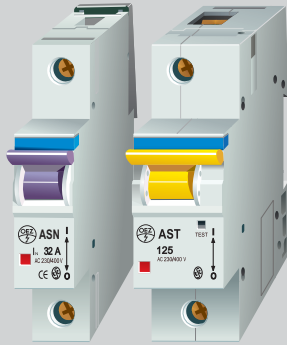


TUMBLER POWER SWITCHES



Tumbler power switches ASN, AST

- For building, commercial and industrial installations up to 125 A, 230/400 V a.c. 48 V d.c.
- For electric circuit switching
- Wide range of accessories – auxiliary and relative switches, undervoltage releases and shunt trips, busbars, labels etc.
- Possible interconnection by means of busbars

Tumbler power switches

Rated current I_n [A]	Poles	Type	Product code	Weight [kg]	Packing [pcs]
32	1	ASN 32/1	01158	0.14	12
	1+N	ASN 32/1N	01159	0.27	6
	3	ASN 32/3	01160	0.41	4
	3+N	ASN 32/3N	01161	0.54	3
63	1	ASN 63/1	01162	0.14	12
	1+N	ASN 63/1N	01163	0.27	6
	3	ASN 63/3	01164	0.41	4
	3+N	ASN 63/3N	01165	0.54	3
125	1	AST 125/1	12170	0.21	3
	3	AST 125/3	12173	0.63	1
	3+N	AST 125/3N	12174	0.84	1

Accessories to ASN

Auxiliary and relative switches	S-LSN	page 19
Shunt trips	V...-LSN	page 21
Undervoltage releases	N...-LSN	page 23
Labels	P...-LSN	page 25
Locking insert	VU-LSN	page 25
Interconnecting busbars	G..., S...	page 93
Connecting adapters	AS/25-GN, AS-AL/Cu-16-50	page 95
Interconnecting module	PSN	page 97

Accessories to AST

Auxiliary switches	S-LSN	page 19
Shunt trips	V...-LSN	page 21
Undervoltage releases	N...-LSN	page 23
Interconnecting busbars	S-3L	page 93
Connecting adapters	CS-FH000-...	page 95

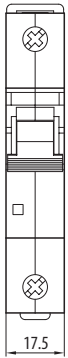
Specification

Type	ASN	AST	
Standards	EN 60 947-3	EN 60 947-3	
Approval marks			
Rated current	I_e 32 A a 63 A	125 A	
Rated operating voltage	U_e 230/400 V a.c., 48 V d.c.	230/400 V a.c., 48 V d.c.	
Max. operating voltage	U_{max} 253/440 V a.c., 52 V d.c.	253/440 V a.c., 52 V d.c.	
Min. operating voltage	U_{min} 12 V a.c. / d.c.	12 V a.c. / d.c.	
Rated frequency	f_n 40 ÷ 60 Hz	40 ÷ 60 Hz	
Rated conditional short-circuit current	with backup fuse ≤ 32 A gG	I_{nc} 10 kA ($I_n=32$ A)	-
	with backup fuse ≤ 63 A gG	I_{nc} 6 kA ($I_n=63$ A)	-
	with backup fuse ≤ 125 A gG	I_{nc} -	10 kA ($I_n=125$ A)
Endurance	10 000 operating cycles	10 000 operating cycles	
Rated impulse withstand voltage (1.2/50 μs)	I_{imp} 6 kV	6 kV	
Overvoltage category	IV	IV	
Utilization category	AC-22A, DC-22A	AC-22A, DC-22A	
Mounting on the rail DIN EN 50 022 - width	35 mm	35 mm	
Degree of protection	IP20	IP20	
Connection	conductor - rigid (solid, stranded)	0.5 ÷ 25 mm ² , 2x(0.5 ÷ 10) mm ²	1.5 ÷ 50 mm ²
	conductor - flexible	0.5 ÷ 16 mm ²	1.5 ÷ 50 mm ²
	tightening torque	2 Nm	3.5 Nm
Operating conditions	opposite	yes	yes
	ambient temperature	-20 ÷ +55 °C	-20 ÷ +55 °C
	operating position	arbitrary	arbitrary
	seismic immunity (8÷50 Hz)	5 g	5 g

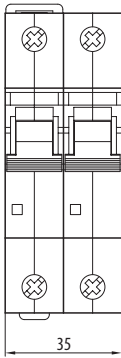
TUMBLER POWER SWITCHES

Dimensions

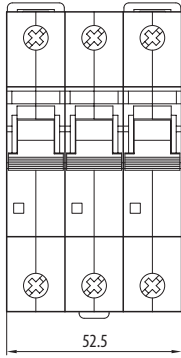
ASN.../1



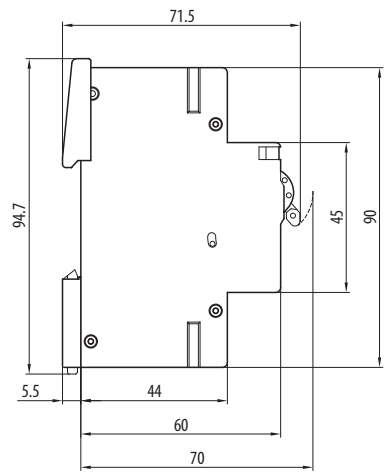
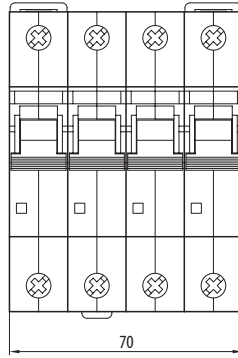
ASN.../1N



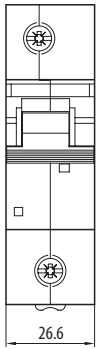
ASN.../3



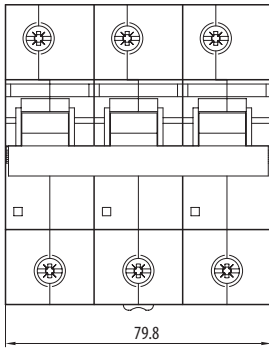
ASN.../3N



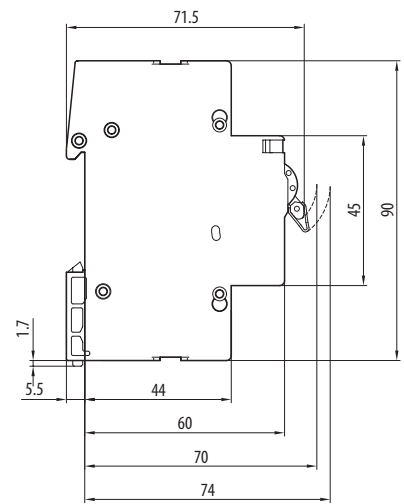
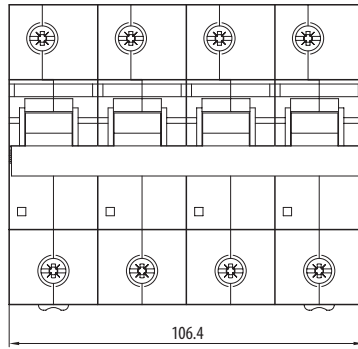
AST.../1



AST.../3

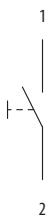


AST.../3N

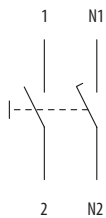


Diagram

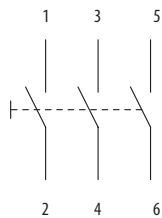
ASN.../1, AST.../1



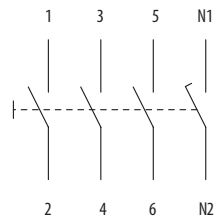
ASN.../1N



ASN.../3, AST.../3



ASN.../3N, AST.../3N



AUXILIARY AND RELATIVE SWITCHES



Auxiliary switches S-LSN11, S-LSN21

- Accessories to: LSN, LSE, LST, ASN, AST
- The auxiliary switches are designed for signalling the position of the main contacts of miniature circuit breakers and tumbler power switches in tripping by releases or manually – i.e. in tripping by overload, short-circuit, shunt trip, overvoltage release or control lever
- At correct connection of S-LSN11 or S-LSN21 with a miniature circuit breaker or tumbler power switch electric isolation is provided like between the input and output circuits of a protective transformer
- The auxiliary switch function can be tested by the test push-button on the front panel of the device

Auxiliary and relative switch S-LSN2001

- Accessories to: LSN, LSE, ASN
- The auxiliary and relative switch is designed for signalling the position of the main contacts of miniature circuit breakers and tumbler power switches in tripping:
 - by releases or manually – i.e. in tripping by overload, short-circuit, shunt trip, overvoltage release or control lever. This is signalled by auxiliary switches – terminals 33-34, 23-24
 - only by releases – i.e. only in tripping by overload, short-circuit, shunt trip or overvoltage release. This is signalled by so called relative switch – terminals 95-96
- The auxiliary switch function can be tested by the test push-button on the front panel of the device

Auxiliary and relative switches

Contact sequence ¹⁾	Type	Product code	Weight [kg]	Packing [pcs]
11	S-LSN11	01494	0.05	1
21	S-LSN21	01495	0.05	1
2001	S-LSN2001	01498	0.05	1

¹⁾ Each digit indicates successively the number of make, break, break-make and relative contacts

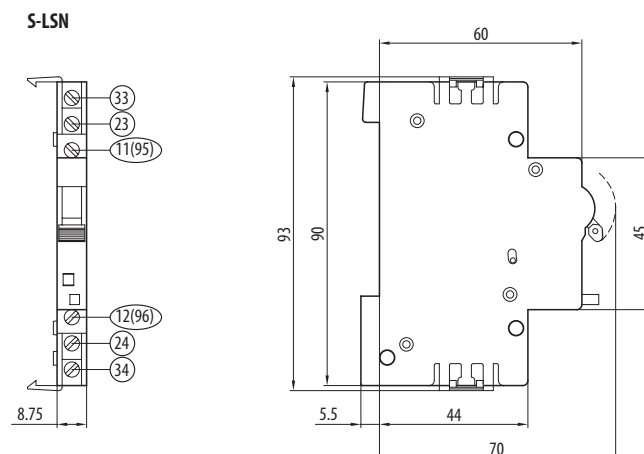
Specification

Type	S-LSN11, S-LSN21		S-LSN2001
Standards	EN 60 947-5-1		EN 60 947-5-1
Approval marks			
Contact sequence ^{1) 2)}	11, 21		2001
Rated operating voltage / current	AC-1	U_e/I_e	230 V/6 A
	AC-15	U_e/I_e	230 V/4 A or 400 V/2 A
	DC-1	U_e/I_e	-
	DC-13	U_e/I_e	220 V/1 A
Rated impulse withstand voltage		U_{imp}	4 kV
Endurance	10 000 operating cycles		10 000 operating cycles
Degree of protection	IP20		IP20
Mounting	on right side		on right side
Connection - conductor	rigid	$0.75 \div 4 \text{ mm}^2$	$0.75 \div 4 \text{ mm}^2$
	flexible	$0.75 \div 2.5 \text{ mm}^2$	$0.75 \div 2.5 \text{ mm}^2$
Seismic immunity (8÷50 Hz)	3 g		3 g

¹⁾ Each digit indicates successively the number of make, break, break-make and relative contacts

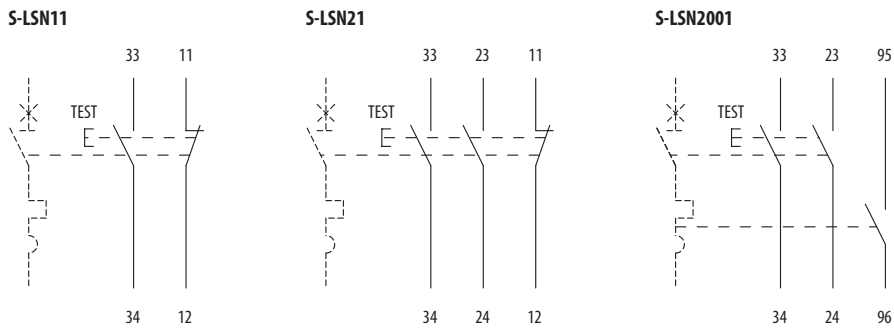
²⁾ Another possibility to achieve a higher number or a different sequence of contacts: install V101-LSN... shunt trip on the left side of the device and use only the auxiliary switch function

Dimensions



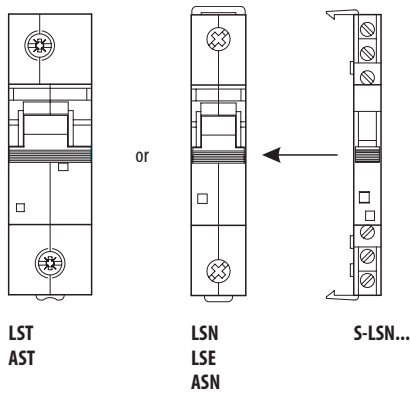
AUXILIARY AND RELATIVE SWITCHES

Diagram



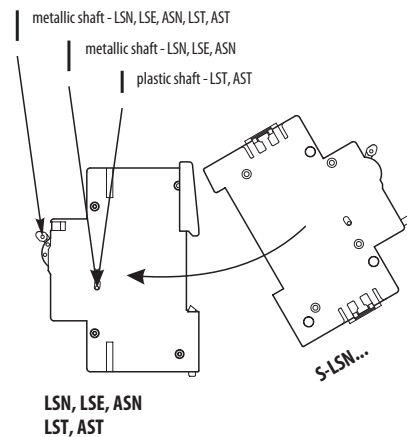
Assembly and installation of auxiliary switches

Assembly



Installation of an auxiliary switch on a miniature circuit breaker or tumbler power switch (hereinafter only the device):

1. Switch on both the auxiliary switch and the device.
2. Insert one shaft into the control lever of the device and the second shaft (for LST, AST the shaft is plastic) into the hole in the switching system of the device.
3. Slide the auxiliary switch from the right onto the device in such a way that one shaft interconnects control levers and the other interconnects the switching systems.
4. Press the auxiliary switch to the device and click the side fixing latches of the auxiliary switch into the device recess.
5. Check correct function by switching.



SHUNT TRIPS



- Accessories to: LSN, LST, LSE, ASN, AST
- For tripping the miniature circuit breakers or tumbler power switch by applied voltage between 70 % and 110 % U_e
- For signalling the position of the main contacts of the miniature circuit breaker or tumbler power switch by make or break-make contact
- The shunt trip coil is connected to terminals A1 and A2 to ensure its disconnection from the control voltage in the device trip. So the coil is powered for a required time. The disconnection is provided by the contact in the circuit between the terminals A1 and A2.
- Shunt trips V101-LSN contains additionally an auxiliary switch with break-make contact

Shunt trips

U_n AC/DC [V]	Contact sequence - 10 ¹⁾		Contact sequence - 101 ¹⁾		Weight [kg]	Packing [pcs]
	Type	Product code	Type	Product code		
24 / 24	V10-LSN-X024	08487	V101-LSN-X024	08497	0.12	1
48 / 48	V10-LSN-X048	08488	V101-LSN-X048	08755	0.12	1
110 / 110	V10-LSN-X110	08489	V101-LSN-X110	08926	0.12	1
230 / 220	V10-LSN-X230	08490	V101-LSN-X230	08498	0.12	1
400 / 440	V10-LSN-X400	08491	V101-LSN-X400	08499	0.12	1

¹⁾ Each digit indicates successively the number of make, break and break-make contacts

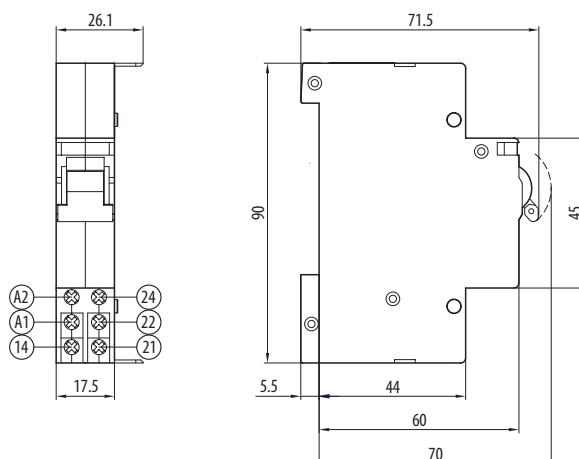
Specification

Type	V...-LSN		
Standards	EN 60 947-1		
Coil			
Rated operating voltage	U_e	24, 48, 110, 230, 400 V a.c. 24, 48, 110, 220, 440 V d.c.	
Rated frequency	f_n	40 ÷ 60 Hz	
Max. starting input power	90 VA		
Break time	10 ms		
Contact			
Sequence ¹⁾	10, 101		
Rated operating voltage / current	AC-1	U_e/I_e	230 V / 4 A or 400 V / 2 A
	DC-1	U_e/I_e	220 V / 0.5 A
	AC-15	U_e/I_e	230 V / 2 A
Endurance	10 000 operating cycles		
Other data			
Mounting	on the left side		
Connection - conductor rigid and flexible	0.75 ÷ 2.5 mm ²		
Degree of protection	IP20		
Seismic immunity (8÷50 Hz)	1.5 g		

¹⁾ Each digit indicates successively the number of make, break and break-make contacts

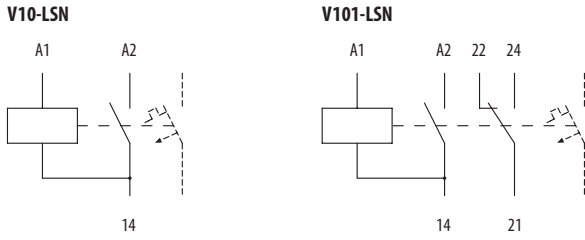
Dimensions

V...-LSN



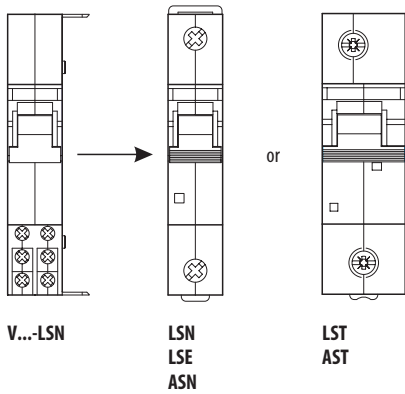
SHUNT TRIPS

Diagram



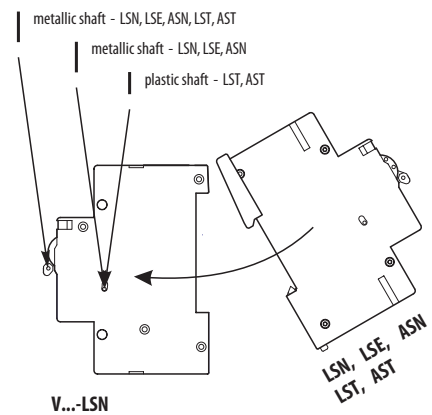
Assembly and installation of shunt trips

Assembly



Installation of a shunt trip on a miniature circuit breaker or tumbler power switch (hereinafter only the device):

1. Switch off both the shunt trip and the device.
2. Insert one shaft into the control lever of the shunt trip and the second shaft (for LST, AST the shaft is plastic) into the hole in the switching system of the shunt trip.
3. Slide the device from the right onto the shunt trip in such a way that one shaft interconnects control levers and the other interconnects the switching systems.
4. Press the device to the shunt trip and click the side fixing latches of the shunt trip into the device recess.
5. Check correct function by switching



UNDervOLTAGE RELEASES



- Accessories to: LSN, LST, LSE, ASN, AST
- For tripping the miniature circuit breaker or tumbler power switch at voltage drop between 70 % and 35 % U_e
- For tripping the miniature circuit breaker or tumbler power switch on pressing the switch-off push-button
- For elimination of miniature circuit breakers or tumbler power switch closing at voltage lower than 35 % on the undervoltage release (the closing is possible at $U \geq 85 \% U_e$)
- It is frequently used for protection against motor restart after the mains failure
- Undervoltage releases N101-LSN contain in addition an auxiliary switch with make and break-make contact for signalling the position of main contacts of the miniature circuit breaker or tumbler power switch

Undervoltage releases

U_n AC [V]	Without contacts		Contact sequence - 101 ¹⁾		Weight [kg]	Packing [pcs]
	Type	Product code	Type	Product code		
24	N-LSN-A024	08475	N101-LSN-A024	08485	0.12	1
48	N-LSN-A048	08476	N101-LSN-A048	09053	0.12	1
110	N-LSN-A110	08477	N101-LSN-A110	09055	0.12	1
230	N-LSN-A230	08478	N101-LSN-A230	08486	0.12	1
400	N-LSN-A400	08479	N101-LSN-A400	08927	0.12	1

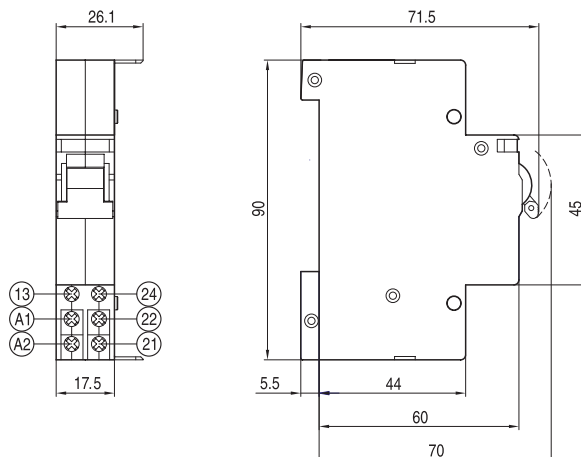
Specification

Type	N...-LSN		
Standards	EN 60 947-1		
Coil			
Rated operating voltage	U_e 24, 48, 110, 230, 400 V a.c.		
Rated frequency	f_n 40 ÷ 60 Hz		
Consumption	2.5 W		
Max. starting input power	90 VA		
Break time	25 ms		
Contact			
Sequence ¹⁾	0, 101		
Rated operating voltage/current	AC-1	U_e/I_e	230 V / 4 A or 400 V / 2 A
	DC-1	U_e/I_e	220 V / 0.5 A
	AC-15	U_e/I_e	230 V / 2 A
Endurance	10 000 operating cycles		
Other data			
Mounting	on the left side		
Connection	0.75 ÷ 2.5 mm ²		
Degree of protection	IP20		
Operating position	vertical		
Seismic immunity (8÷50 Hz)	3 g		

¹⁾ Each digit indicates successively the number of make, break and break-make contacts

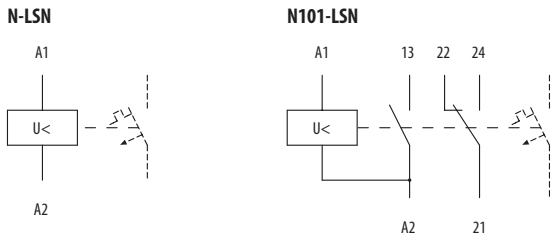
Dimensions

N...-LSN



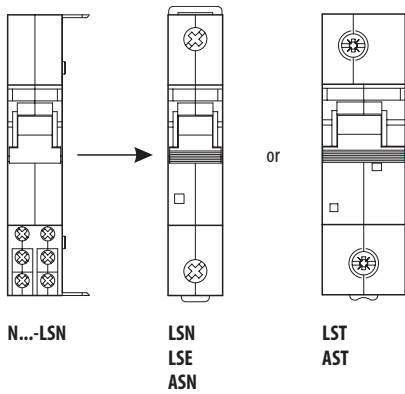
UNDERVOLTAGE RELEASES

Diagram



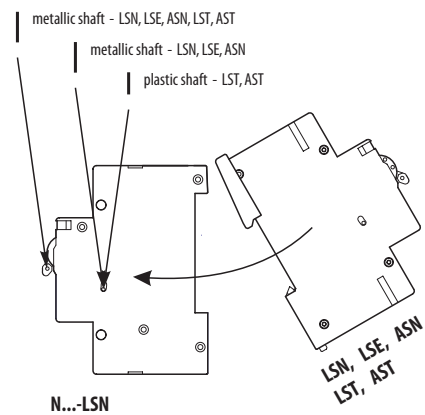
Assembly and installation of undervoltage releases

Assembly



Installation of an undervoltage release on a miniature circuit breaker or tumbler power switch (hereinafter only the device):

1. Switch off both the undervoltage release and the device.
2. Insert one shaft into the control lever of the undervoltage release and the second shaft (for LST, AST the shaft is plastic) into the hole in the switching system of the undervoltage release.
3. Slide the device from the right onto the undervoltage release in such a way that one shaft interconnects control levers and the other interconnects the switching systems.
4. Press the device to the undervoltage release and click the side fixing latches of the undervoltage release into the device recess.
5. Check correct function by switching



LOCKING INSERT, LABELS



Locking insert VU-LSN

- Accessories to: LSN, LSE, ASN, MS
- For reliable locking in both closed and open positions
- The breaking function of miniature circuit breakers is possible also in the locked position
- Max. diameter of the lock shank – 4.5 mm
- The padlock is not a part of delivery

Label P...-LSN

- Accessories to: LSN, ASN, MS, MT, MK, M2T, MCR, IR116K, C-IR, D-IR, PR116, PR208, ...
- For better orientation in the switchboard
- Use spirit marker for description of blank labels

Locking insert

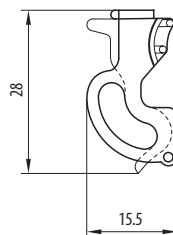
Type	Product code	Weight [kg]	Packing [pcs]
VU-LSN	09087	0.002	1

Labels

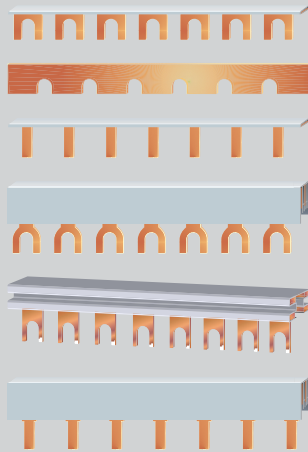
Description	Colour	Type	Product code	Weight [kg]	Packing [pcs]
		PB-LSN	01499	0.001	20
L1		PB07-LSN	01506	0.001	20
L2		PB08-LSN	01507	0.001	20
L3		PB09-LSN	01508	0.001	20
		PW-LSN	01509	0.001	20

Dimensions

VU-LSN



INTERCONNECTING BUSBARS AND END CAPS



Interconnecting busbars

- For interconnection of 1 to 4-pole circuit breakers, tumbler power switches, residual current circuit breakers, lightning current arresters and surge voltage arresters
- For interconnection of a series of single-phase or three-phase circuit breakers and tumbler power switches, on which an auxiliary switch is mounted
- Busbars G-... with forks into the head part of the device
Busbars S-... with pins into the clip part of the device

End cap EK-C-2+3:

- To cover end of busbar G-2L-1000/16, G-3L-1000/16C, S-3L-27-1000/16

End cap EK-C-3/36:

- To cover end of busbar S-3L-27-1000/25

End cap EK-C-4/16:

- To cover end of busbar G-4L-1000/16

End cap EK-C-3:

- To cover end of busbar G-3L-1000/10C

Interconnecting busbars

Phase	Cross-section [mm ²]	Max. current at power supply of [A/phase] end middle	Length [mm]	Type	Product code	Accessories to	Weight [kg]	Packing [pcs]
1	12	65	110	G-1L-1000/12	00171	LSN, LSE, ASN	0.22	50
				G-1L-1000/12g ¹⁾	00170	LSN, LSE, ASN	0.1	50
	16	80	130	S-1L-210/16iso	13012	LSN, LSE, SVL, SJL, ASN	0.045	50
	20	90	150	G-1L-1000/20	00172	LSN, LSE, SJB, SVM, ASN	0.36	50
	24	100	180	G-1L-27-1000/24 ²⁾	11001	LSN, LSE, ASN	0.3	50
	16	80	130	G-2L-1000/16	11179	LSN, LSE, LFI, LFE, OFI, OFE, ASN	0.46	20
3	10	63	100	G-3L-1000/10C	00173	LSN, LSE, ASN	0.44	20
	16	80	130	G-3L-1000/16C	00174	LSN, LSE, OFI, OFE, SJB, SVM, ASN	0.72	20
				G-3L+9-1000/16 ²⁾	11002	LSN, LSE, ASN	0.66	10
				S-3L-27-1000/16 ³⁾	11864	LSN, LST, LSE, ASN, AST	0.52	20
	25	100	180	S-3L-27-1000/25 ³⁾	11865	LSN, LST, LSE, ASN, AST	0.96	10
4	16	80	130	G-4L-1000/16	11180	LSN, LSE, OFI, OFE, ASN	0.96	15

¹⁾ The busbar is uninsulated

²⁾ For 1-pole or 3-pole devices with an auxiliary switch

³⁾ For 3-pole LST; for 1-pole LSN, LSE, ASN with an auxiliary switch

End caps

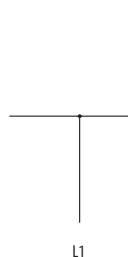
Type	Product code	Accessories to	Weight [kg]	Packing [pcs]
EK-C-3	00178	G-3L-100/10C	0.001	10
EK-C-2+3	00181	G-2L-1000/16, G-3L-1000/16C, S-3L-27-1000/16	0.001	10
EK-C-3/36	11176	S-3L-1000/25	0.002	10
EK-C-4/16	11181	G-4L-1000/16	0.002	10

Specification

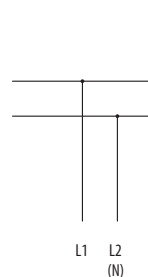
Type	G-1L, G-2L, G-3L, G-4L, S-1L, S-3L
Rated operating voltage	U_e 230/400 V a.c., 220/440 V d.c.
Load current	63 ÷ 180 A
Length	210, 1000 mm
Cross-section	10 ÷ 25 mm ²

Diagram

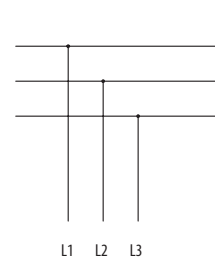
G-1L, S-1L



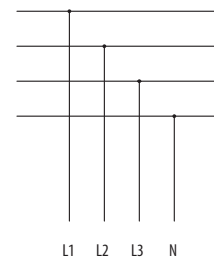
G-2L



G-3L, S-3L

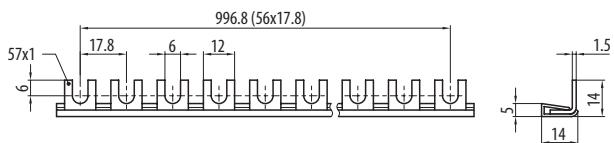
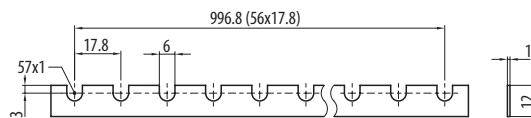
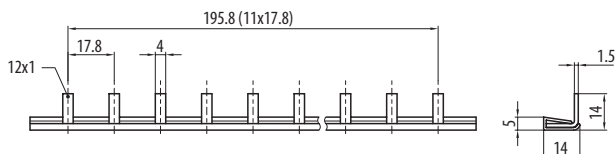
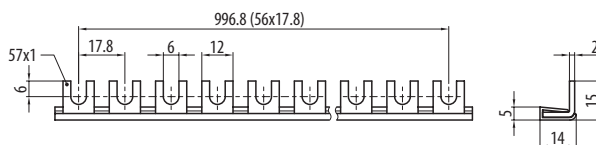
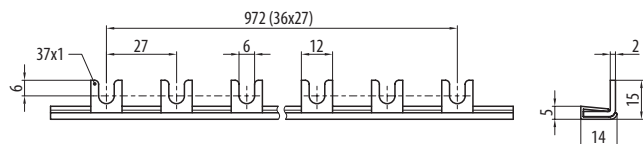
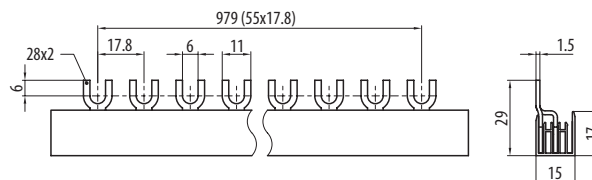
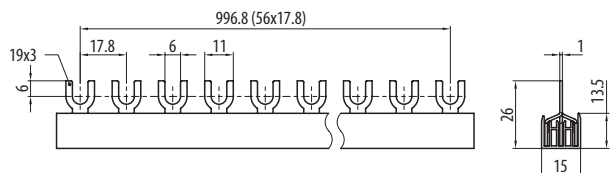
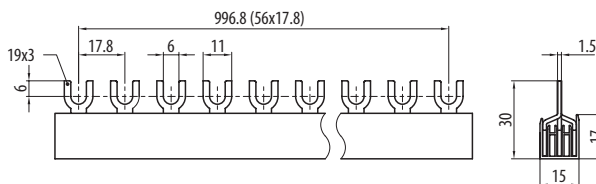
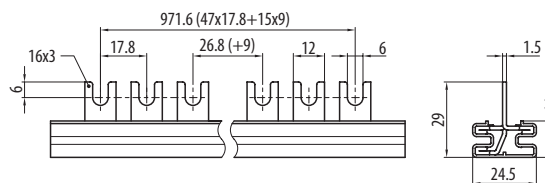
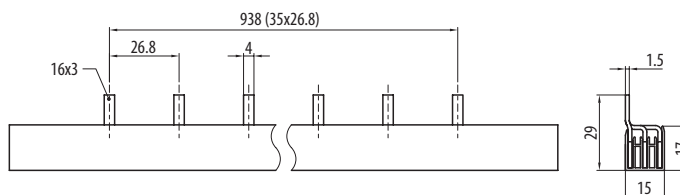
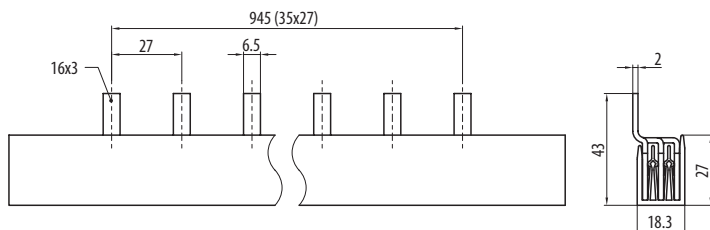
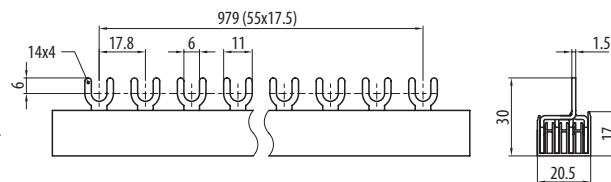


G-4L



INTERCONNECTING BUSBARS AND END CAPS

Dimensions

G-1L-1000/12

G-1L-1000/12g

S-1L-210/16iso

G-1L-1000/20

G-1L-27-1000/24

G-2L-1000/16

G-3L-1000/10C

G-3L-1000/16C

G-3L+9-1000/16C

S-3L-27-1000/16

S-3L-27-1000/25

G-4L-1000/16


CONNECTING ADAPTERS AND BLOCKS



Connecting adapter AS/25-GN

- Accessories to: LSN, LSE, LFI, LFE, OFI, OFE, SJB, SVM, ASN
- For connection of another conductor to the head part of the terminal of a circuit breaker or tumbler power switch
- For example, it the best solution is to connect a conductor for power supply of an electric meter in the clip part of the circuit breaker terminal, and another conductor through the connecting adapter AS/25-GN in the head part of the circuit breaker terminal
- Conductor cross-section: $6 \div 25 \text{ mm}^2$

Connecting adapter AS/25-SN

- Accessories to: OFI20, OFE20, SVL, SJL, RP1
- For connection of conductor to the clip part of the terminal of a circuit breaker or tumbler power switch
- Conductor cross-section: $6 \div 25 \text{ mm}^2$

Connecting adapter AS-AL/Cu-16-50

- Accessories to: LSN, LST, LSE, LFI, LFE, SJBplus, ASN, AST
- For connection of Al or Cu conductors
- Cross-section of Cu conductors: $2.5 \div 50 \text{ mm}^2$
- Cross-section of Al conductors: $16 \div 50 \text{ mm}^2$

Connecting adapter CS-FH000-...NP95

- Accessories to: LST, SJBplus, SJB100/NPE/1,5, AST
- For connection of Cu/Al conductors of cross-section $35 \div 95 \text{ mm}^2$
- Connecting adapter with straight terminal

Connecting adapter CS-FH000-3NV95

- Accessories to: LST, SJBplus, SJB100/NPE/1,5, AST
- For connection of Cu/Al conductors of cross-section $35 \div 95 \text{ mm}^2$
- Connecting adapter with outbowed terminal

Connecting adapter N3x10-FH000

- Accessories to: LST, SJB, SVM, AST
- For connection of 3 conductors/pole of the device of cross-section 10 mm^2

Connection block ES/35S/G

- Accessories to: G-1L, G-2L, G-3L, G-4L, S-1L, S-3L
- It enables power supply of interconnecting busbars of conductors of section up to 35 mm^2
- The blocks can be installed in series to create a multiple-pole connection block
- Degree of protection IP20

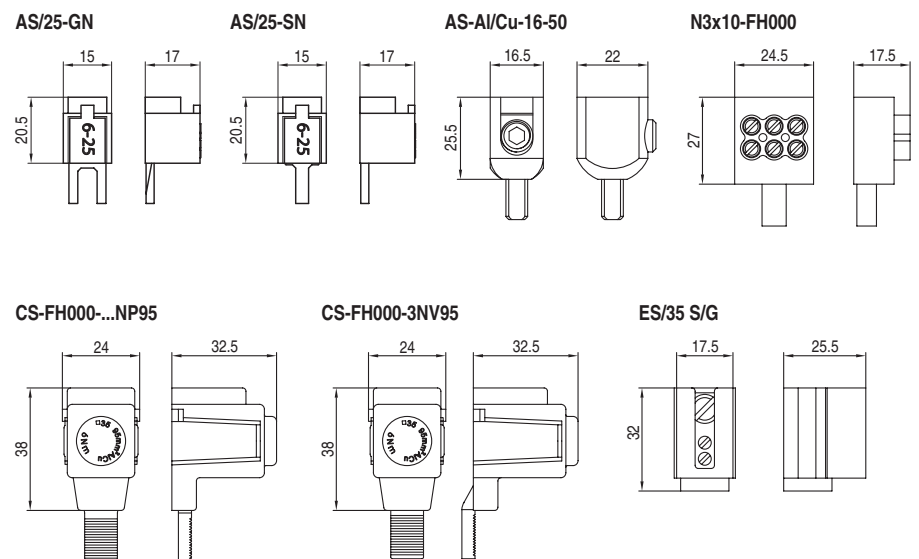
Connecting adapters

Type	Product code	Weight [kg]	Accessories to	Set [pcs]	Packing [pcs]
AS/25-GN	00177	0.012	LSN, LSE, LFI, LFE, OFI, OFE, SJB, SVM, ASN	1	10
AS/25-SN	00176	0.013	OFI20, OFE20, SVL, SJL, RP1	1	10
AS-AL/Cu-16-50	18351	0.016	LSN, LST, LSE, LFI, LFE, SJBplus, ASN, AST	1	15
CS-FH000-3NP95	13740	0.1	LST, SJBplus, SJB100/NPE/1,5, AST	3	1
CS-FH000-1NP95	14378	0.1	LST, SJBplus, SJB100/NPE/1,5, AST	1	1
CS-FH000-3NV95	13742	0.1	LST, SJBplus, SJB100/NPE/1,5, AST	3	1
N3x10-FH000	14127	0.02	LST, SJB, SVM, AST	3	1

Connection block

Type	Product code	Weight [kg]	Packing [pcs]
ES/35 S/G	00175	0.03	10

Dimensions



INTERCONNECTING MODULE



- Accessories to all modular devices
- It is used as a connecting element between input and output terminals in a series of modular devices
- It covers free spaces between individual devices in series
- Possibility of interconnection with LSN, LSE, ASN by means of busbars

Interconnecting module

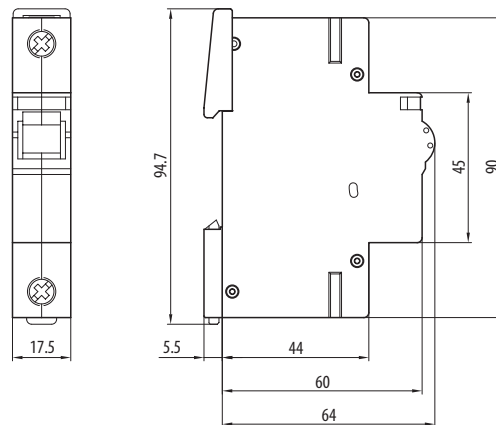
Type	Product code	Weight [kg]	Packing [pcs]
PSN	07450	0.08	12

Specification

Type	PSN	
Approval marks		
Number of poles	1	
Rated operating voltage	U_c	230/400 V a.c., 250/440 V d.c.
Rated current	I_n	80 A
Mounting on the rail DIN EN 50 022 width	35 mm	
Ambient temperature	-25 ÷ +55 °C	
Degree of protection	IP20	
Connection	Cu conductor - rigid (solid, stranded)	0.5 ÷ 25 mm ² , 2x (0.5 ÷ 10) mm ²
	Cu conductor - flexible	0.5 ÷ 16 mm ²
	rail – thickness	2 mm
	tightening torque	2 Nm
	opposite	yes
Seismic immunity (8 ÷ 50 Hz)	5 g	

Dimensions

PSN



Diagram

PSN

