

PRODUCTS & SYSTEMS FOR THE ELECTRICITY INDUSTRY

Catalogue
Version 27



Fuses + Fuse bases



Vertical fuse disconnects



Horizontal fuse disconnects



Busbar systems

Welcome

Welcome to the latest Edition of our catalogue. We are pleased to be in our 16th year as Jean Müller NZ and servicing our New Zealand and Pacific Island customers.

Please visit our web page - **www.jeanmueller.co.nz**

Products tab, for a downloadable pdf of this catalogue (includes printable sections). Retired products and catalogue information is available upon request.

For further information on any of our products please contact us.

Phone 06 769 9694

Email sales@jeanmueller.co.nz

Notes:

1. Unless otherwise indicated Jean Müller NZ Ltd will endeavour to maintain stock of all items in this catalogue.
2. Returned Goods should be addressed to:
Jean Müller NZ Ltd
56 Hurlstone Drive
NEW PLYMOUTH 4312
Attn: Returns

New products:

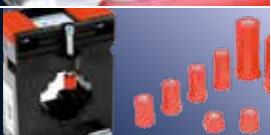
CT Block
(for more information go to page 39)



Keto 000
(for more information go to page 54)



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Headquarters in Germany



**64
COUNTRIES**

with active sales



**>600
EMPLOYEES**

worldwide



**>40.000
ITEMS**

of the highest quality

About us

JEAN MÜLLER was founded in 1897 in the village of Eltville on the banks of the Rhine River in Germany.

At this time the applications for electricity were still in their early days. Jean Müller chose as its basic activity the development of fuses.

Today the company has more than six hundred employees and works with modern production methods to produce fused switchgear, low voltage switchgear assemblies, current distribution components, electronic monitoring systems and energy management systems.

The combination of specialist knowledge of the electrical supply industry and the experience of a company that has been growing for more than 100 years means that JEAN MÜLLER is

THE NAME FOR SAFETY

Since the year 2000, JEAN MÜLLER has been represented in New Zealand by EMF Industrial Ltd however in December 2010 EMF Industrial became JEAN MÜLLER NZ Ltd, a fully owned subsidiary of Jean Müller GmbH.



New Zealand

Products

Our tried and tested products comply with the international IEC standards and with the relevant national standards. They are manufactured in conformity with the highest quality requirements, and our quality management is certified according to DIN EN ISO 9001.

Solutions

Our profession is the development and manufacture of products suitable for the entire electrical power distribution system in industry, within the power supply grid and in buildings. We also provide customized solutions for specific customer applications.

Service

We offer to our customers specialised technical consulting tailored to their specific applications. Our more than 125 years of experience and technical know-how, including knowledge of specific national requirements worldwide, provide a solid basis of competence that spans from the consulting phase to manufacture and subsequent customer service.

We remain permanently available to our customers by means of our extensive service network - in Germany, Europe and other countries of the world. The data sheets, the dxf drawings and the product news are available for you around-the-clock on your homepage www.jeanmueller.de.

Current distribution for industrial applications

Our current distribution components are used for electrical power supply in industrial applications, large buildings, office centres, factories, ships, airports and everywhere where protection against overload is essential.

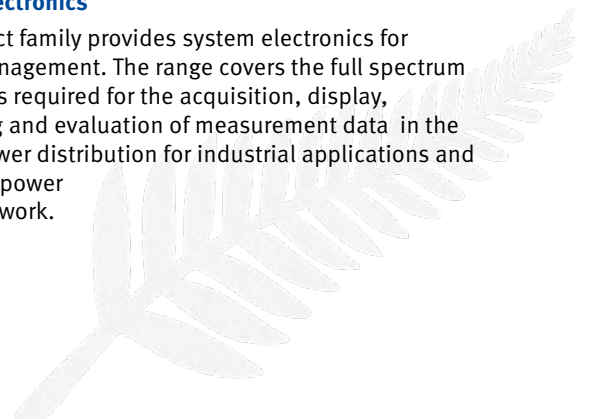
For switchgear and controlgear panel builders, we are setting new standards with our SASIL and COSMO distribution systems.

Power distribution for electricity supply companies

The "Power Distribution" product line covers all the requirements of electricity supply companies worldwide. The field of application is the public power supply system, including current distribution all the way from power station to house service connection.

System electronics

Our product family provides system electronics for energy management. The range covers the full spectrum of products required for the acquisition, display, monitoring and evaluation of measurement data in the field of power distribution for industrial applications and the public power supply network.



Shaping the Energy Transition



Sustainability at JEAN MÜLLER

The energy transition is about more than just technology. The way we generate, distribute and consume energy has a tangible impact on us and our environment. A secure energy infrastructure and sustainable solutions do not come about by chance. They require foresight, reliability, and technological expertise. As a family-run business, JEAN MÜLLER has upheld these values for over 125 years.

Made by JEAN MÜLLER – long-term value rather than short-term gain

Our products are designed for long-term use in demanding, safety-critical applications and are often still in service after 30 years. We are also developing an increasing number of retrofittable solutions, ensuring our designs are repair-friendly and suitable for recycling to support a circular economy.

Our medium-sized company structure enables us to shape sustainability aspects directly and develop processes quickly and efficiently. This creates value that goes beyond the product's price tag — for the environment, society, and all those who rely on our solutions. Rather than focusing solely on the lowest possible initial cost, we invest in tested and proven systems, safety, durable design and responsible practices. This is our commitment to quality and responsibility.

We would like to take you on this journey

At JEAN MÜLLER, sustainability is not a finished product, but an ongoing process. We are transparent about where we are now, the systematic measures we already have in place and the further steps still required. We want to actively involve our customers and partners in this process and look forward to receiving your feedback.

You can share your thoughts on 'Sustainability at JEAN MÜLLER' on our website:



For more information, see our 2025 Sustainability Report:

Sustainability - at a glance (E | S | G)

E – Environment: Conscious management of energy and resources

- Development of durable products that are repairable and retrofittable
- Certified environmental management and energy management
- Corporate carbon footprint in accordance with the Greenhouse Gas Protocol (Scopes 1, 2 and 3)
- Measures related to resource use and circular economy

S – Social: Good work is part of the solution

- Certified occupational health and safety management
- Fair working conditions
- Skills development and training for employees

G – Governance: Clear rules. Reliable cooperation

- A globally binding Code of Conduct for responsible conduct, compliance with applicable laws and integrity
- Certified quality management (ISO 9001)
- Supply chain management: Voluntary human rights and environmental risk analysis based on legal requirements
- Aligned with the United Nations' Sustainable Development Goals (SDGs)

Do you have any questions about sustainability at JEAN MÜLLER?

Please get in touch!

"FOR US, SUSTAINABILITY MEANS GIVING EQUAL WEIGHT TO ENVIRONMENTAL, ECONOMIC, AND SOCIAL FACTORS IN OUR BUSINESS ACTIVITIES"



DIN-fuse-links

DIN fuse-links are used for the protection of electrical installations and equipment and are common for a wide area of applications.

Standardised characteristics, technical data and dimensions offer adapted solutions without complex individual calculations.





SM000

Notes: DIN000
Fuses are
suitable for
mounting in
DIN00 holders



SM00



SM1



SM2



SM3



SM4A

Utilisation category gG 500VAC with combi indicator

Size	Rating (A)	Power Dissipation (W)	Part No.
DIN 000	4A	0.7	SM000-GL/004
	6A	0.8	SM000-GL/006
Refer Notes	10A	1.1	SM000-GL/010
	16A	1.6	SM000-GL/016
	20A	1.7	SM000-GL/020
	25A	1.9	SM000-GL/025
	32A	2.5	SM000-GL/032
	35A	3.3	SM000-GL/035
	40A	3.4	SM000-GL/040
	50A	3.9	SM000-GL/050
	63A	5.4	SM000-GL/063
	80A	6.1	SM000-GL/080
	100A	6.9	SM000-GL/100
	125A	8.9	SM000-GL/125
DIN 00	125A	9.0	SM00-GL/125
	160A	11.2	SM00-GL/160
DIN 1	35A	3.2	SM1-GL/035
	63A	6.0	SM1-GL/063
	80A	6.5	SM1-GL/080
	100A	9.1	SM1-GL/100
	125A	12.9	SM1-GL/125
	160A	14.9	SM1-GL/160
	200A	16.5	SM1-GL/200
	224A	16.7	SM1-GL/224
	250A	21.6	SM1-GL/250
DIN 2	63A	5.7	SM2-GL/063
	80A	7.1	SM2-GL/080
	100A	8.1	SM2-GL/100
	125A	9.5	SM2-GL/125
	160A	14.9	SM2-GL/160
	200A	16.9	SM2-GL/200
	250A	21.8	SM2-GL/250
	315A	23.7	SM2-GL/315
	355A	26.9	SM2-GL/355
	400A	30.5	SM2-GL/400
DIN 3	315A	23.5	SM3-GL/315
	400A	33.8	SM3-GL/400
	500A	39.0	SM3-GL/500
	630A	47.6	SM3-GL/630
	800A	43.0	SM3-GL/800
DIN 4a	250A	21.5	SM4A-GL/250
	315A	24.5	SM4A-GL/315
	400A	28.5	SM4A-GL/400
	500A	36.5	SM4A-GL/500
	630A	43.5	SM4A-GL/630
	800A	59.5	SM4A-GL/800
	1000A	84.0	SM4A-GL/1000
	1250A	104.0	SM4A-GL/1250
	1600A	146.0	SM4A-GL/1600

Fuses



SM00-GL/125K

Utilisation category gG 500VAC with striker

Size	Rating (A)	Power Dissipation (W)	Part No.
DIN 000	6A	0.8	SM000-GL/006K
	10A	1.1	SM000-GL/010K
	16A	1.6	SM000-GL/016K
	20A	1.7	SM000-GL/020K
	25A	1.9	SM000-GL/025K
	32A	2.5	SM000-GL/032K
	40A	3.0	SM000-GL/040K
	50A	3.9	SM000-GL/050K
	63A	5.4	SM000-GL/063K
	80A	6.1	SM000-GL/080K
	100A	6.9	SM000-GL/100K
DIN 00	125A	9.0	SM00-GL/125K
	160A	11.2	SM00-GL/160K
DIN 1	100A	9.1	SM1-GL/100K
	125A	12.9	SM1-GL/125K
	160A	14.9	SM1-GL/160K
DIN 1	200A	16.5	SM1-GL/200K
	250A	21.6	SM1-GL/250K
DIN 2	315A	23.7	SM2-GL/315K
	400A	30.5	SM2-GL/400K
DIN 3	500A	39.0	SM3-GL/500K
	630A	47.6	SM3-GL/630K



SM2-UF/315

Utilisation category aR 690VAC - üf1 (very fast acting)

Size	Rating (A)	Power Dissipation (W)	Part No.
DIN 000	16A	6.0	SM000-UF/016
	20A	7.0	SM000-UF/020
	25A	8.0	SM000-UF/025
	32A	9.0	SM000-UF/032
	40A	11.5	SM000-UF/040
	50A	12.0	SM000-UF/050
	63A	14.5	SM000-UF/063
	80A	20.0	SM000-UF/080
	100A	23.0	SM000-UF/100
	125A	26.0	SM000-UF/125
DIN 1	160A	34.0	SM000-UF/160
	200A	46.0	SM1-UF/200
DIN 2	250A	51.0	SM1-UF/250
	315A	68.0	SM2-UF/315
DIN 3	400A	75.0	SM2-UF/400
	500A	110.0	SM3-UF/500
	630A	121.0	SM3-UF/630

TRANSFORMER FUSE RANGE

NH fuse-links utilization category gTr for transformer protection 400VAC



SM3-GTR/910

Size	Rating (A)	Sn (kVA)	Blow Indicator	Power Dissipation (W)	Part No.
DIN 2	144A	100	Top	9.5	SM2-TT/145
DIN 2	289A	200	Top	18.8	SM2-TT/289
DIN 3	455A	315	Top	30.5	SM3-GTR/455
DIN 3	722A	500	Top	49	SM3-GTR/722
DIN 3	909A	630	Top	58	SM3-GTR/910
DIN 4a	722A	500	Top	50.5	SM4A-TT/722
DIN 4a	909A	630	Top	61	SM4A-TT/910
DIN 4a	1443A	1000	Top	98	SM4A-TT/1443

Fuses



M**aM**

Utilization category aM for motor protection 690V Combi Indicator

Size	Rating (A)	Power Dissipation (W)	Part No.
DIN 000	2A	0.2	SM000-aM/002/69
	4A	0.3	SM000-aM/004/69
	6A	0.4	SM000-aM/006/69
	10A	0.5	SM000-aM/010/69
	16A	0.7	SM000-aM/016/69
	20A	0.9	SM000-aM/020/69
	25A	1.3	SM000-aM/025/69
	32A	1.5	SM000-aM/032/69
	35A	1.8	SM000-aM/035/69
	40A	2.0	SM000-aM/040/69
DIN 00	50A	2.7	SM00-aM/050/69
	63A	3.9	SM00-aM/063/69
	80A	4.5	SM00-aM/080/69
	100A	5.8	SM00-aM/100/69
	125A	8.2	SM00-aM/125/69
	160A	10.3	SM00-aM/160/69
DIN 1	63	4.4	SM1-aM/063/69
	80	5.4	SM1-aM/080/69
	100	6.8	SM1-aM/100/69
	125	7.8	SM1-aM/125/69
	160	10.5	SM1-aM/160/69
	200	14.4	SM1-aM/200/69
	224	16.9	SM1-aM/224/69
	250	19.4	SM1-aM/250/69
DIN 2	160	9.8	SM2-aM/160/69
	200	13.0	SM2-aM/200/69
	224	15.4	SM2-aM/224/69
	250	19.3	SM2-aM/250/69
	300	22.5	SM2-aM/300/69
	315	25.5	SM2-aM/315/69
	355	29.9	SM2-aM/355/69
DIN 3	400	34.8	SM2-aM/400/69
	400	29.4	SM3-aM/400/69
	425	34.4	SM3-aM/425/69
	500	37.0	SM3-aM/500/69
DIN 4a	630	50.0	SM3-aM/630/69
	800	65.0	SM4a-aM/800/69
	1000	81.0	SM4a-aM/1000/69



TM

Solid links 690VAC

Size	Rating (A)	Gripping Lugs	Power Dissipation (W)	Part No.
DIN 00	160A	Insulated	2.0	TM00-ISM
DIN 1	250A	Insulated	5.0	TM1-ISM
DIN 2	400A	Insulated	10.0	TM2-ISM
DIN 3	630A	Insulated	21.0	TM3-ISM
	1250A	Insulated	24.0	TM3-1250-ISM
DIN 4a	1250A	Live	21.0	TM4A-1250
	1600A	Live	22.0	TM4A-1600



GPSHE



GP 1200



HP-SE/L

Accessories

Description	Part No.
For fitting and removal of DIN 000, 00, 1, 2, 3 fuse links	GPSHE
NH Fuse Handle for inserting and removing of NH fuse-links sizes NH1, NH2, NH3, NH1XL, NH2XL and NH3L, as well as solid links and fuse-base covers.	GP 1200
Piggy Bank Fuse Adaptor for temporary power supply 100 amp max	HP-SE/L

D-Type fuse links utilisation category gG 500VAC

Size	Rating (A)	For thread	Power Dissipation (W)	Part No.
DII	10A	E27	2.1	GLD2/10
	16A	E27	2.5	GLD2/16
	20A	E27	2.6	GLD2/20
	25A	E27	3.3	GLD2/25
DIII	35A	E33	4.4	GLD3/35
	50A	E33	6.0	GLD3/50
	63A	E33	6.2	GLD3/63



GLD

Fuses



SKR

22 X 58 Cylindrical fuse links (house service fuses) gG

Size	Rating (A)	Voltage	Power Dissipation (W)	Part No.
22 x 58mm	32A	690V	3.7	SKR-GL/032
22 x 58mm	40A	690V	4.5	SKR-GL/040
22 x 58mm	50A	500V	5.2	SKR-GL/050
22 x 58mm	63A	500V	6.9	SKR-GL/063
22 x 58mm	80A	500V	7.8	SKR-GL/080
22 x 58mm	100A	500V	8.6	SKR-GL/100

10 X 38 CYLINDRICAL FUSES

Z type gG 400/500 VAC



Z10

Size	Rating (A)	Voltage	Part No.
10 x 38mm	2A	AC500V	Z10GL2/5
10 x 38mm	4A	AC500V	Z10GL4/5
10 x 38mm	6A	AC500V	Z10GL6/5
10 x 38mm	10A	AC500V	Z10GL10/5
10 x 38mm	12A	AC500V	Z10GL12/5
10 x 38mm	16A	AC500V	Z10GL16/5
10 x 38mm	20A	AC400V	Z10GL20/4
10 x 38mm	25A	AC400V	Z10GL25/4
10 x 38mm	32A	AC500V	Z10GL32/5

Z type PV 1000 VDC



Z10DC

Size	Rating (A)	Voltage	Part No.
10 x 38mm	2A	DC1000V	Z10DC2/1000V
10 x 38mm	4A	DC1000V	Z10DC4/1000V
10 x 38mm	6A	DC1000V	Z10DC6/1000V
10 x 38mm	10A	DC1000V	Z10DC10/1000V
10 x 38mm	12A	DC1000V	Z10DC12/1000V
10 x 38mm	16A	DC1000V	Z10DC16/1000V
10 x 38mm	20A	DC1000V	Z10DC20/1000V
10 x 38mm	25A	DC1000V	Z10DC25/1000V

Z type PV cylindrical fuse disconnecter



Z10-TL

Size	Rating (A)	Voltage	Indicator	Part No.
2 pole	25A	DC1000V	None	Z10-TL2/DC1000V
2 pole	25A	DC1000V	LED	Z10-TL2/DC1000V LED

NH metering fuse-links



Features

Truncated size with additional feature

- Truncated isolating body with rated voltage AC400V
- Dimensions in conjunction with attached current transformer



Attachable current transformers

- Dedicated current transformers offer two measuring ranges
- Current transformers allow open-ended operation



Bimetallic current meters

- Dedicated bimetallic current meters with two measuring ranges and slave pointer



Application in switchgear

- Jean Müller fuse disconnects are prepared to accept metering fuse-links

Fuses

Metering fuse links utilisation category gG 400VAC

	Size	Rating (A)	Power Dissipation (W)	Part No.
	DIN2	200	12.0	SMCT2-GL/200
		250	17.0	SMCT2-GL/250
		315	20.0	SMCT2-GL/315
		400	24.0	SMCT2-GL/400
	DIN3	400	24.0	SMCT3-GL/400
		630	32.0	SMCT3-GL/630

Current transformers for metering fuse links

Size	Primary Current (A)	Secondary Current (A)	Power (VA)	Class	Part No.
DIN2	400/200	5	5/3.5	3	MSMK2/400/200/5
DIN3	400/200	5	5/3.5	3	MSMK3/400/200/5
DIN3	600/300	5	5/3.5	3	MSMK3/600/300/5
Circlip for securing CTs					SIBZ-R

Bimetallic meters for metering fuse links (MDIs)

	Size	Scale (A)	Measuring Range (A)	Part No.
	DIN 1,2,3	400/200	0-5	SL-MDI-400
	DIN 1,2,3	600/300	0-5	SL-MDI-600



NH fuse-links for DC applications



Features

Compact dimensions DC80V

- High current carrying capacity up to 800A
- Compact size NH00
- Suitable NH fuse-switch-disconnectors available



Compact dimensions DC250V

- High current carrying capacity up to 315A
- Compact size NH00
- Suitable NH fuse-switch-disconnectors available



Various applications

- DC80V especially for short circuit protection in power supply systems for telecommunication
- DC250V for protection against overload and short circuit in common DC applications



DIN00 fuse links 80VDC for telecommunication applications

	Size	Rating (A)	Power Dissipation (W)	Part No.
	DIN00	100	8.0	SM00-DC100
		160	9.0	SM00-DC160
		250*	12.0	SM00-DC250
		400*	18.0	SM00-DC400
		630*	28.0	SM00-DC630
		800*	39.0	SM00-DC800

DIN00 fuse links 250VDC

	Size	Rating (A)	Power Dissipation (W)	Part No.
	DIN00	63	7.5	SM00-DC063/250
		100	9.4	SM00-DC100/250
		160	13.8	SM00-DC160/250
		200*	18.9	SM00-DC200/250
		250*	21.2	SM00-DC250/250
		315*	23.5	SM00-DC315/250

* only for use with JEAN MÜLLER fuse disconnects type LTT.



Fuse Bases

NH fuse-bases DIN size 00 to 4a are suitable for surface mounting on mounting plates and for direct mounting on busbars.

They are used for application of NH fuse-links according to DIN VDE 0636-2/IEC 60269-2 as well as solid links. They are operated by a fuse handle according to DIN VDE 0636-2/IEC 60269-2 and VDE 0680-4. According to the standard size 4a fuse-bases have to be equipped with a swing-in device and interlocking and therefore are offered as NH fuse-disconnectors.



Fuse bases for DIN fuses

Size	For Fuses	Current Rating (A)	Terminal	Connection Capacity (mm ²)	Part No.
00	DIN000 & DIN00	160	Flat Terminal M8	max. 95	U00-1IGZ/H
1	DIN1	250	Flat Terminal M10	max. 150	U1-1IGZ/H
2	DIN2	400	Flat Terminal M12	max. 240	U2-1IGZ/H



U00



U1



U2

Fuse bases for cylindrical fuses

For Fuses	Current Rating (A)	Switch width (mm)	Terminal	Connection Capacity (mm ²)	Part No.
10 x 38mm	32	18	Clamp	0.75 - 25	WH-AMB1/10 JM
10 x 38mm	32	54	Clamp	0.75 - 25	WH-AMB3/10 JM
22 x 58mm	100	36	Clamp	4 - 50	WH-AMB1/22 JM
22 x 58mm	100	108	Clamp	4 - 50	WH-AMB3/22 JM



WH-AMB1/10 JM



WH-AMB3/10 JM



WH-AMB1/22 JM



WH-AMB3/22 JM

Fuses and Fuse Bases - Technical Information

Type	Standard DIN and Striker Fuses	Semiconductor Fuses	Motor Rated Fuses	CT Mount Fuses	D-Type Fuses	Cylindrical House Service Fuses
Reference	SM...-GL/... SM...-GL/...K	SM...-UF/...	SM...-AM/...	SMCT...-GL/...	GLD...-	SKR...
Utilisation	Cable and Line protection	Semiconductor protection	Motor protection	Cable and Line protection	Cable and Line protection	Cable and Line protection
Protection Type	Full Range	Short Circuit only	Short Circuit only	Full Range	Full Range	Full Range
Characteristic	gG	aR	aM	gG	gG	gG
Rated Voltage	500 VAC	690 VAC	690 VAC	400 VAC	500 VAC	690 VAC (100A 500V) (125A 400V)
Maximum Voltage	500 VAC	725 VAC	725 VAC			
Rated Breaking Capacity						
at 500 VAC	120 kA	100 kA	120 kA NH000/100KA	50 kA	50 kA	
Construction						
Body		Steatite Ali - oxide ceramic for semi-conductor fuses			-	-
Blade Contacts		Silver Plated Copper Alloy or Copper			-	-
Fuse Element		Silver or Copper melting element			-	-
Fuse Blown Indication		Combi/top indicator			None	None

Type	M ₂ GTR(TT) ...			M ₃ GTR(TT) ...		
Size	-	-	NH2	NH3		
Rated voltage	U _n	V	AC400	AC400		
Rated current	I _n	A	72-361	72-361	455-577	722-909
Transformer rating	S _n	kVA	50-250	50-250	315-400	500-630
Rated breaking capacity	-	kA	100	100		
Utilization category	-	-	gTr	gTr		
Standards	-	-	IEC/EN 60269-1 DIN VDE 0636-2011			

Notes :

Characteristics/Standards

gG IEC60269

aR IEC60269-4

Fuses for motor protection

1. Fuses with aM characteristic

The rated fuse current must be $\geq$ rated motor current.

2. Fuses with gG characteristic

The following table shows fuse ratings for short circuit protection of 3 phase motors, 1500 rpm and internal or surface cooling

Direct Starting : max start current 6 x rated motor current, max start time 5 seconds

Star/Delta Starting : max start current 2 x rated motor current, max start time 15 seconds

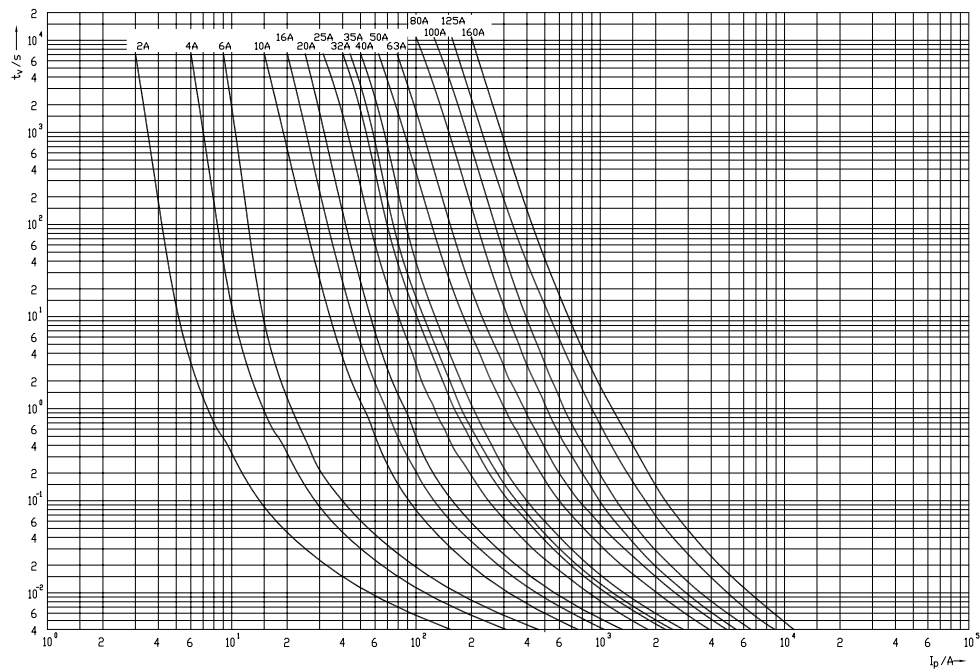
Ratings for Star/Delta starting also apply for 3 phase slip-ring motors

kW	Motor Rating @ 400V			Fuse Rating aM (Amps)	Fuse Rating gG (Amps)	
	cos ϕ	Eff %	Rated Motor Current Amps	D.O.L Start	D.O.L Start	Star-Delta Start
0.18	0.7	62	0.6	2	2	-
0.25	0.7	62	0.83	2	4	2
0.55	0.75	69	1.5	2	4	2
0.75	0.8	74	1.8	4	6	2
1.1	0.83	77	2.5	4	6	4
2.2	0.83	81	4.7	6	10	6
3.0	0.84	81	6.4	10	16	10
4.0	0.84	82	8.4	10	20	10
7.5	0.86	85	14.8	16	32	16
11	0.86	87	21.2	25	50	25
15	0.86	87	28.9	32	63	32
22	0.87	89	41	50	80	50
30	0.87	90	55	63	100	63
37	0.87	90	68	80	125	80
55	0.88	91	99	125	200	100
75	0.88	91	135	160	200	160
90	0.88	92	160	200	250	160
110	0.88	92	196	250	315	200
132	0.88	92	235	250	400	250
160	0.88	93	282	315	400	315
200	0.88	93	353	400	500	400

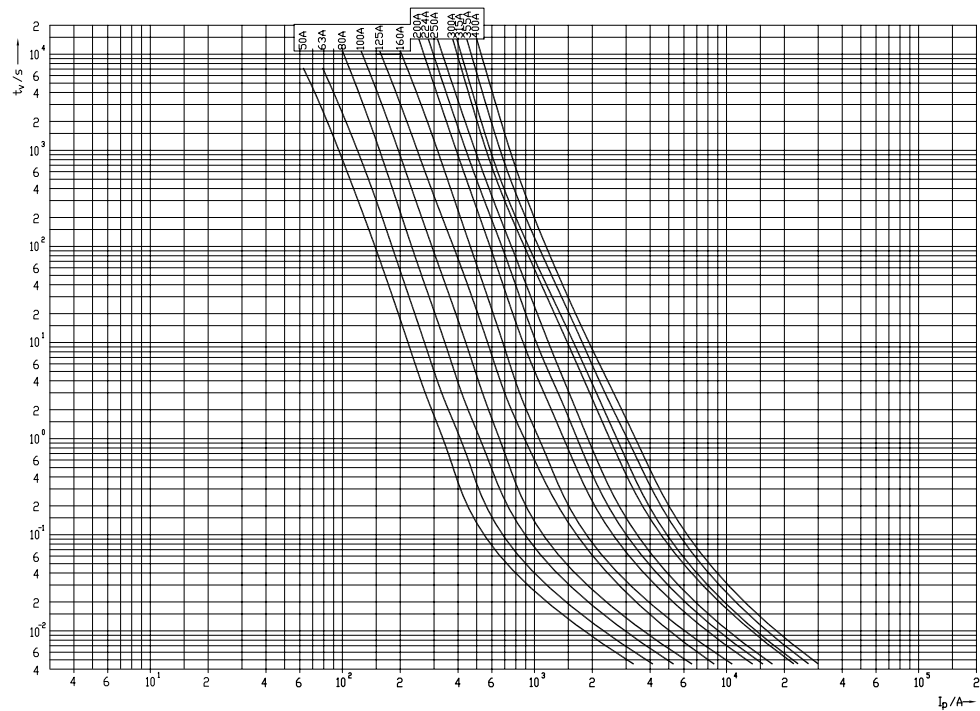
HRC DIN Fuses

NH fuse-links for general protection

NH000-NH00



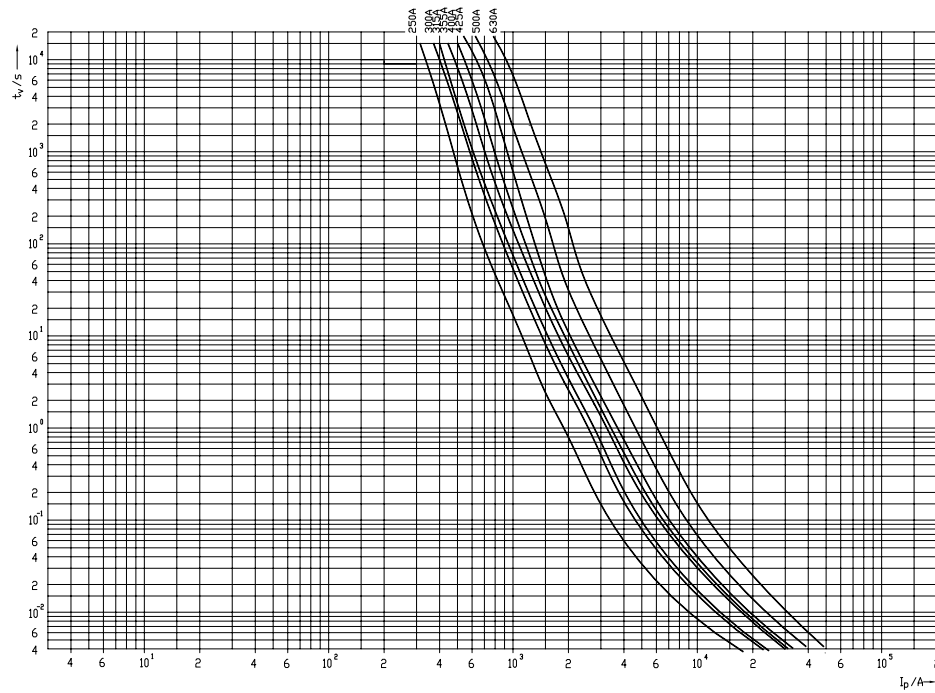
NH1+2



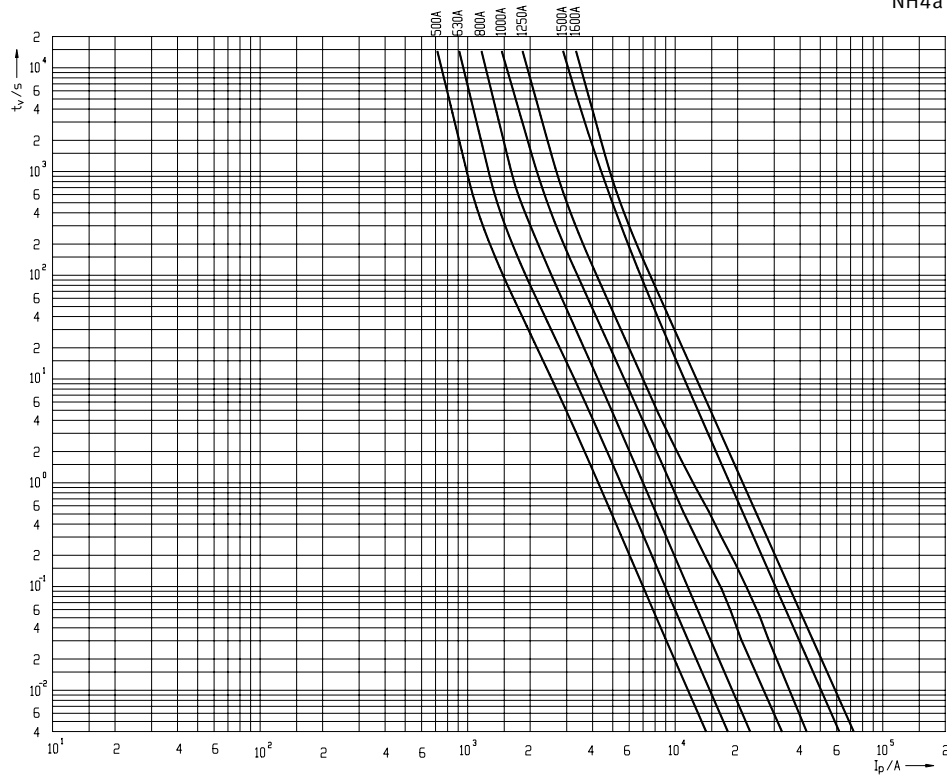
HRC DIN Fuses

Time/current characteristics curves

NH3



NH4a

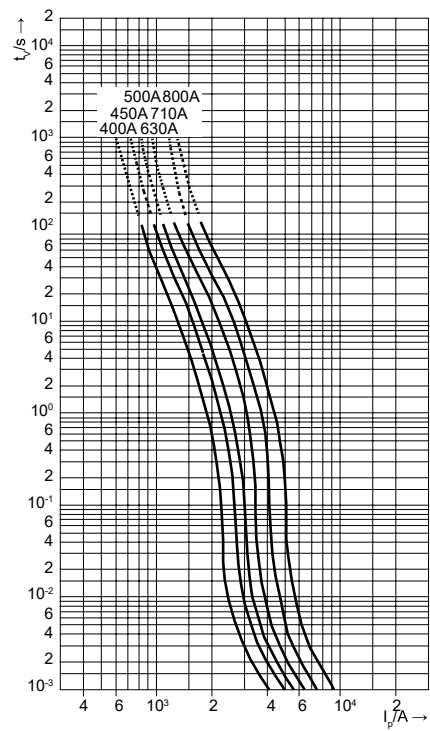
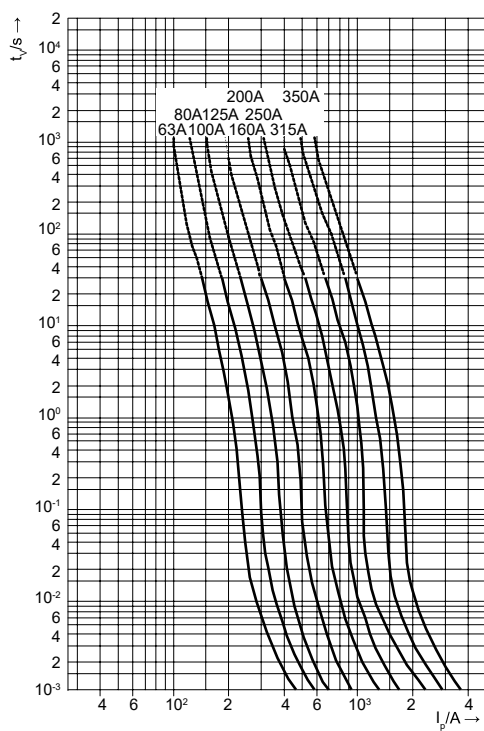
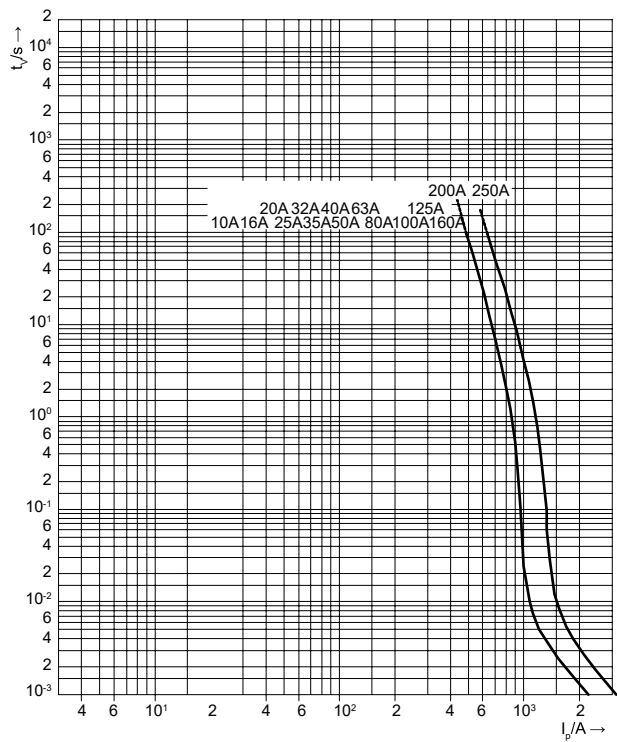


Fuses and Fuse Bases - Technical Information

HRC DIN Fuses

Time/current characteristics üf1

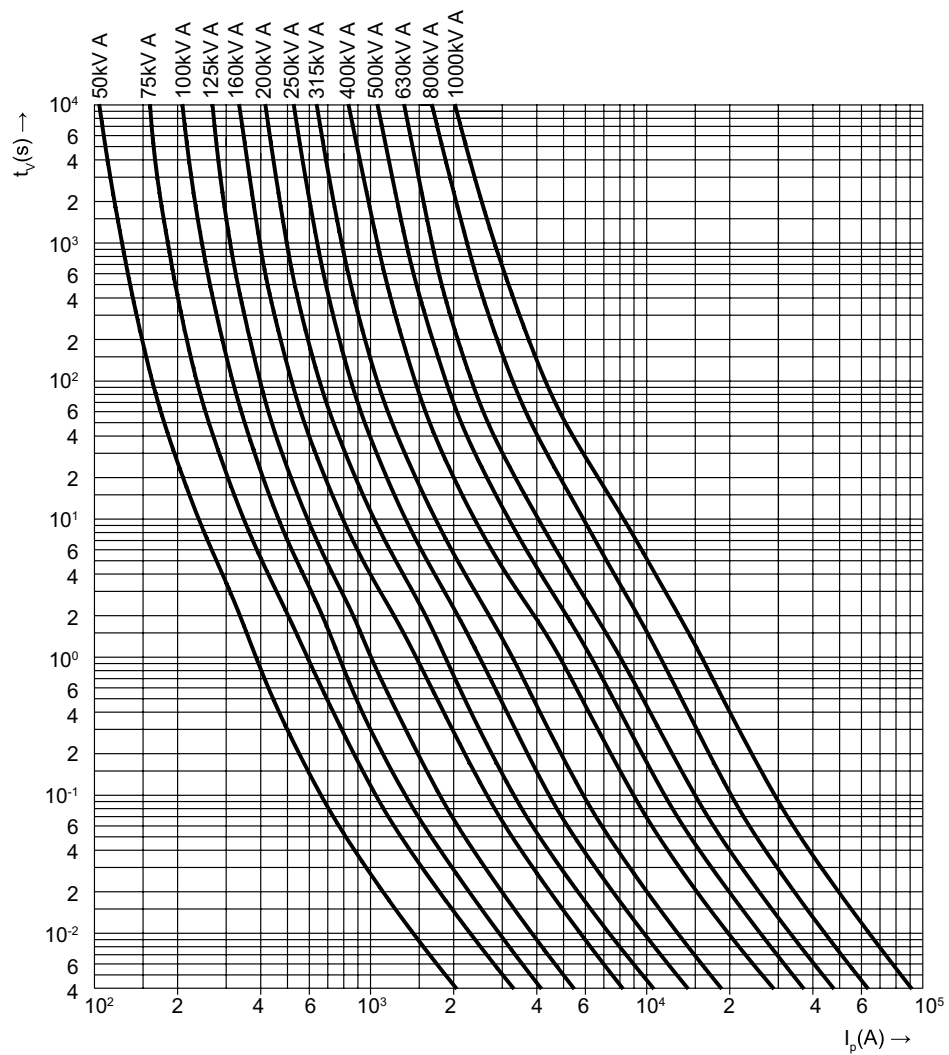
Very fast acting



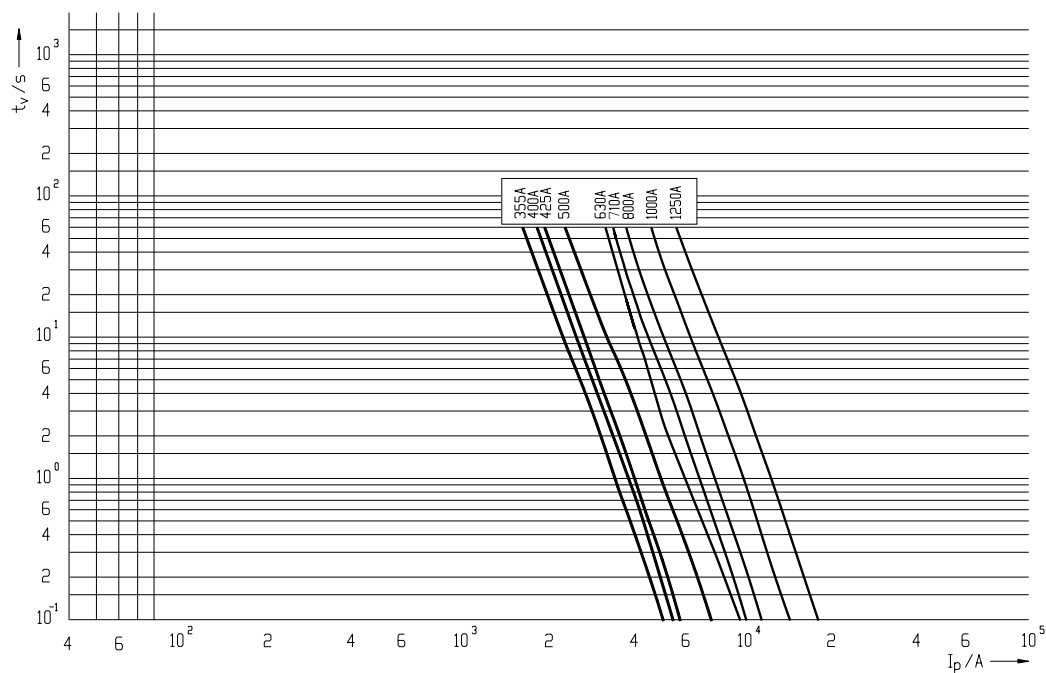
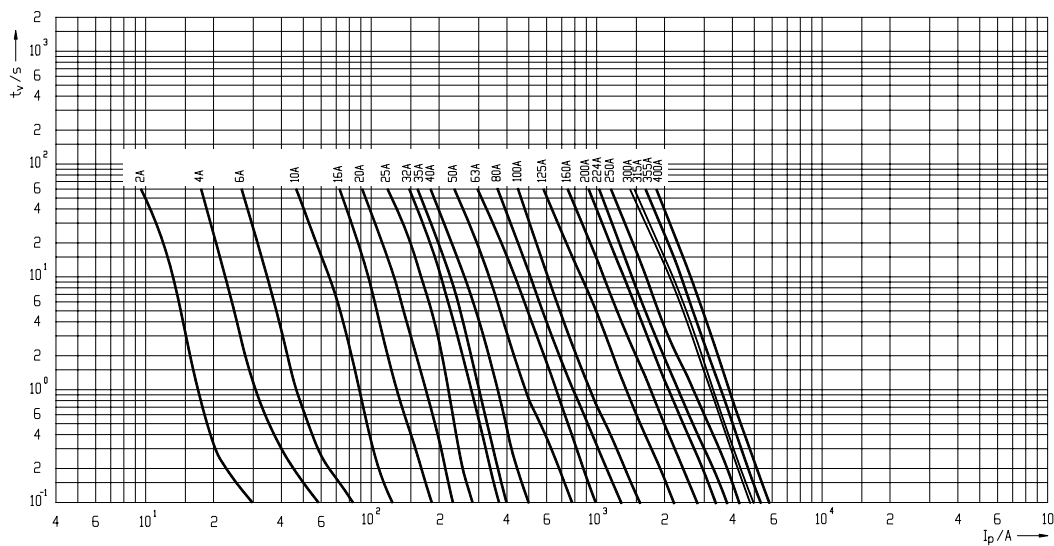
HRC DIN Fuses

Time/current characteristics gTr

Transformer range

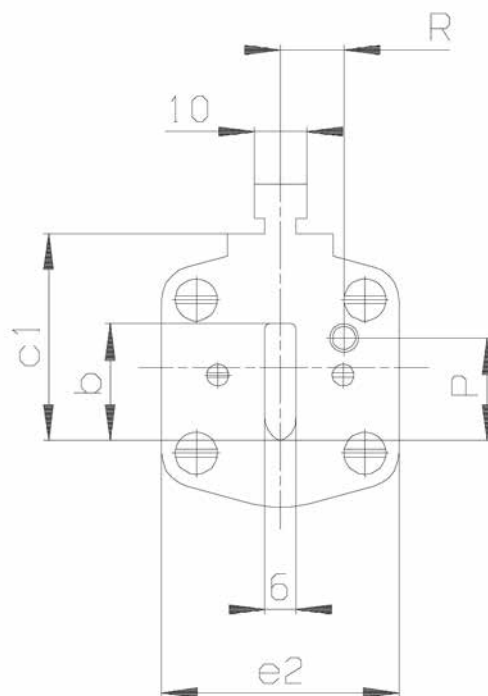
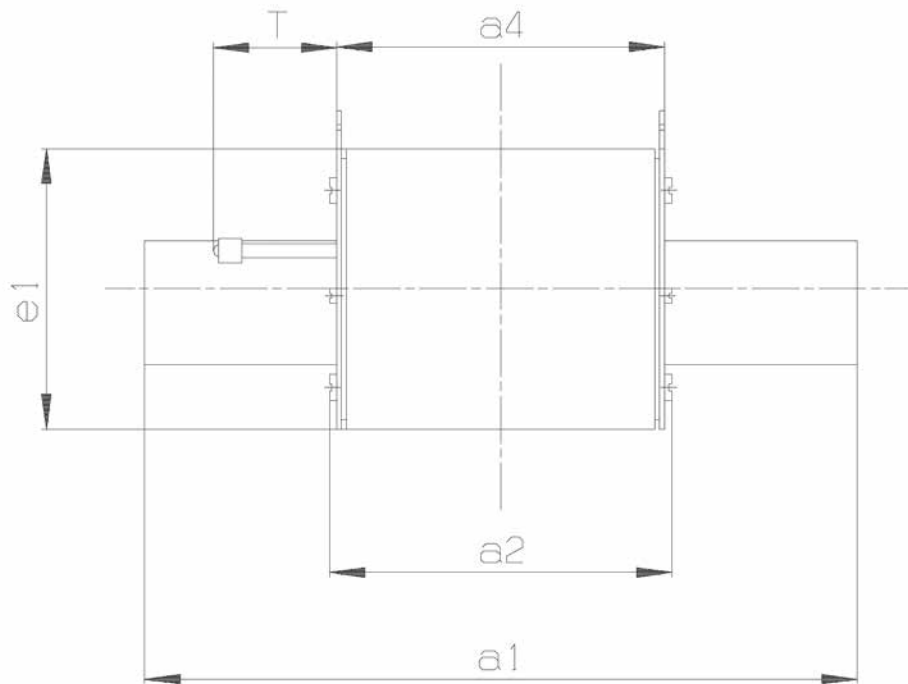


HRC DIN Fuses
Time/current characteristics gaM



Fuses and Fuse Bases - Dimensions

HRC fuses/ Striker fuses/aM fuses/Semiconductor



Fuses and Fuse Bases - Dimensions

Gg fuses 500V

Type	SM000	SM00	SM1		SM2		SM3			SM4a	
A	4-125	125-160	6-160	200-250	50-250	315-400	50-400	425-500	630	50-1000	1250-1600
a1	78,5	78,5	135	135	150	150	150	150	150	200	200
a2	53	53	68	72	72	72	72	72	72	87	87
a4	50	50	67	67	67	67	67	67	67	90	90
b	15	15	15	20	20	26	26	32	37	50	50
c1	35	35	40	40	48	48	60	60	60	85	85
e1	40	47	50	55	50	59	59	69	69	95	106
e2	21	29	28	46	46	54	54	64	64	87	95
Striker fuses only											
T	17	17	26		*	26	*	26	26	26	26
R	0	0	13,7		*	16,2	*	17	17	24	24
P	20,5	20,5	20,5		*	27,3	*	35,6	35,6	49	49

Dimensions in mm

* Striker types (K) always have dimensions of the respective size

Semi conductor fuses 690V

Type	SM000	SM1	SM2	SM3
A	10-160	6-250	50-400	50-630
a1	78	135	150	150
a2	55	72	72	72
a4	48	65	65	65
b	15	24	30	37
c1	35	40	48	60
e1	49	52	61	74
e2	27	46	54	64

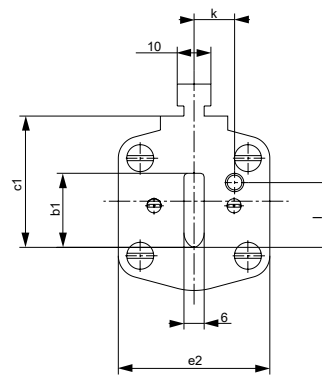
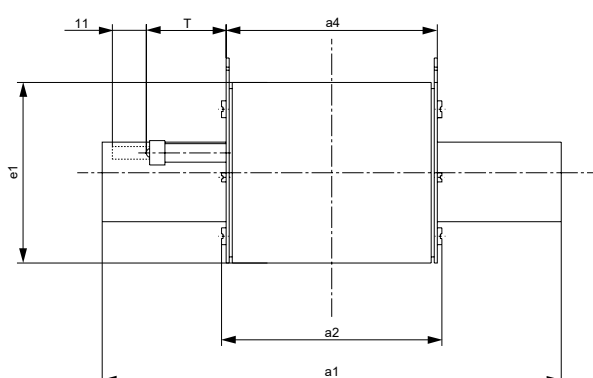
Dimensions in mm

aM fuses 690V

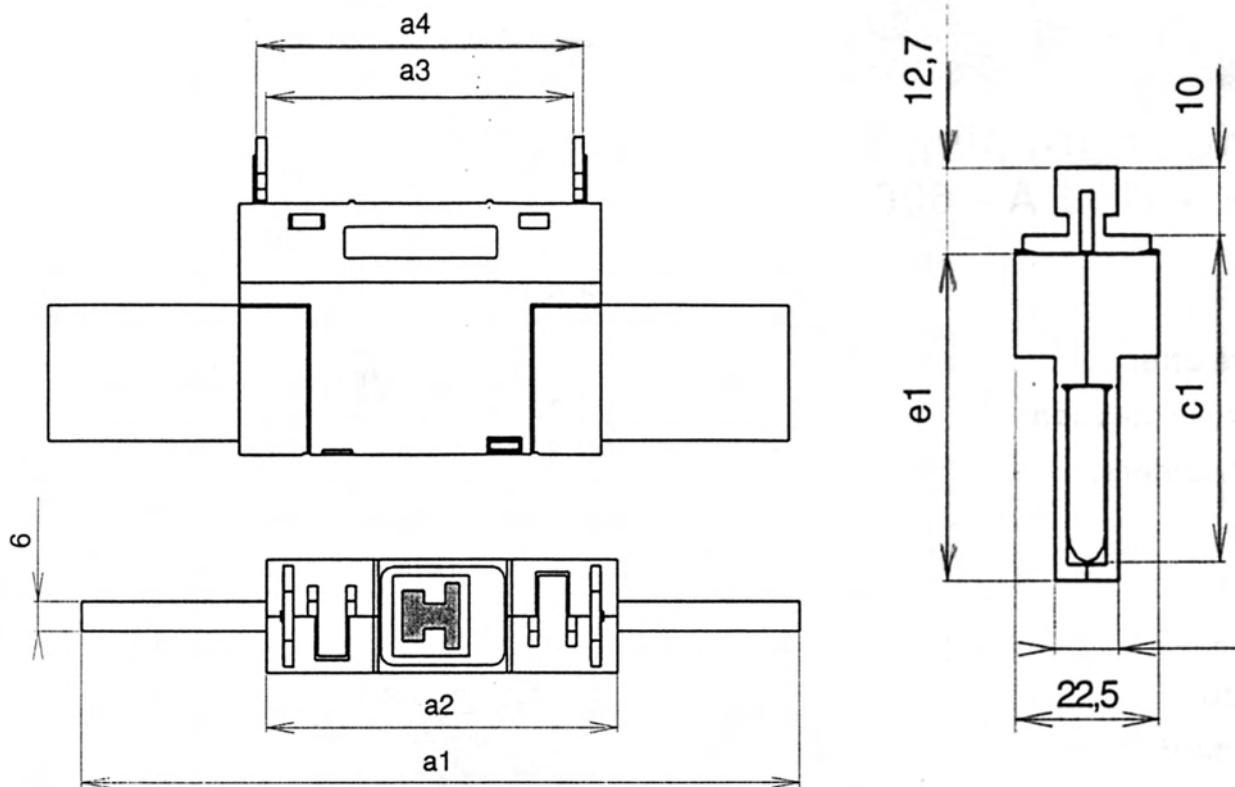
Type	SM000	SM00	SM1	SM2	SM3
A	16-63	80-160	125-250	200-400	500-630
a1	78,5	78,5	135	150	150
a2	53	53	72	72	72
a4	50	50	67	67	67
b	15	15	20	26	37
c1	35	35	40	48	60
e1	40	47	49	58	73
e2	21	29	46	54	73

Dimensions in mm

Type			M2GTR(TT) ...	M3GTR(TT) ...		
Dimensions	a1	mm	150	150	150	150
	a2		72	72	72	73
	a4		67	67	67	67
	b1		26	26	33	37
	c1		48	60	60	60
	e1		63	74	74	76
	e2		54	54	65	73
Weight	-	g	500	510	923	940



Solid link



DIN size	a1	a2	a3	a4	c1	e1
TM00-ISM	80	54	44.4	48.4	35	36
TM1-ISM	135	73.5	62.4	66.4	40	48.2
TM2-ISM	150	73.5	62.4	66.4	48	56.2
TM3-ISM	150	73.5	62.4	66.4	60	68.2



Vertical fuse disconnects

Vertical fuse disconnects are designed to receive NH fuse links. Hinged fuse-carriers enable opening and closing operation in electric circuits under load conditions. Thereby, the fuse-link or solid link forms the moving contact. Both, single pole and three-pole switching is possible.

Vertical fuse disconnects are used in Transformer stations and cable distribution cabinets of public utilities as well as low voltage switchgear and controlgear assemblies acc. to IEC/EN 61439-1. Their closed design and high breaking capacity make them extremely reliable and powerful fuse-combination units.





Product definition

Vertical fuse disconnects are three-pole fuse-switches for busbar mounting. They combine three single-pole fuse-switches longitudinally arranged in one unit. Each of the feeder terminals is directly connected to one phase of a three-phase busbar system. The outgoing terminals are equipped with terminals for cable conductors.

Applications

Vertical fuse disconnects conform to the requirements of public utilities and industrial companies for power distribution boards in ring main units, transformer substations, cable distribution cabinets as well as main distribution boards. Vertical fuse disconnects having built-in current transformers are essential devices for efficient energy management. With built-in fuse monitoring function they ensure short reaction time even in decentralized power distribution systems.

Product advantages

JEAN MÜLLER vertical fuse disconnects are available in sizes 00 to 3 for both single pole and three-pole switching operation. Product versions with built-in current transformers, feeder units up to 2000A rated current, and a wide range of specially designed products enable efficient and reliable power distribution.

Insulation parts

All insulating parts are made of high mechanical strength polymers are resistant to breaking, self extinguishing and halogen-free. The fuse-base insulator for 185mm busbar systems, which supports the current carrying parts, is made of high stability glass fibre reinforced thermosetting polyester, according to power utility specifications.

Current carrying parts

Silver-plated receiving contacts for DIN fuse-links ensure low power loss, optimum temperature behaviour and high breaking capacity. The tin-plated down leads are available with different types of terminals.

Thanks to the contact covers that provide safety from touch by the back of the hand, the products can be mounted on live busbar systems, provided the local safety rules allow for. The upper parts of vertical fuse disconnects including the fuse carriers can be easily mounted and fixed by means of turn-lock fasteners.

Product versions/Accessories

The products prepared for current transformers can be equipped with specifically designed current transformers inserted in the base insulator. Current transformers are available for primary currents ranging from 50A to 1000A.

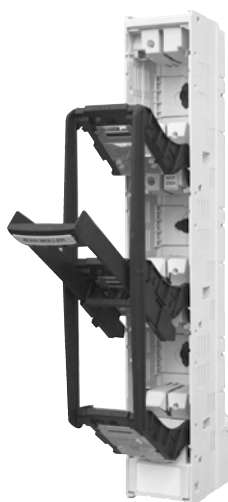
Vertical fuse disconnects



SL00-3X3/100/F/HA



SL00-3X3/185/F



SL1G-3X3/3A
SL2G-3X3/3A
SL3-3X3/3A



SL3-3X3/1000HA



SL3-3X6/1250/HA



SL00-3X/100/F/HA



SL00-3X/185/F



SL1G-3X/3A
SL2G-3X/3A
SL3-3X/3A



SL3-3X/1000HA



SL3-3X/910/HA



SL3-3X2/1250/HA

Terminal covers (sold separately) are required for all disconnects (refer to page 39)

Vertical fuse disconnects 3 pole switching in one action

Size	For Fuses	Current Rating (A)	Switch width (mm)	Busbar Centre Spacing (mm)	Inclusions	Part No.
00	DIN 000 & DIN00	160A	50 mm	100 mm	Terminal cover included	SL00-3X3/100/F/HA
00	DIN 000 & DIN00	160A	50 mm	185 mm	-	SL00-3X3/185/F
1	DIN 1	250A	100 mm	185 mm	-	SL1G-3X3/3A
2	DIN 1 & 2	400A	100 mm	185 mm	-	SL2G-3X3/3A
3	DIN 1, 2 & 3	630A	100 mm	185 mm	-	SL3-3X3/3A
3	DIN3	910A	100mm	185mm	Terminal cover double length included	SL3-3X3/910/HA
	Solid Links	1000A	100 mm	185 mm	Terminal cover & solid links included	SL3-3X3/1000/HA
	DIN 2 & DIN 3 (2)	1250A	200 mm	185 mm	Terminal cover double width included	SL3-3X6/1250/HA
3	DIN3	1600A	200mm	185mm	Terminal cover double width included	SL3-3X6/2000/HA

Vertical fuse disconnects 3 pole individual pole switching

Size	For Fuses	Current Rating (A)	Switch width (mm)	Busbar Centre Spacing (mm)	Inclusions	Part No.
00	DIN 000 & DIN00	160A	50mm	100mm	Terminal cover included	SL00-3X/100/F/HA
00	DIN 000 & DIN00	160A	50 mm	185 mm	-	SL00-3X/185/F
1	DIN 1	250A	100 mm	185 mm	-	SL1G-3X/3A
2	DIN 1 & 2	400A	100 mm	185 mm	-	SL2G-3X/3A
3	DIN 1, 2 & 3	630A	100 mm	185 mm	-	SL3-3X/3A
3	DIN3	910A	100mm	185mm	Terminal cover double length included	SL3-3X/910/HA
	Solid Links	1000A	100 mm	185 mm	Terminal cover & solid links included	SL3-3X/1000/HA
	DIN 2 & DIN 3 (2x)	1250A	200mm	185 mm	Terminal cover double width included	SL3-3X2/1250/HA
	DIN 2 & DIN 3 (2x)	1600A	200mm	185 mm	Terminal cover double width included	SL3-3X2/2000/HA

Vertical fuse buscouplers 3 pole switching in one action

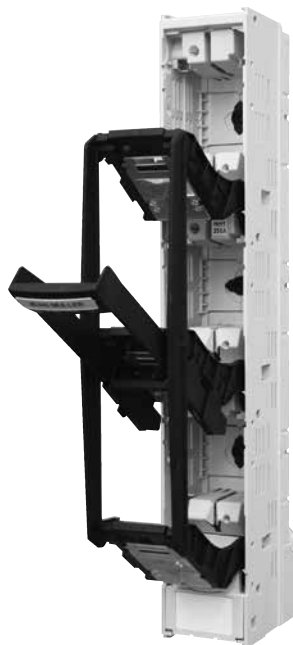
Size	For Fuses	Current Rating (A)	Switch width (mm)	Busbar Centre Spacing (mm)	Inclusions	Part No.
3	Solid Links	1000A (solid links only)	100 mm	185 mm	-	SLT3-3SL/3X3/1000

SL00 - refer to technical pages 40 & 41
SL1 & SL2 - refer to technical page 42
SL3 - refer to technical pages 44, 45 & 46
Accessories - refer to pages 38 & 39

Vertical fuse disconnects



REAR VIEW
With CTS Fitted



SL1G-3X3/W/3A
SL2G-3X3/W/3A
SL3-3X3/W/3A



SL3-3X3/1000/W/HA



SL1G-3X/W/3A
SL2G-3X/W/3A
SL3-3X/W/3A



SL3-3X/1000/W/HA

Terminal covers (sold separately) are required for all disconnects (refer to page 39)

Vertical fuse disconnects with CT mount facility - 3 pole switching in one action

Size	For Fuses	Current Rating (A)	Switch width (mm)	Busbar Centre Spacing (mm)	Part No.
2	DIN2	400	100	185	SL2-3X3/W/3A
3	DIN2 & DIN3	630	100	185	SL3-3X3/W/3A
	Solid Links	1000A (Solid links only)	100	185	SL3-3X3/1000/W/HA

Vertical fuse disconnects with CT mount facility - 3 pole individual pole switching

Size	For Fuses	Current Rating (A)	Switch width (mm)	Busbar Centre Spacing (mm)	Part No.
2	DIN2	400	100	185	SL2-3X/W/3A
3	DIN2 & DIN3	630	100	185	SL3-3X/W/3A
	Solid Links	1000A (Solid links only)	100	185	SL3-3X/1000/W/HA

Current transformers for above class 1

				Ratio	Part No.
				250:5	WKD51/1/250-5
				400:5	WKD51/1/400-5
				600:5	WKD51/1/600-5
				1000:5	WKD52/1/1000-5

Vertical fuse disconnects

POWER UTILITIES RANGE

Vertical fuse disconnects with 3 pole switching in one action

Size	For Fuses	Current Rating (A)	Terminals	Switch width (mm)	Connection Capacity (mm2)	Part No.
00	DIN000 & 00	160	M8 Bolt	50	max. 95	PU-SL00-3X3/185/F
1	DIN1	250	M10 Bolt	100	max. 150	PU-SL1H-3X3/3A
2	DIN1 & 2	400	M12 Bolt	100	max. 240	PU-SL2H-3X3/3A
3	DIN1, 2 & 3	630	M12 Bolt	100	max. 300	PU-SL3-3X3/3A

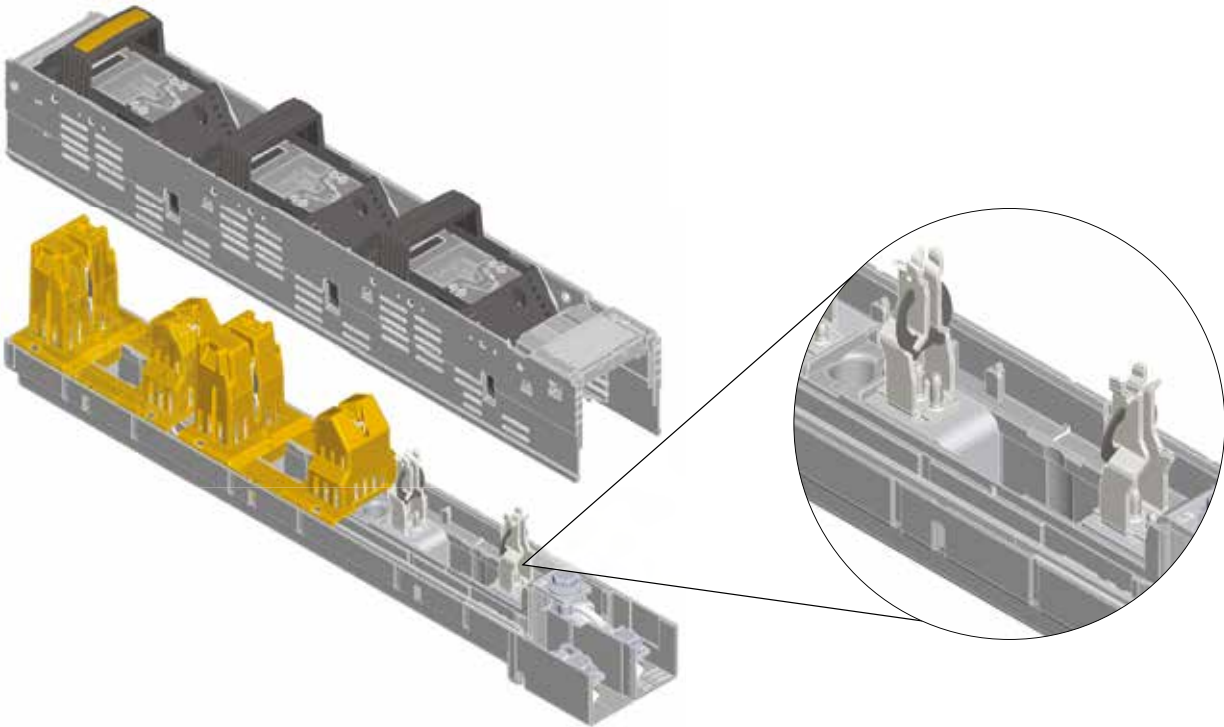
Vertical fuse disconnects with 3 pole individual switching action

Size	For Fuses	Current Rating (A)	Terminals	Switch width (mm)	Connection Capacity (mm2)	Part No.
00	DIN000 & 00	160	M8 Bolt	50	max. 95	PU-SL00-3X/185/F
1	DIN1	250	M10 Bolt	100	max. 150	PU-SL1H-3X/3A
2	DIN1 & 2	400	M12 Bolt	100	max. 240	PU-SL2H-3X/3A
3	DIN1, 2 & 3	630	M12 Bolt	100	max. 300	PU-SL3-3X/3A



PU

SL00 - refer to technical pages 40 &41
 SL1H & SL2H - refer to technical page 43
 SL3 - refer to technical page 44
 Accessories - refer to pages 38 & 39



Universal measuring devices



UMG96RM

	Part No.
3 phase display indicating:	UMG96RM
- voltage, L-L, L-N, max values, min values - current L1, L2, L3, N, average, max, MDI - frequency and power factor - real power, W per phase, sum & max - apparent power, VA per phase, sum & max - reactive power, VAR per phase, sum & max - energy kWh total and kVARh total - total harmonic distortion - 2x digital outputs - RS485 interface - data memory	



MDI metering - complete solutions

3 Phase metering using UMG96RMmeter	Part No.
The following three items are all that is needed to construct a fully metered vertical disconnect.	
Vertical disconnect from page 35	SL*-3X*/W/3A
Current transformers from page 35 (3x reqd)	WKD51/1/***-5
UMG96RM mounted in an IP65 enclosure Enclosure dimensions 130 x 130 x 100mm A bracket on the enclosure provides easy mounting on the top of the disconnect. The meter is fully wired for connection to the CTs and to the three phase supply and neutral. The phase connections are wired through 5A fuses.	UMG96RM/ENCL

Vertical fuse disconnects

Accessories



Description		For Mounting on	Part No.
Prism clamp			
	10-70 mm ² Al/Cu	SL00	P0070



Clip terminal			
	1,5-70 mm ² Cu	SL00	S00



Direct terminal clamp KM2G..			
	50-300 mm ² Al/Cu	SL1-3	KM2G/AF3040



Direct terminal clamp			
	70-240 mm ² Al/Cu	SL1-3	K2G/A



Direct terminal clamp			
	2 conductors 50-120 mm ² Al/Cu	SL1-3	K2HG/2/AF30

Direct terminal clamp			
	2 conductors 120-185 mm ² Al/Cu	SL1-3	KV2HG/2/WF30



Cover for clamp			
	For V-type box clamp type KM2G		HRV
	For clamp type K2G/A, K2HG/ and KV2HG		HR-K2

Accessories



Description	For Mounting on	Part No.
CT Mounting block		
CT Block SL 123 Empty	SL1, SL2, SL3	WB-SL-123
WB-SL-123 Connect Block WKD52	SL1, SL2, SL3	WB-SL-123 Connect Block WKD52
WB-SL-123 Wiring loom WKD51	SL1, SL2, SL3	WB-SL-123 Wiring loom WKD51
Mounting aid CT Block SL 123	SL1, SL2, SL3	WB-SL-HOOK



Terminal cover			
For SL00-185 + PU-SL00	SL00/185	HA-SL00/185	
For SL123 + PU-SL123	SL1-3	HA-SL123/10	
For SL3-3X/1000 Extended depth+ PU-SL3x	SL3	HA220-SL123/10	
Double width terminal cover	SL3	HA220-SL3x2/10	



Terminal extension kit			
Terminal for 2x300mm ² + PU (3 Pieces)	SL1-3	VS-SL3/1000	
Terminal kit for ganged disconnect 3 x 300mm +PU	SL1-3	VS-SL3x2	
For connection of 4 x 240mm ² Ganged disconnect	SL3	VS-SL3/4x240mm ²	
For connection of 1 x 400mm ²	SL3	VS-SL3/400QMM	



Handle connecting kit			
For ganged disconnect (1x handle Joiner)	SL3	VBS-SL3X6(2)	
Isolator label	SL1,2+3	Isolator-lab	
Joining Kit (3x handles connection link)		VBS-SL3 Kit	
Joining Kit to make SL3-3X2/1250	SL3	VS-SL3/1250VBS/HA	



Fuse cover with symbol "Do not switch"			
Size 00		SZ00-R	
Size 1-3		SZ123-R	



Cover holder			
Set of 4 blocks	SL00-3	AH-SL	



Switch Posi Indicator			
For Vert 3x3 only	SL1,2+3	EV-SL123/3x3/10	

Vertical fuse disconnects - Technical Information

NH strip-type fuse-switch-disconnectors – Technical data

Type		SL00/100			SL00/185			
Electrical characteristics	According to standard				DIN EN 60947-3			
	For NH fuse-links acc. to DIN VDE 0636-2		Size		000/00	000/00		
	Rated operational voltage		U _e	V	AC690	AC690		
	Rated operational current ¹⁾		I _e	A	160	160		
	Conv. free air thermal current with fuse-links		I _{th}	A	160	160		
	Conv. free air thermal current with solid-links		I _{th}	A	210	210		
	Rated frequency		f	Hz	50-60	50-60		
	Rated insulation voltage		U _i	V	AC800	AC800		
	Total power loss at I _{th} (without fuse-links)		P _v	W	18	23		
	Power loss at 80% I _{th} (without fuse-links) ²⁾		P _v	W	11.5	14.7		
	Rated impulse withstand voltage		U _{imp}	kV	8	8		
	Utilization category		-	-	AC-22B (160A/400V) AC-22B (160A/500V) AC-22B (100A/690V) DC21B (160A/250V)	AC-23B (160A/400V) AC-23B (160A/500V) AC-22B (160A/690V)		
	Rated conditional short-circuit current ³⁾		I _{cc}	kA	80	100kA (690V) 120kA (500V)		
	Max. permis. power loss per fuse-link		P _a	W	12	12		
Cable terminal	Flat terminal	Bolt diameter	-	-	M8	M8		
		Cable lug	-	mm ²	1 x 10-95 (max. 25mm width)	1 x 10-95 (max. 25mm width)		
		Flat bar	-	mm	20 x10	20 x10		
		Tightening torque	M _a	Nm	12-15	12-15		
	Clamp	Clamping cross-section	-	mm ²	S00	○ : 1.5-70 Cu/ □ : 6 x 9 x 0.8	S00	○ : 1.5-70 Cu/ □ : 6 x 9 x 0.8
		Tightening torque	-	Nm		2.6		2.6
		Clamping cross-section	-	mm ²	P00-70	10-70 Al/Cu	P00-70	10-70 Al/Cu
		Tightening torque	-	Nm		2.6		2.6

Annotation: ○ = Round conductor □ = Strip conductor

Type					SL00/100		SL00/185	
Cable terminal	Clamp	Clamping cross-section	-	mm ²	KU00	10-95 Al/Cu ⁵⁾	KU00	10-95 Al/Cu ⁵⁾
		Tightening torque	-	Nm		10		15
		Clamping cross-section	-	mm ²	F70	○ : 1.5-70 Cu/ □ : 6 x 9 x 0.8Cu	KRO	16-95 re/rm 35-150 se/sm
		Tightening torque	-	Nm		2.6		20Nm
		Clamping cross-section	-	mm ²	KM00	16-95 Al/Cu	KM00	16-95 Al/Cu
		Tightening torque	-	Nm		10		10
Degree of protection	Front side, device fitted with clamp and lateral covers	Operating condition	-	-	IP30		IP30	
		Switching element open	-	-	IP10		IP10	
Operating conditions	Ambient temperature ⁴⁾		T _{amb}	°C	-25 to +70			
	Rated operating mode		-	-	Uninterrupted duty			
	Actuation		-	-	Dependent manual operation			
	Mounting position		-	-	Vertical, horizontal			
	Altitude		-	m	Up to 2000			
	Pollution degree		-	-	3			
	Overvoltage category		-	-	III		IV	

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) Type tested with NH fuse-links characteristic gG.

4) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

5) No verification of non-deterioration acc. to IEC 60269-2 for Al-conductors.

Vertical fuse disconnects - Technical Information

NH strip-type fuse-switch-disconnectors – Technical data

Type					SL1G		SL2G		
Electrical characteristics	According to standard				DIN EN 60947-3				
	For NH fuse-links acc. to DIN VDE 0636-2		Size		1		2		
	Rated operational voltage		U _e	V	AC690		AC690		
	Rated operational current ¹⁾		I _e	A	250		400		
	Conv. free air thermal current with fuse-links		I _{th}	A	250		400		
	Conv. free air thermal current with solid-links		I _{th}	A	400		630		
	Rated frequency		-	Hz	50-60		50-60		
	Rated insulation voltage		U _i	V	AC1000		AC1000		
	Total power loss at I _{th} (without fuse-links)		P _v	W	23		54		
	Power loss at 80% I _{th} (without fuse-links) ²⁾		P _v	W	14.7		34.6		
	Rated impulse withstand voltage		U _{imp}	kV	12		12		
	Utilization category		-	-	AC-23B (250A/400V) AC-22B (250A/500V) AC-21B (250A/690V) Only 3x3: DC21B (250A/440V)		AC-23B (400A/400V) AC-22B (400A/500V) AC-21B (400A/690V) Only 3x3: DC21B (400A/440V)		
	Rated conditional short-circuit current ³⁾		I _{cc}	kA	80				
	Max. permis. power loss per fuse-link		P _a	W	32		45		
Cable terminal	Flat terminal	Bolt diameter	-	-	M10		M12		
		Cable lug	-	mm ²	1 x 25-185		1 x 25-300		
		Flat bar	-	mm	30 x10		30 x10		
		Tightening torque	M _a	Nm	30-35		35-40		
	Clamp	Clamping cross-section	-	mm ²	KM2G-F	25-240	KM2G-F	25-240	
			-	mm ²	RM300	25-300	RM300	25-300	
		Tightening torque	-	Nm	-	32	-	32	
			-	Nm	RM300: 25-70	12	RM300: 25-70	12	
Degree of protection	Front side, device fitted with clamp and lateral covers	Operating condition	-	-	IP30		IP30		
		Switching element open	-	-	IP10		IP10		
Operating conditions	Ambient temperature ⁴⁾		T _{amb}	°C	-25 to +70				
	Rated operating mode		-	-	Uninterrupted duty				
	Actuation		-	-	Dependent manual operation				
	Mounting position		-	-	Vertical, horizontal				
	Altitude		-	m	Up to 2000				
	Pollution degree		-	-	3				
	Overvoltage category		-	-	IV				

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) Type tested with NH fuse-links characteristic gG.

4) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

Type					SL1H		SL2H				
Electrical characteristics	According to standard				DIN EN 60947-3						
	For NH fuse-links acc. to DIN VDE 0636-2			Size		1		2			
	Rated operational voltage			U _e	V	AC690		AC690			
	Rated operational current ¹⁾			I _e	A	250		400			
	Conv. free air thermal current with fuse-links			I _{th}	A	250		400			
	Conv. free air thermal current with solid-links			I _{th}	A	400		400			
	Rated frequency			-	Hz	50-60		50-60			
	Rated insulation voltage			U _i	V	AC1000		AC1000			
	Total power loss at I _{th} (without fuse-links)			P _v	W	29		73			
	Power loss at 80% I _{th} (without fuse-links) ²⁾			P _v	W	18.6		46.7			
	Rated impulse withstand voltage			U _{imp}	kV	12		12			
	Utilization category			-	-	AC-23B (250A/400V) AC-22B (250A/500V) AC-21B (250A/690V)		AC-23B (400A/400V) AC-22B (400A/500V) AC-21B (400A/690V)			
	Rated conditional short-circuit current ³⁾			I _{cc}	kA	120					
	Max. permis. power loss per fuse-link			P _a	W	23		34			
Cable terminal	Flat terminal	Bolt diameter	-	-	M10		M12				
		Cable lug	-	mm ²	1 x 25-150		1 x 25-240				
		Flat bar	-	mm	30 x10		30 x10				
		Tightening torque	M _a	Nm	30-35		35-40				
	Clamp	Clamping cross-section	-	mm ²	KM2G-F	25-240	KM2G-F	25-240			
			-	mm ²	RM300	25-300	RM300	25-300			
		Tightening torque	-	Nm	-	32	-	32			
			-	Nm	RM300: 25-70	12	RM300: 25-70	12			
Degree of protection	Front side, device fitted with clamp and lateral covers	Operating condition	-	-	IP30		IP30				
		Switching element open	-	-	IP10		IP10				
Operating conditions	Ambient temperature ⁴⁾			T _{amb}	°C	-25 to +70					
	Rated operating mode			-	-	Uninterrupted duty					
	Actuation			-	-	Dependent manual operation					
	Mounting position			-	-	Vertical, horizontal					
	Altitude			-	m	Up to 2000					
	Pollution degree			-	-	3					
	Overvoltage category			-	-	IV					

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) Type tested with NH fuse-links characteristic gG.

4) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

Vertical fuse disconnects - Technical Information

NH strip-type fuse-switch-disconnectors – Technical data

Type					SL3		SL3/910A		
Electrical characteristics	According to standard				DIN EN 60947-3				
	For NH fuse-links acc. to DIN VDE 0636-2			Size		3		3	
	Rated operational voltage			U _e	V	AC690		AC400	
	Rated operational current ¹⁾			I _e	A	630		910	
	Conv. free air thermal current with fuse-links			I _{th}	A	630		910	
	Conv. free air thermal current with solid-links			I _{th}	A	800		1250	
	Rated frequency			-	Hz	50-60		50-60	
	Rated insulation voltage			U _i	V	AC1000		AC690	
	Total power loss at I _{th} (without fuse-links)			P _v	W	115		155	
	Power loss at 80% I _{th} (without fuse-links) ²⁾			P _v	W	73.6		99.2	
	Rated impulse withstand voltage			U _{imp}	kV	12		8	
	Utilization category			-	-	AC-23B (630A/400V) AC-22B (630A/500V) AC-21B (630A/690V) Nur / Only 3x3: DC21B (500A/440V)		AC-22B (1250A/400V) AC-22B (910A/400V)	
	Rated conditional short-circuit current			I _{cc}	kA	120 ³⁾		80	
	Rated short-time withstand current			I _{cw}	kA	10/15kA/1s ⁴⁾		10/15kA/1s ⁴⁾	
	Max. permis. power loss per fuse-link			P _a	W	48		61	
Cable terminal	Flat terminal	Bolt diameter	-	-	M12		2 x M12		
		Cable lug	-	mm ²	1 x 25-300	Width max. 43mm	2 x 300, 3 x 185		
		Flat bar	-	mm	30 x10		80 x10		
		Tightening torque	M _a	Nm	35-40		35-40		
	Clamp	Clamping cross-section	-	mm ²	KM2G	25-150/ 185-300	-	-	
			-	mm ²	KM2G-F	25-240	-	-	
			-	mm ²	RM300	25-300	-	-	
		Tightening torque	-	Nm	-	32	-	32	
			-		RM300: 25-70	12	RM300: 25-70	12	
Degree of protection			Front side, device fitted with clamp and lateral covers	Operating condition	-	-	IP30		IP30
	Switching element open	-		-	IP10		IP10		
Operating conditions	Ambient temperature ⁵⁾			T _{amb}	°C	-25 to +70			
	Rated operating mode			-	-	Uninterrupted duty			
	Rated operating mode			-	-	Dependent manual operation			
	Mounting position			-	-	Vertical, horizontal			
	Altitude			-	m	Up to 2000			
	Pollution degree			-	-	3			
	Overvoltage category			-	-	IV			

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) Type tested at AC420V with NH fuse-links 630A/500V characteristic gG, at AC725V with NH fuse-links 500A/690V characteristic gG.

4) 1-pole/3-pole switchable.

5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

Type			SL3/1000-TM		SL3/1250	
Electrical characteristics	According to standard			DIN EN 60947-3		
	For NH fuse-links acc. to DIN VDE 0636-2		Size		3	3
	Rated operational voltage		U _e	V	AC690	AC690
	Rated operational current ¹⁾		I _e	A	1000	1250
	Conv. free air thermal current with fuse-links		I _{th}	A	630	1250
	Conv. free air thermal current with solid-links		I _{th}	A	1000	1600
	Rated frequency		-	Hz	50-60	50-60
	Rated insulation voltage		U _i	V	AC1000	AC1000
	Total power loss at I _{th} (without fuse-links)		P _v	W	275	215
	Power loss at 80% I _{th} (without fuse-links) ²⁾		P _v	W	176	138
	Rated impulse withstand voltage		U _{imp}	kV	12	12
	Utilization category		-	-	AC-22B (1000A/400V) AC-22B (800A/500V) AC-21B (630A/690V)	AC-22B (1250A/400V) AC-22B (1250A/500V) AC-21B (1250A/690V)
	Rated conditional short-circuit current		I _{cc}	kA	120 ³⁾	80
	Rated short-time withstand current		I _{cw}	kA	10/15/25/1s ⁴⁾	20/25/46/1s ⁴⁾
	Max. permis. power loss per fuse-link		P _a	W	51	48
Cable terminal	Flat terminal	Bolt diameter	-	-	2 x M12	3 x M12
		Cable lug	-	mm ²	2 x 300, 3 x 120	3 x 300, 4 x 185
		Flat bar	-	mm	80 x10	-
		Tightening torque	M _a	Nm	35-40	35-40
Degree of protection	Front side, device fitted with clamp and lateral covers	Operating condition	-	-	IP30	IP30
		Switching element open	-	-	IP10	IP10
Operating conditions	Ambient temperature ⁵⁾		T _{amb}	°C	-25 to +70	
	Rated operating mode		-	-	Uninterrupted duty	
	Rated operating mode		-	-	Dependent manual operation	
	Mounting position		-	-	Vertical, horizontal	
	Altitude		-	m	Up to 2000	
	Pollution degree		-	-	3	
	Overvoltage category		-	-	IV	

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) Type tested at AC420V with NH fuse-links 630A/500V characteristic gG, at AC725V with NH fuse-links 500A/690V characteristic gG.

4) 1-pole/3-pole switchable/with additional interlock.

5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

Vertical fuse disconnects - Technical Information

NH strip-type fuse-switch-disconnectors – Technical data

Type		SL3/1600-TM			SL3/2000-TM	
Electrical characteristics	According to standard			DIN EN 60947-3		
	For NH fuse-links acc. to DIN VDE 0636-2		Size		3	3
	Rated operational voltage		U _e	V	AC690	AC400
	Rated operational current ¹⁾		I _e	A	1600	2000
	Conv. free air thermal current with fuse-links		I _{th}	A	1250	gG 1600/gTr 1444
	Conv. free air thermal current with solid-links		I _{th}	A	1600	2000
	Rated frequency		-	Hz	50-60	50-60
	Rated insulation voltage		U _i	V	AC1000	AC690
	Total power loss at I _{th} (without fuse-links)		P _v	W	350	375
	Power loss at 80% I _{th} (without fuse-links) ²⁾		P _v	W	224	240
	Rated impulse withstand voltage		U _{imp}	kV	12	8
	Utilization category		-	-	AC-22B (1600A/400V) AC-22B (1600A/500V) AC-21B (1250A/690V)	AC-22B (2000A/400V)
	Rated conditional short-circuit current ³⁾		I _{cc}	kA	80	50
	Rated short-time withstand current		I _{cw}	kA	20/25/46/1s ⁴⁾	20/25/46/1s ⁴⁾
	Max. permis. power loss per fuse-link		P _a	W	48	51
Cable terminal	Flat terminal	Bolt diameter	-	-	3 x M12	4 x M12
		Cable lug	-	mm ²	3 x 300, 4 x 185	4 x 300
		Flat bar	-	mm	-	-
		Tightening torque	M _a	Nm	35-40	35-40
Degree of protection	Front side, device fitted with clamp and lateral covers	Operating condition	-	-	IP30	IP30
		Switching element open	-	-	IP10	IP10
Operating conditions	Ambient temperature ⁵⁾		T _{amb}	°C	-25 to +70	
	Rated operating mode		-	-	Uninterrupted duty	
	Rated operating mode		-	-	Dependent manual operation	
	Mounting position		-	-	Vertical, horizontal	
	Altitude		-	m	Up to 2000	
	Pollution degree		-	-	3	
	Overvoltage category		-	-	IV	

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to EN 61439-1.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

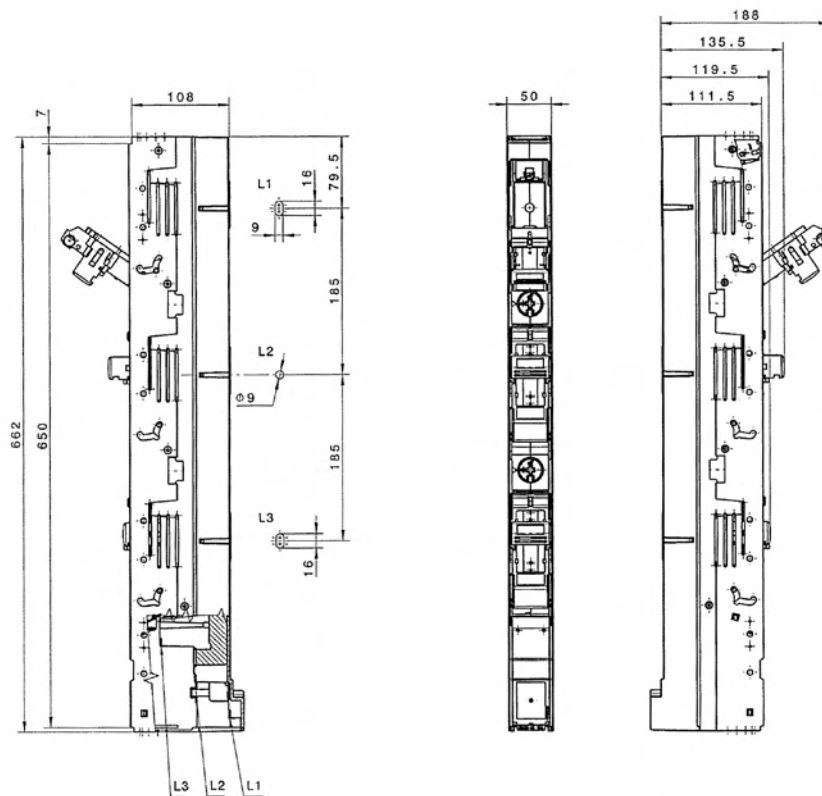
3) Type tested with NH fuse-links characteristic gG.

4) 1-pole/3-pole switchable/with additional interlock.

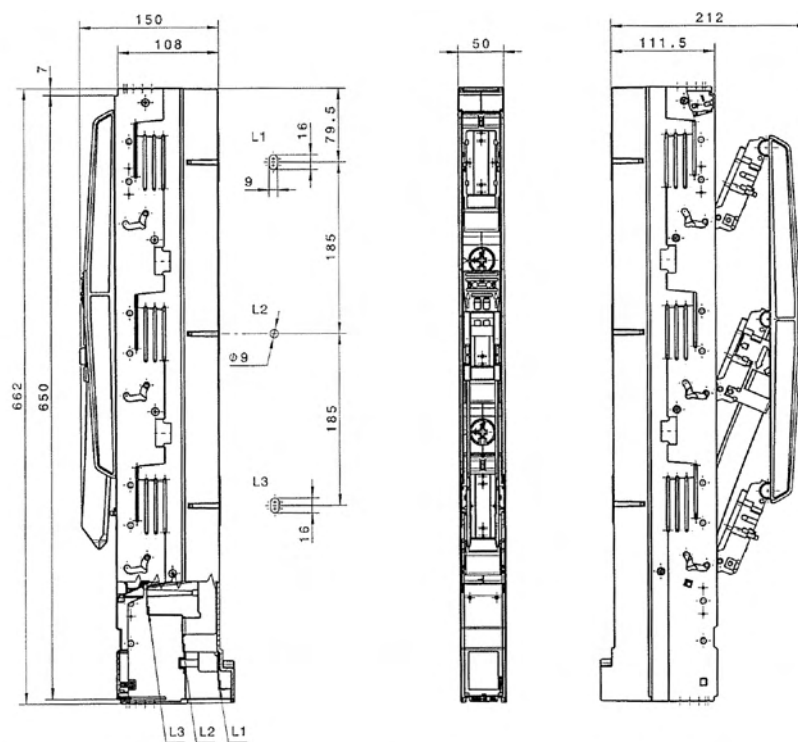
5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

Vertical fuse disconnects - Dimensions

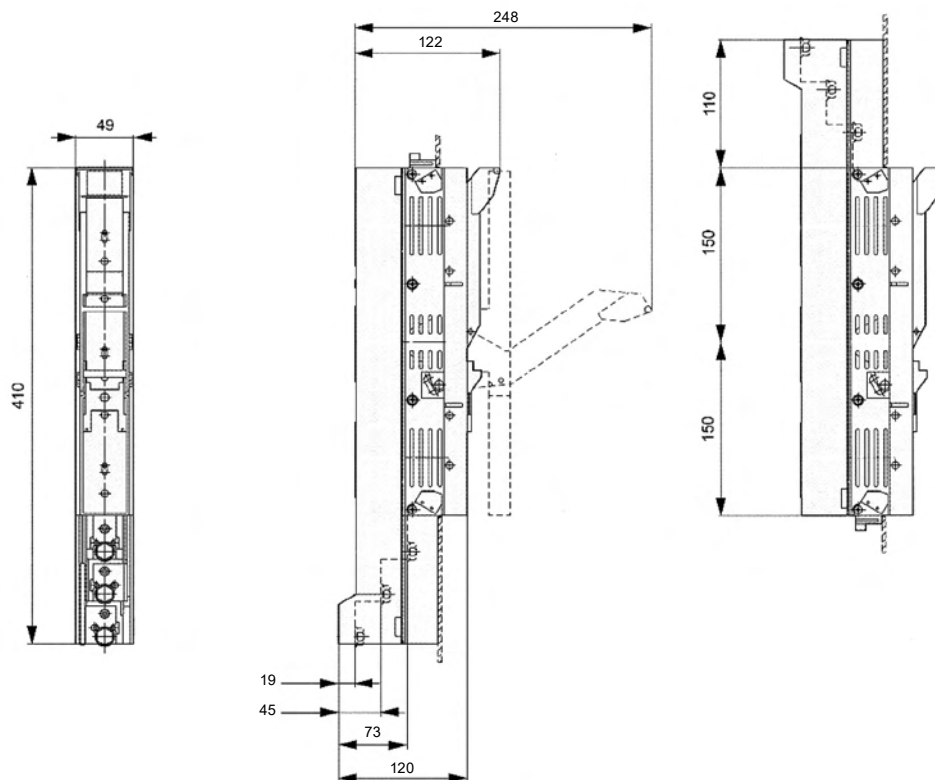
SL00-3X/185/F
PU-SL00-3X/185/F



SL00-3X3/185/F
PU-SL00-3X3/185/F



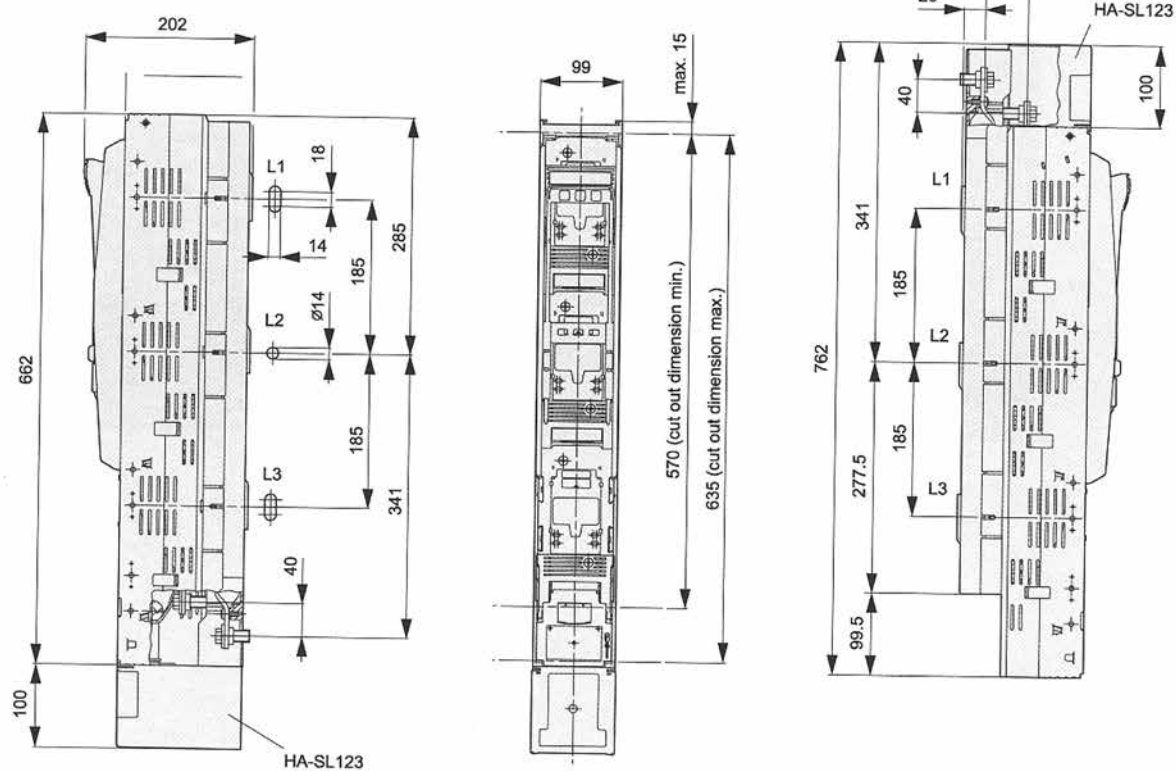
SL00-3X../100



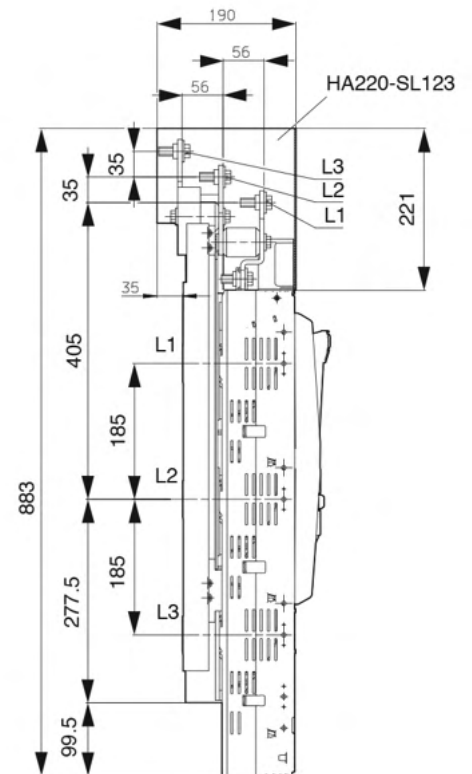
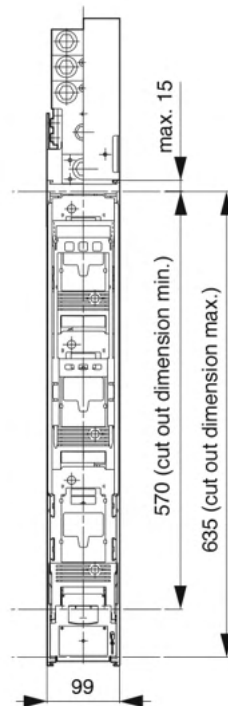
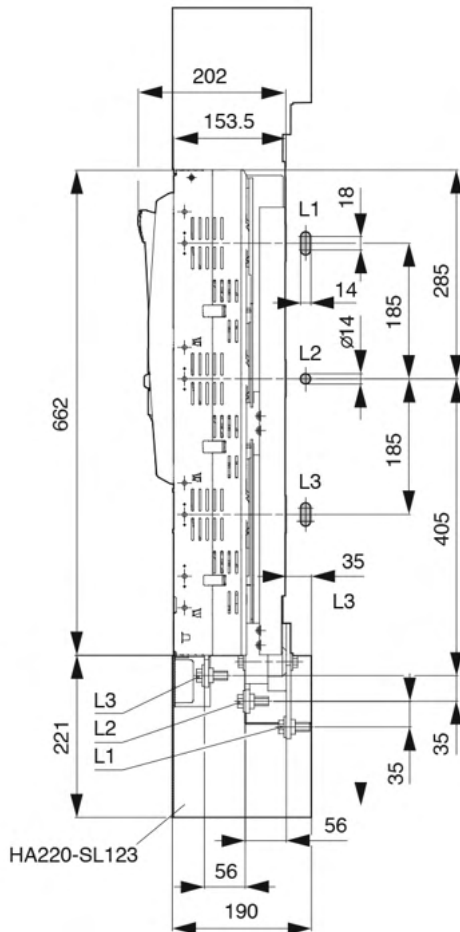
SL1G-3X/3A
SL2G-3X3/3A
SL2G-3X/3A
SL2G-3X3/3A
SL3-3X/3A
SL3-3X3/3A

SL1G-3X/W/3A
SL2G-3X3/W/3A
SL2G-3X/W/3A
SL2G-3X3/W/3A
SL3-3X/W/3A
SL3-3X3/W/3A

PU-SL1H-3X/3A
 PU-SL1H-3X3/3A
 PU-SL2H-3X/3A
 PU-SL2H-3X3/3A
 PU-SL3H-3X/3A
 PU-SL3H-3X3/3A



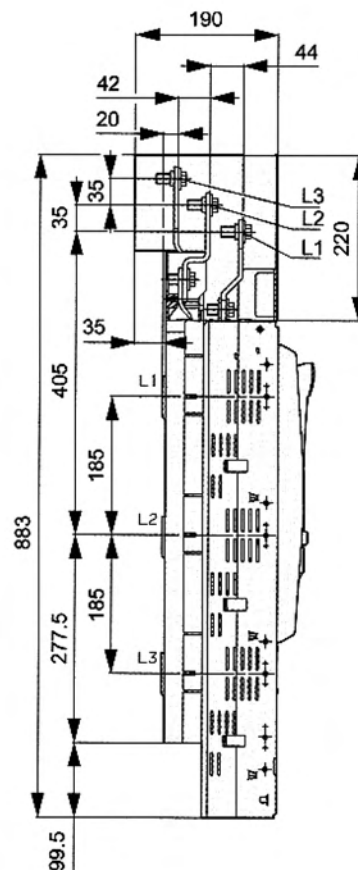
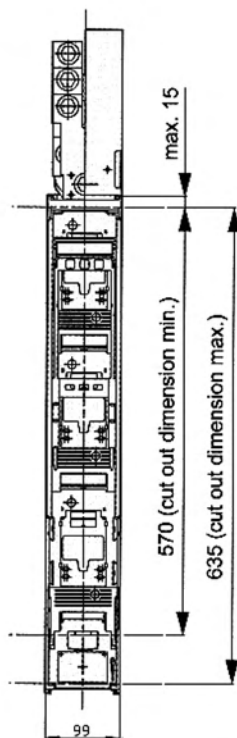
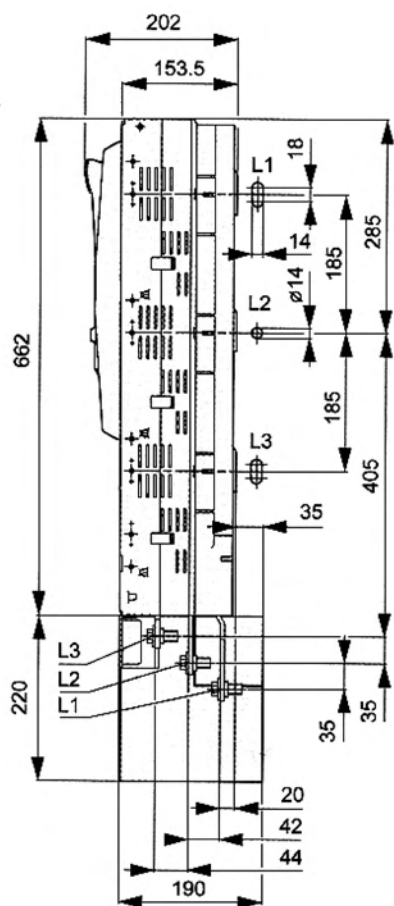
SL3-3X/910/HA
SL3-3X3/910/HA



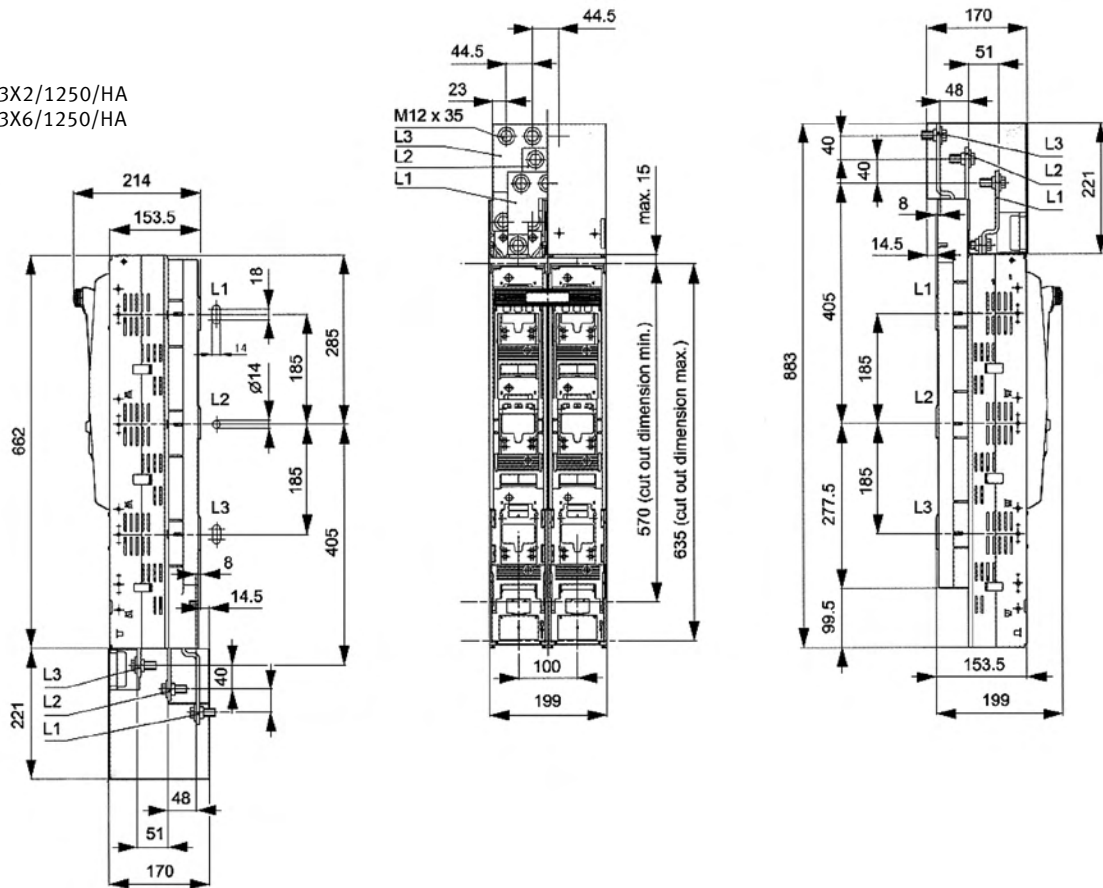
Vertical fuse disconnects - Dimensions

SL3-3X/1000/HA
SL3-3X3/1000/HA

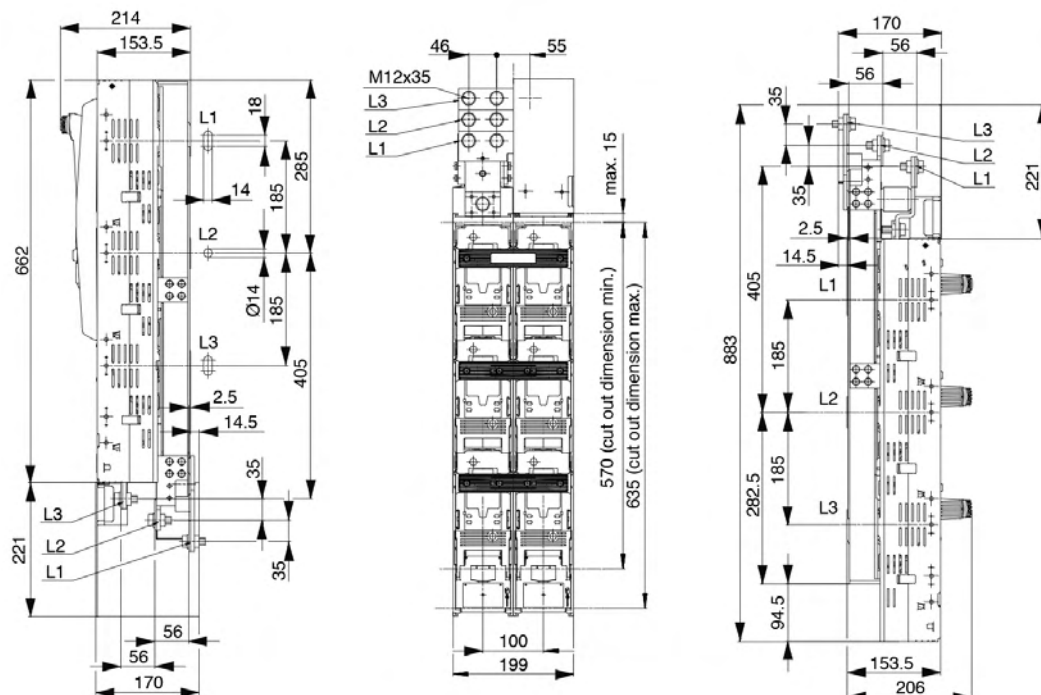
SL3-3X/1000/W/HA
SL3-3X3/1000/W/HA



SL3-3X2/1250/HA
SL3-3X6/1250/HA



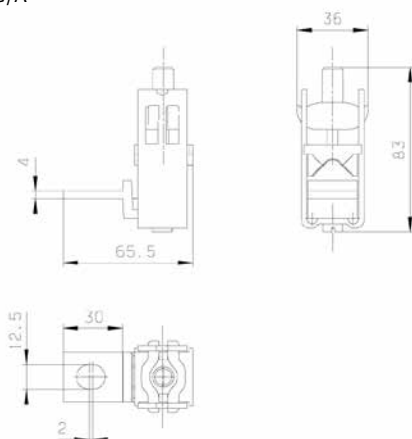
SL3-3X2/2000/HA
SL3-3X6/2000/HA



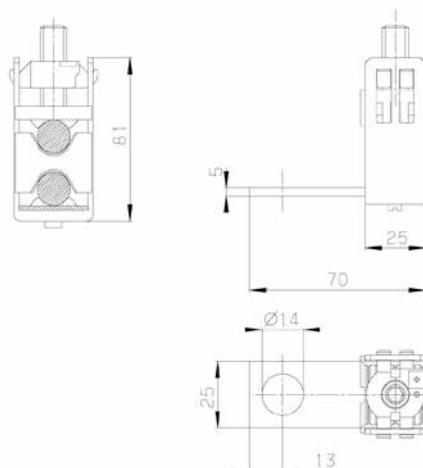
Vertical fuse disconnects - Dimensions

Vertical disconnect accessories

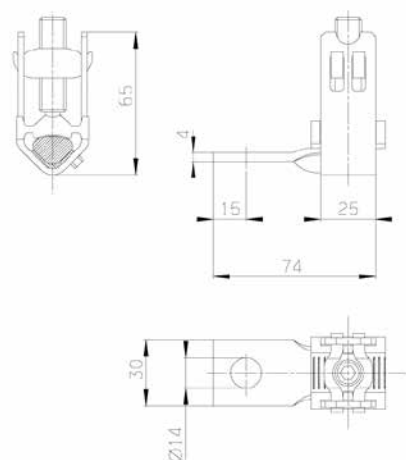
Terminals with connecting lugs K2G/A



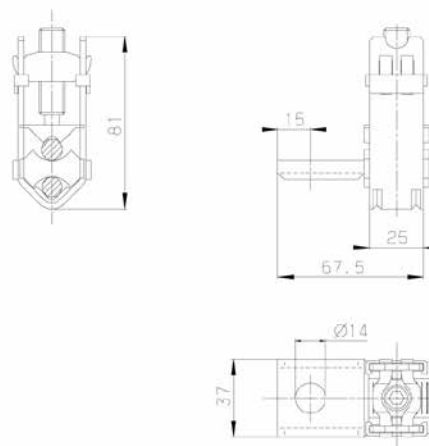
K2HG/2/AF30



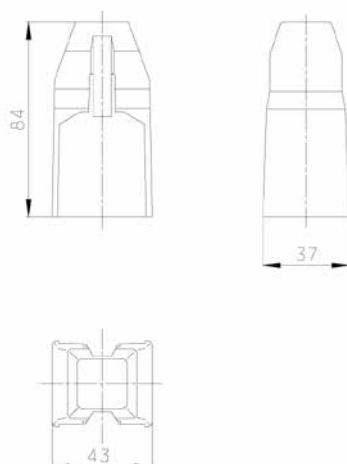
KM2G/AF3040



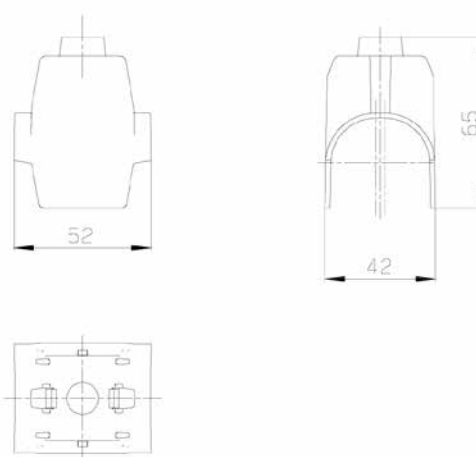
KV2HG/2/AF30



Covers for terminals with connecting lugs HR

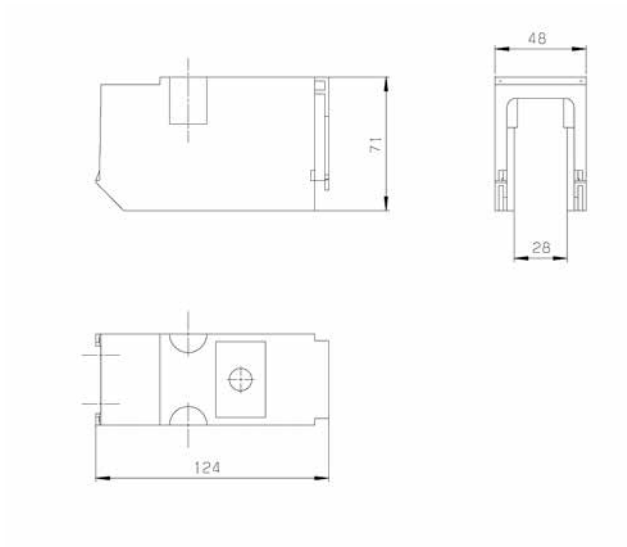


HRV

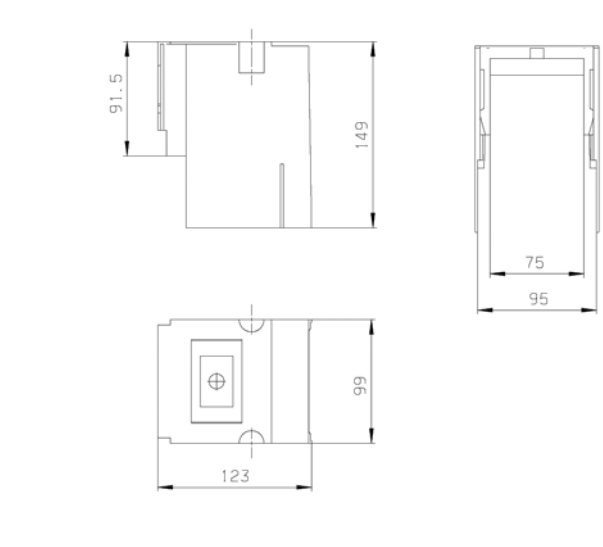


Terminal covers

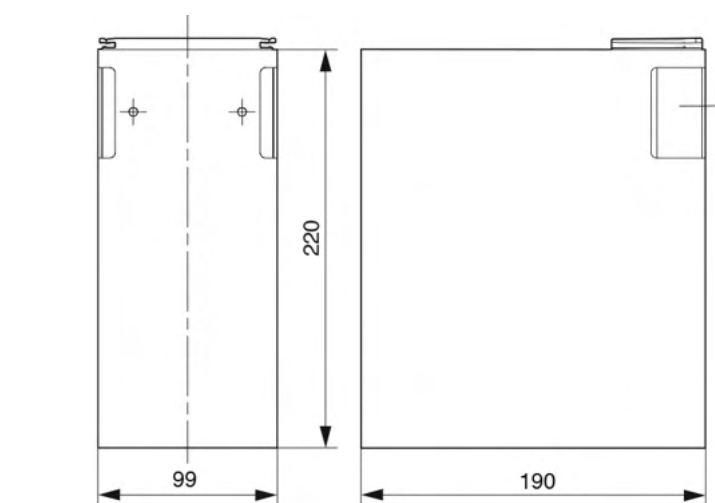
HA-SL00/185



HA-SL123/10



HA220-SL123/10



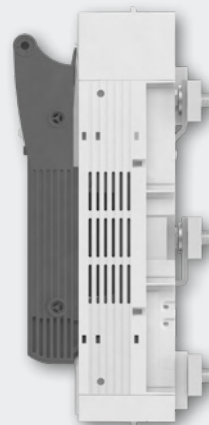
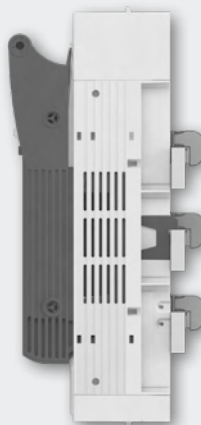


KETO – The new generation NH-fuse-switch-disconnector

KETO-disconnectors can be combined regardless of the size. Different dimensions are adjusted to an uniform cover cutout with the available components for touch protection. Many functions are integrated across all construction sizes, e.g. four cover support levels at 32, 60, 70 and 90mm above top of busbar. This ensures an optimal system integration.

Versions for baseplate mounting, busbar- and DIN rail mounting offer the suitable solution for each application.

Note: Product colour may vary depending on stock available.



Baseplate mounting

Multiple mounting hole pattern allow a variable installation and quick replacement. KETO-00 and KETO-1 can optionally be built on two parallel DIN-rails.

Busbar mounting

KETO-00 to KETO-3 are easy to fit onto busbar systems with 60mm centre distance – without any drilling.



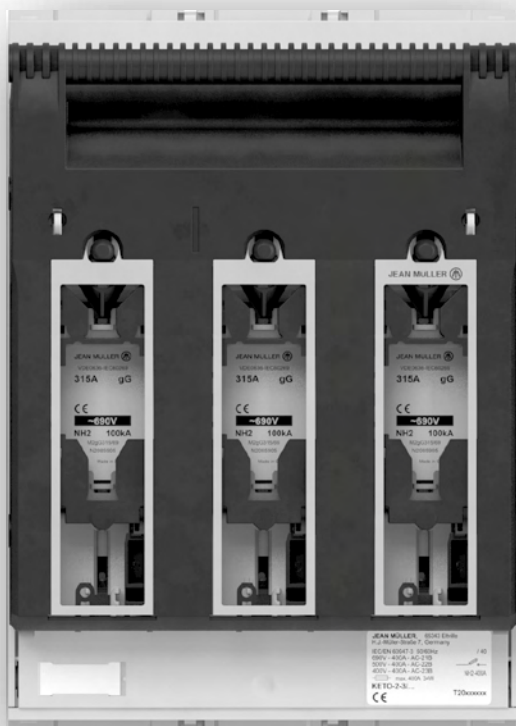
KETO size 000
 $I_e = 125A$
Overall width: 53mm



KETO size 00
 $I_e = 160A$
Overall width: 106mm



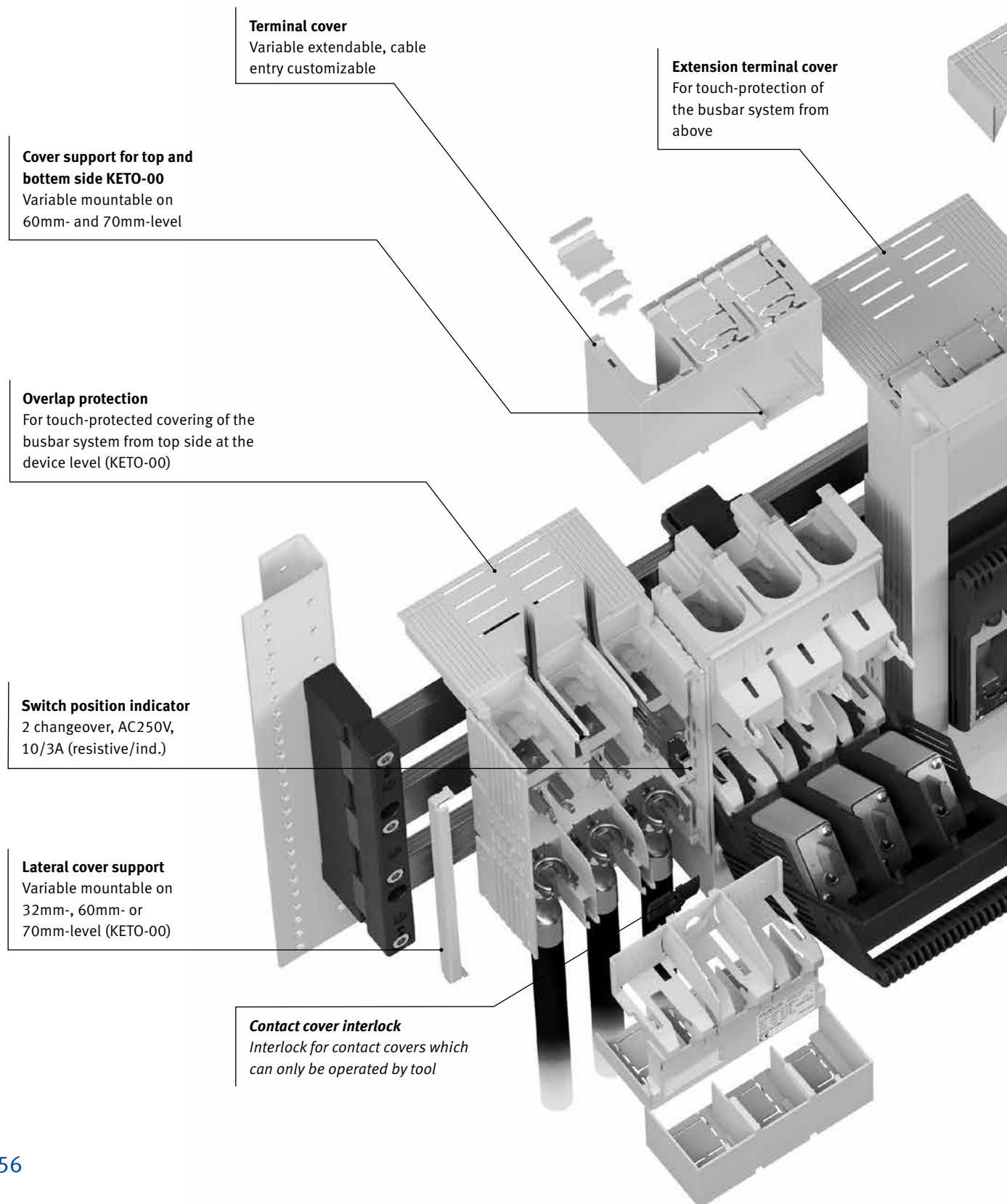
KETO size 1
 $I_e = 250A$
Overall width: 184mm

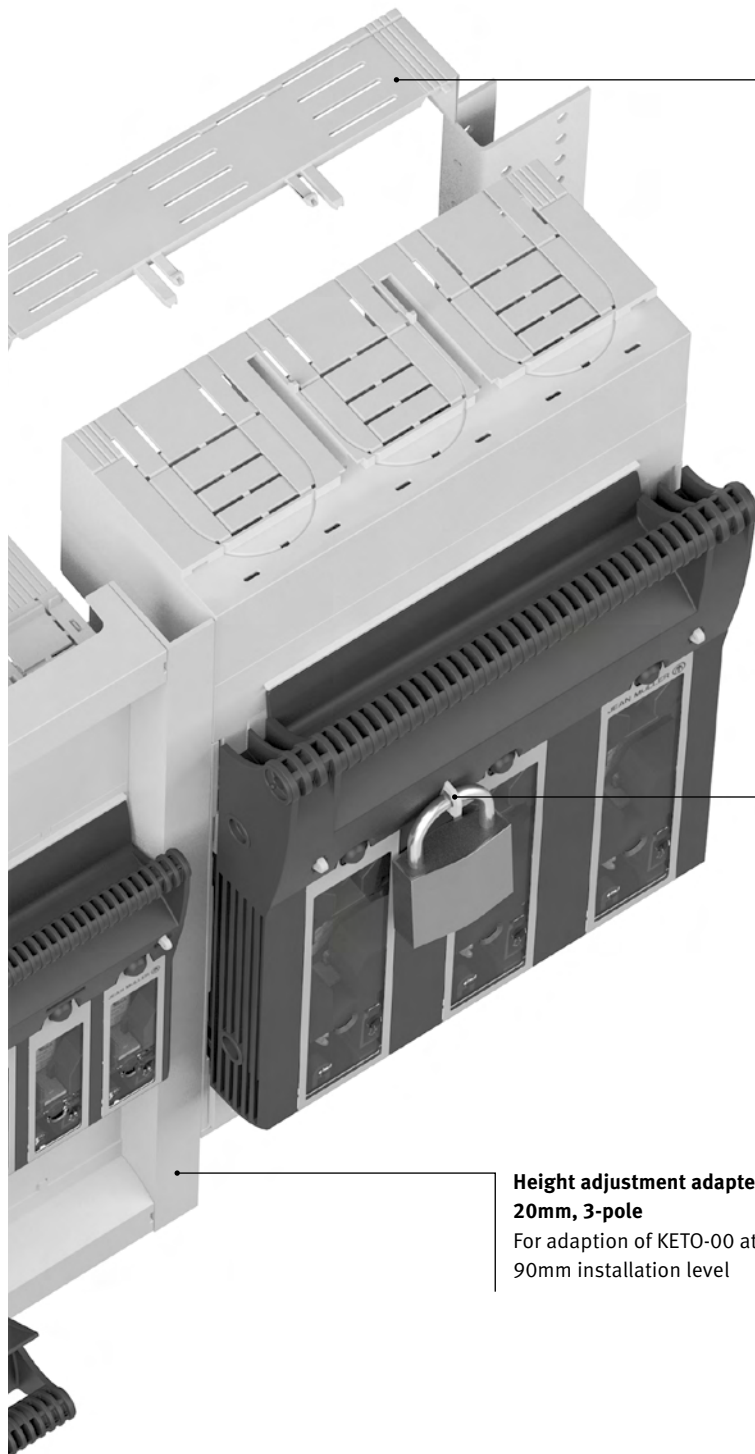


KETO size 2
 $I_e = 400A$
Overall width: 210mm



KETO size 3
 $I_e = 630A$
Overall width: 250mm





Overlap protection

For touch-protected covering of the busbar system from top side at the device level (KETO-1, -2, -3)

**Lateral cover support
KETO-00**

Variable mountable on 32mm-, 60mm-, 70mm- or 90mm-level (KETO-1, -2, -3)

Locking device

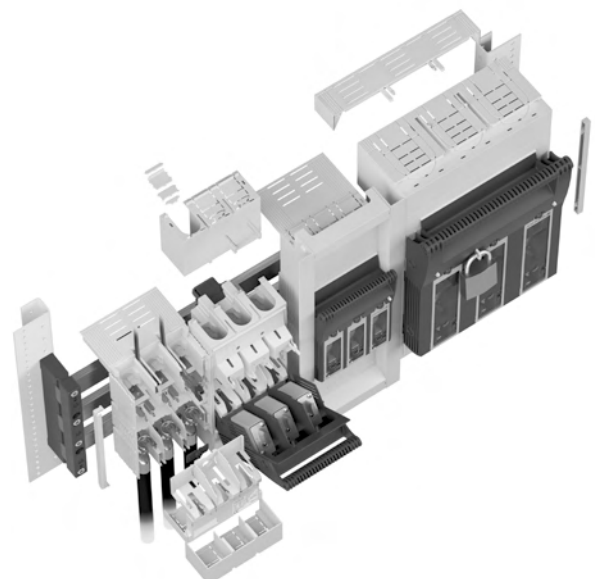
For holding of one padlock with max. 6mm shackle diameter

**Height adjustment adapter
20mm, 3-pole**

For adaption of KETO-00 at 90mm installation level

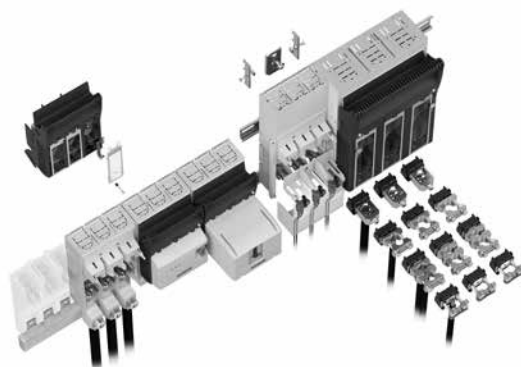
Focus on user safety

At KETO is safety always at the highest level. Even under voltage ensure features like overlap-protectors, status indicators, easy to use measuring access but also special touch protection covers at any time for maximum user safety.



Options for all conditions

Depending on the installation situation the specifications vary, options are required. Various types of terminals, four different clamping systems and many further equipment options – KETO is the solution for all installation conditions.



Fuse-monitoring ESligh

Selective fault indication – one red LED per phase

Power theft protection

For tamper-proof locking of the windows

Phase busbar 3-phase

Touch-protected feeding system for up to five KETO-00

Feeding clamp

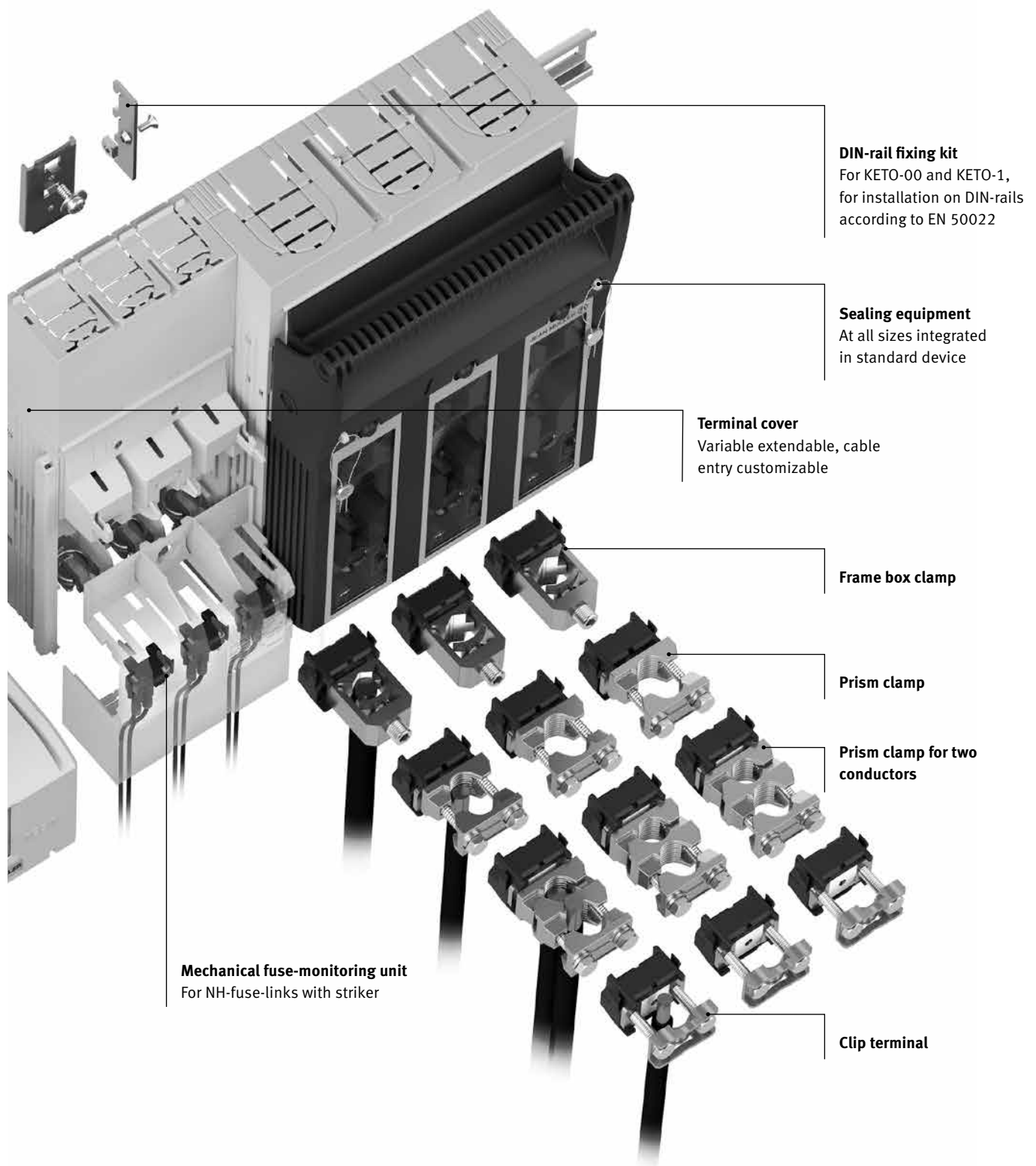
Touch-protected feeding clamps 25-95mm² for KETO-00, terminal M8

Electromechanical fuse-monitoring unit (AM)

Monitoring with motor-protection switch for special applications AC690V/DC150V

Electronic fuse-monitoring unit (ES10)

The allround-solution for AC400-500V, with stand-by indicator, fault simulation and selective fault indicator for fuse failure



The terminal clamps can be retrofitted for connection type "F" and can be found in the accessories section page 63.

KETO RANGE

With composite terminal covers

5-10mm thick 60mm spacing busbar system disconnects

1-pole horizontal fuse disconnects

Busbar mount Fixing via bolt

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-1/AOU/F

1-pole horizontal fuse disconnects

Busbar mount Fixing via bolt

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
00	DIN00 & DIN000	160	Box clamp	max. 95	KETO-00-1/AOU/F/SK

5-10mm thick 60mm spacing busbar system disconnects

Top or bottom feed

3-pole horizontal fuse disconnects

Busbar mount Fixing via bolt

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
000	DIN000	125	Box clamp	1.5-50Cu	KETO-000-3/60/AO/F50 BK Top feed
000	DIN000	125	Box clamp	1.5-50Cu	KETO-000-3/60/AU/25 BK Bottom feed
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-3/60/AOU/F
00	DIN00 & DIN000	160	Box clamp	1.5-95 Al/Cu	KETO-00-3/AOU/R95
1	DIN1	250	Flat terminal M10	max. 150	KETO-1-3/AOU/F
1	DIN1	250	Box clamp	35-150 Al/Cu	KETO-1-3/AOU/R150
2	DIN2	400	Flat terminal M10	max. 240	KETO-2-3/AOU/F
2	DIN2	400	Box clamp	95-300 Al/Cu	KETO-2-3/AOU/R300
3	DIN 2 & 3	630	Flat terminal M10	max. 300	KETO-3-3/AOU/F
3	DIN 2 & 3	630	Box clamp	95-300 Al/Cu	KETO-3-3/AOU/R300

5-10mm thick 60mm spacing busbar system disconnects

Top or bottom feed

Dual feed 3-pole horizontal fuse disconnects

Busbar mount Fixing via bolt

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-3/60/AOU/F/EST
1	DIN1	250	Flat terminal M10	max. 150	KETO-1-3/60/AU/F/EST
2	DIN2	400	Flat terminal M10	max. 240	KETO-2-3/AO/F/EST
3	DIN 2 & 3	630	Flat terminal M10	max. 300	KETO-3-3/AO/F/EST

1-pole horizontal fuse disconnects

Base mount

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-1/F
00	DIN00 & DIN000	160	Box clamp	1.5-95 Al/Cu	KETO-00-1/R95
1	DIN1	250	Flat terminal M10	max. 150	KETO-1-1/F
3	DIN 2 & 3	630	Flat terminal M10	max. 300	KETO-3-1/F

2-pole horizontal fuse disconnects

Base mount

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-2/F
1	DIN1	250	Flat terminal M10	max. 150	KETO-1-2/F
3	DIN 2 & 3	630	Flat terminal M10	max. 300	KETO-3-2/F

3-pole horizontal fuse disconnects

Base mount

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
000	DIN000	125	Box clamp	1.5-50Cu	KETO-000-3/F50 BK
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-3/F
00	DIN00 & DIN000	160	Box clamp	1.5-95 Al/Cu	KETO-00-3/R95
1	DIN1	250	Flat terminal M10	max. 150	KETO-1-3/F
1	DIN1	250	Box clamp	35-150 Al/Cu	KETO-1-3/R150
2	DIN2	400	Flat terminal M10	max. 240	KETO-2-3/F
2	DIN2	400	Box clamp	95-300 Al/Cu	KETO-2-3/R300
3	DIN 2 & 3	630	Flat terminal M10	max. 300	KETO-3-3/F
3	DIN 2 & 3	630	Box clamp	95-300 Al/Cu	KETO-3-3/R300

4-pole horizontal fuse disconnects

Base mount

Size	For Fuses	Current Rating (A)	Terminals	Connection Capacity (mm)	Part No.
00	DIN00 & DIN000	160	Flat terminal M8	max. 95	KETO-00-4/F
1	DIN1	250	Flat terminal M10	max. 150	KETO-1-4/F
3	DIN 2 & 3	630	Flat terminal M10	max. 300	KETO-3-4/F

Base mount only accessories - DIN rail fixing kits

Description	Part No.
For KETO-000	KETO-Z-000 Z Gr.000 3p
For KETO-00	KETO-Z-00 100-15MM
For KETO-1	KETO-Z-1 100-150MM

Ganging kits (For making pole & 4 pole units)	Part No.
For KETO-00	KETO-VBS-00/2+4P
For KETO-1, 2 & 3	KETO-VBS-123/2+4P

Description	Part No.
Extension terminal covers if extra touch protection required.	
3-pole for KETO-000-3, Bottom, 36mm long	KETO-AA-000-BTTM 36mm
3-pole for KETO-000-3, Top, 66mm long	KETO-AA-000-TOP 66mm
1-pole for KETO-00-1, Top & bottom, 36mm long	KETO-AA-00-1/36
1-pole for KETO-00-1, Top & bottom, 66mm long	KETO-AA-00-1/66
1-pole for KETO-1-1, Top & bottom, 42mm long	KETO-AA-1-1
1-pole for KETO-3-1, Top & bottom, 42mm long	KETO-AA-3-1
3-pole for KETO-00-3, Top & bottom, 36mm long	KETO-AA-00-3/36
3-pole for KETO-00-3, Top & bottom, 66mm long	KETO-AA-00-3/66
3-pole for KETO-1-3, Top & bottom, 42mm long	KETO-AA-1-3
3-pole for KETO-2-3, Top & bottom, 42mm long	KETO-AA-2-3
3-pole for KETO-3-3, Top & bottom, 42mm long	KETO-AA-3-3
Busbar series busbar covers if extra touch protection required.	
For KETO-00-3-AOU, Top & bottom, 32 long	KETO-UGS-00-3/32
For KETO-1-3-AOU, Top & bottom, 32 long	KETO-UGS-1-3/32
For KETO-1-3-AOU, Top & bottom, 34-39 long	KETO-UGS-1-3/39-34
For KETO-2-3-AOU, Top & bottom, 32 long	KETO-UGS-2-3/32
For KETO-3-3-AOU, Top & bottom, 32 long	KETO-UGS-3-3/32
Integral contact/terminal cover interlock	
For KETO-00,1,2 & 3 3P (Interlocks to cover needs a tool to remove)	KETO-VKA-00123-3
Padlock device	
For KETO-00,1,2 & 3 3P (6mm hole, allows to padlock closed)	KETO-ASV-00123-3
Switch position indicator (Micro-switch)	
For KETO-00 1 Pole - 1 micro-switch per pack (part)	KETO-EV-00/1
For KETO-00 3 Pole - 1 micro-switch per pack (part)	KETO-EV-00/3
For KETO-1, 2 & 3 Pole - 1 micro-switch per pack (part)	KETO-EV-123
Fuse blow indicator (Micro-switch)	
For KETO-00 - 3 micro-switch per pack (part)	KETO-K-00
For KETO-1, 2 & 3 - 3 micro-switch per pack (part)	KETO-K-123
Phase combi bars for KETO-00-3	
2 way 35mm ³ 200Amp	KETO-PHS-00-3/2/35
2 way 50mm ² 200Amp	KETO-PHS-00-3/2/50
3 way 35mm ² 200Amp	KETO-PHS-00-3/3/35
3 way 50mm ² 200Amp	KETO-PHS-00-3/3/50
4 way 35mm ² 200Amp	KETO-PHS-00-3/4/35
4 way 50mm ² 200Amp	KETO-PHS-00-3/4/50
5 way 35mm ⁵ 200Amp	KETO-PHS-00-3/5/35
5 way 50mm ² 200Amp	KETO-PHS-00-3/5/50

Description	Part No.
Feed connection clamp terminal lug	
For KETO-00, M8 fixing hole, 25-95mm ² Cu/Al	KETO-ESK-00/95
Clip terminals to modify KETO with bolt connections	
For KETO-00, 1.5-70mm ² Cu	S00-Z
For KETO-1, 25-150mm ² Cu	S1
For KETO-2, 25-240mm ² Cu	S2
For KETO-3, 11x21mm Band Cu	S3
Prism clamp terminals to modify KETO with bolt connections	
For KETO-00, 10-70mm ² Al/Cu	P0070-Z
For KETO-1, 70-150mm ² Al/Cu	P1
For KETO-2, 120-240mm ² Al/Cu	P2
For KETO-3, 120-300mm ² Al/Cu	P3
Double Prism clamp terminals to modify KETO with bolt connections. Two cables	
For KETO-1, 2 x 70-150mm ² Al/Cu	P12
For KETO-2, 2 x 120-240mm ² Al/Cu	P22
For KETO-3, 2 x 120-300mm ² Al/Cu	P32
Frame (Box) clamp terminals to modify KETO with bolt connections	
For KETO-1, 35-150mm ² Al/Cu	KETO-R150
For KETO-2 & 3, 95-300mm ² Al/Cu	KETO-R300-2+3

KETO - Technical Information

NH fuse-switch-disconnectors KETO – Technical data

Type			Size		KETO-000 Baseplate mounting	KETO-000 Busbar mounting
Electrical characteristics	Rated operational voltage		U _e	V	690	
	Rated operational current		I _e	A	125	
	Conventional free air thermal current with fuses		I _{th}	A	125	
	Rated insulation voltage		U _i	V	800	
	Rated conditional short-circuit current		I _{cc}	kA _{eff}	80(500V)	
	Short-circuit making capacity with protected by fuses		-	kA	80	
	Short-time withstand with protected by fuses		-	kA	80	
	Utilization category		I _e	A	AC-23B(400 V/125A) AC-22B(500 V/125A) AC-21B(690 V/80A)	AC-22B(500 V/125A) AC-21B(690 V/80A)
	Rated impulse withstand voltage		U _{imp}	kV	6	
	Operating cycles with current		-	-	200	
	Total power loss at I _{th} (without TM)		P _v	W	10.5	12
Fuse-links	Size to DIN 43 620		-	-	000	
	Max. rated current		I _N	A	125	
	Max. permis. power loss per fuse-link		P _v	W	9	
Cable terminal	F50	Clamping cross-section	-	mm ²	1.5-50 Cu	
	F50	Tightening torque	-	Nm	4.5	
Type of protection	Front side, device fitted	Operational state	-	-	IP30	
		Front cover open	-	-	IP10	
Operating Conditions	Ambient temperature		T _u	°C	-25bis/to +70	
	Reduction factor	>35°C	-	-	0.9	1.0
		>55°C	-	-	0.8	0.95
	Rated operating mode		-	-	Continuous operation	
	Actuation		-	-	Dependent manual operation	
	Mounting position		-	-	Vertical, horizontal	
	Altitude		-	m	Up to 2000	
	Pollution degree		-	-	2	
Overvoltage category		-	-	III		

KETO - Technical Information

NH fuse-switch-disconnectors KETO – Technical data

Type				KETO-00 Baseplate mounting		KETO-00 Busbar mounting	
Electrical characteristics	According to standard			DIN EN 60947-3			
	For NH fuse-links acc. to DIN VDE 0636-2	Size		000/00			
	Rated operational voltage	U _e	V	AC690 DC440			
	Rated operational current ¹⁾	I _e	A	160			
	Conv. free air thermal current with fuse-links ¹⁾	I _{th}	A	160			
	Conv. free air thermal current with solid-links ¹⁾	I _{th}	A	210		On request	
	Rated frequency	f	Hz	50-60			
	Rated insulation voltage	U _i	V	AC800			
				1P	3P	1P	3P
	Total power loss at I _{th} (without fuse-links)	P _v	W	3	9	5	14
	Power loss at 80% I _{th} (without fuse-links) ²⁾	P _v	W	1.9	5.8	3	9
	Rated impulse withstand voltage	U _{imp}	kV	8			
	Utilization category ³⁾	-	-	AC-23B (400V/160A) AC-22B (500V/160A) AC-21B (690V/160A) DC-22B (250V/160A)			
	Rated conditional short-circuit current ^{3) 4)}	-	kA	120 (500V) 100 (690V)			
	Rated short-time withstand current	I _{cw}	kA	5/1s			
Max. permis. power loss per fuse-link	P _a	W	12				

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) It must be considered a minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm.

4) Type tested with NH fuse-links characteristic gG.

Type		KETO-00 Baseplate mounting			KETO-00 Busbar mounting
Cable terminal	Flat terminal		Bolt diameter	-	M8
			Tightening torque	M_a	Nm
	Clip terminal	S00-70	Clamping cross-section	-	mm ²
			Tightening torque	M_a	Nm
	Clamp	P00-70 P00-95	Clamping cross-section	-	mm ²
			Tightening torque	M_a	Nm
	Clamp	R95	Clamping cross-section	-	mm ²
			Tightening torque	M_a	Nm
Degree of protection	Front side Device fitted	Operating condition	-	-	IP20
		With clamp- and lateral cover	-	-	IP2XC
		Switching element open	-	-	IP10
Operating conditions	Ambient temperature ⁵⁾		T_{amb}	°C	-25 up to +70
	Rated operating mode		-	-	Uninterrupted duty
	Actuation		-	-	Dependent manual operation
	Mounting position		-	-	vertical /horizontal
	Altitude		-	m	Up to 2000
	Pollution degree		-	-	3
	Overvoltage category		-	-	III

Annotation: ○ = Round conductor □ = Strip conductor

5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

6) Pretread Al-conductors mechanically! Cleaning and greasing!

KETO - Technical Information

NH fuse-switch-disconnectors KETO – Technical data

Type				KETO-1 Baseplate mounting		KETO-1 Busbar mounting	
Electrical characteristics	According to standard			DIN EN 60947-3			
	For NH fuse-links acc. to DIN VDE 0636-2	Size		1			
	Rated operational voltage	U _e	V	AC690 DC440			
	Rated operational current ¹⁾	I _e	A	250			
	Conv. free air thermal current with fuse-links ¹⁾	I _{th}	A	250			
	Conv. free air thermal current with solid-links ¹⁾	I _{th}	A	325			
	Rated frequency	-	Hz	50-60			
	Rated insulation voltage	U _i	V	AC800			
				1P	3P	1P	3P
	Total power loss at I _{th} (without fuse-links)	P _v	W	5	15	7	22
	Power loss at 80% I _{th} (without fuse-links) ²⁾	P _v	W	3.2	9.6	4.7	14.1
	Rated impulse withstand voltage	U _{imp}	kV	8			
	Utilization category ³⁾	-	-	AC-23B (400V/250A) AC-22B (500V/250A) AC-21B (690V/250A) DC-22B (250V/250A) 3P: DC-21B (440V/250A)			
	Rated conditional short-circuit current ^{3) 4)}	-	kA	120 (500V) 100 (690V)			
	Rated short-time withstand current	I _{cw}	kA	8.6/1s			
Max. permis. power loss per fuse-link	P _a	W	23				

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) It must be considered a minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm.

4) Type tested with NH fuse-links characteristic gG.

Type		KETO-1 Baseplate mounting			KETO-1 Busbar mounting
Cable terminal	Flat terminal		Bolt diameter	-	M10
			Tightening torque	M _a	Nm
	Clip terminal	S1	Clamping cross-section	-	mm ²
			Tightening torque	M _a	Nm
	Clamp	P1	Clamping cross-section	-	mm ²
			Tightening torque	M _a	Nm
	Clamp	P12	Clamping cross-section	-	mm ²
			Tightening torque	M _a	Nm
		R150	Clamping cross-section	-	mm ²
			Tightening torque	M _a	Nm
Degree of protection	Front side Device fitted	Operating condition		-	IP20
		With clamp- and lateral cover		-	IP2XC
		Switching element open		-	IP10
Operating conditions	Ambient temperature ⁵⁾		T _{amb}	°C	-25 up to +70
	Rated operating mode		-	-	Uninterrupted duty
	Actuation		-	-	Dependent manual operation
	Mounting position		-	-	vertical /horizontal
	Altitude		-	m	Up to 2000
	Pollution degree		-	-	3
	Overvoltage category		-	-	III

Annotation: ○ = Round conductor □ = Strip conductor

5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

KETO - Technical Information

NH fuse-switch-disconnectors KETO – Technical data

Type			KETO-2 Baseplate mounting	KETO-2 Busbar mounting
Electrical characteristics	According to standard		DIN EN 60947-3	
	For NH fuse-links acc. to DIN VDE 0636-2	Size	2	
	Rated operational voltage	U_e V	AC690 DC440	
	Rated operational current ¹⁾	I_e A	400	
	Conv. free air thermal current with fuse-links ¹⁾	I_{th} A	400	
	Conv. free air thermal current with solid-links ¹⁾	I_{th} A	520	
	Rated frequency	f Hz	50-60	
	Rated insulation voltage	U_i V	AC1000	
	Total power loss at I_{th} (without fuse-links)	P_v W	28	36
	Power loss at 80% I_{th} (without fuse-links) ²⁾	P_v W	17.9	23
	Rated impulse withstand voltage	U_{imp} kV	8	
	Utilization category ³⁾	-	AC-23B (400V/400A) AC-22B (500V/400A) AC-21B (690V/400A) DC-22B (440V/400A)	
	Rated conditional short-circuit current ^{3) 4)}	- kA	120 (500V) 100 (690V)	
	Rated short-time withstand current	I_{cw} kA	15/1s	
	Max. permis. power loss per fuse-link	P_a W	34	

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) It must be considered a minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm.

4) Type tested with NH fuse-links characteristic gG.

Type			KETO-2 Baseplate mounting			KETO-2 Busbar mounting
Cable terminal	Flat terminal		Bolt diameter	-	-	M10
			Tightening torque	M _a	Nm	30-35
	Clip terminal	S2	Clamping cross-section	-	mm ²	○ : 25-185 Cu □ : 10 x 16 x 0.8 Cu
			Tightening torque	M _a	Nm	23
	Clamp	P2	Clamping cross-section	-	mm ²	120-240 Al/Cu
			Tightening torque	M _a	Nm	11
	Clamp	P22	Clamping cross-section		mm ²	2 x (120-150) Al/Cu
			Tightening torque	M _a	Nm	11
		R300	Clamping cross-section		mm ²	95-300 Al/Cu
			Tightening torque	M _a	Nm	20
Degree of protection		Front side Device fitted	Operating condition	-	-	IP20
			With clamp- and lateral cover	-	-	IP2XC
			Switching element open	-	-	IP10
Operating conditions	Ambient temperature ⁵⁾			T _{amb}	°C	-25 up to +70
	Rated operating mode			-	-	Uninterrupted duty
	Actuation			-	-	Dependent manual operation
	Mounting position			-	-	vertical /horizontal
	Altitude			-	m	Up to 2000
	Pollution degree			-	-	3
	Overvoltage category			-	-	III

Annotation: ○ = Round conductor □ = Strip conductor

5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

KETO - Technical Information

NH fuse-switch-disconnectors KETO – Technical data

Type				KETO-3 Baseplate mounting		KETO-3 Busbar mounting	
Electrical characteristics	According to standard			DIN EN 60947-3			
	For NH fuse-links acc. to DIN VDE 0636-2	Size		3			
	Rated operational voltage	U _e	V	AC690 DC440			
	Rated operational current ¹⁾	I _e	A	630			
	Conv. free air thermal current with fuse-links ¹⁾	I _{th}	A	630			
	Conv. free air thermal current with solid-links ¹⁾	I _{th}	A	910		On request	
	Rated frequency	f	Hz	50-60			
	Rated insulation voltage	U _i	V	AC1000			
				1P	3P	1P	3P
	Total power loss at I _{th} (without fuse-links)	P _v	W	17	51	7	86
	Power loss at 80% I _{th} (without fuse-links) ²⁾	P _v	W	10.9	32.6	18.3	55
	Rated impulse withstand voltage	U _{imp}	kV	8			
	Utilization category ³⁾	-	-	AC-23B (400V/630A) AC-22B (500V/630A) AC-21B (690V/630A) DC-21B (250V/630A) 3P: DC-22B (440V/630A)			
	Rated conditional short-circuit current ^{3) 4)}	-	kA	120 (500V) 100 (690V)			
	Rated short-time withstand current	I _{cw}	kA	15kA/1s			
Max. permis. power loss per fuse-link	P _a	W	48				

1) In case of mounting of several units in low voltage switchgear-combinations, please consider rated diversity factors acc. to DIN EN 61439.

2) Reference value for replacement of devices acc. to DIN EN 61439-1 clause 10.10.4.2.

3) It must be considered a minimum distance to earthed, conductive parts: Lateral: 20mm/Above: 50mm.

4) Type tested with NH fuse-links characteristic gG.

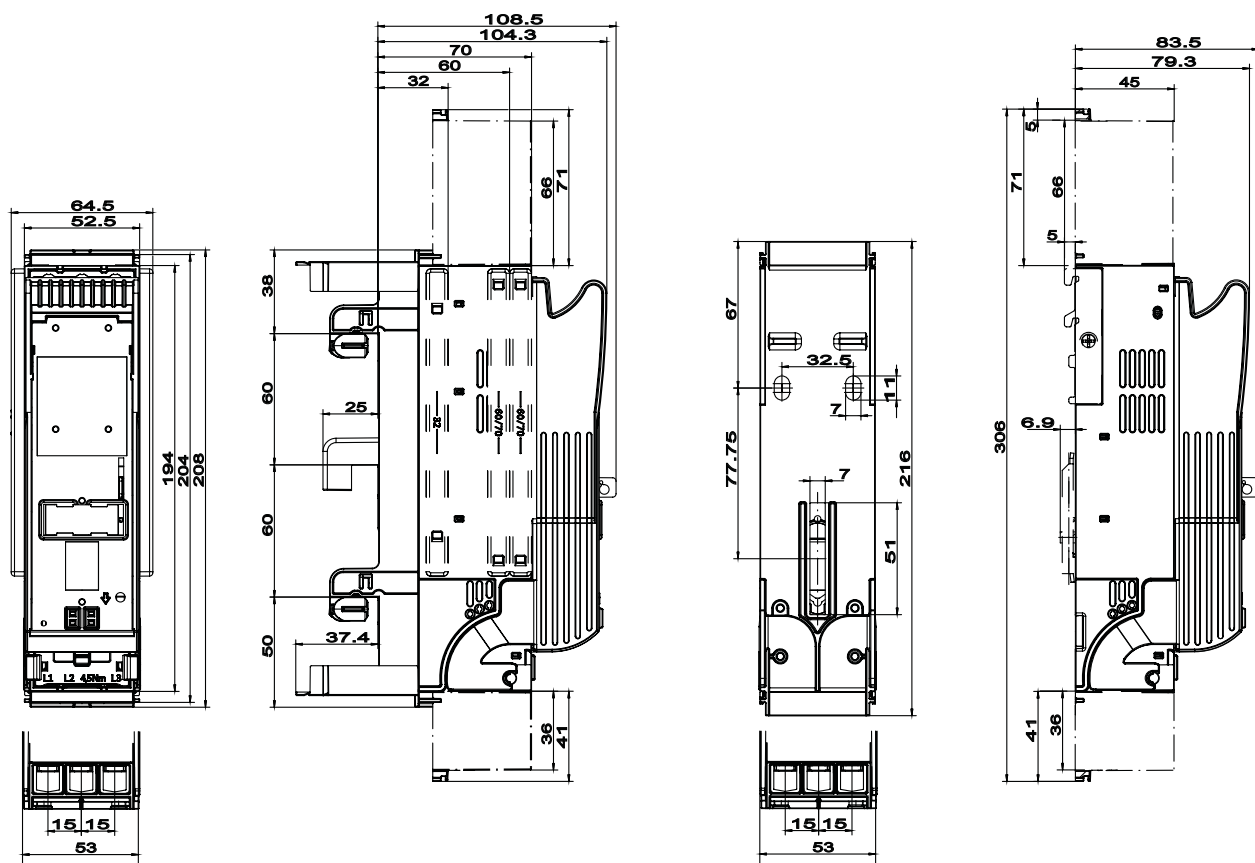
Type					KETO-3 Baseplate mounting	KETO-3 Busbar mounting
Cable terminal	Flat terminal		Bolt diameter	-	-	M10/12
			Tightening torque	M _a	Nm	30-35
	Clip terminal	S3	Clamping cross-section	-	mm ²	□ : 11 x 21 x 1 Cu
			Tightening torque	M _a	Nm	23
	Clamp	P3	Clamping cross-section	-	mm ²	120-300 Al/Cu
			Tightening torque	M _a	Nm	11
	Clamp	P32	Clamping cross-section		mm ²	2 x (120-240) Al/Cu
			Tightening torque	M _a	Nm	11
		R300	Clamping cross-section		mm ²	95-300 Al/Cu
			Tightening torque	M _a	Nm	20
Degree of protection	Front side Device fitted		Operating condition	-	-	IP20
			With clamp- and lateral cover	-	-	IP2XC
			Switching element open	-	-	IP10
Operating conditions	Ambient temperature ⁵⁾			T _{amb}	°C	-25 up to +70
	Rated operating mode			-	-	Uninterrupted duty
	Actuation			-	-	Dependent manual operation
	Mounting position			-	-	vertical /horizontal
	Altitude			-	m	Up to 2000
	Pollution degree			-	-	3
	Overvoltage category			-	-	III

Annotation: ○ = Round conductor □ = Strip conductor

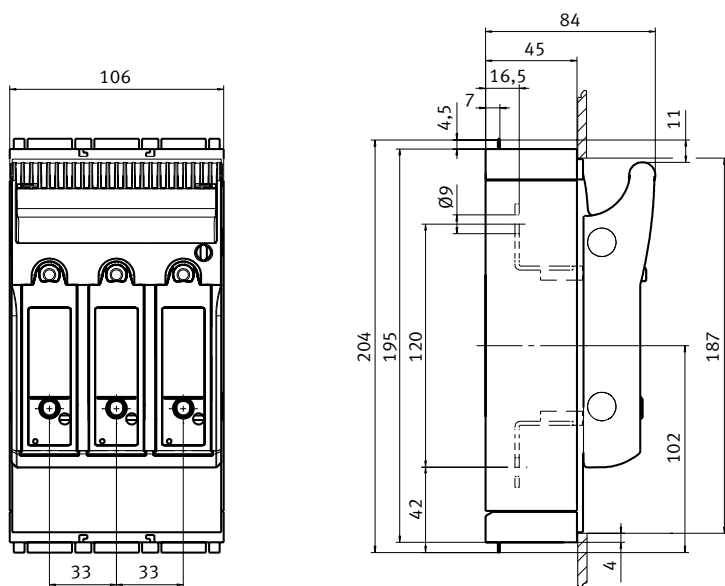
5) 35°C Normal temperature, above 35°C up to 70°C with reduces operating current.

KETO - Dimensions

Part No.	Mounting type	Terminal side
KETO-000-3/60/AO/F50	Busbar	Top
KETO-000-3/60/AU/F50	Busbar	Bottom
KETO-000-3/F50	Baseplate	Top, bottom

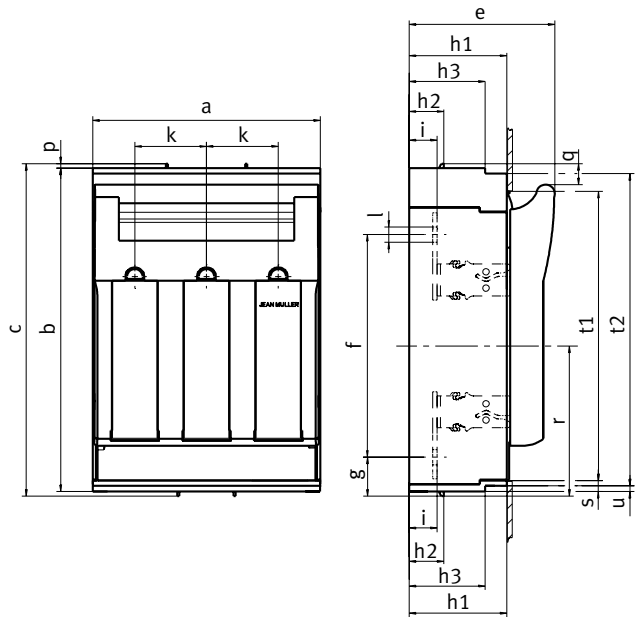


Part No.	Part No.
KETO-00-3/F	KETO-00-3/F/ESL
KETO-00-3/R95	KETO-00-3/R95/ESL



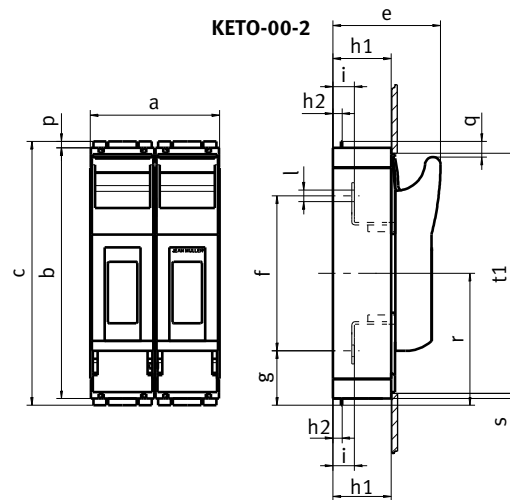
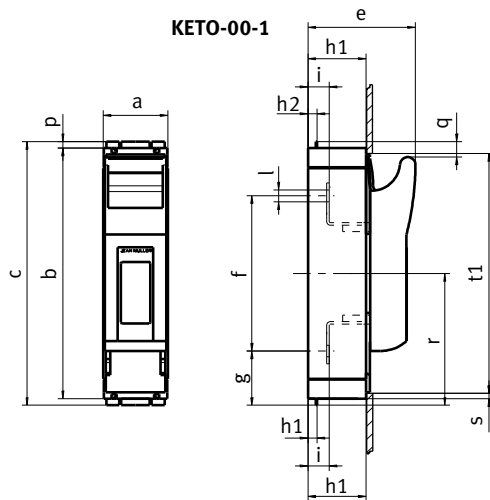
Part No.	Part No.
KETO-1-3/F/(ESL)	KETO-2-3/R300/(ESL)
KETO-1-3/R150/(ESL)	KETO-3-3/F/(ESL)
KETO-2-3/F/(ESL)	KETO-3-3/R300/(ESL)

Type	a	b	c	e	f	g	h1	h2	h3	i	k	l	p	q	r	s	t1	t2	u
KETO-1-3	184	298	306	117	185	46	70	32	—	25	58	Ø10,5	4	19	138	5	272	—	—
KETO-2-3	210	298	306	134	205	36	90	32	70	26	66	Ø14	4	19	138	10	268	288	5
KETO-3-3	250	298	306	143	205	36	90	32	70	26	82	Ø14	4	19	138	10	268	288	5



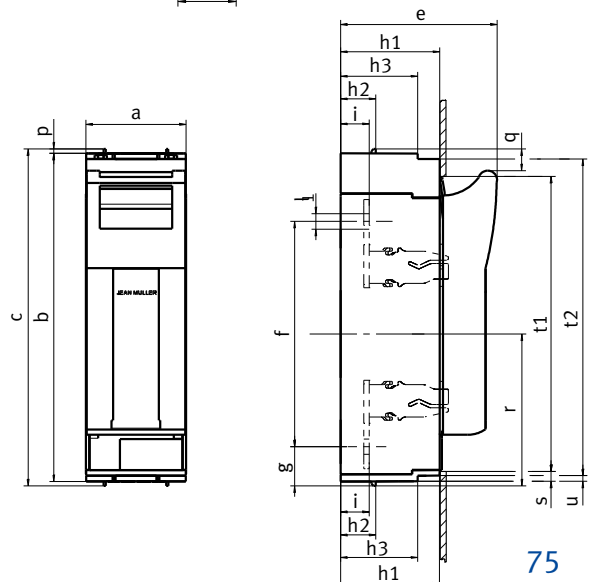
Part No.
KETO-00-1/F
KETO-00-2/F
KETO-00-1/R95

Type	a	b	c	e	f	g	h1	h2	h3	i	l	p	q	r	s	t1
KETO-00-1	50	195	204	84	120	42	45	7	—	16,5	Ø9	4,5	12	102	5	187
KETO-00-2	100	195	204	84	120	42	45	7	—	16,5	Ø9	4,5	12	102	5	187



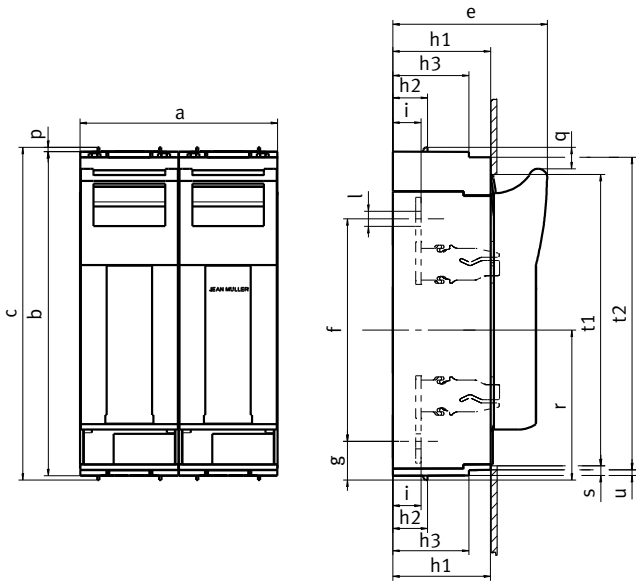
Part No.	Part No.
KETO-1-1/F	KETO-3-1/F

Type	a	b	c	e	f	g	h1	h2	h3	i	l	p	q	r	s	t1	t2	u
KETO-1-1	69	298	306	117	185	46	70	32	—	25	Ø10,5	4	19	138	5	272	—	—
KETO-3-1	91	298	306	143	205	36	90	32	70	26	Ø14	4	19	138	10	268	288	5



KETO - Dimensions

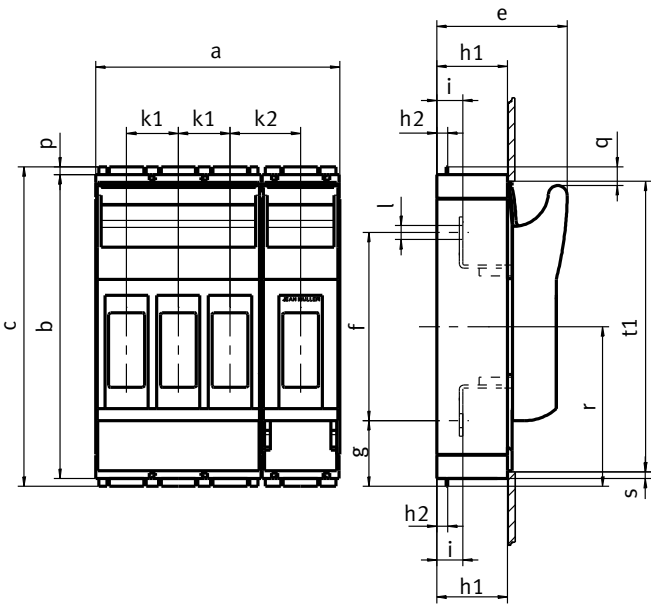
Part No.	Part No.
KETO-1-2/F	KETO-3-2/F



Type	a	b	c	e	f	g	h1	h2	h3	i	l	p	q	r	s	t1	t2	u
KETO-1-2	138	298	306	117	185	46	70	32	-	25	Ø10,5	4	19	138	5	272	-	-
KETO-3-2	182	298	306	143	205	36	90	32	70	26	Ø14	4	19	138	10	268	288	5

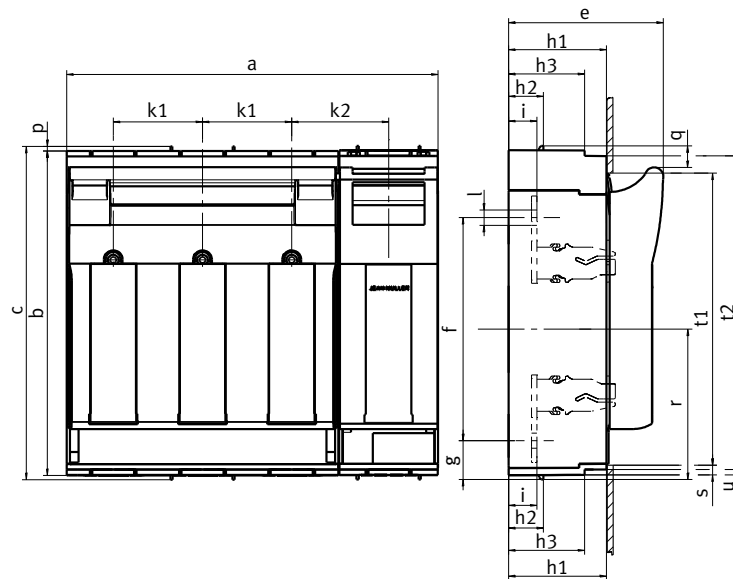
Part No.
KETO-00-4/F

Type	a	b	c	e	f	g	h1	h2	h3	k1	k2	i	l	p	q	r	s	t1	t2	u
KETO-00-4	156	195	204	84	120	42	45	7	-	33	45	16,5	Ø9	4,5	12	102	5	187	-	-



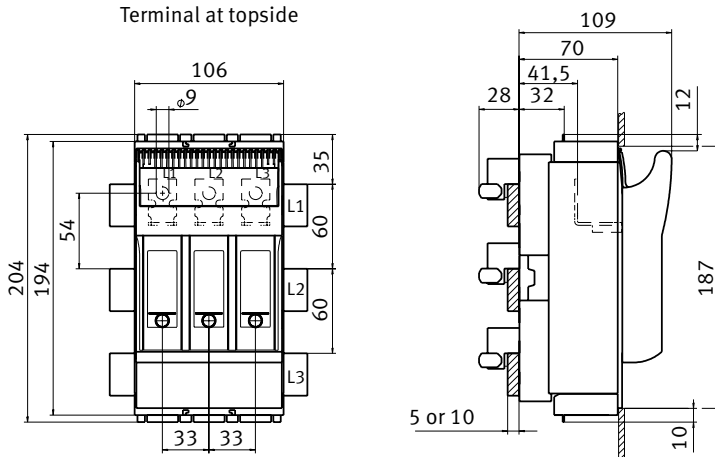
Part No.	Part No.
KETO-1-4/F	KETO-3-4/F

Type	a	b	c	e	f	g	h1	h2	h3	k1	k2	i	l	p	q	r	s	t1	t2	u
KETO-1-4	254	298	306	117	185	46	70	32	-	58	69	25	Ø10,5	4	19	138	5	272	-	-
KETO-3-4	341,5	298	306	143	205	36	90	32	70	82	89	26	Ø14	4	19	138	10	268	288	5

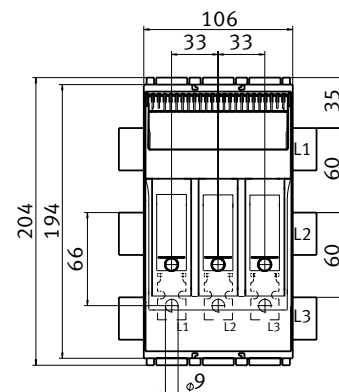


Part No.
KETO-00-3/60/AOU/F/(ESL, EST)
KETO-00-3/60/AOU/R95/(ESL, EST)

Terminal at top side



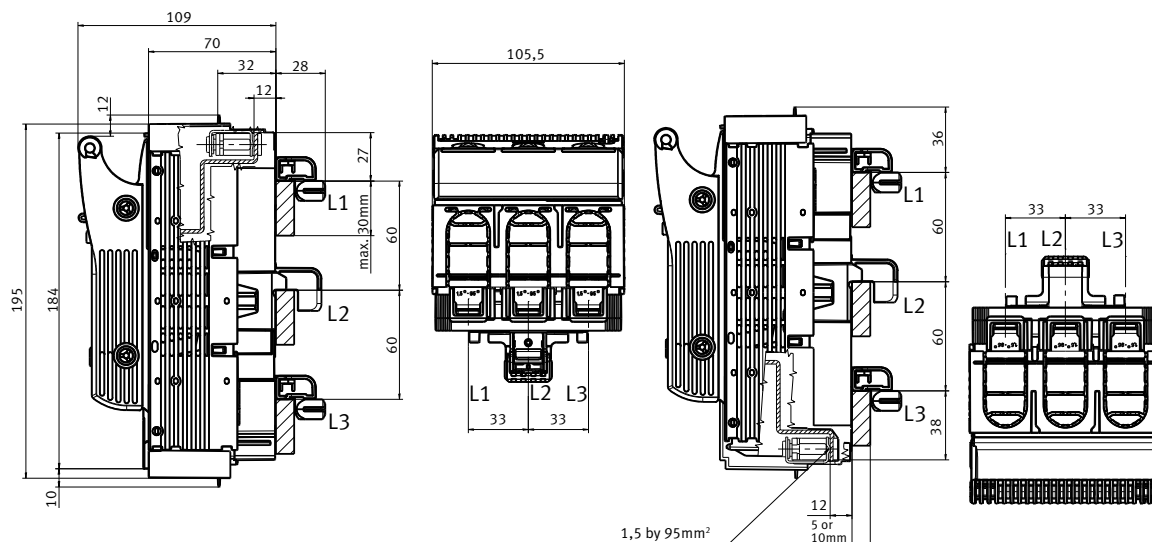
Terminal at bottom side



KETO - Dimensions

Part No.

KETO-00-3/60/AOU/R95T/(ESL)



Part No.

KETO-1-3/60/AOU/F/(ESL, EST)

KETO-1-3/60/AOU/R150/(ESL, EST)

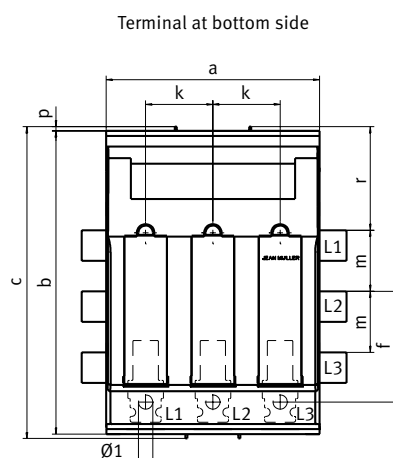
KETO-2-3/60/AOU/F/(ESL, EST)

Part No.

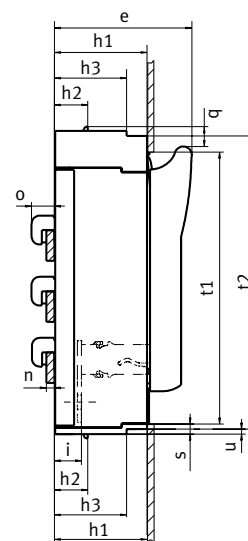
KETO-2-3/60/AOU/R300/(ESL, EST)

KETO-3-3/60/AOU/F/(ESL, EST)

KETO-3-3/60/AOU/R300/(ESL, EST)

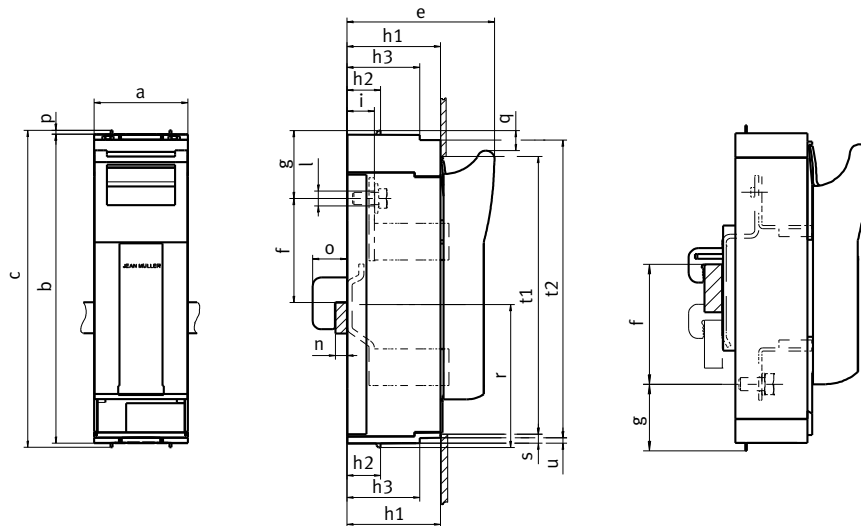


Terminal at bottom side



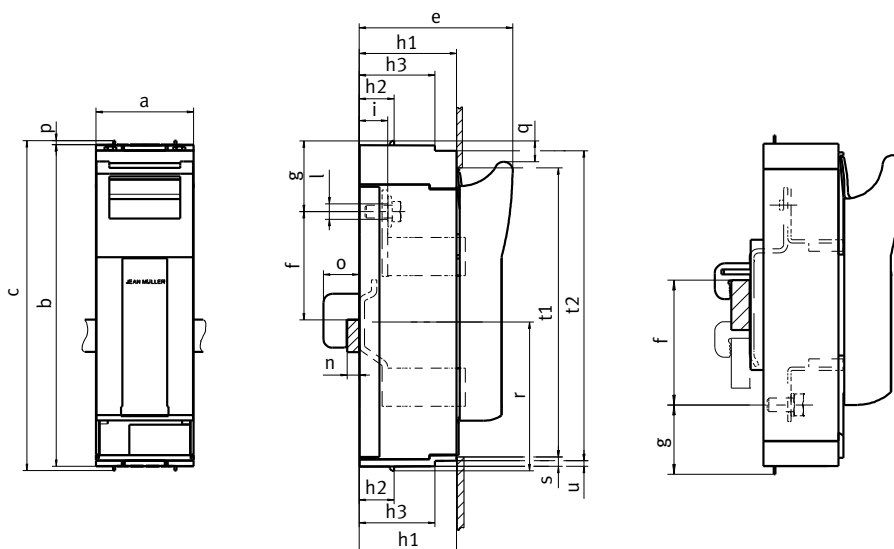
Type	a	b	c	e	f-Au	a-Ao	h1	h2	h3	i	k	l	m	n	o	p	q	r	s	t1	t2	u
KETO-1-3	184	298	306	117	98	87	70	32	-	25,5	58	Ø10,5	60	4-10	25	4	19	102	5	272	-	-
KETO-2-3	210	298	306	135	109	96	90	32	70	26,5	66	Ø14	60	4-10	25	4	19	102	10	268	289	5
KETO-3-3	250	298	306	143	109	96	90	32	70	26,5	82	Ø14	60	4-10	25	4	19	102	10	268	289	5

Part No.	Part No.
KETO-00-1/AOU/F	KETO-00-1/AOU/F/SK
KETO-00-1/AOU/R95	KETO-00-1/AOU/R95/SK



Type	a	b	c	e	f-Ao	f-Au	g-Ao	g-Au	h1	h2	i	l	n	o	p	q	r	s	t1
KETO-00-1	50	195	204	92	45,50,55 ... 75	75,70,65 ... 45	42	42	53	15	24,5	Ø9	4-10	22	4,5	12	102	5	187

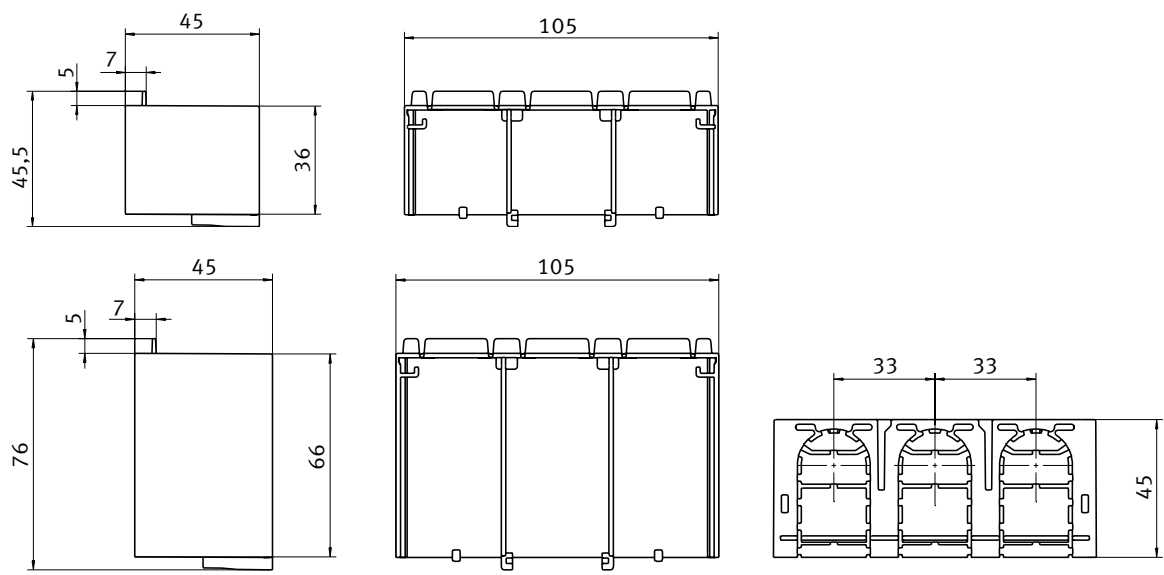
Part No.	Part No.
KETO-1-1/AOU/F	KETO-1-1/AOU/F/SK
KETO-3-1/AOU/F	KETO-3-1/AOU/F/SK



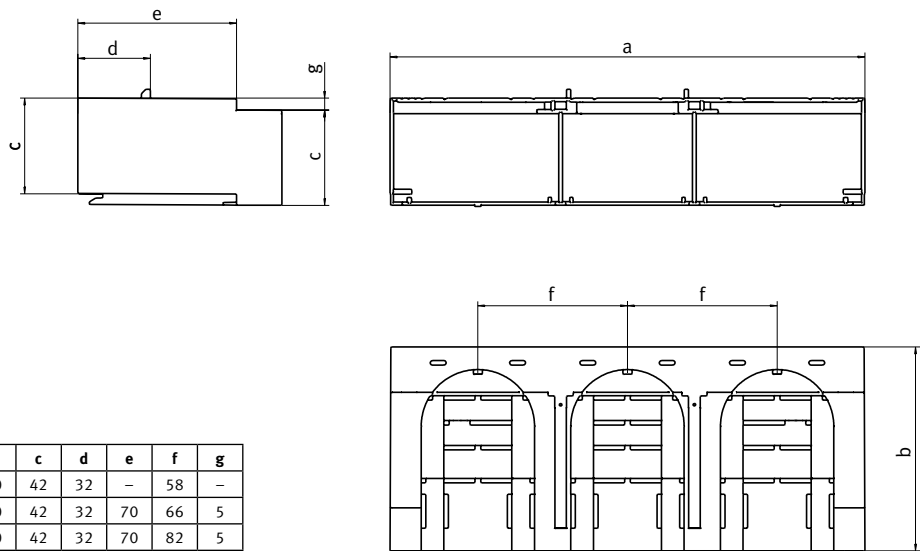
Type	a	b	c	e	f-Ao	f-Au	g-Ao	g-Au	h1	h2	h3	i	l	n	o	p	q	r	s	t1	t2	u
KETO-1-1	69	298	306	117	93	93	76	44	70	32	—	25,5	Ø10,5	5-10	33	4	19	138	5	272	—	—
KETO-3-1	91	298	306	143	100	104	66	36	90	32	70	26,5	Ø14	5-10	33	4	19	138	10	268	289	5

KETO - Dimensions

Part No.	Part No.
AA-KETO-00-3/36	AA-KETO-00-3/66

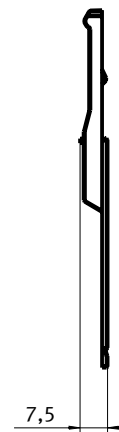
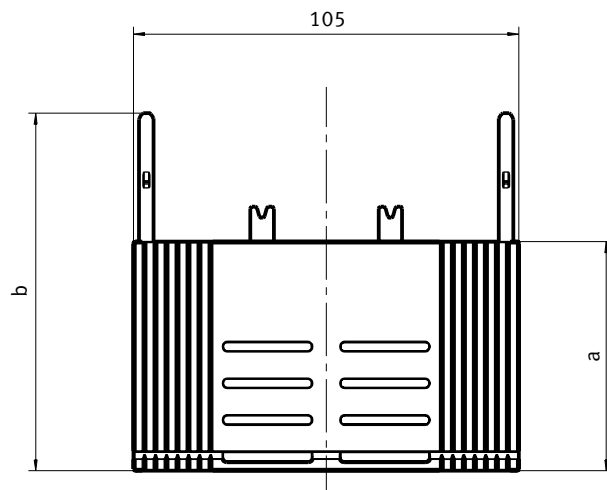


Part No.
AA-KETO-1-3
AA-KETO-2-3
AA-KETO-3-3



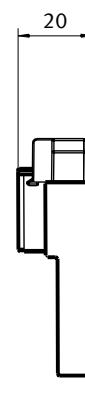
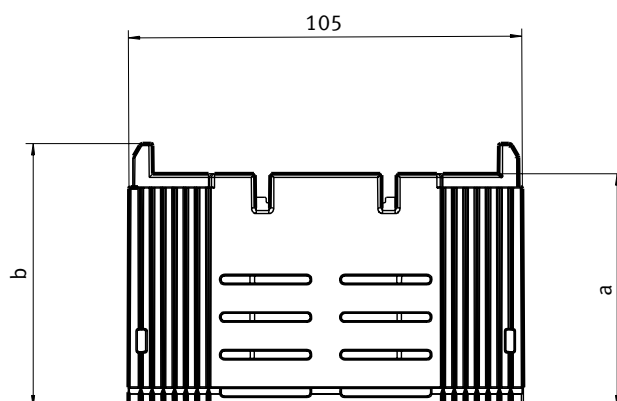
Type	a	b	c	d	e	f	g
AA-KETO-1-3	184	70	42	32	-	58	-
AA-KETO-2-3	210	90	42	32	70	66	5
AA-KETO-3-3	250	90	42	32	70	82	5

Part No.	Part No.
ARV-KETO-00-3/39-34	ARV-KETO-00-3/32



Type	a	b
ARV-KETO-00-3/39-34	62,5	97,5
ARV-KETO-00-3/32	55,5	90,5

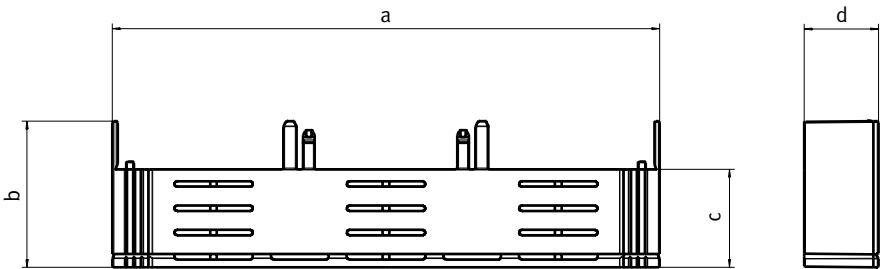
Part No.	Part No.
UGS-KETO-00-3/39-34	UGS-KETO-00-3/32



Type	a	b
UGS-KETO-00-3/39-34	62	70
UGS-KETO-00-3/32	55	63

KETO - Dimensions

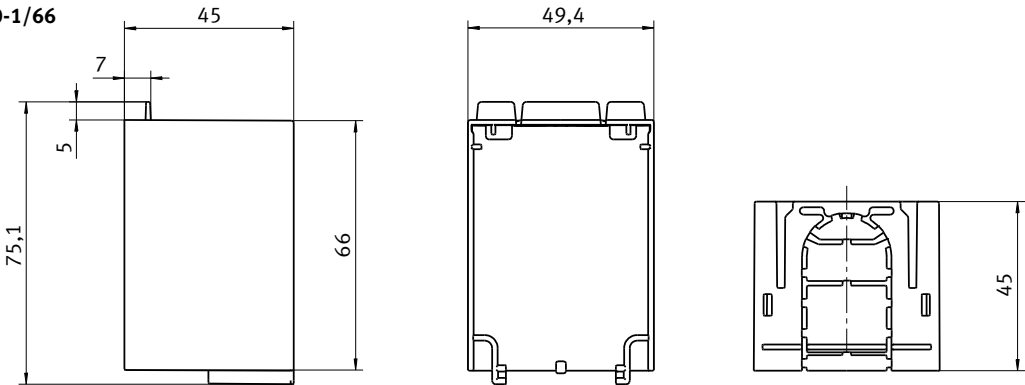
Part No.	Part No.
UGS-KETO-1-3/32	UGS-KETO-2-3/39-34
UGS-KETO-1-3/39-34	UGS-KETO-3-3/32
UGS-KETO-2-3/32	UGS-KETO-3-3/39-34



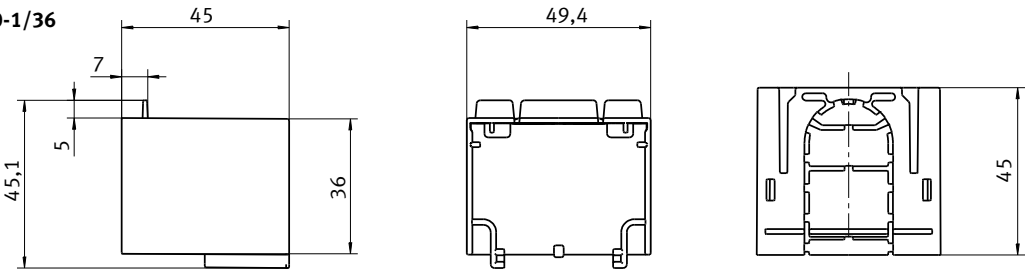
Type	a	b	c	d
UGS-KETO-1-3/32	184	51,5	30,5	16
UGS-KETO-1-3/39-34	184	58,5	37,5	16
UGS-KETO-2-3/32	210	49	30,5	28,5
UGS-KETO-2-3/39-34	210	56	37,5	28,5
UGS-KETO-3-3/32	250	49	30,5	28,5
UGS-KETO-3-3/39-34	250	56	37,5	28,5

Part No.	Part No.
AA-KETO-00-1/66	AA-KETO-00-1/36

AA-KETO-00-1/66

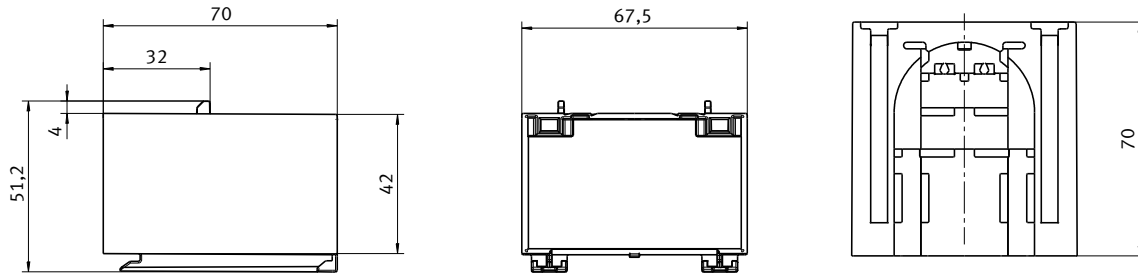


AA-KETO-00-1/36

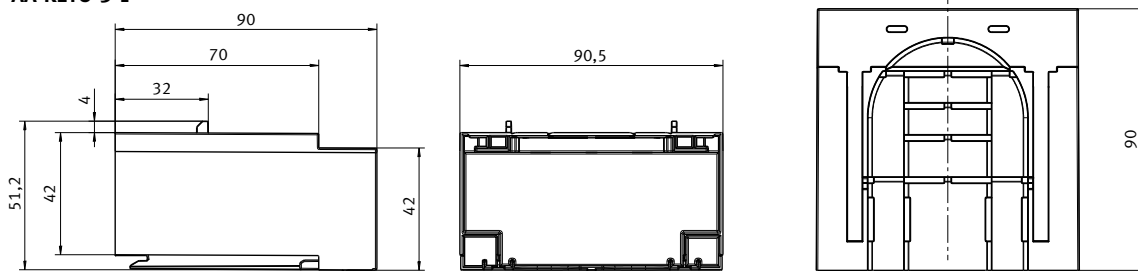


Part No.	Part No.
AA-KETO-1-1	AA-KETO-3-1

AA-KETO-1-1



AA-KETO-3-1





Horizontal fuse disconnects

Horizontal fuse Disconnects are used in building installations, switchgear and controlgear as well as in power utility networks. The contact system enables safe load break operation using the fuse-links as moving contacts.

The product is safe against finger-touch in closed position and provides a safe and visible isolating distance in open position. Different versions for baseplate mounting, DIN-rail or busbar mounting are available to fit a variety of applications.





Product definition

Horizontal fuse disconnect according to EN60947-3 are single-pole or multipole NH fuse-bases arranged horizontally and equipped with a common fuse-carrier.

Incoming and outgoing contacts are accessible from outside and fitted with terminals for the connection of cables or bars. The feeder side of fuse-switches for busbar mounting is designed to provide mechanical and electrical connection to standardised busbar systems.

Applications

Its compact design makes the horizontal fuse disconnect a perfect feeder switch in low voltage distribution panels, as well as a protective device mounted on standardized busbar systems having 40mm, 60mm or 100mm busbar distance or for meter protection in domestic buildings. Single-pole and two-pole fuse-switches are used for UPS battery protection or in telecom power supplies e.g. 4-pole fuse-switches can be used to disconnect secondary power generators from public networks.

Product advantages

JEAN MÜLLER offers NH fuse-switches in sizes 000 and 4a. The switch size 4a is available in single-pole up to 4-pole design. Executions for baseplate mounting as well as for busbar mounting are available in all sizes. Thanks to the wide product range, tailor-made solutions with respect to current rating, voltage rating and mode of installation can be found for nearly every application.

Insulation parts

Similar to the vertical fuse disconnects all products from size 1 and above, contain only thermosetting materials for insulators supporting live parts because of their high dimensional stability and superior resistance to tracking.

Current carrying parts

Products having rated currents of 400A and above, are equipped with Q-contacts for quasi-independent operation. Q-contacts ensure high short-circuit capability up to 80kA and safe load-break operation. Particularly NH fuse-switches for busbar mounting without separate adapters exhibit very low values for power loss due to their short connecting bars.

Versions/Accessories

Monitoring components allow remote monitoring of switch-position as well as of fuse-links. Microswitches or electronic components will be used for fuse monitoring, depending on the application.

Special executions enable size 00 fuse-switches up to 800A rated current in combination with the corresponding fuse-links, thus providing significant savings in space.

1-pole and 3-pole disconnectors up to 1200V, protected against direct access to live parts and safe in operation, provide electric protection of solar power installations.

Horizontal fuse disconnects

Horizontal fuse disconnects for panel mounting



Features

General-purpose terminal

- All sizes are equipped with general-purpose flat terminals for cable lugs and direct terminal clamps



Reliable overreach protection

- Optimum touch protection including when feeding from bottom side by retrofit overreach protector



High short-circuit capability

- Fuse protected conditional short-circuit current up to 80kA
- 35kA/1s short-circuit withstand when equipped with solid links



Terminal covers (sold separately) are required for all disconnects (refer to page 90)

1 pole horizontal fuse disconnects

Size	For Fuses	Current Rating (A)	Terminal	Connection Capacity(mm ²)	Part No.
000	DIN 000	100	Flat terminal M8	max. 95	LTL000-1/9
4A	DIN4A	1250	Flat terminal M16	max. 400	LTL4A-1/9/1250
4A	DIN4A	1600	Flat terminal 2x M12		LTL4A-1/9/1600

3 pole and 4 pole horizontal fuse disconnects

Size	For Fuses	Current Rating (A)	Terminal	Connection Capacity(mm ²)	Part No.
000	DIN000	160	Flat terminal M8	max. 95	LTL000-3/9
4A	DIN4A	1250	Flat terminal 1xM16	max. 400	LTL4A-3x3/9/1250
4A	DIN4A	1600	Flat terminal 2xM12		LTL4A-3x3/9/1600

Note: for sizes 00 (160A), 1 (250A), 2 (400A), and 3 (630A), refer Keto.

Horizontal fuse disconnects

Horizontal fuse disconnects for busbar mounting



Features

Adaptor free installation

- Small installation depth and direct busbar connection ensure low power loss



Compact size 000 fuse-switch

- Space saving 63mm width
- Easy snap-on technique without screws
- For busbars having 5mm or 10mm thickness



3 pole horizontal fuse disconnects - 60mm centres busbar mount

Size	For Fuses	Current Rating (A)	Cable Connection	Connection Capacity(mm²)	Connection to Busbars	Part No.
000	DIN000	100	Bottom clamp	1.5 - 50	Snap-on	LTL000-3/9/60/ AU/F57/5

Horizontal fuse disconnects

Horizontal fuse disconnects - Special versions



Features

Fuse-switch-disconnectors for baseplate monitoring

- For fuse-protected feeding of plug-in modules
- Fast module changing without cable disconnecting



Disconnectors rated 1000V and above

- Proven technology for reliable operation of switchgear rated 1000V and above



Space-saving protection of DC-systems up to 1000V

- 1-pole disconnector for safe feeding of photovoltaic installations



Compact switching devices up to DC 250V rating

- Minimum space required for fuse protection up to 800A with LTT size 00
- Versions for baseplate and busbar mounting as well as feeding on rear side



Terminal covers (sold separately) are required for all disconnects (refer to page 92)

1 pole horizontal fuse disconnects for telecom supplies up to 250V DC base mounting

Size	For Fuses	Current Rating (A)	Connection	Terminal	Part No.
00	DC	800	Top and bottom	Flat Terminal M12	LTT00-1/9
00	DC	800	Rear	Flat Terminal M12	LTT00-1/9R
00	DC	800	Top and bottom 2 Pole	Flat Terminal M12	LTT00-2/9
00	DC	750	Top and bottom	Flat Terminal M12	KETO-00-1/F/750A/250V DC (LTT)



LTT00-1/9



LTT00-1/9R



LTT00-2/9

Horizontal fuse disconnects

Accessories



Description	Size	Part No.
Clamp terminal		
1,5-70 mm ² Cu	LTL00	S00
25-150 mm ² Cu	LTL1	S1
25-240 mm ² Cu	LTL2	S2
Bar 11 x 21	LTL3	S3



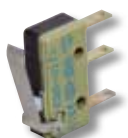
Prism clamp		
10-70 mm ² Al/Cu	LTL00	P0070
70-150 mm ² Al/Cu	LTL1	P1
120-240 mm ² Al/Cu	LTL2	P2
120-300 mm ² Al/Cu	LTL3	P3



Prism clamp for 2-conductors connection		
2 x 70-150 mm ² Al/Cu	LTL1	P12
2 x 120-240 mm ² Al/Cu	LTL2	P22
2 x 120-300 mm ² Al/Cu	LTL3	P32



Switch position indicator		
1- and 3- pole	LTL00	EV-LTL00
1- and 2-pole	LTL1-3	EV-LTL123-1
3-pole	LTL1-3	EV-LTL123-3



Switch position indicator or fuse blown indicating microswitch		
1- and 3- pole	LTL4a	K/EV-LTL/SLTL4A



Fuse blown indicating microswitch (use with striker fuses)		
1-pole	LTL00	K-LTL00-1/H
1-pole	LTL1	K-LTL1-1/H
1-pole	LTL3	K-LTL3-1/H
3-pole	LTL00	K-LTL00-3/H
3-pole	LTL1	K-LTL1-3/H
3-pole	LTL2	K-LTL2-3/H
3-pole	LTL3	K-LTL3-3/H



Protective cover, 3-pole, baseplate mounting		
Top and bottom side	LTL000	GOU-LTL000-3
Top and bottom side	LTL4	GOU-LTL4-3



DIN Rail Mounting Kit		
For mounting of NH fuse-switch-disconnectors on DIN rails acc. to EN 50022	LTL00	Z-LTL00-3

Horizontal fuse disconnects - Technical Information

LTL NH fuse switch-disconnector specification

		Unit	LTL000	LTL000 Busbar	LTL4a-1250	LTL4a-1600
Accord to standard			EN60947-3			
For NH fuse link			000	000	4a	
Rated operational Voltage	V		AC690 DC220	AC500 DC220	AC690	AC690
Rated operational Current	A		160	125	1250	1600
Thermal rating with fuse links	A		160	125	1250	1600
Thermal rating with solid links	A		160	160	1250	1600
Rated frequency	Hz		40-60			
Rated AC insulation	V		AC690	AC500	AC800	
Power loss at max current not including fuse or link	W		7	18	32	52
Power loss at 80% max current not including fuse or link	W		4.5	11.5	20.5	33.3
Rated withstand voltage	kV		8			
Utilisation category	AC-22B 400V		160A			
	AC-22B 500V		100A	125A	1250A	1600A
	AC-22B 690V					
	AC-21B 690V		125A		1000A	1000A
	DC-21B 440V					
	DC-22B 220V			100A		
No switching under load	DC-20B 1000V				1250A	1600A
Rated conditional short circuit current	kA		63	50	35	35
Max. power loss per fuse link	W		10	8	110	164
Flat Bolt terminal	Bolt Diameter		M8		M16	2xM12
	Cable lug	mm ²	1x10-70		400	400
	Flat bar	mm			80x30	80x30
	Tightening Torque	Nm	12-15		50-60	35-40
Clamp S type copper			S000-16 S000-50	F50		
Cu	Cross Section	mm ²	6-16 25-50	1.5-50		
Tightening torque		Nm	2.6	2.6		
Clamp P type copper & aluminium	Single		P000-35 P000-70			
	Double		P000-2-35 P000-2-50			
Cu/Al	Cross section	mm ²	10-35 50-70 2x25-35Cu 2x50 Cu			
	Double Clamp					
Tightening torque		Nm	4.5			
Front side IP	Closed Position		IP20			
	Open position		IP10			
Operating temperature	°C		-25/+70			
Actuation			Dependent manual operation			
Mounting position			Vertical or horizontal			
Altitude	M		Up to 2000			
Pollution degree			3			
Overvoltage category			III			

Accessories - Micro switches			
Switch Position Indicator Fuse Blown Position Indicator		EV-LT00, EV-LTL123-1 K-LTL**-1/H	EV-LTL123-3, EV-LTL4A K-LTL**-3/H, K-LTL4A
Rated Current @ 250V AC	A	5	5
Rated Current @ 110V DC	A	0.35	0.35

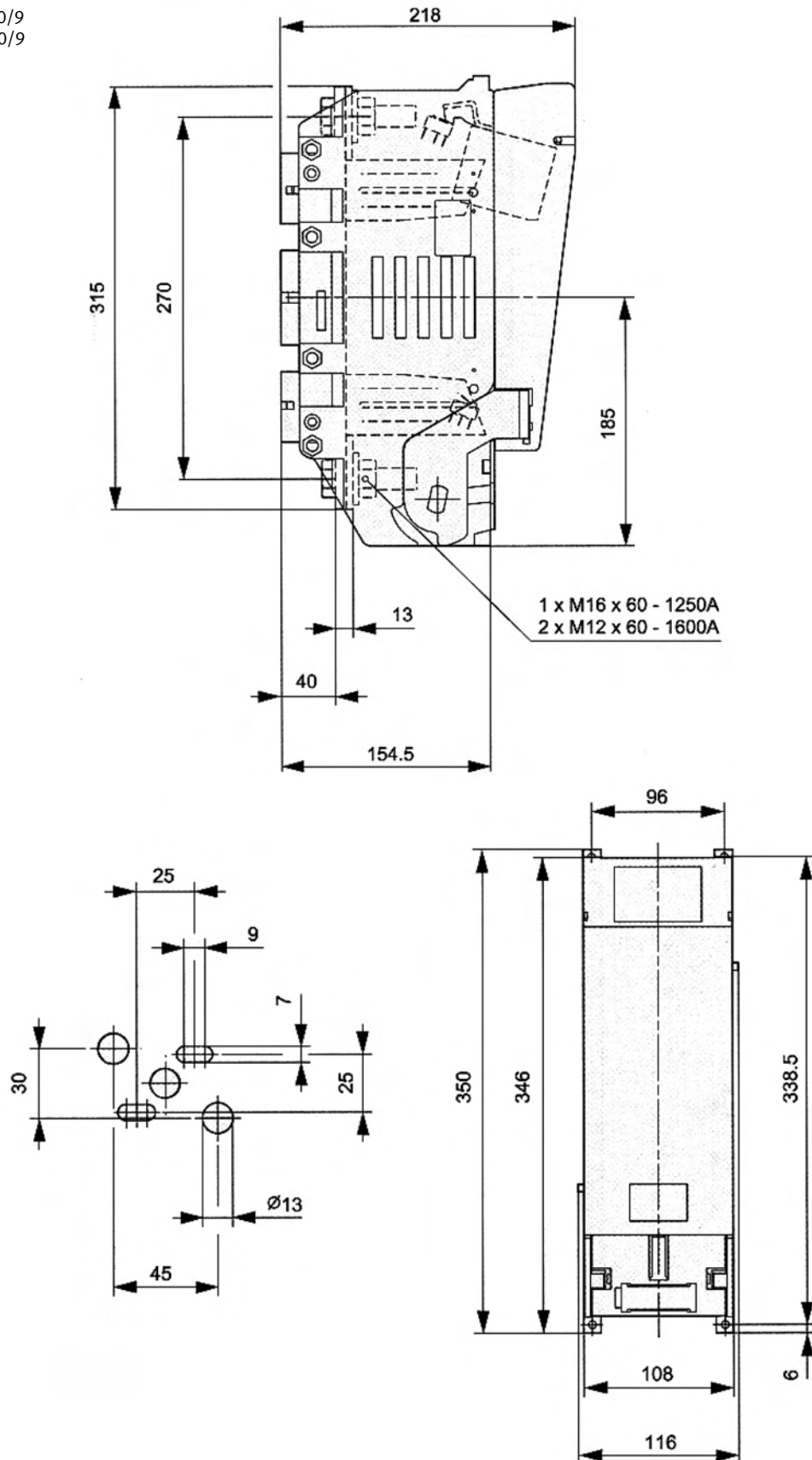
Terminal with connecting lug						
	AL/Cu Cable [mm ²]				Allen Key	Tightening Torque (Nm)
	Rounded Stranded	Sector Stranded	Round Solid	Sector Solid		
K2G/A	50-185	70-240	50-185	70-240	6 mm	40
KM2G/AF3040	25-300	25-240	25-150	25-240	6 mm	32
K2HG/2/AF30	2 x 25-120	2 x 35-120	2 x 25-50	2 x 50-120	6 mm	40
KV2HG/2/AF30	2 x 12-185	2 x 12-185	-	-	6 mm	40

Fuse switches DIN-Rail mount			
		WH-AMB1/10 JM WH-AMB3/10 JM	WH-AMB1/22 JM WH-AMB3/22 JM
Rated Current @ 690V AC		32A	100A
Application Category		AC-22B (650V)	AC-21B (690V)
Conditional Rated Short Circuit Current		100kA (400V)	120kA (500V)
Terminal Capacity		1x 1.5 - 25mm ²	1x 4 - 50mm ²

LT00-1/9

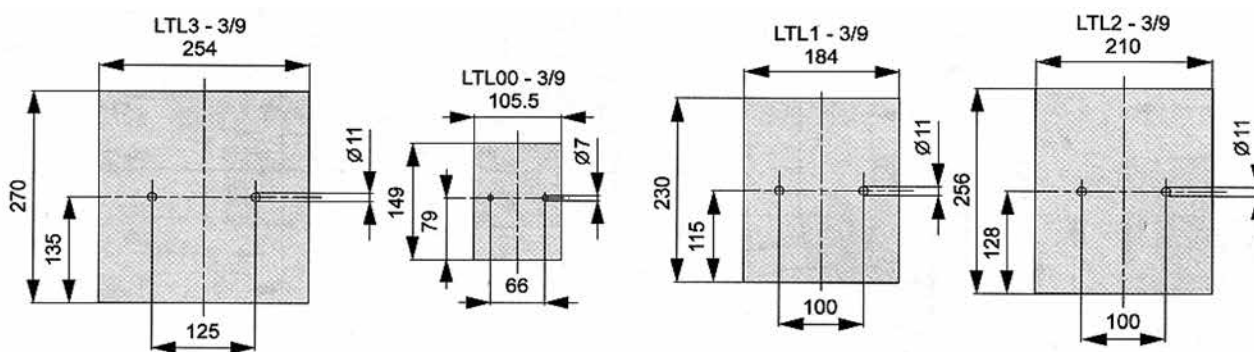
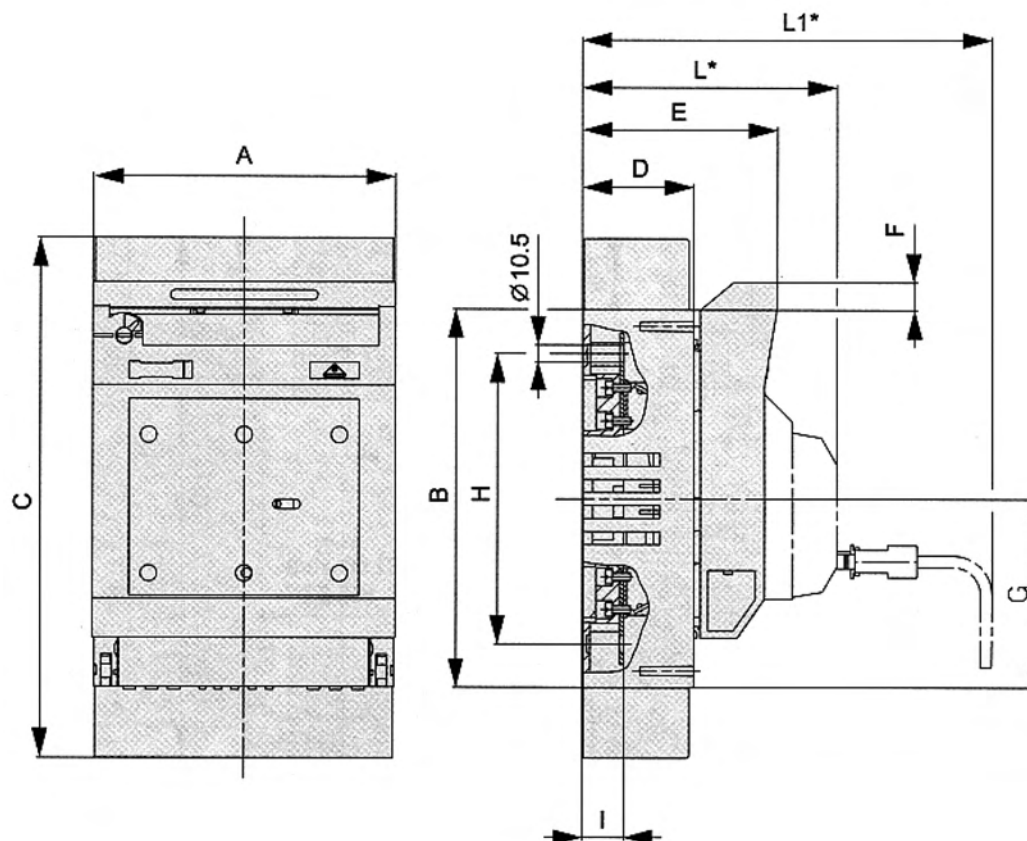


LTL4a-1/1250/9
LTL4a-1/1600/9



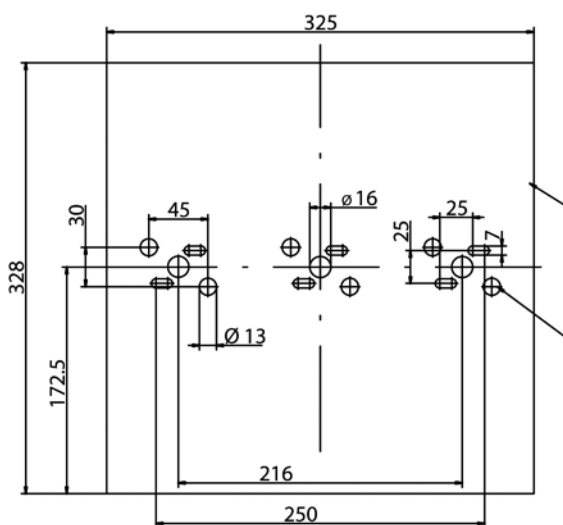
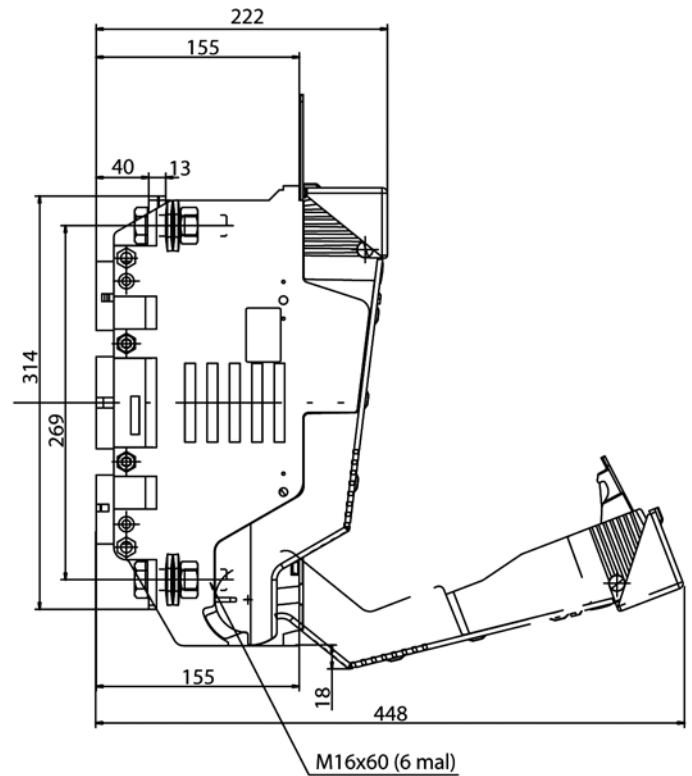
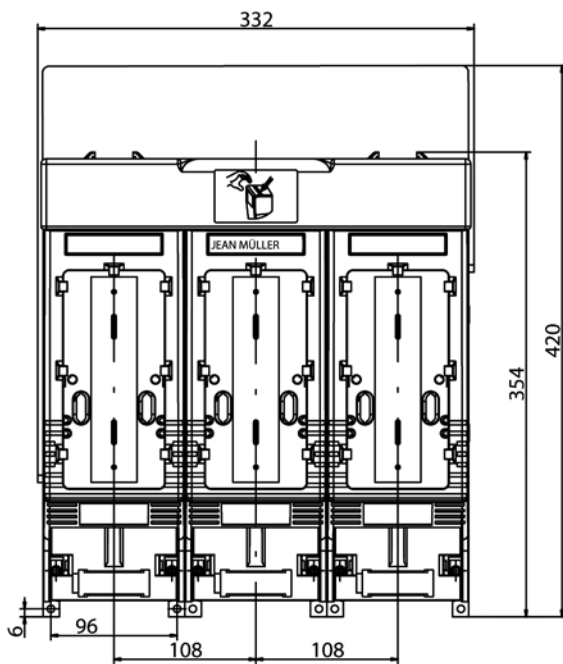
Horizontal fuse disconnects - Dimensions

LTL00-3/9
LTL1-3/9
LTL2-3/9
LTL3-3/9



	A	B	C	D	E	F	G	H	I
LTL000-3/9	89	139	150	48	78.5	0	70	112	15
LTL00-3/9	105.5	149	200	45	86	20.5	74.5	120	17
LTL1-3/9	184	230	317	68	119	16.5	115	177	25
LTL2-3/9	210	256	397	81	133	16.5	128	205	25
LTL3-3/9	254	270	430	96	147	9	135	220.5	30.5

LTL4A-3X3/1250/9
LTL4A-3X3/1600/9

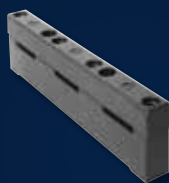




C|O|S|M|O® 60mm busbar-system

Busbar supports

- Two-piece busbar supports adjustable to different busbar width with means of integrated adjusting element



Busbar cover

- Clip on busbar covers are used for the protection of 3-pole and 4-pole busbar systems
- They are extendable or detachable at anytime. In addition they offer variable covering widths without measuring and cutting



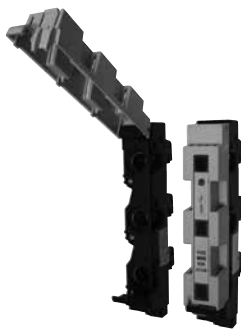
Connection modules

- Connection modules connect the busbars to power supply and protect against unintentional access to live parts
- Integrated robust clamps establish electrical contact



C|O|S|M|O® system components

Description	Part No.
Busbar support	
3-pole	SST-60/49-3
End cover	
3-pole	A-SST-60/3
Busbar cover	
3-pole	SAD60/3
Connecting modules up to 250A	
3-pole 1,5mm ² -70mm ²	AM-60/250/3
Connecting modules up to 630A	
3-pole 70mm ² -300mm ²	AM-60/630/3



DSL-60/183-5

C|O|S|M|O® 60mm busbar system

Load disconnect switches for D-type fuses 63A

For Fuses	Current Rating (A)	Cable Connection	Connection Capacity(mm ²)	Connection to Busbars	Part No.
D02	63	Clamp	max. 25	Snap-on	DSL-60/183-5
Screw cap					K02

Fuse bases for D-type fuses -25A

For Fuses	Current Rating (A)	Cable Connection	Connection Capacity(mm ²)	Connection to Busbars	Part No.
DII	25	Clamp	max. 25	Snap-on	RS-60/273-5
Front Cover					ARS-273/230
Top or bottom end cover					GOURS273-230
Left or right side cover					ASRS-230
Screw Cap					K2



RS-60/273-5

Fuse bases for D-type fuses -63A

For Fuses	Current Rating (A)	Cable Connection	Connection Capacity(mm ²)	Connection to Busbars	Part No.
DIII	63	Clamp		Snap-on	RS-60/333-5
Front Cover					ARS-333/230
Top or bottom end cover					GOURS333-230
Left or right side cover					ASRS-230
Screw Cap					K3

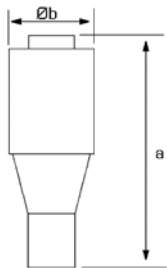


RS-60/333-5

D - Type fuse bases

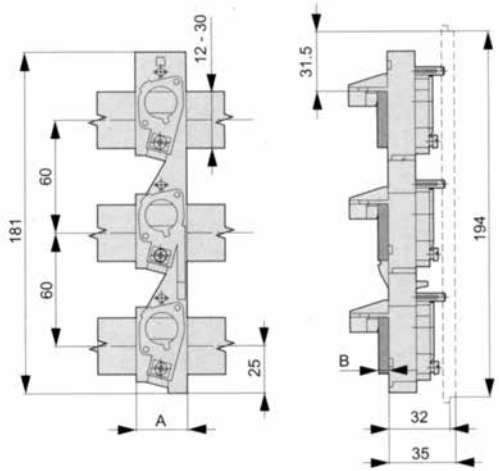
- Rated Current: 25A and 63A
- Rated Voltage: 25A - 500V, 63A - 690V
- Standard: IEC269-3-1
- Flame Resistance to: UL94V-0
- Terminal: Clamp Type, self lifting, 25mm² max.
- Touch Protection: Clip-on Covers for top, bottom and sides are available.
- Mounting: On Busbars 12-30mm width, 5 or 10mm thick.

Busbar systems

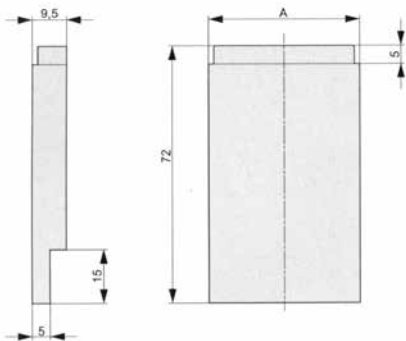


DIN size	Thread	Amps	a	Øb
D11	E27	10-25	50	21.8
D111	E33	35-63	50	28

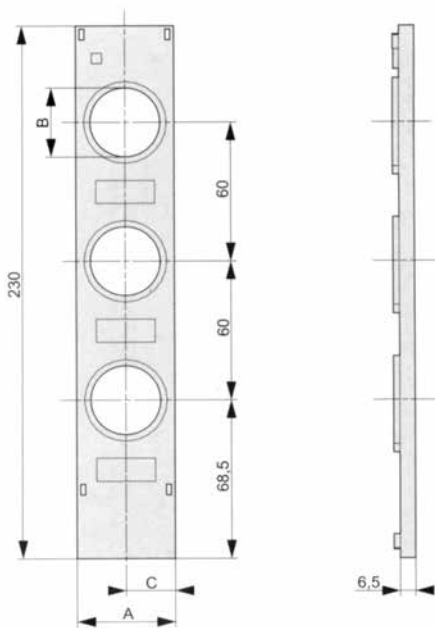
D -Type fuse bases



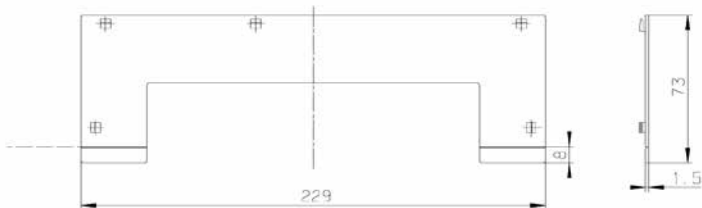
	A	A
RS60/273-5	45	45
RS60/333-5	54	5



	A
GOURS273-60	42
GOURS333-60	57



	A	B	C
ARS273/230	45	30	22.5
ARS333/230	54	36	27



ASRS-60

Busbar system

100mm busbar system components

Description			Part No.
Busbar hole inserts			
	M8 thread	14mm bar hole	SI-BHI/M8
	M10 thread	14mm bar hole	SI-BHI/M10
	M12 thread	14mm bar hole	SI-BHI/M12
	M16 thread	18mm bar hole	SI-BHI/M16



Vertical fuse disconnects 100mm busbar mount - 3 pole individual pole switching

Size	For Fuses	Current Rating (A)	Switch Width (mm)	Busbar centre spacing (mm)	Part No.
00	DIN000 & DIN 00	160	50	100	SL00-3X/100/F/HA

Vertical fuse disconnects 100mm busbar mount - 3 pole switching in one action

Size	For Fuses	Current Rating (A)	Switch Width (mm)	Busbar centre spacing (mm)	Part No.
00	DIN000 & DIN 00	160	50	100	SL00-3X3/100/F/HA

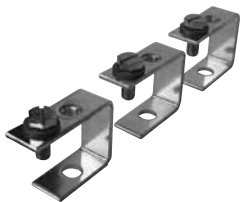
SL00-3X3/100/F/HA

Note: Refer also to Vertical fuse disconnects (pages 30-46)

Busbar systems



SH100/185



AB-SL00/1



AL-SL00/42



H-SL00/185



H-RF

185mm busbar system

Description	Part No.
-------------	----------

3 pole busbar support	
For busbars at 100mm or 185mm spacing	SH100/185

Busbar hole inserts			
	M8 thread	14mm bar hole	SL-BHI/M8
	M10 thread	14mm bar hole	SL-BHI/M10
	M12 thread	14mm bar hole	SL-BHI/M12
	M16 thread	18mm bar hole	SL-BHI/M16

Adaptor kit (set of 3 pieces)	
To mount 1x SL00-*** with front flush with SL 1,2,3	AB-SL00/1

Adaptor plates	
To mount 2x SL00../185 with fronts flush with SL 1,2,3	AL-SL00/42
Cover 50mm width for spare position on AL-SL00/42	H-SL00/185

Spare position cover	
Clip on cover 100mm width	H-RF

Cover holder	
Set of 4 blocks to mount onto SL00,1,2,3	AH-SL

100mm busbar system

Description	Part No.
-------------	----------

Adaptor plates	
To mount 2x SL00../100 with fronts flush with SL 1,2,3	AL185-SL00/100/52
Cover 50mm width for spare position on AL185-SL00/100/52	H-SL00/100



JMTE-BBS3



JMTE-BBS6 front,
with 2x JMTE-BAR1
fitted



JMTE-BBS6 rear,
with 2x JMTE-BAR1
fitted

185mm Rack systems

Jean Müller NZ Ltd assembles complete busbar rack assemblies to customer requirements. The racks listed below are stock types but we can build racks to suit all requirements.

Rack construction:

- SH100/185 type tested busbar supports
- Plated copper busbars with M12 inserts fitted and stainless steel bolt, spring washer and flat washer attached.
- a 3mm plastic backplate give complete finger protection when disconnects are fitted in all positions.

Description	Part No.
-------------	----------

JMTE Rack systems			
700A	50x6mm bar	3 way	JMTE-BBS3
700A	50x6mm bar	4 way	JMTE-BBS4
700A	50x6mm bar	5 way	JMTE-BBS5
700A	50x6mm bar	6 way	JMTE-BBS6
1000A	60x10mm bar	4 way	JMTE-BBS4/1000
1000A	60x10mm bar	6 way	JMTE-BBS6/1000
1000A	60x10mm bar	8 way	JMTE-BBS8/1000
1300A	80x10mm bar	4 way	JMTE-BBS4/1300
1300A	80x10mm bar	6 way	JMTE-BBS6/1300
1300A	80x10mm bar	8 way	JMTE-BBS8/1300

Mounting straps		
For 6 way racks	30 x 5 x 650mm	JMTE-BAR1
For 6 way racks	50 x 5 x 650mm	JMTE-BAR13



JMTE-ENBS

Earth and neutral bars

Below is a listing of standard earth and neutral bars manufactured by JEAN MÜLLER NZ Ltd.

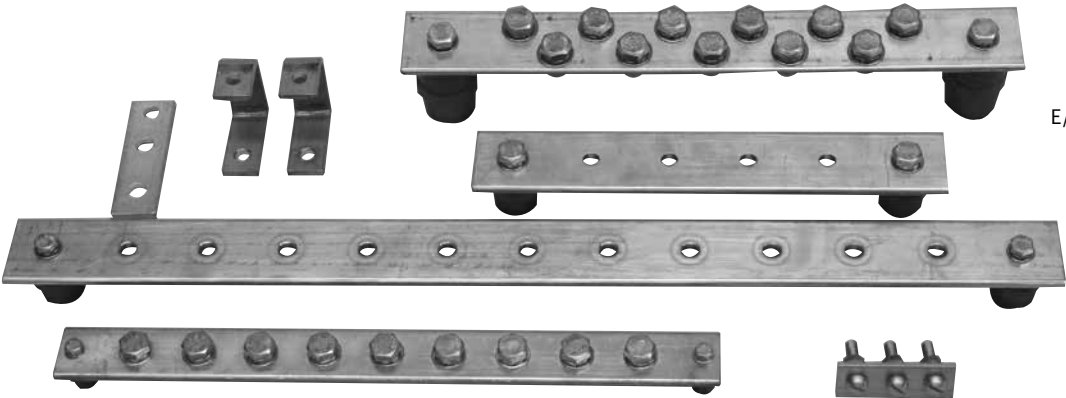
We also assemble any type and size to customer requirements. Bars are tin plated copper and fitted with standoff insulators. Connections shown are the quantity of busbar inserts fitted with screws and washers.

Standard earth and neutral bars

Connections	Bar Size	Current Rating	Part No.
7 x M10 connections	100x6x440mm	1200amp	JMTE-ENBS
8 x M12 connections			
6 x M10 connections	50x6x800mm	700amp	JMTE-ENBS2
8 x M12 connections			
10 x M12 connections	50x6x810mm	700amp	JMTE-ENBS10



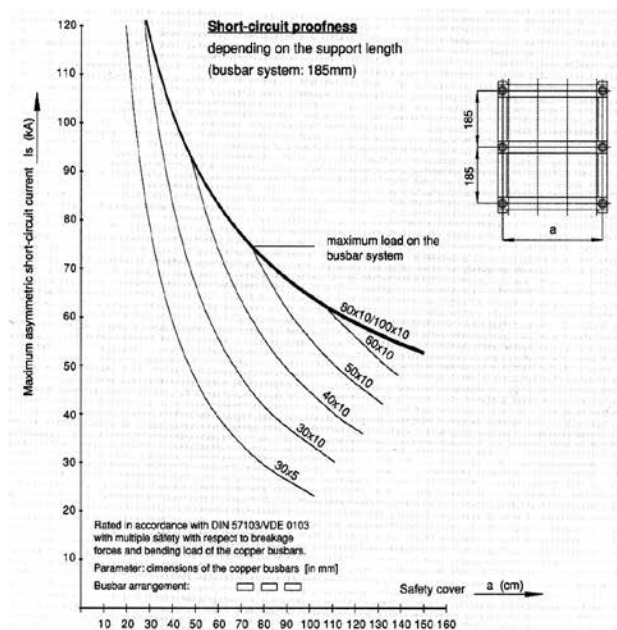
E/N bars



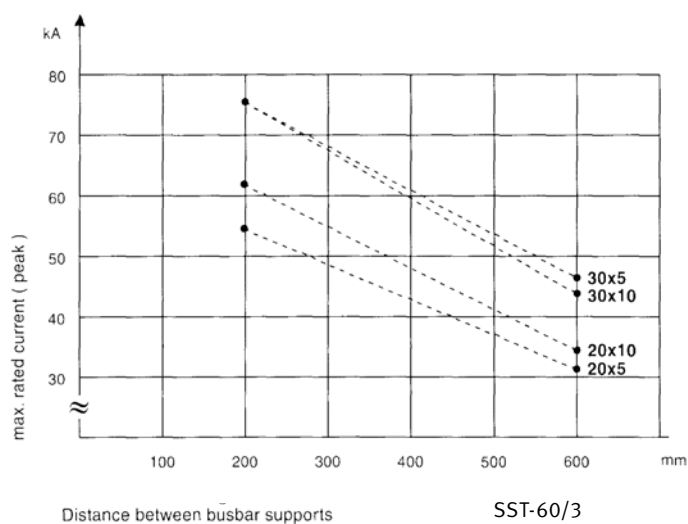
E/N bars made to customer specification

Busbar systems - Technical Information

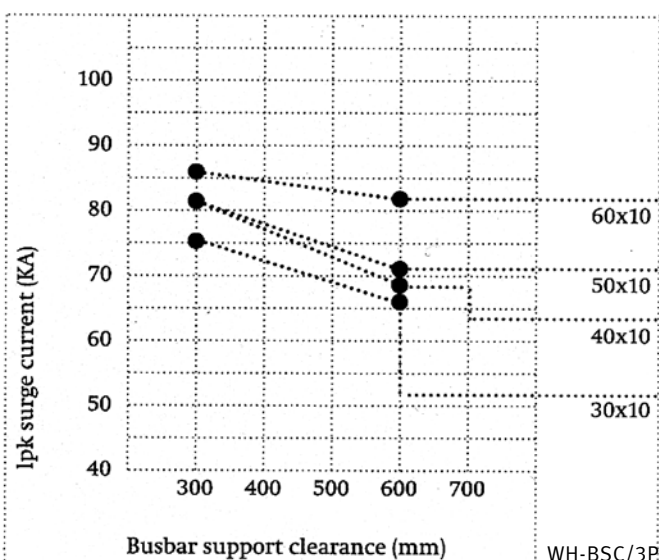
Busbar supports	SST-60/3	WH-BSC/3P	SH-100/185
Busbar thickness	5 or 10 mm	10mm	any
Busbar width	20 or 30 mm	30-60mm	20-120mm
Busbar mounting	Clamp on 60mm centres	Clamp on 100mm centres	Bolted into threaded bush M10 on 100mm or 185mm centres
Material		Silicon free, chlorine free	Glass-fibre, reinforced polyester
Temperature withstand		120C	
Short-circuit withstand	See Graph	See Graph	See Graph



SH-100/185



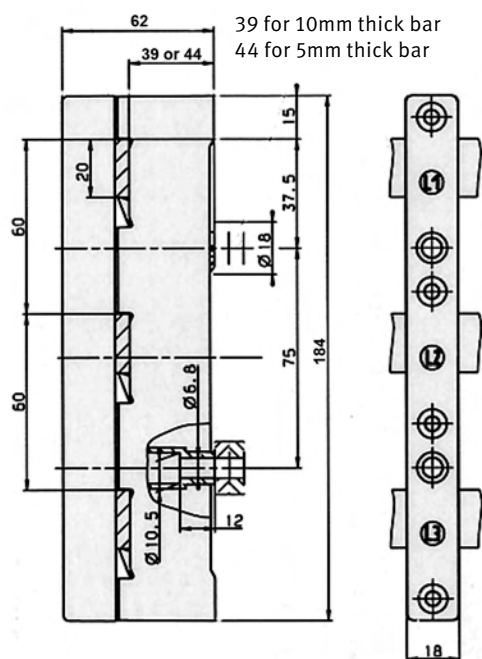
SST-60/3



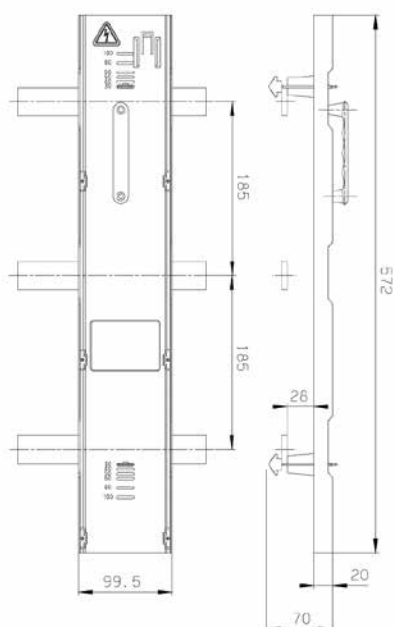
WH-BSC/3P

Busbar systems - Dimensions

SST-60/49-3



H-RF

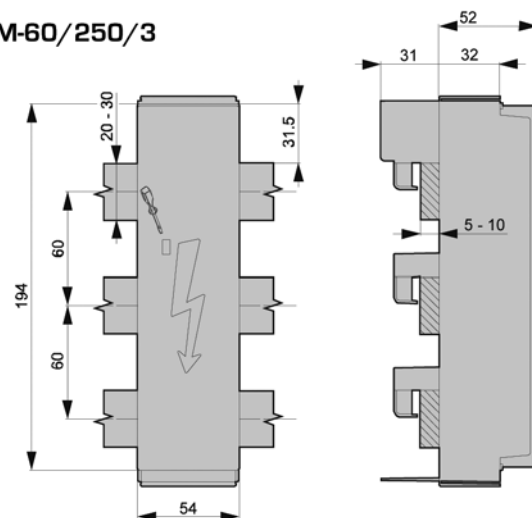


ASST-60/3

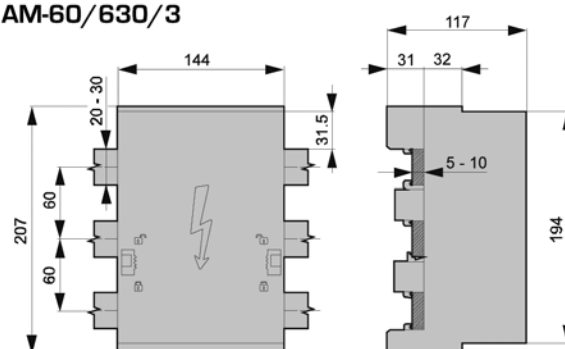


AM-60/250/3

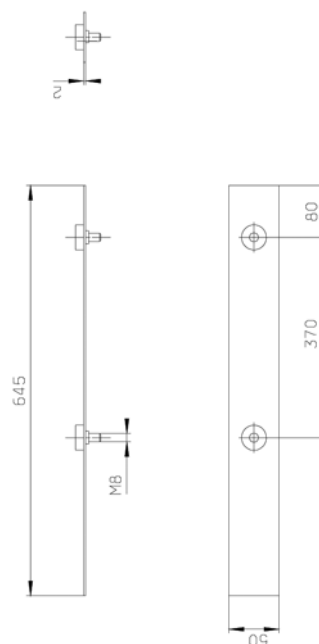
AM-60/250/3



AM-60/630/3

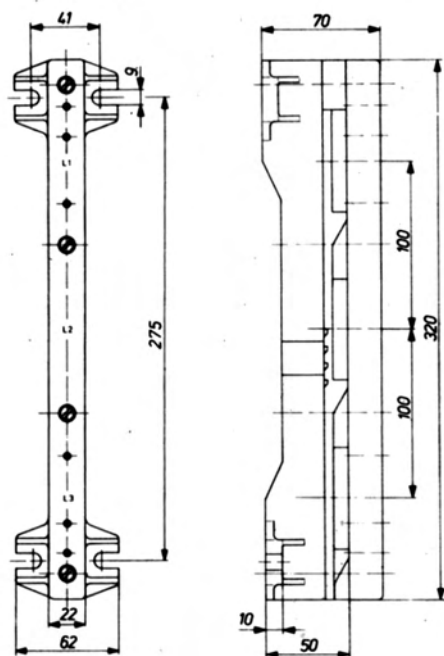


H-SL00/185

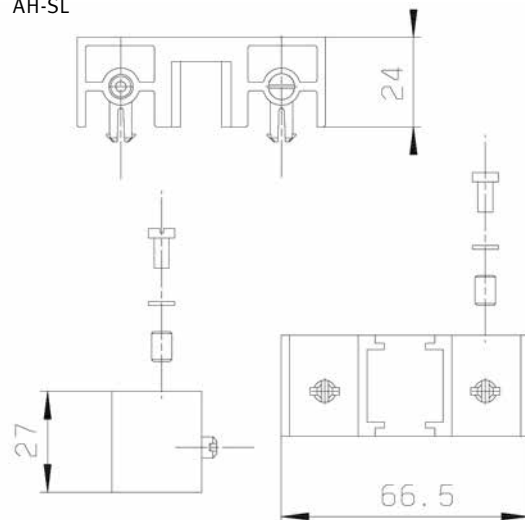


Busbar systems - Dimensions

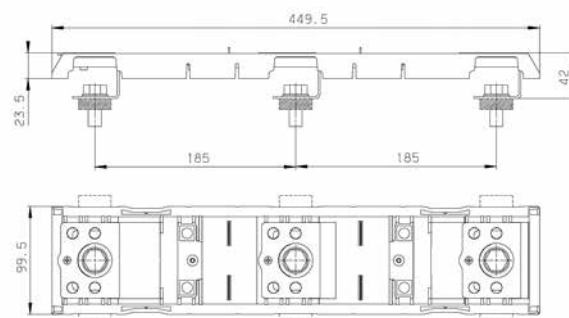
WH-BSC/3P



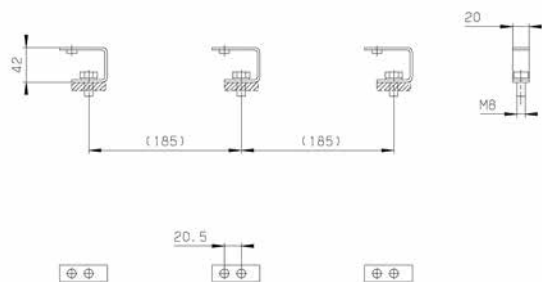
AH-SL



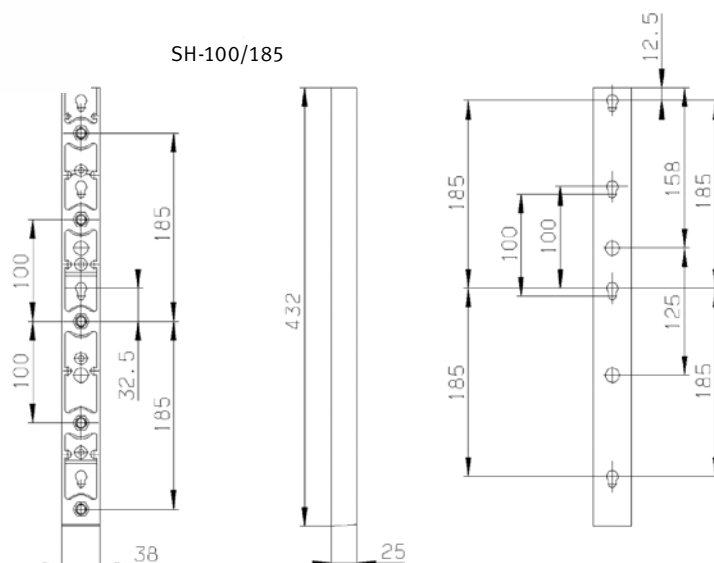
AL-SL00/42



AB-SL00/1

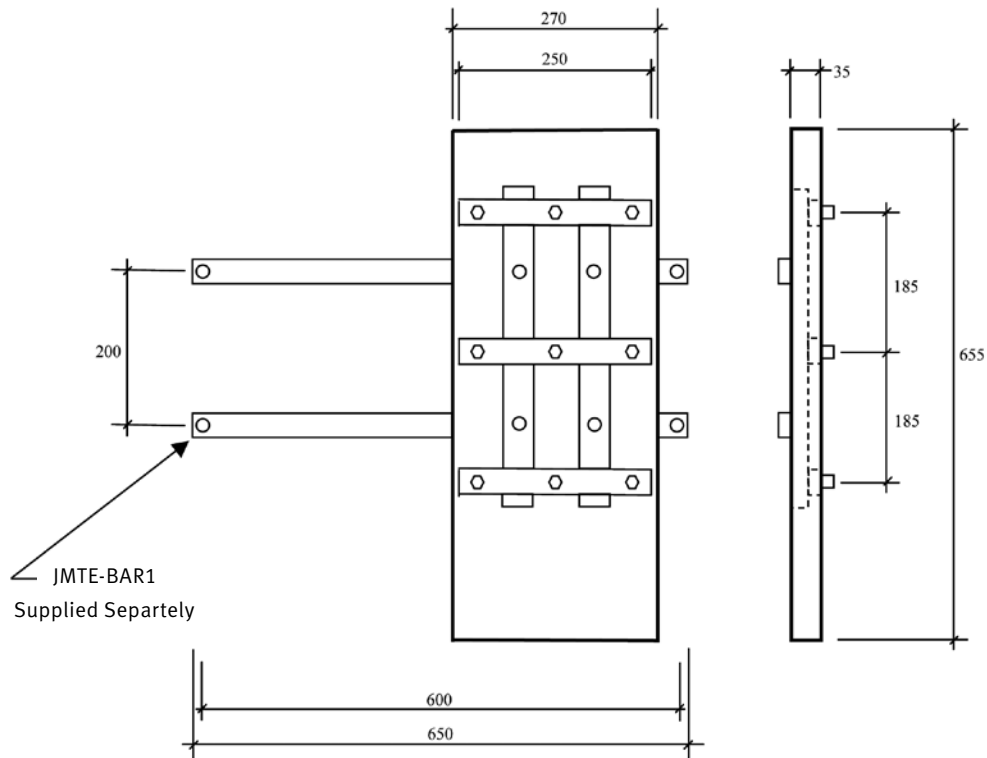


SH-100/185

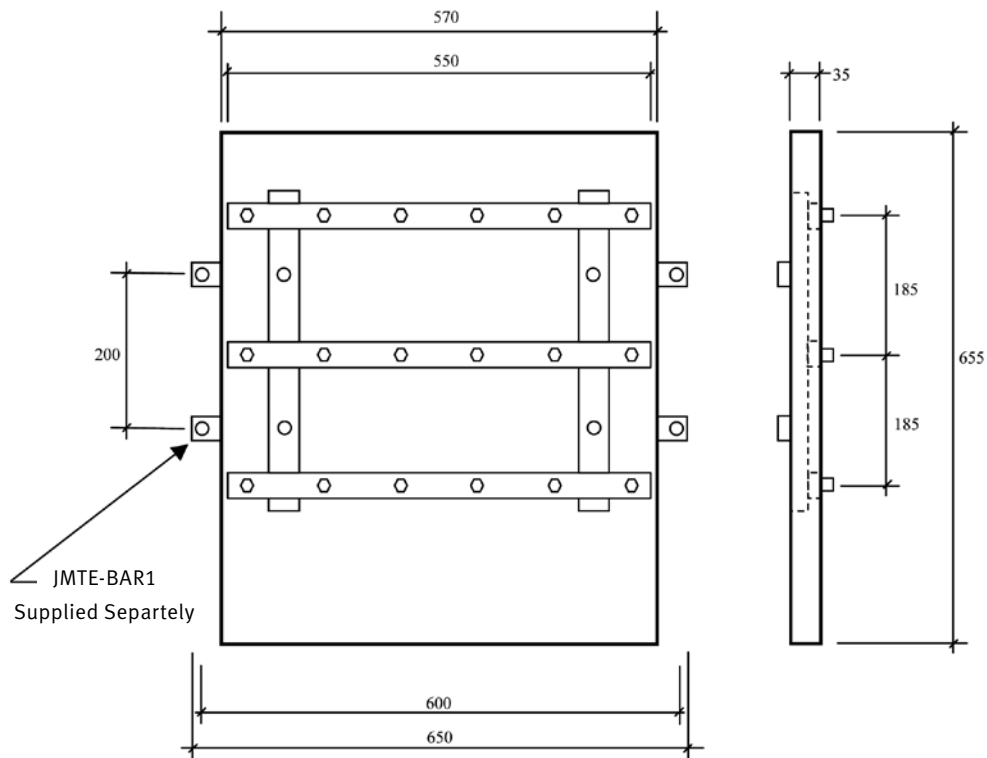


Rack systems

JMTE-BBS3
JMTE-BBS6



JMTE-BBS6





Cable Distribution Cabinets (CDC)

Cable distribution cabinets according DIN EN 61439 part 5 and DIN 43629 are enclosures for outdoor installation to distribute electric energy in low voltage distribution network.

For that purpose they are generally equipped with LV HRC strip-fuseways mounted on a busbar system.

The housing offers multiple protection against influence of weather, contact and unauthorised access. Standardised models ensure fast replaceability.

Possible applications exist as enclosures for traffic or pump control devices, street lighting, control devices or solar engineering.



Cable Distribution Cabinets series KVS



Series KVS

Product definition

DIN EN 61439-1, DIN EN 61439-2
DIN EN 61439-5 and DIN 43629

Range

- 850mm high cabinets
- four widths from 4 way to 10 way
- available in kitset or assembled
- available with busbars up to 1000A

Construction

- constructed from glass-fibre reinforced polyester to DIN14598
- cabinet and base are separate items

Features

- IP44 protection
- three point door locking
- ribbed surface to resist poster adhesion
- door opening 180°
- grid for additional ground holding available

Cable Distribution Cabinets (CDC)

Cable Distribution Cabinets series KVS 850mm height

Cabinet supplied assembled

		No of ways	Dimensions mm H x W x D	Part No.
		4 way	850 x 462 x 322	KVS00/10/PNT
		5 way	850 x 596 x 322	KVS0/10/PNT
		7 way	850 x 791 x 322	KVS1/10/PNT
		10 way	850 x 1121 x 322	KVS2/10/PNT

Cabinet supplied assembled with 700A busbars (keylock additional)

		No of ways	Dimensions mm H x W x D	Part No.
		4 way	850 x 462 x 322	KVS00/10SAP
		5 way	850 x 596 x 322	KVS0/10SAP
		7 way	850 x 791 x 322	KVS1/10SAP
		10 way	850 x 1121 x 322	KVS2/10SAP

Cable Distribution Cabinets series KVSL (LABEO)



Replacement for NKVS series

Product definition

DIN EN 61439-1, DIN EN 61439-2
DIN EN 61439-5 and DIN 43629

Range

- 1100mm high cabinets
- three widths from 5 way to 10 way

Construction

- constructed from glass-fibre reinforced polyester to DIN14598
- cabinet and base are separate items

Features

- IP44 protection
- three point door locking
- door opening 180°
- grid for additional ground holding available

Cable Distribution Cabinets (CDC)

Cable Distribution Cabinets series KVSL (LABEO) 1100mm height

Cabinet supplied assembled

		No of ways	Dimensions mm H x W x D	Part No.
		5 way	1100 x 605 x 320	KVSL0-31/PNT
		7 way	1100 x 800 x 320	KVSL1-31/PNT
		10 way	1100 x 1130 x 320	KVSL2-31/PNT

Cabinet supplied assembled with 700A busbars (keylock additional)

		No of ways	Dimensions mm H x W x D	Part No.
		5 way	1100 x 605 x 320	KVSL0/SAP
		7 way	1100 x 800 x 320	KVSL1/SAP
		10 way	1100 x 1130 x 320	KVSL2/SAP

KVSL accessories

Oval head screw	All cabinets	KVSL Dome screw
Counter sunk screw		KVSL Counter sunk screw
Door stay		KVSL Door stay





FP0

Cable Distribution Cabinets - bases and accessories

Bases for KVS and KVSL cabinets
NEW KVSL cabinets fit existing FP base

For cabinets	Dimensions mm H x W x D	Part No.
KVS00	902 x 460 x 310	FP00-10/PNT
KVS0 & KVSL0	902 x 585 x 310	FP0-10/PNT
KVS1 & KVSL1	902 x 780 x 310	FP1-10/PNT
KVS2 & KVSL2	902 x 1110 x 310	FP2-10/PNT



FP1 with GBPLO

Bases for KVS cabinets assembled with 700A E/N bar

For cabinets	Dimensions mm H x W x D	Part No.
KVS00	902 x 460 x 310	FP00-SAN
KVS0 & KVSL0	902 x 585 x 310	FP0-SAN
KVS1 & KVSL1	902 x 780 x 310	FP1-SAN
KVS2 & KVSL2	902 x 1110 x 310	FP2-SAN



FP1 with FPH

Pedestal elevation for flood areas

Description	Size	Part No.
511mm elevation	00	FPH00-10/KS/BV
	0	FPH0-10/KS/BV
	1	FPH1-10/KS/BV
	2	FPH2-10/KS/BV

Accessories

	Part No.
Cylinder key lock for KVS and KVSL cabinets Additional charge for lock keyed to customers requirement (net price)	CKL-UL
Grid baseplate to increase groundholding for 00/0/1	GBPLO
Padlockable handle	SV-PL

Cable Distribution Cabinets (CDC)

Cable Distribution Cabinets series EH

Empty cabinets

Model	Dimensions mm H x W x D		Part No.
EHFB		1349 x 425 x 240	EHFB
EHFERB		1622 x 425 x 240	EHFERB

Fitted cabinets (keys invoiced separately, but included in price)

Model	Fitted with	Dimensions mm H x W x D	Part No.
EHFB	- formica panel 400 x 450mm - key lock additional	1349 x 425 x 240	EHFB/PNL
EHFERB	- 700A phase bars - single earth/neutral bar - key lock additional	1622 x 425 x 240	EHFERB/35

Accessories

	Part No.
Cylinder key lock for EH cabinets Additional charge for lock keyed to customers requirement (net price)	CKL-UL
Threaded insert M6	SOC-IT6
500ml paint kit - any colour	JMTE/PAINT/KIT500
1000ml paint kit - any colour	JMTE/PAINT/KIT1000

Note: Paint kits include - 2k colour, hardener, thinner, mixing bowl, roller with sleeve & data sheet.



EHFB



EHFERB



EHFERB/35 with
disconnects fitted

Distribution, instrument cabinets and service entrance pillars

For decrease condensation in distribution and instrument cabinets

Due to weather conditions, condense water develops in cable distribution cabinets and precipitates on the inner surfaces. This humidity may lead to the corrosion of the metal parts and to the formation of creepage currents.

Measures for decrease excessive condensation:

1. Ventilation of the cabinet through existing ventilation slots in accordance with IP44

The existing ventilation slots in the lower area of the door and the rear wall as well as in the upper area between the roof, door and rear wall are able to bring about dehumidification of the interior of the cabinet with the help of the heat generated by the given power loss of the fuse elements. The basic requirement for this is that the size of the ventilation slots is proportional to the width of the cabinet. This is the case with the construction of

JEAN MÜLLER distribution and equipment cabinets, as there are ventilation slots at the bottom and top of the door and rear wall.

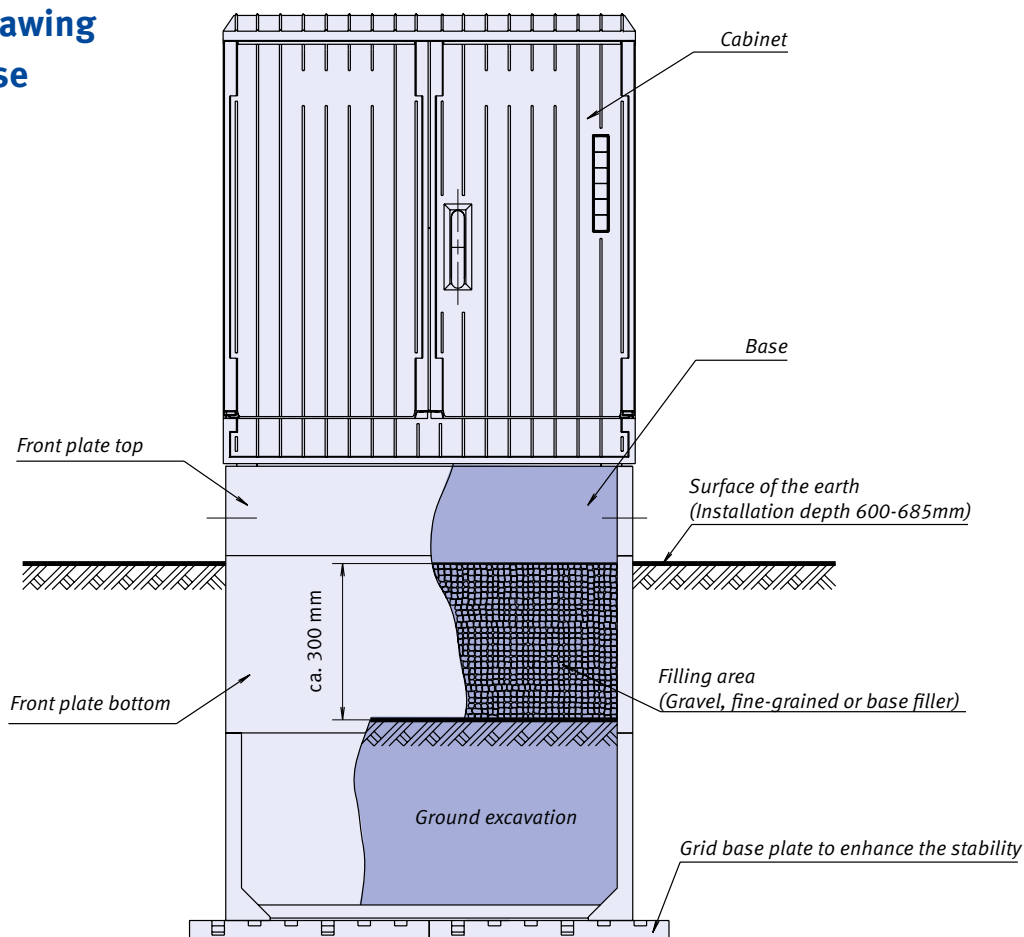
2. Protection against ground moisture

An effective dehumidification of the cabinet interior can only be achieved if the latter is protected against rising ground moisture. Such a protection can be implemented by filling in fine-grained gravel or base filler up to the ground surface level.

3. Application

The foundation is filled with excavated soil up to a height of approx. 300 mm below the ground surface level. A layer of gravel or base filler of approx. 300 mm height is filled above this. This gravel layer prevents the rising of moisture, this has been shown in practice.

Cutaway drawing of filled base



Material

Enclosures and bases consist of hot-molded glass-fibre reinforced polyester (SMC). SMC (sheet moulding compound) refers to mat-shaped thermosetted material, moulded under compression and temperature.

Exposed glassfibres are of no danger, in case of high sensitivity skin contact may result in redness and irritations. There is no respirability conditional to fibre length and the attribute of not breaking across the fibre. Therefore carcinogenic hazard is not present.

Thermosetted materials are characterized by an irreversible chemical reaction, as a result a deformation induced by temperature is excluded.

Characteristics of material:

- high degree of flame-resistance
- insulating
- acid resistant
- stable in dimensions
- weatherproof
- long operating life

Main constituents are polyester resin, filler materials (chalkstone) and glassfibres, added with flame retardants and pigmentation substances.

The enclosures encounter -due to outdoor exposition- natural UV radiance, rain and dew. As a result, the resin matrix superposing the glassfibres diminishes. In the lapse of time the surface weathers, leading to an exposition of glassfibres. Mechanical stability of the cabinets remains unaffected.

UV protection of cabinets made of glass-fibre-reinforced polyester

In order to optimize the UV protection of cable distribution cabinets, a light-impermeable lacquer is suitable. In addition to the standard color RAL7035, further colors from the RAL palette are available.

1. Surface coating is to ensure the following:

- a) Prevention of surface erosion of the cabinet as a consequence of UV radiation.
- b) UV protection as sub a) with an additional anti-adhesive for spray varnishes (graffiti).

2. Potential measures for new cabinets:

- a) Surface coating with a two-component acrylic lacquer: This surface coating effectively prevents the yellowing and subsequent erosion of the glass-fibre-reinforced polyester resin. Depending on the site, surfaces with a polyacrylic coating are protected against UV radiation for a period of 15 to 20 years.
- b) Surface coating with a two-component acrylic lacquer which comprises an additional antiadhesive for spray varnishes (anti-graffiti coating). This provides the same UV protection as sub a) but with an option to remove spray varnishes with a cleaning paste.

3. Potential measures for secondary treatment:

- a) Coating with a two-component acrylic lacquer. This provides effective protection against UV radiation, but has to be repeated after a short period of time (8 – 10 years) because of the low durability of the varnish.
- b) Surface coating with a two-component acrylic lacquer which comprises an anti-adhesive for spray varnishes (anti-graffiti coating). This provides the same protection as sub 2b).

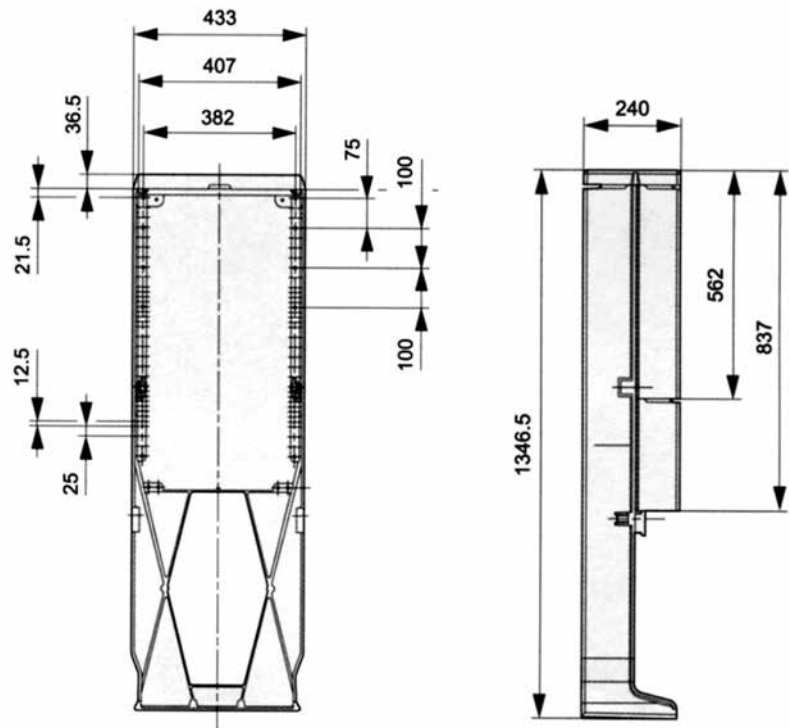
4. Required surface preparation for secondary treatment:

Degreasing by washing with a detergent dissolved in water. Subsequently, removal of dirt and loose material particles with a cleaning brush or fleece. To ensure good adhesive properties of the surface coating, the lacquer must be pigmented (coloured), generally light grey (RAL7035), as the polyester used.

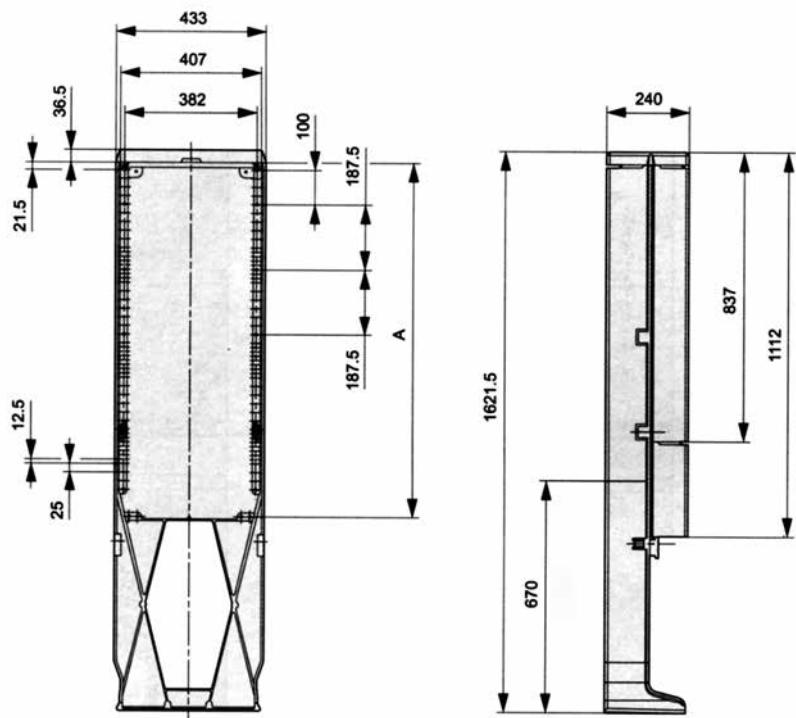
Transparent lacquers are not capable of filtering UV radiation. The surface below the varnish will thus erode, which will deteriorate the adhesive properties.

Cable Distribution Cabinets (CDC) - Dimensions

EHFB

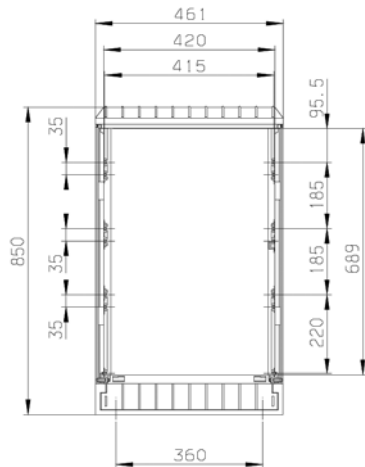


EHFERB

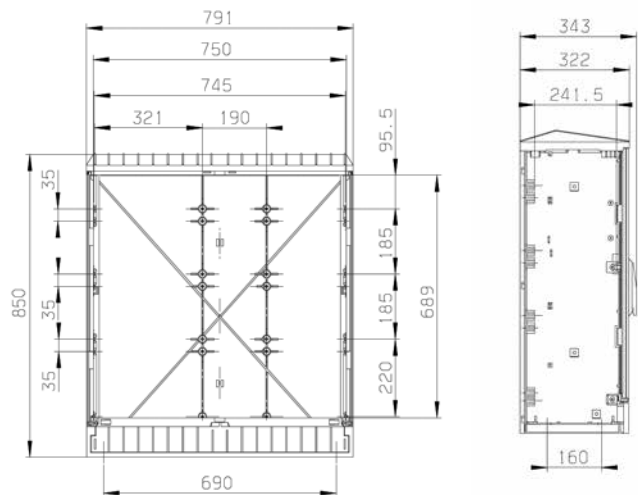


EHFERB

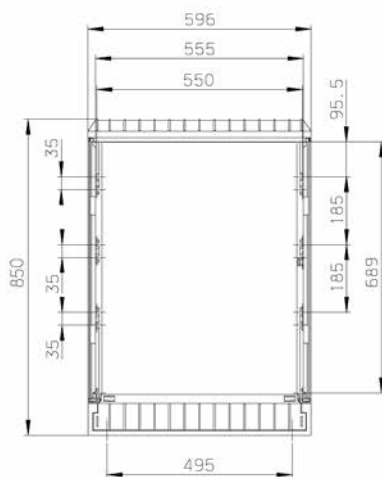
KVS00/10



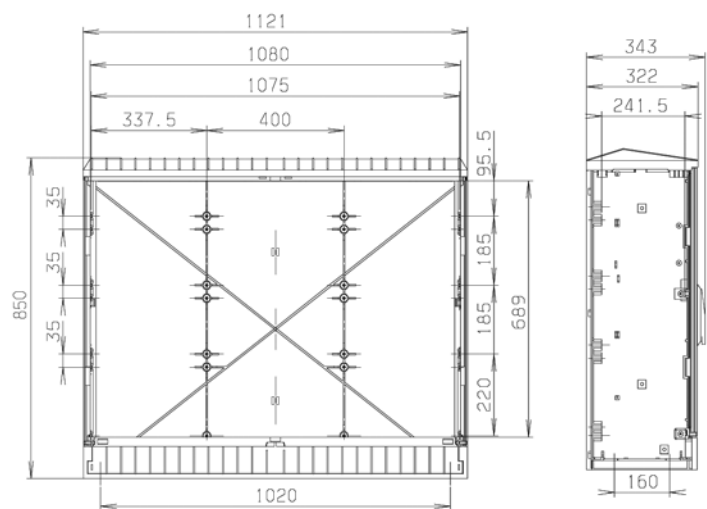
KVS1/10



KVS0/10

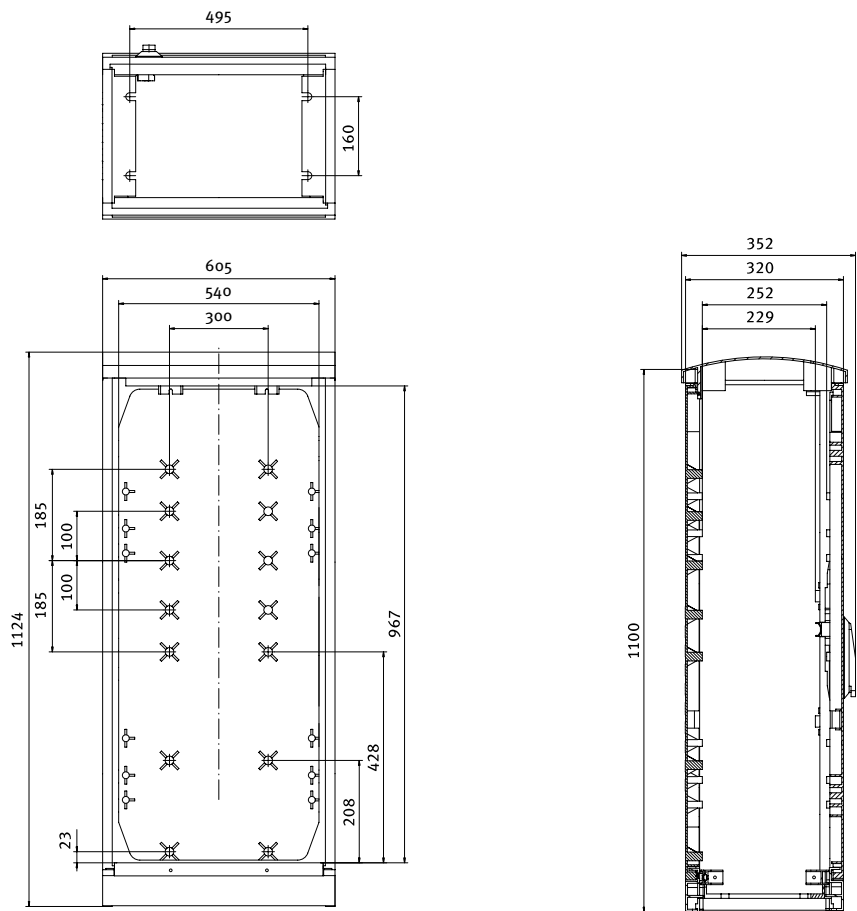


KVS2/10

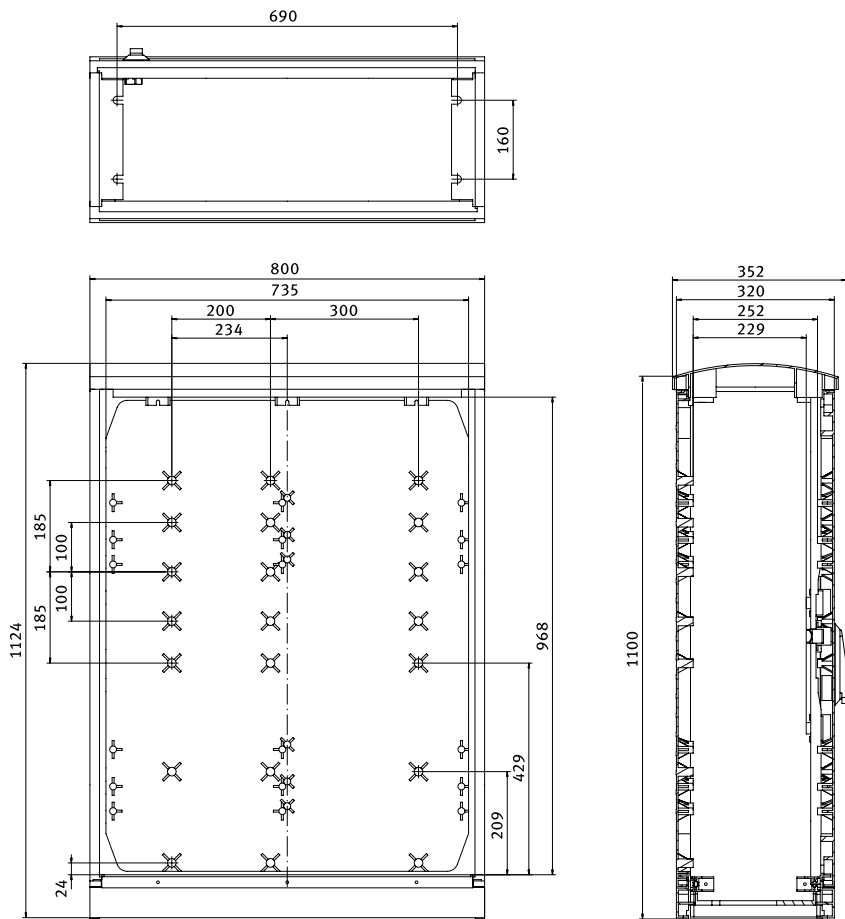


Cable Distribution Cabinets (CDC) - Dimensions

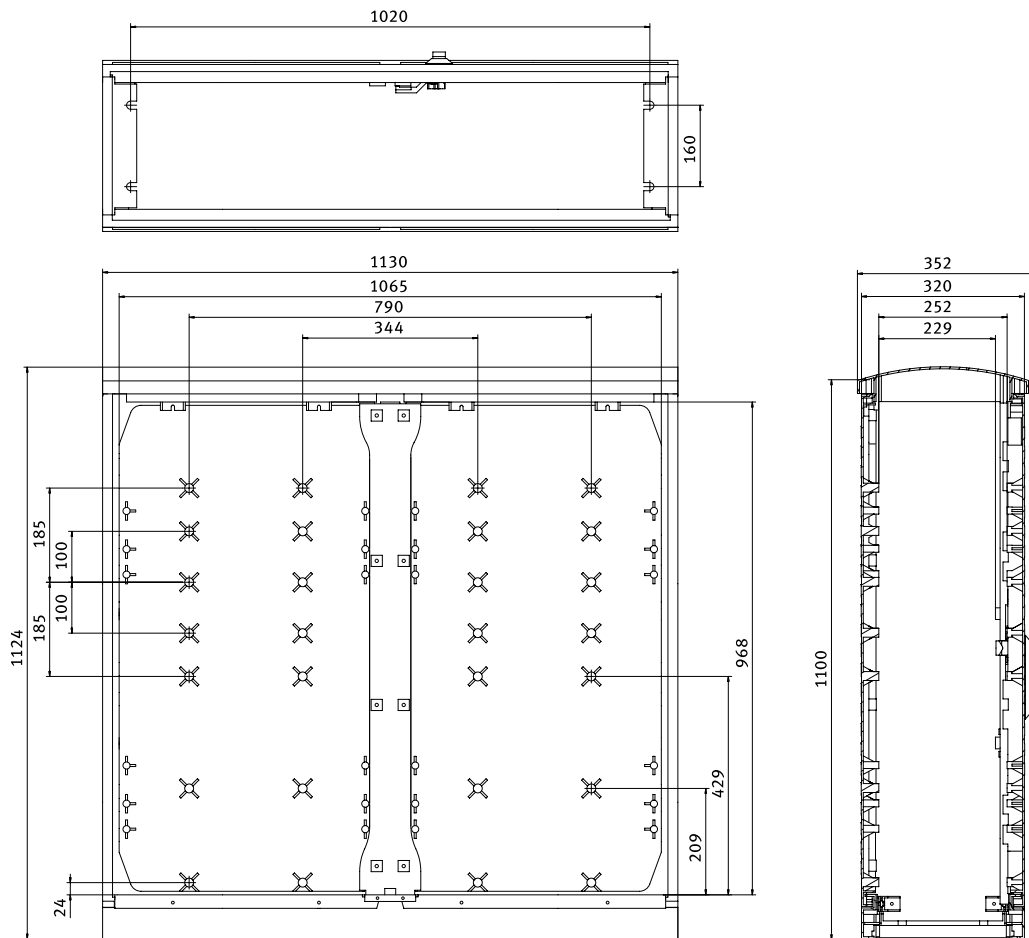
KVSL0



KVSL1

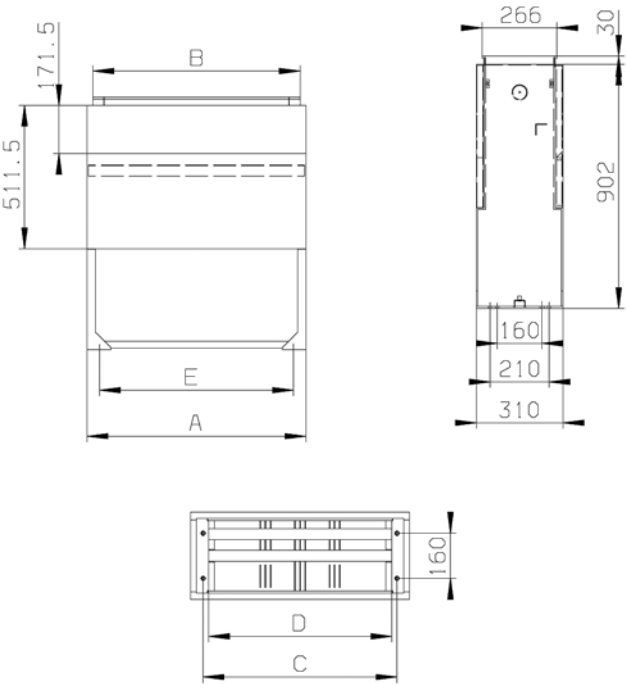


KVSL2



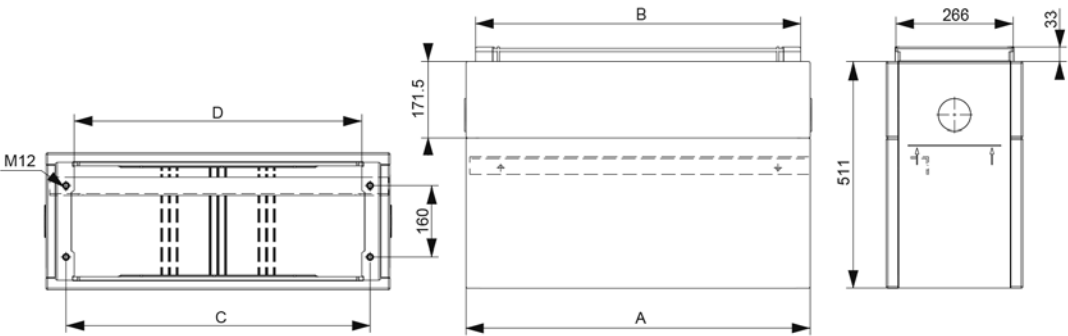
Cable Distribution Cabinets (CDC) - Dimensions

FP00
FP0
FP1
FP2



Size	A	B	C	D	E
FP00	450	408	360	322	360
FP0	585	543	495	457	495
FP1	780	738	690	652	690
FP2	1110	1068	1020	982	1020

FPH00
FPH0
FPH1
FPH2



Size	A	B	C	D
FPH00	450	408	360	322
FPH0	585	543	495	457
FPH1	780	738	690	652
FPH2	1110	1068	1020	982



ENSTO - Saves your energy

Ensto Underground offers a comprehensive solution for 1-36kV cable networks.

The products have been developed to endure the most varying and demanding conditions and both their mechanical and electrical properties have been thoroughly type tested. Ensto products exceed the requirements of international and national standards.

The shear bolt connector and cable lug range stocked by Jean Müller NZ Ltd offer many advantages over other brands available including:

- both LV and MV lugs available
- wider range of LV connectors and lugs
- less tools required
- competitive pricing.

Low voltage cable connectors & lugs 1kV



Shear head bolt connectors with barrier 1kV



ESLJ

Nominal cable size	No. of bolts	Tools required for installation	Part No.
Suitable for solid and stranded, sector and circular shaped cables			
6-50mm ²	2	14mm Socket	ESLJ6-50
35-95mm ²	2	14mm Socket	ESLJ35-95
95-240mm ²	4	21mm Socket	ESLJ95-240
150-300mm ²	4	21mm Socket	ESLJ150-300

Fillers



SLJT*

Nominal cable size	Part No.
Used with ESLJ connectors when the cable to be joined is smaller	
16-35mm ² for ESLJ35-95	SLJT2
50-70mm ² for ESLJ95-240	SLJT3
95-120mm ² for ESLJ150-300	SLJT4

Shear head bolt cable lugs 1kV



ESAL

Nominal cable size	No. of bolts	Tools required for installation	Part No.
Suitable for solid and stranded, sector and circular shaped cables			
6-50mm ²	2	14mm Socket	ESAL6-50
50-95mm ²	2	14mm Socket	ESAL50-95
95-185mm ²	2	21mm Socket	ESAL95-185
150-300mm ²	2	24mm Socket	ESAL150-300



Medium voltage cable connectors & lugs 36kV

Shear head bolt connectors with barrier 36kV



ESMJ

Nominal cable size	No. of bolts	Tools required for installation	Part No.
Suitable for solid and stranded, sector and circular shaped cables			
10-95mm ²	2	17mm Socket	ESMJ10-95
50-240mm ² NEW	4	24mm Socket	ESMJ50-240
95-300mm ² NEW	6	24mm Socket	ESMJ95-300
*120-300mm ²	6	24mm Socket	ESMJ120-300
185-400mm ²	6	22mm Socket	ESMJ185-400
300-630mm ² NEW	6	24mm Socket	ESMJ300-630
*400-630mm ²	6	24mm Socket	ESMJ400-630

Shear head bolt cable lugs 36kV



ESML

Nominal cable size	No. of bolts	Tools required for installation	Part No.
With 13mm palm hole			
10-95mm ²	2	17mm Socket	ESML10-95
50-240mm ²	2	24mm Socket	ESML50-240
95-300mm ² NEW	2	28mm Socket	ESML95-300
*120-300mm ²	2	28mm Socket	ESML120-300
185-400mm ²	3	22mm Socket	ESML185-400
300-630mm ² NEW	3	22mm Socket	ESML300-630
*400-630mm ²	3	22mm Socket	ESML400-630

* As above some items have been superseded. The range and usefulness has been improved. Stock is available of both as we transition stock out and replace.



KE69, KE64, KE63

Clampo Pro Bi-Metallic Terminals

Nominal cable size	Screw size	No. of poles & colour	Part No.
Suitable for copper and aluminium cables			
16-95mm ²	5mm Allen Key	1 pole, grey	KE62
35-150mm ²	8mm Allen Key	1 pole, grey	KE63
35-240mm ²	8mm Allen Key	1 pole, grey	KE64
35-240mm ²	8mm Allen Key	2 pole, grey	KE69

Terminal shrouds

	Part No.
Terminal shroud for KE62	KEL62
Terminal shroud for KE63	KEL63
Terminal shroud for KE62	KEL64

Current transformers class 1



ASK31

Max size of primary conductor (mm)		Primary current	Secondary current (A)	VA	Part No.
Bar	Cable Dia				
Foot or busbar mount Class 1 accuracy					
30 x 10mm	26mm	200A	5A	5VA	ASK31.3/200/5
30 x 10mm	26mm	400A	5A	5VA	ASK31.3/400/5
30 x 10mm	26mm	600A	5A	5VA	ASK31.3/600/5



ASK51

50 x 12mm	44mm	800A	5A	10VA	ASK51.4/800/5
50 x 12mm	44mm	1000A	5A	10VA	ASK51.4/1000/5
50 x 12mm	44mm	1200A	5A	10VA	ASK51.4/1200/5



ASK101

100 x 10mm	70mm	600A	5A	10VA	ASK101.4/600/5
100 x 10mm	70mm	800A	5A	10VA	ASK101.4/800/5
100 x 10mm	70mm	1000A	5A	10VA	ASK101.4/1000/5
100 x 10mm	70mm	1200A	5A	10VA	ASK101.4/1200/5
100 x 10mm	70mm	1500A	5A	10VA	ASK101.4/1500/5



ASK128

128 x 38mm	-	1000A	5A	10VA	ASK128.4/1000/5
128 x 38mm	-	1200A	5A	10VA	ASK128.4/1200/5
128 x 38mm	-	1500A	5A	15VA	ASK128.4/1500/5
128 x 38mm	-	2000A	5A	15VA	ASK128.4/2000/5
128 x 38mm	-	2500A	5A	15VA	ASK128.4/2500/5

Standoff insulators



Stand off height (mm)	Fixing thread	Part No.
Colour - red		
25	M6	DB25/PM6
34	M8	DB34/PM8
34	M10	DB34/PM10
50	M10	DB50/PM10
50	M12	DB50/PM12
65	M10	DB65/PM10
65	M12	DB65/PM12



Power distribution blocks



Incoming cables		Outgoing cables		Part No.
Qty	Size (mm²)	Qty	Size (mm²)	
A space saving and cost saving alternative to DIN-Rail mount terminals. Panel or DIN-Rail mounting IP20 finger proof terminals Plated brass block accepts aluminium or copper cables				
3	2.5 - 16	4	2.5 - 6	FTG-1/080
1	10 - 35	6	2.5 - 16	FTG-1/125
1	6 - 16			
1	35 - 120	5	2.5 - 16	FTG-1/250
		4	2.5 - 10	
		2	6 - 35	



PDB-500

Compact Power Distribution Block
1x Cu/Al input 500mm² max
2x Cu/Al outputs 300mm² max

Power distribution block 500mm² - 2x300mm²

Cross section

	Cu/Al		Rated torque (Nm)	Part No.
	Round solid (mm²)	Round stranded (mm²)		
Input	95-500	95-500	30-60	PDB 500
Output (x2)	50-300	50-300	25-35	

Sector shaped Al-conductors 90mm²-300mm² have to be pre-rounded with a crimping-tool.

Current transformers

Type	ASK**
Standards	VDO 414 Part 1; DIN42600; VBG4; IEC60044-1
Construction	
Case	Ultrasonically welded Polycarbonate
Flammability	Self-extinguishing to UL94Vo
Terminals	Nickel Plated Brass
Environment	For dry indoor use.
Temperature	-5 °C to +40 °C
Ratings	
Voltage maximum	0.72 kV
Frequency	50/60Hz
Nominal Thermal Short Time Current	60 x In
Insulation	Class E
Supply	
Foot Mountings	2
Bar Mount Screws	2 (12 with ASK128)

Standoff insulators

Type		DB25	DB34	DB50	DB65
Operating Temperature		-40 °C to +130 °C			
Flammability		to UL94VO			
AC Internal Flashover Voltage	kV	20	30	40	40
AC Surface Flashover Voltage	kV	7	10	12	15
Twisting Stress	DN X m	3	5	6	6
Compressive Stress	DN	2100	6500	6800	8300
Cantilever Stress	DN	180	450	450	700
Tensile Stress	DN	300	800	850	1500

Power distribution blocks

			FTG-1/080	FTG-1/125	FTG-1/250
Operational Voltage		VAC	600	600	600
Current Rating Cu/Al		A	85 / 66	130 / 103	300 / 260
Short Cct Peak - Ipk		kA	2.7	30	51
Short Cct 1 second - Icw		kA	1.9	4.4	21
Input connections	Qty / Size		1x 2.5-16mm ²	1x 10-35mm ²	1x 35-120mm ²
	Tool		Pozi or flat screwdriver	4mm Allen Key	6mm AllenKey
	Torque	Nm	1.5	3.5	19
Output connections without ferrules	Qty / Size		2x 2.5-16mm ² 4x 2.5-6mm ²	1x 6-16mm ² 6x 2.5-16mm ²	4x 2.5-10mm ² 5x 2.5-16mm ² 2x 6-35mm ²
	Tool		Pozi or flat screwdriver	Pozi or flat screwdriver	Flat screwdriver
	Torque	Nm	1.5 / 0.8	3.5 / 2.0	18 / 18 / 31
Mounting			DIN-Rail or base mounting with 2x M5 screws		
Protection			IP20	IP20	IP20
Dimensions (LxWxH) mm			66 x 27 x 47	74 x 27 x 47	96 x 45 x 49

Power distribution block 500mm² - 2x300mm²

Technical data

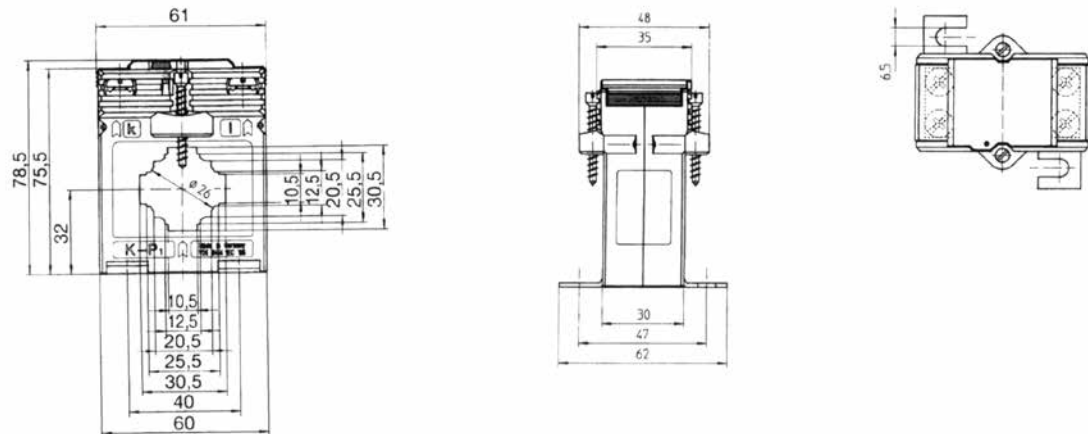
Material			
Clamping body	Aluminium	Plated	
Housing	PA66-VO	Grey RAL 7035	
Screw	Steel	Nickle plated	
General data			
Heat deflection temperature		130°C - UL94-VO	
CTI value of isolation		600	
Regulations		IEC 60947-7-1	
Electrical data			
Nominal operating current		950A	
Nominal voltage		AC 1000V/DC1500V	
Cross section			
	Cu/Al		Rated torque (Nm)
	Round solid (mm²)	Round stranded (mm²)	
Input	95-500	95-500	30-60
Output (x2)	50-300	50-300	25-35

Sector shaped Al-conductors 90mm²-300mm² have to be pre-rounded with a crimping-tool.
Article numbers on request.

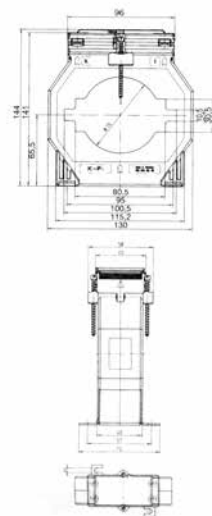
Dimensions



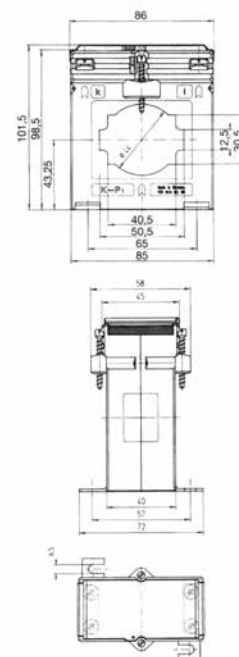
ASK31.3



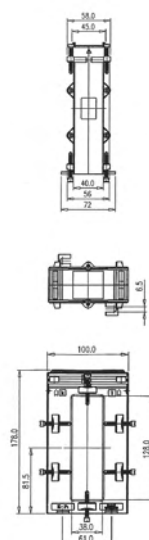
ASK101.4



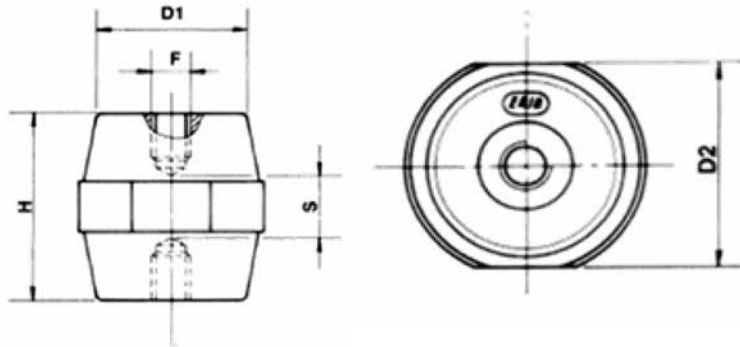
ASK51.4



ASK128.4

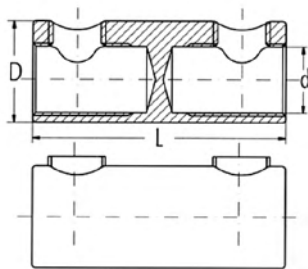


DB Standoff Insulators

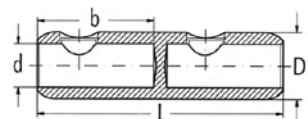


	F	H	D1	D2	S
DB25	M6	25.2	15	19	9
DB34	M8	35	28	32	10
DB34	M10	35	28	50	10
DB50	M10	51	29	36	20
DB65	M10	63.5	35	41	30

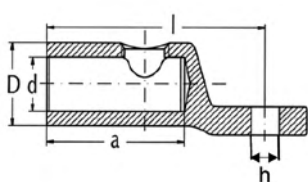
Shear head bolt connectors & lugs



	L	D	d
ESLJ6-50	54	20	11
ESLJ35-95	58	31	20
ESLJ95-240	119	38	26
ESLJ150-300	130	43	29



	L	D	d
ESMJ10-95	70	25	14
ESMJ95-240	120	34	20.5



	L	D	d	h	Palm Width
ESAL6-50	50	20	10	10.3	20
ESAL50-95	74	25	15	10.5	25
ESAL95-185	85	30	19	12.5	30
ESAL150-300	114	42	29	12.5	42

ESML10-95	60	26	14	13	26
ESML95-240	103	34	20	17	34



APPENDIX

NH fuse-links are established for protection of electrical installations and equipment and common for a wide area of applications.

By means of their application personal injury and physical damage can be prevented. Therewith they notably improve personal and operational safety and support the quality of supply and reliability of the mains.

Standardised characteristics, technical data and dimensions offer adapted solutions without complex individual calculations.

Contents

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Degrees of protection (IP-Code)

Degrees of protection provided by enclosures (IP-Code) according to DIN EN 60529:2000-09 (extract)

1st digit	Protection against contact	Protection against ingress of objects	2nd digit	Protection against harmful ingress of water
0	No protection	No protection	0	No protection
1	Protected against access to dangerous parts with the back of a hand	Protected against solid foreign object size >50mm	1	Protected against dripping water
2	Protected against access to dangerous parts with a finger	Protected against solid foreign object size >12.5mm	2	Protected against dripping water when tilted up to 15°
3	Protected against access to dangerous parts with a tool	Protected against solid foreign object size >2.5mm	3	Protected against spraying water
4	Protected against access to dangerous parts with a wire	Protected against solid foreign object size >1mm	4	Protected against splashing water
5	Protected against access to dangerous parts with a wire	Protected against dust	5	Protected against water jets
6	Protected against access to dangerous parts with a wire	Dust tight	6	Protected against powerful water jets
–	–	–	7	Protected against temporary immersion in water
–	–	–	8	Protected against continuous immersion in water

An X stands as a placeholder for any identification number. This relates to the first and the second identification number. It is possible to define a degree of protection of enclosure against a access of dangerous parts with two additional letters after

the identification figures. This is necessary, if the actual protection against access is higher than the first identification figure. This protection can be realised with a cover or enough distance from dangerous parts.

Additional letter	Degree of protection of enclosure	
	Brief description	Definition
A	Protected from access with the back of the hand	The access probe, ball 50mm diameter, must have enough distance from dangerous parts.
B	Protected from the access with the finger	The structured test finger, 12mm diameter, 80mm length, must have enough distance from dangerous parts.
C	Protected against access with tool	The access probe, 2,5mm diameter, 100mm length, must have enough distance from dangerous parts.
D	Protected against access with wire	The access probe, 1,0mm diameter, 100mm length, must have enough distance from dangerous parts.

Appendix

Utilization categories

Utilization categories for fuse combination units in accordance with DIN EN 60947-3:2012-12. VDE 0660 Part 107 AC

Utilization category	Typical applications	Verification of electrical endurance							Verification of making and breaking capacities						
		Make				Break			Make				Break		
		I _e A	I I _e	U U _e	cos Φ	I _c I _e	U _r U _e	cos Φ	I _e A	I I _e	U U _e	cos Φ	I _c I _e	U _r U _e	cos Φ
AC-20A(B) ¹⁾	Connecting and disconnecting under no-load conditions	3)	2)	2)	2)	2)	2)	2)	3)	2)	1.05	2)	2)	1.05	2)
AC-21A(B) ¹⁾	Switching of resistive loads, including slight overloads	3)	1	1	0.95	1	1	0.95	3)	1.5	1.05	0.95	1.5	1.05	0.95
AC-22A(B) ¹⁾	Switching of mixed resistive and inductive loads, including slight overloads	3)	1	1	0.8	1	1	0.8	3)	3	1.05	0.65	3	1.05	0.65
AC-23A(B) ¹⁾	Switching of motor loads and other highly inductive loads	3)	1	1	0.65	1	1	0.65	4)	10	1.05	0.45	8	1.05	0.45
									5)	10	1.05	0.35	8	1.05	0.35

DC

Utilization category	Typical applications	I_e A	I I_e	U U_e	L/R ms	I_c I_e	U_r U_e	L/R ms	I_e A	I I_e	U U_e	L/R ms	I_c I_e	U_r U_e	L/R ms
		I_e A	I I_e	U U_e	L/R ms	I_c I_e	U_r U_e	L/R ms	I_e A	I I_e	U U_e	L/R ms	I_c I_e	U_r U_e	L/R ms
DC-20A(B) ¹⁾	Connecting and disconnecting under no-load conditions	3)	2)	2)	2)	2)	2)	2)	3)	2)	1.05	2)	2)	1.05	2)
DC-21A(B) ¹⁾	Switching of resistive loads, including slight overloads	3)	1	1	1	1	1	1	3)	1.5	1.05	1	1.5	1.05	1
DC-22A(B) ¹⁾	Switching of mixed resistive and inductive loads, including overloads (e.g. shunt motors)	3)	1	1	2	1	1	2	3)	4	1.05	2.5	4	1.05	2.5
DC-23A(B) ¹⁾	Switching of highly inductive loads (e.g. series motors)	3)	1	1	0.75	1	1	0.75	3)	4	1.05	15	4	1.05	15

I = Making current

I_c = Breaking current

I_e = Rated operational current

U = Voltage

U_e = Rated operational voltage

1) A: Frequent actuation. B: Occasional actuation

2) If the switching device has a making and/or breaking capacity, the values for the current and the power factor (time constants) must be stated by the manufacturer

3) All values

4) $I_e < 100$ A

5) $I_e > 100$ A

Temperature-rise limits

Temperature-rise limits of fuse combination units in accordance with DIN EN 60947-1:2011-10 and VDE 0660
Part 100

a) Temperature-rise limits of connections

Connection material	Temperature-rise limit in K
Copper, blank	60
Copper-zinc alloy, blank	65
Copper or copper-zinc alloy, tin-plated	65
Copper or copper-zinc alloy, silver-plated or nickel-plated	70
Other metal parts	65

b) Temperature-rise limits of accessible parts

Accessible part	Temperature-rise limit in K
Manually operated actuators:	
• Metallic	15
• Non-metallic	25
Parts which are touched but not gripped:	
• Metallic	30
• Non-metallic	40
Parts which need not be touched during normal actuation	
Outside surface of cases, near the cable inlet	
• Metallic	40
• Non-metallic	50
Outside surface of cases which contain resistors air from ventilation apertures of cases which contain resistors	200

Temperature-rise limits of low voltage switchgear and controlgear assemblies according to DIN EN 61439-1:2012-06 and VDE 0660 Part 500

Assembly components	Temperature-rise limit in K
Built-in equipment • Conventional switchgear • Electronic modules • Equipment components	In accordance with the relevant product standard requirements for the individual components or, in accordance with the component manufacturer's instructions, taking into consideration the temperature in the ASSEMBLY.
Connections for insulated conductors introduced from the outside	70
• Busbars • Conductors • Plug-in contacts of removable parts	Limiting factors: • Mechanical strength of the conductor materials • Potential influence on neighbouring equipment • Permissible temperature-rise limit of the insulating material touched by the conductor • Effects of the conductor temperature on connected devices • Type and surface of the contact material for plug-in contacts

Actuators which are accessible from the outside

• Metallic	15
• Insulating material	25

External surfaces of cases or covers which are accessible from the outside

• Metallic	30
• Insulating material	40

External surfaces of cases or covers which are accessible from the outside but need not be touched during normal operation

• Metallic	40
• Insulating material	50
Connectors	Limiting factors are the values for the equipment of which they form part

Low voltage switchgear assemblies

List of design verifications to be performed according to DIN EN 61439-1:2012-06, appendix D

No.	Characteristics to be verified	Testing	Comparison with a reference design	Assessment
Strength of material and parts	Resistance to corrosion	yes	no	no
	Thermal stability	yes	no	no
	Resistance of insulating materials to normal heat	yes	no	no
	Resistance to abnormal heat and fire due to internal electric effects	yes	no	no
	Resistance to ultra-violet (UV) radiation	yes	no	no
	Lifting	yes	no	no
	Mechanical impact	yes	no	no
	Marking	yes	no	no
Degree of protection of enclosures	Degree of protection of enclosures	yes	no	yes
Creepage distances	Creepage distances	yes	yes	yes
Protection against electric shock and integrity of protective circuits	Effective continuity between the exposed conductive parts of the ASSEMBLY and the protective circuit	yes	no	no
	Short circuit withstand strength of the protective circuit	yes	yes	yes
Incorporation of switching devices and components	Incorporation of switching devices and components	no	no	yes
Internal electrical circuits and connections	Creepage distances	no	no	yes
Terminals for external conductors	Terminals for external conductors	no	no	yes
Dielectric properties	Power-frequency withstand voltage	yes	no	no
	Impulse withstand voltage	yes	no	yes
Temperature-rise limits	Temperature-rise limits	yes	yes	yes
Short-circuit withstand strength	Short-circuit withstand strength	yes	yes	yes
Electromagnetic compatibility (EMC)	Electromagnetic compatibility (EMC)	yes	no	yes
Mechanical operations	Mechanical operations	yes	no	no

Low voltage assemblies

Compartmentalization of assemblies in accordance with DIN EN 61439-2:2012-06

Modern low voltage assemblies must comply with operational safety and personnel protection requirements.

The division of switchgear cabinets into separate function sections and their compartmentalization are prerequisites for:

- High availability
- Exchangeability of the built-in switchgear under operational conditions, i.e. while the system is energized
- Short downtimes for maintenance and testing.

A switchgear cabinet is divided into the following function sections:

- Device compartment
- Busbar compartment (Main and field distributor busbar system)
- Cable compartment

Type of protection IP2X or above is required to prevent the ingress of solid foreign bodies from a function unit into an adjacent unit. In addition, type of protection IPXXB or above is required to prevent contact with live parts of an adjacent unit.

The compartmentalization design and higher protection than described above must be agreed between the manufacturer and the user.

Design	Main characteristic	Connections	Image
1	No compartmentalization	–	
2a	Compartmentalization between the busbars and function units	External conductor connections not separated from the busbars	
2b	Compartmentalization between the busbars and function units	External conductor connections separated from the busbars	
3a	Compartmentalization between the busbars and function units and between the function units	External conductor connections not separated from the busbars	
3b	Compartmentalization of the external conductor connections and function units, but no compartmentalization between the conductor connections	External conductor connections not separated from the busbars	
4a	Compartmentalization between the busbars and function units and between the function units including the external conductor connections which are an integral part of the function units	External conductor connections in the same compartment as the corresponding function unit	
4b	Compartmentalization between the busbars and function units and between the function units including the external conductor connections which are an integral part of the function units	External conductor connections not in the same compartment as the corresponding function units, but in a separate enclosed and protected section or compartment	

Current carrying capacity aluminium busbars

Continuous currents in accordance with DIN 43 670 for rectangular E-Al busbars used in indoor systems at 35°C air temperature and 65°C busbar temperature

Continuous current in A										
Width x Thickness [mm]	Crossection [mm²]	Weight ¹⁾ [kg/m]	AC up to 60Hz				DC/AC up to 16 ² / ₃ Hz			
			Painted Number of busbars		Blank Number of busbars		Painted Number of busbars		Blank Number of busbars	
			I	II	I	II	I	II	I	II
12X2	23.5	0.0633	97	160	84	142	97	160	84	142
15X2	29.5	0.0795	118	190	100	166	118	190	100	166
15X3	44.5	0.120	148	252	126	222	148	252	126	222
20X2	39.5	0.107	150	240	127	206	150	240	127	206
20X3	59.5	0.161	188	312	159	272	188	312	159	272
20X5	99.1	0.268	254	446	214	392	254	446	214	392
20X10	199	0.538	393	730	331	643	393	733	331	646
25X3	74.5	0.201	228	372	190	322	228	372	191	322
25X5	124	0.335	305	526	255	460	305	528	255	460
30X3	89.5	0.242	267	432	222	372	268	432	222	372
30X5	149	0.403	356	606	295	526	356	608	296	528
30X10	299	0.808	536	956	445	832	538	964	447	839
40X3	119	0.323	346	550	285	470	346	552	285	470
40X5	199	0.538	456	763	376	658	457	766	376	662
40X10	399	1.08	677	1180	557	1030	682	1200	561	1040
50X5	249	0.673	556	916	455	786	558	924	456	794
50X10	499	1.35	815	1400	667	1210	824	1440	674	1250
60X5	299	0.808	655	1070	533	910	658	1080	536	924
60X10	599	1.62	951	1610	774	1390	966	1680	787	1450
80X5	399	1.08	851	1360	688	1150	858	1390	694	1180
80X10	799	2.16	1220	2000	983	1720	1250	2150	1010	1840
100X5	499	1.35	1050	1650	846	1390	1060	1710	858	1450
100X10	999	2.70	1480	2390	1190	2050	1540	2630	1240	2250
100X15	1500	4.04	1800	2910	1450	2500	1930	3380	1560	2900
120X10	1200	3.24	1730	2750	1390	2360	1830	3090	1460	2650
120X15	1800	4.86	2090	3320	1680	2850	2280	3950	1830	3390
160X10	1600	4.32	2220	3470	1780	2960	2380	4010	1900	3420
160X15	2400	6.47	2670	4140	2130	3540	2960	5090	2370	4360
200X10	2000	5.40	2710	4180	2160	3560	2960	4940	2350	4210
200X15	3000	8.09	3230	4950	2580	4230	3660	6250	2920	5350

1) Weight calculated with a density of 2,7kg/dm³

Appendix

Current carrying capacity copper busbars

Continuous currents in accordance with DIN 43 670 for rectangular E-Cu busbars used in indoor systems at 35°C air temperature and 65°C busbar temperature

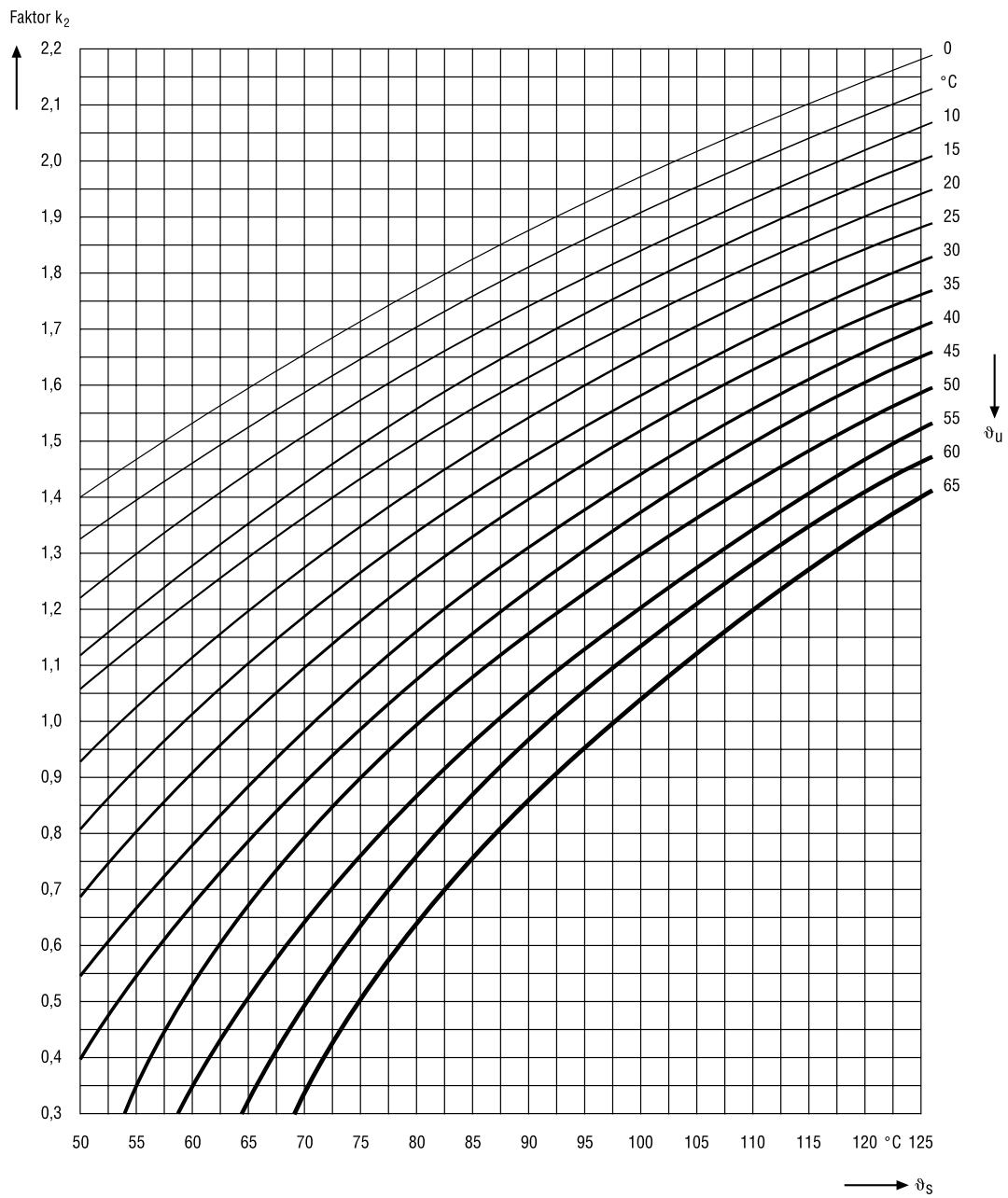
Continuous current in A										
Width x Thickness [mm]	Crossection [mm²]	Weight 2) [kg/m]	AC up to 60Hz				DC/AC up to 16 ² / ₃ Hz			
			Painted Number of busbars		Blank Number of busbars		Painted Number of busbars		Blank Number of busbars	
			I	II	I	II	I	II	I	II
12X2	23.5	0.209	123	202	108	182	123	202	108	182
15X2	29.5	0.262	148	2400	128	212	148	240	128	212
15X3	44.5	0.396	187	316	162	282	187	316	162	282
20X2	39.5	0.351	189	302	162	264	189	302	162	266
20X3	59.5	0.529	237	394	204	348	237	394	204	348
20X5	99.1	0.882	319	560	274	500	320	562	274	502
20X10	199	1.77	497	924	427	825	499	932	428	832
25X3	74.5	0.663	287	470	345	412	287	470	245	414
25X5	124	1.11	384	662	327	586	384	664	327	590
30X3	89.5	0.796	337	544	285	476	337	546	286	478
30X5	149	1.33	447	760	379	672	448	766	380	676
30X10	299	2.66	676	1200	573	1060	683	1230	579	1080
40X3	119	1.06	435	692	366	600	436	696	367	604
40X5	199	1.77	573	952	482	836	576	966	484	878
40X10	399	3.55	850	1470	715	1290	865	1530	728	1350
50X5	249	2.22	697	1140	583	994	703	1170	588	1020
50X10	499	4.44	1020	1720	852	1510	1050	1830	875	1610
60X5	299	2.66	826	1330	688	1150	836	1370	696	1190
60X10	599	5.33	1180	1960	985	1720	1230	2130	1020	1870
80X5	399	3.55	1070	1680	885	1450	1090	1770	902	1530
80X10	799	7.11	1500	2410	1240	2110	1590	2730	1310	2380
100X5	499	4.44	1300	2010	1080	1730	1340	2160	1110	1810
100X10	999	8.89	1810	2850	1490	2480	1940	3310	1600	2890
120X10	1200	10.7	2110	3280	1740	2860	2300	3900	1890	3390
160X10	1600	14.2	2700	4130	2220	3590	3010	5060	2470	4400
200X10	2000	17.8	3290	4970	2690	4310	3720	6220	3040	5390

2) Weight calculated with a density of 8,9kg/dm³

Current carrying capacity – correction factor

For busbar/air temperatures

Correction factor k_2 for copper busbars at varied busbar and air temperatures



Factor k_2 to determine the conductor cross-section of copper busbars at ambient temperatures ϑ_u of 0 to 60°C and/or operating temperatures ϑ_s up to 125°C

Appendix

Nominal and short-circuit currents of standard transformers

Nominal voltage U _N	400V/231V			525V			690V/400V		
Short-circuit voltage U _K	Nominal current I _N [A]	4%	6%	Nominal current I _N [A]	4%	6%	Nominal current I _N [A]	4%	6%
Rating [kVA]		Short-circuit current I _K [A]			Short-circuit current I _K [A]			Short-circuit current I _K [A]	
50	72	1805	—	55	1375	—	42	1042	—
100	144	3610	2406	110	2750	1833	84	2084	1392
160	230	5776	3850	176	4400	2933	133	3325	2230
200	288	7220	4812	220	5500	3667	168	4168	2784
250	360	9025	6015	275	6875	4580	210	5220	3560
315	455	11375	7583	346	8660	5775	263	6650	4380
400	578	14450	9630	440	11000	7333	336	8336	5568
500	722	18050	12030	550	13750	9166	420	10440	7120
630	910	22750	15166	693	17320	11550	526	13300	8760
800	1156	—	19260	880	—	14666	672	—	11136
1000	1444	—	24060	1100	—	18333	840	—	13920
1250	1805	—	30080	1375	—	22916	1050	—	17480
1600	2312	—	38530	1760	—	29333	1330	—	22300
2000	2888	—	48120	2200	—	36666	1680	—	27840

U_k Short-circuit voltage in %

$$I_k = \frac{I_n \cdot 100}{U_k [\%]}$$

Terminal studs for transformers in accordance with DIN EN 50386

Male thread	Rated current [A]	Transformer rating [kVA]
M12	250	100/160
M20	630	250/315/400
M30x2	1250	500/630/800
M42x3	2000	800/1000
M48x3	3150	1250

Rated currents of NH strip-type fuse-switch-disconnectors

	Size	I_e [A]	Type	A	B	C	D	E	F	G
Single disconnecter	1	250	SL1	DELTA	100	250	gG	32	400	no
	1	250	SL1G	OMEGA	100	250	gG	23	400	no
	2	400	SL2	DELTA	100	400	gG	45	630	no
	2	400	SL2G	OMEGA	100	400	gG	34	400	no
	3	630	SL3	DELTA	100	630	gG	48	800	no
	3	910	SL3/910	DELTA	100	910	gTr	61	1250	no
	3	910	SL3/910+	DELTAplus	100	1000	gTr	61	1250	no
	3	1000	SL3/1000	DELTA	100	630	gG	48	1000	yes
Ganged disconnecter	2 x 3	1250	SL3/1250	DELTA	200	1250 (2 x 630A)	gG	48	1600	no
						1154 (2 x 577A)	gTr	48		
	2 x 3	1600	SL3/1600	DELTA	200	1250 (2 x 630A)	gG	48	1600	yes
						1154 (2 x 577A)	gTr	48		
	2 x 3	2000	SL3/2000	DELTA	200	1600 (2 x 800A)	gG	43	2000	no
						1444 (2 x 722A)	gTr	51		

A Contact version

B Width [mm]

C Conventional free air thermal current I_{th} [A] with fuse-links

D Fuse-characteristic

E Maximum allowable power loss of fuse-link P_a [W]

F Conventional free air thermal current I_{th} [A] with solid links ¹⁾ (Rated current of solid link: minimum 1250A)

G Solid link included (yes/no)

Appendix

Reduction of rated currents of devices and systems

Current reduction at altitudes >2000m

- Reduction of heat dissipation
- Average values of switching devices and switchgear

Altitudes over NN			
2000m	3000m	4000m	5000m
1	0,95	0,9	0,85

Recommended rated diversity factor in according with DIN/EN 61439-2:2021-10

No. of main circuits	Rated diversity factor
2 and 3	0.9
4 and 5	0.8
6 up to 9	0.7
10 and more	0.6

SL / KETO / LTL: Horizontal installation = Vertical installation Factor x 0.8

D-Type-switch-disconnector-fuses

Current reduction at raised ambient temperature

Size	Type	Rated operational voltage U_e	Power loss P_v	Rated current I_e	Reduction factors at ambient temperature							
		[V]	[W]	[A]	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
D02	DSL	400	5.5	63	1.00	1.00	1.00	0.99	0.95	0.90	0.85	0.80

NH-strip-type fuse-switch disconnectors NH strip-fuseways

Current reduction at raised ambient temperature

Size	Type	Rated operational voltage U_e	Power loss P_v	Rated current I_e	Reduction factors at ambient temperature							
		[V]	[W]	[A]	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
NH00	SL00-3x3/100/F/HA	400 / 500 / 690	12	160	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.90
NH00	SL00-3x3/185/F	400 / 500 / 690	12	160	1.00	1.00	1.00	1.00	1.00	0.96	0.89	0.82
NH1	SL1-3x/3A	400 / 500	23	250	1.00	1.00	1.00	1.00	1.00	1.00	0.99	0.93
		690	32	250	1.00	1.00	1.00	1.00	1.00	0.99	0.93	0.86
NH1	SL1H-3x/3A	400 / 500	23	250	1.00	1.00	1.00	1.00	1.00	1.00	0.96	0.90
		690	32	250	1.00	1.00	1.00	1.00	1.00	0.95	0.89	0.82
NH2	SL2-3x/3A	400 / 500	34	400	1.00	1.00	1.00	0.97	0.90	0.84	0.79	0.74
		690	45	400	1.00	0.96	0.93	0.89	0.85	0.81	0.78	0.74
NH2	SL2H-3x/3A	400 / 500	34	400	1.00	1.00	1.00	0.99	0.93	0.88	0.82	0.77
		690	45	400	1.00	1.00	1.00	0.95	0.89	0.84	0.79	0.73
NH3	SL3-3x/3A	400 / 500	48	630	1.00	1.00	0.96	0.91	0.86	0.81	0.76	0.71
		690	60	630	1.00	0.95	0.90	0.84	0.79	0.74	0.69	0.63
NH3	SL3-3x/910/HA	400 / 500 / 690	61	910	1.00	0.95	0.89	0.84	0.79	0.74	0.69	0.63
NH3	SL3-3x/1000/HA/TM3	400 / 500 / 690	20 ¹⁾	1000	1.00	0.94	0.90	0.84	0.80	0.75	0.71	0.65
NH3	SL3-3x3/SR	400 / 500	48	630	1.00	1.00	0.97	0.93	0.88	0.83	0.77	0.71
		690	60	630	1.00	0.95	0.90	0.84	0.79	0.74	0.69	0.63

1) When used with solid-link.

Appendix

NH fuse-switch disconnecter KETO

Current reduction at raised ambient temperature

Size	Rated operational voltage U_e	Power loss P_v	Rated current I_e	Reduction factors at ambient temperature							
	[V]	[W]	[A]	35°C	40°C	45°C	50°C	55°C	60°C	65°C	70°C
NH00	400 / 500 / 690	12	160	1.00	1.00	1.00	0.99	0.93	0.88	0.83	0.77
NH1	400 / 500	23	250	1.00	1.00	1.00	1.00	1.00	1.00	0.92	0.86
	690	32	250	1.00	1.00	1.00	1.00	1.00	0.97	0.90	0.82
NH2	400 / 500	34	400	1.00	1.00	1.00	1.00	1.00	0.95	0.88	0.82
	690	45	400	1.00	1.00	1.00	1.00	0.98	0.91	0.85	0.79
NH3	500	48	630	1.00	1.00	1.00	0.97	0.91	0.85	0.79	0.72
	690	60	630	1.00	1.00	0.96	0.91	0.86	0.80	0.74	0.68
NH3/ 1000A	400 / 500	48	1000	1.00	0.97	0.93	0.87	0.82	0.77	0.71	0.64
	690	60	1000	0.90	0.88	0.85	0.83	0.79	0.74	0.68	0.61
LTS 250	400 / 500 / 690	0	250	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.98
LTS 800	400 / 500 / 690	0	800	1.00	0.97	0.93	0.88	0.83	0.78	0.71	0.64

Influence of ambient temperature on the function of fuse-links according to IEC 60269-1 (Annex D)

D.1 Effect of increase of ambient temperature

D.1.1 On current rating

For fuse-links that operate at full load for long periods in an average ambient temperature above the value given in 3.1, a reduction of the current rating may be required.

The derating factor should be as agreed by the manufacturer and the user after taking into account all the circumstances.

D.1.2 On temperature rise

An increase in average ambient temperature causes a relatively small increase in temperature rise.
(...)

D.2 Effect of decrease of ambient air temperature

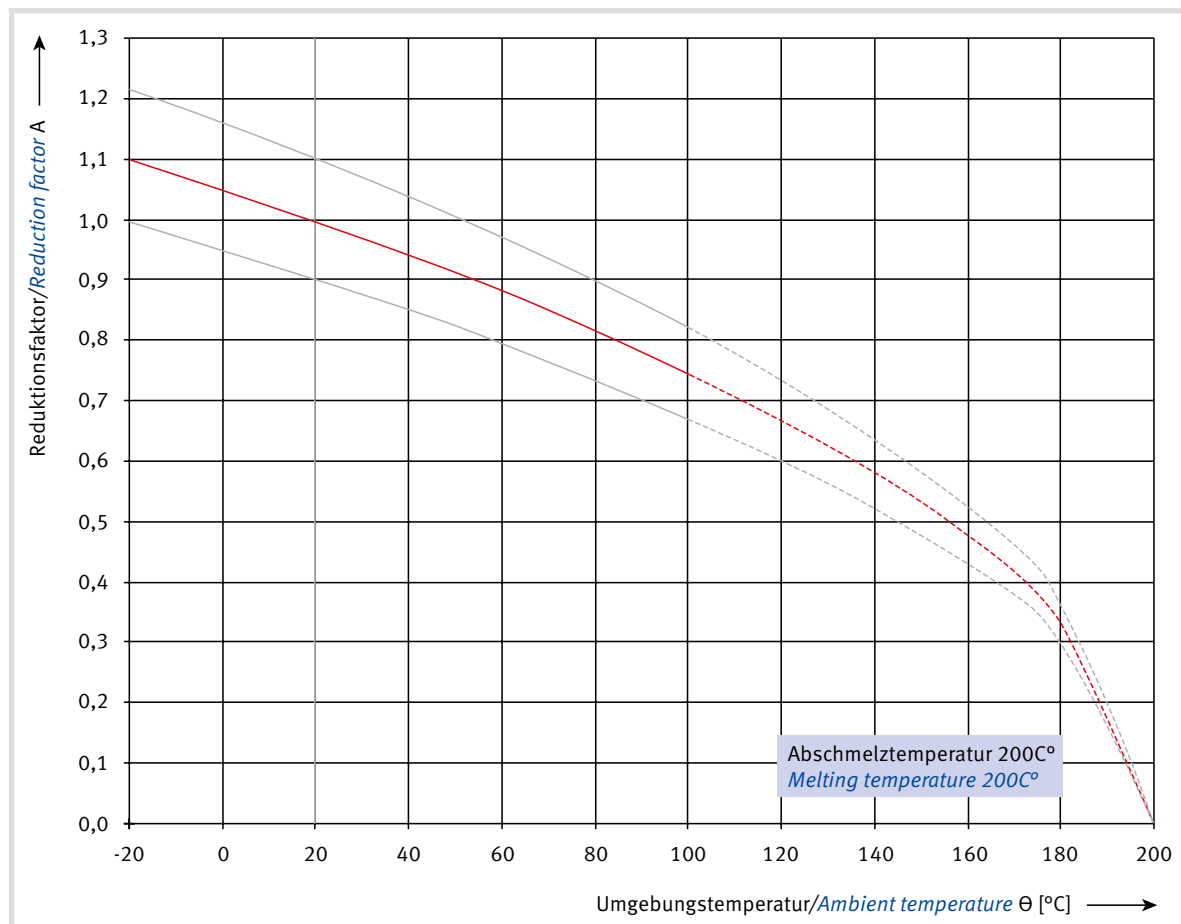
A decrease in ambient air temperature below the value given in 3.1 may permit an increase in current rating but it may also cause an increase in the conventional fusing current, conventional nonfusing current and pre-arcing times for smaller over-currents. The magnitude of the relevant increases will be dependent upon the actual temperature and on the design of the fuse-link. In this case the manufacturer should always be consulted.

D.3 Effect of installation conditions

Different installation conditions, such as:

- a) enclosure in a box or mounting in the open;
 - b) the nature of the mounting surface;
 - c) the number of fuses mounted in a box;
 - d) the cross-section and insulation of connections;
- can affect the operating conditions and should be taken into account.

Influence of ambient temperature on the rated current of NH fuse-links utilization category gG



Jean Müller (New Zealand) Limited - Standard Terms of Trade

These terms of trade ("Terms") are incorporated into any contract for the sale of goods and/or services ("Goods and/or Services") between Jean Müller (New Zealand) Limited, company number 3220567 (the "Supplier") and any customer (the "Customer") that places an order for Goods and/or Services with the Supplier ("Order").

These Terms prevail over any other terms and conditions, or any other form of contract, despite any indication to the contrary by any person acting or apparently acting on behalf of the Supplier, unless agreed in writing by a duly authorised officer of the Supplier. The Supplier reserves the right to change these Terms from time to time by giving notice of the amendment to the Customer. Notice is deemed given to the Customer when the Supplier posts the amendment to the Supplier's website, but, for the avoidance of doubt, will not apply to Orders already placed.

1. Orders

All Orders placed by the Customer shall constitute acceptance of these Terms, despite anything to the contrary in an Order. If the Customer does not understand or agree with any of the terms or conditions outlined herein, please contact the Supplier immediately. Receipt by the Supplier of any Order does not conclude a contract. An Order will only be deemed accepted by the Supplier, and a contract concluded, upon the earlier of delivery of the Goods and/or Services or the time the Supplier confirms the Order in writing.

Orders can be made in accordance with the Supplier's procedures as promulgated from time to time. The Supplier may, at the Supplier's absolute discretion, decline to accept an Order at any time if the Supplier has reasonable cause to do so.

2. Price and payment

The price for the Goods and/or Services will be the price agreed by the Supplier with the Customer at the time of the Order. The Supplier is under no obligation to publish a price list.

Unless otherwise agreed in writing by the Supplier, payment for Goods and/or Services is due on the 20th of the month following the date of the Supplier's invoice to the Customer, receipt of delivery of the Goods and/or completion of the Services (whichever is the earlier) by way of a direct credit to the Supplier's nominated bank account from time to time.

The Customer agrees to pay the Supplier the price for the Order, as well as any applicable taxes, duties (including GST in accordance with the Goods and Services Tax Act 1985) and/or delivery costs (as applicable). Where payment is made by credit card, a surcharge of approximately 3% may be charged. The Supplier reserves the right to request that the Customer pay a deposit for the Order.

The Customer may not withhold payment or make any deductions from any amount owing in respect of the supply of Goods and/or Services from the Supplier without the Supplier's prior written consent. There is no prompt payment discount unless specifically agreed in writing by the Supplier. The Supplier reserves the right to withdraw a Customer's credit facilities at the Supplier's sole discretion at any time.

All payments received will be credited chronologically against invoices which are issued earlier in time regardless of whether the payment is stated to be for a later invoice.

3. Delivery

The Supplier will deliver, or arrange delivery, of the Goods to the location specified in the Order. The Supplier will use the Supplier's best endeavours to fulfil Orders, but the Supplier will not be liable for any failure to deliver, or for a delay in delivery. If the Customer refuses to accept delivery of the Goods and/or Services, the Supplier may charge the Customer for any additional costs incurred as a result, including storage and transportation costs.

The Supplier reserves the right to charge freight costs for despatches under the value of NZ\$250.00, or for bulky deliveries such as cabinets and distribution racks. Otherwise, unless specifically agreed to the contrary in writing, the Supplier will absorb the costs of, and incidental to, transportation of Goods having a value above NZ\$250.00.

If after 5 Business Days from the date on which the Goods are ready for collection or despatch, delivery is delayed due to the Customer's act, omission, breach or default, the Supplier may at the Supplier's election either store the Goods at the Supplier's premises or elsewhere (and the cost of storage, handling and insurance shall be payable by the Customer on the Supplier's demand), or the Supplier may terminate the Order without liability to the Customer.

Freight cost for deliveries outside of New Zealand must be negotiated between the Supplier and the Customer on a case by case basis.

4. Personal property securities act 1999 (the ppsa)

The Customer grants a security interest to the Supplier in each and every part of the Goods as security for payment of that part and of each other part or parts of the Goods and for any other amounts owing by the Customer to the Supplier from time to time, and for the performance by the Customer of all the Customer's other obligations to the Supplier from time to time, ("Customer's indebtedness and obligations").

For the purposes of section 36(1)(b) of the PPSA, and to ensure maximum benefit and protection for the Supplier by virtue of section 36(1)(b)(iii) of the PPSA, the Customer confirms and agrees that the Customer intends to and does grant to the Supplier, as security for the Customer's indebtedness and obligations, a security interest in all of the Customer's present and after-acquired property except only for any such property which is or comprises items or kinds of personal property which have not been supplied by the Supplier to the Customer, but includes proceeds of any of that present and after-acquired property which has been supplied by the Supplier to the Customer.

The Supplier may allocate amounts received from the Customer in any manner it determines, including in any manner required to preserve any purchase money security interest it has in any Goods.

The Customer waives the right to receive a copy of the verification statement confirming registration of a financing statement or financing change statement relating to the security interest under these Terms.

The Customer agrees that nothing in sections 114(1)(a), 133 and 134 of the PPSA shall apply to these Terms, or the security created under these Terms, and waives the Customer's rights under sections 121, 125, 129, 131 and 132 of the PPSA.

5. Retention of title

The title to Goods delivered remains with the Supplier until payment has been received in full by the Supplier.

6. Risk and ownership

Notwithstanding clause 5, risk of any loss, damage or deterioration of or to the Goods passes to the Customer on delivery. The Customer is responsible for insuring Goods from the time of delivery. The Customer may not refuse to receive Goods based on minor defects as to quality or insignificant deviations as to quantity. Partial deliveries are also permitted, unless they are unreasonable for the Customer to accept.

Despite any period of credit, Ownership of the Goods remains with the Supplier and does not pass to the Customer until the Customer pays the price of the Goods (and other related sums including any transportation costs and any applicable duties or taxes) to the Supplier ("Customer Debt") or resells the Goods in accordance with these Terms provided that the proceeds from any such resale are held in trust in accordance with the provisions set out in this section.

While Ownership of the Goods remains with the Supplier, the Customer must store them separately in a saleable condition as fiduciary, bailee and agent of the Supplier and clearly identify them as belonging to the Supplier; the Customer may (until advised to the contrary in writing by the Supplier), in the ordinary course of its business, use the Goods or sell them for full value, provided that the proceeds from any such resale are held in trust in accordance with the provisions set out in this section and as the Customer's irrevocably appointed agent for the purposes of this clause, the Supplier may, if the Supplier has reasonable grounds to believe that the Customer has not complied with these Terms or an "event of default" has occurred or is likely to occur, enter the premises where the goods are stored and remove them. In such circumstances, the Customer shall not impede or otherwise prevent the Supplier or its agents from entering the premises to retrieve the Goods.

The Supplier will not be responsible for any damage reasonably caused in entering and removing the Goods. The Customer will indemnify the Supplier for any costs or liability incurred by the Supplier as a result of any such damage. The Customer is liable for all costs of the Supplier (including transportation and storage charges) of and incidental to entering and removing the Goods.

The Supplier may resell any of the Goods and apply the proceeds of sale in reduction of the Customer Debt. If the Customer resells or uses the Goods before ownership of the Goods has passed to the Customer, the proceeds of such sale or use will be held by the Customer (in whatever form) in trust for both the Customer and the Supplier. The Supplier's interest as beneficiary under that trust is that portion of the proceeds which does not exceed the Customer Debt. The balance of the proceeds (if any) shall be the Customer's beneficial interest under that trust. The Supplier may at any time, by notice in writing, require the Customer to convert the proceeds into money, to be paid into a bank account nominated by the Supplier for disbursement in accordance with these Terms.

7. Warranties

The Supplier warrants to the Customer that (i) all Goods shall be supplied in good condition at the date of delivery, (ii) all Goods shall be free of defects for a period of 12 months from the date of delivery and (iii) all Services will be performed with due care and attention and in accordance with applicable laws and regulations.

The above warranty does not cover, and the Customer assumes any and all responsibility for, defects, losses and damages arising from or relating to the consequences of natural wear and tear, overloading, fraudulent concealment of the defect, misuse, unauthorised modifications, non-compliance with instructions, negligent handling, accident, intentional damage or any other external influences not assumed under these Terms. Claims based on defects attributable to installation/removal, or repair work, carried out by the Customer or a third party and the consequences thereof are also excluded.

Where any warranty claim is made pursuant to these Terms, the Customer must notify the Supplier of any alleged damage or defect or potential claim as soon as possible, and in any event within 10 business days, once it becomes aware of the same, and, to the extent possible, the Customer must preserve the Goods in the state they were at the time it became aware of such damage, defect or potential claim.

If the claim is then accepted, the Supplier must (at its sole cost and discretion, and within a reasonable time) either repair the Goods, provide a replacement, or provide a credit, provided that the Customer has complied with its obligations under these Terms. The Customer agrees that, to the extent permitted by law, the Supplier's liability to the Customer in respect of damaged or defective Goods is limited to replacement, repair/ remedy or credit.

No warranty or condition is implied against the Supplier under any statute, at common law or otherwise, including pursuant to the Sale of Goods Act 1908, and no representation, condition, warranty or variation of these Terms is binding on the Supplier unless it is in writing and signed by a duly authorised officer of the Supplier.

Where the Customer acquires or holds itself out as acquiring Goods from the Supplier for the purposes of a business as defined in the Consumer Guarantees Act 1993 ("CGA"), the provisions of the CGA will not apply.

If the CGA does apply, the Customer has guaranteed legal rights for Goods and/or Services it buys in addition to the above warranty. If the Goods and/or Services supplied to the Customer do not meet a consumer guarantee, but can be remedied within a reasonable time, the Supplier will either repair or replace the relevant Goods and/or Services. The Supplier carries a comprehensive range of spare parts and can remedy most issues. If the Supplier cannot repair or replace the Goods, or those parts of the goods that are at fault, the Supplier will provide the Customer with a refund of the purchase price.

8. Indemnity

The Customer hereby indemnifies and agrees to hold harmless the Supplier (and the Supplier's directors, officers, employees, agents and authorised representatives) against all loss, damage, liability, actions, proceedings, claims, demands or prosecutions, costs, damages and expense of any kind or nature suffered, incurred, brought or commenced against the Supplier (and the Supplier's directors, officers, employees, agents and authorised representatives) as a result of the Customer's fraud, negligence or failure to comply with these Terms.

9. Return of goods

Sale and Return: Goods are not sold on a sale or return basis unless specifically agreed in writing.

Goods Damaged in Transit: Goods damaged in transit must be reported to the Supplier within five business days of their receipt quoting packing slip or invoice number. Where it is identified that damage occurred after risk in the Goods passed to the Customer then the Supplier accepts no responsibility for such claim and will advise the Customer of the appropriate person to claim against.

Mispicked Goods: Short or incorrect Goods must be reported to the Supplier within five business days of their receipt quoting packing slip or invoice number.

Defective Goods: Any Goods which show obvious manufacturing defects must be notified in writing to the Supplier within two business days from receipt of the Goods. Where possible please quote the packing slip or invoice number.

No Credit for Returned Goods: Goods cannot be returned unless the Supplier has specifically agreed with the Customer in writing to this effect in advance and in any event credit will be issued only to the value of the Goods less a re-stocking fee of 10% of the net invoice value.

10. Liability

To the maximum extent permitted by applicable law, the Supplier will not be liable for any claim for loss or compensation or any other remedy (of any nature, including under contract or in negligence) by the Customer or any other person, including without limitation any claim relating to or arising from any condition, warranty, description, representation, condition as to fitness or suitability for any purpose, merchantability or otherwise, whether express or implied by law, trade custom or otherwise, or any representation, warranty, or agreement made by any agent or representative which is not expressly confirmed by the Supplier in writing.

If despite this clause the Supplier is held to be liable to the Customer under these Terms for loss of any nature (including under contract and in negligence), the Supplier's total liability (i) will not include damages for indirect or consequential loss of any kind and (ii) will not exceed the price of the Goods and/or Services in relation to which that liability was incurred.

11. Default

If an event of default occurs, the Supplier may suspend or terminate any current or future Orders made between the Supplier and the Customer. If an event of default occurs, the price and any other amounts owing will immediately become due and payable to the Supplier notwithstanding that the due date has not arisen. Default interest will accrue on the daily balances of overdue accounts from the day following the due date to the day of payment (both dates inclusive) at a rate of 2.5% per month or part thereof, compounding.

The Supplier reserves the right to cancel or withhold any Orders from the Customer until all moneys owed by the Customer are paid to the Supplier. The Supplier may also recover any Goods where title has not yet passed to the Customer and the Supplier may withdraw any discount against trade list prices or that which has otherwise agreed to be provided.

For the purposes of this clause, an "event of default" means an event where the Customer fails to comply with these Terms or any other contract with the Supplier or any related company of the Supplier; where the Customer commits an act of bankruptcy or is unable to pay its debts as they fall due; where the Customer is deemed to be bankrupt or insolvent or where the Customer enters into any composition or arrangement with its creditors. Where the Customer is a company, an "event of default" occurs when the Customer commits any act or any event occurs in relation to it which exposes it to a risk of being put into liquidation or receivership; where a resolution is passed or proceedings commenced for the Customer to be wound up or liquidated; where a receiver or statutory or official manager or trustee is appointed over all or any of the Customer's assets, or ownership or effective control of the Customer is transferred without the prior written consent of the Supplier.

The Customer agrees to indemnify the Supplier for all costs that the Supplier may incur in connection with a default by the Customer under these Terms, including any legal costs (on a solicitor/client basis), any debt collection costs (including commissions) that become payable to any collection agency that the Supplier may choose to engage, in addition to any other costs that the Supplier may become liable for as a result of the default.

12. Privacy

Through conducting normal business, the Supplier may collect the Customer's personal information, such as purchase history, contact and delivery details. This information will be held and used in accordance with the Privacy Act 2020.

The Supplier may disclose your personal information as required by law.

The Customer authorises the Supplier to collect, retain and use any information about the Customer for the purpose of enforcing any rights under these Terms, or marketing any goods provided by the Supplier to the Customer or any other party. Where the Customer is a natural person, the authorities are considered authorities or consents for the purposes of the Privacy Act 2020.

Where the Customer has provided information to the Supplier on a confidential basis, the Supplier will hold that information in confidence, except as required by law. The Customer has the right under the Privacy Act 2020 to obtain access to, and to request the correction of, any personal information concerning the Customer held by the Supplier.

The Customer acknowledges that the Supplier will communicate with the Customer (including by telephone, email and/or text message) for the purpose of performing the Supplier's obligations in connection with the Order.

13. Force majeure

The Supplier will not be liable for any failure or delay in complying with any obligation imposed by these Terms if the failure or delay arises from any circumstance beyond the Supplier's control, including without limitation fire, flood, earthquake, explosion, war, insurrection, sabotage, industrial disputes, transportation embargo, changes in law, delays or disruption by government or government agencies, epidemics or pandemics.

If the delay continues for a period of 30 business days or more, either party may cancel the Order without liability to the other.

14. Miscellaneous

While the Supplier endeavours to supply correct information on the Supplier's website at all times, mistakes, errors or omissions may occur. The Supplier takes no responsibility for any loss or damage, direct or indirect, resulting from the use or application of information contained on the Supplier's website.

Failure by the Supplier to enforce any of the Terms contained herein shall not be deemed to be a waiver of any of the rights or obligations the Supplier may have under these Terms.

These Terms shall be governed and construed in accordance with the laws of New Zealand and the parties submit to the non-exclusive jurisdiction of the courts of New Zealand.

Where the Customer or any other person who the Customer acts for, or who the Customer permits to act for the Customer, supplies incorrect information for the purchase of Goods and the Supplier incurs cost in any matter concerning that name then the Supplier may recover the costs incurred by the Supplier from the Customer (including legal costs on a solicitor-client basis).

The Customer agrees to use the Supplier's website, products and services in accordance with the applicable laws of the country or countries where the Customer's business or organisation is based.

The singular shall include the plural and vice versa and words importing any gender shall include every other gender.

A "business day" means any day, other than a Saturday, Sunday or public holiday in New Plymouth, on which banks are generally open for business.

Unless any provision in these Terms expressly provides otherwise, these Terms are not intended to confer a benefit on any person or class of person who is not a party to it.

The Supplier may deliver notices to the Customer by sending them to an email address that the Customer has notified to the Supplier.

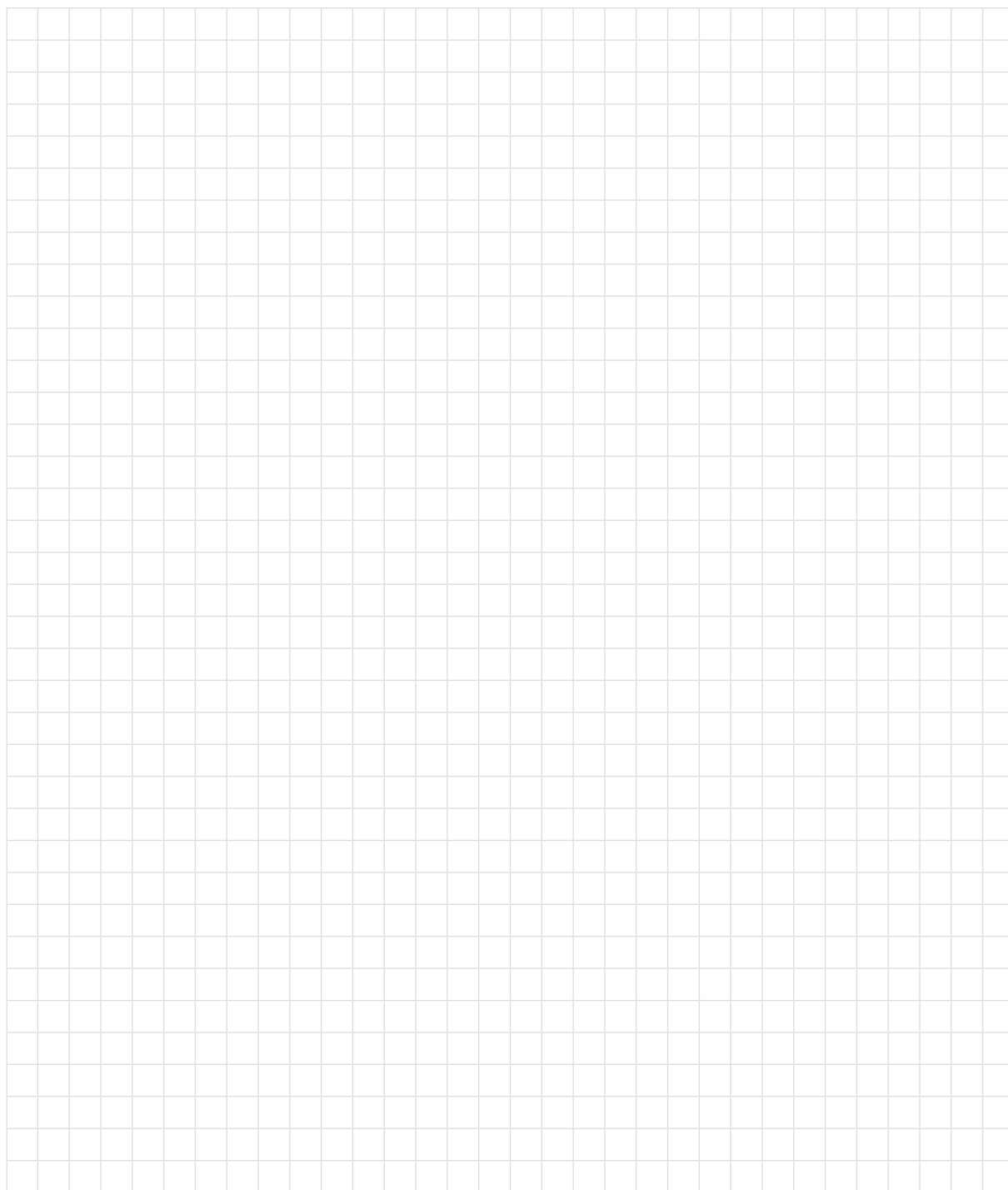
If anything in these Terms is unenforceable, illegal or void, then it is severed and the rest remains in force, unless the severance would change the underlying principal commercial purpose or effect.

The United Nations Convention on Contracts for the International Sale of Goods adopted at Vienna, Austria, on 10 April 1980 does not apply to the sale of Goods the subject of these Terms.

The Customer must not transfer its rights in respect of the purchase of Goods to any other party without the Supplier's prior consent in writing.

If the Supplier exercises or fails to exercise any right or remedy available to it, this will not prejudice the Supplier's rights in exercising that or any other right or remedy. Any waiver of any term of the contract into which these Terms are incorporated must be specified in writing and signed by an authorised officer of the Supplier.

Notes



Further developments of our products and technical changes are subject to change. Alterations, errors and errata constitute no claim for damages. Our valid sales terms and delivery conditions are available on our website www.jeanmueller.co.nz

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