

SIVACON Power Distribution Boards, Busway and Cubicle Systems

14



14/2 Introduction

SIVACON Power Distribution Boards and Motor Control Centers

14/7 General data

14/8 8PV power distribution boards and motor control centers

14/10 8PT power distribution boards and motor control centers

SIKUS Series of Switchgear Cubicles

14/13 General data

ALPHA 630-DIN Floor-Mounted Distribution Boards

14/15 General data

8HP Molded-Plastic Distribution Systems

14/17 General data

Components for 8US, 8UC, 4NC Distribution Systems 8US Busbar Systems

14/23 General data

40 mm Busbar Systems

14/24 General data

14/25 Base assemblies

14/26 Supply and connection technologies

14/27 Busbar adapters and device holders

14/30 Accessories for busbar adapters and device holders

60 mm Busbar Systems

14/31 General data

14/32 Base assemblies up to 630 A

14/34 Base assemblies up to 1600 A

14/35 Supply and connection technologies

14/37 Busbar adapters and device holders

14/40 Bus-mounting fuse bases

14/41 Accessories for busbar adapters and device holders

Components for 8US, 8UC, 4NC Distribution Systems 8UC6 Door-Coupling Rotary Operating Mechanisms

14/42 General data

14/44 For 3K switch disconnectors

14/44 For 3VF and 3VL circuit-breakers

14/45 Individual parts

14/46 Operating mechanisms for fixed mounting

Components for 8US, 8UC, 4NC Distribution Systems 4NC Current Transformers

14/47 General data

14/50 Classes 1 and 3, from 50 A to 1500 A

SIVACON Power Distribution Boards, Busway and Cubicle Systems

Introduction

Overview



SIVACON power distribution boards and motor control centers

Up to 7400 A

Reliable, economical, flexible and communication-capable

For all applications in infrastructure and process industry

In circuit-breaker design

In fixed-mounted design

In in-line design

In plug-in design

In withdrawable design

Degree of protection up to IP54

Type-tested

Tested for resistance to internal arcing faults

Tested for resistance to earthquakes

SICUBE system cubicles and cubicle air-conditioning

System cubicles for individual solutions including cubicle air-conditioning for optimum operating conditions

For a wide range of applications in tough environments and in laboratories, offices and medical practices

Flexible expansion levels and types of delivery

Coordinated logistical and delivery concepts

Degree of protection up to IP55

For heavy integrated equipment up to 1000 kg

System cubicles in EMC design

System cubicles in earthquake-proof design

In all RAL colors, including special colors

SIVACON Power Distribution Boards, Busway and Cubicle Systems



		SIKUS 3200 series of switchgear cubicles	ALPHA 630-DIN floor-mounted distribution boards
		For expansion as main and subdistribution boards up to 3200 A	Up to 630 A
		For all applications in infrastructure	For applications in non-residential and industrial buildings
		For stand-alone and series-connected installation	Flexible delivery forms (flat pack or preassembled)
		Flexible expansion with many different assembly kits and accessories	Modular system
		In circuit-breaker design	Many different assembly kits for individual expansion
		In fixed-mounted design	Safety class 1 and safety class 2
		In in-line design	Depth 210 mm, 250 mm and 320 mm
		Degree of protection up to IP55	Degree of protection up to IP55
Overvoltage category	V	1000/III	III
Rated impulse withstand voltage U_{imp}		8	6
Clearance and creepage distances		DIN VDE 0110	DIN VDE 0110
Rated insulation voltage U_i		1000	690
Rated operational voltage U_e		690	690
Rated voltage U_n (AC 40 Hz to 60 Hz)		--	690 for built-in devices
Rated current	A	3200, main busbars	Up to 630
Short-circuit strength			
Main busbars	I_{pk} kA	Up to 220	Up to 61.3 (3-pole) ¹⁾ , conduction interval 30 ms 20, conduction interval 1 s
	I_{cw} (1 s) kA	Up to 100	
Distribution buses	I_{pk} kA	Up to 220	
	I_{cw} (0.5 s) kA	Up to 100	
Protective measures		Safety class 1 (protective conductor connection)	Safety class 1 (protective conductor connection) Safety class 2 (total insulation)
Number of conductors in busbar run		3, AC 4, AC 2 and 3, DC	4/5
Degree of protection acc. to EN 60529		IP55, with cover for shock protection and sealed door IP20, with cover for shock protection, without door	IP43 with door, IP55 with door (with matching flanges)
Mounting rail row spacing per standard mounting rail	mm	--	150
Modular width (MW)		--	18 mm, 12 MW + 1 mountable MW
Degree of pollution		3	3
Ambient temperature	°C	35 (24 h mean value)	35 (24-h average value)
Relative atmospheric humidity	%	50 at 40 °C	50 at 40 °C
Test specification		AAcc.cc. to EN 60439-1 (VDE 0660 Part 500), IEC 60439-1	Acc. to EN 60439-1/3 (VDE 0660 Part 500/504), DIN VDE 0603-1
Altitude	m	Max. 2000 (above mean sea level)	--
Enclosures		Frame and doors of 2 mm sheet steel	Sheet steel
Surface of metal parts		Electrogalvanized and powder-coated	Electrogalvanized and powder-coated
Color		RAL 7035 light gray (other RAL colors on request)	RAL 7035 (light gray)
Locking system		2/4-point interlocking with integrated espagnolette lock and double-bit key with 3 mm pin	3-point interlocking with integrated espagnolette lock (on request can be replaced by other locking systems)
Packing material		--	Shock-proof, environmentally-compatible

1) Busbar support spacing 400 mm, Cu busbars 30 mm x 10 mm.

SIVACON Power Distribution Boards, Busway and Cubicle Systems

Introduction



Enclosure size		1	2	2.5	3	4
8HP molded-plastic distribution systems						
Width	mm	307	307	307	307	614
Height	mm	153.5	307	460.5	614	614
Depth						
• 147.0 mm		✓	✓	✓	✓	✓
• 185.0 mm				✓		
• 212.0 mm			✓			
• 239.5 mm					✓	✓
Enclosure designs						
• Empty enclosures						
- Transparent cover		✓	✓	✓	✓	✓
- Opaque cover		✓	✓	✓	✓	✓
Enclosures for modular installation devices						
• 1 x 11 MW						
- Transparent cover		✓				
- Opaque cover		✓				
- Cover with operating flap		✓				
• 2 x 14 MW						
- Transparent cover			✓			
- Opaque cover			✓			
- Cover with operating flap			✓			
• 3 x 14 MW						
- Transparent cover				✓		
- Opaque cover				✓		
- Cover with operating flap				✓		
• 4 x 14 MW						
- Transparent cover					✓	
- Opaque cover					✓	
- Cover with operating flap					✓	
DIAZED fuse enclosures						
• 3 x 25A (E27)		✓	✓	✓	✓	
• 3 x 63A (E33)		✓	✓	✓	✓	
Enclosures with LV HRC fuse base						
• 3 x NH00		✓	✓			
• 6 x NH00			✓			
• 3 x NH1			✓	✓		
• 3 x NH2			✓	✓	✓	
• 3 x NH3			✓	✓	✓	
Meter enclosures						
			✓	✓	✓	✓
Enclosures with NP fuse switch disconnectors						
• NH000		✓	✓			
• NH00		✓	✓	✓		
• NH1			✓		✓	
• NH2			✓		✓	
• NH3			✓		✓	
Enclosures with main control and EMERGENCY-STOP switch						
• $I_e = 63$ A		✓	✓			
• $I_e = 160$ A			✓			
• $I_e = 250$ A			✓		✓	
• $I_e = 400$ A			✓		✓	
• $I_e = 630$ A					✓	
• $I_e = 1000$ A					✓	

SIVACON Power Distribution Boards, Busway and Cubicle Systems

Introduction



Type	40 mm busbar systems	60 mm busbar systems
8US busbar systems		
Adapters for SIRIUS size S00/S0		
Circuit-breakers	✓	✓
Circuit-breakers + lateral auxiliary switch	✓	✓
Contactors + overload relay	✓	✓
Direct start load feeders	✓	✓
Reversing feeders	✓	✓
Adapters for SIRIUS size S2		
Circuit-breakers	✓	✓
Circuit-breakers + lateral auxiliary switch	✓	✓
Contactors + overload relay	✓	✓
Direct start load feeders	✓	✓
Reversing feeders	✓	✓
Adapters for SIRIUS size S3		
Circuit-breakers	✓	✓
Adapters for 3VF circuit-breakers		
3VF3	✓	✓
3VF4		✓
3VF5		✓
Adapters for 3VL circuit-breakers		
3VL1	✓	✓
3VL2	✓	✓
3VL3		✓
3VL4		✓
Adapters for 3KA switch disconnectors		
3KA52		✓
3KA53		✓
3KA55		✓
3KA57		✓
3KA58		✓
Adapters for 3NP fuse switch disconnectors		
3NP50 60		✓
3NP52		✓
3NP53		✓
3NP54		✓

SIVACON Power Distribution Boards, Busway and Cubicle Systems

Introduction



Rating P_n	VA	1	1.5	2.5	5	10	15
Current transformers from 50 A to 1500 A							
Rated primary current I_{pn} (A) / rated secondary current (A)							
50/1		✓					
50/5		✓					
60/1		✓					
60/5		✓					
75/1			✓	✓			
75/5			✓	✓			
80/1			✓	✓			
80/5			✓	✓			
100/1				✓	✓		
100/5				✓	✓		
125/1				✓	✓		
125/5				✓	✓		
150/1				✓	✓		
150/5				✓	✓		
200/1				✓	✓		
200/5				✓	✓		
250/1				✓	✓	✓	
250/5				✓	✓	✓	
300/1				✓	✓	✓	
300/5				✓	✓	✓	
400/1				✓	✓	✓	
400/5				✓	✓	✓	
500/1					✓	✓	
500/5					✓	✓	
600/1					✓	✓	✓
600/5					✓	✓	✓
750/1					✓	✓	
750/5					✓	✓	
800/1						✓	✓
800/5						✓	✓
1000/1						✓	✓
1000/5						✓	✓
1200/1						✓	✓
1200/5						✓	✓
1500/1						✓	✓
1500/5						✓	✓

SIVACON Power Distribution Boards and Motor Control Centers

Overview

Low-voltage switchboards form the link between equipment (generators), transmission (cables, overhead lines) and transformation (transformers) of electrical energy on the one hand, and the loads, such as motors, solenoid valves, actuators and devices for heating, illumination and air conditioning on the other.

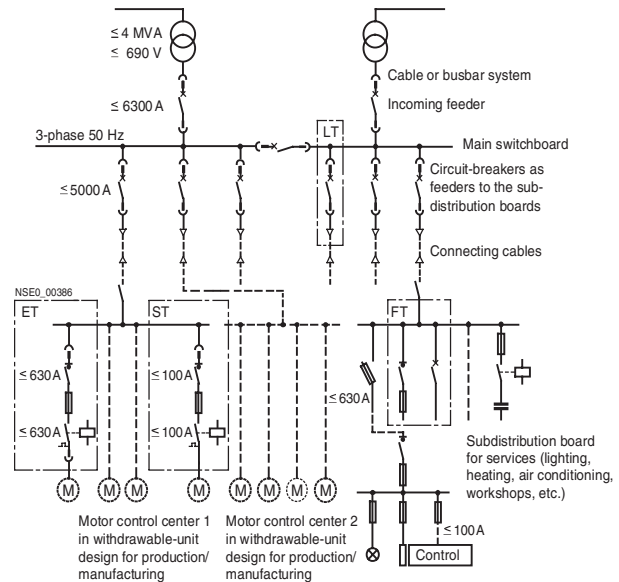
As the majority of applications are supplied with low voltage, the low-voltage switchboard is of special significance in both public supply systems and industrial plants.

Reliable power supplies depend on good availability, flexibility to allow for changes and process-related modifications, and high operating safety.

Power distribution in a low-voltage system usually takes place through a main switchboard (power center or main distribution board) and a number of sub-distribution boards or motor distribution boards, also known as motor control centers (MCC). See example opposite.

The SIVACON low-voltage switchboards offer optimum solutions in low-voltage systems for all applications up to 7400 A. The SIVACON 8PV switchboards are manufactured by Siemens in Leipzig, and the SIVACON 8PT switchboards by our SIVACON Technology Partners near you.

The most important selection criteria are shown in the table below.



Selection criteria	SIVACON 8PV		SIVACON 8PT	
	Top	Rear	Top	Rear
Busbar position	Top	Rear	Top	Rear
Rated currents				
Busbars up to	2500 A	6300 A	7400 A	3200 A
Infeed up to	2500 A	6300 A	6300 A	3200 A
Short-circuit strength I_{pk} up to	110 kA	220 kA (250 kA)	375 kA	187 kA
Equipment layout	Fixed-mounted design	Fixed-mounted design	Fixed-mounted design	Fixed-mounted design ¹⁾
	In-line design	In-line design	In-line design	In-line design
	Plug-in design	Plug-in design	Plug-in design	--
	Withdrawable-unit design	Withdrawable-unit design	Withdrawable-unit design	--
Type of installation	Free-standing/against wall	Free-standing/against wall	Free-standing/against wall	Free-standing/against wall
	Back to back	Back to back	Back to back	Back to back
	--	Double-fronted	--	--
Use	Motor control center	Motor control center	Motor control center	--
	Power distribution boards	Power distribution boards	Power distribution boards	Power distribution boards
Manufactured by SIVACON Technology Partner	--	--	x	x

1) Circuit-breakers optionally in withdrawable design.

SIVACON Power Distribution Boards and Motor Control Centers

8PV power distribution boards and motor control centers

Overview

The SIVACON 8PV low-voltage switchboard is a type-tested switchgear and controlgear combination that is used for example in the power industry, in the chemical and oil industries and in the capital goods sector.

It is notable for its excellent service availability and high degree of personnel and system safety. It can be used for all applications up to 6300 A:

- As main switchboard (power control center or main distribution board)
- As motor control center (MCC)
- As sub-distribution board

With the many combinations that the SIVACON modular design allows, a wide range of demands can be met both in fixed-mounted, plug-in and in withdrawable-unit design.

All modules used are type-tested (TTA), i.e. they comply with the following standards:

- IEC 60439-1
- EN 60439-1, VDE 0660 Part 500

and in addition

- EN 60274, VDE 0660 Part 514 (protection against electric shock)

- IEC 61641, VDE 0660 Part 500, supplement sheet 2 (arcing faults)
- IEC 60068 Part 2, IEC 60980 (induced shocks)
- Certification EN 9001 and EN 14001 (quality/environmental management system).



Design

Withdrawable-unit design (MCC design)

For frequently changing requirements, predominantly in the process industry, the design of choice is the withdrawable-unit design. What is required here is flexibility and the highest level of availability.

Without shutting down the switchboard it is possible, for example, to adapt withdrawable units to changed motor outputs or incorporate withdrawable units for new loads. It is even possible to modify the withdrawable unit compartments. With the ease of handling and short conversion times the withdrawable-unit design ensures high levels of system availability.



Withdrawable unit size 1/4 (11 kW with direct contactor and SIMOCODE pro)



Withdrawable unit size 1 (30 kW with contactor-type wye-delta circuit)

You can find more information on the Internet at:

<http://www.sivacon.com>



Withdrawable-unit section

- Test and disconnected position behind closed door without affecting the degree of protection
- Highest packing density with minimum base area (up to 40 withdrawable units per section)
- Integrated operator error protection for all withdrawable units
- Clear indication of unit positions
- Easy insertion of the withdrawable units without overcoming insertion forces
- Visible isolating distances on the infeed and outgoing sides

SIVACON Power Distribution Boards and Motor Control Centers

8PV power distribution boards and motor control centers

Technical specifications

Rated insulation voltage U_i			
Main circuit	V		1000
Rated operational voltage U_e			
Main circuit	V		Up to 690
Clearance and creepage distances			
Rated impulse withstand voltage U_{imp}	kV		8
Overvoltage category			III
Degree of pollution			3
Busbars (3- and 4-pole)			
Horizontal main busbars	Rated current	A	Up to 6300
	Rated impulse withstand current I_{pk}	kA	Up to 250
	Rated short-time withstand current I_{cw}	kA	Up to 100
Vertical busbars, for circuit-breaker design	Rated current	A	Up to 6300
	Rated impulse withstand current I_{pk}	kA	Up to 250
	Rated short-time withstand current I_{cw}	kA	Up to 100
For fixed-mounted design, for in-line type (plugged in)	Rated current	A	Up to 2000
	Rated impulse withstand current I_{pk}	kA	Up to 110
	Rated short-time withstand current I_{cw}	kA	Up to 50 ¹⁾
For plug-in design, for withdrawable-unit design	Rated current	A	Up to 1000
	Rated impulse withstand current I_{pk}	kA	Up to 143
	Rated short-time withstand current I_{cw}	kA	Up to 65 ¹⁾
Device rated currents			
Circuit-breakers	A		Up to 6300
Cable feeders	A		Up to 1600
Motor feeders	A		Up to 630
Internal separation			
Form 1 to form 4			IEC 60439-1, Section 7.7, EN 60439-1
Surface treatment			
Frame parts			Sendzimir-galvanized
Enclosures			Sendzimir-galvanized/powder-coated
Doors			Powder-coated
Color of powder-coated parts (coating thickness 100 $\mu\text{m} \pm 25 \mu\text{m}$)			RAL 7032, pebble gray
Degree of protection			
Acc. to IEC 60529, EN 60529			IP20 to IP54
Dimensions			
Height	mm		2200
Width	mm		400 to 1200
Depth	mm		600 to 1200

1) Rated conditional short-circuit current I_{cc} up to 100 kA.

SIVACON Power Distribution Boards and Motor Control Centers

8PT power distribution boards and motor control centers

Overview

SIVACON 8PT with busbar at rear up, to 3200 A



SIVACON 8PT with busbar at top, up to 7400 A



1st + 2nd field on left

Circuit-breaker design with:

- SENTRON WL and VL circuit-breakers for:
 - Incoming feeders
 - Outgoing feeders to sub-distribution boards
 - Bus couplings

3rd field on left

Fixed-mounted design with:

- 3VL circuit-breakers
- 3RV motor starter protectors
- 3NP fuse switch disconnectors
- 3NJ4 fuse switch disconnectors for:
 - Cable feeders to loads

4th field on left

3NJ6 circuit-breaker design with:

- 3NJ6 in-line switch disconnectors with fuses for:
 - Cable feeders to loads

The SIVACON 8PT low-voltage switchboard is a type-tested switchgear and controlgear combination that is used for infra-structural supply in industry and in buildings (administrative and functional buildings as well as industrial and commercial buildings), but also in the process industry.

SIVACON 8PT is tailored to the needs of the global market, i.e. it considers the demand for standard solutions from a single source but at the same time for local production. It can be used for all applications up to 7400 A:

- As main switchboard (power control center or main distribution board)
- As motor control center (MCC)
- As sub-distribution board

With the many combinations that the SIVACON modular design allows, a wide range of demands can be met both in fixed-mounted, plug-in and in withdrawable-unit design.

All modules used are type-tested (TTA), i.e. they comply with the following standards:

- IEC 60439-1
- EN 60439-1, VDE 0660 Part 500

and in addition

- IEC 61641, VDE 0660 Part 500, supplement sheet 2 (arcing faults)
- Certification EN 9001 and EN 14001 (quality/environmental management system).



Left field

Plug-in design with:

- Outgoing feeders and contactor assemblies (fuseless, fused) for:
 - Motor feeders
 - Cable feeders

Right field

Withdrawable-unit design with:

- Outgoing feeders and contactor assemblies (fuseless, fused) for:
 - Motor feeders
 - Actuators
 - Solenoid valves
 - Cable feeders

SIVACON Power Distribution Boards and Motor Control Centers

8PT power distribution boards and motor control centers

Design

Circuit-breaker design

Switchboards for high energy demands usually have a large number of sub-distribution boards and loads connected downstream. This means that there are special requirements with regard to long-term operating reliability and operator safety. The "infeed", "coupling" and "feeder" functions must be reliably available over long periods. Maintenance and testing must entail only short downtimes. The circuit-breaker design meets these requirements with the SENTRON WL and VL circuit-breakers.



SENTRON WL 1600 A circuit-breaker, withdrawable design
Section width 400 mm

You can find more information on the Internet at:

<http://www.sivacon.com>



Circuit-breaker section

- Up to 3 circuit-breakers per section can be installed
- Test and disconnected position with door closed
- Free choice of direction of incoming supply without restriction to technical specifications
- Optimum connection conditions for every rated current range.

SIVACON Power Distribution Boards and Motor Control Centers

8PT power distribution boards and motor control centers

Technical specifications

Rated insulation voltage U_i			
Main circuit	V		1000
Rated operational voltage U_e			
Main circuit	V		Up to 690
Clearance and creepage distances			
Rated impulse withstand voltage U_{imp}	kV		8
Overtoltage category			III
Degree of pollution			3
Busbars (3- and 4-pole)			
Horizontal main busbars	Rated current	A	Up to 7400
	Rated impulse withstand current I_{pk}	kA	Up to 375
	Rated short-time withstand current I_{cw}	kA	Up to 150
Vertical busbars, for circuit-breaker design	Rated current	A	Up to 6300
	Rated impulse withstand current I_{pk}	kA	Up to 250
	Rated short-time withstand current I_{cw}	kA	Up to 100
For fixed-mounted design, for in-line type (plugged in)	Rated current	A	Up to 2100
	Rated impulse withstand current I_{pk}	kA	Up to 110
	Rated short-time withstand current I_{cw}	kA	Up to 50 ¹⁾
For plug-in design, for withdrawable-unit design	Rated current	A	Up to 1200
	Rated impulse withstand current I_{pk}	kA	Up to 163
	Rated short-time withstand current I_{cw}	kA	Up to 65 ¹⁾
Device rated currents			
Circuit-breakers	A		Up to 6300
Cable feeders	A		Up to 1600
Motor feeders	A		Up to 630
Internal separation			
Form 1 to form 4			IEC 60439-1, Section 7.7, EN 60439-1
Surface treatment			
Frame parts			Sendzimir-galvanized
Enclosures			Sendzimir-galvanized/powder-coated
Doors			Powder-coated
Color of powder-coated parts (coating thickness 100 μm \pm 25 μm)			RAL 7032, pebble gray
Degree of protection			
Acc. to IEC 60529, EN 60529			IP20 to IP54
Dimensions			
Height	mm		2000 to 2600
Width	mm		400 to 1200
Depth	mm		600 to 1200

1) Rated conditional short-circuit current I_{cc} to 100 kA.

SIKUS Series of Switchgear Cubicles

General data

Technical specifications

Environmental aspects

The plastics used are recyclable. The paints used are free from solvents, cadmium and lead.

Form of internal separation (compartmentalization)

Partitions increase the level of operator safety and protect against solid foreign bodies passing between adjacent units.

Overvoltage category	V	1000/III
Rated impulse withstand voltage U_{imp}	kV	8
Clearance and creepage distances		DIN VDE 0110
Rated insulation voltage U_i	V	1000
Rated operational voltage U_e	V	690
Rated current	A	3200, main busbars
Short-circuit strength		
Main busbars	I_{pk} kA I_{cw} (1 s) kA	Up to 220 Up to 100
Distribution busbars	I_{pk} kA I_{cw} (0.5 s) kA	Up to 220 Up to 100
Protective measures		Safety class 1 (protective conductor connection)
Number of conductors in busbar run		3, AC 4, AC 2 and 3, DC
Degree of protection acc. to EN 60529		IP55, with cover for shock protection and sealed door IP20, with cover for shock protection, without door
Degree of pollution		3
Ambient temperature	°C	35 (24 h average value)
Relative air humidity	%	50 at 40 °C
Altitude	m	Max. 2000 (above mean sea level)
Enclosure		Frame and doors of 2 mm sheet steel
Surface of metal parts		Electrogalvanized and powder-coated
Color		RAL 7035 light gray (other RAL colors on request)
Locking system		2/4-point interlocking with integrated espagnolette lock and double-bit key with 3 mm pin

Constructional and test requirements

The partially equipped SIKUS 3200 modular cabinets are tested as "type-tested low-voltage controlgear combinations" (TTA) according to EN 60439-1 (VDE 0660 Part 500) IEC 60439-1.

The manufacturer of a switchboard is usually the manufacturer of the switchgear and controlgear. During installation, the switchgear manufacturer must pay attention to the special instructions for the partially equipped SIKUS 3200 modular cabinets and for the Siemens switching devices that are to be fitted. We offer a two-day distribution board training course for this purpose.

If there are deviations in the components fitted or in the dimensions, the characteristics of the type-tested SIKUS 3200 modular cabinets change accordingly.

The tested characteristics of the controlgear combination TTA must not change to an impermissible extent, for example with regard to:

- Short-circuit strength
- Temperature rise
- Arcing spaces of the controls

Provided account is taken of the standard IEC 60204-1 (EN 60204-1), equipment safety, it is also possible to use the units for control systems for machinery and process plants.

Type testing

The SIKUS 3200 type-tested modular cabinets comply with the requirements in the following categories:

- Temperature-rise limit
- Insulation strength
- Short-circuit strength
- Effectiveness of the protective conductor
- Clearance and creepage distances
- Mechanical functions
- Degree of protection

As the manufacturer, the switchgear and controlgear maker must set up the installation in conformance with EN 60439-1 (VDE 0660 Part 500), IEC 60439-1 and the instructions of the system supplier.

The routine test for

- Wiring
- Electrical functions
- Insulation
- Protective measures

must subsequently be performed by the manufacturer (switchgear and controlgear maker), and the test report must be signed.

The internal arcing fault test is performed according to EN 60439-1, supplement sheet 2 (VDE 0660, Part 500, supplement sheet 2) or IEC 61641 (report).

SIKUS Series of Switchgear Cubicles

General data

14

INSTITUT „PRÜFFELD FÜR ELEKTRISCHE HOCHLEISTUNGSTECHNIK“ GMBH		IPH BERLIN
Unabhängiges, akkreditiertes Prüflaboratorium - independent, accredited test laboratory		
PRÜFBESCHEINIGUNG		
Über durchgeführte Typprüfungen im angegebenen Umfang		
Siemens AG - Automatisierungs- und Antriebstechnik Siemensstraße 10 D-93055 Regensburg		AUFTRAGGEBER
Siemens AG		HERSTELLER
Niederspannungs-Schaltgerätekombination		PRÜFOBJEKT
SIKUS 3200 Abgangsfeld; 3NUG-Sicherungsleistungsfeld; 600 mm breit 1 x 630 A Gr.3 ; 1 x 400 A Gr. 2; 1 x 250 A Gr. 1; Einbaulage vertikal		TYP
Fertigungsmuster		FERTIGUNGS-NR.
Bemessungsbetriebspannung	U_b 690 V	NENN- /
Bemessungsisolationspannung	U_i 1000 V	BEMESSUNGS-
Bemessungsstoßspannungsfestigkeit	U_{sto} 8 kV	DATEN NACH
Bemessungsstrom Hauptammelschiene	I_b 3200 A	ANGABEN DES
Bemessungsstrom Verteilschiene	I_v 1150 A	AUFTRAGGEBERS
Bemessungsbelastungsfaktor	k_f 0,9	
Bemessungskurzzeitstromfestigkeit Hauptammelschiene	I_{kw} 100 kA	
Bemessungskurzzeitstromfestigkeit Hauptammelschiene	t 1 s	
Bemessungskurzzeitstromfestigkeit Verteilschiene	I_{kw} 50 kA	
Bemessungskurzzeitstromfestigkeit Verteilschiene	t 1 s	
Bemessungsstoßstromfestigkeit Hauptammelschiene	I_{st} 220 kA	
Bemessungsstoßstromfestigkeit Verteilschiene	I_{st} 115 kA	
Bemessungsfrequenz	f 50 Hz	
Schutzart	IP30	Dach belüftet
IEC 60439-1: 1999		PRÜFVORSCHRIFT
DIN EN 60439 Teil 1 (VDÉ 0660 Teil 500): 2000-8		
Nachweis der	<ul style="list-style-type: none"> • Einhaltung der Grenzübertemperaturen • Isolationsfestigkeit • Kurzschlußfestigkeit • Wirksamkeit des Schutzleiterstromkreises • Kriechstrecken und Luftstrecken • mechanischen Funktion • IP-Schutzart 	UMFANG DER PRÜFUNG
19. bis 26. April 2001		DATUM DER PRÜFUNG
Die Typprüfungen wurden BESTANDEN. Die Prüfergebnisse sind im IPH-Typprüfbericht Nr. 1209.0140.1.077 dokumentiert.		PRÜFERGEBNIS
 RONALD BORCHERT Leiter Niederspannungs-Prüffeld	 JÜRGEN VÖGLER Verantwortlicher Prüferingenieur	
Berlin, 21. Juni 2001		
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IPH - LANDSBERGER ALLEE 378 - D-12681 BERLIN - TEL. 030/54 96 02 00 - FAX 030/54 96 02 22		IPH BERLIN

ALPHA 630-DIN Floor-Mounted Distribution Boards

General data

Overview

System

The new Siemens switchboard system, based on decades of experience with distribution boards, is of modular design.

Particular attention was paid to individual installation practices.

The system includes unequipped boards as flat packs (delivered in individual parts for customer assembly, see also Part 3) in degree of protection IP43, unequipped boards ready assembled in degree of protection IP55, assembly kits for project-related and individual compilation, and a comprehensive range of accessories.

Enclosure

Material: Sheet steel, electrolytically zinc-coated, powder-coated.

Sheet thickness:
Degree of protection IP43/IP55
Body 1 mm, door 1 mm

Color:
RAL 7035 light gray
Other RAL colors on request

Assembly kits

The assembly kits consist of sendzimir-galvanized sheet steel and molded-plastic covers for a wide range of configuration possibilities, for example for switchgear and installation equipment.

The largest controls that can be installed in the ALPHA 630-DIN floor-mounted distribution boards are the Siemens controls up to a maximum rated current of 630 A.

Cubicle dimensions

All dimensions in mm

Height:
Internal dimension: 1800
External dimension with base: 1950

Width (internal/external dimensions):
250/300, 500/550, 750/800, 1000/1050, 1250/1300

Depth (external dimension): 210, 250, 320

Assembly kits in section size grid dimension
Height x Width: 150 x 250

ALPHA 630-DIN Floor-Mounted Distribution Boards

General data

Technical specifications

Overvoltage category		III
Rated impulse withstand voltage U_{imp}	kV	6
Clearance and creepage distances		DIN VDE 0110
Rated insulation voltage U_i	V	690
Rated operational voltage U_o	V AC/DC	690
Rated voltage U_n (AC 40 Hz to 60 Hz)	V	690 for built-in devices
Rated current	A	Up to 630
Rated peak withstand current I_{pk}	kA	Up to 61.3 (3-pole) ²⁾ , conduction interval 30 ms
Rated short-time current I_{cw}	kA	20, conduction interval 1 s
Protective measures		Safety class 1 (protective conductor connection) Safety class 2 (total insulation)
Number of conductors in busbar run		4/5
Degree of protection acc. to EN 60529		IP43 with door, IP55 with door (with matching flanges)
Mounting rail tier spacing per standard mounting rail tier	mm	150
Modular width (MW)		18 mm, 12 MW + 1 mountable MW
Degree of pollution		3
Ambient temperature	°C	35 (24-h average value)
Relative air humidity	%	50 at 40 °C
Test specifications		Acc. to EN 60439-1/3 (VDE 0660 Part 500/504), DIN VDE 0603-1
Enclosure		Sheet steel
Mounting dimensions		DIN 43870
Surface Color¹⁾		Electrogalvanized and powder-coated RAL 7035 (light gray)
Locking system		3-point interlocking with integrated espagnolette lock (on request can be replaced by other locking systems)
Packing material		Shock-proof, environmentally-compatible

1) Other RAL colors on request.

2) Busbar support spacing 400 mm,
Cu busbar 30 mm × 10 mm.

Dimensions for cabinets

Cabinet (external dimensions)		
Height mm	Width mm	Depth mm
1950 with base (100 mm)	300	210
	550	
	800	
	1050	
	1300	
1950 with base (100 mm)	300	250
	550	
	800	
	1050	
	1300	
1950 with base (100 mm)	300	320
	550	
	800	
	1050	
	1300	

8HP Molded-Plastic Distribution Systems

General data

Overview

The 8HP distribution system is a modular system for low-voltage small distribution boards, control panels and power distribution boards.



8HP distribution board with support rack and cable space cover

Design

The distribution system consists of 5 enclosure sizes with a basic dimension of 307 mm.

The enclosures have removable knockouts for flange openings and cable entries. They can be used for distributed as well as for stand-alone installation.

Non-transparent or transparent covers are available (size 2.5 only transparent).

The covers are fitted with quick-release locks which require a tool for opening. They also can be equipped with locks for manual operation as well as with screwed locks.

The internal mounting depth of the enclosures is 147 mm. For enclosure size 2 additional covers are available for mounting depth 212 mm; for enclosure size 2.5 a transparent cover is available for mounting depth 185 mm.

The mounting depth of enclosure sizes 3 and 4 can be extended by means of an intermediate frame. Several intermediate frames can be used. Each frame increases the mounting depth by 92.5 mm.

Installation conditions under various climatic conditions, "Application – Installation Conditions". Appropriate measures are to be taken (e.g. ventilation, indoor heating) for installation in rooms with high air humidity and heavily varying temperatures in order to exclude generation of harmful condensation water. Breathers must be installed when temperatures vary to a great extent.

Technical specifications

		A	250	400	630	1000
Rated current		A	250	400	630	1000
Rated operational voltage U_e		V	690 AC, 600 DC			
Rated insulation voltage U_i		V	1000 AC, 1200 DC			
Molded-plastic group I		Acc. to DIN VDE 0110 Parts 1 and 2/01.89	600 ≤ CTI For the installed devices, the specifications listed in the following catalogs are applicable:			
Rated impulse voltage/degree of pollution			8 kV/3			
Minimum air clearances		mm	8			
Minimum creepage distances		mm	12.5			
Rated current	Busbars	V	250	400	630	1000
	Integrated devices	A	Up to 800			
	Infeed	A	Up to 1800			
Degree of protection	Acc. to EN 60529, DIN VDE 0470		IP65 (8HP1 520 cable entry plate and incoming feeder panel with additional measures)			
Color	Enclosure parts Transparent cover Cable space cover		RAL 7035, light gray Colorless RAL 7035, light gray			
Ambient temperature		°C	-40 to +55			
Busbars						
Rated current		A	250	400	630	1000
Bar dimensions	Main conductor L1, L2, L3	mm	12 × 5	20 × 8	2 × 20 × 8	2 × 30 × 10
	N and PE bar	mm	12 × 5	20 × 8	20 × 8	30 × 10
Infeed	Single-sided	A	250	400	630	1000
	Centered	A	400	800	1000	1800
Short-circuit strength of the busbar						
Rated current		A	250	400	630	1000
Max. distance of busbar supports	307 mm I_{th} (1 s)	kA	10	40	10	40
	307 mm I_s	kA	40	70	20	70
	614 mm I_{th} (1 s)	kA	10	70	30	70
	614 mm I_s	kA	40	80	30	60

8HP Molded-Plastic Distribution Systems

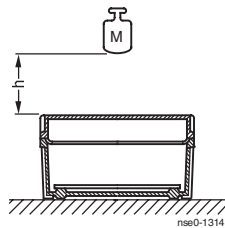
General data

Properties

Test acc. to		Unit	Enclosure bottom parts, opaque cover, cover plates	Transparent cover	Cable entry plate, cover lock
Material			Glass-fiber reinforced polyester	Polycarbonate/Makrolon	PBTP-GV
Electrical characteristics					
Surface resistance	DIN 53482	Ω Level	$> 10^{12}$ KA 3c	$> 10^{15}$ kA1	$> 10^{13}$ KB 225
Tracking resistance	DIN 53480				
Specific insulation resistance	DIN 53482	Ω/cm	$> 10^{14}$	$> 10^{16}$	$> 10^{16}$
Physical characteristics					
Density	DIN 53479/B	g/cm^3	1.7	1.2	1.37
Water absorption	DIN 53495/C				
Temperature resistance					
Flammability	DIN VDE 0304/3	$^{\circ}\text{C}$	BH2 < 10 mm 120	BH2 < 30mm 115	BH2 < 30 mm 120
Continuous operating temperature					
Mechanical characteristics					
Bending strength	DIN 53452	N/mm^2 kJ/m^2	120 40	90 > 25	140 --
Notched bar impact strength	DIN 53453				
Impact strength	DIN 53453	kJ/m^2	50	Not broken	45
Chemical resistance					
Acid (weak)			Resistant	Resistant	Resistant
Alkali (weak)			Resistant	Conditionally resistant	Conditionally resistant
Alcohol			Resistant	Resistant	Resistant
Gasoline			Resistant	Resistant	Resistant
Benzene			Resistant	Use polyester cover	Resistant
Grease and oil			Resistant	Conditionally resistant	Resistant
Chlorinated hydrocarbons			Resistant	Use polyester cover	Resistant

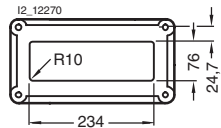
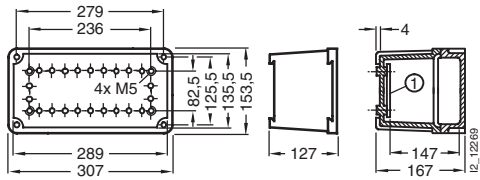
Impact strength according to Belgian standard NBN C20-001 and French standard NF C20-010

Code	Test values		Enclosure bottom part	Cover
	M kg	h m		
IP65 7	1.5	0.4	8HP1 101	8HP1 201
			8HP1 102	8HP1 202/8HP1 212
IP65 8	5	0.2	8HP1 103	8HP1 203
			8HP1 104	8HP1 204
IP65 10	15	0.235	8HP1 101	8HP1 221
			8HP1 102	8HP1 222
			8HP1 103	8HP1 223
			8HP1 104	8HP1 224
IP65 11	15	0.4	8HP1 102	8HP1 232
			8HP1 107	8HP1 247

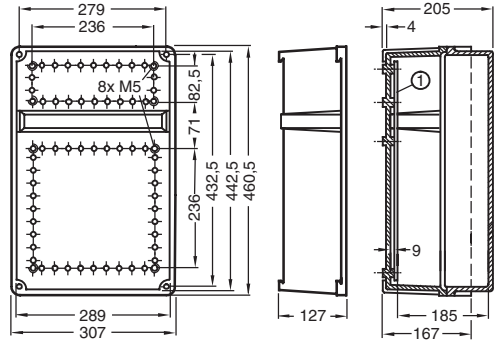


Dimensional drawings

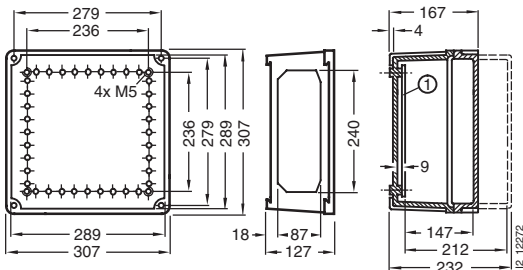
Empty enclosures, covers



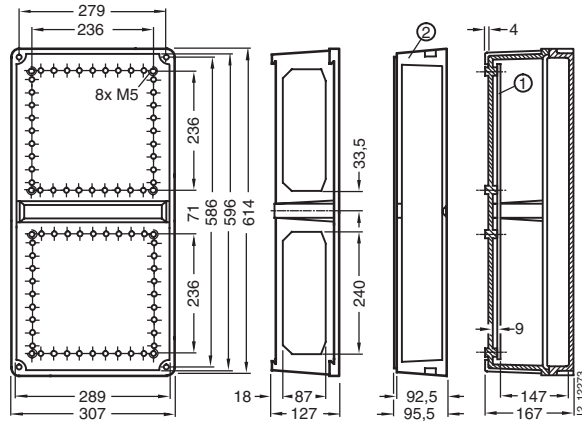
Enclosure size 1



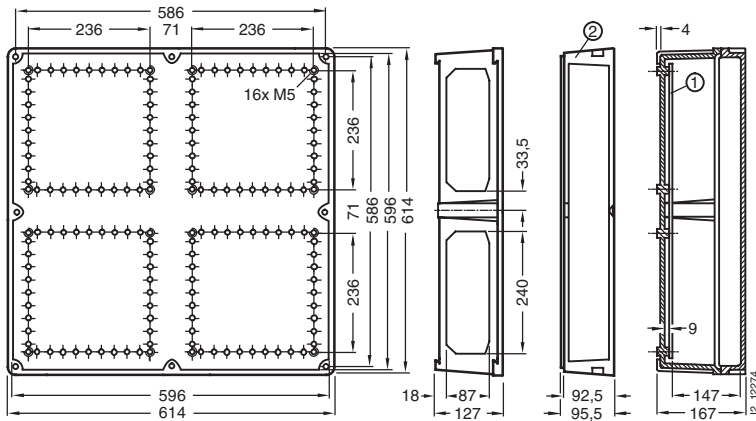
Enclosure size 2.5



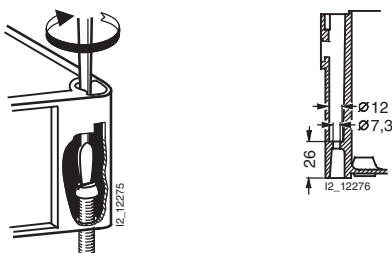
Enclosure size 2



Enclosure size 3



Enclosure size 4



Enclosure fixing

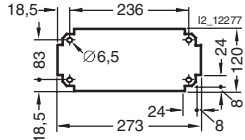
- ① Mounting plate, 2 mm thick
- ② Intermediate frame for increasing the mounting depth (multiple stacking)

8HP Molded-Plastic Distribution Systems

General data

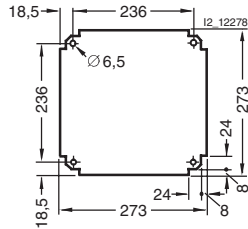
Mounting plates

Sheet steel 2 mm thick, sendzimir-galvanized



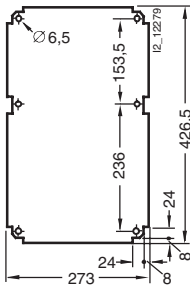
8HP6 301

For enclosure size 1



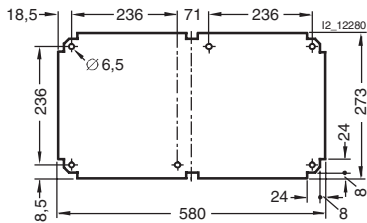
8HP6 302

For enclosure size 2



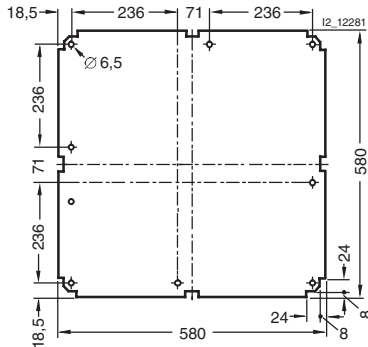
8HP6 307

For enclosure size 2.5



8HP6 303

For enclosure size 3



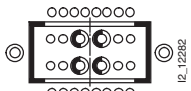
8HP6 304

For enclosure size 4

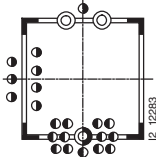
8HP Molded-Plastic Distribution Systems

General data

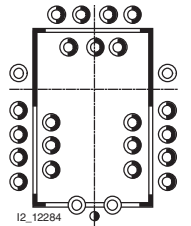
Knockouts for flange openings and cable entries



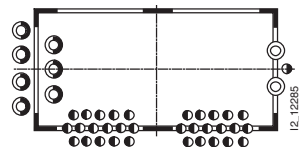
Enclosure size 1



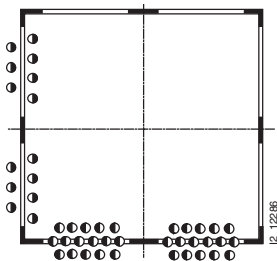
Enclosure size 2



Enclosure size 2.5



Enclosure size 3



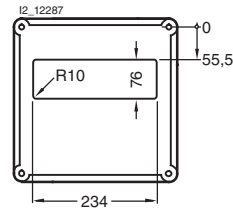
Enclosure size 4

Pg 13.5
Pg 16
Pg 29
Pg 21/Pg 13.5
Pg 29/Pg 16
Pg 48¹⁾/Pg 29
Flange knockouts

If the knockouts do not meet requirements, end cover plates with or without knockouts can be mounted, see Catalog LV1 · 2006, Chapter 14.

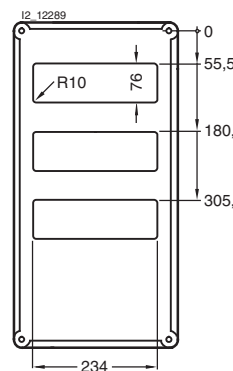
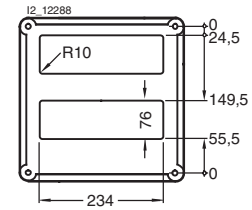
1) Also for joining enclosures with sealing frame

Cover with operating flaps



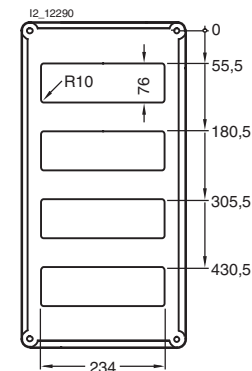
Enclosure size 2

For modular installation devices with snap-on mounting



Enclosure size 3

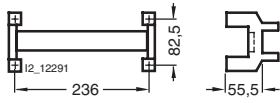
For modular installation devices with snap-on mounting



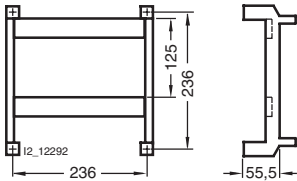
8HP Molded-Plastic Distribution Systems

General data

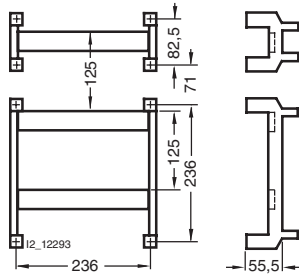
Assembly kits for devices with snap-on mounting



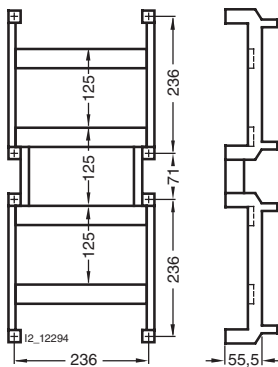
8HP5 531



8HP5 532

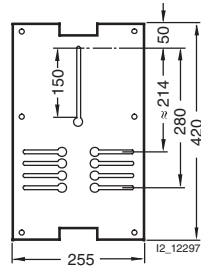


8HP5 533



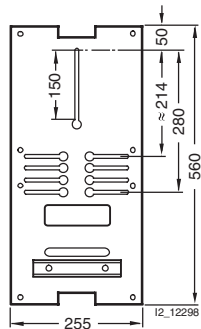
8HP5 534

Meter support plates



8HP6 111

For enclosure size 2.5



8HP6 112

For enclosure size 3 and 4

More information

More data can be found in the Catalog "8HP System", Order No. 8ZX1012-0HP54-5AB1.

Overview



Design

8US busbar systems with 40 mm and 60 mm busbar center-to-center distance as well as flat copper profiles have now become firmly established on the world market. The permissible busbar temperature is a decisive factor when dimensioning the busbars. The busbar temperature is dependent on the current and the current distribution, on the busbar cross-section and the busbar surface, on the position of the busbars, convection and the ambient temperature. The values stated in the table below can only be considered as reference values because the conditions vary with each location. The values are based on uninterrupted current over the whole busbar length.

The trend toward busbars proves most advantageous when the incoming supply is centrally located and the load is distributed symmetrically on both sides.

Function

Short-circuit strength

The short-circuit strength of the busbar system is dependent on the distance of the busbar supports and on the busbar cross-section.

The short-circuit strength of the whole system is dependent on the short-circuit strength of the busbars and of the adapters with circuit-breakers or switch disconnectors (see "Molded-case circuit-breakers (MCCB)" and "Switch disconnectors").

If one of these values is lower than the prospective short-circuit current at the mounting point, a current-limiting protective device has to be mounted upstream of the 8US busbar system. This may also be mounted as a feeder circuit-breaker on the busbar system itself.

8US Busbar Systems

40 mm Busbar Systems

General data

Overview



The 40 mm busbar system is used in machinery and plant building, in motor control centers and in power distribution systems of the low power range up to 400 A.

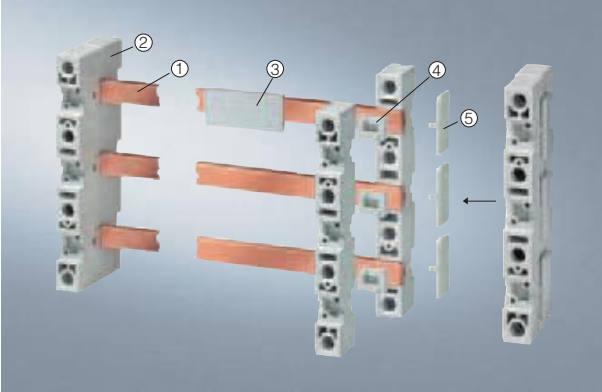
The busbar cross-sections are adapted to the rated currents and are available in the sizes 12 x 5 mm, 12 x 10 mm, 15 x 5 mm and 15 x 10. The basic system is configured without covers. If touch protection is required, this is possible with busbar covers.

An optimized spectrum of busbar device adapters offers numerous adaptation and mounting options. Terminals round off the product range of the 40 mm busbar system.

8US Busbar Systems 40 mm Busbar Systems

Base assemblies

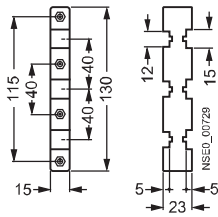
Overview



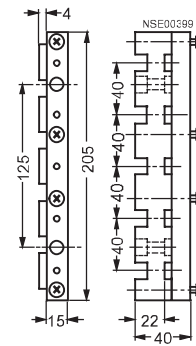
- ① Flat copper profile
- ② Busbar support
- ③ Cover profile
- ④ Inlay part
- ⑤ Covering cap

Dimensional drawings

8US19 03-3AB00



8US19 03-5AA00

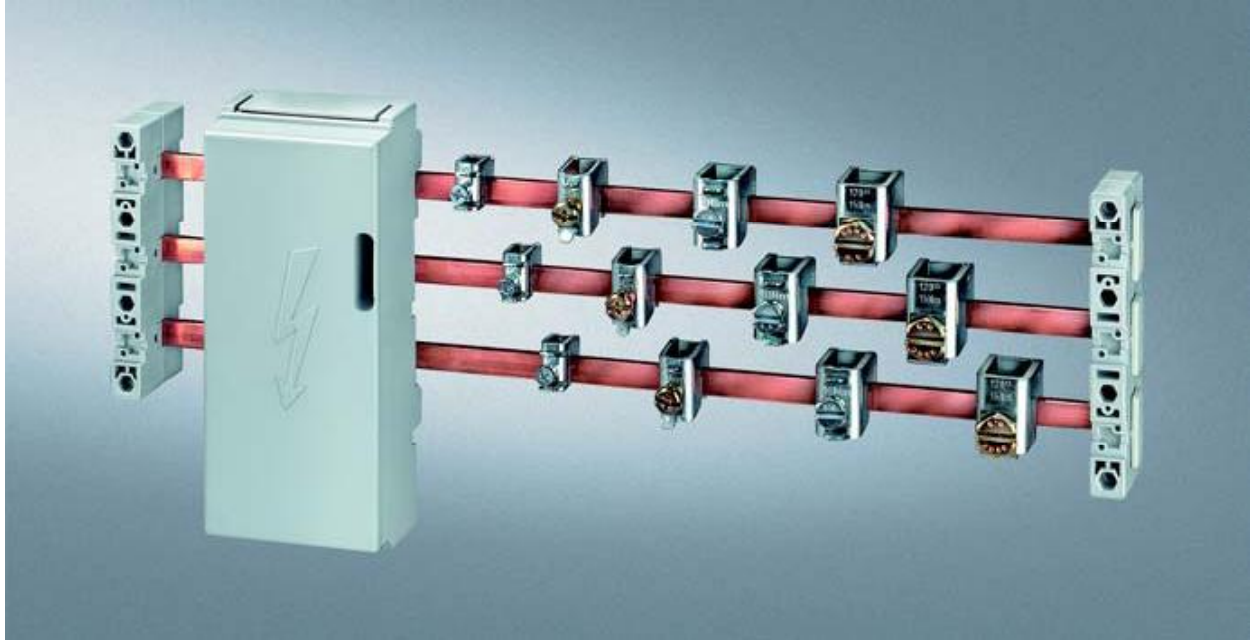


8US Busbar Systems

40 mm Busbar Systems

Supply and connection technologies

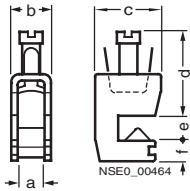
Overview



14

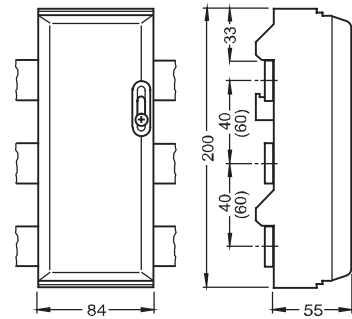
Dimensional drawings

8US19 21-2..0.



Type	a	b	c	d	e	f
8US19 21-2AA0.	7,5	11,5	22,5	25	5	10
-2AB0.	10,5	15,5	29	35	5	10
-2AC0.	17	23,5	36	55	5	12
-2AD0.	14,5	20,5	32	42	5	12
8US19 21-2BA0.	7,5	11,5	22,5	25	10	10
-2BB0.	10,5	15,5	29	35	10	10
-2BC0.	17	23,5	36	55	10	12
-2BD0.	14,5	20,5	32	42	10	12

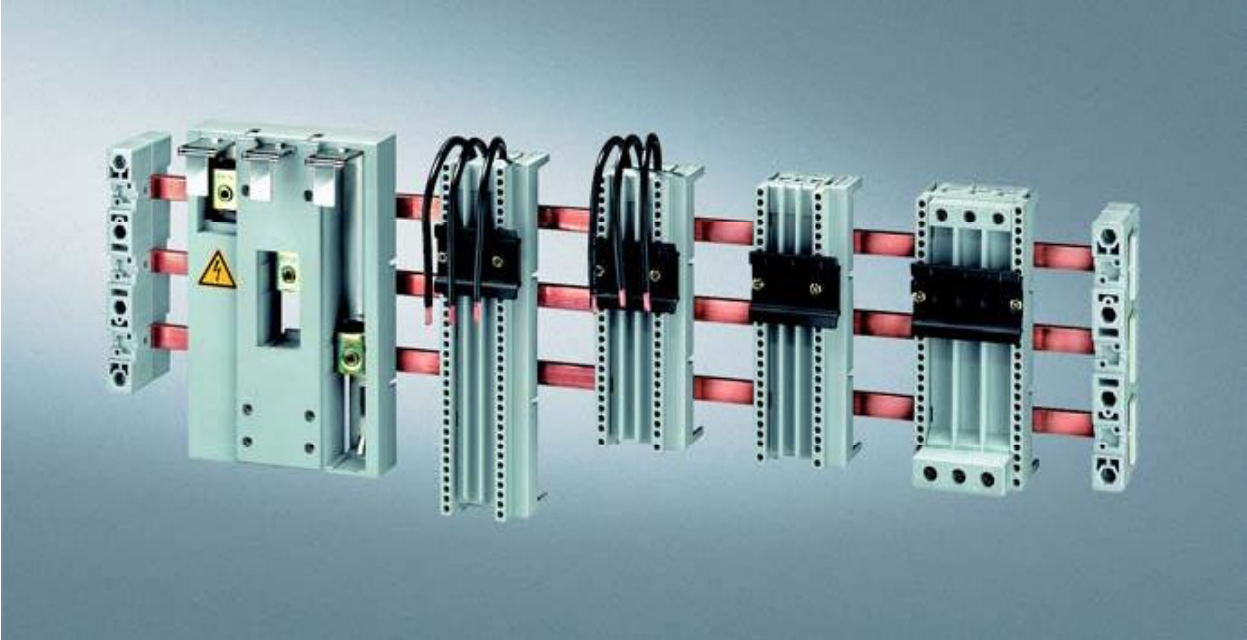
8US19 22-1GA00



8US Busbar Systems 40 mm Busbar Systems

Busbar adapters and device holders

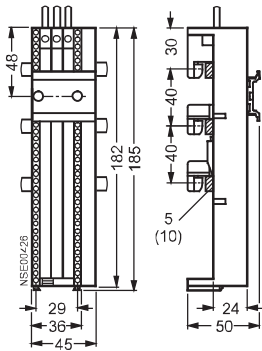
Overview



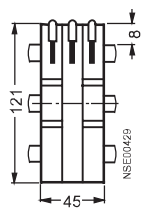
14

Dimensional drawings

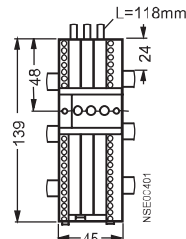
8US10 51-5CM47



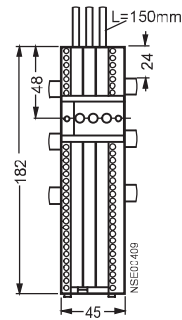
8US10 51-5DJ07



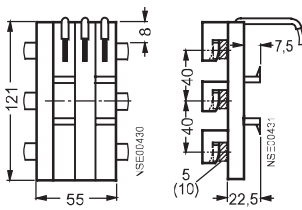
8US10 51-5DK07



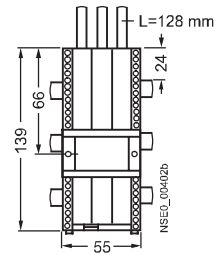
8US10 51-5DM07



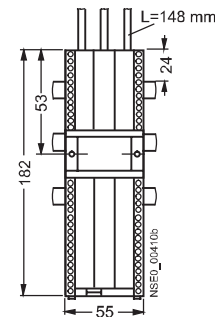
8US10 61-5DJ07



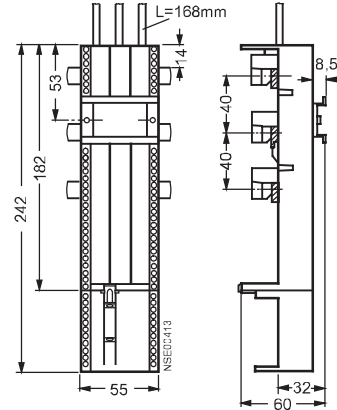
8US10 61-5FK08



8US10 61-5FM08



8US10 61-5FP08

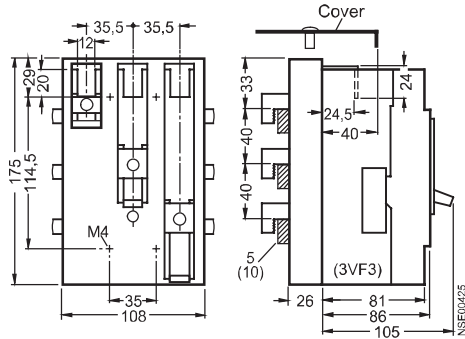


8US Busbar Systems

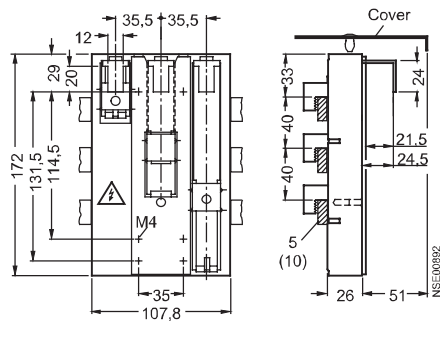
40 mm Busbar Systems

Busbar adapters and device holders

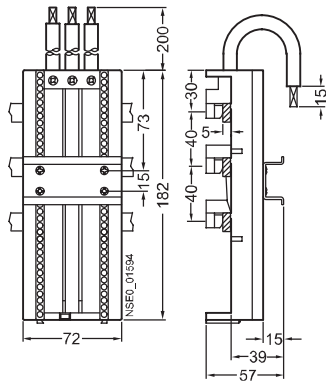
8US10 11-4SB00



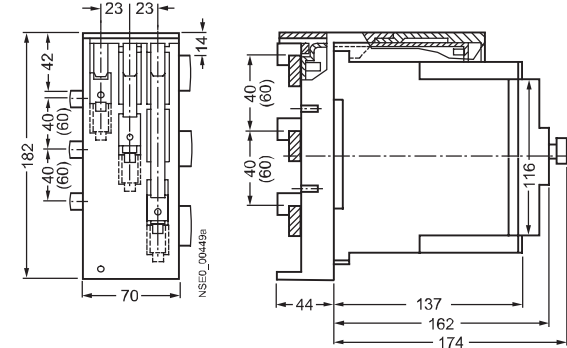
8US10 11-4SL01



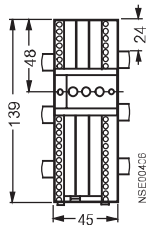
8US10 11-4TM00



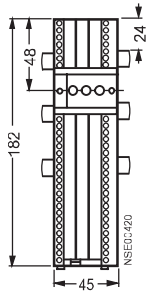
8US11 11-4SM00



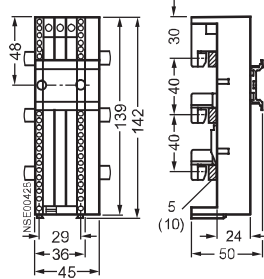
8US10 50-5AK00



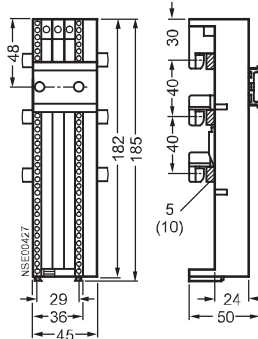
8US10 50-5AM00



8US10 50-5RK07



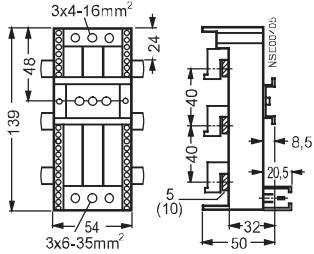
8US10 50-5RM07



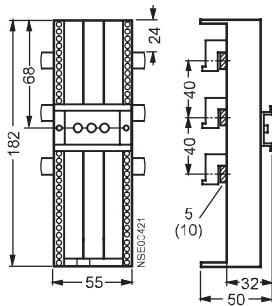
8US Busbar Systems 40 mm Busbar Systems

Busbar adapters and device holders

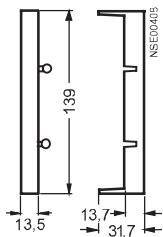
8US10 60-5AK00



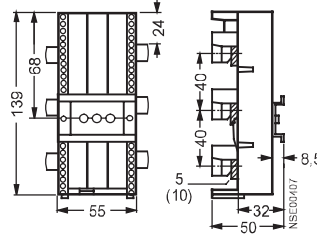
8US10 60-5AM00



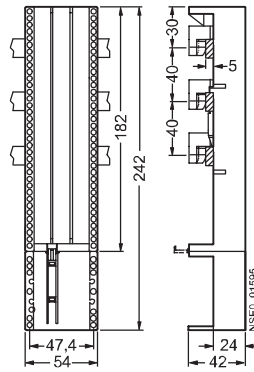
8US19 98-2BK00



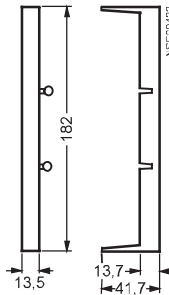
8US10 60-5AK08



8US10 60-5AP00



8US19 98-2BM00



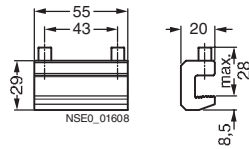
8US Busbar Systems

40 mm Busbar Systems

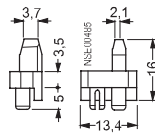
Accessories for busbar adapters
and device holders

Dimensional drawings

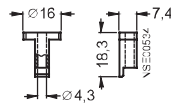
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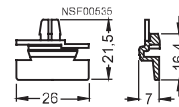
8US19 98-1BA00



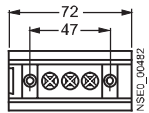
8US19 98-1CA00



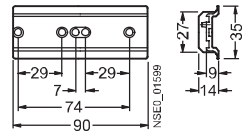
8US19 98-1DA00



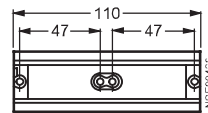
8US19 98-4AA00



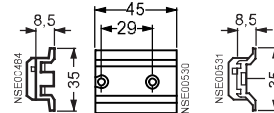
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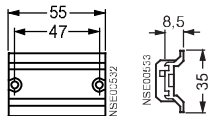
8US19 98-7CA10



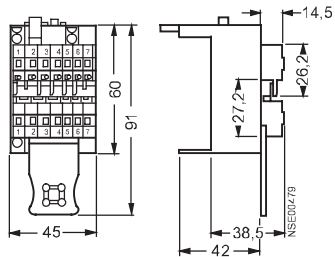
8US19 98-7CA15



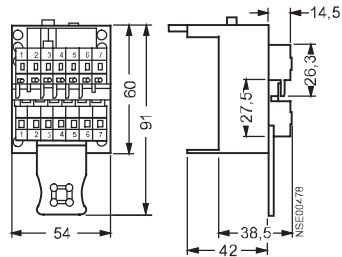
8US19 98-7CA16



8US19 98-8AM07



8US19 98-8AA10



8US Busbar Systems

60 mm Busbar Systems

General data

Overview



The 60 mm busbar system is used preferably in control cabinet construction, in motor control centers and in power distribution systems of the medium power range (630 A) and top power range (1600 A, special profile).

The 60 mm busbar system can be used as a basic system without covers, as a partly compartmented system or as a fully compartmented system with bottom shell. The busbar cross-sections are available in the sizes 12 x 5 mm to 30 x 10 mm and as a special profile.

Busbar device adapters for SIRIUS, 3VL circuit-breakers, 3KA and 3KL switch disconnectors, 3NP5 fuse switch disconnectors and 3NP4 directly mountable fuse switch disconnectors offers numerous options for configuring this busbar system. Incoming feeders, terminals and other accessories open up a large range of application.

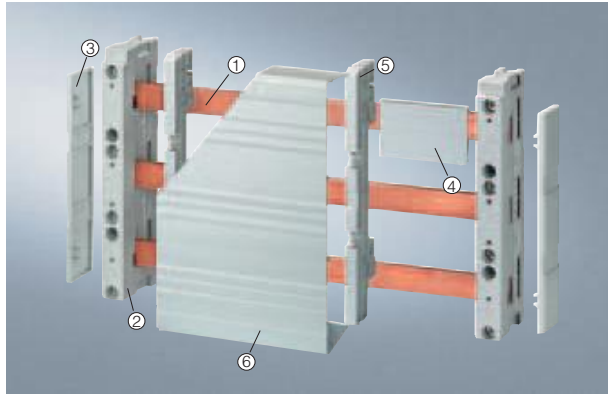
Busbars with a special profile are suitable for applications up to 1600 A. All components of the 60 mm busbar system can be fitted.

8US Busbar Systems

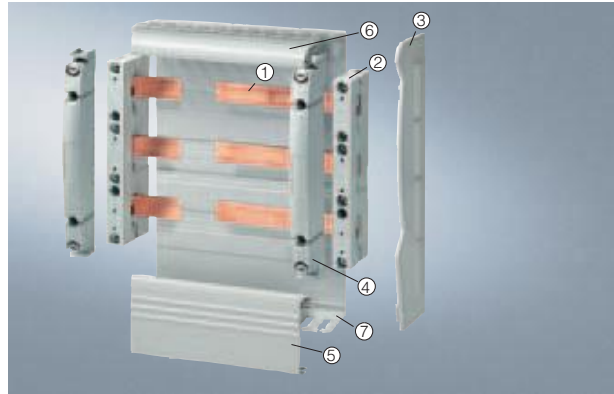
60 mm Busbar Systems

Base assemblies up to 630 A

Overview



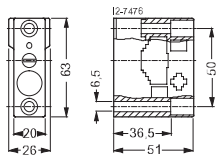
- ① Flat copper profile
- ② Busbar support
- ③ End cover
- ④ Cover profile
- ⑤ Reserve section holder
- ⑥ Reserve section cover



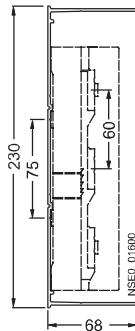
- ① Flat copper profile
- ② Busbar support
- ③ End cover for 60 mm busbar system
- ④ Holder for edge profile and partition profile
- ⑤ Edge profile for bottom trough 290 mm
- ⑥ Edge profile for bottom trough 230 mm
- ⑦ Bottom trough for 4-pole system

Dimensional drawings

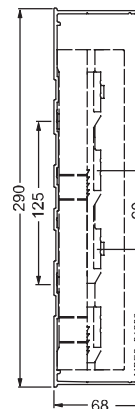
5SH3 506



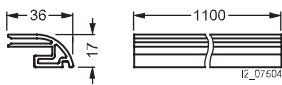
5SH3 526



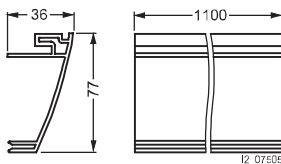
5SH3 527



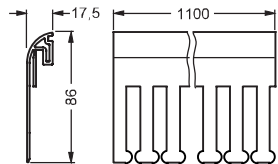
5SH3 528



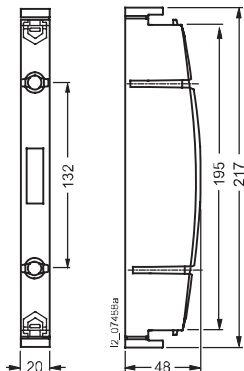
5SH3 530



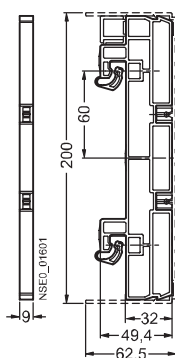
5SH3 531



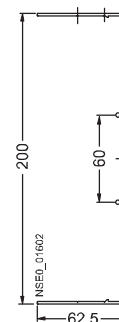
5SH3 532



5SH3 536



5SH3 537

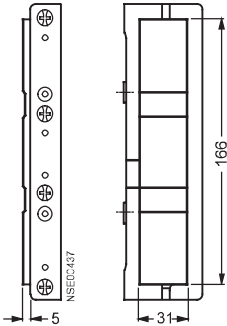


8US Busbar Systems

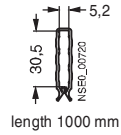
60 mm Busbar Systems

Base assemblies up to 630 A

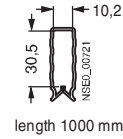
8US19 22-1AC00 with 8US19 23-3AA01



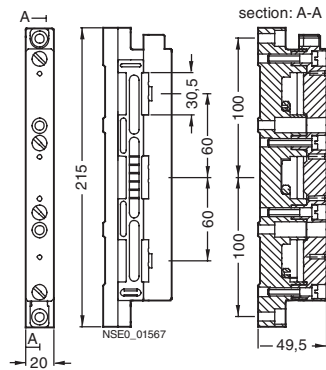
8US19 22-2AA00



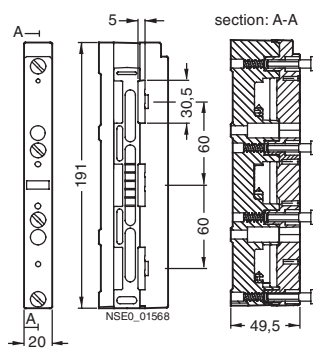
8US19 22-2BA00



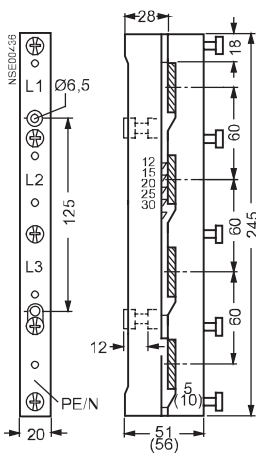
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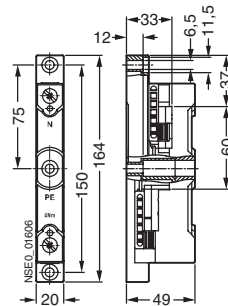
8US19 23-3AA01



8US19 23-4AA00



8US19 23-5AA00

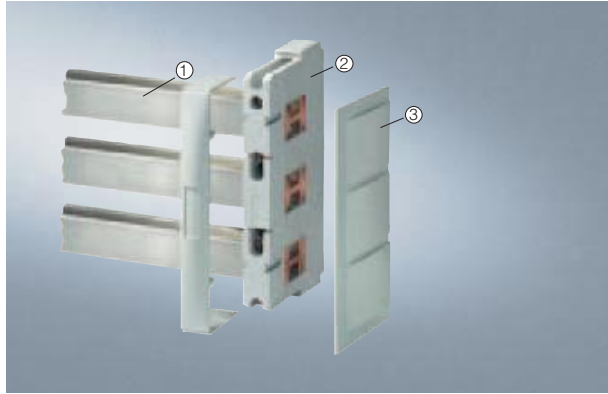


8US Busbar Systems

60 mm Busbar Systems

Base assemblies up to 1600 A

Overview

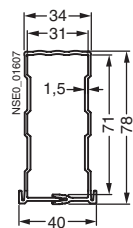


- ① Flat copper profile
- ② Busbar support
- ③ End cover

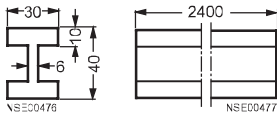
14

Dimensional drawings

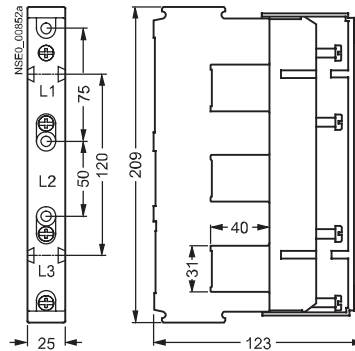
8US19 22-2DA00



8US19 48-2AA00



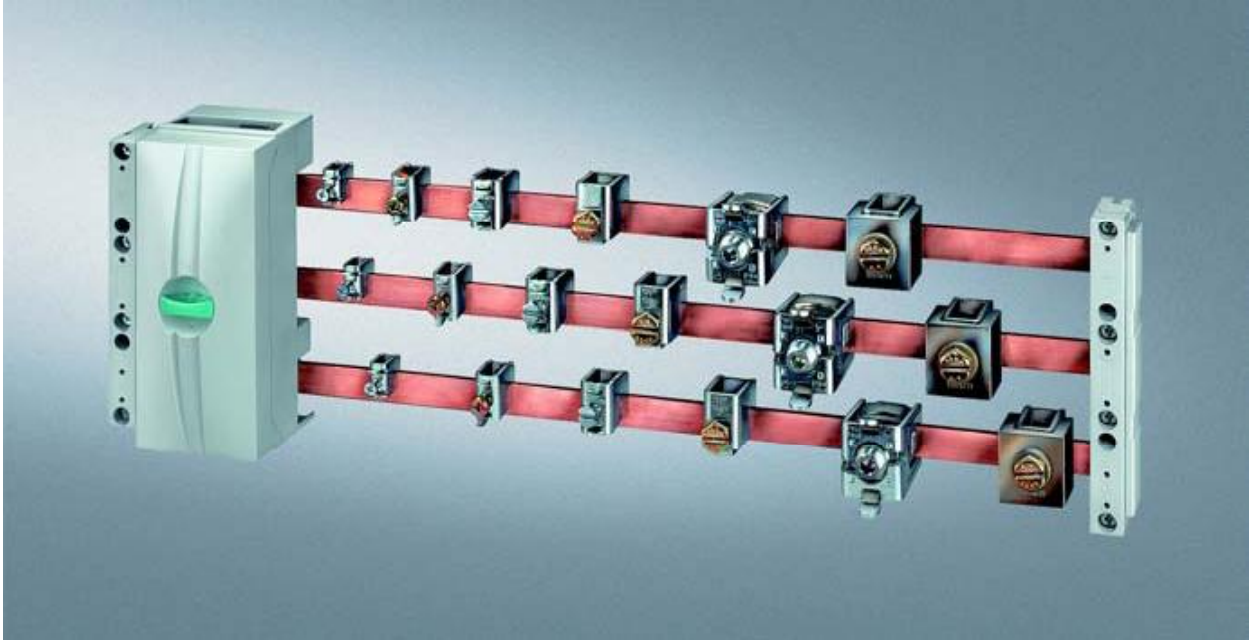
8US19 43-3AA00



8US Busbar Systems 60 mm Busbar Systems

Supply and connection technologies

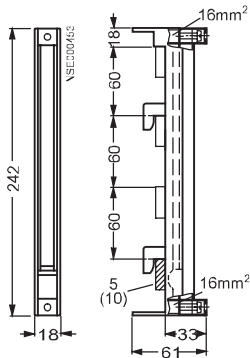
Overview



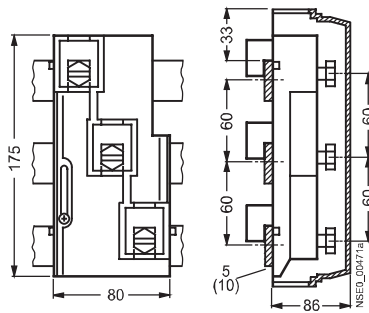
14

Dimensional drawings

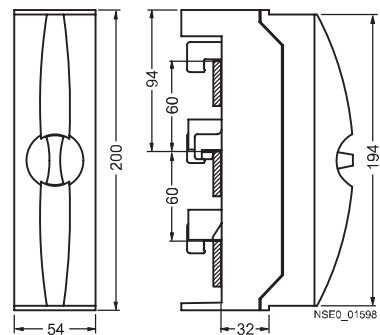
8US12 00-0AA00



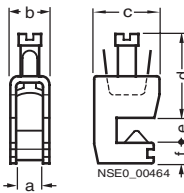
8US19 21-1AA00



8US19 21-1BA00



8US19 21-2.0.



Type	a	b	c	d	e	f
8US19 21-2AA0.	7,5	11,5	22,5	25	5	10
-2AB0.	10,5	15,5	29	35	5	10
-2AC0.	17	23,5	36	55	5	12
-2AD0.	14,5	20,5	32	42	5	12
8US19 21-2BA0.	7,5	11,5	22,5	25	10	10
-2BB0.	10,5	15,5	29	35	10	10
-2BC0.	17	23,5	36	55	10	12
-2BD0.	14,5	20,5	32	42	10	12

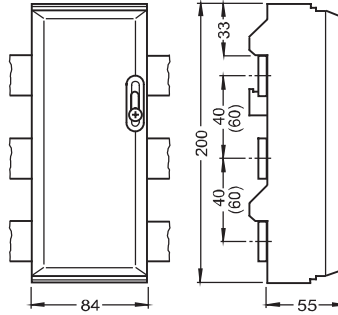
8US Busbar Systems

60 mm Busbar Systems

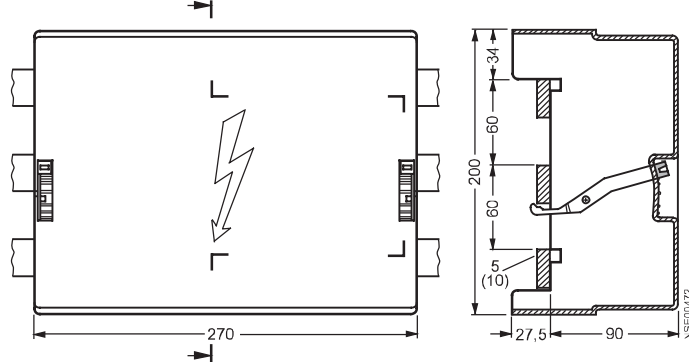
Supply and connection technologies

14

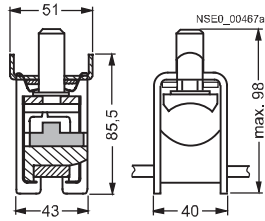
8US19 22-1GA00



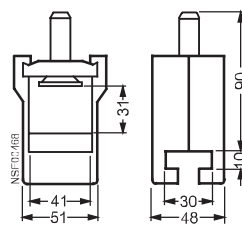
8US19 22-1GA02



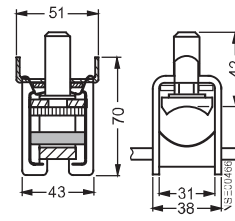
8US19 41-2AA02



8US19 41-2BA00



8US19 41-2BB00, 8US19 41-2AA01



8US Busbar Systems 60 mm Busbar Systems

Busbar adapters and device holders

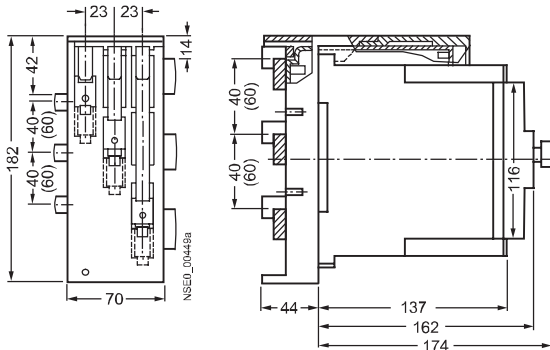
Overview



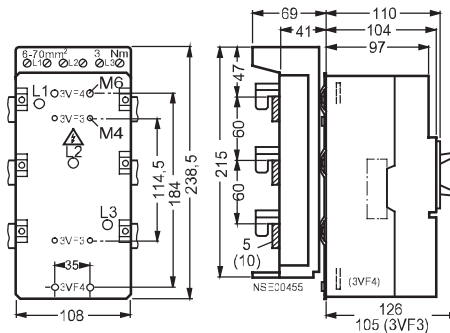
14

Dimensional drawings

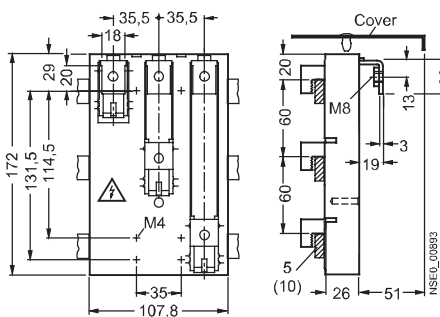
8US11 11-4SM00



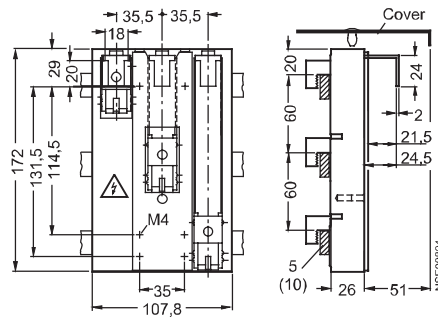
8US12 10-4AA04



8US12 11-4SL00



8US12 11-4SL01



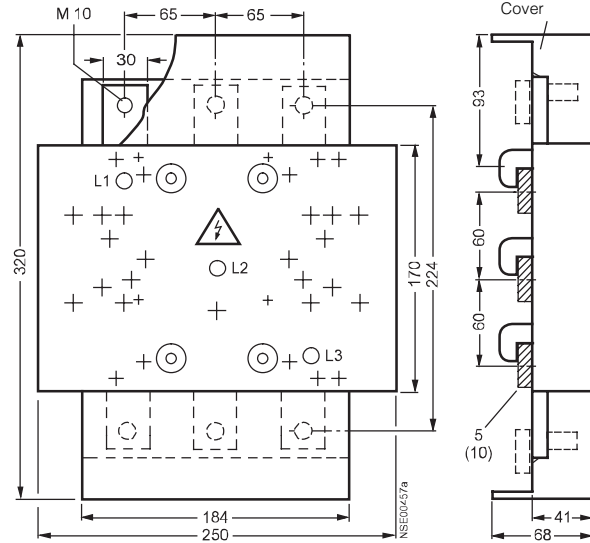
8US Busbar Systems

60 mm Busbar Systems

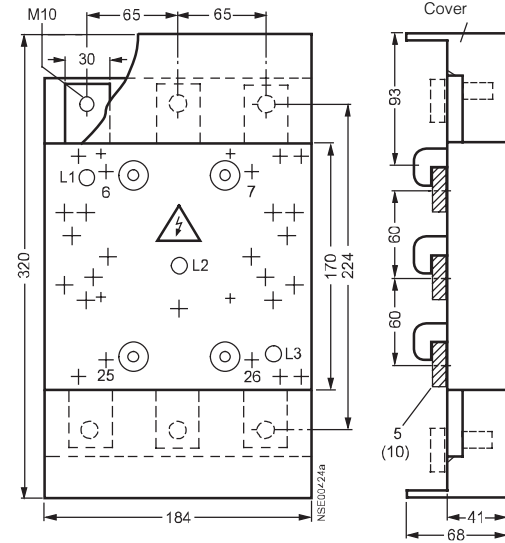
Busbar adapters and device holders

14

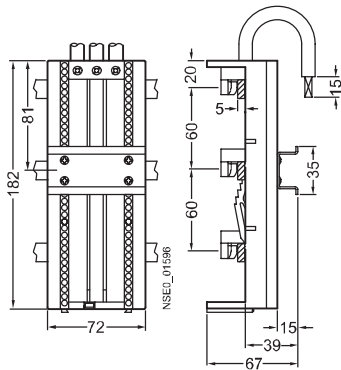
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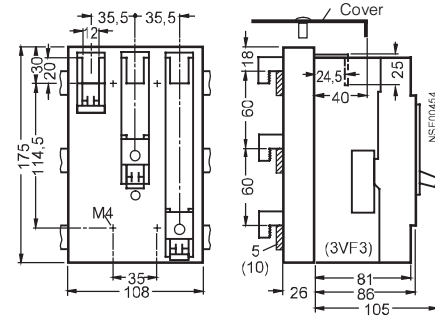
8US12 10-4AF00



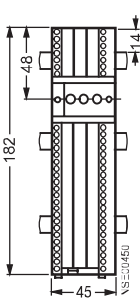
8US12 11-4TM00



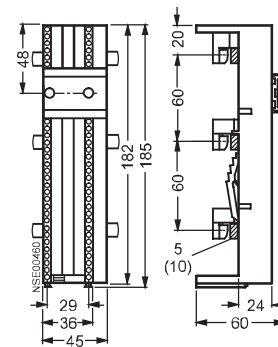
8US12 11-4SB00



8US12 50-5AM00



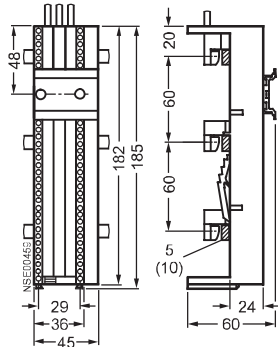
8US12 50-5RM07



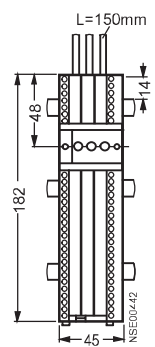
8US Busbar Systems 60 mm Busbar Systems

Busbar adapters and device holders

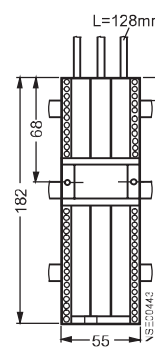
8US12 51-5CM47



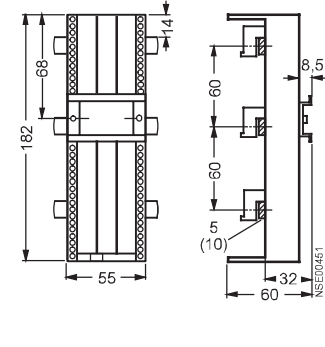
8US12 51-5DM07



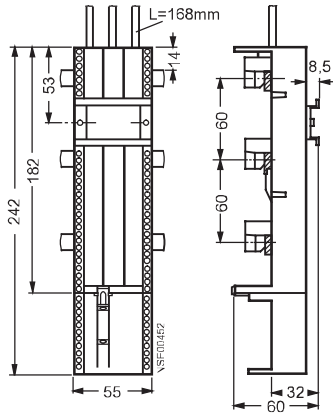
8US12 61-5FM08



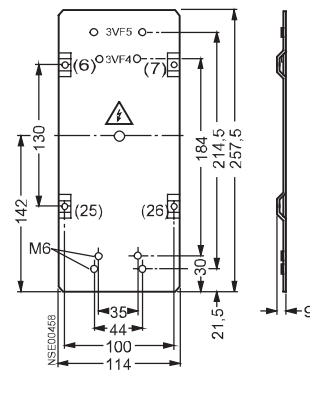
8US12 60-5AM00



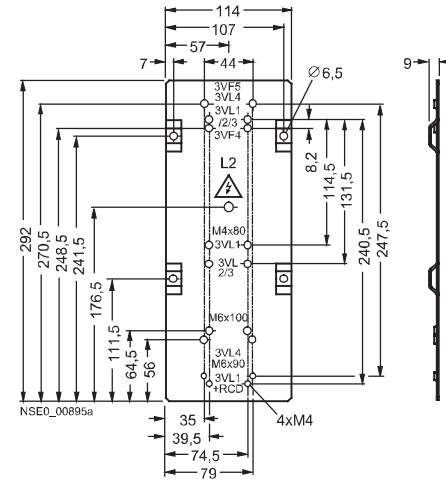
8US12 60-5AP00, 8US12 61-5FP08



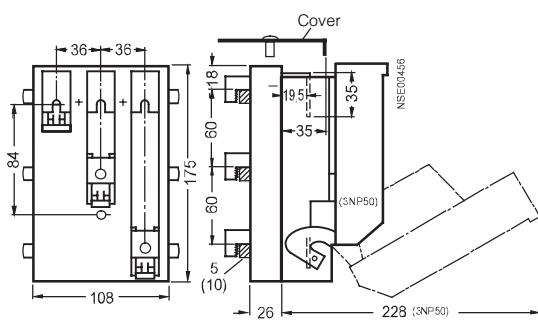
8US19 27-4AF00



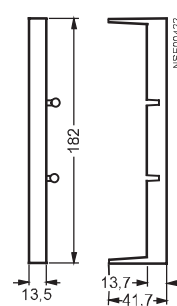
8US19 27-4AF01



8US12 91-4SB00
with 3NP50



8US19 98-2BM00



8US Busbar Systems

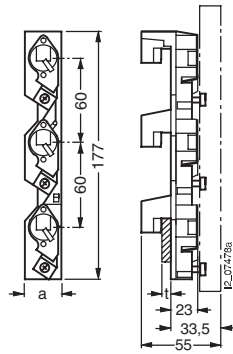
60 mm Busbar Systems

Bus-mounting fuse bases

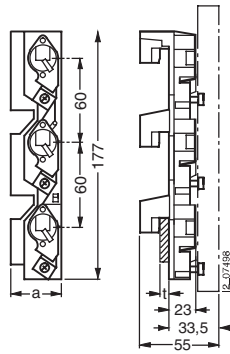
Dimensional drawings

5SG6, 5SF6 bus-mounting fuse bases

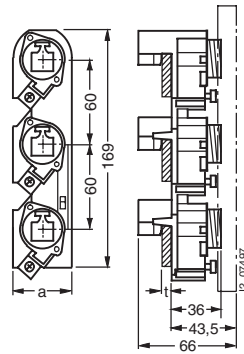
5SG6 202 (t = 5 mm),
5SG6 203 (t = 10 mm)
 D02/63 A (a = 27 mm)
 (t = busbar thickness)



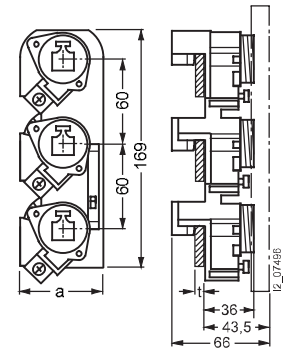
5SG6 204 (t = 5 mm),
5SG6 205 (t = 10 mm)
 D02/63 A (a = 42 mm)



5SF6 014, 5SF6 015 (t = 5 mm),
5SF6 016, 5SF6 017 (t = 10 mm)
 DII/25 A (a = 57 mm)

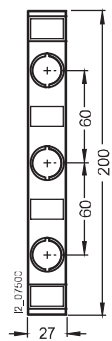


5SF6 214, 5SF6 215 (t = 5 mm),
5SF6 216, 5SF6 217 (t = 10 mm)
 DIII/63 A (a = 42 mm)

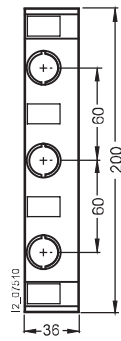


Cover for 5SH bus-mounting fuse base

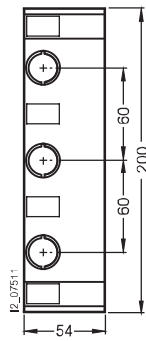
5SH5 241
 single
 D02/63 A



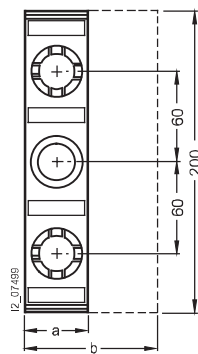
5SH5 242
 1.33-fold



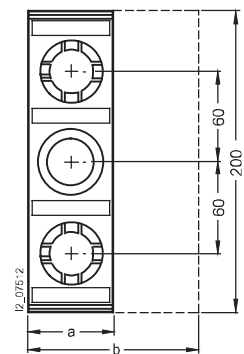
5SH5 243
 double



5SH2 042 (single: a = 42 mm)
5SH2 043 (double: b = 84 mm)
 DII/25 A



5SH2 242 (single: a = 57 mm)
5SH2 243 (double: b = 114 mm)
 DIII/63 A

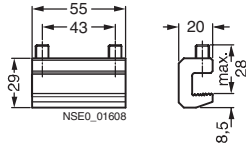


8US Busbar Systems 60 mm Busbar Systems

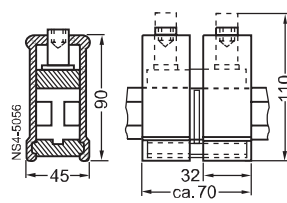
Accessories for busbar adapters
and device holders

Dimensional drawings

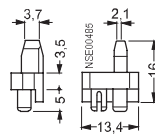
8US19 21-2BF00



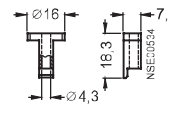
8US19 41-2BF00



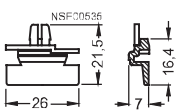
8US19 98-1BA00



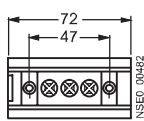
8US19 98-1CA00



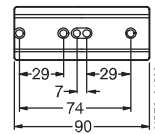
8US19 98-1DA00



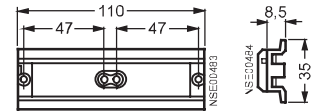
8US19 98-4AA00



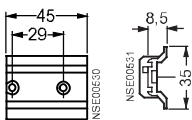
8US19 98-7CA08



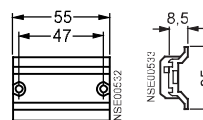
8US19 98-7CA10



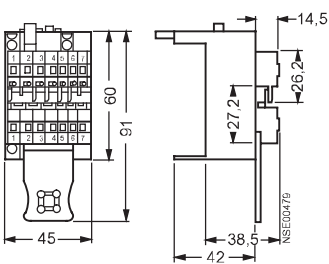
8US19 98-7CA15



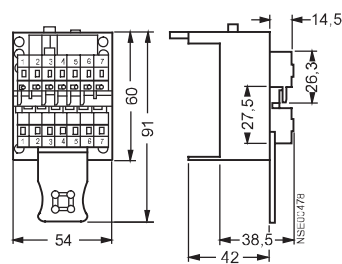
8US19 98-7CA16



8US19 98-8AM07



8US19 98-8AA10



8UC6 Door-Coupling Rotary Operating Mechanisms

General data

Overview

5 standard sizes of operating mechanisms are available:

Size	Rated torque ¹⁾ Nm	Shaft profile mm x mm	Masking plate mm x mm
1	4	6 x 6	75 x 75
2	7.5	8 x 8	75 x 75
3	16	10 x 10 or 12 x 12	100 x 100
4	30	12 x 12	100 x 100
5	55	12 x 12	100 x 100

1) Operating mechanisms tested with triple torque (VDE 0660 Part 107). They are therefore qualified for use in all controls, especially for disconnectors.

Design

Operating mechanisms consist of a masking plate with handle including seal and fixing screws for door installation and of shaft coupling, extension shaft (300 mm) and coupling driver to be mounted onto the switch shaft. Operating mechanisms for 3KA/3KL/3KM switch disconnectors do not have a shaft coupling since the extension shaft is fitted directly into the switch. Extension shafts with a length of 600 mm are available.

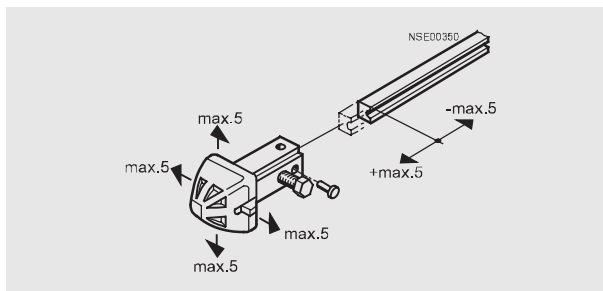
Masking plates are light-gray with black inscription, handles are black. For EMERGENCY-STOP switches, a yellow indicator plate with black inscription is mounted; the handles are red. The retractable locking device (light-gray) for padlocks is integrated in the handle.

The door interlock on the operating mechanisms is suitable for padlocks with shackle diameters of 4.5 mm to 8.5 mm (locks according to DIN 7465).

Up to three locks with shackle diameter of 8.5 mm or up to five locks with shackle diameter of 6 mm can be fitted.

Mounting instructions containing mounting dimensions and hints on activation or modification of interlocking conditions are delivered with each operating mechanism.

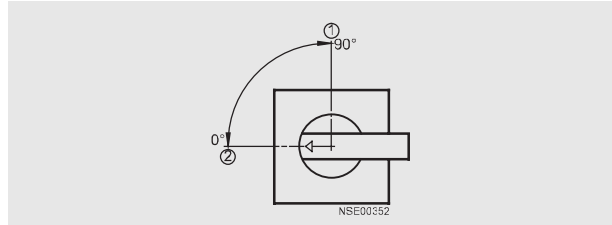
8UC6 door-coupling rotary operating mechanisms are capable of taking up a radial eccentricity of max. 5 mm between the actuating shaft of the switching device and the operating mechanism. Supporting the extension shaft is recommended with greater tolerances. ± 5 mm can be compensated in axial direction. The distance between the door hinge and the center of rotary operating mechanism must not be less than 100 mm.



Permissible radial eccentricity and axial tolerance compensation

Switching position

In order to ensure compliance with locking and interlocking conditions, the controls and operating mechanisms must be installed such that, with two-position switches the "0" position lies at 9 o'clock and the "I" position at 12 o'clock.



Positions for two-position switches with 90° switching angle

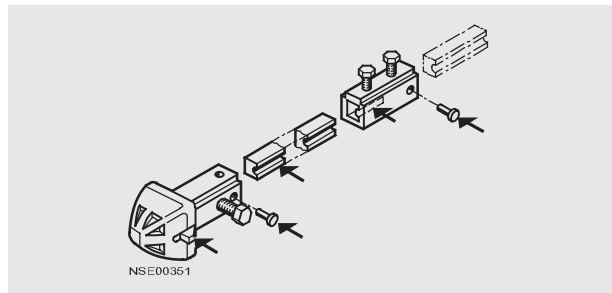
Non-interchangeability

In order to ensure that, when installing switches and door-coupling operating mechanisms, all components – the actuating shaft, shaft coupling, extension shaft, coupling driver and door-coupling operating mechanism – are assembled in the correct position with respect to one another, all the above-mentioned parts are provided with non-interchangeability features (groove and lug).

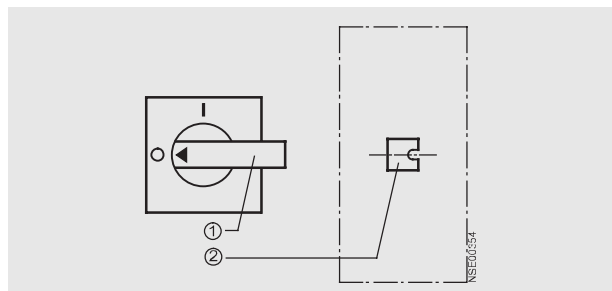
For controls whose non-interchangeability groove is not at 3 o'clock in the "0" position or switches that can be installed at an angle of 90° to the left or right, the non-interchangeability groove can be repositioned.

When the switch and the door coupling are fitted, the rivet in the shaft coupling or coupling driver is moved accordingly. All door-coupling rotary operating mechanisms listed in this catalog are supplied with the "0" position of the mechanism at 9 o'clock and the "I" position at 12 o'clock. This refers to controls to be installed in the normal mounting position.

In operation and when performing maintenance, these non-interchangeability features preclude the risk of accidents caused by incorrect handling or incorrect switching operations.



Non-interchangeability features (see arrows) of rotary operating mechanisms



Correlation between handle of rotary operating mechanism and actuating shaft

8UC6 Door-Coupling Rotary Operating Mechanisms

General data

Stops

To prevent damage to smaller switches, an excessive manual operating torque can be absorbed by stops fitted on the inside of sizes 1 and 2 rotary operating mechanisms. These stops are supplied loose with the operating mechanisms and can be fitted as required after consulting the operating instructions.

Stops are fitted at the factory to size 1 and 2 operating mechanisms with a 90° actuating angle (exception: 3V. circuit-breakers).

Pull-out strength

The pull-out strength of interlocked operating mechanisms, e.g. pulling off the shaft or destruction of the operating mechanism, amounts to ≥ 800 N when the pulling force acts directly onto the operating mechanism in direction of shaft.

Function

The basic (standard) versions of the rotary operating mechanisms comply with the following interlocking conditions:

- Operating mechanism and switch in "0" (OFF) position:
The control cabinet door can be opened, the operating mechanism is uncoupled and the handle of the operating mechanism engages.
If padlocks are fitted with the control cabinet door closed and the actuator is set to "0", the operating mechanism (and switch) cannot be actuated and the door cannot be opened.
- Operating mechanism and switch in "I" (ON) position:
The control cabinet door cannot be opened in this position. The interlocking mechanism can, however, be overridden by trained personnel (pressing of a concealed latch with a screwdriver or the like), thus making it possible to open the control cabinet door in the "I" position of the control for performing checks. The handle engages in the "I" setting with the door open. In the "I" position it is not possible to fit padlocks to lock the operating mechanisms.

Other interlocking conditions

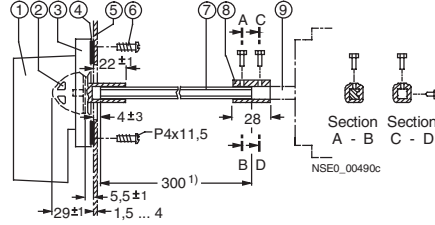
- If no door interlock is required, the user can remove the door interlocking plate of the rotary operating mechanism after consulting the operating instructions.
- If provision is to be made for fitting padlocks to the mechanism in the "I" position as well, the user can easily achieve this after consulting the operating instructions by knocking out a lug. Such a measure must not, however, be implemented with EMERGENCY-STOP rotary operating mechanisms. If padlocks are fitted in the "I" position of the rotary operating mechanism, the mechanism cannot be actuated, the control cabinet door cannot be opened and the operating mechanism cannot be overridden in order to open the door.
- If necessary the rotary operating mechanisms can also be locked in the 90°, 180° position etc. as well as in the "0" position.
The measures previously listed in item 2 under "Other Interlocking Conditions" must be carried out by the user.
- In the case of rotary operating mechanisms for switches without "0" position, such as stepping switches without "0" position, the door interlocking plate is removed.

8UC6 Door-Coupling Rotary Operating Mechanisms

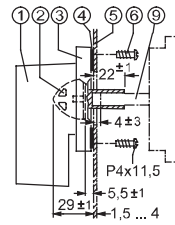
For 3K switch disconnectors

Dimensional drawings

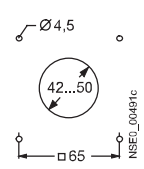
8UC61 and 8UC62 door-coupling rotary mechanisms, sizes 1 and 2



With extension shaft



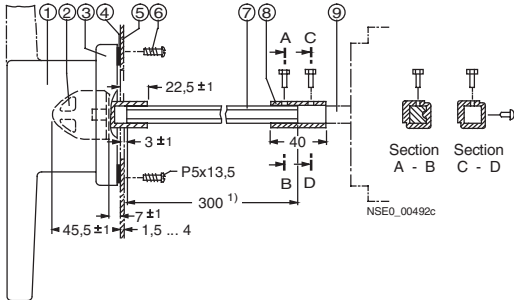
Without extension shaft



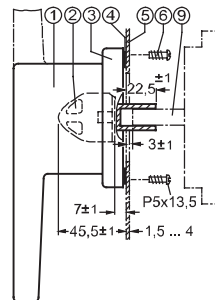
Door cutout with fastening holes

- ① Selector switch
- ② Coupling driver
- ③ Masking plate
- ④ Seal
- ⑤ Door
- ⑥ Fixing screw, 4 units
- ⑦ Extension shaft
- ⑧ Shaft coupling
- ⑨ Actuating shaft of the control

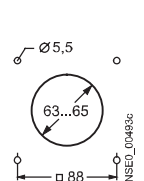
8UC63 to 8UC66 door-coupling rotary mechanisms, sizes 3 to 6



With extension shaft



Without extension shaft



Door cutout with fastening holes

- ① Handle or twin handle
- ② Coupling driver
- ③ Masking plate
- ④ Seal
- ⑤ Door
- ⑥ Fixing screw, 4 units
- ⑦ Extension shaft
- ⑧ Shaft coupling
- ⑨ Actuating shaft of the control

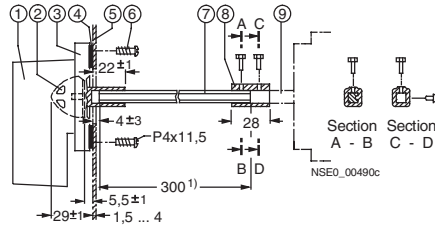
1) Length of extension shaft can be cut to fit mounting depth. Extension shaft also available in 600 mm length.

14

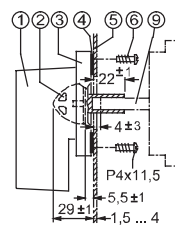
3VF and 3VL circuit-breakers

Dimensional drawings

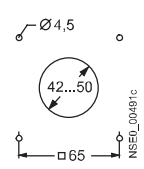
8UC61 and 8UC62 door-coupling rotary mechanisms, sizes 1 and 2



With extension shaft



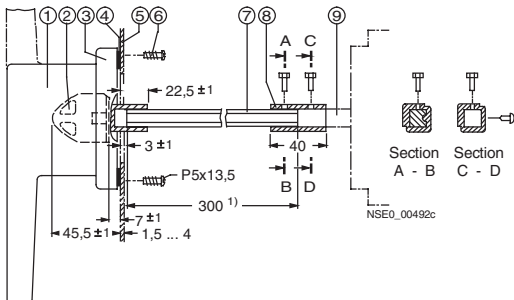
Without extension shaft



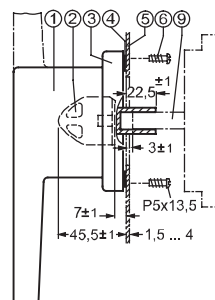
Door cutout with fastening holes

- ① Selector switch
- ② Coupling driver
- ③ Masking plate
- ④ Seal
- ⑤ Door
- ⑥ Fixing screw, 4 units
- ⑦ Extension shaft
- ⑧ Shaft coupling
- ⑨ Actuating shaft of the control

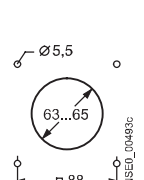
8UC63 to 8UC66 door-coupling rotary mechanisms, sizes 3 to 6



With extension shaft



Without extension shaft



Door cutout with fastening holes

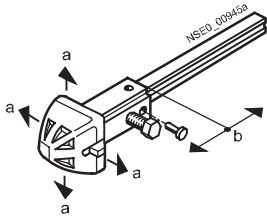
- ① Handle or twin handle
- ② Coupling driver
- ③ Masking plate
- ④ Seal
- ⑤ Door
- ⑥ Fixing screw, 4 units
- ⑦ Extension shaft
- ⑧ Shaft coupling
- ⑨ Actuating shaft of the control

1) Length of extension shaft can be cut to fit mounting depth. Extension shaft also available in 600 mm length.

8UC6 Door-Coupling Rotary Operating Mechanisms

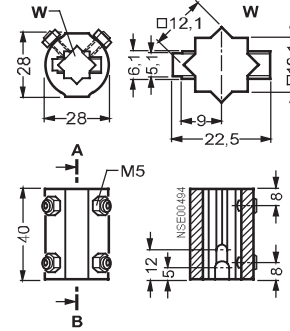
Dimensional drawings

8UC60 coupling driver

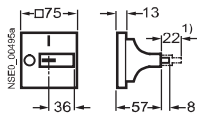


Coupling drivers	a	b	Shaft length
With tolerance compensation	+5	±5	x
Without tolerance compensation	+1.5	±2.5	x+23.5

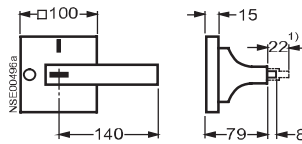
8UC92 53 shaft coupling



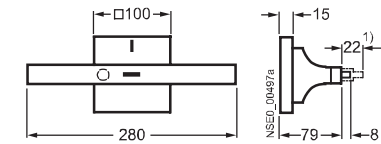
Size 1



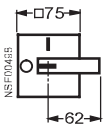
Size 3



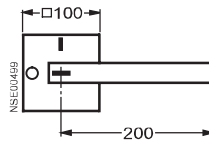
Size 5



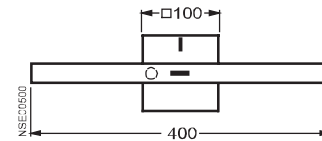
Size 2



Size 4



Size 6



Handles with masking plate, sizes 1 to 6

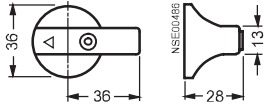
- 1) Padlock feature of handle pulled out.

8UC6 Door-Coupling Rotary Operating Mechanisms

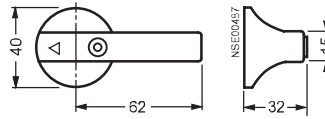
Operating mechanisms for fixed mounting

Dimensional drawings

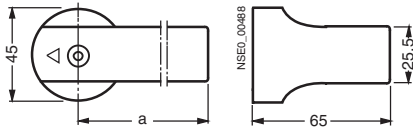
8UC93 54, 3KX3 516-1AA operating mechanisms for fixed mounting
Size 1



8UC93 60 to 8UC93 63, 3KX3 536-1AA operating mechanisms for fixed mounting
Size 2

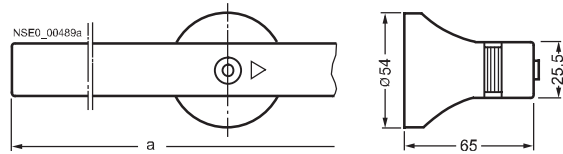


8UC93 65 to 8UC93 75, 3KX3 176-1E operating mechanisms for fixed mounting
Sizes 3 and 4



Size	Shape	a
3		140
4		200

8UC93 81 to 8UC93 82, 3KX3 616-1A operating mechanisms for fixed mounting
Size 5

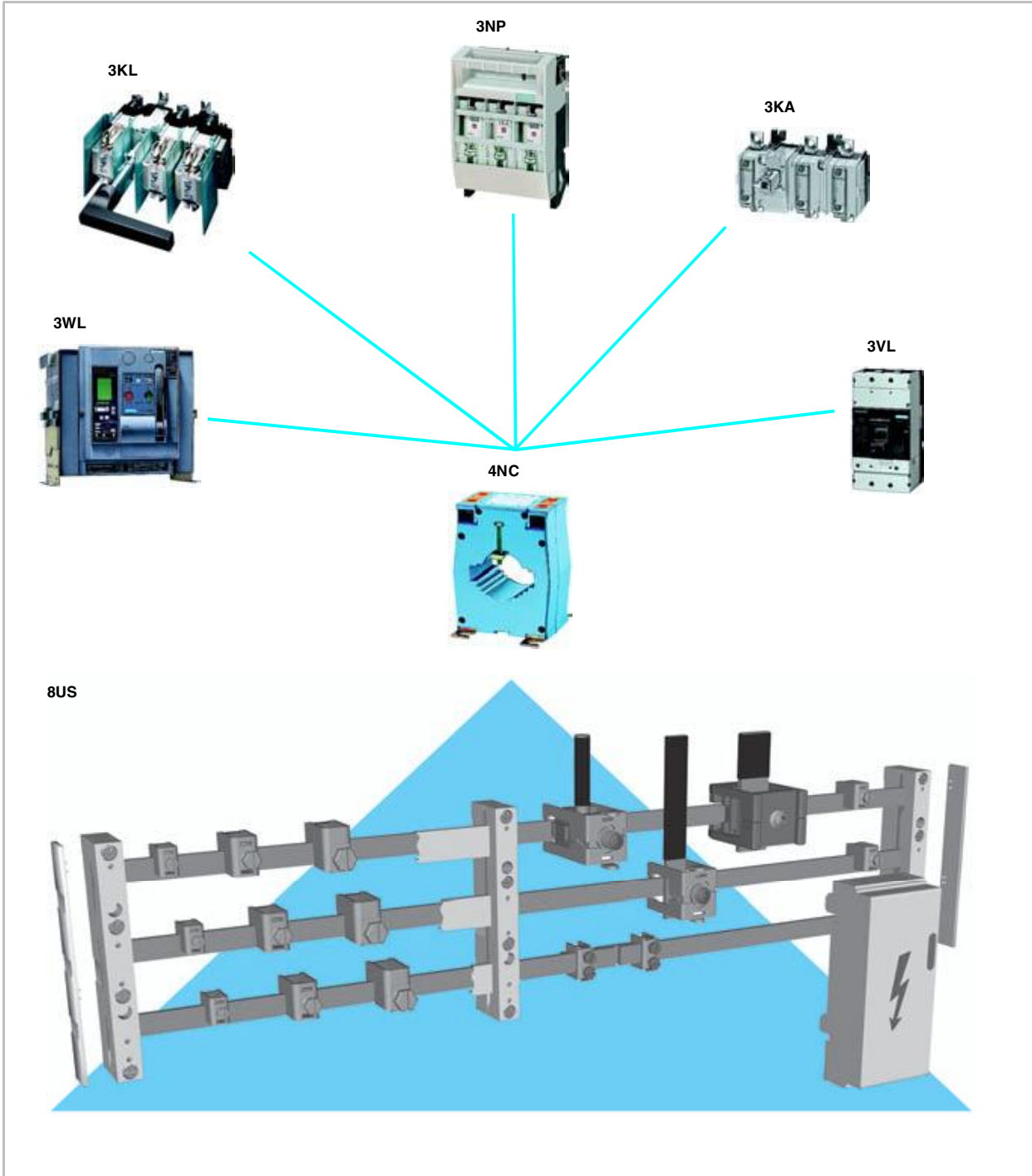


Size	Shape	a
5		280

4NC Current Transformers

General data

Overview



14

4NC Current Transformers

General data

General criteria for the selection of current transformers for measurement purposes

Standards	→ IEC 60185, DIN VDE 0414 Part 1 and 2	
Window-type current transformers	→ The conductor to be measured (busbar or wire) is passed through the window opening and creates the primary circuit of the window-type current transformer. Pin-wound transformers: An economical solution especially for small primary currents of 5 A to 75 A is achieved when the conductor to be measured is pin-wound several times.	
Rated primary current I_{pn}	→ Current transformers can be continuously loaded with 1.3 times the primary rated current (I_{pn}).	
Rated secondary current I_{sn}	→ 1 A Particularly suitable for longer measuring leads. Cable losses of only 4% in contrast to 5 A current transformers.	→ 5 A 5 A current transformers create 25 times the power losses on measurement leads as compared with 1 A current transformers. These stray losses result in higher power in the case of long leads. Only recommended for use with short measurement leads.
Accuracy class	→ Class 1 Operation measurement, internal metering Current error $\pm 1\%$ at $1 \times I_{pn}$ and $1.2 \times I_{pn}$	→ Class 3 Coarse measurement Current error $\pm 3\%$ at $0.5 \times I_{pn}$ and $1.2 \times I_{pn}$
Rated output power P_n	→ The rated output power of transformers is specified in VA. The actual load should be similar to the rated output power; a lower actual load (underburden) increases the overcurrent factor and measuring instruments may be damaged in case of a short-circuit, a higher actual load (overburden) has a negative effect on the accuracy. With a frequency of 60 Hz the rated output power increases to 1.2 times. With $16^{2/3}$ Hz the output power decreases to $1/3$ of the rated output power.	
Maximum voltage for equipment U_m	→ This is the rms value of the maximum voltage between the conductors of a system. For this voltage the insulation must be rated at normal operating conditions. 4NC5 current transformers are suitable for 720 V.	
Overcurrent limiting factor FS	→ The overcurrent limiting factor is expressed using the letters FS and a factor, e.g. FS5 or FS10. When a short-circuit current flows through the primary winding of a current transformer, the load on the measuring instruments connected to the current transformer is the lower the smaller the current factor is.	
Rated short-time thermal current I_{th}	→ The rated short-time thermal current I_{th} is the rms value of the primary current with a duration of one second, whose heat effect the current transformer can resist without being damaged in the event of a short-circuited secondary winding.	
Rated impulse current I_{dyn}	→ The rated impulse current I_{dyn} is the highest instantaneous value of the current after a short-circuit whose force the current transformer can resist without being damaged. The rated impulse current is specified as peak value.	

4NC Current Transformers

General data

Technical specifications

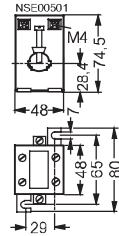
Standards	IEC 60185, DIN VDE 0414 Part 1 and 2
Rated primary current I_{pn}	50 to 1500 A for use as pin-wound transformer for low currents from 5 to 75 A.
Rated secondary current I_{sn}	1 A or 5 A
Maximum voltage for equipment U_m	720 V
Frequency	50 Hz to 60 Hz
Rated overcurrent factor FS	FS5 (DIN VDE/IEC)
Max. uninterrupted current	$1.2 \times I_{pn}$
Rated short-time thermal current I_{th}	$60 \times I_{pn}$
Rated impulse current I_{dyn}	$2.5 \times I_{th}$ or $150 \times I_{pn}$
Accuracy class	1 (3)
Ambient temperature	+55 °C at $1.0 \times I_{pn}$ +40 °C at $1.2 \times I_{pn}$ -10 °C minimum
Max. busbar temperature	+120 °C
Molded-plastic class	E (max. 120 °C continuously)
Insulation	Thermoplastic enclosure, halogen-free
Test voltage	AC 3 kV
Secondary terminals	Double terminals using M4 captive screws, finger-safe to DIN VDE 0106 Part 100
Solid	$2 \times (2.5 \dots 6 \text{ mm}^2)$
Two-wire	$2 \times (1.5 \dots 4 \text{ mm}^2)$
Terminals with same polarity	primary → secondary K/P1 → k/S1 (DIN VDE/IEC) L/P2 → l/S2 (DIN VDE/IEC)
Mounting	Either busbar or foot mounting

4NC Current Transformers

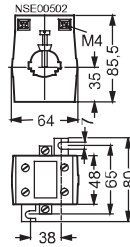
Classes 1 and 3, from 50 A to 1500 A

Dimensional drawings

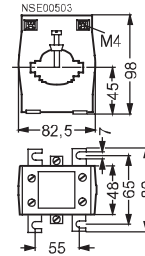
4NC51



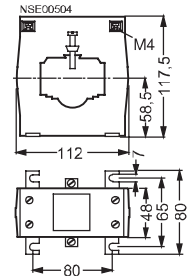
4NC52



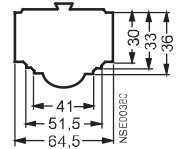
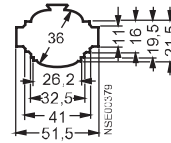
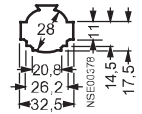
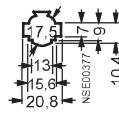
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4NC54



Window openings



- For busbars

Number	1	1	2	1	2	1	2	3	
Width x Thickness mm	12 x 5 12 x 10 20 x 5	20 x 5 20 x 10 25 x 5 30 x 5 30 x 10	20 x 5 25 x 5	25 x 5 30 x 5 30 x 10 40 x 5 40 x 10 50 x 5 50 x 10	25 x 5 30 x 5 40 x 5	40 x 5 40 x 10 50 x 5 50 x 10 60 x 5 60 x 10	40 x 10 40 x 5 50 x 5 50 x 10 60 x 5 60 x 10	40 x 5 40 x 10 50 x 5 50 x 10 60 x 5 60 x 10	40 x 5 50 x 5 60 x 5
- For circular conductors max. mm	17.5 Ø	28 Ø		36 Ø		45 Ø			

Schematics

Connection designation according to IEC 60185, DIN VDE 0414

