
	IEC 61850-9-2		●	–	●	–	–	–	–	–	●
	DIGSI		●	●	■	●	–	●	●	–	■
	RTD-unit connection		●	–	●	–	–	–	–	–	–
	20 mA unit connection		●	–	●	–	–	–	–	–	–
	Protection Interface (PI)		●	–	●	–	–	–	–	–	–
	Synchrophasor (IEEE C37.118)		●	–	●	–	–	–	–	–	●
	Redundancy Protocols		●	●	●	●	● 1)	●	●	● 1)	●
	RSTP (Ethernet ring redundancy)		●	●	●	●	● 1)	●	●	● 1)	●
	PRP V1 (Parallel Redundancy Protocol)		●	●	●	●	● 1)	●	●	● 1)	●
	HSR (High available Seamless Ring configuration)		●	●	●	●	● 1)	●	●	● 1)	●
	Further Ethernet protocols on Ethernet modules		●	●	●	●	–	●	●	–	●
	Time Synchronisation		■	■	■	■	■	■	●	■	■
	IEEE 1588 C37.238 profile (PSRC - profile)		●	–	●	–	–	–	–	–	●
	Timesync. via integrated GPS module		–	–	–	–	–	–	–	–	–

Indication of conformity

CE This product complies with the directive of the Council of the European Communities on harmonization of the laws of the Member States relating to electromagnetic compatibility (EMC Council Directive 2004/108/EC) and concerning electrical equipment for use within specified voltage limits (Low Voltage Directive 2006/95/EC).

This conformity has been proved by tests performed according to the Council Directive in accordance with the generic standards EN 61000-6-2 and EN 61000-6-4 (for EMC directive) and with the standard EN 60255-27 (for Low Voltage Directive) by Siemens AG.

The device is designed and manufactured for application in an industrial environment.

The product conforms with the international standards of IEC 60255 and the German standard VDE 0435.

Disclaimer of liability

This document has been subjected to rigorous technical review before being published. It is revised at regular intervals, and any modifications and amendments are included in the subsequent issues. The content of this document has been compiled for information purposes only. Although Siemens AG has made best efforts to keep the document as precise and up-to-date as possible, Siemens AG shall not assume any liability for defects and damage which result through use of the information contained herein.

This content does not form part of a contract or of business relations; nor does it change these. All obligations of Siemens AG are stated in the relevant contractual agreements.

Siemens AG reserves the right to revise this document from time to time.

Document version: 07

Release status: 10.2018

Copyright

Copyright © Siemens AG 2018. All rights reserved.

The disclosure, duplication, distribution and editing of this document, or utilization and communication of the content are not permitted, unless authorized in writing. All rights, including rights created by patent grant or registration of a utility model or a design, are reserved.

Registered trademarks

SIPROTEC and DIGSI are registered trademarks of Siemens AG. Any unauthorized use is illegal. All other designations in this document can be trademarks whose use by third parties for their own purposes can infringe the rights of the owner.

Notes

Published by
Siemens AG 2018

Energy Management Division
Digital Grid
Automation Products
Humboldtstr. 59
90459 Nuremberg, Germany

www.siemens.com/protection

For more information,
please contact our
Customer Support Center.
Tel.: +49 180 524 7000
Fax: +49 180 524 2471
(Charges depending on provider)
E-mail: support.energy@siemens.com

Article No. EMDG-C10065-02-7600
Printed in Germany
Dispo 06200
PU184/4819 WS 11181.0

© 2018 Siemens. Subject to changes and errors.

The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

For all products using security features of OpenSSL the following shall apply:
This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit. (http://www.openssl.org)
This product includes cryptographic software written by Eric Young (eay@cryptsoft.com)
This product includes software written by Tim Hudson (tjh@cryptsoft.com)
This product includes software developed by Bodo Moeller.