

Modular, Compact, Communication-Capable

Switching, Protection and Measuring Devices for Low-Voltage Power Distribution



SENTRON

Answers for industry.

SIEMENS

Power risks – abolished!

s as in “superior” –
with the comprehensive low-voltage
power distribution portfolio

We Provide Systematic Support

High power volumes, countless consumers, maximum availability around the clock?

No matter how turbulent your power distribution requirements – our integrated low-voltage power distribution products and systems support you with the competent and superior control of your system.

Our matched and powerful components help you to considerably reduce your investment costs and risks. You will benefit from the components' modularity and intelligence over the complete utilization period and thus keep a tight control of your operating costs while exploiting maximum system availability. As an essential component of the Totally Integrated Power concept, we provide integrated power distribution solutions from the medium-voltage supply right to the socket outlet. Communication capability and software modules allow for efficient connection to industrial and building automation, which bears further significant saving potentials.

With our systematic support, you no longer need to worry about your power distribution.



Power management system



Power distribution board
and motor control center
SIVACON



Busbar trunking systems
SIVACON



Switching, protection and
measuring devices SENTRON

Power requirements – fully complied with!

as in “optimum solutions” –
for all requirements

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Overview of the SENTRON Range

Highlights at a glance

- Complete range of switching, protection and measuring devices for power distribution from a single source
- High flexibility in terms of planning, configuration and mounting through modular and compact design as well as comprehensive accessories
- Continuous optimization and advancement of communication capability
- International applicability through manifold approvals
- Reliable interaction of components through integration in overall low-voltage power distribution concepts
- Efficient global logistics and fast service



Power monitoring device PAC



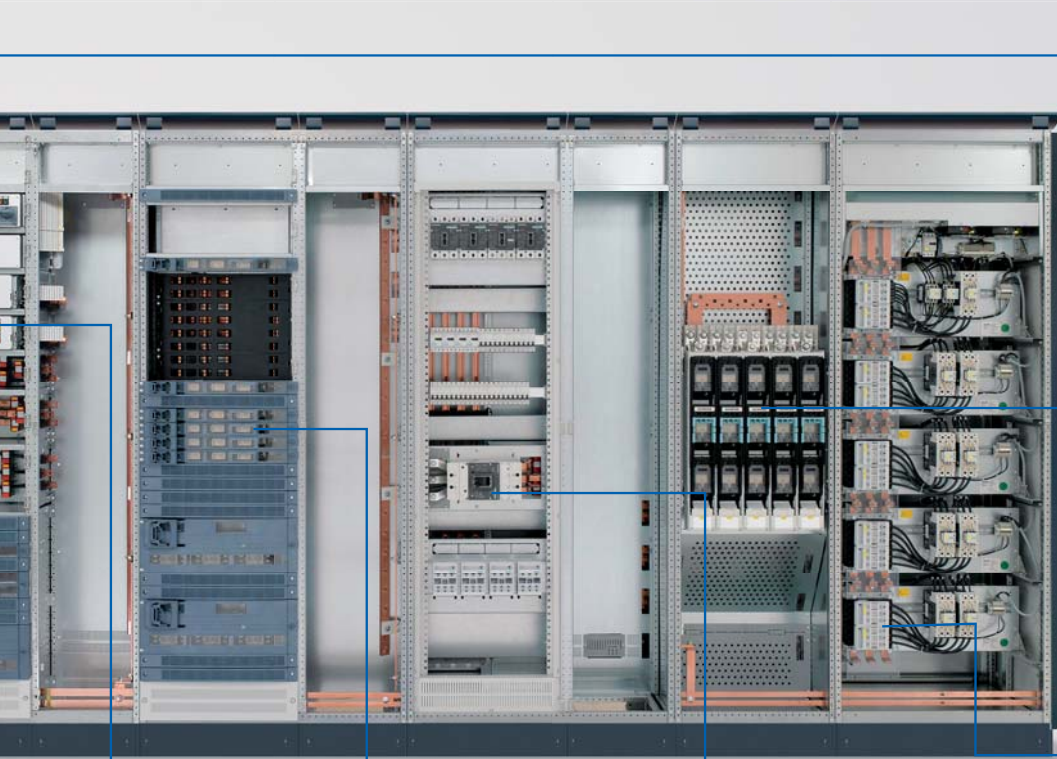
Air circuit breaker 3WL



Switch disconnecter with fuses 3KL/KM



Whether intelligent circuit breakers, tried-and-tested switch disconnectors or innovative multifunction measuring devices – the SENTRON range offers all components required for efficient, safe and reliable power distribution. Featuring a consistently modular design and equipped with comprehensive accessories, the SENTRON range systematically caters to today's requirements in terms of versatility and flexibility. Also as regards the increasingly important relevance of communication within the power distribution, SENTRON leaves nothing to be desired.



Main and EMERGENCY-STOP switch 3LD2



In-line fuse switch disconnecter 3NJ4



Fuse switch disconnecter 3NP1



Switch disconnecter 3KA/3KE



In-line plug-in switch disconnecter with fuses 3NJ62



Molded-case circuit breaker 3VL

- ① SENTRON 3VL ETU
- ② Electronic trip unit
LCD ETU
- ③ Electronic trip unit ETU
- ④ COM10 PROFIBUS module,
including ZSI
- ⑤ COM20 PROFIBUS module²⁾,
including ZSI
- ⑥ Breaker data adapter (BDA)
- ⑦ BDA Plus with Ethernet
interface
- ⑧ Browser-capable input
and output device (e.g.
notebook)
- ⑨ SENTRON 3WL
- ⑩ COM15 PROFIBUS module¹⁾
- ⑪ Breaker status sensor (BSS)
- ⑫ Electronic trip unit ETU
- ⑬ Measuring function Plus
- ⑭ ZSI module
- ⑮ Digital output module with
relay contacts
- ⑯ Digital output module
with relay contacts,
configurable
- ⑰ Analog output module
- ⑱ Digital input module
- ⑲ Switch ES Power on PC
- ⑳ PLC, e.g. SIMATIC S7
- ㉑ SIMATIC powerrate
- ㉒ SENTRON PAC

- **Increased system availability** through permanent system transparency, e.g. thanks to the early detection of critical system states and automatic alarms
- **Sustainably reduced operating costs** through transparency of the power flows
- **Considerable additional benefits in the power distribution board** through connection options of external input and output modules to the breaker-internal CubicleBus of the SENTRON 3WL, e.g. thanks to the elimination of complicated wiring
- **Easy parameterization and monitoring** through innovative software products for the on-site parameterization, operation, monitoring and diagnostics of SENTRON circuit breakers via PROFIBUS DP, Modbus or via Ethernet/Intranet/Internet
- **Future-proof investments** through high modularity of the SENTRON product range and accessories, which facilitates the easy retrofitting of all communication components
- **System integration via block libraries**
The optionally available block libraries support the easy connection of SENTRON PAC, SENTRON 3WL and SENTRON 3VL to the SIMATIC PCS 7 process control system



Reduced operating costs, enhanced system availability:

Power Management System

The SIMATIC PCS 7 powerrate and SIMATIC WinCC powerrate power management add-ons, the block libraries for SIMATIC PCS 7 and SIMATIC WinCC and the SENTRON PAC3200 and SENTRON PAC4200 power monitoring devices offer innovative and future-proof solutions for optimized power utilization with energy cost saving potentials of up to 20 %.

Further information on our power management products is available at www.siemens.com/powermanagementsystem

Highlights at a glance

- **Sustainably reduced operating costs**
through transparency of the power flows from the infeed to the consumer
- **Increased system availability**
e.g. through the early detection of critical system states
- **Future-proof investments**
through integrated industrial technology as well as integration in Totally Integrated Automation and Totally Integrated Power

Typical application areas

- Mainly as panel-mounting instrument in power distribution systems and control cabinets
- Detection and display as well as continuous monitoring of all relevant network parameters of a power distribution system

International standards and approvals

- UL approval: UL 61010-1
- CSA approval: CAN/CSAC22.2 No. 61010.1



Precise control of electrical characteristic and power values:

Power Monitoring Device SENTRON PAC

The compact and powerful SENTRON PAC3200 and SENTRON PAC4200 power monitoring devices precisely and reliably detect the power values of electrical feeders or individual consumers. Furthermore, they provide important measured values for assessing the system state and mains quality. The power monitoring devices are communication-capable and equipped with an Ethernet interface as a standard. For configuration, the free SENTRON powerconfig software is available for the significantly eased setting of multiple measuring devices.

Planning advantages

- Broad functional scope, thanks to which only one device version is required for various measuring tasks
- Global applicability thanks to international approvals and support of 9 languages
- Easy subsequent expandability thanks to plug-in expansion modules
- Easy adjustability to the application thanks to integrated multifunctional digital inputs and outputs
- Communication capability via PROFIBUS DP, Modbus RTU or Ethernet with Modbus TCP
- Applicability also in harsh environments (degree of protection IP65 as a standard)
- Easy integration in automation or power management systems, e.g. SIMATIC PCS 7 powerrate or SIMATIC WinCC powerrate

Benefits in the control cabinet

- Minimum space requirements thanks to compact design (96 x 96 mm) with low mounting depth
- Space and cost savings thanks to optional direct connection to power supply networks up to 690 V (L-L) without expensive voltage transformers
- Easy and rapid mounting, also without tools
- Time-saving configuration of multiple devices via free SENTRON powerconfig software

Added operational value

- Easy operation thanks to intuitive user prompt and multilingual plain text displays on the device
- Fast detection of the system state on the device thanks to comfort displays

- Sound readability also with poor light conditions thanks to large, illuminated graphical LC display
- Precise measuring results thanks to high measuring accuracy in accordance with current standards
- Early detection of overloads and operational faults thanks to comprehensive monitoring functions
- Eased fault analysis thanks to time-related recording of values and events
- Comprehensive power measuring as basis for the identification of saving potentials

Highlights at a glance

■ Versatile and global applicability

Direct connection to industrial networks up to 690 V, CATIII, optional measuring via voltage transformer, connection to current transformer x/1A or x/5A, IP65, large function and performance scope

■ Manifold communication options

e.g. via PROFIBUS DP, Modbus RTU or Modbus TCP

■ Easy and intuitive operation

Plain text displays in 9 languages

■ High measuring accuracy

■ Comprehensive consumption detection

■ Detailed overview of the system state

■ Integration in power management systems



Measured values	SENTRON PAC3200	SENTRON PAC4200
Basic measured values e.g. voltages, currents, power, energy values, frequency, power factor	✓	✓
Mains quality measured values e.g. phase angle, phase displacement angle, harmonics for voltage and current	–	✓
Energy detection / counters		
Energy counters for apparent, active and reactive energy, import and export	✓	✓
Operating hours counter (consumer runtime)	✓	✓
Multifunctional universal counter	✓	✓
Monitoring functions		
Max. number of limit values	6	12
Boolean logic AND, OR / NAND, NOR XOR	✓ / –	✓ / ✓
Limit values / inputs Logically interlinkable	✓ / –	✓ / ✓
Recording functions		
Load curve recording	–	✓
Event recording	–	✓
Interfaces		
Ethernet (integrated)	10 Mbit/sec	10 / 100 Mbit/sec
PROFIBUS DP (V1)	Optional expansion module PAC PROFIBUS DP	
Modbus RTU	Optional expansion module PAC RS485	
Inputs / outputs		
Digital inputs Multifunctional	1	2
Digital outputs Multifunctional	1	2
Real-time clock / calendar function	–	✓
Fault limits		
Voltage / current Referred to the measured value	0.3 % 0.2 %	0.2 %
Active energy According to 62053-22	Class 0.5S	Class 0.2S

Typical application areas

- As incoming-feeder, distribution, coupler and outgoing-feeder circuit breaker in electrical systems
- For the switching and protection of motors, capacitors, generators, transformers, busbars and cables

Devices in AC version are available as circuit breaker and non-automatic circuit breaker. Devices in DC version are available as non-automatic circuit breaker.

International standards and approvals

- IEC 60947-2
- DIN VDE 0690 Part 1
- Climatic withstand capability in acc. with DIN IEC 68 Part 30-2
- CCC, Gost
- Shipbuilding, e.g. GL, ABS, LRS, PRS

For international applications, also versions in acc. with UL 489 are available. For 3WL air circuit breakers / non-automatic circuit breakers approved in acc. with UL 489 up to 5000 A, refer to catalog LV 16. (Order No. E86060-K1816-A101-A1)



Flexibly applicable and communication-capable:

SENTRON 3WL Air Circuit Breakers

SENTRON 3WL air circuit breakers offer a very flexible applicability and integrated communication capability. They optimally meet the increased requirements placed upon air circuit breakers particularly with regard to the operation and monitoring of network processes in connection with electronic control systems. The quality of this range sets new standards worldwide.

With only three sizes, the SENTRON 3WL air circuit breakers cover a power range from 630 A to 6300 A. Featuring a 3- or 4-pole design, they are suitable for applications up to 1150 V. All models are characterized by identical design – in fixed-mounted as well as withdrawable version – identical operation and identical comprehensive accessories. The particularity: In the upper performance range, the SENTRON 3WL is the world's smallest circuit breaker of its class.

Highlights at a glance

- **Flexible and global applicability**
for temperatures up to 70 °C; no derating up to 55 °C
- **Easy planning, assembly and retrofitting**
through modular design with only 3 sizes, few components and uniform accessories
- **Full communication capability**
via PROFIBUS-DP or Modbus;
integrated communication concept with SENTRON 3VL
- **Smallest circuit breaker on the market**
in the power range from 5000 to 6300 A
- **RoHS-compliant**

Planning advantages

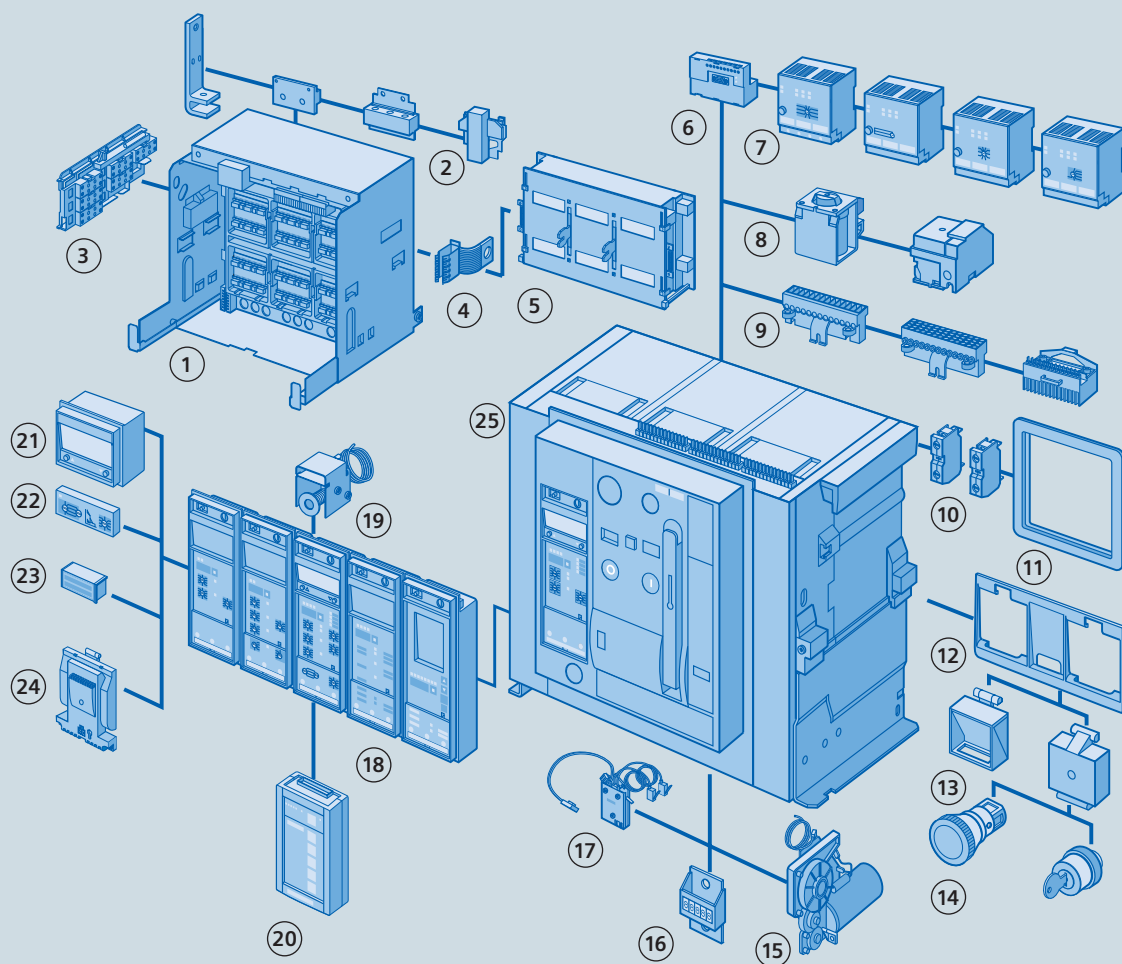
- Only 3 sizes with identical accessories for coverage of all current ranges
- 4 short-circuit breaking capacity levels for all applications
- Consistent modularity for eased assembly and subsequent adjustments
- Special retrofittable modules for over-current releases
- Integrated communication concept for PROFIBUS or Modbus

Benefits in the control cabinet

- Compact design for reduced stock-keeping and control cabinet costs (size 1 (up to 1600 A) fits into 400-mm-wide panel, size 3 (up to 6300 A) fits into 800-mm-wide panel)
- 4 switching capacity levels: cost-favorable solution for all customer requirements
- Fast and safe parameterization
- Reduced costs and increased productivity through communication capability
- Prevention of system downtimes through timely information and responding
- Effective diagnostics management; measured values serve as basis for efficient load management, for the preparation of power demand profiles and for power cost allocation to cost centers
- Preventive maintenance for reduced risk of costly system failures
- Long service life of breakers and power distribution board; prolonged service life through easy replacement of the main contacts

Added operational value

- Very high reliability and long service life
- Provision of data via communication, e.g. for load management (display of overrating on PMC)
- Service readiness indication
- Various connection systems for easy and optimum customer connection delivered ex works
- Very high current carrying capacity
- Considerable additional benefits through connection option of external input and output modules



SENTRON 3WL:

Modular design of the circuit breaker
with consistently uniform accessories

- | | |
|--|---|
| ① Guide frame | ⑮ Motorized operating mechanism |
| ② Main connection front, flange,
horizontal, vertical | ⑯ Switching cycle counter |
| ③ Position signaling switch | ⑰ Breaker status sensor (BSS) |
| ④ Grounding contact, leading | ⑱ Protective device with device carrier,
overcurrent release (ETU) |
| ⑤ Shutter | ⑲ Remote reset solenoid |
| ⑥ COM15 PROFIBUS module or
COM16 Modbus module | ⑳ Breaker data adapter (BDA) |
| ⑦ External CubicleBus modules | ㉑ Four-line display |
| ⑧ Closing solenoid, auxiliary release | ㉒ Ground-fault protection module |
| ⑨ Auxiliary conductor plug-in system | ㉓ Rated current module |
| ⑩ Auxiliary switch block | ㉔ Measuring function module |
| ⑪ Door sealing frame | ㉕ Circuit breaker |
| ⑫ Locking set base plate | |
| ⑬ Transparent panel, function insert | |
| ⑭ EMERGENCY-STOP pushbutton,
key operation | |



Size I



Size II



Size III

**3WL air circuit breakers / non-automatic circuit breakers
for AC up to 6300 A**

Size	I, II, III			II
Rated current I _n	A	630, 800, 1000, 1250, 1600, 2000, 2500, 3200, 4000, 5000, 6300		
Number of poles		3-pole, 4-pole		
Rated operational voltage U _e	V AC V DC	up to 690/1150 – up to 1000		
Rated ultimate short-circuit breaking capacity with 415 / 500 V AC	kA	Size I 55/66	Size II 66/80/100	Size III 100/150 (3-pole), 100/130 (4-pole) 30/25/20 (with 300/600/1000 V DC)

Type	3WL11			3WL12			3WL13		
Size	I			II			III		
Switching capacity class	N	S		N	S	H	H	C 3-pole	C 4-pole
Short-circuit breaking capacity									
Rated operational voltage U _e with 415 / 500 V AC									
I _{cu}	kA	55	66	66	80	100	100	150	130
I _{cs}	kA	55	66	66	80	100	100	150	130
I _{cm}	kA	121	145	145	176	220	220	330	286
Rated operational voltage U _e with 690 V AC									
I _{cu}	kA	42	50	50	75	85	85	150	130
I _{cu}	kA	42	50	50	75	85	85	150	130
I _{cm}	kA	88	105	105	165	187	187	330	286
Rated short-time withstand current I _{cw} of the circuit breakers									
0.5 sec	kA	55	66	66	80	100	100	100	100
1 sec	kA	42	50	55	66	80	100	100	100

Overcurrent releases of SENTRON 3WL circuit breakers

Type	ETU15B	ETU25B	ETU27B	ETU45B	ETU76B
Overload protection	✓	✓	✓	✓	✓
Short-time delayed short-circuit protection	–	✓	✓	✓	✓
Instantaneous short-circuit protection	✓	✓	✓	✓	✓
Neutral conductor protection	–	–	✓	✓	✓
Ground-fault protection	–	–	✓	•	•
ZSI	–	–	–	•	•
LCD, 4-line	–	–	–	•	–
LCD, graphical	–	–	–	–	✓
Communication via PROFIBUS-DP/Modbus	–	–	–	•	•
Measuring function Plus	–	–	–	•	•
Selectable parameter sets	–	–	–	–	✓
Freely programmable parameters	–	–	–	–	✓
CubicleBUS	–	–	–	✓	✓

Typical application areas

- As incoming-feeder and branch circuit breaker in LV power distribution boards
- As switching and protection device for motors, transformers and capacitors
- As network element with shutdown and disconnection characteristics in connection with lockable rotary operating mechanisms and terminal covers

International standards and approvals

- IEC 60947-1, EN 60947-1
- DIN VDE 0660 Part 100 as well as Part 101
- Disconnecter characteristics in acc. with IEC 60947-2, EN 60947-2
- Characteristics as network element (main switch) in acc. with DIN EN 60204 and DIN VDE 0113

For international applications, also versions in acc. with UL 489 are available.



Universally applicable, space-saving and consistently communication-capable:

SENTRON 3VL Molded-Case Circuit Breakers

Featuring optimized communication capability and a particularly compact design, the SENTRON 3VL molded-case circuit breakers meet all requirements placed upon space-saving electrical distribution systems – in a power range from 16 A to 1600 A. Depending on the individual requirements, the universal and communication-capable circuit breakers are available for system and motor protection, for starter combinations or as non-automatic circuit breakers. The corresponding releases are optionally available as thermal-magnetic (16 A to 630 A) or electronic (63 A to 1600 A) trip units. With only two ranges of internal accessories, SENTRON 3VL circuit breakers offer maximum versatility with minimum expenditures.

Highlights at a glance

- **SENTRON 3VL circuit breakers meet the high requirements of current electrical distribution systems**
through their compact design, excellent technical characteristics and easy operation
- **Flexible and global applicability**
through wide product portfolio as well as international IEC and UL approvals; for temperatures up to 70 °C; no derating up to 50 °C or 55 °C; available as thermal-magnetic (16 A–630 A) and electronic version
- **Easy planning, assembly and retrofitting**
through modular design, few components and uniform accessories
- **Full and cost-favorable communication capability**
through COM20/21 modules for connection to PROFIBUS/Modbus

Planning advantages

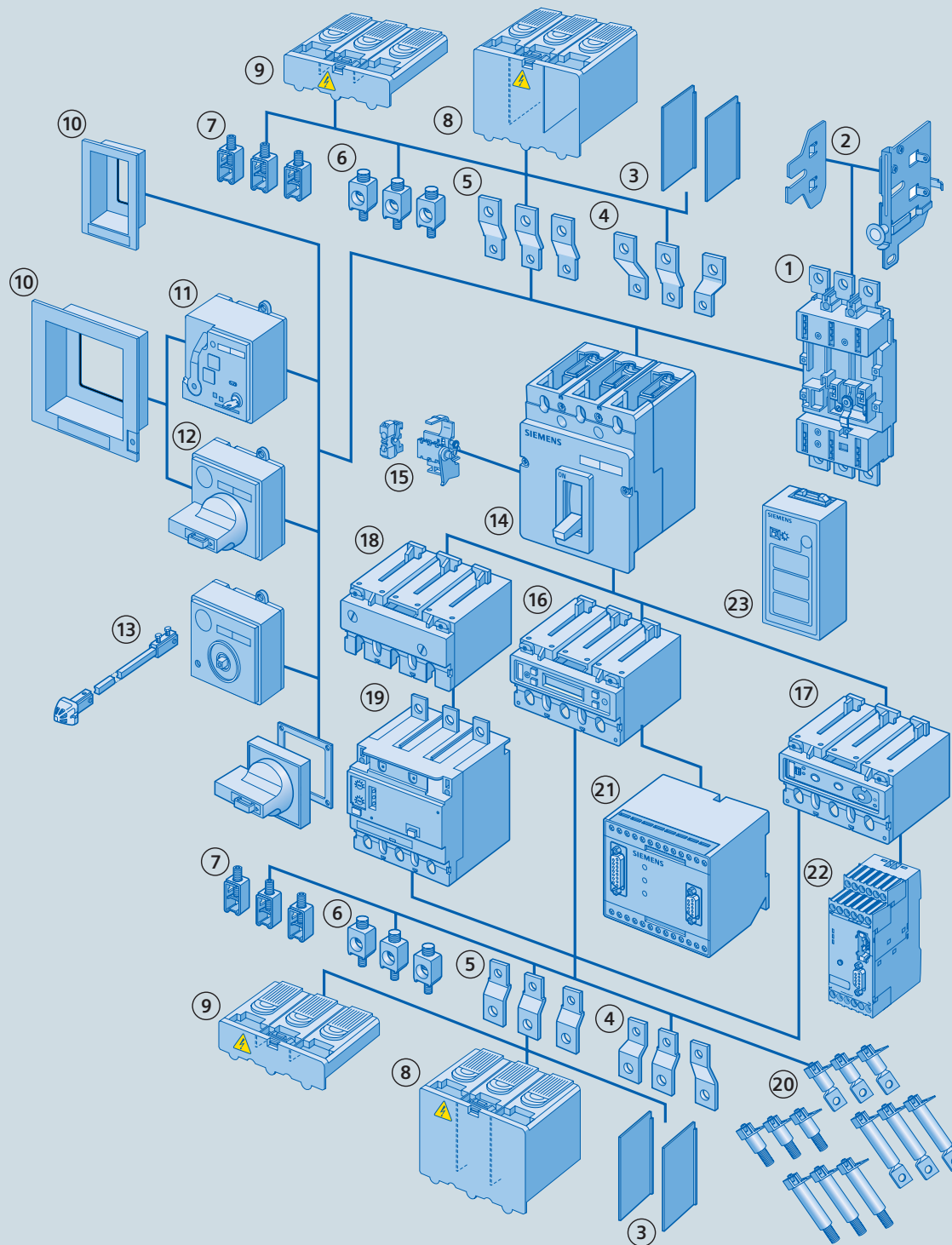
- Wide product portfolio from 16 to 1600 A
- Flexible application options as incoming-feeder and outgoing-feeder circuit breaker for motors, system, generator and transformer protection
- Manifold certifications and international approvals for almost unlimited applicability (IEC, CCC, GOST, shipbuilding)
- Modular design
- Uniform and retrofittable accessories for many sizes
- Integrated communication concept with PROFIBUS or Modbus

Benefits in the control cabinet

- Compact design for reduced stock-keeping and control cabinet costs
- 3 switching capacity levels: cost-favorable solution for all customer requirements
- Easy mounting and operation
- High flexibility through manifold accessories and modular design

Added operational value

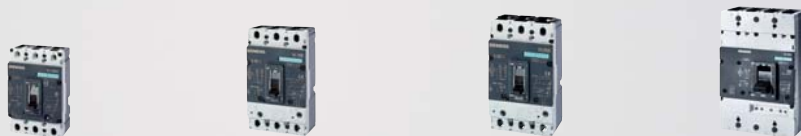
- High efficiency and reliability through continuous quality optimization
- Fast and safe parameterization
- Reduced costs and improved productivity through communication capability
- Prevention of system downtimes through timely information and responding (effective diagnostics management)
- Easy retrofitting through modular design
- Customized solutions available ex works
- Test options for revision and maintenance (hand-held test unit for electronic releases)



SENTRON 3VL:

Modular design and improved technology

- | | |
|--|---|
| ① Withdrawable/plug-in base | ⑬ Door-coupling rotary operating mechanism |
| ② Side walls for withdrawable version | ⑭ SENTRON 3VL circuit breaker |
| ③ Phase barriers | ⑮ Internal accessories |
| ④ Flared front busbar, connecting bars | ⑯ Solid-state overcurrent trip unit LCD ETU |
| ⑤ Straight connecting bars | ⑰ Solid-state overcurrent trip unit with communications function |
| ⑥ Circular conductor terminal | ⑱ Thermal-magnetic overcurrent trip unit |
| ⑦ Box terminal for Cu | ⑲ RCD module |
| ⑧ Extended terminal cover | ⑳ Rear terminals – flat and round |
| ⑨ Standard terminal cover | ㉑ COM10 communications module to the PROFIBUS DP |
| ⑩ Masking frame/cover frame for door cut-out | ㉒ COM20 communications module to the PROFIBUS DP |
| ⑪ Motorized operating mechanism with spring energy store | ㉓ Power supply with battery incl. test function for solid-state trip unit |
| ⑫ Front-operated rotary operating mechanism | |

**3VL molded-case circuit breakers up to 1600 A**

Type		VL160X/3VL1		VL160/3VL2		VL250/3VL3		VL400
Rated current I _n with 50 °C ambient temperature ¹⁾	A	16 to 160		26 to 160		80 to 250		125 to 400
Rated operational voltage U _e 50/60 Hz AC	V	690	690	690	690	690	690	690
Overcurrent releases								
Thermal-magnetic		✓	✓	✓	✓	✓	✓	✓
Electronic ETU LCD		–	✓	✓	✓	✓	✓	✓
Replaceable		–	–	✓	✓	✓	✓	✓
PROFIBUS module COM10		–	–	✓	✓	✓	✓	✓
Switching capacity I _{cu} /I _{cs} effective value, in acc. with IEC 60947-2								
Standard switching capacity N ³⁾								
with 415 V AC	kA	55/55		55/55		55/55		55/55
High switching capacity H ²⁾								
with 415 V AC	kA	70/70		70/70		70/70		70/70
with 690 V AC	kA	12/6 ³⁾		12/6		12/6		15/8
Very high switching capacity L ²⁾								
with 415 V AC	kA	–		100/75		100/75		100/75
with 690 V AC	kA	–		12/6		12/6		15/8

**3VL molded-case circuit breakers up to 1600 A****3VF2 molded-case circuit
breaker up to 100 A**

Type		VL630/3VL5		VL800/3VL6		VL1250/3VL7		VL1600/3VL8		
Rated current I _n with 50 °C ambient temperature ¹⁾	A	252 to 630		320 to 800		400 to 1250		640 to 1600		16 to 100
Rated operational voltage U _e 50/60 Hz AC	V	690	690	690	690	690	690	690	690	up to 415
Overcurrent releases										
Thermal-magnetic		✓	✓	–	–	–	–	–	–	✓
Electronic ETU LCD		✓	✓	✓	✓	✓	✓	✓	✓	–
Replaceable		✓	✓	✓	✓	✓	✓	✓	✓	–
PROFIBUS module COM10		✓	✓	✓	✓	✓	✓	✓	✓	–
Switching capacity I _{cu} /I _{cs} effective value, in acc. with IEC 60947-2										
Standard switching capacity N ³⁾										
with 415 V AC	kA	45/45		50/50		50/25		50/25		18/9
High switching capacity H ²⁾										
with 415 V AC	kA	70/70		70/70		70/35		70/35		–
with 690 V AC	kA	30/15		30/15		30/15		30/15		–
Very high switching capacity L ²⁾										
with 415 V AC	kA	100/75		100/75		100/50		100/50		–
with 690 V AC	kA	20/10		20/10		35/17		35/17		–

✓ Available
– Not available

¹⁾ 3VF2 with 40 °C ambient temperature

²⁾ With 240 V AC, 415 V AC and 525 V AC max. 5% overvoltage,
with 440 V AC, 500 V AC and 690 V AC max. 10% overvoltage

³⁾ Rated current $I_n \geq 25$ A

Typical application areas

- For switching of main and auxiliary circuits
- For switching of three-phase motors and other consumers in maintenance and repair cases

International standards and approvals

- Certified as manually operated switch disconnector complying with disconnector conditions in acc. with IEC 60947-3, DIN VDE 0660 Part 107, EN 60947-3
- Applicable as ON-OFF, EMERGENCY-STOP and main switch in acc. with DIN EN 60204-1

For international applications, also versions in acc. with UL 508 are available.



Effective and safe:

3LD2 Main and EMERGENCY-STOP Switches

In addition to isolation from the mains, they ensure the safe disconnection of the entire electrical equipment and can be employed for switching three-phase motors and air-conditioning systems up to 132 kW as well as solar plants. SENTRON 3LD2 main and EMERGENCY-STOP switches have been tried and tested in numerous applications and are particularly suitable for processing machines in the field of machine and conveyor system construction as well as for the chemical and food and beverages industry.

Planning advantages

- Modular design
- Comprehensive accessories
- Universal auxiliary switch 1NO/1NC for all sizes
- Certified as manually operated switch disconnector complying with disconnector conditions in acc. with IEC 60947-3, DIN VDE 0660 Part 107, EN 60947-3
- Applicable as EMERGENCY-STOP switch in acc. with DIN EN 60204-1
- Type-tested as manual motor controller in acc. with UL 508
- 3-, 4- and 6-pole versions
- 3-pole changeover switch available
- Devices with defeatable door-coupling rotary operating mechanism available
- High degree of protection up to IP65
- Auxiliary switch with gold-plated contacts available

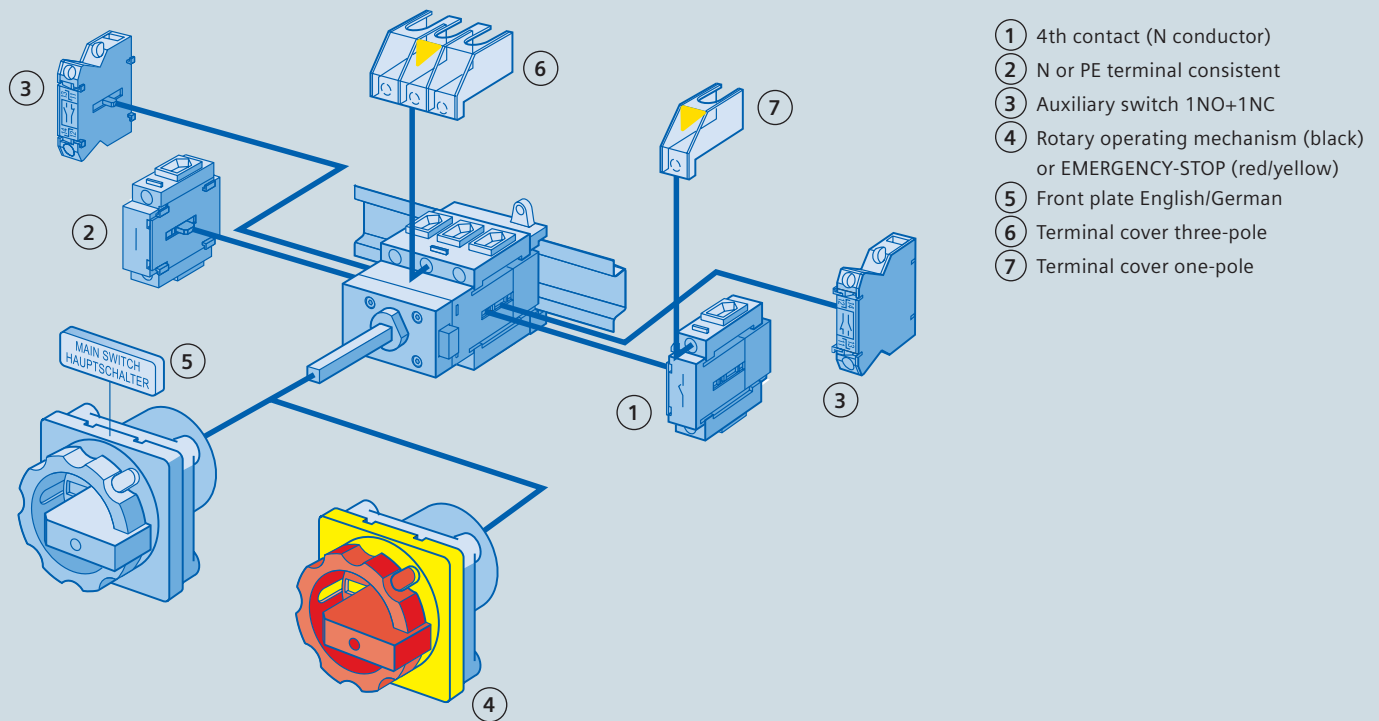
- Also devices available in enclosures / molded-plastic enclosures up to 125 A
- Floor-mounted versions for DIN rail or screw fastening
- Front-mounted versions for four-hole or central hole fastening

Benefits in the control cabinet

- Central hole and four-hole fastening available for front installation
- Eased mounting through removable plug-in actuating shaft
- Very rugged door-coupling rotary operating mechanism for frequent switching operations
- Floor-mounted devices switchable via lockable knobs or door-coupling rotary operating mechanisms
- Rapid mounting of auxiliary switches, N or PE terminal and 4th pole through easy snap-on without time-consuming screw fastening

Added operational value

- Universally applicable for switching of main and auxiliary circuits, three-phase motors and other consumers in maintenance and repair cases
- Flexible and global applicability through international IEC and UL approvals
- Easy planning, assembly and retrofitting through modular design
- Few components and uniform accessories
- High reliability and long service life
- Special versions available upon request



Highlights at a glance

- **Optimum mains isolation from 16 to 250 A**
through lockable rotary operating mechanism
- **Flexible and global applicability**
through international IEC and UL approvals
- **Easy planning, assembly and retrofitting**
through modular design, few components and uniform accessories
- **Version as isolator for DC applications**
Required for maintenance works on solar plants in acc. with DIN VDE 0100-712

3LD main and EMERGENCY-STOP switches

Type		3LD2 0	3LD2 1	3LD2 2	3LD2 5	3LD2 7	3LD2 8	3LD2 3	3LD2 4
Rated operational voltage U_e	V AC	690	690	690	690	690	690	690	690
AC-21A load switch									
Rated operational current I_e	A	16	25	32	63	100	125	160	250
AC-3 motor circuit breaker, operational switching of individual motors									
Rated operational power									
415 V	kW	5.5	7.5	9.5	18.5	30.0	37.0	75.0	110.0
690 V	kW	5.5	7.5	9.5	15.0	22.0	30.0	45.0	55.0
AC-3 motor circuit breaker, repair switch, frequent but no operational switching of individual motors									
Rated operational power									
415 V	kW	7.5	9.5	11.5	22.0	37.0	45.0	90.0	132.0
690 V	kW	7.5	9.5	11.5	18.5	30.0	37.0	55.5	75.0

Typical application areas

- As main, EMERGENCY-STOP, repair or transfer switch in distribution boards employed in residential and functional buildings or in industrial power distribution boards

International standards and approvals

- IEC 60947-1, IEC 60947-3, DIN VDE 0660 Part 107
- Climate-proof
- For application as safety switch, we offer switch disconnectors in type-tested 8HP molded-plastic distribution board enclosure in degree of protection IP65



Fuseless safety:

3KA/3KE Switch Disconnectors

The SENTRON 3KA/3KE switch disconnectors are the experts for fuseless disconnection operations in all low-voltage networks. Available as three- or four-pole version, they perfectly master “disconnection” tasks and “switching under load” in distribution boards employed in residential and functional buildings as well as in industrial power distribution boards.

Planning advantages

- Modular accessories
- Certified as manually operated switch disconnector complying with disconnector conditions in acc. with IEC 60947-3, DIN VDE 0660 Part 107, EN 60947-3
- Applicable as ON-OFF and main switch in acc. with DIN EN 60204-1
- Type-tested as manual motor controller in acc. with UL 508
- Devices with defeatable door-coupling rotary operating mechanism available
- Realization of changeover and parallel switch possible

Benefits in the control cabinet

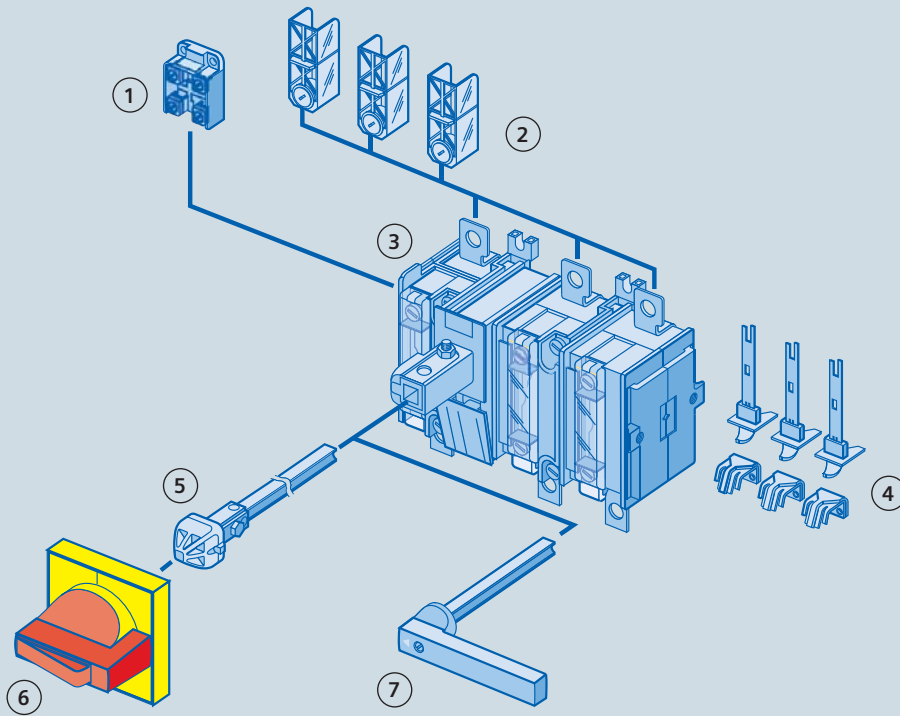
- Eased mounting through removable plug-in actuating shaft
- Very rugged door-coupling rotary operating mechanism for frequent switching operations
- Floor-mounted devices switchable via lockable knobs or door-coupling rotary operating mechanisms
- Rapid mounting of auxiliary switches
- Realization as changeover/parallel switch possible

Added operational value

- Universally applicable for switching of main and auxiliary circuits, three-phase motors and other consumers in maintenance and repair cases
- Flexible and global applicability through international IEC and UL approvals
- Easy planning, assembly and retrofitting
- High reliability and long service life
- Locking option against unauthorized operation

Highlights at a glance

- High switching capacity up to 690 V
- Easy and rapid mounting
- Clear switch position indication



- ① Auxiliary switch (3SB for 3KA; 3KX for 3KE)
- ② Terminal cover IP20 (operation side)
- ③ 3K switch disconnecter
- ④ Arc contact pieces (only for 3KE)
- ⑤ Extension shaft
- ⑥ 8UC7 door-coupling rotary operating mechanism in standard (Ti-Grey) or EMERGENCY-STOP (red/yellow) version
- ⑦ Knob for fixed mounting 8UC9 in standard (black) or EMERGENCY-STOP (red/yellow) version

3KA switch disconnectors

Type		3KA50	3KA51	3KA52	3KA53	3KA55	3KA57	3KA58
Rated continuous current I_n	A	36	80	125	160	250	400	630
Rated operational voltage U_e								
50/60 Hz AC 690	V	690						
DC	V	440 (3 conducting paths switched in series)						
Switching capacity (infeed top or bottom) with 400 V AC								
Breaking current I_c (power factor = 0.35) A (effective value)		500	650	1000	1280	2000	3200	5040
Rated operational current I_e with AC-23A	A	63	80	125	160	250	400	630
Motor switching capacity AC-23A	kW	30	40	65	80	130	200	350
with 690 V AC								
Breaking current I_c (power factor = 0.35) A (effective value)		500	500	1000	1280	2000	3200	3200
Rated operational current I_e with AC-23A	A	63	63	125	160	250	400	400
Motor switching capacity AC-23A	kW	50	50	110	150	220	375	375

3KE switch disconnectors

Type		3KE42	3KE43	3KE44	3KE45
Rated continuous current I_n	A	250	400	630	1000
Rated operational voltage U_e					
50/60 Hz AC 690	V	690			
DC	V	440 (3 conducting paths switched in series)			
	V	220 (2 conducting paths switched in series)			
Rated short-circuit making capacity I_{cm} with 50/60 Hz AC 690 V	kA (peak value)	35	365	60	60
Rated short-circuit making capacity with upstream fuses with 50/60 Hz AC 690 V	kA (peak value)	105	105	105	84
Switching capacity (infeed top or bottom) with 400 V AC					
Breaking current I_c (power factor = 0.35) A (effective value)		1000	1000	2520	2520
Rated operational current I_e with AC-21A	A	250	440	630	1000
with 690 V AC					
Breaking current I_c (power factor = 0.35) A (effective value)		1000	1000	2520	2520
Rated operational current I_e with AC-23A	A	125	125	315	315

Typical application areas

- As main and EMERGENCY-STOP switch for power distribution boards, distribution boards and motor feeders
- In connection with SITOR semiconductor fuses also suitable for high requirements, e.g. in UPS systems, frequency converters and capacitor control systems

International standards and approvals

- IEC 60947-1
- IEC 60947-3
- VDE 0660 Part 107



Comprehensive flexibility:

3KL/3KM Switch Disconnectors with Fuses

3KL/3KM switch disconnectors are ideally suited as main and EMERGENCY-STOP switches. Thanks to their fused design, they additionally provide short-circuit and overload protection. In connection with SITOR semiconductor fuses, they even master high requirements.

Planning advantages

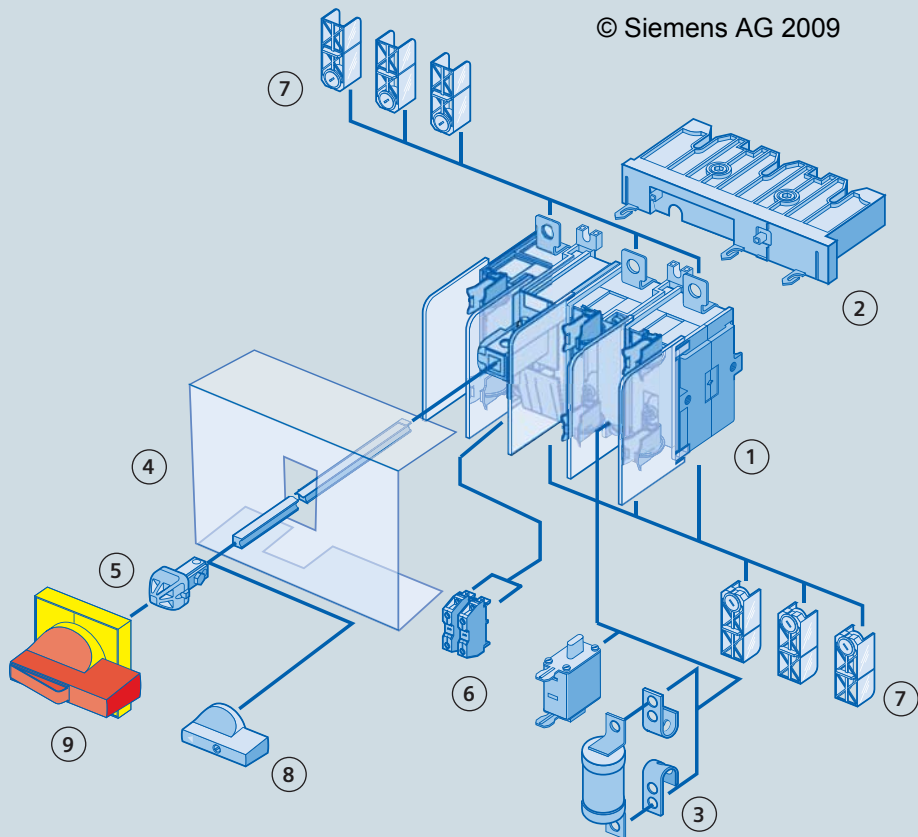
- Modular accessories
- Application with LV HRC and BS fuse links
- Certified as manually operated switch disconnector complying with disconnector conditions in acc. with IEC 60947-3, DIN VDE 0660 Part 107, EN 60947-3
- Applicable as ON-OFF and main switch in acc. with DIN EN 60204-1
- Type-tested as manual motor controller in acc. with UL 508
- Devices with defeatable door-coupling rotary operating mechanism available

Benefits in the control cabinet

- Eased mounting through removable plug-in actuating shaft
- Suitable for the protection of frequency converters and soft starters together with semiconductor fuses
- Available as plug-in version (3KM)
- Very rugged door-coupling rotary operating mechanism for frequent switching operations
- Floor-mounted devices switchable via lockable knobs or door-coupling rotary operating mechanisms
- Rapid mounting of auxiliary switches
- Realization as changeover/parallel switch possible

Added operational value

- Universally applicable for switching of main and auxiliary circuits, three-phase motors and other consumers in maintenance and repair cases
- Flexible and global applicability through international IEC and UL approvals
- Easy planning, assembly and retrofitting
- High reliability and long service life
- Locking option against unauthorized operation



- ① 3KL or 3KM basic device
- ② Plug-in contact bar for 3KM
- ③ Fuses, optionally BS-88 or LV HRC fuses
- ④ Fuse cover, IP20 (vertical to operation side)
- ⑤ Coupling driver with extension shaft
- ⑥ As auxiliary switches, standard products from the Siemens 3SB1 range are used
- ⑦ One-pole terminal cover from 63 A to 630 A, IP20 (vertical to operation side)

All components from the breaker to the operating mechanism feature non-interchangeable properties.

Optional

- ⑧ 8UC9 knob for fixed mounting in standard (black) or EMERGENCY-STOP (red) version or
- ⑨ 8UC7 door-coupling rotary operating mechanism in standard (Ti-Grey) or EMERGENCY-STOP (red/yellow) version

Highlights at a glance

- High switching capacity up to 690 V
- Easy and rapid mounting
- Clear switch position indication

3KL/3KM switch disconnectors

Type		3KL50 3KM50	3KL52 3KM52	3KL53 3KM53	3KL55 3KM55	3KL57 3KM57	3KL61	3KL62
Rated continuous current I_n for fuse links in acc. with DIN 43620 ¹⁾	A size	63 00 and 000	125 00 and 000	160 00 and 000	250 1 and 2	400 1 and 2	630 3 and 2	800 3 and 2
Rated operational voltage U_e 50/60 Hz AC 690 DC	V V V	690 440 (3 conducting paths switched in series) 220 (2 conducting paths switched in series)						
Switching capacity (infeed top or bottom)								
with 400 V AC								
Breaking current I_c (power factor = 0.35) A (effective value)		500	1280	1280	2000	3200	5100	6400
Rated operational current I_e with AC-21A, AC-22A, AC-23A	A	63	160	160	250	400	630	800
Motor switching capacity AC-23A	kW	30	80	80	130	200	335	400
with 690 V AC								
Breaking current I_c (power factor = 0.35) A (effective value)		500	1000	1280	2000	3200	3200	6400
Rated operational current I_e with AC-21A, AC-22A, AC-23A	A	63	125	160	250	400	630	800
Motor switching capacity AC-23A	kW	50	110	150	220	375	560	700

¹⁾ When using semiconductor fuse links, the rated current has to be reduced, see catalog SITOR configurators, order no. E200001-A700-P302

Typical application areas

- In cable feeders
- As infeed in sub-distributions
- Switching/protection of compensation modules
- In power plants and industrial applications as overload and short-circuit protection for power distribution boards
- In substations and transformer stations as well as in cable distribution cabinets
- In main distributions of commercial buildings
- In cable outlets and distribution boards
- In distribution boards for construction sites and as infeed for busbar systems

International standards and approvals

- IEC 60947-1, IEC 60947-3
- EN 60947-3
- DIN VDE 0660 Part 107



Numerous cable outlets in minimum space:

3NJ62 In-Line Plug-In Switch Disconnectors with Fuses

In contrast to the 3NJ4 in-line fuse switch disconnectors, the devices of the 3NJ6 range are equipped with an integrated switching element with double-break. They are particularly suitable for applications in which many cable outlets for power distribution have to be accommodated in minimum space. The intelligent plug-in connection system ensures very easy, safe and comfortable mounting.

Planning advantages

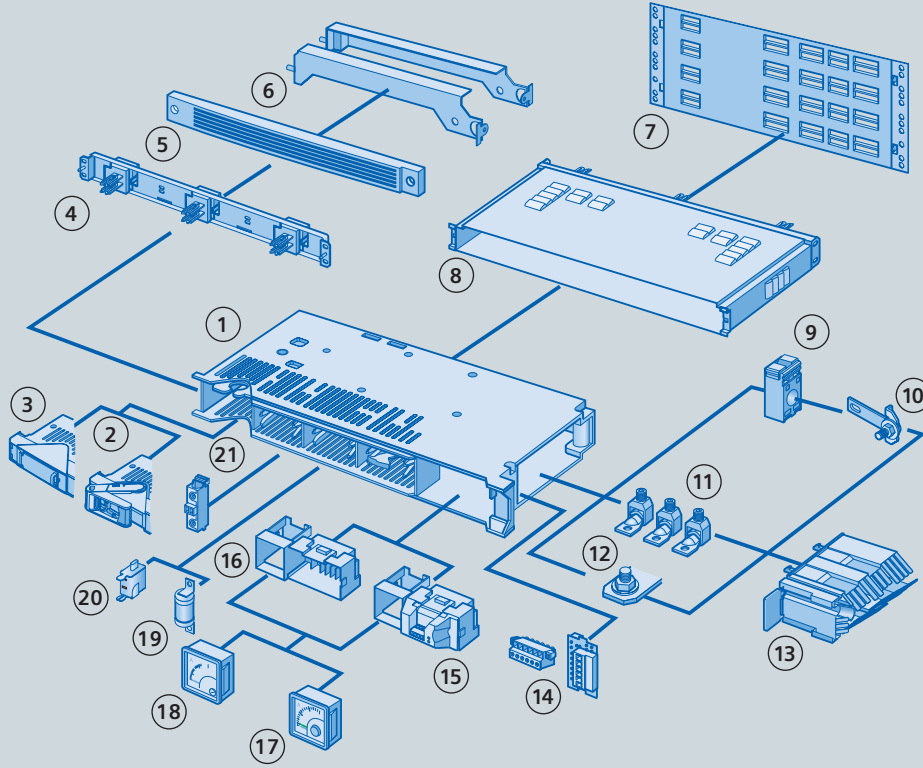
- Uniform grid sizes for easy configuration
- High packing density supported in power distribution boards
- Global availability

Benefits in the control cabinet

- Modular and compact design
- Easy and efficient mounting through supply-side plug-in contact
- High packing density in the section
- Cable connection with cable terminals or cable lugs
- Installation in various control cabinet depths
- Comprehensive accessories

Added operational value

- Conversion, retrofitting and replacement without disconnection of the power distribution board
- De-energized fuse replacement
- Zero maintenance
- High personnel protection
- Operator lever lockable in OFF position
- Clear switch position indication



- ① 3NJ62 switch disconnectors basic device
here in size 00, open, without front cover
- ② Hand drive
- ③ Motor drive
- ④ Connection module
- ⑤ Blanking cover
- ⑥ Guide rails
- ⑦ Busbar cover
- ⑧ Contact extension
- ⑨ Current transformer
- ⑩ Current transformer bar
- ⑪ Connection terminals
- ⑫ Stud terminal
- ⑬ Terminal cover
- ⑭ Multifunction plug
- ⑮ Holder for measuring device with
electronic fuse monitoring (EFM)
- ⑯ Holder for measuring device without EFM
- ⑰ Bimetal current measuring device
- ⑱ Moving-iron current measuring device
- ⑲ BS fuse
- ⑳ NH fuse
- ㉑ Auxiliary switch

Highlights at a glance

- Easy and rapid mounting
- Clear switch position indication
- High switching capacity up to 690 V
- Minimum space requirements through compact design
- 3- and 4-pole versions
- Versions with manual or motorized operating mechanism
- For LV HRC or BS fuses
- Optionally with integrated fuse monitoring

3NJ62 switch disconnectors with fuses

Type	3NJ62 03-1		3NJ62 03-3		3NJ62 13-1		3NJ62 13-3		3NJ62 23-1		3NJ62 23-3		3NJ62 33-1		3NJ62 33-3		
Switching capacity	S		H		S		H		S		H		S		H		
Rated operational current I_n for fuse links in acc. with IEC 60269	A	160	125	160	125	250	250	400	400	630	500	630	500				
for LV HRC fuse links in acc. with IEC 60269	type	00				1				2				3			
Rated operational voltage U_n with rated frequency 50/60 Hz	V AC	500	690	500	690	690	690	690	690	500	690	500	690				
Conditional rated short-circuit current																	
Short-circuit strength (effective value)	kA	100		100		100		100		100		100					
Short-circuit making capacity (effective value)	kA	55		66		55		66		55		66					
Utilization category		AC-22B		AC-23B		AC-22B		AC-23B		AC-22B		AC-23B					

Typical application areas

- In cable feeders
- Switching/protection of compensation modules
- In power plants and industrial applications as overload and short-circuit protection for power distribution boards
- In substations and transformer stations as well as in cable distribution cabinets
- In main distributions of commercial buildings
- In cable outlets and distribution boards
- In distribution boards for construction sites and as infeed for busbar systems

International standards and approvals

- IEC 60947-1, IEC 60947-3
- EN 60947-3
- DIN VDE 0660 Part 107
- CCC



Maximum safety with minimum installation width:

3NJ4 In-Line Fuse Switch Disconnectors

Our 3NJ4 in-line fuse switch disconnectors combine the functions “load switching” and “disconnecting” in a single system. Thanks to an integrated LV HRC fuse, they additionally provide reliable overload and short-circuit protection. The very compact disconnectors can also be optimally mounted in confined spaces thanks to manifold connection options – making them the perfect devices for the occasional manual switching and disconnection of load feeders and current distributions in industrial and functional buildings.

Planning advantages

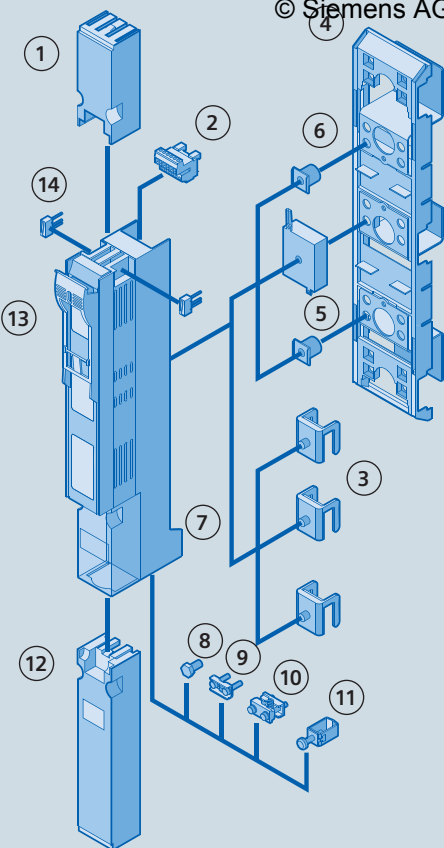
- Uniform grid sizes for easy configuration
- High packing density supported in power distribution boards
- Global availability

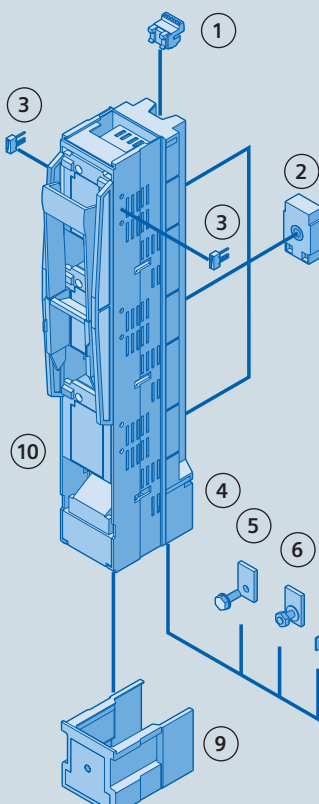
Benefits in the control cabinet

- High packing density supported
- Standardized widths 50/100 mm
- All sizes can be adjusted to identical external dimensions and levels for the control cabinet door cut-out by means of adapters and compensating covers
- Cable outlet variably at the top or bottom
- Manifold cable connection options
- Identical enclosure dimensions, cable connection options and technical data for device versions with and without installable current transformer
- Type-tested in SIVACON power distribution boards

Added operational value

- Touch protection (back-of-hand-proof) also with the device open
- Lockable against unauthorized operation
- Standard devices can also be subsequently replaced by device versions with installable current transformer thanks to identical enclosure dimensions
- Distinct and clear labeling options
- The integrated fuse monitoring supports the signaling of system standstills and facilitates reduced downtimes

- 
- ① Cover
 - ② Terminal strip
 - ③ Busbar terminal
 - ④ Adapter for 2 x LV HRC
 - ⑤ Current transformer
 - ⑥ Distance compensation
 - ⑦ Connection module
 - ⑧ Flat connection
 - ⑨ Saddle terminal
 - ⑩ Prism terminal
 - ⑪ Box terminal
 - ⑫ Cover
 - ⑬ 3NJ4/5 switch disconnectors basic device size 00
 - ⑭ Auxiliary switch – mounting kit

- 
- ① Terminal strip
 - ② Distance compensation / current transformer
 - ③ Auxiliary switch
 - ④ Connection module
 - ⑤ Flat connection
 - ⑥ Stud terminal
 - ⑦ V-type clamp
 - ⑧ Box terminal
 - ⑨ Cover
 - ⑩ 3NJ4/5 switch disconnectors basic device size 1/2/3

Highlights at a glance

- Minimum space requirements through compact design
- Suitable for cable outlet on the top or bottom
- Large variance of connection options
- Integrated fuse monitoring available
- Transformer protection on the secondary side available with additional versions

3NJ4 fuse switch disconnectors

Type		3NJ41 0	3NJ41 2	3NJ41 3	3NJ41 4	3NJ41 8	3NJ41 5	3NJ56
Rated operational current I_n with 400 V AC AC-22B	A	160	250	400	630	910	1000	1250
	A	100	200	315	500	—	600	—
for fuse links in acc. with DIN 43620	size	00	1	1 and 2	2 and 3	3	3	4a
Rated operational voltage U_n 40...60 Hz AC	V	690	690	690	690	400	690	690
Conditional rated short-circuit current with fuses								
with 50/60 Hz AC 690 V	kA (effective value)	50	110	110	110	50	110	80
Rated current I_n	A	160	250	400	630	910	722	1250

Switchable fuse switch disconnectors, 3-pole switchable for secondary-side transformer protection

Type		3NJ41 53-3BF01	3NJ41 83-3BF01	3NJ41 63-3BF01	3NJ41 73-3BF01
Apparent transformer power	kVA	500	630	800	1000
Nominal apparent power and rated current of the gTr fuses with 400 V AC	kVA	500	630	2 x 400	2 x 500
	A	722	909	2 x 577	2 x 722
Rated operational current I_n	A	1000	1250	1600	2000

Typical application areas

- Cable feeders
- Switching/protection of compensation modules
- Fuse protection (with SITOP) of frequency converters and soft starters
- Cable distribution cabinets
- Power distribution boards and control cabinets
- Machines and systems
- Compensation systems and cabinets

International standards and approvals

- IEC 60947-1
- IEC 60947-3
- EN 60947-1
- DIN VDE 0660 Part 107



Protection against overloads and short circuits:

3NP1 Fuse Switch Disconnectors

Our 3NP1 range offers reliable protection against overloads and short circuits. The 3NP1 devices also support floor mounting as well as mounting on DIN rails and busbar systems. They are perfectly suited for high requirements, for example thanks to their large and clear inspection window, through which the inserted fuses can be clearly recognized as well as due to the soundly visible isolating distance, which is highly advantageous for maintenance. Furthermore, the fuse switch disconnecter can be equipped with an electromechanical / electronic fuse monitoring as well as an innovative network monitoring function. All these features make the SENTRON 3NP1 the ideal disconnecter for maximum system availability.

Planning advantages

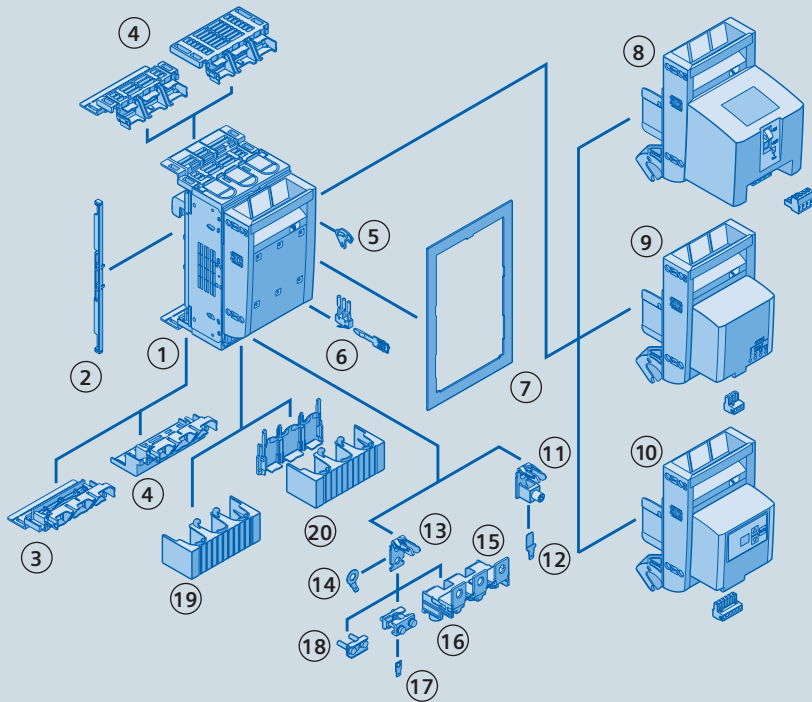
- High packing density supported in power distribution boards
- Flexible cable feeder conversion (top/bottom) without intervention with internal circuits
- One device version for industrial and infrastructure applications thanks to standard touch and reach-round protection
- Also suitable for Rittal RiLine60 busbar system
- Flexible busbar contacting conversion from 5 mm to 10 mm
- Uniform grid sizes for easy configuration

Benefits in the control cabinet

- Rapid snap-on mounting with sizes 000/00
- Tight fit of the large and heavier device versions (sizes 1, 2, 3) thanks to screw fastening
- Cost-favorable solution for occasional switching and protection
- Space-saving feeders
- Availability of load tables for application at higher temperatures or with semiconductor fuses
- Connection of cables or laminated conductors by means of flat-type, saddle, prism or box terminals
- Superimposed mounting option of busbar holders

Added operational value

- Lockable against unauthorized operation
- Extended touch protection – back-of-hand-proof with handle units removed
- Fuse monitoring facilitates remote signaling and eases on-site troubleshooting for the avoidance of cost-intensive system standstills (incl. network monitoring function with EFM20)
- High degree of safety for maintenance works in the control cabinet thanks to standard reach-round and touch protection



- ① SENTRON 3NP1 fuse switch disconnecter
- ② Frame support
- ③ Reach-round protection for Siemens busbar system
- ④ Reach-round protection for Rittal busbar system
- ⑤ Locking device
- ⑥ Auxiliary switch with actuator
- ⑦ Molded-plastic frame
- ⑧ Fuse carrier with electromechanical fuse monitoring (MFM)
- ⑨ Fuse carrier with electronic fuse monitoring (EFM10)
- ⑩ Fuse carrier with electronic fuse monitoring (EFM20/25)
- ⑪ Box terminal
- ⑫ Auxiliary conductor connection for box terminal
- ⑬ Flat-type terminal
- ⑭ Auxiliary conductor connection for flat-type terminal
- ⑮ Deep-drawn terminal module
- ⑯ Prism terminal
- ⑰ Auxiliary conductor connection for prism terminal
- ⑱ Saddle terminal
- ⑲ Cable connection cover
- ⑳ Cable connection cover with rear cover

Highlights at a glance

- Cable feeder conversion top/bottom without intervention with internal circuits
- Consistent availability of box terminals for all sizes
- Conversion for 5-mm- or 10-mm-wide busbars without losable or breakable parts
- Electromechanical and electronic fuse monitoring available
- Electronic network monitoring function

3NP fuse switch disconnectors

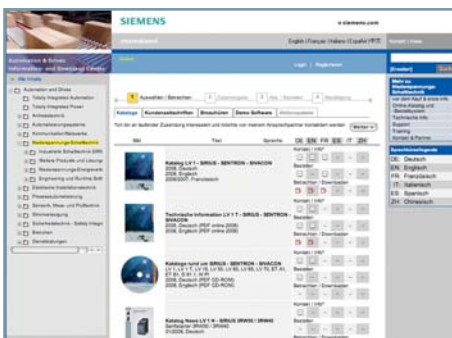
Type		3NP112	3NP113	3NP114	3NP115	3NP116
Rated continuous current I_n for fuse links in acc. with DIN 43620	A Size	100 000	160 00	250 1	400 2	630 3
Rated operational voltage U_n 50/60 Hz AC DC	V V	690 (1000 V with AC-20B) 440 (1000 V with DC-20B)				
Rated operational current I_n with 400 V AC and AC-23B	A	100	160	250	400	630
with 690 V AC and AC-21B	A	100	160	250	400	630
with 440 V DC and DC-21B	A	100	160	250	400	630
Conditional rated short-circuit current (eff.) with 500 V AC						
Short-circuit making capacity	kA	80	80	80	80	80
Short-circuit strength	kA	120	120	120	100	100
Degree of protection		IP40				

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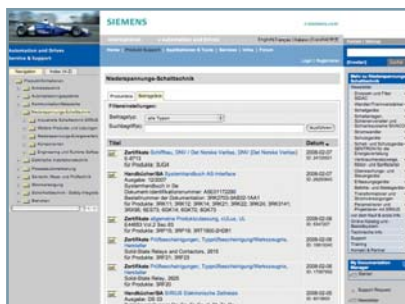
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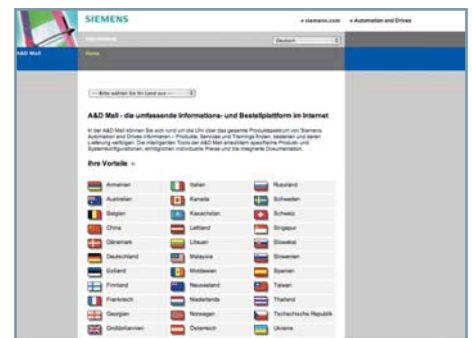
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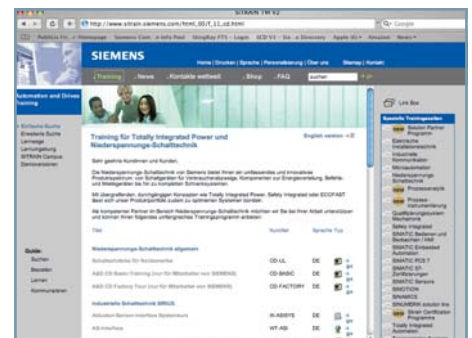
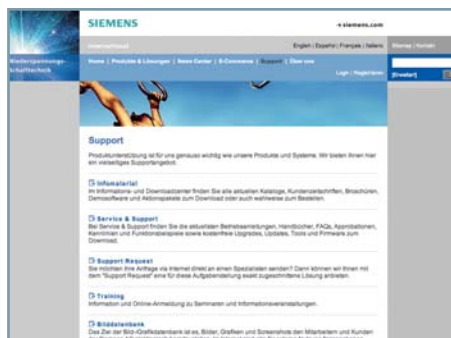
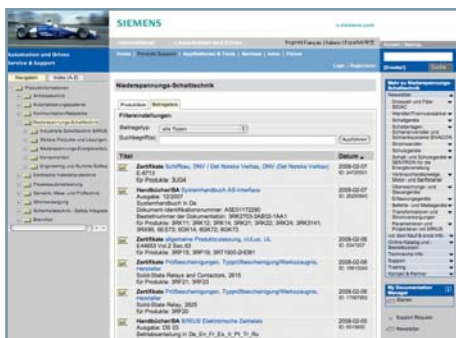
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