

Vertical fuse disconnects



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 60439-1. 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.



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 35)

Vertical fuse disconnects 3 pole switching in one action

Size	For Fuses	Current Rating (A)	Switch width (mm)	Busbar Centre Spacing (mm)	Part No.
DIN 00	DIN 000 & DIN00	160A	50 mm	100 mm	SL00-3X3/100/F/HA
DIN 00	DIN 000 & DIN00	160A	50 mm	185 mm	SL00-3X3/185/F
DIN 1	DIN 1	250A	100 mm	185 mm	SL1G-3X3/3A
DIN 2	DIN 1 & 2	400A	100 mm	185 mm	SL2G-3X3/3A
DIN 3	DIN 1, 2 & 3	630A	100 mm	185 mm	SL3-3X3/3A
DIN 3	DIN3	910A	100mm	185mm	SL3-3X3/910/HA
	Solid Links	1000A (solid links only)	100 mm	185 mm	SL3-3X3/1000/HA
	DIN 2 & DIN 3 (2)	1250A	200 mm	185 mm	SL3-3X6/1250/HA
DIN3	DIN3	1600A	200mm	185mm	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)	Part No.
DIN 00	DIN 000 & DIN00	160A	50mm	100mm	SL00-3X/100/F/HA
DIN 00	DIN 000 & DIN00	160A	50 mm	185 mm	SL00-3X/185/F
DIN 1	DIN 1	250A	100 mm	185 mm	SL1G-3X/3A
DIN 2	DIN 1 & 2	400A	100 mm	185 mm	SL2G-3X/3A
DIN 3	DIN 1, 2 & 3	630A	100 mm	185 mm	SL3-3X/3A
DIN3	DIN3	910A	100mm	185mm	SL3-3X/910/HA
	Solid Links	1000A (solid links only)	100 mm	185 mm	SL3-3X/1000/HA
	DIN 2 & DIN 3 (2x)	1250A	200mm	185 mm	SL3-3X2/1250/HA
	DIN 2 & DIN 3 (2x)	1600A	200mm	185 mm	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)	Part No.
DIN3	Solid Links	1000A (solid links only)	100 mm	185 mm	SLT3-3SL/3X3 /1000



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 35)

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.
DIN1	DIN1	250	100	185	SL1G-3X3/W/3A
DIN2	DIN2	400	100	185	SL2-3X3/W/3A
DIN3	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.
DIN1	DIN1	250	100	185	SL1G-3X/W/3A
DIN2	DIN2	400	100	185	SL2-3X/W/3A
DIN3	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

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 (mm ²)	Part No.
DIN00	DIN000 & 00	160	M8 Bolt	50	max. 95	PU-SL00-3X3/185/F
DIN1	DIN1	250	M10 Bolt	100	max. 150	PU-SL1H-3X3/3A
DIN2	DIN1 & 2	400	M12 Bolt	100	max. 240	PU-SL2H-3X3/3A
DIN3	DIN1, 2 & 3	630	M12 Bolt	100	max. 300	PU-SL3-3X3/3A

Vertical fuse disconnects with 3 pole individual switching action

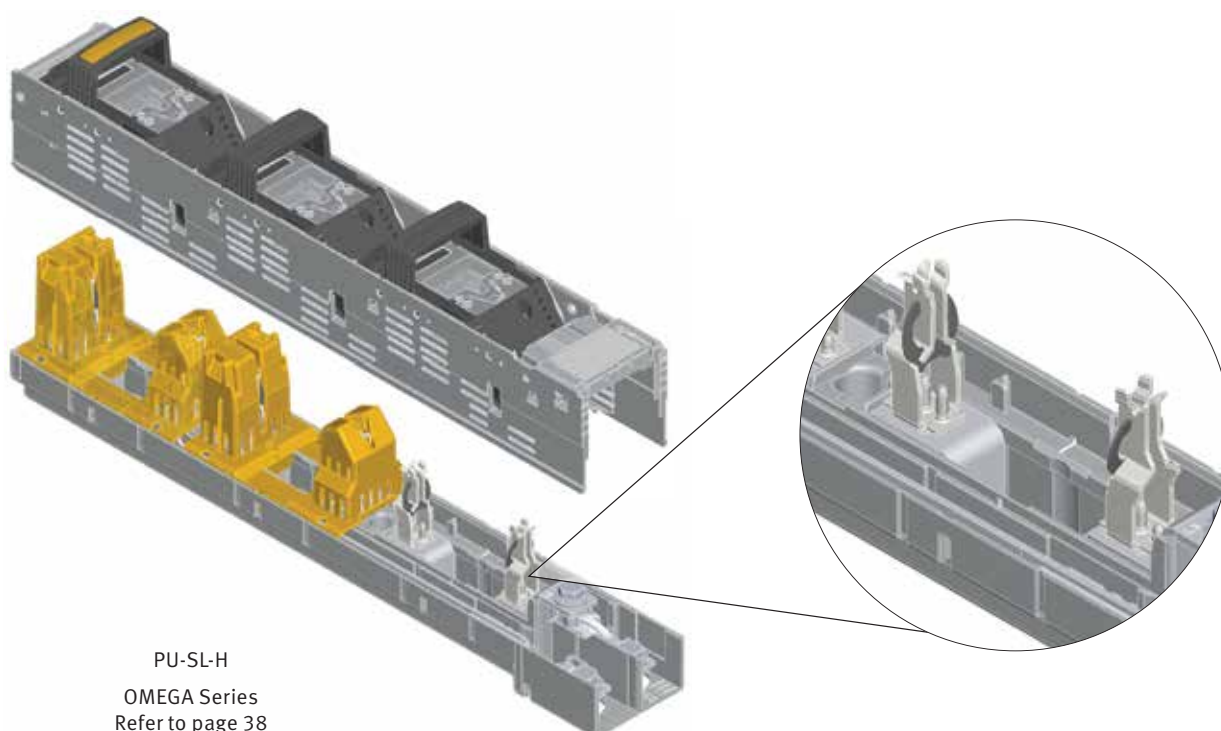
Size	For Fuses	Current Rating (A)	Terminals	Switch width (mm)	Connection Capacity (mm ²)	Part No.
DIN00	DIN000 & 00	160	M8 Bolt	50	max. 95	PU-SL00-3X/185/F
DIN1	DIN1	250	M10 Bolt	100	max. 150	PU-SL1H-3X/3A
DIN2	DIN1 & 2	400	M12 Bolt	100	max. 240	PU-SL2H-3X/3A
DIN3	DIN1, 2 & 3	630	M12 Bolt	100	max. 300	PU-SL3-3X/3A

Power Utilites range

Accessories - Refer to pages 34 & 35



PU



PU-SL-H
OMEGA Series
Refer to page 38

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.
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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



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



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

TECHNICAL INFORMATION

Type			SL00-3X3/ 100FHA	SL00-3X SL00-3X3	SL1G-3X/3A SL1G-3X3/3A SL1G-../W/HA	SL2G-3X/3A SL2G-3X3/3A SL2G../W/HA	SL3-3X/3A SL3-3X3/3A SL3-../W/HA
Electrical characteristics							
Rated Voltage	U	[V]	500	500	500	500	500
Rated Current	/	[A]	160	160	250	400	630
Current (with Fuse links)	/	[A]	160	160	250	400	630
Current (with Solid links)	/	[A]	210 with TM00	210 with TM00	400 with TM2	400 with TM2	800 with TM3-1250
Rated Frequency		[Hz]	40-60	40-60	40-60	40-60	40-60
Rated Insulation Voltage	U	[V]	800	800	1000	1000	1000
Rated Short Circuit Current		[kA]	80	120kA(500V)	80	80	120kA(500V)
Switching Class (with solid links)			AC-22B	AC-22B AC23B(400V)	AC-22B	AC-22B	AC-22B AC23B(400V)
Rated Making Capacity		[A]	480	480	750	1200	1890
Rated Breaking Capacity		[A]	480	480	750	1200	1890
Rated Impulse Voltage	U	[kV]	8	8	12	12	12
Electrical Life	[No. of ops]		200	200	200	200	200
Total Power Dissipation (without fuse-links)	P	[W]	18	23	29	74	115
Fuse links							
DIN Size			000 & 00	000 & 00	1	1 & 2	1 & 2 & 3
Max. Rated Current (gL/gG)	/	[A]	160	160	250	400	630
Permissible Maximum Power Dissipation per fuse-links		[W]	12	12	32	45	48
Mechanical characteristics							
Mechanical Life	[No. of ops]		1400	1400	1400	800	800
Weight (without packing)	3 pole	[kg]		2.4	4.9	4.9	7.5
Busbar fitting Screw Size			M8	M8	M12	M12	M12
Terminal capacity							
Spade Terminal (Standard Supply)			M8x16	M8x16	M10x25	M12x30	M12x30
Cable lug (DIN 46235)		[mm²]	1x10-95	1x10-95	1x25-150	1x25-240	1x25-300
Flat bar		[mm]	20x10	20x10	30x10	30x10	30x10
Torque		[Nm]	12-15	12-15	30-35	35-40	35-40
Prism Clamp [P0070]							
Cable Size (Al/Cu)		[mm²]	10-70	10-70	-	-	-
Torque		[Nm]	2.6	2.6	-	-	-
Degree of protection							
Front, device fitted							
Operating condition			IP30	IP30	IP30	IP30	IP30
Front cover open			IP10	IP10	IP10	IP10	IP10
Service conditions							
Max. Ambient Temperature		[C]	-25... +55 (reduced operation at max)				
Rated Duty			Uninterrupted duty				
Operation			Manual dependent				
Mounting Position			Vertical or Horizontal				
Altitude		[m]	Up to 2000				
Pollution Degree			3	3	3	3	3
Overvoltage Category			III	III	III	III	IV

*tested with LV-HRC fuse-links characteristics gG

Type			SL3/910/HA SL3X3/910/HA	SL3-3X/1000/HA SL3-3X3/1000/HA	SL3-3X2/1250/HA SL3-3X6/1250/HA	SL3-3X2/2000/HA SL3-3X6/2000/HA	SLT3.../ SL(SR)/1000 bus coupler
Electrical characteristics							
Rated Voltage	U	[V]	400	500	500	400	500
Rated Current	/	[A]	910	1000	1250	1600	1000
Current (with Fuse links)	/	[A]	910	630	1250	1600	630
Current (with Solid links)	/	[A]	1250 (TM3-1250)	1000(TM3-1250)	1600	2000 (TM 3/1250)	1000 (TM3-1250)
Rated Frequency		[Hz]	40-60	40-60	40-60	40-60	40-60
Rated Insulation Voltage	U	[V]	690	1000	1000	690	1000
Rated Short Circuit Current (conditional)*		[kA]	50	120kA	80kA	50kA	80kA with fuse links
Switching Class (with solid links)			AC-22B(910/400V)	AC-22B (500V)	AC22B(500V)	AC22B(400V)	AC-22B 630A/400V
Rated Making Capacity		[A]	2400	2400	3750	4800	1890
Rated Breaking Capacity		[A]	2400	2400	3750	4800	1890
Rated Impulse Voltage	U	[kV]	8	12	12	8	12
Electrical Life	[No. of ops]		100	100	100	100	100
Total Power Dissipation (without TM)	P	[W]	155	275	215	375	275
Fuse links							
DIN Size			3	2 & 3	2 & 3	2 & 3	2 & 3
Max. Rated Current (gL/gG)	/	[A]	800A (910A gTr)	630	2x 630	2x gG 800/gTr722	630
Permissible Maximum Power Dissipation per fuse-link		[W]	61	51	48	51	51
Mechanical characteristics							
Mechanical Life	[No. of ops]			800	500	500	800
Weight (without packing)	3 pole	[kg]		9	16	33	9
Busbar fitting Screw Size			2xM12	M12	M12	M12	M12
Terminal capacity							
Spade Terminal			2xM12x35	2xM12x35	3xM12x35	4xM12x35	2xM12x35
Cable lug (DIN 46235)		[mm²]	2x300	2x300	3x300 or 4x185	4x300	2x300
Flat bar		[mm]	-	-	-	-	-
Torque		[Nm]	35-40	35-40	35-40	35-40	35-40
Degree of protection							
Front, device fitted			IP30	IP30	IP30	IP30	IP30
Operating condition			IP10	IP10	IP10	IP10	IP10
Front cover open							
Service conditions							
Max. Ambient Temperature		[C]	-25...+55	-25... +55 (reduced operation at max)			
Rated Duty			Uninterrupted duty	Uninterrupted duty			
Operation			Manual dependent	Manual dependent			
Mounting Position			Vertical or Horizontal	Vertical or Horizontal			
Altitude		[m]	Up to 2000	Up to 2000			
Pollution Degree			3	3	3	3	3
Overvoltage Category			IV	IV	IV	IV	IV

* tested with LV-HRC- fuse-links characteristics gG



NH strip-type fuse-switch-disconnectors series OMEGA

Type					SL1H	SL2H
Electrical characteristics	According to standard				EN60947-3	
	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 ¹⁾		I_{th}	A	250	400
	Conv. free air thermal current with solid-links ¹⁾		I_{th}	A	400	400
	Rated frequency		-	Hz	40-60	40-60
	Rated insulation voltage		U_i	V	C1000	AC1000
	Total power loss at I _{th} (without fuse-links)		P_v	W	29	73
	Rated impulse withstand voltage		U_{imp}	kV	12	12
	Utilization category		-	-	AC-21B (250A/690V) AC-22B (250A/500V) AC-23B (250A/400V)	AC-21B (400A/690V) AC-22B (400A/500V) AC-23B (400A/400V)
	Rated conditional short-circuit current ²⁾		I_{cc}	kA	120	
	Rated short-time withstand current		I_{cw}	kA	-	
	Max. permis. power loss per fuse-link		P_a	W	23	34
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 ³⁾		T_{amb}	°C	-25 bis/to +55	
	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 EN 61439-1.

2) Type tested at AC725V with NH fuse-links characteristic gG.

3) 35°C Normal temperature, at 55°C with reduced operating current

Cable terminal

Type					L1H/SL1H	L2H/SL2H
Cable terminal	Flat terminal	Bolt diameter	-	-	M10	M12
		Cable lug (DIN 46 235)	-	mm ²	1 x 25-150	1 x 25-240
		Flat bar	-	mm	30 x 10	30 x 10
		Tightening torque	M_a	Nm	30-35	35-40

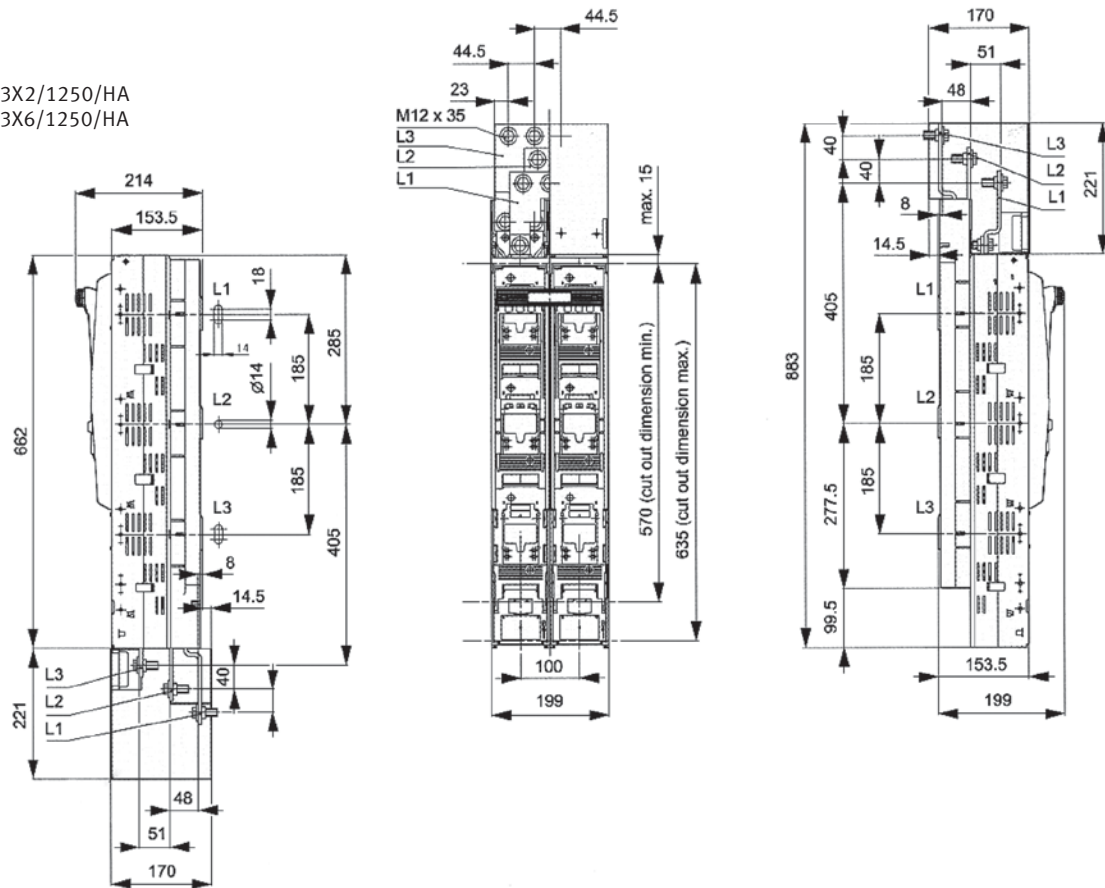
Technical drawings of the 'Krym' ship model, showing side, top, and front views with dimensions in millimeters.

Side View (Left): Dimensions include overall length 662, hull length 650, and deck width 7. Internal dimensions include 150, 108, 185, 185, and 79.5. Section lines L1, L2, and L3 are indicated.

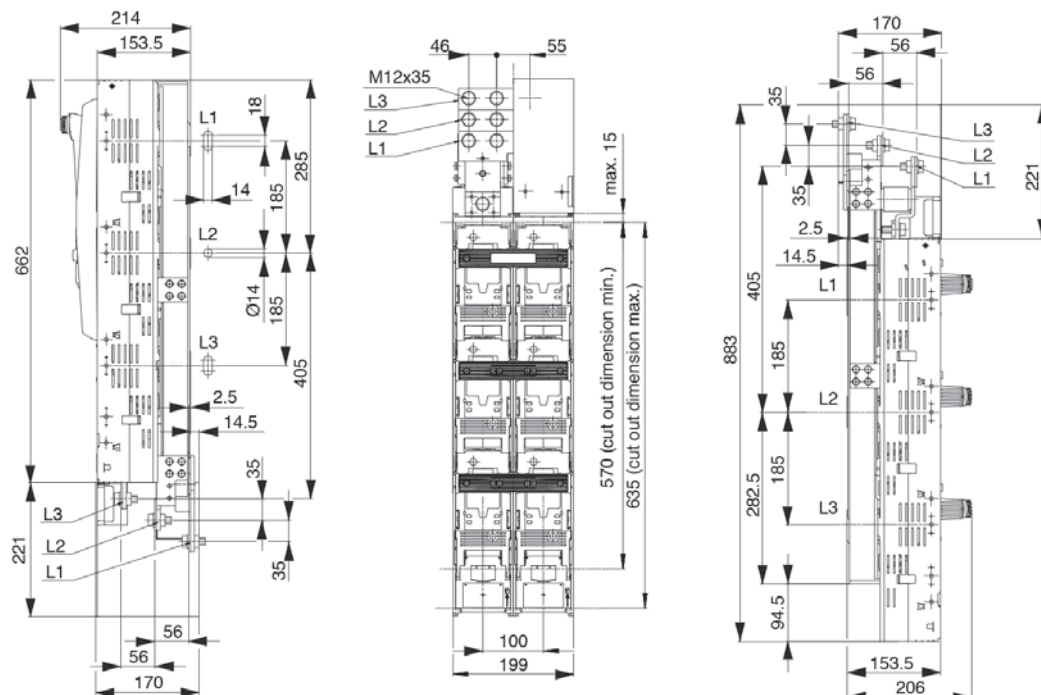
Top View (Middle): Dimensions include overall width 50.

Front View (Right): Dimensions include overall width 212 and hull width 111.5.

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



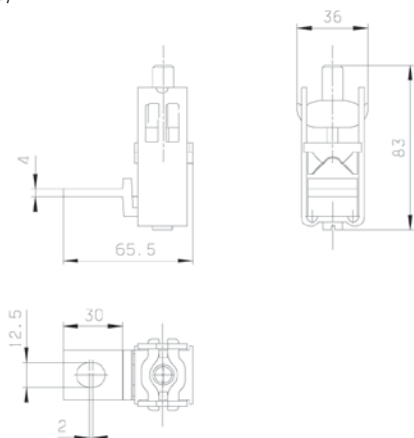
SL3-3X2/2000/HA
SL3-3X6/2000/HA



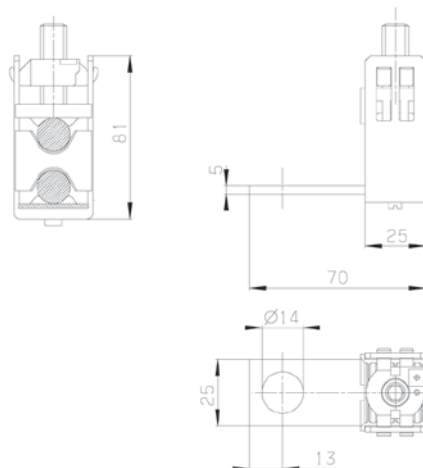


Vertical disconnect accessories

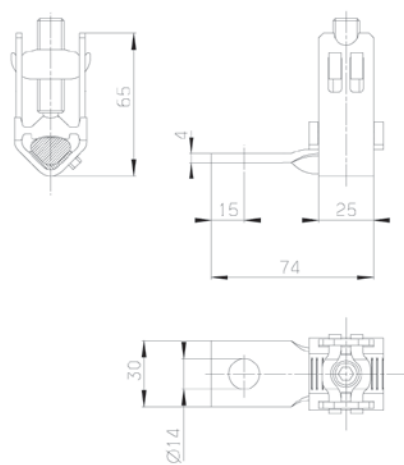
Terminals with connecting lugs K2G/A



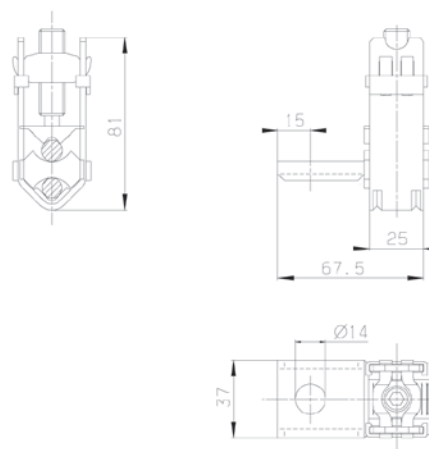
K2HG/2/AF30



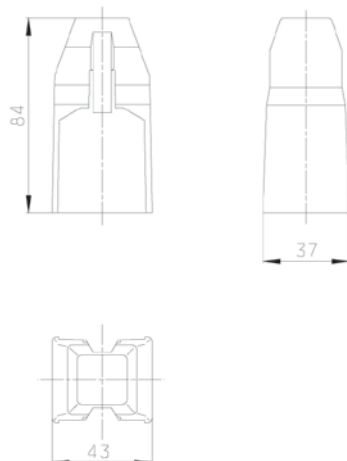
KM2G/AF3040



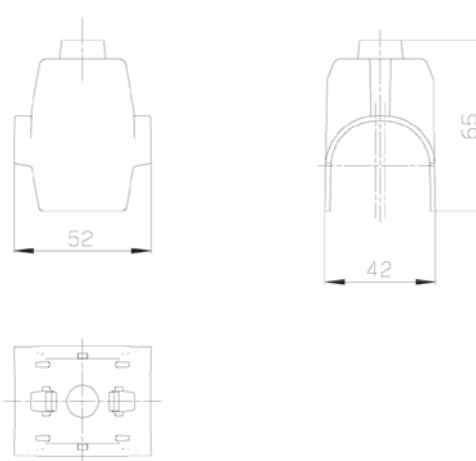
KV2HG/2/AF30



Covers for terminals with connecting lugs HR

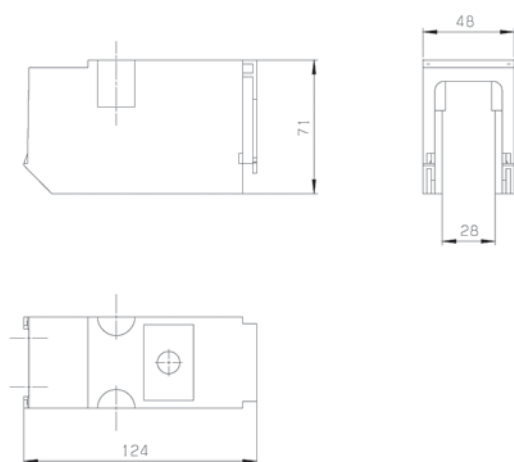


HRV

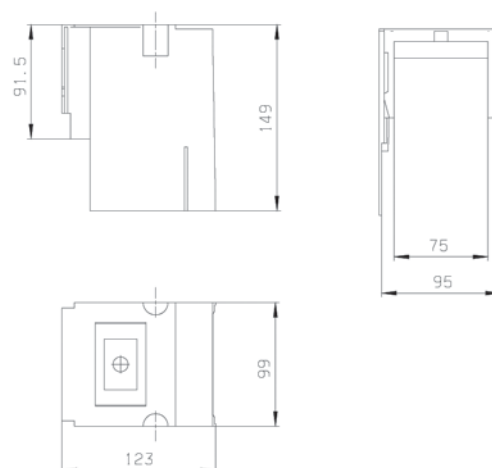


Terminal covers

HA-SL00/185



HA-SL123/10



HA220-SL123/10

