SPRECON®-E-P DQ..6-SERIES
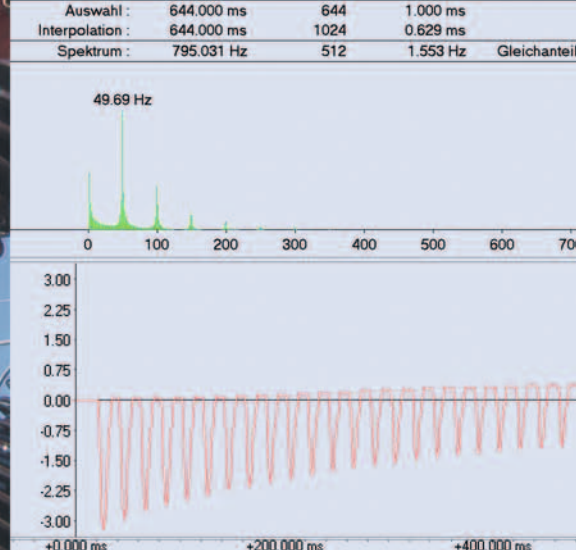
PROTECTION DEVICES AND COMBINED PROTECTION AND CONTROL DEVICES WITH TRANSFORMER DIFFERENTIAL PROTECTION

sprecher automation

Auswahl :	644.000 ms	644	1.000 ms
Interpolation :	644.000 ms	1024	0.629 ms
Spektrum :	795.031 Hz	512	1.553 Hz	Gleichanteil

49.69 Hz

0   100   200   300   400   500   600   70

3.00
2.25
1.50
0.75
0.00
-0.75
-1.50
-2.25
-3.00

+0.000 ms   +200.000 ms   +400.000 ms

SPRECON-E-P DQ..6-Series

Introduction

SPRECON-E-P DQ..6 devices provide differential protection for transformers. The devices include standardised hardware modules and firmware. They all provide protection functions of the same range. The series consists of:

- SPRECON-E-P DQ..6-1 (Protection device)

- SPRECON-E-P DQ..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.

Idiff / Inos

Tripping

Blocking

Istab / Inos

Current stabilised differential protection
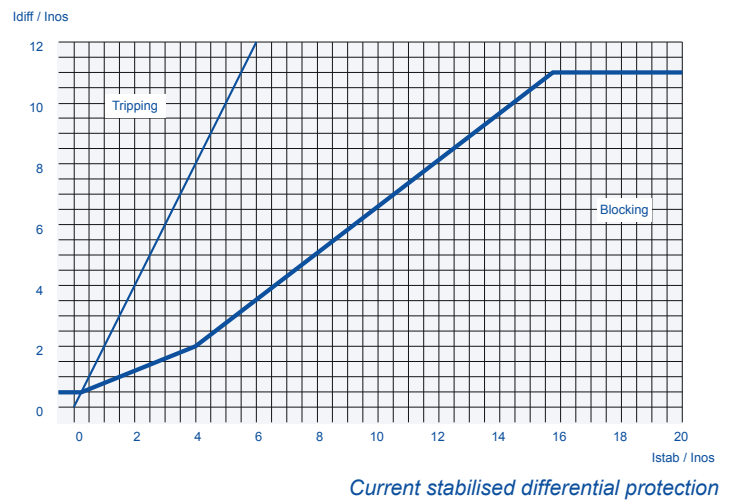
Areas of Application

The SPRECON-E-P DQ..6 devices are multifunctional devices for protection, control and automation of energy stations. They can be applied as main protection units of transformers in different neutral-point connections at medium or high voltage levels.

In addition to the characteristic-stabilised differential protection for phase currents, SPRECON-E-P DQ..6 also comes with characteristic-stabilised ground differential protection, zero-sequence filtering, inrush and overexcitation stabilisation as well as overcurrent protection per winding. Furthermore, motor protection, a thermal image as well as overvoltage and undervoltage protection secure the use within medium voltage motor applications.
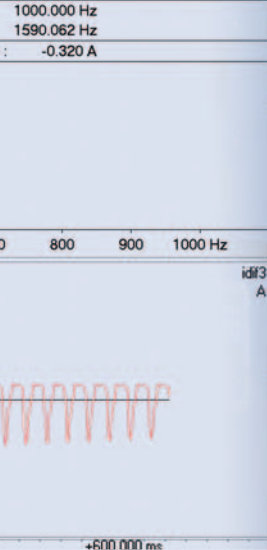
The implementation of standard and proprietary protocols allows close collaboration with controlling systems of various manufacturers. All necessary protection and control functions are integrated in the devices.

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.
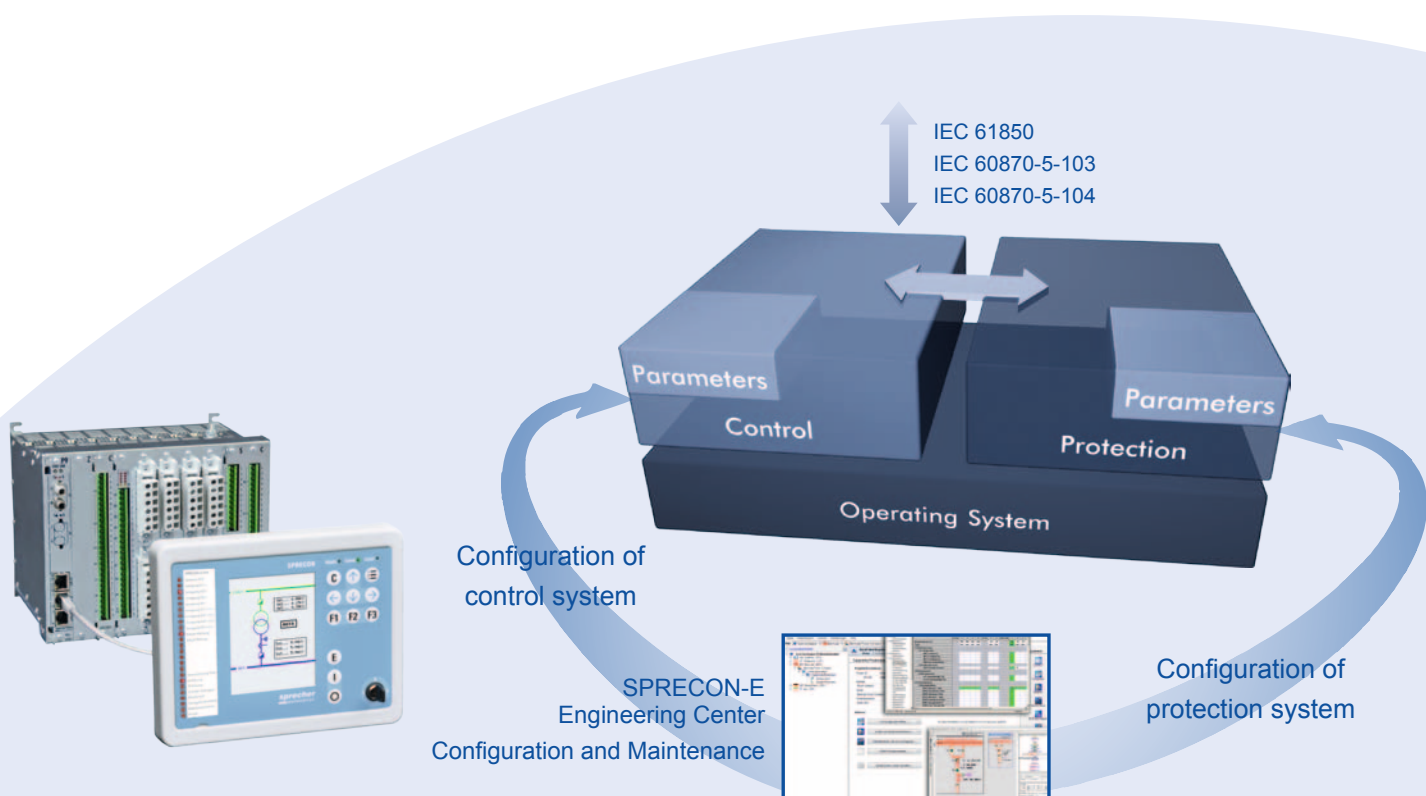
All configured bays are type-oriented stored in a database. They can be therefore copied and re-used as well as easily re-adapted, which facilitates configuration of large-scale systems.

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

SPRECON-E
Engineering Center
Configuration and Maintenance

Configuration of protection system

Principle of consequent separation of protection and control

sprecher automation

SPRECON-E-P DQ..6 – TECHNICAL DATA (EXCERPT)

sprecher *automation*

DIMENSIONS & WEIGHT
- Dimensions: 212x176x257mm (WxHxD) incl. connections
- Weight: < 7kg

GENERAL FUNCTIONS
- Remote maintenance and configuration
- Time synchronisation (DCF77, GPS, station & remote control)

COMMUNICATION
- IEC 60870-5-103/-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 (external GSM or wireless modem)
- Integration of stand-alone devices via station bus (counter, metering devices, protection relays, AVR, Petersen coil controller, etc.)

IMPLEMENTED PROTECTION FUNCTIONS	Reference		Type						
	IEEE C37.2	IEC 61850-7-4	D2Q6		D2QU6	D3Q6		D3QU6	
Number of current and voltage inputs			7I	8I	7I+1U	11I	12I	10I+1U	11I+1U
Neutral-Point current sensitivity			1x	1x/1x or 1x/20x	1x	1x/1x or 1x/20x	1x/1x/20x	1x	1x/1x or 1x/20x
Differential protection, number of ends	87T	PDIF	2	2	2	3	3	3	3
Ground differential protection, number of ends	87N	PDIF	1	2	1	2	2	1	2
Switch on protection (SOTF, SOP)	50, 50N	PIOC	x	x	x	x	x	x	x
Amplitude and vector group matching			x	x	x	x	x	x	x
Zero-sequence filtering			x	x	x	x	x	x	x
Phase-rotation adaption			x	x	x	x	x	x	x
I_L>DT/IDMT, three stages per end, number of ends	50, 51	PTOC	2	2	2	3	3	3	3
I_E>DT/IDMT, three stages per end, number of ends	50N,51N, 51Ns	PTOC	2	2	2	3	3	3	3
Inrush restraint		PHAR	x	x	x	x	x	x	x
Overvoltage protection (U>), two stages*	59	PTOV			x			x	x
Undervoltage protection (U<), two stages*	27	PTUV			x			x	x
Frequency protection (f< four stages, f>two stages)*	81	PTUF, PTOF			x			x	x
Negative sequence protection I_{neg}>, three stages, assignable to end	46	PTOC	x	x	x	x	x	x	x
Overload protection (2 images, assignable to end)	49, 49N	PTTR	x	x	x	x	x	x	x
Starting protection, locked rotor protection (motor protection), assignable to end*	49R, 66, 48, 51LR	PMRI/PMSS	x	x	x	x	x	x	x
Underload protection (motor protection)*	37	PTUC	x	x	x	x	x	x	x
Lockout*, number of ends	86	PMRI	2	2	2	3	3	3	3
Circuit breaker failure prot. (CBF), two stages per end, number of ends	50BF	RBRF	2	2	2	3	3	3	3
Current annunciation stages (3x $I_{L>an}$, 3x $I_{E>an}$), assignable to end			x	x	x	x	x	x	x
Circuit breaker tripping by up to 6 external signals		(PTRC)	x	x	x	x	x	x	x
Trip circuit supervision, number of ends	74TC		2	2	2	3	3	3	3
Parameter sets			4	4	4	4	4	4	4
Logic + time stages for optocoupler inputs			x	x	x	x	x	x	X
Virtual binary inputs/control input			15/15	15/15	15/15	15/15	15/15	15/15	15/15
Logic + hold time for output relays			x	x	x	x	x	x	x
Measurands, short report			x	x	x	x	x	x	x
Event logging, non-volatile		RDRE	x	x	x	x	x	x	x
Disturbance data recording, non-volatile		RADR, RBDR	x	x	x	x	x	x	x
Statistics			x	x	x	x	x	x	x
Measurand checks, self supervision			x	x	x	x	x	x	x
Assistance for test and putting into operation			x	x	x	x	x	x	x

* implemented in structure 4602 and higher

ADDITIONAL PROTECTION FUNCTIONS
- Pulse shaper stage (programmable logic)
- 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
- Configurable automatic functions
- Switching device interlocking
- Group-assigned indication and measured-value blocking
- Threshold value monitoring
- Maximum demand value calculation
- Maximum value calculation (non-return pointer)
- Configurable transmission modes for measured values
- Metered value capturing
- Operating hours counter, switching operations counter
- Event recording