BT LV TIP Shortform Catalogue

Catalogue - 2011

Low Voltage Equipment

Answers for construction.

SIEMENS

Related Catalogues

3VL MCCB
Modular, Compact, Communication-Capable

Switching, Protection and Measuring Devices for Low-Voltage Power Distribution with ACB's/MCCB's.

3VT Moulded Case Circuit breakers LV36 2008
Circuit Breakers

3VT Molded Case Circuit Breakers up to 1600 A

Automatic Transfer Switch
Automatic and manual transfer between two power supply systems in the low-voltage power distribution field

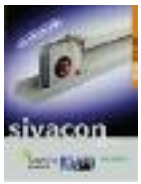
Safe, cost-efficient and flexible

BT LV Portfolio
The Complete Portfolio for Low-Voltage Power Distribution

Safe, cost-efficient and flexible

LX Busbar engineering guide LV72 2005

LX Busbar offers compact high current carrying capacity from 800 - 6300Amps, in both Copper and Aluminium sandwich conductor versions.



Small/medium Power Busbars LV70 2011

Small and medium power Busbar trunking for rising main, horizontal distribution, and pre-wired lighting applications.

LV Circuit protection & Distribution boards

UK built distribution board products for commercial and industrial buildings.

Sivacon S4 Switchgear Intro LV56

SIVACON S4 type-tested switchgear offers a high degree of safety with arc vent technology,and a fast and easy access to the devices for setting purposes is facilitated through doors with central locking, swivel frames and quick-release locks.

Sivacon S4 Switchgear Intro

Basic intro to SIVACON S4 switchgear

Energy Management in Low Voltage Power distribution

Compliance with Part L and CRC regulations requires accurate high quality metering and well featured PC based supporting software.

Sentron Powermanager Software

PC based fully scaleable Software to collect, monitor, Evaluate, Present and archive energy consumption data from networked devices.

Underfloor Busbar

Low profile, quick fix Underfloor Busbar trunking designed to be assembled directly onto the floor slab of a cavity floor installation, allowing for rapid on site assembly. Clean Earth and dual earth systems available, matched with complementary floor boxes and grommet floor boxes, utilising the latest range of Crabtree switches, sockets, and data accessories.

DVD-ROM included with catalogue 2011

BT LV TIP Shortform Catalogue - 2011

- ACB/MCCB
- Automatic Transfer Control device
- BT LV Portfolio
- Busbar catalogues
- Busbar Installation Instructions
- Busbar Installation Videos
- Energy Management
- LV Circuit protection & Distribution boards
- LV Switchgear
- Power Management
- Underfloor Busbar
- TIP shortform catalogue 2011

SIEMENS BT LV product offering
Low Voltage Equipment

Catalogue 2011/12

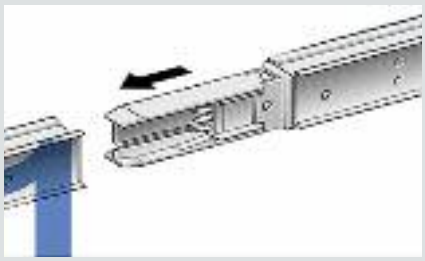
The products and systems listed in this catalog are manufactured/ distributed using a certified quality management system which complies with EN ISO 9001 (for the Certificate Register No. see the IC 10 appendix). The certificate is recognized in all IQNet countries.

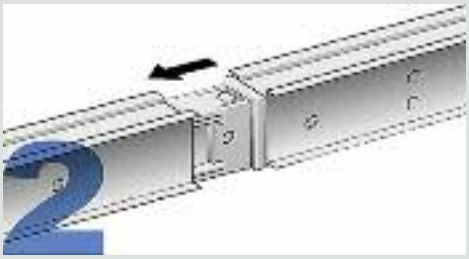
Blue Chip company Siemens, synonymous with engineering excellence and quality, offers an unrivalled range of LV Infrastructure equipment suited to use in modern energy conscious construction projects.

The Siemens Building Technologies Low Voltage business with headquarters in Wythenshawe, is capable of delivering intelligent total power solutions to meet even the most exacting client specification in the Building Services market. This encompasses products covering;

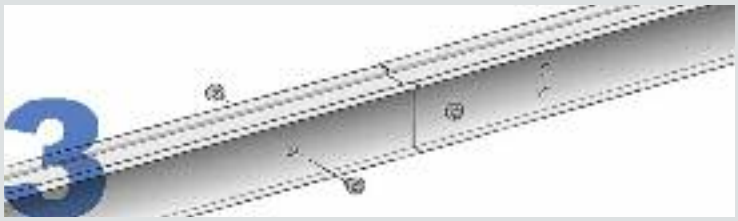
- LV Switchboards, (through franchised Power Partner network)
- Busbar Trunking, (25 to 6300Amps)
- ACB's, MCCB's, MCB's, Switch disconnectors
- Power Monitoring devices and meters, (If you don't measure it you cant control it!)
- Energy management software (trending, storing, sharing energy usage data)
- Distribution boards/Panelboards – (with and without metering, plug & play)
- Low voltage circuit protection

It is evident that more and more sites are designing services to comply with the Carbon reduction initiatives and Part L. To be able to manage energy usage, it is first essential to accurately measure it, store it, compare trends and identify areas for adjustment. Best practice currently includes utilising electrical equipment i.e. (Low Voltage Switchgear, Busbar trunking tap off units, and distribution boards) to capture electrical energy data via metering, and enabling visibility over open protocol communication channels.





Push fit joints enable rapid uncomplicated assembly of trunking units



Single (2,3,4 pole) or double (6, 8 pole) conductor

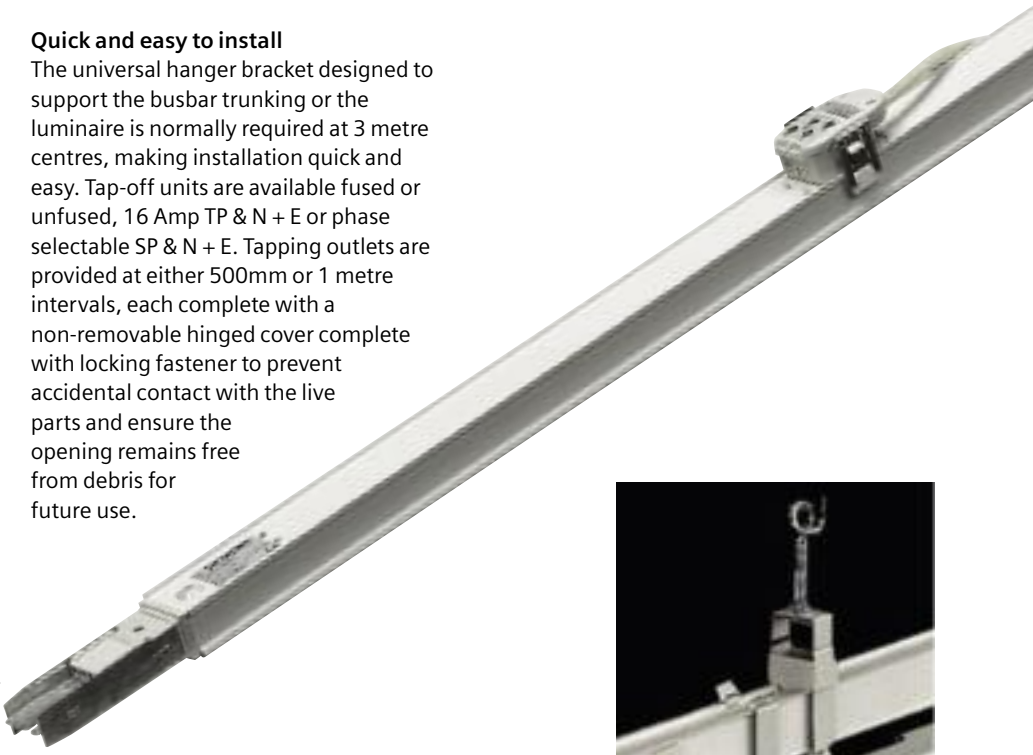
The CD system is designed for applications from 25A to 40A. It is used particularly where attractive appearance is important, such as in department stores, supermarkets or furniture stores, and offers efficient power supply to lighting installations and small loads. Any commercially available lighting system can be easily suspended from any point along the trunking unit.

Flexible and reliable
The CD lighting trunking range features snap-fi t joints and brackets for rapid installation, an aesthetically pleasing white finish which eliminates the need for painting, and IP54 protection which ensures exceptionally long life, even in hostile environments. Even when installation requirements change, the totally recoverable CD lighting trunking can easily be removed and re-installed in a new location.

Available in 2 x 25, 30, 40 and 2 x 40 amp ratings at 415V with a wide choice of copper conductor configurations and an interlock to ensure correct interconnection of phases,

CD lighting trunking represents a new concept in miniature plug-in busbars.

Quick and easy to install
The universal hanger bracket designed to support the busbar trunking or the luminaire is normally required at 3 metre centres, making installation quick and easy. Tap-off units are available fused or unfused, 16 Amp TP & N + E or phase selectable SP & N + E. Tapping outlets are provided at either 500mm or 1 metre intervals, each complete with a non-removable hinged cover complete with locking fastener to prevent accidental contact with the live parts and ensure the opening remains free from debris for future use.



Simple fast fixing also allows fixing of luminaires to trunking giving single fix installation

CD-K System 25A-40A

Pre-wired, plug in, flexible lighting busbar trunking

Typical Specification

The following is intended as a guide to specifying CD-K Busbar Trunking:

All lighting busbar trunking shall be approved manufacture and comply with degree of protection IP54 as defined in BSEN 60439. The current rating shall be defined on the drawings and schedules but will be typically 25A, 32A & 40A, 4pole or 8pole.

The system shall be totally enclosed. The trunking shall be suitable for use on a 400v 1, 2, 3, 4 phase (2, 3, 4 wire; PE = housing), 50/60 Hz supply and for the installation to meet the requirements of the IEE Wiring Regulations BS 7671 and BSEN 60439 parts 1 & 2. The enclosure shall be manufactured from zinc coated sheet steel, finished in white (similar to RAL 9002), rectangular in section with flanges to the manufacturers standard suspension and luminaire support brackets. Phase and neutral conductors shall be tinned copper, of equal cross section, fully insulated and supported at both the tapping outlet positions and at each end of the trunking.

The lighting Busbar trunking shall be manufactured in 2 or 3 metre lengths each complete with a self-aligning electrical joint sleeve, interlocked to prevent phase reversal.

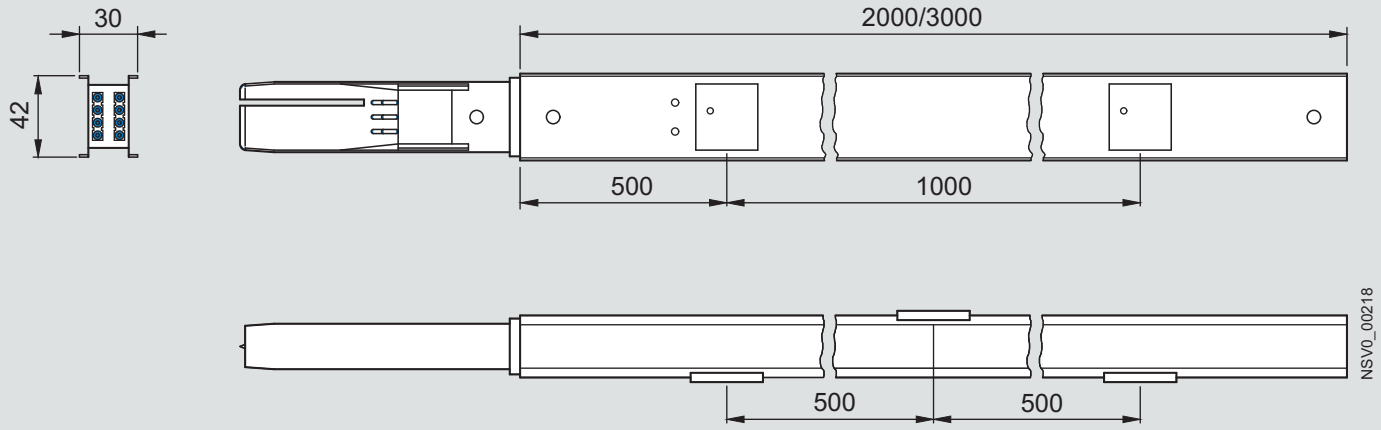
Tapping outlet positions shall be provided at 0.5 or 1 metre interval each complete with a non removable hinged cover complete with locking screw to ensure IP54 rating and preventing accidental contact with the live conductors.

All end feed units, end caps, joint sleeves and tap off units shall be manufactured from non-hygroscopic, self-extinguishing halogen-free insulating material and designed such that IP54 degree of protection is maintained.

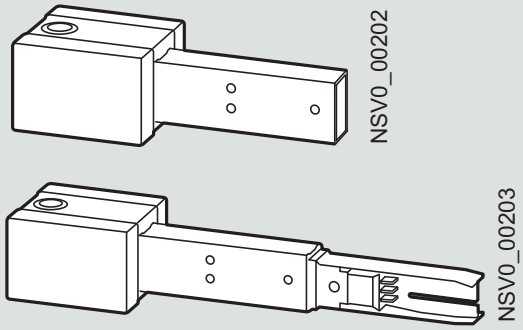
Tap-off Units
Tap-offs shall be rated at 10A or 16A, 3pole or 5pole as defined on the drawings and schedules. They shall be plug-in and designed so as to permit phase selection on site by inserting of prewired contact blocks into the appropriate positions. Fused or unfused tap-off units shall be provided as required.

The lighting trunking shall be 'Siemens CDK' brand or equal and approved.

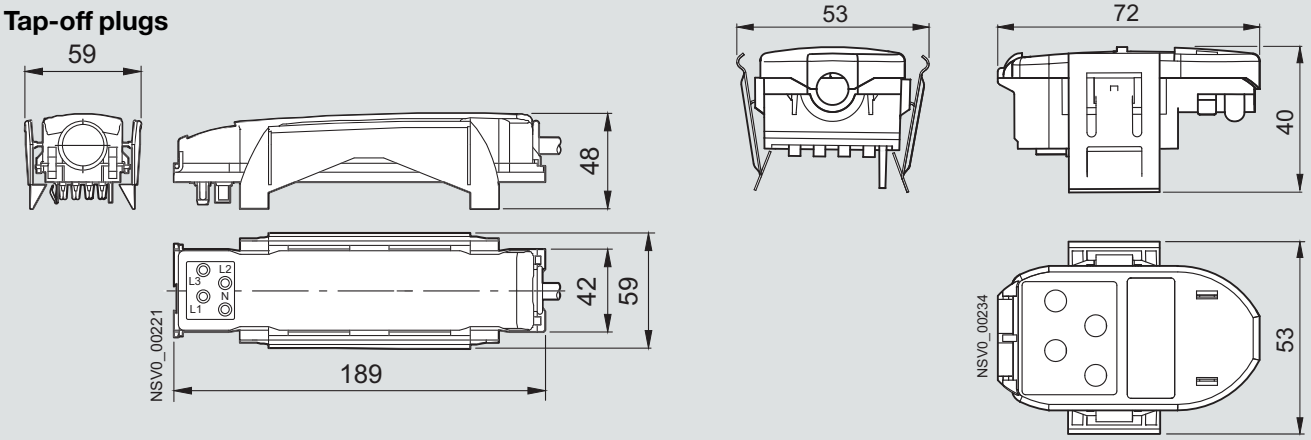
Pre-wired, plug in, flexible lighting busbar trunking
Dimensions



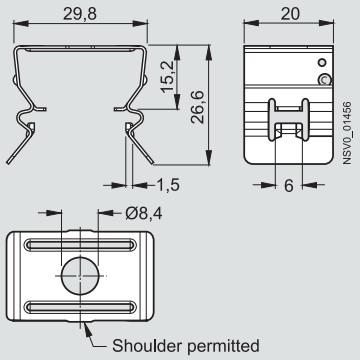
Feeder Units



Tap-off plugs



Fixing brackets, snap-on



Technical Data and Part Numbers for CD-K Busbar Trunking

Current Rating		**A**	**30**	**30**	**30**	**2 x 25**	**40**	**40**	**40**	**2 x 40**
Product Reference (CD-K-…)			**1302**	**1303**	**1304**	**2254**	**1402**	**1403**	**1404**	**2404**
Ambient temperature (min/max)		ºC	-5ºC to +40ºC							
Degree of protection			IP54; IEC/EN 60529							
Mounting			Edgewise, with tap off points on the side							
Conductors										
Rated Operational Voltage Ue		V~	400	400	400	400	400	400	400	400
Frequency		Hz	50–60	50–60	50–60	50–60	50–60	50–60	50–60	50–60
Rated Current Ie therm. Rated current at max.		Amps	30	30	30	2 x 25	40	40	40	2 x 40
40ºC and 35ºC averaged over 24 hours										
Conductor impedance at 50Hz and 20ºC busbar temperature										
Resistance R_{20}		mΩ/m	5.79	5.79	5.79	4.56	3.55	3.55	3.55	3.69
Reactance X_{20}		mΩ/m	0.26	0.26	0.26	0.15	0.40	0.40	0.40	0.13
Impedance $Z7_{20}$		mΩ/m	5.80	5.80	5.80	4.56	3.57	3.57	3.57	3.69
Conductor impedance in the event of a fault										
AC Resistance R_F		mΩ/m	8.24	8.24	8.24	7.50	5.61	5.61	5.61	4.17
Reactance X_F		mΩ/m	0.44	0.44	0.44	0.32	0.80	0.80	0.80	0.40
Impedance Z_F		mΩ/m	8.25	8.25	8.25	7.51	5.67	5.67	5.67	4.18
Zero Impedance tested to IEC 60 909, DIN VDE 0102										
Resistance R_0	Phase to N	mΩ/m	24.24	24.24	24.24	18.59	14.85	14.85	14.85	14.33
Reactance X_0	Phase to N	mΩ/m	1.77	1.77	1.77	0.82	0.99	0.99	0.99	0.78
Impedance Z_0	Phase to N	mΩ/m	24.30	24.30	24.30	18.61	14.88	14.88	14.88	14.33
Resistance R_0	Phase to PE	mΩ/m	12	12	12	13.49	9.87	9.87	9.87	5.15
Reactance X_0	Phase to PE	mΩ/m	1.8	1.8	1.8	0.82	1.02	1.02	1.02	0.74
Impedance Z_0	Phase to PE	mΩ/m	12.13	12.13	12.13	13.52	9.92 9.	92	9.92	5.21
Trunking Weight		kg/m	0.75	0.78	0.81	1.06	0.78	0.83	0.88	1.22
Short Circuit Rating										
Rated peak withstand Ipk		kA	2.4	2.4	2.4	3	3.6	3.6	3.6	3.6
Rated short time withstand current Icw (t=1 s)		kA	0.56	0.56	0.56	0.69	0.85	0.85	0.85	0.85
Rated short-time withstand current Icw (t=0.1 s)		kA	1.6	1.6	1.6	2	2.4	2.4	2.4	2.4
Number of active conductors			2	3	4	2 x 4	2	3	4	2 x 4
Terminal Capacity										
N, L1, L2, L3		mm²	3.2	3.2	3.2	4	5	5	5	5
N		mm²	3.2	3.2	3.2	4	5	5	5	5
PE (enclosure) Cu		mm²	11	11	11	11	11	11	11	11
Conductor Material			Cu	Cu	Cu	Cu	Cu	Cu	Cu	Cu
Tap off Plugs										
Tap-off point			Offset every 0.5 m, 1 m or 0.5 m on each side; max. 16 A							
Tap-off plug			3- and 5-pole; with or without permanently attached cable; with or without fuse holders for 8.5 mm x 31.5 mm; type gG (IEC) and type gL (VDE) fast cylinder fuses. All tap-off plugs are of utilization category AC-20B to IEC/EN 60 947-3. The PE operates as an early-make contact during connection, and as a late-break contact during removal of the tap-off plug.							

Terminal Capacities								
Designation	**Type**	**N, L1, L2, L3**		**N**		**PE**	
		Min mm²	Max mm²	Min mm²	Max mm²	Min mm²	Max mm²
Entry Feeder Unit	CD-K-…-EA	2.5	6 (f)	2.5	6 (f)	2.5	6 (f)
(Complete with end cap)			10 (st, so)		10 (st, so)		10 (st, so)
Entry Feeder Unit	CD-K-…-EE	2.5	6 (f)	2.5	6 (f)	2.5	6 (f)
			10 (st, so)		10 (st, so)		10 (st, so)
Notes							
			so = solid, st = stranded, f = flexible with ferrule				
Suspension Bracket	CD-BC						

*L-N Volt Drop Distributed Load

Range of empty tap off units allow customisation at our Modshop facility within UK

Flexible in every direction.

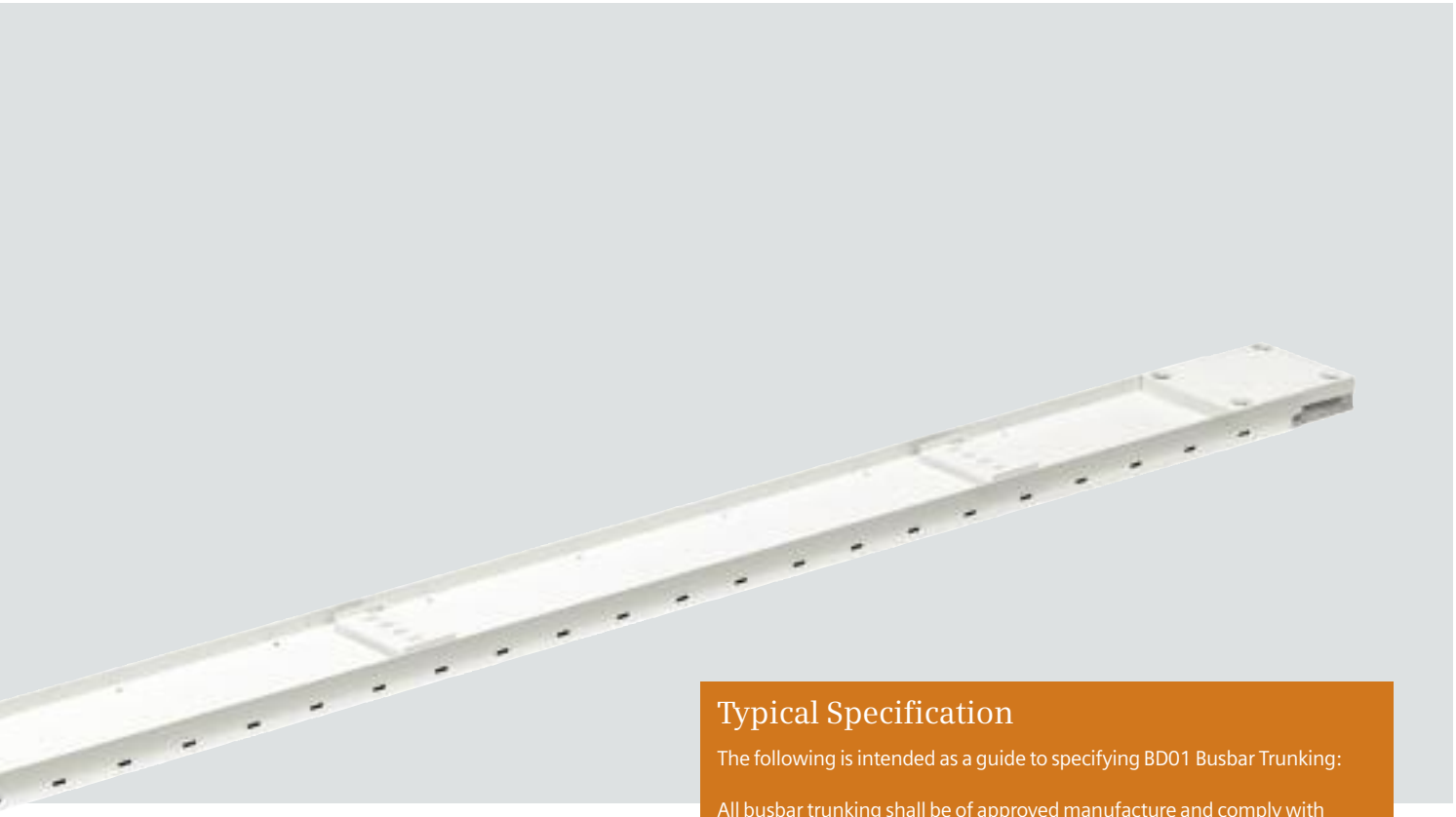
The feeder unit can be fitted to any junction point, even used as a centre feed.

The BD01 system is designed for applications from 40A to 160A. It is primarily used in trade and industry to provide a safe power supply for small loads and to feed Siemens' CD-K lighting trunking. The asymmetrical design of the connection points ensures fault-free installation of the trunking units. The design imposed fitting of the tap offs on the trunking unit ensures a high degree of safety for operating personnel. The tap off points only open automatically when the tap off units are fitted. They close automatically when the tap off units are removed.

Flexible power supply
The power supply for the BD01 system is provided via end or centre feeder units as required. These can be positioned at junction points on the trunking run and ensure flexibility to match changing site conditions. The flexible junction unit enables the run to be adapted to any building layout.

Tap off units are available in four sizes for equipping with devices of your choice or ready-fitted with protective devices (fuses, MCBs) or protective devices combined with CEE sockets. Combined with empty or pre-wired ancillary equipment units, the result is a wide range of solutions for many different applications. Furthermore, the galvanised and painted enclosure of the trunking unit ensures optimum protection against corrosion.

Simple design
Just one size for five different current ratings means minimum stock-holding and uncomplicated design. The variable mounting position – edgewise or flat – ensures straightforward engineering without de-rating. The well thought- out BD01 system, with the mechanical and electrical connection of the trunking units accomplished in a single operation, saves on installation time and thus reduces assembly costs.



Typical Specification

The following is intended as a guide to specifying BD01 Busbar Trunking:

All busbar trunking shall be of approved manufacture and comply with degree of protection IP54 (IP55 available with accessories) as defined in BSEN 60439 when edgewise (tap off points at the side and bottom) and IP50 when flat (tap off points on the top). The current rating shall be defined on the drawings and schedules but will be typically 40A to 160A. The busbar shall be designed and manufactured to comply with BSEN 60439 parts 1 & 2. For use on a 400v, 3phase 4wire (PE = Housing), 50/60Hz supply, and capable of withstanding prospective fault levels as detailed on the drawing schedules. The busbar trunking shall be manufactured in 2 or 3 metre lengths. The enclosure shall be manufactured from pale grey (RAL 7035) painted galvanised sheet steel and is the protective earth conductor. The busbar trunking shall have solid conductors with silver-plated aluminium and copper connection points at all tap off outlets and joint positions. Tap off outlets shall be spaced at 0.5 and 1 metre distance and shall have automatic opening and closing shutters. They will also ensure correct polarity is maintained. The joint section shall provide electrical & mechanical connection by four screws. The joint section shall absorb any differential expansion between the trunking and the conductors.

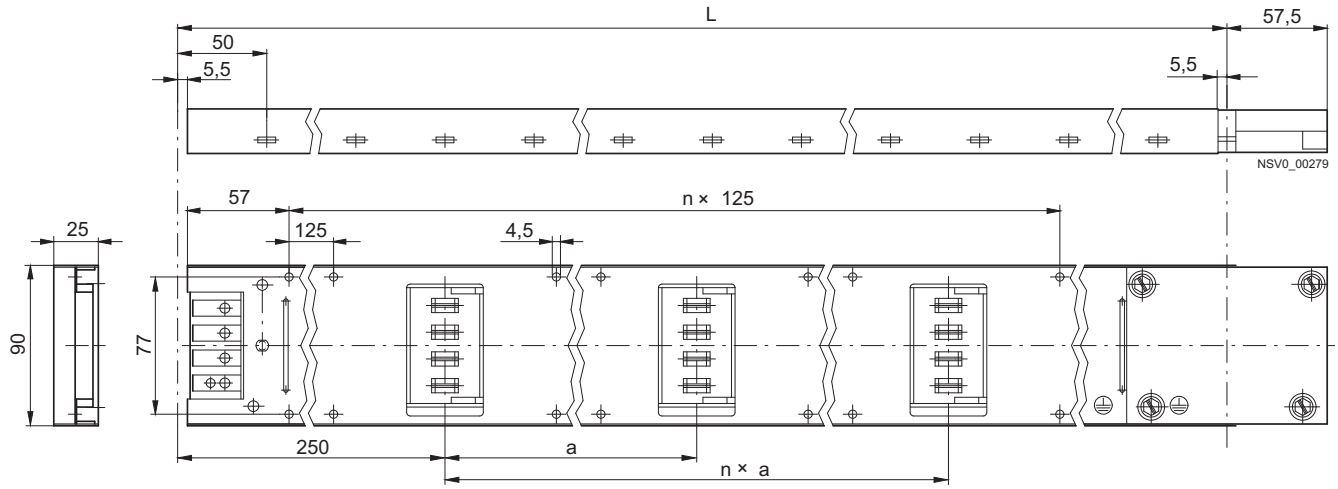
When a change in direction, rating or termination occurs in a busbar run, manufacturer's purpose made fittings such as junction units, feeder units, end flanges and centre feeds shall be used. Where detailed on the drawings and schedules interlocking coding sets shall be installed into the tap off outlets and tap off units to provide non-interchange ability of tap off units to non-designated tap off outlets.

Tap off units
Tap off units shall be plug-in type suitable to accept HRC fuses, MCBs, DIN rail mounted devices and socket outlets as detailed on the drawings and schedules. The enclosure shall be constructed from anodised aluminium and/or insulation material, complying to the degree of protection IP54 (IP55 available with accessories), as defined in BSEN 60439. The earth connection of the tap off unit shall provide the opening of the automatic shutter and make before and break after the live connections are made. Where required tap off units shall be extendible to allow additional components to be installed onto the internal DIN rail. The busbar trunking system shall be Siemens BD01, Barduct brand or equal and approved.

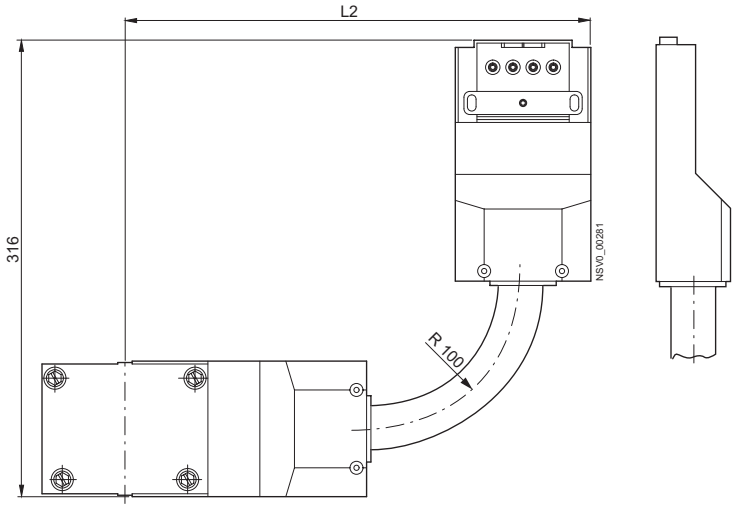
Small current plug-in distribution Busbar
Technical Data

Product Reference – Current Rating				BD01-40	BD01-63	BD01-100	BD01-125	BD01-160
Current paths								
Rated Operational Voltage Ue		V~		400	400	400	400	400
Frequency		Hz		50–60	50–60	50–60	50–60	50–60
Rated Current Ie therm. Rated current at max. 40ºC and 35ºC		A 4		0	63	100	125	160
averaged over 24 hours								
Conductor impedance at 50Hz and 20ºC busbar temperature								
Resistance R_{20}		mΩ/m		3.960	1.936	0.938	0.910	0.578
Reactance X_{20}		mΩ/m		0.280	0.324	0.286	0.300	0.273
Impedance $Z7_{20}$		mΩ/m		3.970	1.968	0.994	1.000	0.642
Conductor impedance in the event of a fault								
AC Resistance R_F		mΩ/m		5.991	4.128	2.841	2.420	2.189
Reactance X_F		mΩ/m		1.396	1.248	1.186	0.940	0.973
Impedance Z_F		mΩ/m		6.151	4.312	3.078	2.600	2.395
L-L Volt Drop Distributed Load								
		mV/A/m	pf 0.7	2.57	1.37	0.75	0.74	0.52
		mV/A/m	pf 0.8	2.89	1.51	0.80	0.79	0.54
		mV/A/m	pf 0.9	3.19	1.63	0.84	0.82	0.55
		mV/A/m	pf 1	3.43	1.68	0.81	0.79	0.50
Zero Impedance tested to IEC 60 909, DIN VDE 0102								
Resistance R_0	Phase to N	mΩ/m		15.904	7.911	4.115	3.810	3.167
Reactance X_0	Phase to N	mΩ/m		2.128	2.058	1.797	1.630	1.656
Impedance Z_0	Phase to N	mΩ/m		16.045	8.175	4.490	4.140	3.574
Resistance R_0	Phase to PE	mΩ/m		10.086	8.565	6.648	5.430	5.343
Reactance X_0	Phase to PE	mΩ/m		2.909	3.338	3.067	2.320	2.355
Impedance Z_0	Phase to PE	mΩ/m		10.498	9.183	7.322	5.910	5.839
Short Circuit Rating								
Rated peak withstand Ipk		kA		2.55	6.30	15.30	15.30	15.30
Rated short time withstand current Icw (t=1 s)		kA		0.58	1.15	2.50	2.50	2.50
Rated short-time withstand current Icw (t=0.1 s)		kA		1.70	4.20	9.00	9.00	9.00
Number of active conductors				4	4	4	4	4
Conductor cross-section								
L1, L2, L3		mm^2		7.9	15.7	34.1	34.1	34.1
N		mm^2		7.9	15.7	34.1	34.1	34.1
PE (enclosure) Cu		mm^2		20.0	20.0	20.0	20.0	20.0
Conductor Material				Al	Al	Al	Al	Cu
Max. interval between trunking unit	edgewise	m		3	3	3	3	3
supports at normal mechanical load	flat	m		1.5	1.5	1.5	1.5	1.5
Combustive Energy		kWh/m		0.76	0.76	0.76	0.76	0.76
Trunking Weight		kg/m		1.45	1.55	1.75	1.75	2.65
Tap off Units								
Rated Operational Voltage Ue		V		230 or 400				
Rated Current Ie max.		A		63				
Switching capacity of the built-in switch-disconnector				AC-20B				

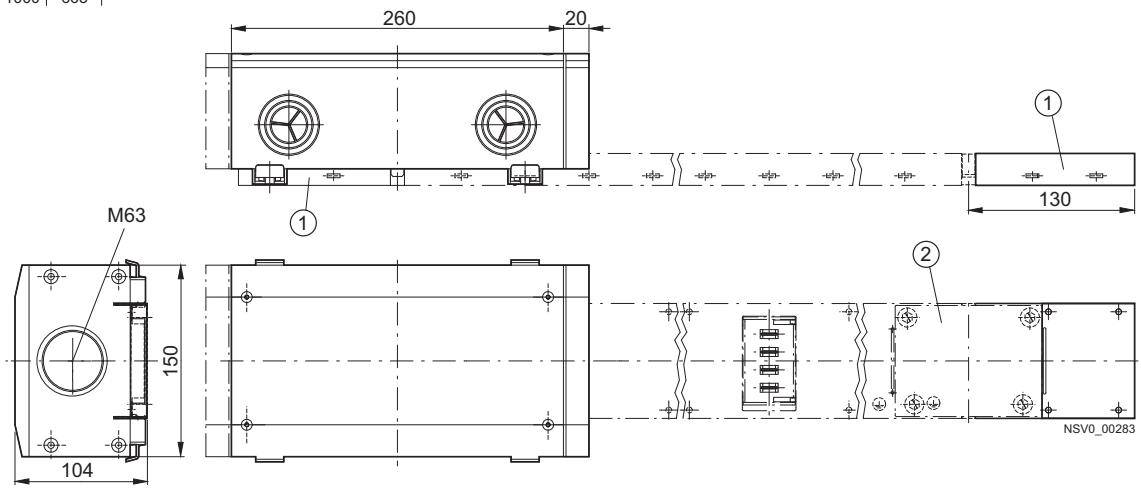
Terminal Capacities		**L1, L2, L3**		**N**		**PE**	
	Type	min mm^2	max mm^2	min mm^2	max mm^2	min mm^2	max mm^2
Feeder units	BD01-E	6 (e, m)	50 (m)	6 (e, m)	50 (m)	6 (e, m)	50 (m)
	BD01-160-E	25 (m)	95 (m)	25 (m)	95 (m)	16 (m)	50 (m)
Tap off units	BD01-AK01X/ZS	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)
	BD01-AK02X/ZS3	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)
	BD01-AK02M0/A163	0.75 (so, st)	16 (so)	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)
	BD01-AK02M0/A323	0.75 (so, st)	16 (so)	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)
	BD01-AK1M1/A101	0.75 (so, st)	16 (so)	0.75 (so, f)	2.5 (so, f)	0.75 (so, f)	2.5 (so, f)
	BD01-AK1M1/A161	0.75 (so, st)	17 (so)	0.75 (so, f)	2.5 (so, f)	0.75 (so, f)	2.5 (so, f)
	BD01-AK1M1/A321	0.75 (so, st)	18 (so)	0.75 (so, f)	2.5 (so, f)	0.75 (so, f)	2.5 (so, f)
	BD01-AK1M1/A...	0.75 (so, st)	16 (so)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so)
	BD01-AK1M1/A...N	0.75 (so, st)	16 (so)	0.75 (so, st)	16 (so)	0.75 (so, st)	16 (so)
	BD01-AK1X/S14	0.50 (f, st)	4 (so)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so)
Notes:	BD01-AK1X/S18	0.50 (f, st)	16 (f, so, st)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so)
	BD01-AK1X/GB...	0.75 (so, st)	16 (so)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so)
so = solid	BD01-AK2X/F1451	0.75 (so, st)	16 (so)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so)
st = stranded	BD01-AK2X/S27	0.75 (f, st)	10 (f, so, st)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so)
f = flexible with ferrule	BD01-AK2HX/S33	1.50 (f, st)	25 (f, st)	0.75 (f, st)	10 (f, so, st)	0.75 (so, st)	16 (so, st)



L	a	Number of tap-off points
2000	500	4
	1000	2
3000	500	6
	1000	3



Type	L	L1	L2
BD01-...-R1	500	165	316
BD01-...-R2	1000	665	–



① BD01-EF end flange
② BD01-...-KB joint block

Compact design can easily fit riser cupboards.

Busbar trunking saves space in riser shafts and allows simple later expansion by plugging in a new tap off unit.

Open protocol communication possible with ancillary tap off units and data conduit.

End feeder units supplied with additional spreader box to suit UK cable sizes.

The BD2 system was developed for applications from 160A to 1250A. It is used in large buildings and in every field of industry to provide the power supply for medium-size loads as well as to supply the smaller systems BD01 and CD.

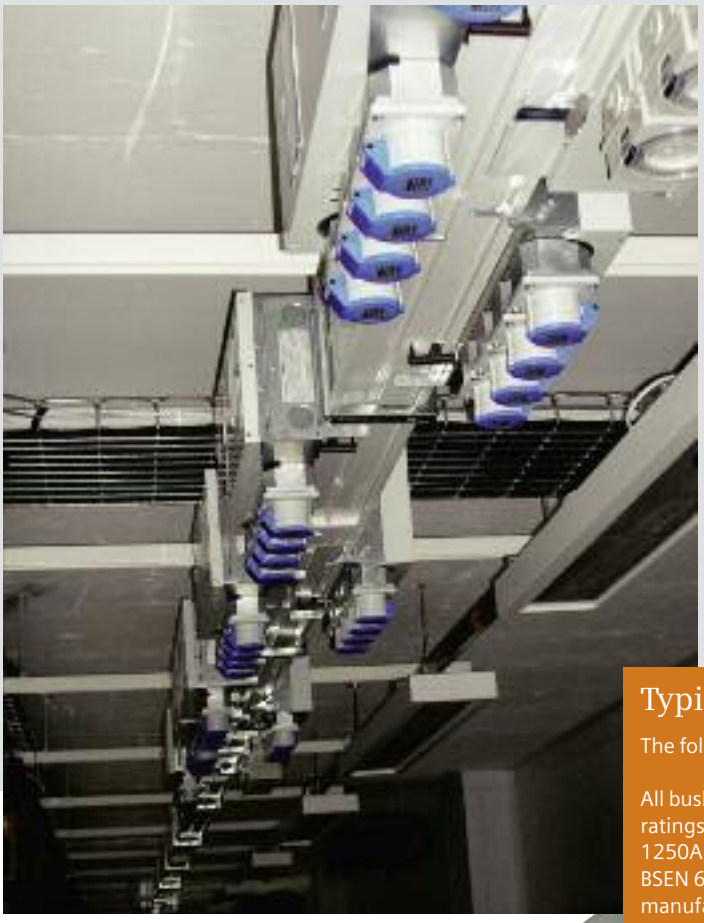
Double the safety

The orientation feature of the tap off unit and the design-imposed connection sequences promote the safety of your personnel. In the event of fire, Siemens busbar system fire barriers maintain integrity against the propagation of fire, gases, vapours and fluids for up to two hours under defined fire conditions. The combustive energy of a typical busbar trunking system such as the BD2-250 is less than a third of that for a comparable cable installation.

Low space requirements

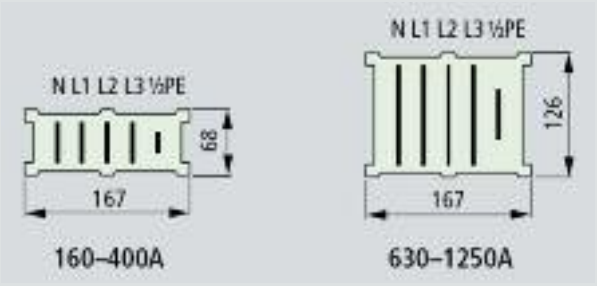
The variety of trunking lengths and angles of the trunking units and the flexible junction units enable the busbar trunking system to be optimally adapted to the layout of your building. A large number of ready-made tap off units with a wide range of components fitted make the BD2 system suitable for universal use. The compact design of the BD2 system means that space is saved when installing the busbar runs vertically in small riser ducts. There are only two sizes for a total of nine current ratings, which means less stock-holding and simplified work for the designer. The inherently low combustive energy significantly reduces the amount of damage resulting from a fire.

The use of busbar trunking systems is also increasing in the field of ship building. Busbar trunking is suitable for use in the riser zones of all decks for power supply to the cabins because of its safety during operation, the considerably lower combustive energy involved, the reduced space requirements, the fast and simple engineering and installation, and the unmatched flexibility.



BD2 Busbar provides flexible UK produced tap off options allowing customization to suit data centres or other bespoke applications

Dimensions: Busbar Housing and 400 Amp End Feeder Unit plus Spreader Box



Typical Specification

The following is intended as a guide to specifying BD2 Busbar Trunking:

All busbar trunking shall be of approved manufacture and the current ratings detailed on the drawings and schedules – typically from 160A to 1250A, and complying to degree of ingress protection IP52 defined in BSEN 60439 and IP54 with accessories. The busbar shall be designed and manufactured to comply with BSEN 60439 parts 1 & 2. For use on a 690v, 3phase 5wire (3L, N or half N, PE or half PE), 50/60Hz supply, and capable of withstanding prospective fault levels as detailed on the drawing schedules. The busbar trunking shall be manufactured in 1.25, 2.25 & 3.25 metre lengths or optional lengths from 0.5 up to 3.24 metres. The enclosure shall be manufactured from pale grey (RAL 7035) painted galvanised sheet steel. The busbar trunking shall have solid conductors with nickel-plated and tinned aluminium or copper, with insulated tap off outlets and busbar supports. Tap off outlets shall be spaced at 0.5 and 1 metre distance and shall have automatic opening and closing shutters. They will also ensure correct polarity is maintained. The joint section shall provide electrical and mechanical connection by four screws. The joint section shall absorb any differential expansion between the trunking and the conductors When a change in direction, rating or termination occurs in a busbar run, manufacturer's purpose-made fittings such as L junction units, feeder units, end flanges and centre feeds shall be used. When supplied as Rising Main busbar suitable fire barriers must be fitted which meet the requirements of BSEN 60439 part 2 and of fire resistance Class S120.

Tap off units

Tap off units shall be plug-in type suitable to accept HRC and BS fuses, MCBs, MCCBs, Switch Disconnectors, DIN rail mounted devices and socket outlets as detailed on the drawings and schedules. The enclosure shall be constructed from painted steel and/or insulation material, complying to the degree of protection IP54, as defined in BSEN 60439. The earth connection of the tap off unit shall provide the opening of the automatic shutter and make before and break after the live connections are made. Where required, tap off units shall be extendible to allow additional components to be installed onto the internal DIN rail. The busbar trunking system shall be Siemens BD2, Barduct brand or equal and approved.

Unistrut mounting bracket

Quick and easy unistrut mounting with clips

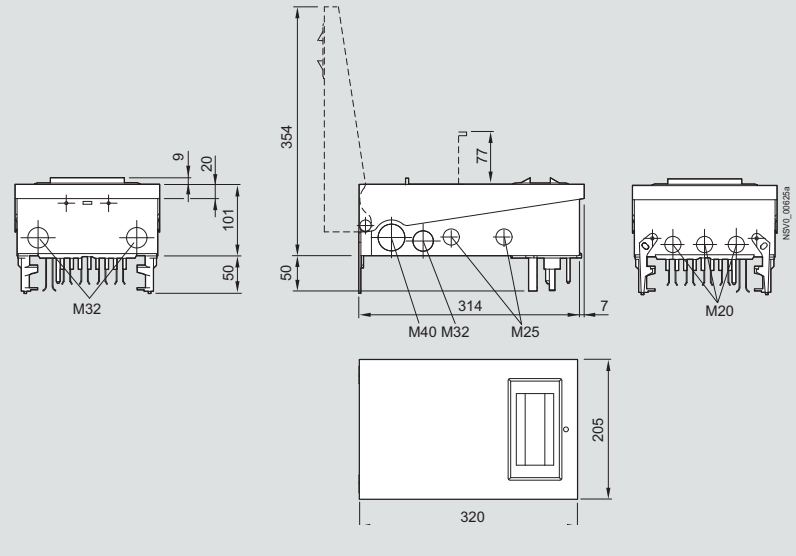
Technical Data for BD2A 5 Bar, Aluminium Conductors Load Distribution Factor = 0.5

Rated Current	**A**		**160**	**250**	**400**	**630**	**800**	**1000**
Rated Voltage	VAC		690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.440	0.330	0.210	0.130	0.090	0.080
		pf = 0.8	0.470	0.360	0.210	0.130	0.100	0.080
		pf = 0.9	0.500	0.380	0.210	0.140	0.100	0.070
		pf = 1.0	0.490	0.380	0.190	0.130	0.080	0.060
Conductor Characteristics								
R	mΩ/m at end temperature		0.564	0.438	0.215	0.149	0.098	0.066
X	mΩ/m at end temperature		0.158	0.111	0.122	0.057	0.057	0.057
Z	mΩ/m at end temperature		0.586	0.452	0.247	0.159	0.114	0.088
Protective Conductor								
R_0	mΩ/m		1.638	1.279	1.059	0.492	0.438	0.408
X_0	mΩ/m		0.606	0.516	0.518	0.303	0.280	0.273
Weight	kg/M		5.3	5.8	7.5	12.3	12.4	15.8
IP Rating	Standard		IP 52	IP 52	IP 52	IP 52	IP 52	IP 52
	Optional		IP 54	IP 54	IP 54	IP 54	IP 54	IP 54
Dimensions	mm		167x68	167x68	167x68	167x126	167x126	167x126
Short Time Rating	kA for 1 sec		5.5	10	16	26	32	34
Prospective Short Circuit Rating	kA		17	32	40	64	84	90
Number of Trunkings			1	1	1	1	1	1

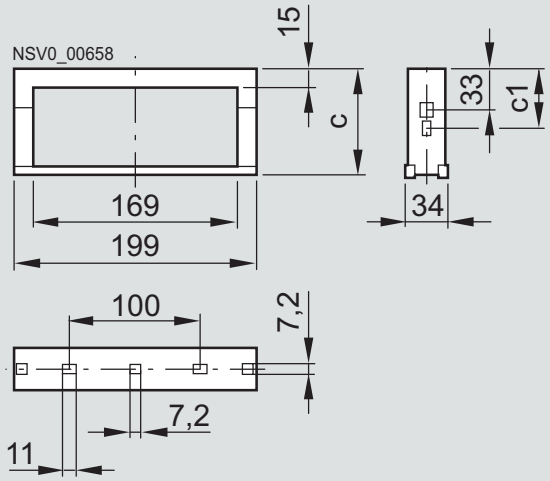
Technical Data for BD2C 5 Bar, Copper Conductors Load Distribution Factor = 0.5

Rated Current	**A**		**160**	**250**	**400**	**630**	**800**	**1000**	**1250**
Rated Voltage	VAC		690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.300	0.330	0.220	0.120	0.070	0.070	0.060
		pf = 0.8	0.310	0.350	0.230	0.130	0.070	0.070	0.060
		pf = 0.9	0.320	0.360	0.230	0.140	0.070	0.070	0.050
		pf = 1.0	0.290	0.330	0.210	0.130	0.060	0.060	0.040
Conductor Characteristics									
R	mΩ/m at end temperature		0.333	0.383	0.239	0.151	0.065	0.068	0.041
X	mΩ/m at end temperature		0.157	0.158	0.115	0.053	0.053	0.053	0.054
Z	mΩ/m at end temperature		0.368	0.414	0.266	0.160	0.084	0.086	0.068
Protective Conductor									
R_0	mΩ/m		1.027	1.139	0.956	0.470	0.258	0.270	0.174
X_0	mΩ/m		0.641	0.529	0.507	0.277	0.265	0.249	0.265
Weight	kg/M		7.3	7.5	9.5	15.6	18.9	25.1	37.6
IP Rating	Standard		IP 52	IP 52	IP 52	IP 52	IP 52	IP 52	IP 52
	Optional		IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP54
Dimensions	mm		167x68	167x68	167x68	167x126	167x126	167x126	167x126
Short Time Rating	kA for 1 sec		5.5	10	16	26	32	34	34
Prospective Short Circuit Rating	kA		17	32	40	64	84	90	90
Number of Trunkings			1	1	1	1	1	1	1

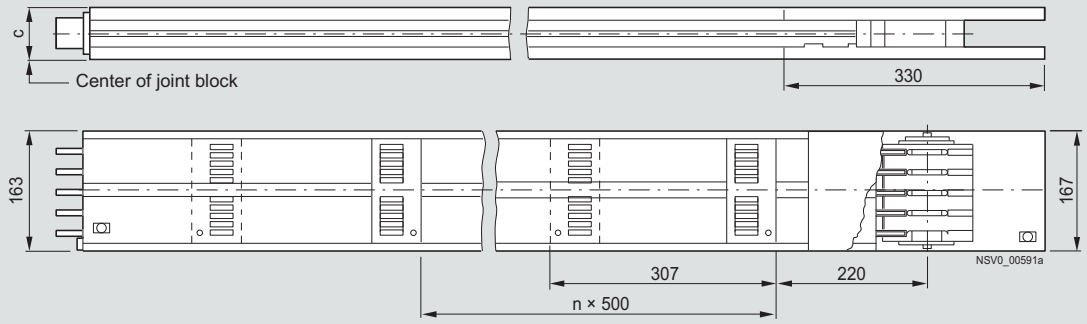
Tap off units



Fixing bracket

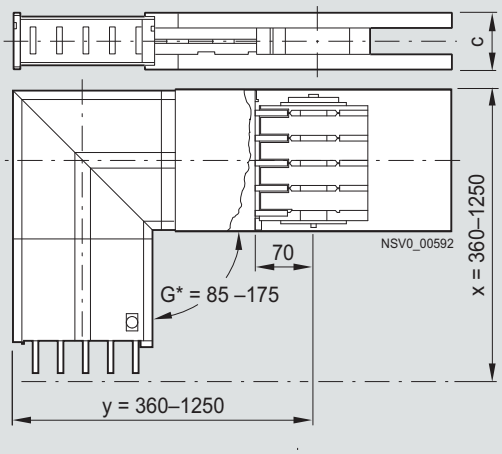


Dimensions Straight trunking units

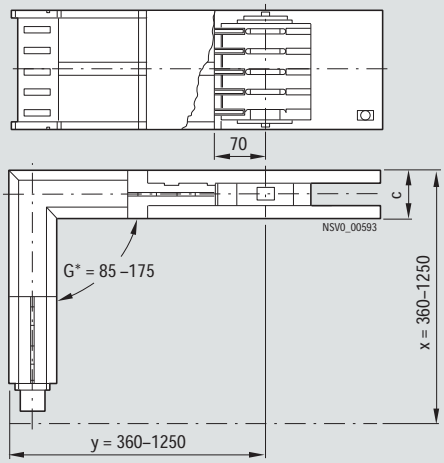


L-junction units

BD2.-…-LR…(-G*), BD2.-…-LL…(-G*)

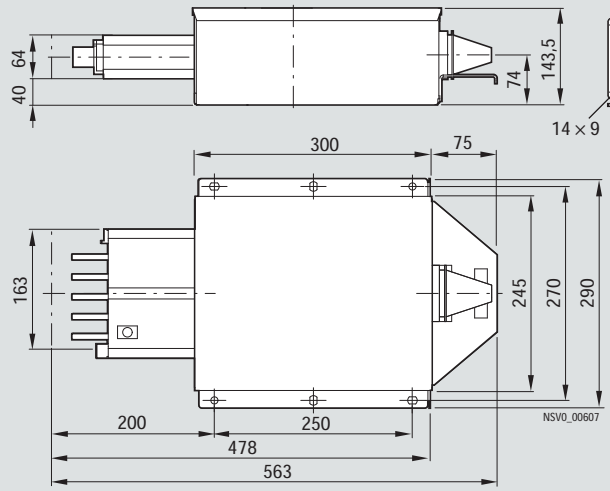


BD2.-…-LV…(-G*), BD2.-…-LH…(-G*)



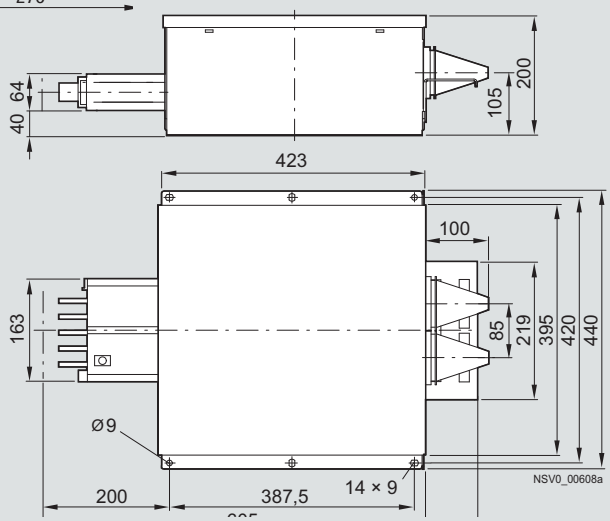
Cabling boxes

BD2-250-EE

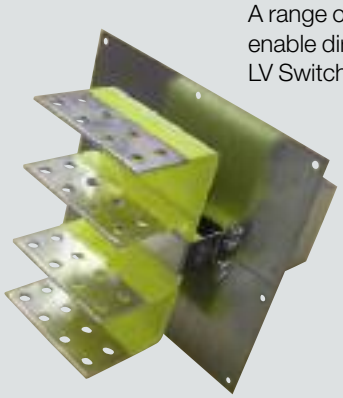


Distribution feeder unit

BD2-400-EE



Reliability of supply was a key consideration when over 1km of LX busbar was installed at the headquarters of Swiss Re in London.



A range of flanged end fittings enable direct connection to any LV Switchboard

The LX system with its 'sandwich' construction is designed for applications from 800A to 6300A. It is used in multi-storey buildings and wherever the flexible transportation of large amounts of power is required. The high degree of protection to IP55 ensures the safe distribution of power even in challenging ambient conditions. The tap off units have an orientation feature, which ensures fault-free installation due to the design- imposed fitting sequence. This, together with the automatic protective mechanism at the tap off points, ensures a high degree of protection from accidental contact for operating personnel.

Reliability in sensitive environments
The conductor configurations with double N conductors and clean earth ensure an overload free neutral conductor even with imbalanced loads. Susceptible loads such as computers are not put at risk by earth faults to the enclosure if they are connected to the clean earth.

Flexibility in every position
The electrical load bearing capacity of the LX system is not affected by its installation position. This enables optimum flexibility where busbar run routing is concerned.

The distortion resistant aluminium enclosure is low in weight and highly resistant to chemical and atmospheric influences.

Compact and light
The compact, low impedance 'sandwich' construction minimises voltage drops, so enabling the cost effective transmission of large amounts of power, even over long distances, whether installed horizontally or vertically. Rapid connection reduces assembly times, as does the low weight of the LX busbar system. For full selection and technical details of the Siemens LX Busbar Trunking System, please request a copy of the LX Catalogue (LV72T – 2004).

Distribution or Plug-in versions can be mixed

90 degree angles and offsets allow Busbar runs to be engineered exactly into tight confines

Typical Specification

The following is intended as a guide to specifying LX Busbar Trunking:

All busbar trunking shall be of approved manufacture and the current ratings detailed on the drawings and schedules – typically from 800A to 6300A, and complying with degree of ingress protection IP55 defined in BSEN 60439. The system shall be totally enclosed and low impedance sandwich construction. The trunking shall be suitable for use on 690v 50Hz supply and available in various configurations including 3 phase and neutral, double neutral, earth and/or clean earth (with a maximum of six conductors). It shall meet the requirements of the IEE Wiring Regulations BS 7671 and BSEN 60439 parts 1 & 2. The enclosure shall be manufactured from aluminium finished in pale grey RAL 7035, prepared to accept manufacturer's standard suspension hangers and support brackets. Phase and neutral conductors shall be nickel and tin plated aluminium or tin plated copper, of equal cross- section fully insulated.
The busbar trunking current rating must be equal in all installation positions (flat, edge or vertical). A derating in any position is not acceptable. The busbar trunking shall be manufactured in different lengths up to 3 metres either as feeder or distribution busbar. Each plug in joint located at the end of each busbar length will be equipped with a single bolt joint block comprising a double headed sheer nut. Manufacturers standard junction units shall be supplied as standard, including elbows, knees, T-sections, offsets, expansion fittings, and end caps. Further standard components must be available such as cable feeder boxes, transformer connections and panel flange connections. For distribution busbar, tapping outlet positions shall be provided as required with up to five outlets on each side of a 3 metre length of busbar. Each outlet shall have a cover complete with seal facility to ensure IP55 rating and preventing accidental contact with live parts. All plastic parts (like tapping outlets) shall be manufactured from non-hygroscopic self-extinguishing halogen-free insulating material and designed such that IP55 degree of protection is maintained. When supplied as Rising Main busbar the construction should be suitable to provide fire barrier protection to meet the requirements of BSEN 60439 part 2 and of fire resistance Class S120.

Tap off Units
When supplied as Rising Main busbar suitable fire barriers must be fitted which meet the requirements of BSEN 60439 part 2 and of fire resistance Class S120. Tap off units shall be plug-in type up to 630amps and fix mounted from 800A to 1250A. Incorrect mounting shall be prevented by an interlocking mechanism. The tap off units shall be equipped with either fused switch or MCCB. The short circuit rating shall be up to 100kA at 415v 50Hz. The enclosure shall be constructed from painted steel and/or insulation material, complying to the degree of protection IP55, as defined in BSEN 60439. The earth connection of the tap off unit shall provide the opening of the automatic shutter and make before and break after the live connections are made. The busbar trunking system shall be Siemens LX, Barduct brand or equal and approved.

Technical Data for LX 4 Bar, Aluminium Conductors Load Distribution Factor = 1

Rated Current	A		800	1000	1250	1600	2000	2500	3200	4000	4500
Rated Voltage	V~		690	690	690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.212	0.167	0.115	0.073	0.052	0.048	0.037	0.027	0.024
		pf = 0.8	0.231	0.179	0.122	0.077	0.056	0.050	0.039	0.029	0.026
		pf = 0.9	0.249	0.189	0.127	0.080	0.060	0.052	0.040	0.030	0.026
		pf = 1.0	0.253	0.184	0.121	0.074	0.059	0.048	0.038	0.029	0.024
Conductor Characteristics											
R	mΩ/m at end temperature		0.146	0.106	0.070	0.043	0.034	0.028	0.022	0.017	0.014
X	mΩ/m at end temperature		0.028	0.031	0.024	0.017	0.009	0.011	0.008	0.005	0.006
Z	mΩ/m at end temperature		0.149	0.110	0.074	0.046	0.035	0.030	0.024	0.018	0.015
Weight	kg/M		10.6	12.0	15.2	20.8	25.6	31.3	42.0	51.3	63.0
IP Rating	Standard		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
	Optional		IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Dimensions	mm		145x137	145x137	145x162	145x207	145x287	145x287	145x439	145x599	145x599
Short Time Rating (phase conductors only)	kA for 1 sec		25	35	50	60	75	86	100	140	150
Prospective Short Circuit Rating	kA		53	70	110	132	158	194	220	255	255

Technical Data for LX 4 Bar, Copper Conductors Load Distribution Factor = 1

Rated Current	A		1000	1250	1400	1600	2000	2500	3200	4000	5000	6300
Rated Voltage	V~		690	690	690	690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.134	0.117	0.091	0.087	0.059	0.037	0.033	0.027	0.020	0.017
		pf = 0.8	0.143	0.122	0.097	0.089	0.062	0.038	0.034	0.028	0.020	0.017
		pf = 0.9	0.150	0.125	0.101	0.090	0.064	0.040	0.033	0.028	0.021	0.017
		pf = 1.0	0.144	0.113	0.095	0.078	0.061	0.036	0.028	0.024	0.019	0.014
Conductor Characteristics												
R	mΩ/m at end temperature		0.083	0.065	0.055	0.045	0.035	0.021	0.016	0.014	0.011	0.008
X	mΩ/m at end temperature		0.027	0.031	0.020	0.026	0.013	0.009	0.011	0.008	0.005	0.005
Z	mΩ/m at end temperature		0.087	0.072	0.059	0.051	0.037	0.022	0.019	0.016	0.012	0.010
Weight	kg/M		17.9	21.6	24.1	29.7	35.3	55.2	70.6	88.9	110.5	141.2
IP Rating	Standard		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
	Optional		IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Dimensions	mm		145x137	145x137	145x162	145x162	145x207	145x287	145x287	145x439	145x599	145x674
Short Time Rating (phase conductors only)	kA for 1 sec		46	50	57	65	75	95	100	150	150	150
Prospective Short Circuit Rating	kA		96.6	110	125	143	165	209	220	255	255	255

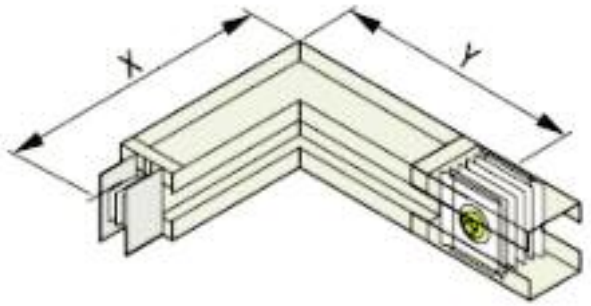
Technical Data for LX 5 Bar, Aluminium Conductors Load Distribution Factor = 1

Rated Current	A		800	1000	1250	1600	2000	2500	3200	4000	4500
Rated Voltage	V~		690	690	690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.211	0.166	0.114	0.073	0.052	0.047	0.036	0.026	0.024
		pf = 0.8	0.231	0.179	0.121	0.077	0.056	0.050	0.038	0.028	0.025
		pf = 0.9	0.248	0.188	0.127	0.079	0.059	0.051	0.040	0.030	0.026
		pf = 1.0	0.252	0.183	0.121	0.074	0.058	0.048	0.038	0.029	0.024
Conductor Characteristics											
R	mΩ/m at end temperature		0.146	0.106	0.070	0.043	0.034	0.028	0.022	0.017	0.014
X	mΩ/m at end temperature		0.028	0.031	0.024	0.017	0.009	0.011	0.008	0.005	0.006
Z	mΩ/m at end temperature		0.149	0.110	0.074	0.046	0.029	0.025	0.024	0.018	0.015
Weight	kg/M		11.6	13.3	17.0	23.8	29.3	36.3	48.5	59.2	73.2
IP Rating	Standard		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
	Optional		IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Dimensions	mm		145x137	145x137	145x162	145x207	145x287	145x287	145x439	145x599	145x599
Short Time Rating (phase conductors only)	kA for 1 sec		25	35	50	60	75	86	100	140	150
Prospective Short Circuit Rating	kA		53	70	110	132	158	194	220	255	255

Technical Data for LX 5 Bar, Copper Conductors Load Distribution Factor = 1

Rated Current	A		1000	1250	1400	1600	2000	2500	3200	4000	5000	6300
Rated Voltage	V~		690	690	690	690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.134	0.117	0.091	0.086	0.058	0.036	0.033	0.026	0.019	0.017
		pf = 0.8	0.143	0.122	0.096	0.089	0.062	0.038	0.033	0.027	0.020	0.017
		pf = 0.9	0.149	0.124	0.100	0.089	0.064	0.039	0.033	0.027	0.020	0.017
		pf = 1.0	0.143	0.112	0.095	0.077	0.060	0.036	0.027	0.024	0.019	0.014
Conductor Characteristics												
R	mΩ/m at end temperature		0.083	0.065	0.055	0.045	0.035	0.021	0.016	0.014	0.011	0.008
X	mΩ/m at end temperature		0.027	0.031	0.020	0.026	0.013	0.009	0.011	0.008	0.005	0.005
Z	mΩ/m at end temperature		0.087	0.072	0.059	0.051	0.037	0.022	0.019	0.016	0.012	0.010
Weight	kg/M		20.7	25.3	28.2	35.2	41.9	66.3	85.5	107.2	133.2	171.0
IP Rating	Standard		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
	Optional		IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Dimensions	mm		145x137	145x137	145x162	145x162	145x207	145x287	145x287	145x439	145x599	145x674
Short Time Rating (phase conductors only)	kA for 1 sec		46	50	57	65	75	95	100	150	150	150
Prospective Short Circuit Rating	kA		96.6	110	125	143	165	209	220	255	255	255

Typical Standard 90 Degree Bends

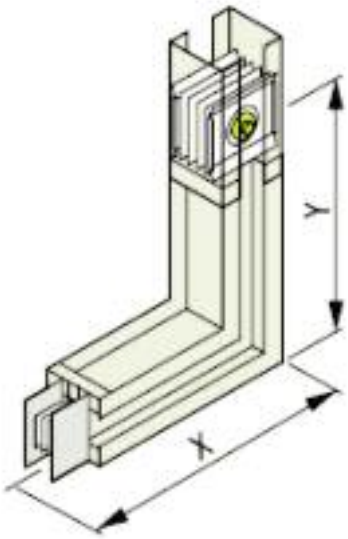


1000-1600A 350 x 350mm

2000 – 3200A 500 x 500mm

4000 – 5000A 800 x 800 mm

350 x 350mm



Standard 90 degree bends. Customised versions available on request to suit site measurements.

4

Technical Data for LX 6 Bar, Aluminium Conductors Load Distribution Factor = 1

Rated Current	A		800	1000	1250	1600	2000	2500	3200	4000	4500
Rated Voltage	V~		690	690	690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.211	0.166	0.114	0.073	0.052	0.047	0.036	0.026	0.024
		pf = 0.8	0.231	0.179	0.121	0.077	0.056	0.050	0.038	0.028	0.025
		pf = 0.9	0.248	0.188	0.127	0.079	0.059	0.051	0.040	0.030	0.026
		pf = 1.0	0.252	0.183	0.121	0.074	0.058	0.048	0.038	0.029	0.024
Conductor Characteristics											
R	mΩ/m at end temperature		0.146	0.106	0.070	0.043	0.034	0.028	0.022	0.017	0.014
X	mΩ/m at end temperature		0.028	0.031	0.024	0.017	0.009	0.011	0.008	0.005	0.006
Z	mΩ/m at end temperature		0.149	0.110	0.074	0.046	0.029	0.025	0.024	0.018	0.015
Weight	kg/M		12.6	14.7	18.9	26.8	33.1	41.3	55.0	67.2	83.7
IP Rating	Standard		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
	Optional		IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Dimensions	mm		145x137	145x137	145x162	145x207	145x287	145x287	145x439	145x599	145x599
Short Time Rating (phase conductors only)	kA for 1 sec		25	35	50	60	75	86	100	140	150
Prospective Short Circuit Rating	kA		53	70	110	132	158	194	220	255	255

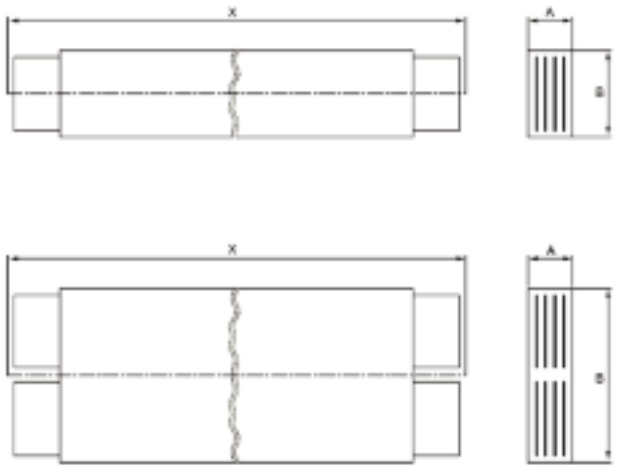
Technical Data for LX 6 Bar, Copper Conductors Load Distribution Factor = 1

Rated Current	A		1000	1250	1400	1600	2000	2500	3200	4000	5000	6300
Rated Voltage	V~		690	690	690	690	690	690	690	690	690	690
Voltage Drop, Balanced Load	mV/A/m	pf = 0.7	0.134	0.117	0.091	0.086	0.058	0.036	0.033	0.026	0.019	0.017
		pf = 0.8	0.143	0.122	0.096	0.089	0.062	0.038	0.033	0.027	0.020	0.017
		pf = 0.9	0.149	0.124	0.100	0.089	0.064	0.039	0.033	0.027	0.020	0.017
		pf = 1.0	0.143	0.112	0.095	0.077	0.060	0.036	0.027	0.024	0.019	0.014
Conductor Characteristics												
R	mΩ/m at end temperature		0.083	0.065	0.055	0.045	0.035	0.021	0.016	0.014	0.011	0.008
X	mΩ/m at end temperature		0.027	0.031	0.020	0.026	0.013	0.009	0.011	0.008	0.005	0.005
Z	mΩ/m at end temperature		0.087	0.072	0.059	0.051	0.037	0.022	0.019	0.016	0.012	0.010
Weight	kg/M		23.5	29.0	32.4	40.8	48.6	77.5	100.4	125.4	155.9	200.8
IP Rating	Standard		IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54	IP54
	Optional		IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55	IP55
Dimensions	mm		145x137	145x137	145x162	145x162	145x207	145x287	145x287	145x439	145x599	145x674
Short Time Rating (phase conductors only)	kA for 1 sec		46	50	57	65	75	95	100	150	150	150
Prospective Short Circuit Rating	kA		96.6	110	125	143	165	209	220	255	255	255

Compact size, high IP rating busbar can carry large current ratings through the most difficult environments.

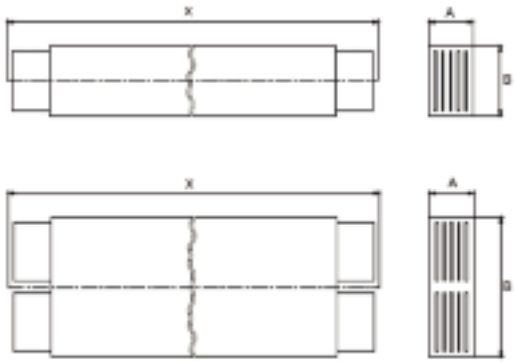
A universal connector enables LR Cast Resin busbar to be linked to the LX busbar system, reducing both cost and installation times.

4 Bar

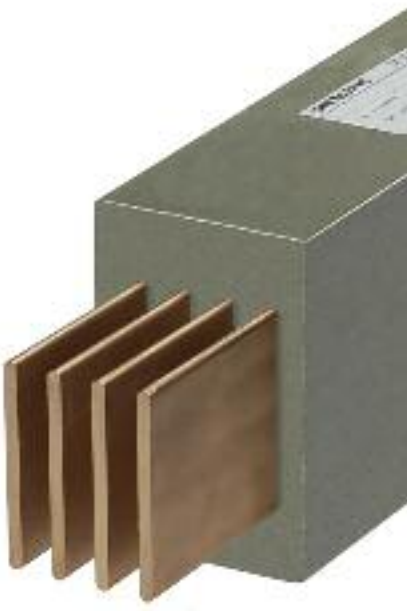


System	A [mm]	B [mm]	X [mm]
LR...0141	90	90	300...3000
LR...0241			
LR...0341			
LR...0441	100	110	
LR...0541		130	
LR...0641		150	
LR...0741		190	
LR...0841		230	
LR...0941		270	
LR...2741		380	
LR...2841		460	
LR...2941		540	

5 Bar



System	A [mm]	B [mm]	X [mm]
LR.....0151	90	90	300...3000
LR.....0251			
LR.....0351			
LR.....0451	120	110	
LR.....0551		130	
LR.....0651		150	
LR.....0751		190	
LR.....0851		230	
LR.....0951		270	
LR.....2751		380	
LR.....2851		460	
LR.....2951		540	



The epoxy cast resin connection system has been developed for the transmission and distribution of electrical energy where environmental factors such as humidity and corrosive or saline environments may affect metal clad systems. It is designed for applications requiring between 630– 6150 amperes, and has been designed in accordance with IEX60439-1/2.

Reliability under tough ambient conditions
Mechanical rigidity is achieved by insulating the conductors within the busbar trunking system using an agglomerate of quartz-epoxy. This is highly resistant to chemical agents and mechanical stress, offering IP68 degree of ingress protection (3.5 bar, 13.5 h) and high short-circuit resistance.

Flexible and effective
The compact construction allows the LR trunking to be positioned either flat or on its edge, vertically or horizontally, retaining its characteristics at all times, and eliminating the chimney effect. The close proximity of the copper conductors and their layout result in low impedance and therefore reduced volt drop. Direct connection of Siemens LR cast resin to LX metallic systems is possible using the connection element. The epoxy cast resin system can be easily adapted to the building layout, by using angles, sets and tees to change direction or negotiate obstacles, and with the lowest space requirements.

Copper and Aluminium conductor versions of its LR Busbars have been tested to IEC60331-31 (Tests for electric cables under fire conditions). This tests the fire withstand ability of the Busbar trunking at 750 °C for 180 minutes, and is often required for life safety and emergency supplies.

Typical Specification

The following is intended as a guide to specifying LR Cast Resin Busbar Trunking:

All busbar systems shall be of approved manufacture and comply with degree of protection IP68, as defined in IEC60529. The current ratings shall be as defined on technical data sheets, drawings and schedules. The trunking shall be suitable for use up to 1000V 50Hz supply, and available in 4 and 5 bar versions, and meet the requirements of the IEE wiring regulations (BS7671) and IEC60439-1 and IEC60439-2. The enclosure shall be manufactured from an agglomerate of quartz and epoxy. Phase and Neutral conductors (as well as the internal PE conductor where required) shall be HDHC copper, of equal cross section.

The busbar must maintain its rated current when mounted in any installation position (flat, edge or vertical). The single body system shall cover up to 3150A in a single-conductor single-body construction, and up to 6150A in a double-conductor single-body construction.

Various junction units shall be supplied as standard, including elbows, knees, tees and flanged switchboard connections.

The Cast Resin Busbar trunking shall be Siemens LRC range or equal and approved.

LR Cast Resin IP68 Busbar 630A–6150A

Protection from hostile atmospheres and for use outdoors

Technical Data for LRA 4 Bar

Rated Current	A	400	630	800	1000	1200	1400	1600	2000	2500	3200	4000	4600
Rated Voltage	VAC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
IP Rating	Standard	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68
Dimensions	mm	90x90	90x90	90x90	100x110	100x130	100x150	100x190	100x230	100x270	100x380	100x460	100x540
Conductor Cross-sectional Area	Sq mm	176	236	354	472	592	712	944	1184	1424	1889	2368	2849
Short Time Rating	kA for 1 sec	12	12	26.5	26.6	53	53	65	65	65	100	100	100
Prospective Short Circuit Rating	kA	24	24	55.7	55.8	117	117	143	143	143	220	220	220
Form-Single/Double		SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB

Technical Data for LRA 5 Bar

Rated Current	A	400	630	800	1000	1200	1400	1600	2000	2500	3200	4000	4600
Rated Voltage	VAC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
IP Rating	Standard	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68
Dimensions	mm	90x90	90x90	90x90	120x110	120x130	120x150	120x190	120x230	120x270	120x380	120x460	120x540
Conductor Cross-sectional Area	Sq mm	176	236	354	472	592	712	944	1184	1424	1889	2368	2849
Short Time Rating	kA for 1 sec	12	12	26.5	26.6	53	53	65	65	65	100	100	100
Prospective Short Circuit Rating	kA	24	24	55.7	55.8	117	117	143	143	143	220	220	220
Form-Single/Double		SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB

Technical Data for LRC 4 Bar

Rated Current	A	630	800	1000	1350	1600	1700	2000	2500	3200	4000	5000	6150
Rated Voltage	VAC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
IP Rating	Standard	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68
Dimensions	mm	90x90	90x90	90x90	100x110	100x130	100x150	100x190	100x230	100x270	100x380	100x460	100x540
Conductor Cross-sectional Area	Sq mm	176	236	354	472	592	712	944	1184	1424	1889	2368	2849
Short Time Rating	kA for 1 sec	23	23	38	65	65	65	65	80	80	100	100	100
Prospective Short Circuit Rating	kA	48	48	80	140	140	140	140	176	176	220	220	220
Form-Single/Double		SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB

Technical Data for LRC 5 Bar

Rated Current	A	630	800	1000	1350	1600	1700	2000	2500	3200	4000	5000	6150
Rated Voltage	VAC	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
IP Rating	Standard	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68	IP68
Dimensions	mm	90x90	90x90	90x90	120x110	120x130	120x150	120x190	120x230	120x270	120x380	120x460	120x540
Conductor Cross-sectional Area	Sq mm	176	236	354	472	592	712	944	1184	1424	1889	2368	2849
Short Time Rating	kA for 1 sec	23	23	38	65	65	65	65	80	80	100	100	100
Prospective Short Circuit Rating	kA	48	48	80	140	140	140	140	176	176	220	220	220
Form-Single/Double		SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB	SB

The Britmac underfloor power track system has undergone some radical changes to meet the ever increasing power requirements of the workplace. The system consists of a series of fully enclosed single phase busbar module units and is designed to be assembled directly onto the floor slab of a cavity floor installation using the integral floor fixing brackets. The track modules have a simple and quick push fit connection allowing for rapid on site assembly. The modules are available as standard 2P+E, Clean Earth 2P+E+CE and dual system 4P+E+CE. The system has been designed with minimal parts to assist the contractor fitting out on site.

- Direct to floor assembly
- Universal cable feeder unit
- Standard Earth 2P+E - Blue
- Clean Earth 2P+E+CE - Yellow
- Dual system 4P+E+CE - Brown

Underfloor Power Track Modules

Track Length Standard Clean Earth Dual Track
1200mm **UPT12 UPT12TE UPT12DE**
2400mm **UPT24 UPT24TE UPT24DE**
3600mm **UPT36 UPT36TE UPT36DE**

- Tap off socket at 300mm intervals complete with clear dust cover
- Track fixing brackets factory fitted 2 on 1.2m, 2 on 2.4m and 3 on 3.6m
- Each length comes with a shuttered interconnection and a track stop end
- Colour Coded: Blue - Standard
  Yellow - Clean Earth
  Brown - Dual Track

Conditional Short Circuit Rating

TRACK
Short circuit protection provided by fuselinks BS-88 and BS 1361 100 amp maximum.
Prospective current 16.5kA
Mechanical withstand 10kA peak
Thermal withstand 1200A for 0.1 seconds

TAP-OFF UNITS
Mechanical withstand 10kA peak
Thermal withstand 1200A for 0.1 seconds

Earth Fault Loop Impedance (measured at 1.0A)
The IEE Wiring Regulations require accurate determination of the total earth loop impedance, which must be low enough to ensure that the protective device will operate within the specified time, which for circuits incorporating socket outlets is 0.4 seconds. The values for the Britmac System for calculating the earth fault loop impedance are as follows:
Phase busbar 1.97mV/m
Earth busbar to housing 1.38mV/m
Earth busbar (Clean Earth) 1.97mV/m
Track connector 0.37mV
Supply connector 0.24mV
32A tap-off (4mm2 x 3m), line 9.92mV

Volt Drop, Combined Phase & Neutral (measured at 1.0A)
Busbar (line & neutral) 3.94mV/A/m
Track connector 0.74mV/A
Supply connector 0.48mV/A
32A tap-off (4mm2 x 3m), line & earth 19.84mV/A/m

Cable Capacity of Terminals
Supply connector 16mm2 csa stranded conductor

Construction

TRACK
Body extrusion Galvanised Steel
Track base Galvanised steel
Busbar High conductivity copper
Degree of protection Track IP4X; In-feed housing IP3X C

TAP-OFF UNITS
Standard, Clean Earth and Dual Track tap-offs are non- interchangeable. All types available in fused and unfused versions.

32A tap-off unit
The 32A tap-off is unfused with 3 metres of 16mm diameter flexible conduit and 4mm2 cables to BS 6004:2000 which are terminated in the tap-off via welded connections.

Fused tap-off unit
Required where conduit lengths greater than 3 metres are used. The tap-off unit is used as standard at 13 amps and is fitted to the specified length of 16mm diameter conduit and 2.5mm2 cables to BS 6004:1995 which are terminated in the tap-off via welded connections. The flexible conduit is manufactured to BSEN 50086-1

STANDARDS
BSEN 60439: Part 1 & Part 2.
The track system enables compliance with the latest IEE Wiring Regulations, BS 7671:2008.

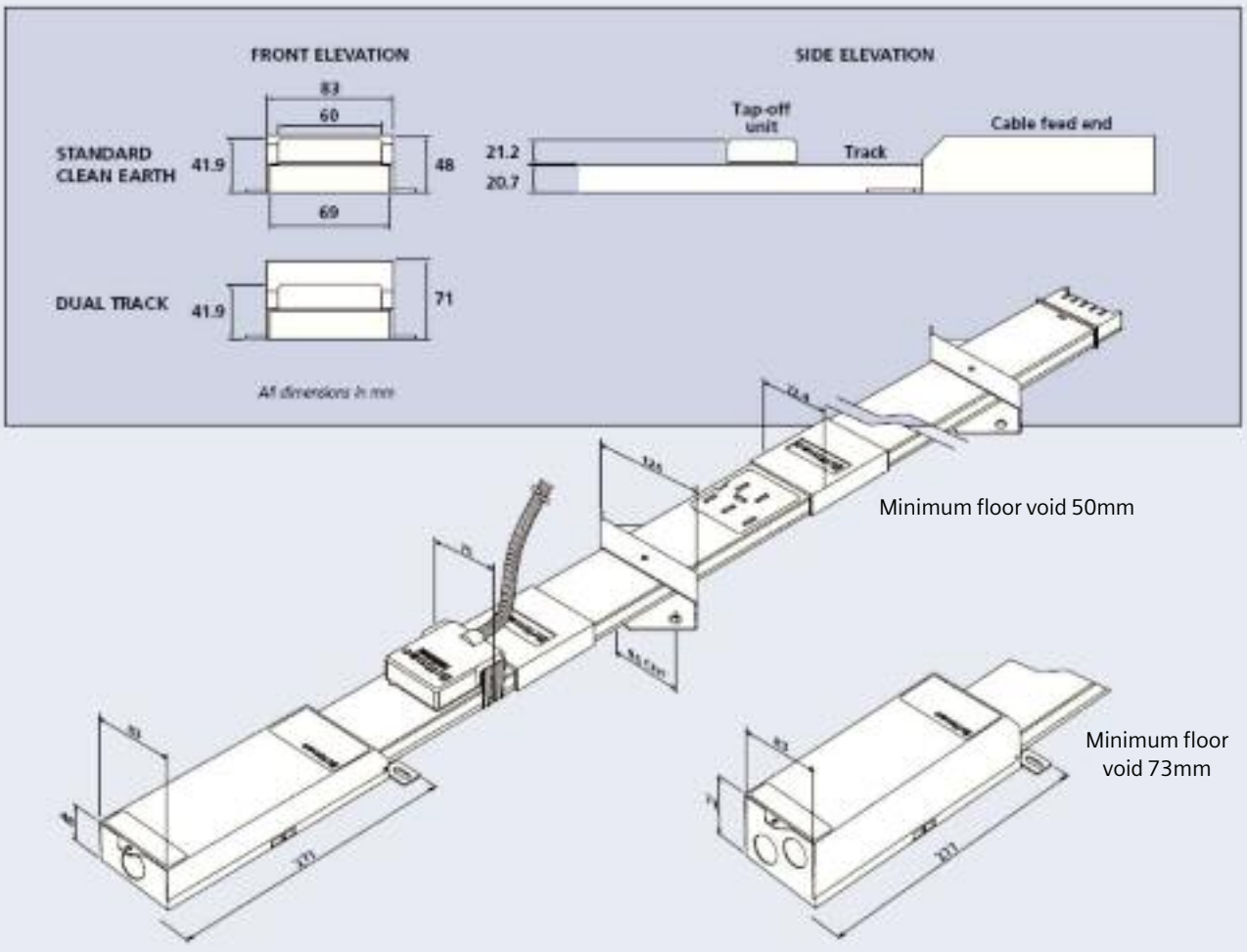
TRACK CURRENT RATING
63 amps, 240V ac; 50Hz single phase ambient temperature 25C.

Floor Box Distribution

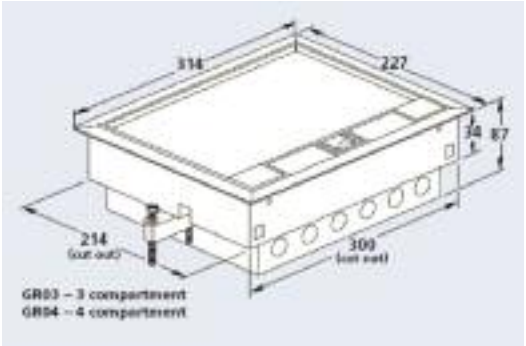
The Britmac range of cable management products have been utilised in the design and installation of electrical systems in commercial and industrial projects for many years. The comprehensive fast-fit floor box provides a wide choice from which to select the most appropriate for a specific application. Units can be supplied fitted with accessories pre-wired to customers' requirements and fully factory tested in the UK prior to delivery.

The products are supported by a nationwide team of Sales Engineers and Stockists.

- Large capacity cable routing guides ensure cables exit the box safely and neatly
- Lid hinge design ensures that lid will always self-close
- Snap-out facility enables the lid to be removed for access to accessory plates
- Pre-wired saving time during site installation



Grosvenor 'Fast Fit' Raised access Floor boxes



Consumer Units
ALPHA BS I All Insulated & Metalclad Surface Mounting

Features:

- Complies with BS EN 60439-3
- 16kA Conditional fault rating
- Rated Voltage 230V 50/60Hz
- Incomer(s) provided as standard
- Modular Construction
- Top, bottom, side & rear entry
- Colour: Siemens light grey to RAL 7035
- Degree of Protection: IP2XC
- Comb busbar system
- Earth & Neutral Bars supplied as standard
- Full DIN rail supplied as standard
- User defined Split load units

For 70mm device mounting depth

All insulated

Main Switch All Insulated Consumer Units with 100A Incomer

Design	External Dimensions H x W x D (mm)			Order No
5 way	230	190	120	8GB1 335-1DA
8 way	230	243	120	8GB1 335-2DA
11 way	230	294	120	8GB1 335-3DA
14 way	230	344	120	8GB1 335-4DA
19 way	230	439	120	8GB1 335-5DA

User defined Split Load All Insulated Consumer Unit with 100A Main Switch incomer and 80A 30mA rccb

9 way	230	294	120	8GB1 335-6DA
12 way	230	344	120	8GB1 335-7DA
17 way*	230	439	120	8GB1 335-8DA

A minimum of 5 outgoing ways is recommended on the main switch circuit

Metal Clad

Main Switch Metalclad Consumer Units with 100A Incomer

5 way	210	188	122	8GB3 335-1DA
8 way	210	242	122	8GB3 335-2DA
11 way	210	292	122	8GB3 335-3DA
14 way	210	343	122	8GB3 335-4DA
19 way	210	439	122	8GB3 335-5DA

User defined Split Load Metalclad Consumer Unit with 100A Main Switch incomer and 80A 30mA rccb

9 way	210	292	122	8GB3 335-6DA
12 way	210	343	122	8GB3 335-7DA
17 way*	210	439	122	8GB3 335-8DA

A minimum of 5 outgoing ways is recommended on the main switch circuit

Accessories mcb blanking plate	8GP1 994-0DA10

Distribution Boards
ALPHA BS II Type B Surface Mounting

Features:

- Type Tested to BS EN 60439-3
- 10kA for 0.1 second fault rated
- 125A rated Current
- Rated Voltage 230/400V 50/60Hz
- Modular Construction
- 1mm Sheet Steel Enclosure
- Colour: Siemens light grey to RAL 7035
- Degree of Protection: IP2XC
- Left hand hinged door
- Shrouded outgoing neutral terminals
- Top & Bottom entry via undrilled removable gland plates

For 70mm device mounting depth

125A rated Distribution Boards

Design	External Dimensions H x W x D (mm)			Order No
4 way	490	430	155	8GP1 204-2DA54
6 way	570	430	155	8GP1 206-2DA54
8 way	650	430	155	8GP1 208-2DA54
12 way	815	430	155	8GP1 212-2DA54
16 way	895	430	155	8GP1 216-2DA54
20 way	975	430	155	8GP1 220-2DA54
24 way	1140	430	155	8GP1 224-2DA54

125A rated Distribution Boards with Integral DIN Rail

4 way	650	430	155	8GP1 104-2DA50
8 way	815	430	155	8GP1 108-2DA50
12 way	975	430	155	8GP1 112-2DA50
16 way	1140	430	155	8GP1 116-2DA50
20 way	1140	430	155	8GP1 120-2DA50

Incomer Options & Kits for the above

100A DP Switch Disconnector *	5TE1 201-0DA
100A TP Switch Disconnector	5TE1 301-0DA
100A 4P Switch Disconnector *	5TE1 401-0DA
125A DP Switch Disconnector	5TE1 202-0DA
125A TP Switch Disconnector **	5TE1 302-0DA
125A 4P Switch Disconnector	5TE1 402-0DA
125A 4P 30mA rccb **	5SM3 345-0
125A 4P 300mA rccb **	5SM3 645-0
Direct Connection Kit - 50mm² cable	8GP1 854-0DA10
Direct Connection Kit - 120mm² cable	8GP1 856-0DA10
Outgoing Direct Connection Kit - 50mm² cable	8GP1 855-0DA10

* Requires 8GP1 853--0DA20 single phase connection kit
** Requires 8GP1 886--0DA10 4P connection kit
*** For use with 125A 16, 20 and 24 way TP&N Distribution boards only

Conversion/Connection Kits

125A TP to SP Conversion Kit	8GP1 853-0DA20
4P rccb Connection Kit	8GP1 886-0DA10

Distribution Board expansion Unit ***

12 way Add-on 125A TP&N Distribution Board	8GP1 937-2DA50
125A Vertical Connection Kit (for the above)	8GP1 981-2DA10

*** For use with 125A 16, 20 & 24 way TP&N Distribution Boards only

Distribution Boards

UK produced flexible format with/without metering

Consumer units / Distribution boards / Panel boards' Technical Data

125A Metering Options & Common Add-on Enclosures ALPHA BS II Type B Surface Mounting

Features:

- Designed to BS EN 60439-3
- 125A rated Current
- Rated Voltage 230/400V 50/60Hz
- Modular Construction
- 1mm Sheet Steel Enclosure
- Colour: Siemens light grey to RAL 7035
- Degree of Protection: IP2XC
- Left hand hinged door
- Top & Bottom entry via undrilled removable gland plates

Integral Meter Pack*

Design	External Dimensions H x W x D (mm)	Order No
125A ct op. 3ph 4w Energy Meter Pack - Std		8GP1 921-2DA80
125A ct op. 3ph 4w Energy Meter Pack - MID		8GP1 991-2DA80

Contains: Digital meter offering Amps, Volts, kWh readout plus pulsed output. 3x125A ct's, fuses & cable loom (the latter supplied loose for connection by others)

* Not recommended for use with incomers mtd in the lower incomer position i.e. rccb incomer, 4P Sw Disconnectors or 5TT8 814 TP Switch Disconnector.

Add-on Meter Pack in Enclosure

Design	External Dimensions H x W x D (mm)	Order No
125A ct op. 3ph 4w Energy Meter Pack - Std		8GP1 990-2DA10
125A ct op. 3ph 4w Energy Meter Pack - MID		8GP1 991-2DA10
dimensions 245x430x155mm		

Contains: Digital meter offering Amps, Volts, kWh readout plus pulsed output. 3x125A ct's, fuses & associated cable loom

Horizontal Lighting & Power Board Metering

Design	External Dimensions H x W x D (mm)	Order No
125A ct op. Twin 3ph 4w Energy Meter Pack -Std		8GP1 992-2DA10
125A ct op. Twin 3ph 4w Energy Meter Pack -MID		8GP1 993-2DA10
Dims:	420 430 155	

Contains: Common 125A TP Sw Disconnector, 2 Digital meters offering Amps, Volts, kWh readout plus pulsed output. 125A ct's, fuses & associated cable loom

Common Add-on Enclosures for 125A & 200A Distribution Boards

For 70mm device mounting depth

Modular Device Extension Boxes

Design	External Dimensions H x W x D (mm)	Order No
1 row x 18 mod wide Extension Box (245mmH)		8GP1 901-0DA10
2 row x 18 mod wide Extension Box (410mmH)		8GP1 902-0DA10
3 row x 18 mod wide Extension Box (570mmH)		8GP1 903-0DA10
4 row x 18 mod wide Extension Box (735mmH)		8GP1 904-0DA10
5 row x 18 mod wide Extension Box (815mmH)		8GP1 905-0DA10

Contains: Main Neutral & Earth Bars, along with the provision for additional 'mini' Neutral & Earth Bars.

Design	External Dimensions H x W x D (mm)	Order No
Service Centre - 18 mod		8GP1 995-0DA13
Service Centre - 36 mod		8GP1 995-0DA14
Cable Spreader Box (245mmH)		8GP1 910-0DA10

Distribution Boards ALPHA BS II Type B Surface Mounting

Features:

- 25kA conditional short circuit rating (Icc) to IEC 61439-2 when used with 5SY8 mcb's
- 250A rated busbar assembly
- Rated Voltage 230/400V 50/60Hz
- Modular Construction
- 1mm Sheet Steel Enclosure
- Colour: Siemens light grey to RAL 7035
- Degree of Protection: IP2XC
- Left hand hinged door
- Shrouded outgoing neutral terminals
- Top & Bottom entry via undrilled removable gland plates

For 70mm device mounting depth

200A rated Distribution Boards

Design	External Dimensions H x W x D (mm)			Order No
4 way	650	430	155	8GP1 204-4DA54
6 way	815	430	155	8GP1 206-4DA54
8 way	815	430	155	8GP1 208-4DA54
12 way	895	430	155	8GP1 212-4DA54
16 way	975	430	155	8GP1 216-4DA54
20 way	1085	430	155	8GP1 220-4DA54
24 way	1190	430	155	8GP1 224-4DA54

Incomer Kits for the above

200A TP Switch Disconnector c/w N Link	8GP1 643-4DA40
200A TP mccb c/w N Link	8GP1 617-0DA41
200A 4P Switch Disconnector	8GP1 643-4DA50
200A 4P mccb	8GP1 618-0DA51
Direct Connection Kit - 120mm² cable	8GP1 867-0DA10

Distribution Board Extension Unit**

12 way Add-on 200A TP&N Distribution Board	8GP1 937-4DA50
200A Vertical Connection Kit (for the above)	8GP1 981-4DA10

** For use with 200A 16, 20 & 24 way TP&N Distribution Boards only

Add-on Meter Pack in Enclosure

200A ct op. 3ph 4w Energy Meter Pack - Std				8GP1 990-4DA10
200A ct op. 3ph 4w Energy Meter Pack - MID				8GP1 991-4DA10
Dims:	245	430	155	

Contains: Digital meter offering Amps, Volts, kWh readout plus pulsed output. 3x200A ct's, fuses & associated wiring

Horizontal Lighting & Power Board Metering

200A ct op. Twin 3ph 4w Energy Meter Pack - Std				8GP1 992-4DA10
200A ct op. Twin 3ph 4w Energy Meter Pack - MID				8GP1 993-4DA10
Dims:	735	430	155	

Contains: Common 200A TP Sw Disconnector, 2 Digital meters offering Amps, Volts, kWh readout plus pulsed output. 200A ct's, fuses & associated cable loom

For Modular Device Extension Boxes, Service Centres & Cable Spreader Boxes please refer to the Common Add-on Enclosure Section

Consumer Unit Devices
BETA Protecting 6kA rated mcb's

Features:

- Standards: EN 60898
- Rated Voltage: 230/400V AC
- Degree of Protection: IP20
- Solid/stranded conductor csa: <25mm²
- Current & Energy Limiting
- Contact position indication
- Mains connection top or bottom
- Top or bottom busbar connections
- Quick fasten & release system

70mm device mounting depth

Rating I_n A	5SY6, 6kA Characteristic B Order No.	5SY6, 6kA Characteristic C Order No.	5SY6, 6kA Characteristic D Order No.
1 pole			
6	5SY6 106-6	5SY6 106-7	5SY6 106-8
10	5SY6 110-6	5SY6 110-7	5SY6 110-8
16	5SY6 116-6	5SY6 116-7	5SY6 116-8
20	5SY6 120-6	5SY6 120-7	5SY6 120-8
25	5SY6 125-6	5SY6 125-7	5SY6 125-8
32	5SY6 132-6	5SY6 132-7	5SY6 132-8
40	5SY6 140-6	5SY6 140-7	5SY6 140-8
50	5SY6 150-6	5SY6 150-7	5SY6 150-8
63	5SY6 163-6	5SY6 163-7	5SY6 163-8
3 pole			
6	5SY6 306-6	5SY6 306-7	5SY6 306-8
10	5SY6 310-6	5SY6 310-7	5SY6 310-8
16	5SY6 316-6	5SY6 316-7	5SY6 316-8
20	5SY6 320-6	5SY6 320-7	5SY6 320-8
25	5SY6 325-6	5SY6 325-7	5SY6 325-8
32	5SY6 332-6	5SY6 332-7	5SY6 332-8
40	5SY6 340-6	5SY6 340-7	5SY6 340-8
50	5SY6 350-6	5SY6 350-7	5SY6 350-8
63	5SY6 363-6	5SY6 363-7	5SY6 363-8

125A Distribution Board Devices
BETA Protecting 10kA rated mcb's

Features:

- Standards: EN 60898
- Rated Voltage: 230/400V AC
- Degree of Protection: IP20
- Solid/stranded conductor csa: <25mm²
- Current & Energy Limiting
- Contact position indication
- Mains connection top or bottom
- Top or bottom busbar connections
- Quick fasten & release system

70mm device mounting depth

Rating I_n A	5SY4, 10kA Characteristic B Order No.	5SY4, 10kA Characteristic C Order No.	5SY4, 10kA Characteristic D Order No.
1 pole			
6	5SY4 106-6	5SY4 106-7	5SY4 106-8
10	5SY4 110-6	5SY4 110-7	5SY4 110-8
16	5SY4 116-6	5SY4 116-7	5SY4 116-8
20	5SY4 120-6	5SY4 120-7	5SY4 120-8
25	5SY4 125-6	5SY4 125-7	5SY4 125-8
32	5SY4 132-6	5SY4 132-7	5SY4 132-8
40	5SY4 140-6	5SY4 140-7	5SY4 140-8
50	5SY4 150-6	5SY4 150-7	5SY4 150-8
63	5SY4 163-6	5SY4 163-7	5SY4 163-8
80	5SY4 180-6*	5SY4 180-7*	-
3 pole			
6	5SY4 306-6	5SY4 306-7	5SY4 306-8
10	5SY4 310-6	5SY4 310-7	5SY4 310-8
16	5SY4 316-6	5SY4 316-7	5SY4 316-8
20	5SY4 320-6	5SY4 320-7	5SY4 320-8
25	5SY4 325-6	5SY4 325-7	5SY4 325-8
32	5SY4 332-6	5SY4 332-7	5SY4 332-8
40	5SY4 340-6	5SY4 340-7	5SY4 340-8
50	5SY4 350-6	5SY4 350-7	5SY4 350-8
63	5SY4 363-6	5SY4 363-7	5SY4 363-8
80	5SY4 380-6**	5SY4 380-7**	-

* 125A Distribution Boards only:
To satisfy BS EN 60439-3 Type Test requirements a Siemens 5TT8 814 TP On/Off Switch or 5TT8 815 (4P On/Off Switch shall be used in place of the standard incomer.)

** 125A Distribution Boards only:
To satisfy BS EN 60439-3 Type Test requirements a Siemens 5TT8 814 TP On/Off Switch or 5TT8 815 (4P On/Off Switch shall be used in place of the standard incomer.)

Distribution Board Devices
BETA Protecting 15kA rated mcb's

Features:

- Standards: EN 60898
- Rated Voltage: 230/400V AC
- Degree of Protection: IP20
- Solid/stranded conductor csa: <25mm²
- Current & Energy Limiting
- Contact position indication
- Mains connection top or bottom
- Top or bottom busbar connections
- Quick fasten & release system

For 70mm device mounting depth

Rating I_n A	5SY7, 15kA Characteristic B Order No.	5SY7, 15kA Characteristic C Order No.	5SY7, 15kA Characteristic D Order No.
1 pole			
6	5SY7 106-6	5SY7 106-7	5SY7 106-8
10	5SY7 110-6	5SY7 110-7	5SY7 110-8
16	5SY7 116-6	5SY7 116-7	5SY7 116-8
20	5SY7 120-6	5SY7 120-7	5SY7 120-8
25	5SY7 125-6	5SY7 125-7	5SY7 125-8
32	5SY7 132-6	5SY7 132-7	5SY7 132-8
40	5SY7 140-6	5SY7 140-7	5SY7 140-8
50	5SY7 150-6	5SY7 150-7	5SY7 150-8
63	5SY7 163-6	5SY7 163-7	5SY7 163-8
3 pole			
6	5SY7 306-6	5SY7 306-7	5SY7 306-8
10	5SY7 310-6	5SY7 310-7	5SY7 310-8
16	5SY7 316-6	5SY7 316-7	5SY7 316-8
20	5SY7 320-6	5SY7 320-7	5SY7 320-8
25	5SY7 325-6	5SY7 325-7	5SY7 325-8
32	5SY7 332-6	5SY7 332-7	5SY7 332-8
40	5SY7 340-6	5SY7 340-7	5SY7 340-8
50	5SY7 350-6	5SY7 350-7	5SY7 350-8
63	5SY7 363-6	5SY7 363-7	5SY7 363-8

Distribution Board Devices
BETA Protecting 25kA rated mcb's

Features:

- Standards: EN 60947-2
- Rated Voltage: 230/400V AC
- Degree of Protection: IP20
- Solid/stranded conductor csa: <25mm²
- Current & Energy Limiting
- Contact position indication
- Mains connection top or bottom
- Top or bottom busbar connections
- Quick fasten & release system

For 70mm device mounting depth

Rating I_n A	5SY8, 25kA Characteristic B Order No.	5SY8, 25kA Characteristic C Order No.	5SY8, 25kA Characteristic D Order No.
1 pole			
6	-	5SY8 106-7	5SY8 106-8
10	-	5SY8 110-7	5SY8 110-8
16	-	5SY8 116-7	5SY8 116-8
20	-	5SY8 120-7	5SY8 120-8
25	-	5SY8 125-7	5SY8 125-8
32	-	5SY8 132-7	5SY8 132-8
40	-	5SY8 140-7	5SY8 140-8
50	-	5SY8 150-7	5SY8 150-8
63	-	5SY8 163-7	5SY8 163-8
3 pole			
6	-	5SY8 306-7	5SY8 306-8
10	-	5SY8 310-7	5SY8 310-8
16	-	5SY8 316-7	5SY8 316-8
20	-	5SY8 320-7	5SY8 320-8
25	-	5SY8 325-7	5SY8 325-8
32	-	5SY8 332-7	5SY8 332-8
40	-	5SY8 340-7	5SY8 340-8
50	-	5SY8 350-7	5SY8 350-8
63	-	5SY8 363-7	5SY8 363-8

ALPHA BS II Distribution Board Accessories

mcb handle locking device	-
Padlock for above (2 keys supplied as std)	-
Door cylinder lock & key (IP3X)	8GP1 960-0DA10
Door padlockable cylinder lock & key (IP3X)	8GP1 961-0DA10
Twist fit mcb door blank	8GP1 975-0DA10
Blanking Strip 6x(1mod)	8GP1 970-0DA11
Blanking Strip 12x(1mod)	8GP1 971-1DA11
Blanking Strip 4x(3mod)	8GP1 972-0DA12
Blanking Strip 2x(12mod)	8GP1 973-0DA15
Busbar terminal insulator (9 per pack)	8GP1 974-0DA10
Clean Earth kit (for TP&N DB's only)*	8GP1 962-0DA10

Additional Earth Bar kits (4 way TP&N)	8GP1 920-0DA41
Additional Earth Bar kits (6 way TP&N)	8GP1 920-0DA42
Additional Earth Bar kits (8 way TP&N)	8GP1 920-0DA43
Additional Earth Bar kits (12 way TP&N)	8GP1 920-0DA44
Additional Earth Bar kits (16 way TP&N)	8GP1 920-0DA45
Additional Earth Bar kits (20 way TP&N)	8GP1 920-0DA46
Additional Earth Bar kits (24 way TP&N)	8GP1 920-0DA47
Cable Clamp assembly	8GP1 976-0DA16
DIN rail mtd Earth Bar - 7x10mm² Terminals	8GP1 930-0DA47
DIN rail mtd Earth Bar - 12x10mm² Terminals	8GP1 931-0DA47
DIN rail mtd Earth Bar - 15x10mm² Terminals	8GP1 932-0DA47
DIN rail mtd Neutral Bar - 7x10mm² Terminals	8GP1 933-0DA47
DIN rail mtd Neutral Bar - 12x10mm² Terminals	8GP1 934-0DA47
DIN rail mtd Neutral Bar - 15x10mm² Terminals	8GP1 935-0DA47

* 4 to 12 way - 1 kit req'd, 16 to 24 way - 2 kits req'd

Consumer Unit Devices BETA Protecting Type AC voltage dependant rcbo's - 6kA rated

Features:

- 6kA rated short circuit capacity
- Rated Voltage: 230/400V AC
- 6 - 45A rated
- B & C characteristics
- Standards: IEC/EN 61009-1,
- IEC/EN 61009-2-1, IEC/EN 61543
- Space saving 1+N one-module device (solid neutral) with flying lead
- Un: 230V, 50-60Hz
- 10, 30 & 100mA sensitivity
- Solid/stranded conductor csa: <16mm²
- Contact position indication

For 70mm device mounting depth

Rating I_n A	Characteristic B Order No.	Characteristic C Order No.
Single module rcbo's - 10mA sensitivity		
10	-	5SU9 106-1KK10
16	-	5SU9 106-1KK16
20	-	5SU9 106-1KK20
32	-	5SU9 106-1KK32
40	-	5SU9 106-1KK40
45	-	5SU9 106-1KK45
Single module rcbo's - 30mA sensitivity		
6	-	5SU9 306-1KK06
10	5SU9 306-0KK10	5SU9 306-1KK10
16	5SU9 306-0KK16	5SU9 306-1KK16
20	5SU9 306-0KK20	5SU9 306-1KK20
25	5SU9 306-0KK25	5SU9 306-1KK25
32	5SU9 306-0KK32	5SU9 306-1KK32
40	5SU9 306-0KK40	5SU9 306-1KK40
45	-	5SU9 306-1KK45
Single module rcbo's - 100mA sensitivity		
6	-	5SU9 406-1KK06
10	5SU9 406-0KK10	5SU9 406-1KK10
16	5SU9 406-0KK16	5SU9 406-1KK16
20	5SU9 406-0KK20	5SU9 406-1KK20
25	5SU9 406-0KK25	5SU9 406-1KK25
32	5SU9 406-0KK32	5SU9 406-1KK32
40	5SU9 406-0KK40	5SU9 406-1KK40

Distribution Board Devices BETA Protecting Type AC voltage dependant rcbo's - 10kA rated

Features:

- 10kA rated short circuit capacity
- Type AC devices
- 6 - 45A rated
- B & C characteristics
- Standards: IEC/EN 61009-1, IEC/EN 61009-2-1, IEC/EN 61543
- Space saving 1+N one-module device (solid neutral) with flying lead
- Un: 230V, 50-60Hz
- 10, 30 & 100mA sensitivity
- Solid/stranded conductor csa: <16mm²
- Contact position indication

For 70mm device mounting depth

Rating I_n A	Characteristic B Order No.	Characteristic C Order No.
Single module rcbo's - 10mA sensitivity		
10	-	5SU9 104-1KK10
16	-	5SU9 104-1KK16
20	-	5SU9 104-1KK20
25	-	5SU9 104-1KK25
32	-	5SU9 104-1KK32
40	-	5SU9 104-1KK40
45	-	5SU9 104-1KK45
Single module rcbo's - 30mA sensitivity		
6	-	5SU9 304-1KK06
10	5SU9 304-0KK10	5SU9 304-1KK10
16	5SU9 304-0KK16	5SU9 304-1KK16
20	5SU9 304-0KK20	5SU9 304-1KK20
25	5SU9 304-0KK25	5SU9 304-1KK25
32	5SU9 304-0KK32	5SU9 304-1KK32
40	5SU9 304-0KK40	5SU9 304-1KK40
45	-	5SU9 304-1KK45
Single module rcbo's - 100mA sensitivity		
6	-	5SU9 404-1KK06
10	5SU9 404-0KK10	5SU9 404-1KK10
16	5SU9 404-0KK16	5SU9 404-1KK16
20	5SU9 404-0KK20	5SU9 404-1KK20
25	5SU9 404-0KK25	5SU9 404-1KK25
32	5SU9 404-0KK32	5SU9 404-1KK32
40	5SU9 404-0KK40	5SU9 404-1KK40
Single module rcbo's - 300mA sensitivity		
6	-	5SU9 604-1KK06
10	-	5SU9 604-1KK10
16	-	5SU9 604-1KK16
20	-	5SU9 604-1KK20
25	-	5SU9 604-1KK25
32	-	5SU9 604-1KK32
40	-	5SU9 604-1KK40

Overview

The Sentron family of circuit breakers is built on a modular design principle encompassing ratings from 16-6300A and breaking capacities from 50-150kA. Designed with flexibility in mind the Sentron family applications can include incoming and outgoing circuits, cost effective simple feeder circuits; to sophisticated networked devices.

The compact moulded case platform from 16-1600A has modularity at its heart, with just two ranges of internal accessories and interchangeable trip units from 50A upwards. Complimenting this modular design ethos the Air Circuit Breaker 630-6300A has many uniform accessories all of which are interchangeable by the user in the field.

Typical application areas

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

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

International standards and approvals

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

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

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

Added Operational value:

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

Size I

Size II

Size III

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

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

Overcurrent releases of SENTRON 3WL circuit breakers

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

✓ Standard – Not available • Optional

Sentron 3VL Molded-Case Circuit Breakers

Universally applicable, space saving and consistently communication-capable

Featuring optimised communication capability and a particularly compact design, the SENTRON 3VL molded-case circuit breakers meet all requirements placed upon space-saving electrical distribution systems – in a power range from 16A to 1600A.

Depending on the individual requirements, the universal and communication-capable circuit breakers are available for system and motor protection, for starter combinations or as non-automatic circuit breakers. The corresponding releases are optionally available as thermal-magnetic (16A to 630A) or electronic (63A to 1600A) trip units. With only two ranges of internal accessories, SENTRON 3VL circuit breakers offer maximum versatility with minimum expenditures.

Typical application areas

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

International standards and approvals

- IEC 60947-1, EN60947-1
- DIN VDE 0690 Part 100 as well as Part 101
- Disconnector characteristics in acc. with IEC 60947-2, EN 60947-2
- Characteristics as network element (main switch) in acc. with DIN EN 60204 and DIN VDE 0113

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

Added Operational value:

- Compact design for reduced stock-keeping and control cabinet costs
- 3 switching capacity levels: cost-favourable solution for all customer requirements
- Easy mounting and operation
- High flexibility through manifold accessories and modular design
- High efficiency and reliability through continuous quality optimisation
- Fast and safe parameterisation
- Reduced costs and improved productivity through communication capability
- Prevention of system downtimes through timely information and responding (effective diagnostics management)
- Easy retrofitting through modular design
- Customised solutions available ex works
- Test options for revision and maintenance (hand-held test unit for electronic releases)

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

3VL molded-case circuit breakers up to 1600A										3VF2 molded-case circuit breaker up to 100A Type
Type		VL630/3VL5		VL800/3VL6		VL1250/3VL7		VL1600/3VL8		
Rated current I_n with 50°C ambient temperature[1]	A	252 to 630		320 to 800		400 to 1250		640 to 1600		16 to 100
Rated operational voltage U_e 50/60 Hz AC	V	690	690	690	690	690	690	690	690	p to 415
Overcurrent releases										
Thermal-magnetic		✓	✓	–	–	–	–	–	–	✓
Electronic ETU LCD		✓	✓	✓	✓	✓	✓	✓	✓	–
Replaceable		✓	✓	✓	✓	✓	✓	✓	✓	–
PROFIBUS module COM10		✓	✓	✓	✓	✓	✓	✓	✓	–
Switching capacity I_{cu}/I_{cs} effective value, in acc. with IEC 60947-2										
Standard switching capacity N[3]										
with 415 V AC	kA	45/45		50/50		50/25		50/		25 18/9
High switching capacity H[2]										
with 415 V AC	kA	70/70		70/70		70/35		70/35		–
with 690 V AC	kA	30/15		30/15		30/15		30/15		–
Very high switching capacity L[2]										
with 415 V AC	kA	100/75		100/75		100/50		100/50		–
with 690 V AC	kA	20/10		20/10		35/17		35/17		–

✓ Available
– Not available

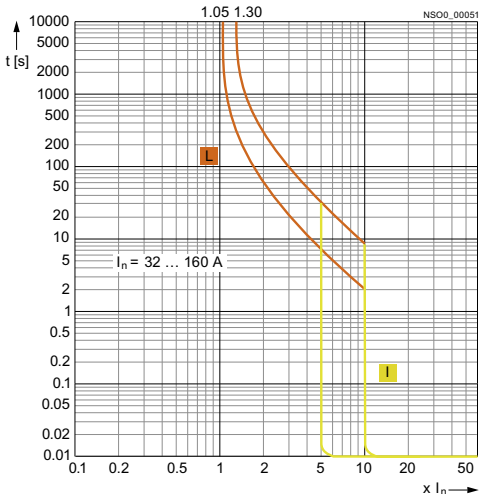
[1] 3VF2 with 40 °C ambient temperature
[2] With 240 V AC, 415 V AC and 525 V AC max. 5% overvoltage, with 440 V AC, 500 V AC and 690 V AC max. 10% overvoltage
[3] Rated current $I_n \geq 25$ A

Overview

16-1600 Amperes With the standard line of 3VT molded-case circuit breaker (MCCB), Siemens offers an economic solution for the entire power range from 16A to 1600A, providing a smart way to protect plants, transformers, generators and motors. Applicable in the infrastructure market as well as in the area of industrial switchgear technology, the 3VT circuit breakers can be used as incoming and outgoing circuit breakers to distribute energy in low voltage switchgear. The 3VT circuit breakers are available in several designs for system and motor protection. Thereby, each circuit breaker is characterised by its modular design, userfriendliness as well as its high degree of safety and reliability.

3VT1: Range 16-160A (3 and 4 pole)

Characteristic „D“, I_n = 32, 40, 50, 63, 80, 100, 125, 160 A



Technical specifications

Specifications		3VT1 7..-2..36-0AA0	3VT1 716-2DE36-0AA0	3VT1 7..-2..46-0AA0	3VT1 716-2EE46-0AA0
Order No.		Circuit Breakers	Switch disconnectors	Circuit Breakers [3]	Switch Disconnectors
Number of poles		3		4	
Standards		EN 60 947-2, IEC 947-2	EN 60 947-3,IEC 947-3	EN 60 947-2, IEC 947-2	EN 60 947-3,IEC 947-3
Approval marks		CE			
Rated current I_n	A	16 ... 160[2]	--	16 ... 160[2]	--
Rated uninterrupted current I_u	A	16 ... 160[2]	160	16 ... 160[2]	160
Rated operational current I_e	A	--	160	--	160
Rated operational voltage U_e	V	max. AC 690		max. AC 690 max. AC 440	
Rated frequency f_n	Hz	50/60			
Rated impulse withstand voltage U_{imp}	kV	8			
Rated insulation voltage U_i	V	690			
Utilization category • selectivity AC 690 V • switching mode		A AC-3 (16 ... 100 A) AC-2 (100 ... 160 A)	-- AC-23 A	A AC-3 (16 ... 100 A) AC-2 (100 ... 160 A)	-- DC-22 A AC-23 A
Rated short-time withstand current I_{cw} /t		--	2 kA/ 1 s	--	2 kA/1 s
Rated ultimate short-circuit breaking capacity (rms value) [1] I_{cu}/U_e		6 kA/AC 690 V 12 kA/AC 500 V 25 kA/AC 415 V 40 kA/AC 230 V	--	13kA/DC 440V (τ = max. 5 ms) 6 kA/AC 690 V 12 kA/AC 500 V 25 kA/AC 415 V 40 kA/AC 230 V	
Off-time at I_{cu}	ms	7	--	7	--
Rated service short-circuit breaking capacity (rms value) I_{cs}/U_e		3 kA/AC 690 V 6 kA/AC 500 V 13 kA/AC 415 V 20 kA/AC 230 V	--	13kA/DC 440V (τ = max. 5 ms) 3 kA/AC 690 V 6 kA/AC 500 V 13 kA/AC 415 V 20 kA/AC 230 V	
Rated short-circuit making capacity (peak value) I_{cm}/U_e		52 kA/AC 415 V	2.8 kA/AC 415 V	52 kA/AC 415 V	2.8 kA/AC 415 V
Losses per pole at I_n = 160 A	W	see table, page 2/14	15		
Mechanical endurance	cycles	20 000			
Electrical endurance (U_e = AC 415 V)	cycles	6 000			
Frequency of switching	cycles/ hr	120			
Operating force	N	55		65	
Front-side device protection		IP40			
Terminal protection		IP20			

✔ available,
-- unavailable,
+ in preparation

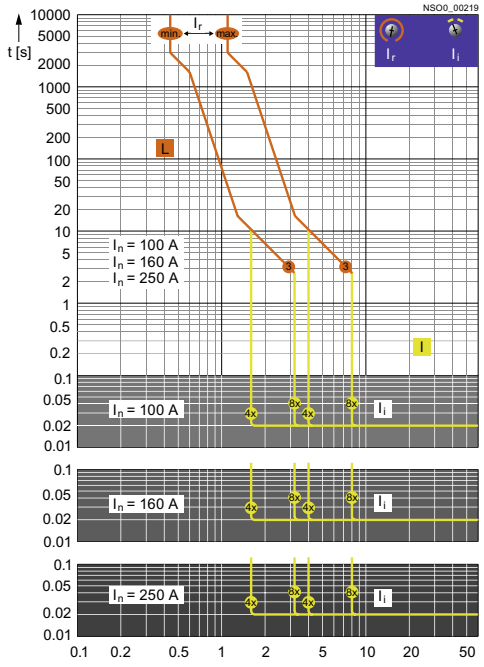
[1] When reversing the circuit breaker connection (power supply connected to terminals 2, 4, 6, (N) output to terminals 1, 3, 5, (N)), I_{cu} does not change.

[2] Ranges of rated currents vary according to characteristics, see page 2/16.

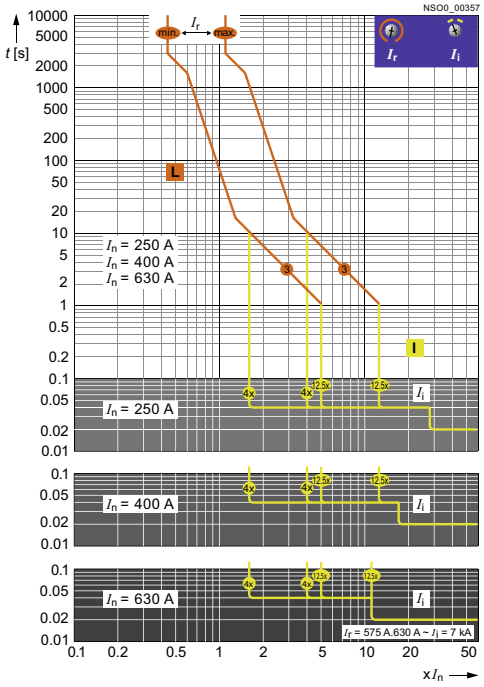
[3] Permissible load of N pole is 100%.

3VT2: Range Up to 250A (3 and 4 pole)

Tripping characteristics



3VT3: Range Up to 630A



Technical specifications

Specifications		Circuit breakers			Switch disconnectors
Standards		EN 60947-2, IEC 60947-2			EN 60947-3, IEC 60947-3
Approval marks		CE			
Number of poles		3, 4			
Rated current I_n	A	100, 160, 200, 250			--
Rated uninterrupted current I_u	A	250			
Rated operational current I_e	A	--			250
Rated operational voltage U_e	V	AC max. 690			AC max. 690 DC max. 440
Rated frequency f_n	Hz	50/60			
Rated impulse withstand voltage U_{imp}	kV	8			
Rated insulation voltage U_i	V	690			
Utilization category (selectivity) AC 690 V		A			--
Utilization category (switching mode)					
AC 690 V		--			AC-23 B
DC 440 V		--			DC-23 B
Rated short-time withstand current U_e = AC 690 V I_{cw}/t		2,5 kA/1 s			3 kA/5 s
Series U_e		3VT2 N	3VT2 H	U_e	--
Rated ultimate short-circuit breaking capacity (rms value) [1] I_{cu}		60 kA 36 kA 16 kA 10 kA	100 kA 65 kA 25 kA 13 kA	AC 230 V AC 415 V AC 500 V AC 690 V	--
Rated short-circuit service br eaking capacity (rms value) I_{cs}/U_e		30 kA 18kA 8kA 5kA	50 kA 36 kA 13 kA 8 kA	AC 230 V AC 415 V AC 500 V AC 690 V	--
Rated short-circuit making capacity (peak value) I_{cm}/U_e		75 kA	140 kA	AC 415 V	4 kA/AC 15 V 4 kA/AC440 V
Off-time at I_{cu}	ms	10			--
Losses per pole at I_n = 250 A	W	18			
Mechanical endurance	cycles	30 000			
Electrical endurance (U_e = AC 415 V)	cycles	3 000			
Switching frequency	cycles /hr	120			
Operating force	N	80			
Front-side device protection		IP40			
Terminal protection		IP20			

Technical specifications

Specifications Type		3VT3 763-2AA36/46/56-0AA0, 3VT3 763-3AA36/46/56-0AA0 Circuit breakers			Switch disconnectors
Standards		EN 60 947-2, IEC 947-2			EN 60 947-3, IEC 947-3
Approval marks		CE			
Number of poles		3, 4			
Rated current I_n	A	250, 315, 400, 500, 630			--
Rated uninterrupted current I_u	A	630			
Rated operational current I_e	A	--			630
Rated operational voltage U_e	V	AC max. 690			AC max. 690 DC max. 440
Rated frequency f_n	Hz	50/60			
Rated impulse withstand voltage U_{imp}	kV	8			
Rated insulation voltage U_i	V	690			
Utilization category					
• selectivity AC 690 V		A			--
• switching mode AC 690 V		--			AC-23 B
DC 440 V		--			DC-23 B
Rated short-time withstand current U_e = AC 690 V I_{cw}/t		8 kA/50 ms, 7 kA/300 ms, 6.5 kA/1 s			7,5 kA/5 s
Series U_e		3VT3 N	3VT3 H	U_e	--
Rated ultimate short-circuit breaking capacity (rms value) [1] I_{cu}		60 kA 36 kA 20 kA 15 kA	100 kA 65 kA 35 kA 20 kA	AC 230 V AC 415 V AC 500 V AC 690 V	--
Rated short-circuit breaking capacity (rms value) I_{cs}/U_e		40 kA 18 kA 10 kA 8 kA	75 kA 36 kA 20 kA 15 kA	AC 230 V AC 415 V AC 500 V AC 690 V	--
Rated short-circuit making capacity (peak value) I_{cm}/U_e		75 kA/	140 kA	AC 415 V	14 kA/AC 415 V 14 kA/AC 440 V
Off-time at I_{cu}	ms	10			--
Losses per pole at I_n = 250 A	W	75			
Mechanical endurance	cycles	20000			
Electrical endurance (U_e = AC 415 V)	cycles	5000			
Switching frequency	cycles/ hr	120			
Operating force	N	110			
Front-side device protection		IP40			
Terminal protection		IP20			

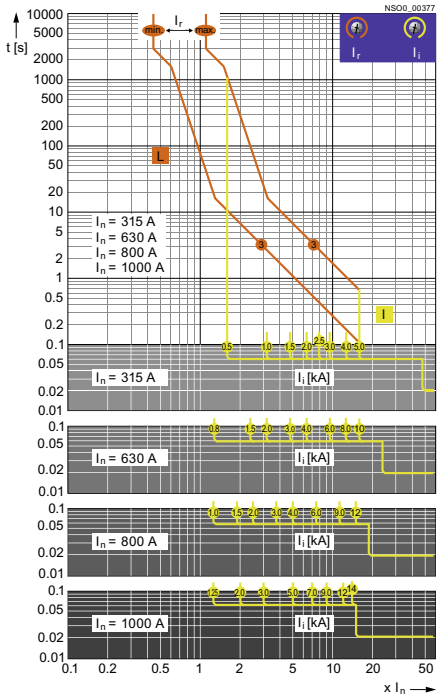
✔ available,
-- unavailable,
+ in preparation

[1] In case circuit breaker connection is reversed (input terminals 2, 4, 6 output terminals 1, 3, 5), I_{cu} does not change.

Universally applicable, space saving and consistently communication-capable

3VT4 range: Up to 1000A

Tripping characteristics



Technical specifications

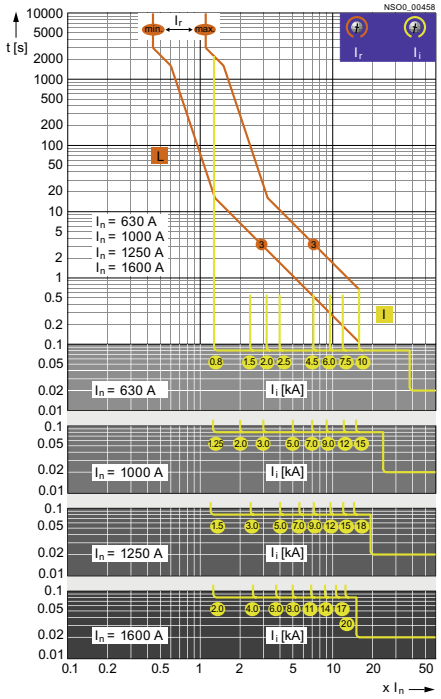
Specifications Type		3VT4 circuit breakers	Switch disconnectors
Standards		EN 60 947-2, IEC 947-2	EN 60 947-3, IEC 947-3
Approval marks		CE	
Number of poles		3	
Rated current I_n	A	315, 630, 800, 1000	--
Rated normal current I_u	A	1000	
Rated operational current I_e	A	--	1000
Rated operational voltage U_e	V	AC max. 690	AC max. 690 DC max. 440
Rated frequency f_n	Hz	50/60	
Rated impulse withstand voltage U_{imp}	kV	8	
Rated insulation voltage U_i	V	690	
Utilization category (selectivity) AC 690 V		A, B	--
Utilization category (switching mode) AC 690 V		--	AC-23 B
DC 440 V		--	DC-23 B
Rated short-time withstand current U_e=AC 690 V I_{cw}/t		15 kA/1 s	15 kA/1 s
Rated ultimate short-circuit breaking capacity (rms value) [1] I_{cu}/U_e		AC 85 kA/230V AC 65 kA/415V AC 45 kA/500V AC 20 kA/690V	--
Off-time at I_{cu}		30 ms	--
Rated short-circuit service breaking capacity (rms value) I_{cs}/U_e		AC 45 kA/230V AC 36 kA/415V AC 30 kA/500V AC 20 kA/690V	--
Rated short-circuit making capacity (peak value) I_{cm}/U_e		140 kA/AC 415 V	30 kA/AC 415 V 30 kA/DC 440 V
Losses per pole at I_n = 250 A	W	100	
Mechanical endurance	cycles	10000	
Electrical endurance (U_e = AC 415 V)	cycles	4000	
Switching frequency	cycles /hr	120	
Operating force	N	230	
Front-side device protection		IP40	
Terminal protection		IP20	

✔ available,
-- unavailable

1) In case circuit breaker connection is re versed (input terminals 2, 4, 6 output terminals 1, 3, 5), I_{cu} does not change.

3VT5 Range: Up to 1600A

Tripping characteristics



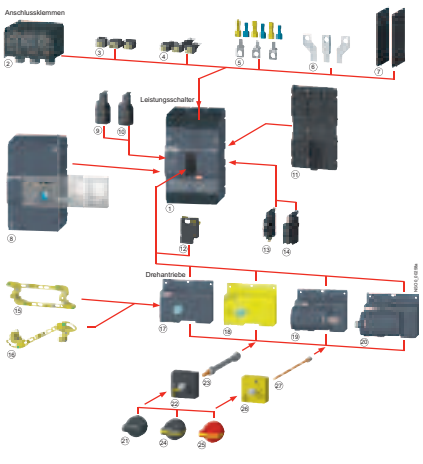
Technical specifications

Specifications Type		3VT5 circuit breakers	Switch disconnectors
Standards		EN 60 947-2, IEC 947-2	EN 60 947-3, IEC 947-3
Approval marks		CE	
Number of poles		3	
Rated current I_n	A	630, 1000, 1250, 1600	--
Rated normal current I_u	A	1600	
Rated operational current I_e	A	--	1600
Rated operational voltage U_e	V	AC max. 690	AC max. 690 DC max. 440
Rated frequency f_n	Hz	50/60	
Rated impulse withstand voltage U_{imp}	kV	8	
Rated insulation voltage U_i	V	690	
Utilization category (selectivity) AC 690 V		A, B	--
Utilization category (switching mode) AC 690 V		--	AC-23 B
DC 440 V		--	DC-23 B
Rated short-time withstand current U_e = AC 690 V I_{cw}/t		20 kA/1 s	
Rated ultimate short-circuit breaking capacity (rms value) [1] I_{cu}		85 kA/AC 230 V 55 kA/AC 415 V 45 kA/AC 415 V 20 kA/AC 690 V	--
Off-time at I_{cu}	ms	30	--
Rated short-circuit service br eaking capacity (rms value) I_{cs}/U_e		45 kA/AC 230 V 36 kA/AC 415 V 30 kA/AC 500 V 20 kA/AC 690 V	--
Rated short-circuit making capacity (peak value) I_{cm}/U_e		140 kA/AC 415 V	40 kA/AC 415 V 40 kA/AC 440 V
Losses per pole at I_n = 250 A	W	120	
Mechanical endurance	cycles	10000	
Electrical endurance (U_e = AC 415 V)		4000	
Switching frequency	cycles/ hr	120	
Operating force	N	230	
Front-side device protection		IP40	
Terminal protection		IP20	

✔ available,
-- unavailable,
+ in preparation

2) In case, the circuit breaker connection is reversed (input terminals 2, 4, 6 output terminals 1, 3, 5), I_{cu} does not change.

Accessories:
Auxiliary switch
Shunt trip units
Motor operators
mechanical Interlocks
Undervoltage trip
Locking mechanisms
Insulation barriers
Connection covers
mounting adaptors
... and more.



1. 3VT circuit breaker
2. Circular conductor terminals
3. Front connection
4. Rear connection
5. Potential terminals
6. Connecting bus with increased pole spacing
7. Adapter to install on 35mm DIN rail
8. Phase barriers
9. Signal switch
10. Auxilliary Switch
11. Shunt release
12. Undervoltage release
13. Locking type lever
14. Front manual operating mechanism
15. Front manual operating mechanism
16. Lateral manual operating mechanism (right)
17. Lateral manual operating mechanism (left)
18. Non lockable knob
19. Lockable knob
20. Lockable knob
21. Coupling driver
22. Coupling driver
23. Telescopic extension shaft
24. Extension shaft
25. Mechanical interlocking
26. Mechanical parallel switching
27. Lateral motorized operating mechanism (right)

For a sustainable reduction of power costs it is widely acknowledged that an optimum solution is to analyse the energy distribution system via automated means. Two examples of these increasingly popular concepts are Automatic Meter Reading (AMR) and Automated Monitoring and Targeting (AM&T), the former being an "early action measure" and a benefit metric within the Carbon Reduction Commitment scheme. The fundamental building blocks of such a system are the means to acquire "real time" transfer of energy data, and the ability to suitably present the information in a clear and succinct manner. This is typically achieved via communication technologies.

Siemens addresses this business imperative by offering a harmonised portfolio of energy measuring devices, all capable of communicating via open protocols such as Modbus, interconnected via industry standard means such as Ethernet CAT5 & Fieldbus cabling, two simple to configure and install software platforms.

Power Monitoring Devices SENTRON PAC

		PAC3100	PAC3200	PAC4200
				
Number of measurement variables		> 30	> 50	> 200
	e.g. voltage, current, power, energy values, frequency, power factor (min./max. values)	■	■	■
Extended measurement variables	e.g. THD, unbalance for current and voltage		■	■
	e.g. phase angle, phase displacement angle, harmonics in voltage and current			■
Power measurement	Power meters (input and output)	■	■	■
	Load profile record with time stamp			■
System integration and communication	Ethernet	integrated	integrated	
	RS485 (Modbus RTU) integrated	optional	optional	
	PROFIBUS DP (V1)		optional	optional
	S0 interface		DI/DO usable as S0 interface	

Power Monitoring Devices SENTRON PAC1500

	Single-phase measuring devices			Three-phase measuring devices		
	7KT1 530	7KT1 531	7KT1 533	7KT1 543	7KT1 545	7KT1 540
						
Direct connection	up to 80 A	up to 80 A	up to 80 A	up to 80 A	up to 80 A	
Transformer connection						...15 A
Calibrated version			■		■	
S0 interface	■	■	■	■	■	■
IR interface (for the connection of communication modules)		■	■	■	■	■

Sentron Powermanager is a PC based software platform, which addresses all of the prerequisites detailed above. Not only does it provide a clear window in to the energy flow, identifying areas for saving in accordance to the latest standards for Energy Management EN16001, it does this in an intuitive, extremely user friendly manner.

Software for Energy Management SENTRON Powermanager

- Visualising and archiving of measured values e.g. also as a load curve
- Limit value monitoring by means of freely configurable alarms
- Predefined cost centre reports for consumption evaluation
- Important block for energy management systems e.g. according to the new standard EN 16001
- Scalable software for flexible adaption to diverse requirements

SENTRON powermanager V 2.0

The SENTRON-based power management system is comprised of a PC with the related power management software and with the related devices which are connected directly to the PC through Ethernet.

General goals of a power management system:
- to identify savings potential
- to reduce power costs
- to ensure power availability through transparency of the momentary conditions and through comprehensive power assignments and evaluations.

The SENTRON powermanager PC-based power management software
- is a stand-alone power management software
- can be operated with a PC and measuring instruments with Ethernet connection
- is expandable from the simple standard application to a fully flexible customer solution
- is fully scalable with regard to the number of devices and to the software's functions
- ensures the optimum integration of measuring instruments from the SENTRON PAC range, SENTRON 3WL/3VL circuit breakers and other devices

SENTRON powermanager is designed for:
- Collecting
- Monitoring
- Evaluating
- Presenting
- Archiving

power data from SENTRON PAC3100, PAC3200 and PAC4200 power monitoring devices, SENTRON 3WL/3VL circuit breakers, and any modbus-capable detecting devices.

Option packages "Expert" and "Web"
The SENTRON powermanager standard package already covers the usual requirements. With this package the user receives an easy-to-engineer power management software which enables the data detected by the measuring instruments to be read out, presented, archived and processed in basic evaluations.

With the option package "Expert" the user receives full flexibility for the presentation of graphic interfaces (e.g. single-line presentations) in order to integrate his own images and devices. The data/images are displayed as standard using a Windows client which must be installed on the PC. The option package "Web" is offered to meet the market's demands for web presentation.

Benefits
- Transparency of power flows
- Exact knowledge of the consumption profile
- Increase of energy efficiency
- Optimization of power supply contracts
- Compliance with contractual terms
- Assignment of power costs to cost centers
- Optimization of plant maintenance
- Identification of critical system conditions

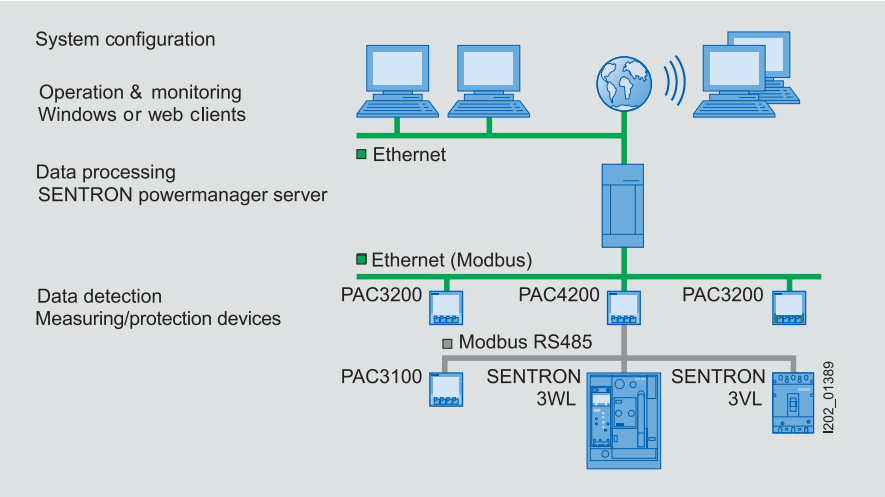
In the SENTRON product family the user will find not only a power management software in the form of SENTRON powermanager but also the matching hardware in the form of SENTRON PAC power monitoring devices and SENTRON 3WL/3VL circuit breakers for realizing a complete power management system. The components are optimally coordinated with each other, e.g. special drivers for the SENTRON devices are integrated in the SENTRON powermanager software so that on the one hand the power data acquisition can take place without any great configuration effort and on the other hand the most important measured values or states are indicated by predefined displays.

This reduces the engineering expenditures for the customer and gives the user the assurance of knowing that the device functions are optimally supported in the software.

The SENTRON powermanager software comprises a server/client software for the acquisition, processing, presentation and archiving of power data. These power data are supplied primarily by power monitoring devices (PAC) or 3WL/3VL circuit breakers which are connected to the system through Ethernet.

Application – Areas of application
The product offers a standard power management solution which provides the user with the following basic functionality:

- Collection of measured values from the devices
- Presentation of the measured values from the devices in table form in a predefined standard view for SENTRON PAC3100, PAC3200 and PAC4200 power monitoring devices and 3WL/3VL circuit breakers
- Free presentation of measured values possible, including from non-Siemens devices using generic Modbus drivers
- Archiving of measured values
- Monitoring of status and limits, with generation of corresponding signals
- Display of load curves for visualizing the achieved data and online data
- Cost centre reports based on predefined rates and the archived consumption data
- OPC server
- Configuration of the system including user management



This standard solution is designed with cost-efficiency and simple system start-up in mind. The option package "Expert" is available for customers with broader requirements particularly with regard to visualizing the status of the entire power distribution. Using this option package it is possible to create any number of graphic images as singleline diagrams and to add and interlink self-defined objects and have them respond to events, e.g. through object animation. In addition the user can define his own devices using a device editor, which is included in the delivery, and integrate them in the system. The user even has the possibility of creating his own runtime scripts.

However, unlike the SENTRON powermanager software, the option package "Expert" requires a certain system know-how, which can be acquired in special training courses.

The system is expandable of course to the extent that it allows the customer to begin with the basic functionality of the SENTRON powermanager and add the option package "Expert" at a later date. Existing data and configurations can still be used after upgrading.

Option packages "Expert" and "Web"
The SENTRON powermanager standard package already covers the usual requirements. With this package the user receives an easy-to-engineer power management software which enables the data detected by the measuring instruments to be read out, presented, archived and processed in basic evaluations.

With the option package "Expert" the user receives full flexibility for the presentation of graphic interfaces (e.g. single-line presentations) in order to integrate his own images and devices. The data/images are displayed as standard using a Windows client which must be installed on the PC. The option package "Web" is offered to meet the market's demands for web presentation.

System configuration
- Integration of measuring instruments by means of predefined device templates for the SENTRON PAC family and the SENTRON 3WL/3VL circuit breakers
- Easy integration of existing modbus-capable detecting devices
- Communication through Standard Ethernet
- Integration of devices with RS485 interface (Modbus RTU) through Modbus gateway, e.g. the SENTRON PAC4200 can be used as gateway

System requirements
- Processor: Intel Pentium IV 2.8 GHz (or better)
- RAM: At least 2 GB
- Hard disk: At least 1 GB free
- Graphics: VGA with at least 1280 x 1024 pixels and 16-bit color intensity

Supported operating systems
- Windows Vista: Business, Ultimate; SP1
- Windows XP: XP with SP2/SP3
- Windows 2003: Server 2003 Server (32-bit)
- Windows 2008: Server 2008 Server (32-bit)

Supported Excel versions (are required for reporting)
- Excel 2000, Excel XP, Excel 2003, Excel 2007
- Integration of devices with RS485 interface (Modbus RTU) through Modbus gateway, e.g. the SENTRON PAC4200 can be used as gateway

SIVACON S4 is part of the comprehensive SIVACON product range, which covers all aspects of power distribution: from the switchgear to the busbar trunking system. The integration in Totally Integrated Power assures full consistency in terms of planning and configuration.

New features for enhanced safety
As type-tested switchgear, SIVACON S4 stands for maximum reliability and a high degree of safety. High-quality, perfectly matched switching devices facilitate an easy integration in the building control technology concept thanks to the system's outstanding feature: built-in intelligence. During operation, an efficient ventilation system prevents heat accumulation and heat pockets, thus assuring long-term system availability. A fast and easy access to the devices for setting purposes is facilitated through doors with central locking, swivel frames and quick-release locks. Thanks to the enormously powerful locking system, maximum personal safety is even guaranteed in fault cases.

Forms of internal separation 1, 2b, 3b, 4a, 4b (type 6 and 7) available.

Roof mounted arc-fault venting provides enhanced personnel protection

Sivacon S4 - Consistent protection, maximum benefits: Low-voltage Power Distribution Board

Construction:
The Sivacon S4 energy distribution concept consists of full galvanised chromed sheet steelframes, of sturdy self standing design , flush or wall mounted.

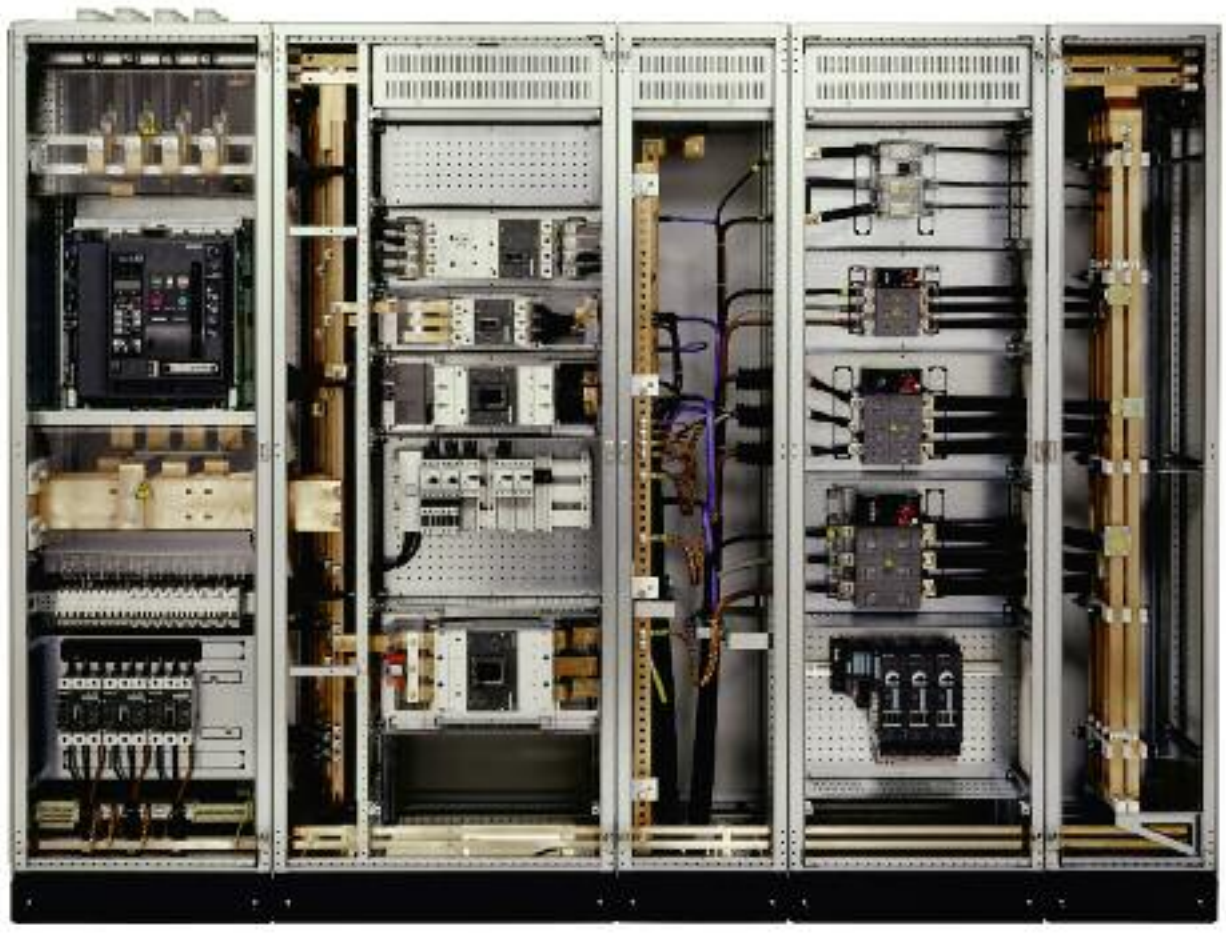
Sivacon S4 low-voltage power distribution are constructed in accordance to a modular design system by means of flexible assembly kits, and can be combined to meet a wide range of power distribution needs

Assembly kits with SENTRON 3WL
- Rated current 630 – 3200A
- 3 pole and 4 pole
- Withdrawable and fixed mounted design
- Copper assembly kits

Assembly kits with SENTRON 3KA & 3KL
- SENTRON 3KL5/6 (LBS) switch disconnectors.
  Rated current up to 630A
- SENTRON 3KL7/3KA7 (LBS) switch disconnectors.
  Rated current up to 1250A
- 3 pole and 4 pole
- Fixed mounted design
- Copper assembly kits
- Door coupling rotary drive

Assembly kits with SENTRON 3VL & 3VT MCCB's
- 3 pole and 4 pole
- Plug-in and fixed mounted design
- Copper assembly kits

Assembly kits with built-in installation devices
- Modular spacing
  24 with 600mm cubicle width
  36 with 800mm cubicle width
- 150mm or 200mm matrix
- Depth-adjustable multi profile busbar (AL 35mm)
- Sikclip raid wiring system

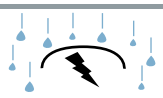
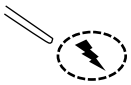
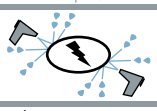
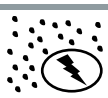
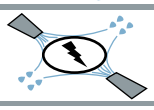


Sentron ATC5300 Automatic Transfer Control Device

- Automatic and manual transfer between two LV power supply systems
- Transfer is possible between the following power sources:
  - Line to Line
  - Line to Generator
  - Generator to Generator
- LED displays for indicating measured values and exact parameter settings
- Easy programming with SENTRON SOFTWARE ATC
- Integration in power management systems through MODBUS RTU
- Panel-mounting device
- Generator test function, load shedding
- Transfer switch in combination with an ACB, MCCB or contactor
- Automatic or manual transfer
- Detection of power supply faults (voltage, frequency, phase sequence, phase failure, voltage unbalance)
- Monitoring of the main system and the backup system
- Neutral conductor monitoring
- Programmable inputs/outputs
- Meets the high requirements of IEC 60947-6-1 in conjunction with Siemens 3VL and 3VT circuit breakers

Measured Variable	Basic setting	Limit value setting	Delay time	Can be deactivated
Nominal system voltage U_n	100 …. 690V	79% …. 98% 102% … 120%	0.1 … 900s 0.1 … 900s	– ✓
Voltage unbalance		1% … 20%	0.1 … 900s	✓
Phase loss		60% … 85%	0.1 … 30s	✓
Phase sequence	Left, Right	–	–	✓
Frequency	50 / 60 Hz	80% … 100% 101% … 120%	0.1 … 900s 0.1 … 900s	✓

(IEC) 60529 Ingress Protection Chart (IP)

First digit	Mechanical protection		Second digit	Mechanical protection	
0		No protection	0		No protection
1		Protected against solid objects over 50mm, e.g. accidental touch by hands	1		Protected against vertically falling drops of water e.g. condensation
2		Protected against solid objects over 12mm, e.g. fingers	2		Protected against direct sprays of water up to 15° from the vertical
3		Protected against solid objects over 2.5mm, e.g. tools & wires	3		Protected against direct sprays of water up to 60° from the vertical
4		Protected against solid objects over 1mm, e.g. wires, nails etc.	4		Protected against water splashed from all directions, limited ingress permitted
5		Protected against dust limited ingress, not harmful deposits	5		Protected against low pressure jets of water from all directions, limited ingress permitted
6		Totally protected against dust	6		Protected against strong jets of water e.g. on ships deck, limited ingress permitted
n/a	n/a	n/a	7		Protected against the effects of temporary immersion between 15cm and 1m. Duration of test 30 mins
n/a	n/a	n/a	8		Agreement between manufacturer and user. Must be more stringent than IP67

Siemens Business Card

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