SPRECON®-E-P DS..6-SERIES
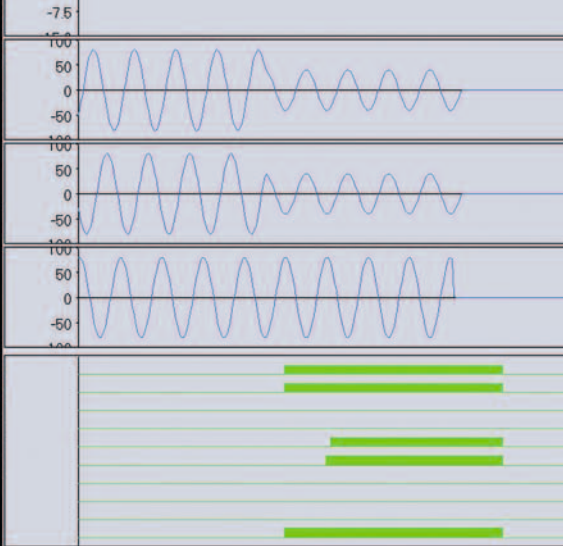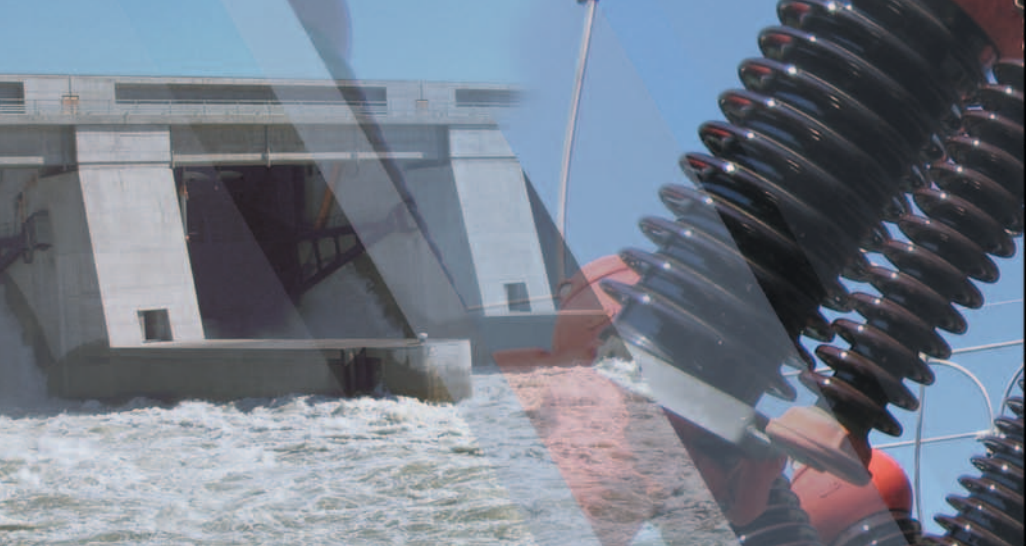
PROTECTION DEVICES AND COMBINED PROTECTION AND CONTROL DEVICES WITH OVERCURRENT-TIME PROTECTION

sprecher automation

SPRECON-E-P DS..6-SERIES

INTRODUCTION

The overcurrent-time protection acts as the main protection function. The devices include standardised hardware modules and firmware. They all provide protection functions of the same range. The series consists of:

- SPRECON-E-P DS..6-1 (Protection device)
- SPRECON-E-P DS..6-2 (One-box solutions with combined protection and control)

One-box solutions are distinguished from protection devices by additional control functions. Beside typical protection functions and measured-value collection, protection devices also feature control of circuit-breakers. The one-box solutions allow protection and measurement as well as control and monitoring of secondary systems.

The multifunctional SPRECON-E-P devices feature a clear separation of control and protection functions which allows either combined or separated operations of control and protection functions:

- Separated data models
- Separated control and protection firmware
- Separated control and protection configuration
- Separated passwords
- No testing of protection function at feeder nor primary circuit disconnection required on updating control parameters or firmware

RANGE OF FUNCTIONS

The devices are accentuated by a technologically fully developed and commercially optimised design. They allow realisations of sophisticated and compact solutions with clear economical benefits through highest possible flexibility and scalability.
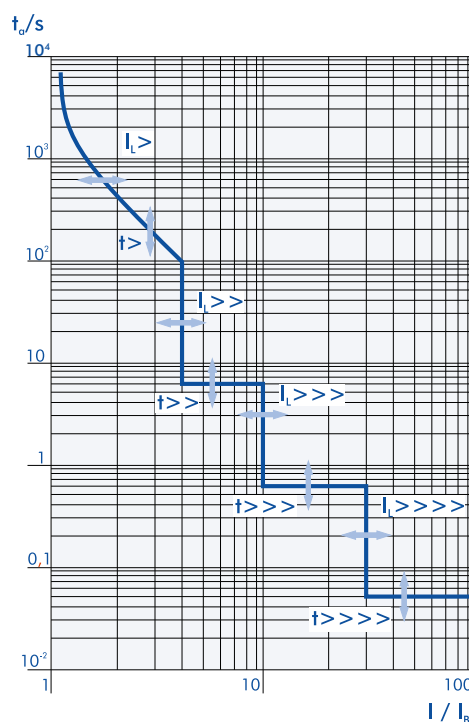
Tripping characteristics (overcurrent-time protection)

AREAS OF APPLICATION

Due to the wide range of implemented protection and control functions, the SPRECON-E-P devices can be used for various protection and control applications. They can be therefore applied to all switchbay types, independent of customer-specific requirements.

The implemented protection functions allow selective protection of one-end and two-end fed lines (underground and overhead lines), transformers and motors, concerning all neutral-point connections. Motor protection completes the functions.

The devices are especially qualified for the following application areas due to their multi-faceted functions:

- One-box solutions for utilities (MV)
- Bay computers with back-up protection (HV)
- Industrial switchgears

Application of modern technologies prevent functions from influencing each other in the devices, through which independence of the various tasks is achieved.

CONFIGURATION

All functions can be configured separately. By separating protection configuration from control configuration, all different kinds of requirements of different applications can be met.
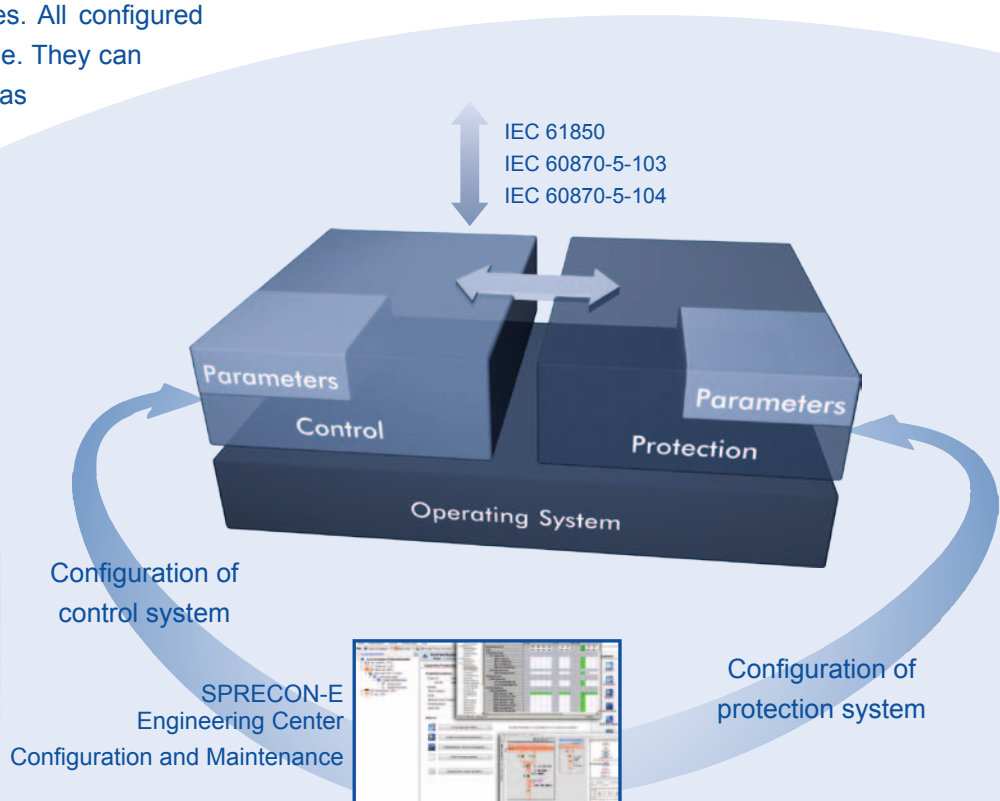
The protection-specific functions are separately configured or deactivated depending on the respective application. Irrelevant functions are hidden and inactive which allows simple and structured configuration of the devices. All configured bays are type-oriented stored in a database. They can be therefore copied and re-used as well as easily re-adapted, which facilitates configuration of large-scale systems.

OPERATING

In order to meet the requirements of efficient system management, all operations can be accomplished with the detachable HMI control panel. Hence, protection configurations can be locally carried out beside usage of the operating program "COMM-3".

All relevant information about processes and devices is shown on the full-graphical display of the control panel. Additionally, configurable LEDs are available for signalling.

Separated navigation keys allow clear user guidance through the various pages and submenus. Furthermore, they facilitate simple configuration of extensive protection and control functions.

IEC 61850
IEC 60870-5-103
IEC 60870-5-104

Parameters

Control

Parameters

Protection

Operating System

Configuration of control system

Configuration of protection system

SPRECON-E
Engineering Center
Configuration and Maintenance

Principle of consequent separation of protection and control

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Dimensions & Weight

- Dimensions: 212x176x257mm (WxHxD) incl. connections
- Weight: < 6kg

General Functions

- Remote maintenance and configuration
- Time synchronisation via DCF77, GPS, station and remote control

Communication

- IEC 60870-5-101/-103/-104, IEC 61850
- RS232, RS422/485, fibre-optic, 10/100 Mbit Ethernet
- 2 additional optical Ethernet interfaces for redundant ring
- Connection via leased or dialup line
- Wireless communication with external modem
- Integration of stand-alone devices via station bus

Implemented Protection Functions	Reference IEEE C37.2	Reference IEC 61850-7-4	Type DS6 $3 \times I_L$, $1 \times I_E$	Type DSE6 $3 \times I_L$, $1 \times I_E$, $1 \times U_{NE}$	Type DSR6 $3 \times I_L$, $3 \times U$	Type DSRE6 $3 \times I_L$, $1 \times I_E$, $3 \times U$	Type DSREY6 $3 \times I_L$, $1 \times I_E$, $4 \times U$
Overcurrent protection							
$I_L >$ DT/IDMT, four stages	50, 51	PIOC, PTOC	x	x	x	x	x
Correction for zero current for IL > DT/IDMT				x	x		x	x
$I_E >$ DT/IDMT, four stages	50N, 51N, 51Ns	PIOC, PTOC	x	x	x	x	x
differential protection for $I_E >$ DT/IDMT	87N	PDIF	x	x		x	x
Switch on protection (SOTF)	50, 50N	PIOC	x	x	x	x	x
Inrush restraint		PHAR	x	x	x	x	x
Short circuit direction decision	67	PDOC, RDIR			x	x	x
Directional earth fault (in earthed systems)	67N	PTOC			x	x	x
Phase selective earth fault detection	64	PHIZ			x	x	x
Earth fault direction decision (admittance method)	67Ns	PSDE		x		x	x
Capture of ext. earth fault direction annunciation		(PTEF, PSDE)	x	x	x	x	x
Auto-reclosing (AR)	79	RREC	3-pole	3-pole	3-pole	3-pole	3-pole
Teleprotection (TP)	85	PSCH	(x)	(x)	x	x	x
Overvoltage (U>, U_{NE}>), two stages each	59, 59N	PTOV		U_{NE}>	x	x	x
Undervoltage (U<), two stages	27	PTUV			x	x	x
Frequency protection (f< four stages, f>two stages)	81	PTUF, PTOF			x	x	x
Directional power protection (P, Q), 2x2 stages	32	PDOP, (PDUP)			x	x	x
Reactive power-undervoltage protection (Q-V<)					x	x	x
Active power direction-dependent frequency load shedding (FLS), six stages					x	x	x
Negative sequence system $I_{neg}>$	46	PTOC	x	x	x	x	x
Overload protection for phases/neutral earthing transformer	49/49N	PTTR	x	x	x	x	x
Temperature protection	49	STMP	Option	Option	Option	Option	Option
Starting protection (motor protection) Locked rotor (motor protection)	49R, 66, 48, 51LR	PMRI, PMSS	x	x	x	x	x
Underload-protection (motor protection)	37	PTUC	x	x	x	x	x
Reclosing lockout	86	PMRI	x	x	x	x	x
Circuit breaker failure protection (CBF)	50BF	PTOC, RBRF	x	x	x	x	x
Automatic synchronizer	25	RSYN					x
Current annunciation stages (2x $I_{L>an}$, 2x $I_{E>an}$)				x	x	x	x
CB-TRIP by an external signal		(PTRC)	x	x	x	x	x
Fault locator (FL)	21FL	RFLO			x	x	x
Phase-sequence reversal			x	x	x	x	x
Pulse shaper stage (programmable logic)			x	x	x	x	x
Trip circuit supervision	74TC		x	x	x	x	x
Parameter sets			4	4	4	4	4
Logic + time stages for optocoupler inputs			x	x	x	x	x
Virtual binary inputs/control inputs			15/15	15/15	15/15	15/15	15/15
Logic + hold time for output relays			x	x	x	x	x
Measurands, short report			x	x	x	x	x
Event logging, non-volatile		RDRE	x	x	x	x	x
Disturbance data recording, non-volatile		RADR, RBDR	x	x	x	x	x
Statistics			x	x	x	x	x
Measurand checks, self supervision			x	x	x	x	x
Assistance for test and putting into operation			x	x	x	x	x

Additional Protection Functions

- Phase preference for double earth faults
- Pulse shaper stages
- Separation of protection data from control data
- Nominal current selection (1/5 A) via terminal connection
- Settings via control panel and PC through menu-assisted plain-text messaging

Control Functions

- Control and monitoring of switching devices and process elements
- Power output with high making/breaking capacity (option)
- Command output either directly or by SBO (select before operate)
- Control of transformer tap changers or Petersen coils
- Switching device interlocking
- Threshold value monitoring
- Maximum value calculation (non-return pointer)
- Configurable transmission modes for measured values
- Metered value capturing
- Event recording

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