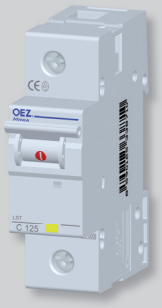
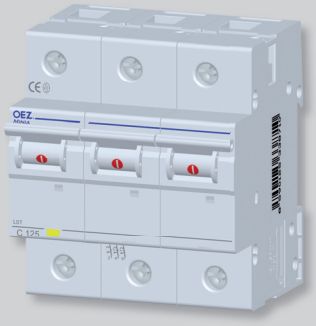
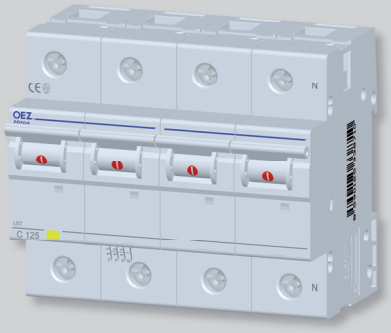
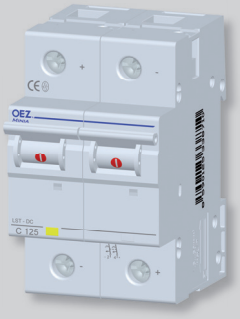
MINIATURE CIRCUIT BREAKERS LST UP TO 125 A (10 kA)









- For building, commercial and industrial installations up to 125 A 230/400 V a.c. and 440 V d.c.
- For protection of cables and conductors against overload and short-circuit.
- Tripping characteristics B, C, D according to EN 60898-1.
- Wide range of accessories – auxiliary switches, undervoltage releases and shunt trips, interconnecting busbars etc.
- Breaking capacity I_{cn} 10 kA – to achieve higher I_{cn} (up to 120 kA) it is recommended to use cylindrical fuse-links PV in fuse switch-disconnectors .
- Possibility of sealing in on or off position.
- N-pole of circuit breakers LST-...-3N contains neither thermal nor short-circuit release, in switching on it closes before and in switching off it opens after the other poles.
- For circuit breakers LST-DC-... device polarity must be always observed in connecting.
- Possibility to connect LST with pin interconnecting busbars spacing 27 mm.

Miniature circuit breakers, 1-pole

I_n	Characteristic B		Characteristic C		Characteristic D		Number	Weight	Package
[A]	Type	Product code	Type	Product code	Type	Product code	of modules	[kg]	[pcs]
40	**LST-40B-1**	37440	**LST-40C-1**	37443	**LST-40D-1**	37446	1.5	0.21	3
50	**LST-50B-1**	37441	**LST-50C-1**	37444	**LST-50D-1**	37447	1.5	0.21	3
63	**LST-63B-1**	37442	**LST-63C-1**	37445	**LST-63D-1**	37448	1.5	0.21	3
80	**LST-80B-1**	37214	**LST-80C-1**	37217	**LST-80D-1**	37220	1.5	0.21	3
100	**LST-100B-1**	37215	**LST-100C-1**	37218	**LST-100D-1**	37221	1.5	0.21	3
125	**LST-125B-1**	37216	**LST-125C-1**	37219	**LST-125D-1**	37222	1.5	0.21	3

Miniature circuit breakers, 3-pole

I_n	Characteristic B		Characteristic C		Characteristic D		Number	Weight	Package
[A]	Type	Product code	Type	Product code	Type	Product code	of modules	[kg]	[pcs]
40	**LST-40B-3**	37449	**LST-40C-3**	37452	**LST-40D-3**	37455	4.5	0.66	1
50	**LST-50B-3**	37450	**LST-50C-3**	37453	**LST-50D-3**	37456	4.5	0.66	1
63	**LST-63B-3**	37451	**LST-63C-3**	37454	**LST-63D-3**	37457	4.5	0.66	1
80	**LST-80B-3**	37223	**LST-80C-3**	37226	**LST-80D-3**	37229	4.5	0.66	1
100	**LST-100B-3**	37224	**LST-100C-3**	37227	**LST-100D-3**	37230	4.5	0.66	1
125	**LST-125B-3**	37225	**LST-125C-3**	37228	**LST-125D-3**	37231	4.5	0.66	1

Miniature circuit breakers, 3+N-pole

I_n	Characteristic B		Characteristic C		Characteristic D		Number	Weight	Package
[A]	Type	Product code	Type	Product code	Type	Product code	of modules	[kg]	[pcs]
40	**LST-40B-3N**	37458	**LST-40C-3N**	37461	**LST-40D-3N**	37464	6	0.84	1
50	**LST-50B-3N**	37459	**LST-50C-3N**	37462	**LST-50D-3N**	37465	6	0.84	1
63	**LST-63B-3N**	37460	**LST-63C-3N**	37463	**LST-63D-3N**	37466	6	0.84	1
80	**LST-80B-3N**	37232	**LST-80C-3N**	37235	**LST-80D-3N**	37238	6	0.84	1
100	**LST-100B-3N**	37233	**LST-100C-3N**	37236	**LST-100D-3N**	37239	6	0.84	1
125	**LST-125B-3N**	37234	**LST-125C-3N**	37237	**LST-125D-3N**	37240	6	0.84	1

DC miniature circuit breakers, 2-pole

I_n	Characteristic C		Number	Weight	Package
[A]	Type	Product code	of modules	[kg]	[pcs]
80	**LST-DC-80C-2**	37241	3	0.45	2
100	**LST-DC-100C-2**	37242	3	0.45	2
125	**LST-DC-125C-2**	37243	3	0.45	2

Accessories

Auxiliary switches	**PS-LS-..**	page B19
Shunt trips	**SV-LS-..**	page B22
Undervoltage releases	**SP-LS-..**	page B25
Interconnecting busbars	**S1L-27-.., S3L-27-.., S4L-27-..**	page E52
Terminal extensions	**AS-50-S-AL01, CS-FH000-.., N3x10-FH000**	page E57

MINIATURE CIRCUIT BREAKERS LST UP TO 125 A (10 kA)

Description

NOTICEABLE CONTACT STATE INDICATOR

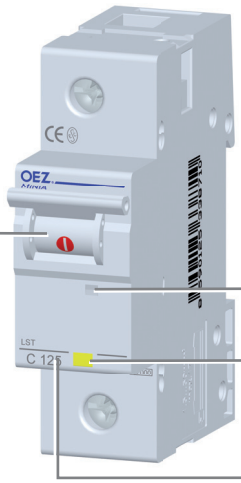
- Unambiguously define the state of the circuit breaker.

Lever down

SWITCHED OFF

Lever up

SWITCHED ON



- **Test push-button** for check of the tripping mechanism function.

NON-INTERCHANGEABILITY OF RATED CURRENT

- **Non-removable coloured sign** according to the rated current of the circuit breaker. Target colours correspond with the colours of the threaded fuse-links.

I_n [A]	Colour
40	black
50	white
63	copper
80	silver
100	red
125	yellow

- **Printing** on circuit breaker is made by a laser - it is indelible.

Specifications

Type			LST	LST-DC
Standards			EN 60898-1	EN 60898-1
Approval marks				
Number of poles			1, 3, 3+N	2
Tripping characteristics			B, C, D	C
Rated current		I_n	40 ÷ 125 A	80, 100, 125 A
Rated operating voltage		U_e	230/400 V a.c. / 48 V d.c. [1]	440 V d.c.
Max. operating voltage		U_{max}	253/440 V a.c. / 52 V d.c. [1]	484 V d.c.
Min. operating voltage		U_{min}	12 V a.c. / d.c.	12 V d.c.
Rated frequency		f_n	40 ÷ 60 Hz	-
Rated short-circuit breaking capacity (EN 60898)		I_{cn}	10 kA	-
Rated short-circuit ultimate breaking capacity (EN 60947-2)		I_{cu}	-	10 kA (τ ≤ 5 ms)
Rated short-circuit service breaking capacity (EN 60947-2)		I_{cs}	-	100 % I_{cu}
Endurance	mechanical		10 000 operating cycles	10 000 operating cycles
	electrical		4 000 operating cycles	4 000 operating cycles
Rated impulse withstand voltage (1.2/50 µs)		U_{imp}	6 kV	6 kV
Overvoltage category (IEC 664-1)			IV	IV
Mounting on "U" rail according to EN - type			TH 35	TH 35
Degree of protection			IP20	IP20
Connection	conductor Cu - rigid (solid, stranded), flexible		1.5 ÷ 50 mm², 2x16 mm²	1.5 ÷ 50 mm², 2x16 mm²
	torque		3.5 Nm	3.5 Nm
	top or bottom connection		yes	yes [2]
Operating conditions	ambient temperature		-30 ÷ +55 °C	-30 ÷ +55 °C
	working position		arbitrary	arbitrary
	seismic resistance		IEC 980:1993 [3]	IEC 980:1993 [3]

[1] Single-pole connection / two-pole connection
[2] It is necessary to keep the polarity marked on the circuit breaker in d.c. circuits
[3] It passed the seismic tests for NPP Dukovany and Temelín

Internal impedance Z, powers losses P, impedance Z_s

I_n [A]	Z [1] [mΩ/pole]	P [1] [VA/pole]	Max. impedance of fault loop Z_s [Ω] [2]		
			characteristic B	characteristic C	characteristic D
40	2.31	3.69	1.16	0.64	0.36
50	1.73	4.32	0.93	0.51	0.28
63	1.42	5.63	0.73	0.40	0.23
80	0.91	5.79	0.57	0.32	0.18
100	0.80	8.03	0.46	0.26	0.14
125	0.61	9.46	0.36	0.20	0.11

[1] Average values per pole protected
[2] For TN network, U = 230 V, break time up to 0.4 s; if the measured value exceeds the table value, use residual current circuit breaker.

MINIATURE CIRCUIT BREAKERS LST UP TO 125 A (10 kA)

Correction of rated currents of miniature circuit breakers LST

I_n [A]	Correction of rated currents for ambient temperature -30 °C up to +60 °C [A] [1]									
	-30 °C	-20 °C	-10 °C	0 °C	10 °C	20 °C	30 °C	40 °C	50 °C	60 °C
40	52.0	50.0	48.0	48.0	46.0	44.0	**40**	37.2	35.2	33.6
50	65.0	62.5	60.0	60.0	57.5	55.0	**50**	46.5	44.0	42.0
63	81.9	78.8	75.6	75.6	72.5	69.3	**63**	58.6	55.4	52.9
80	104.0	104.0	100.0	96.0	92.0	88.0	**80**	74.4	70.4	67.2
100	130.0	130.0	125.0	120.0	115.0	110.0	**100**	93.0	88.0	84.0
125	162.5	162.5	156.3	150.0	143.8	137.5	**125**	116.3	110.0	105.0

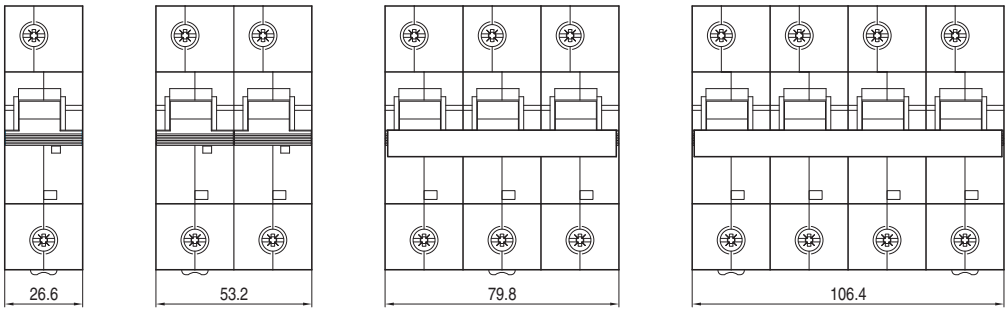
[1] Valid for 1 pole and any characteristic, reference temperature 30 °C

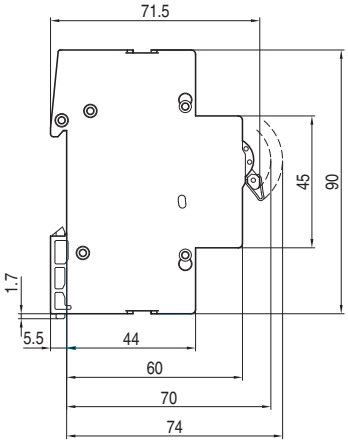
	Correction of rated currents of miniature circuit breakers installed side by side [A] [2]			
	1	2	3	4	5
40	38.00	37.00	36.00	35.20
50	47.50	46.25	45.00	44.00
63	59.85	58.28	56.70	55.44
80	76.00	74.00	72.00	70.40
100	95.00	92.50	90.00	88.00
125	118.75	115.63	112.50	110.00

[2] Valid for reference temperature 30 °C

Dimensions

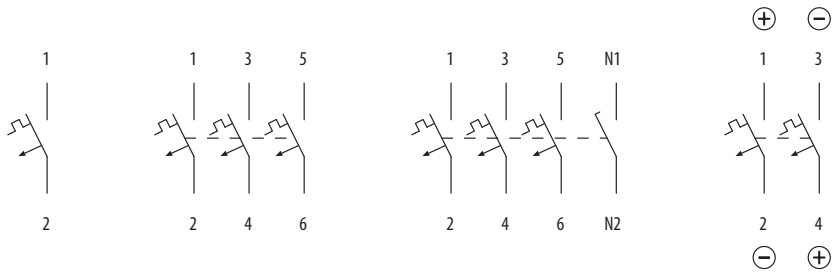
LST-..-1 **LST-DC-..-2** **LST-..-3** **LST-..-3N**





Diagram

LST-..1 **LST-..3** **LST-..-3N** **LST-DC-..-2**



Protection of DC circuits

For protection of d.c. circuits it is possible to use LST circuit breakers and LST-DC circuit breakers depending on voltage.

Protection of DC circuits

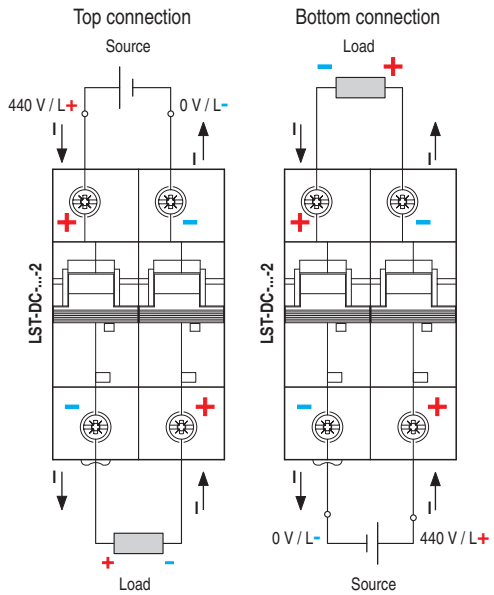
Type of miniature circuit breaker	Rated voltage U_e	
	≤ 48 V d.c.	≤ 440 V d.c.
LST-...-1	●	-
LST-DC-...-2 [1]	●	●

[1] It is necessary to keep the polarity marked on the circuit breaker

● Possible to use

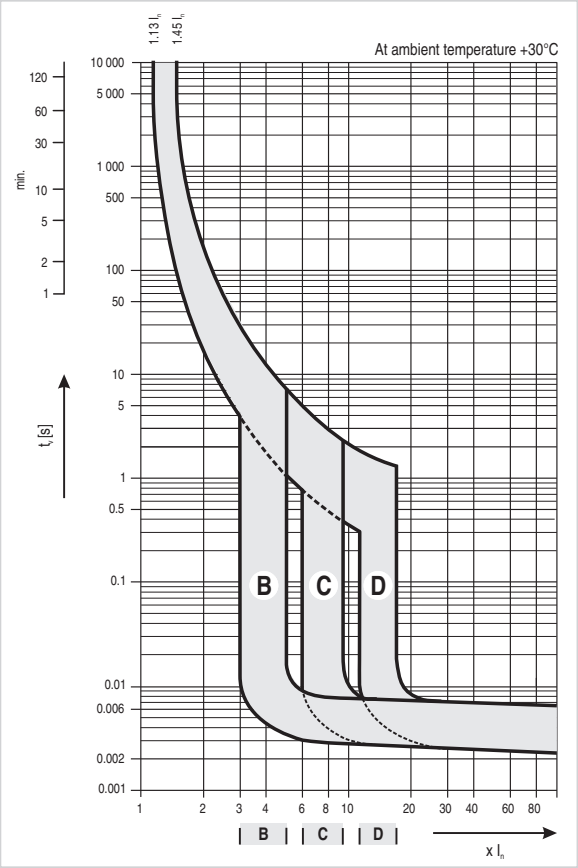
Correct polarity connection of DC circuit breakers, see page B13

2-pole connection LST-DC



MINIATURE CIRCUIT BREAKERS LST UP TO 125 A (10 kA)

Characteristics



- **Characteristic B**: for protection of line of electrical circuits with equipment, which does not cause current surges (lighting and socket circuits etc.). The short-circuit release is set to (3 ÷ 5) I_n .
- **Characteristic C**: for protection of line of electrical circuits with equipment, which causes current surges (light bulb groups, motors etc.). The short-circuit release is set to (6 ÷ 9) I_n .
- **Characteristic D**: for protection of line of electrical circuits with equipment, which causes high current surges (transformers, 2-pole motors etc.). The short-circuit release is set to (12 ÷ 16) I_n .

Tripping characteristics of circuit breakers according to EN 60898-1

Thermal release	Tripping characteristic type B, C, D
Conventional non-tripping current I_{nt} for t ≥ 1 h (for I_n ≤ 63 A) I_{nt} for t ≥ 2 h (for I_n > 63 A)	$I_{nt} = 1.13\ I_n$
Conventional tripping current I_t for t < 1 h (for I_n ≤ 63 A) I_t for t < 2 h (for I_n > 63 A)	$I_t = 1.45\ I_n$
Current I_3 for 1 s < t < 60 s (for I_n ≤ 32 A) 1 s < t < 120 s (for I_n > 32 A)	$I_3 = 2.55\ I_n$

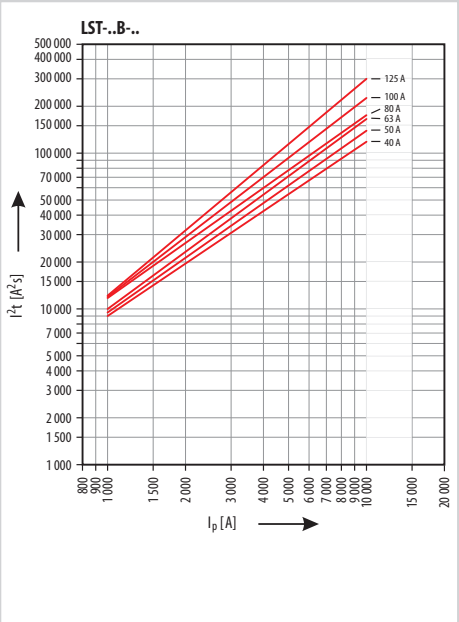
t - break time of the circuit breaker

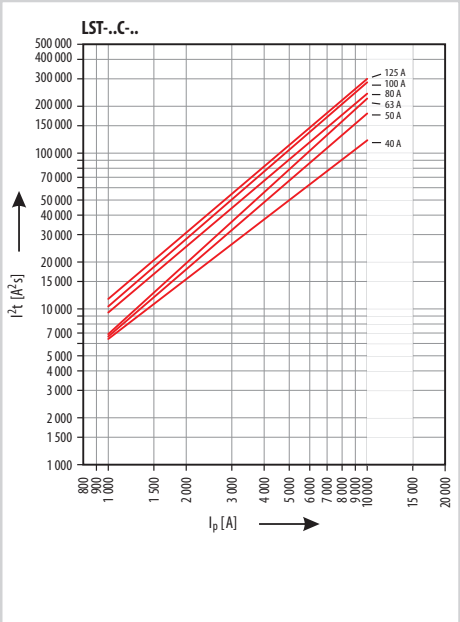
Electromagnetic release		Tripping characteristic type B	C	D
Current I_4 for	0.1 s < t < 45 s (for I_n ≤ 32 A) 0.1 s < t < 90 s (for I_n > 32 A)	$I_4 = 3\ I_n$		
	0.1 s < t < 15 s (for I_n ≤ 32 A) 0.1 s < t < 30 s (for I_n > 32 A)		$I_4 = 5\ I_n$	
	0.1 s < t < 4 s [1] (for I_n ≤ 32 A) 0.1 s < t < 8 s (for I_n > 32 A)			$I_4 = 10\ I_n$
Current I_5 for t < 0.1s		$I_5 = 5\ I_n$	$I_5 = 10\ I_n$	$I_5 = 20\ I_n$

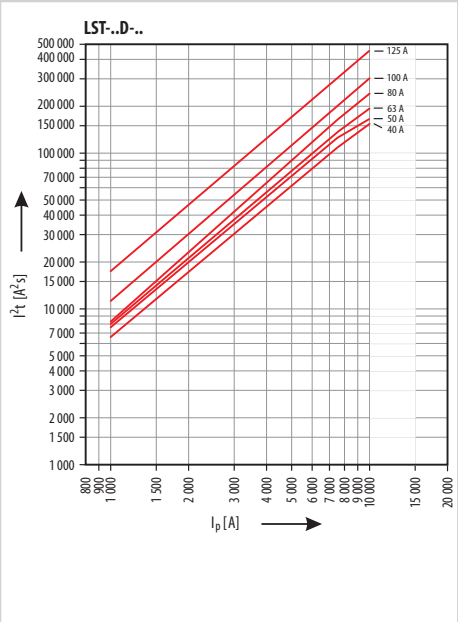
[1] for I_n ≤ 10 A it is permissible that t < 8 s

t - break time of the circuit breaker

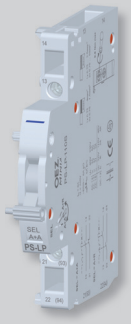
Characteristics I²t





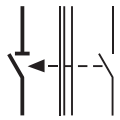


AUXILIARY AND RELATIVE SWITCHES



Auxiliary and relative switches PS-LP

- Accessories to: LPE, LPN, APN.
- Auxiliary and relative switches are designed for signalling the position of the main contacts of circuit breakers LPE, LPN and tumbler power switches APN in tripping:
  - *by releases or manually* – i.e. in switching off by overload, short-circuit, shunt trip or undervoltage release and control lever. It is possible to use contacts with this function (auxiliary contact) to set switch SEL to position „A+A“ (resp. „A“ for switching contact)
  - *only by releases* – i.e. only in tripping by short-circuit, overload, shunt trip or undervoltage release. It is possible to use one contact with this function (relative contact) to set switch SEL to position „A+R“ (resp. „R“ for switching contact).
- Selection of auxiliary/relative contact function is performed by the rotary switch SEL on the side of the device.
- 2 auxiliary and relative switches can be connected to one miniature circuit breakers (tumbler power switch).
- They are suitable for application in SELV and PELV circuits – sufficient insulation is provided between the circuit breaker (power tumbler switch) and auxiliary and relative switches.

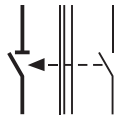


Arrangement of contacts [1] - position of switch SEL		Type	Product code	Number of modules	Weight [kg]	Package [pcs]
A+A [2]	A+R [2]					
A 11	A 10 + R 10	**PS-LP-110S**	34260	0.5	0.05	1
A 11	A 10 + R 10	**PS-LP-110S-Au** [3]	34261	0.5	0.05	1
A 11	A 01 + R 01	**PS-LP-110S-Y**	34262	0.5	0.05	1
A 20	A 10 + R 01	**PS-LP-200S**	34263	0.5	0.05	1
A 02	A 01 + R 10	**PS-LP-020S**	34264	0.5	0.05	1
A 001	R 001	**PS-LP-001S**	34265	0.5	0.045	1

[1] Each digit indicates successively the number of make, break and break-make contacts
[2] Position A+A = contacts function in „auxiliary“ mode; position A+R = one contact is switched to „relative“ mode“
The choice of mode is done by rotary switch SEL on the side of the auxiliary switch
[3] Gold-plated contacts – suitable for switching of low output loads

Auxiliary switches PS-LS

- Accessories to: LST, AST.
- Can be used also with formerly produced types of circuit breakers LSE, LSN.
- Auxiliary switches are used for position signalling of main contacts of circuit breaker LST and tumbler power switches AST in switching off by releases or manually – i.e. in switching off by overload, short-circuit, shunt trip or undervoltage release and control lever.
- They are suitable for application in SELV and PELV circuits – sufficient insulation is provided between the circuit breaker (power tumbler switch) and auxiliary and relative switches.



Arrangement of contacts [1]	Type	Product code	Number of modules	Weight [kg]	Package [pcs]
11	**PS-LS-1100**	35664	0.5	0.043	1
11	**PS-LS-1100-Au** [2]	35665	0.5	0.043	1
21	**PS-LS-2100**	35666	0.5	0.049	1
21	**PS-LS-2100-Au** [2]	35667	0.5	0.049	1

[1] Each digit indicates successively the number of make and break contacts
[2] Gold-plated contacts – suitable for switching of low output loads

AUXILIARY AND RELATIVE SWITCHES

Specifications

Type			PS-LP-..	PS-LS-..
Standards			EN 60947-5-1, EN 62019	EN 60947-5-1
Approval marks				
Arrangement of contacts [1) 2)]			A11/A10+R10, A11/A01+R01, A20/A10+R01, A02/A01+R10, A001/R001	11, 21
Rated operating voltage / current	U_e / I_e	AC-12	230 V a.c. / 6 A	230 V a.c. / 6 A
		AC-13	230 V a.c. / 4 A or 400 V a.c. / 2	-
		AC-15	230 V a.c. / 3 A	230 V a.c. / 4 A or 400 V a.c. / 2 A
		DC-13	220 V d.c. / 0.55 A	220 V d.c. / 1 A
Rated impulse withstand voltage (1.2/50 µs)	U_{imp}		4 kV	4 kV
Mechanical endurance			20 000 operating cycles	10 000 operating cycles
Electrical endurance			4 000 operating cycles	4 000 operating cycles
Mounting			on the right side of the device	on the right side of the device
Degree of protection			IP20	IP20
Connection				
Conductor rigid (solid, stranded)			0.75 ÷ 4 mm²	0.75 ÷ 4 mm²
Conductor flexible			0.75 ÷ 2.5 mm²	0.75 ÷ 2.5 mm²
Torque			0.8 Nm	0.8 Nm
Top or bottom connection			yes	yes
Operating conditions				
Ambient temperature			-30 ÷ 55 °C	-30 ÷ 55 °C
Working position			arbitrary	arbitrary
Seismic resistance			IEC 980:1993 [3)]	IEC 980:1993 [3)]

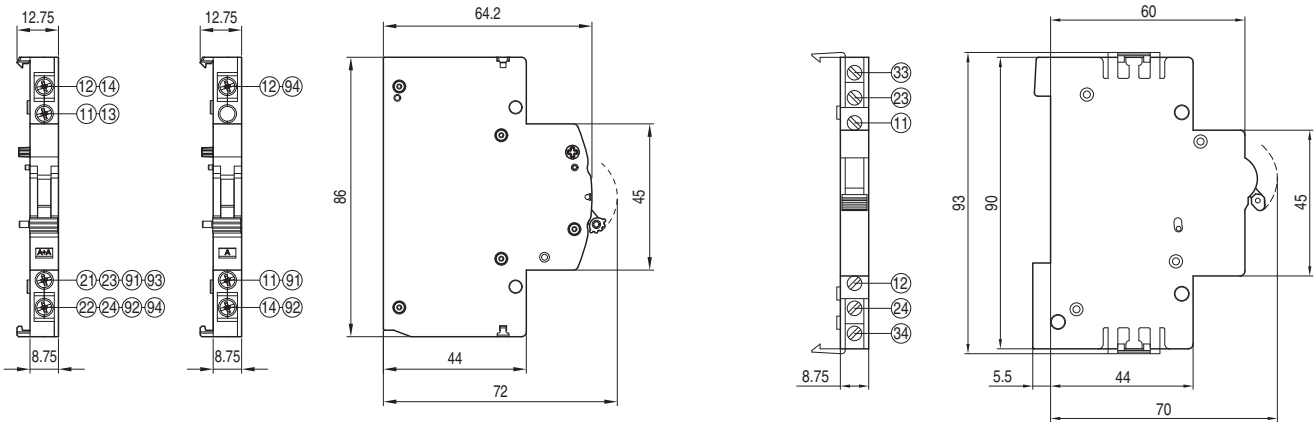
[1)] Each digit indicates successively the number of make, break and break-make contacts
[2)] A=auxiliary contact, R=relative contact
[3)] It passed the seismic tests for NPP Dukovany and Temelín

Dimensions

PS-LP-110S
PS-LP-110S-..
PS-LP-200S
PS-LP-020S

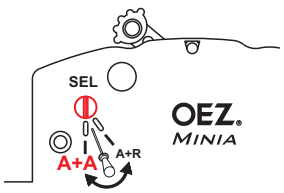
PS-LP-001S

PS-LS-..

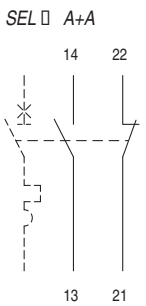


Diagram

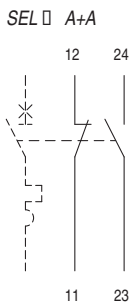
Change-over switch SEL in position A+A



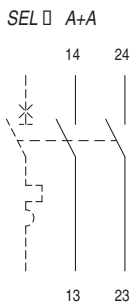
PS-LP-110S
PS-LP-110S-Au



PS-LP-110S-Y



PS-LP-200S



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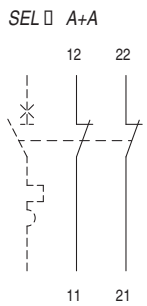

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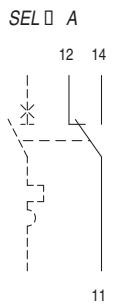
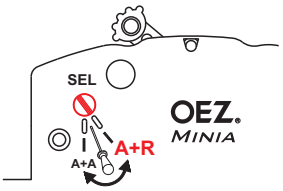


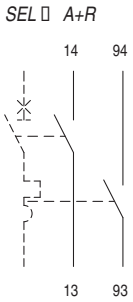
AUXILIARY AND RELATIVE SWITCHES

Diagram

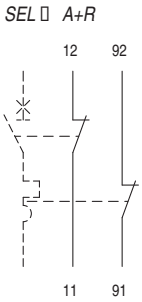
Change-over switch SEL in position A+R



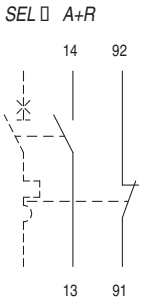
PS-LP-110S
PS-LP-110S-Au



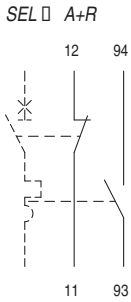
PS-LP-110S-Y



PS-LP-200S

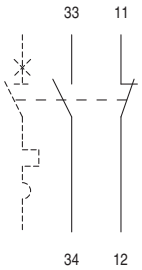


PS-LP-020S

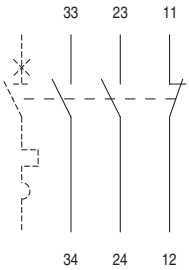


PS-LP-001S

PS-LS-1100



PS-LS-2100



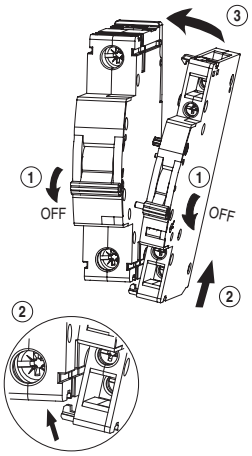
Installation of auxiliary switch on miniature circuit breaker (tumbler switch)

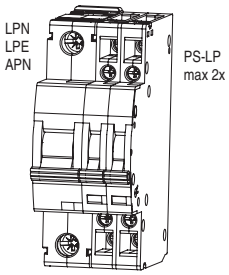
PS-LP-..

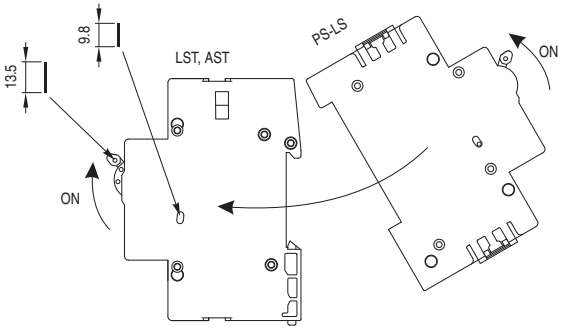
1. At mounting the levers of auxiliary switch and of the device are in OFF position.
2. Insert the lower fastening catch in the device recess.
3. Press the auxiliary switch to the device so that the upper fastening latch of the auxiliary switch snaps in the device recess.
4. Check correct function by switching.

PS-LS-..

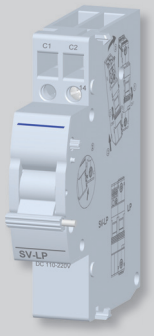
1. At mounting the levers of auxiliary switch and of the device are in ON position.
2. From the right slide the longer shaft in the control lever of the device and shorter one in the hole of the switching system of the device
3. From the right slide the auxiliary switch on the device so that one shaft interconnects control levers and the other the switching systems.
4. Press the auxiliary switch to the device and snap the side fastening clamps of the auxiliary switch in the device recess.
5. Check correct function by switching.







SHUNT TRIPS



Shunt trips SV-LP

- Accessories to: LPE, LPN, APN.
- For tripping the circuit breaker LPE, LPN and tumbler power switch APN by applied voltage.
- It contains auxiliary make contact, which can be used for position signalling of the main contacts of circuit breaker LPE, LPN and tumbler power switch APN.

Rated voltage U_c	Type	Product code	Number of modules	Weight [kg]	Package [pcs]
12 ÷ 60 V a.c. / d.c.	**SV-LP-X060**	34325	1	0.125	1
110 ÷ 415 V a.c. / 110 ÷ 220 V d.c.	**SV-LP-X400**	34326	1	0.125	1

Shunt trips SV-LS

- Accessories to: LST, AST.
- Can be used also with formerly produced types of circuit breakers LSE, LSN.
- For tripping the circuit breaker LST and tumbler power switch AST by applied voltage between 70 % and 110 % U_c.
- It contains make contact (version SV-LS-....-1010 make and break), which can be used for position signalling of the main contacts of circuit breaker LST and tumbler power switch AST.

Rated voltage U_c	Arrangement of contacts [1]	Type	Product code	Number of modules	Weight [kg]	Package [pcs]
24 V a.c. / d.c.	10	**SV-LS-X024-1000**	35695	1	0.12	1
	101	**SV-LS-X024-1010**	35696	1	0.12	1
48 V a.c. / d.c.	10	**SV-LS-X048-1000**	35697	1	0.12	1
	101	**SV-LS-X048-1010**	35698	1	0.12	1
110 V a.c. / d.c.	10	**SV-LS-X110-1000**	35699	1	0.12	1
	101	**SV-LS-X110-1010**	35700	1	0.12	1
230 V a.c. / 220 V d.c.	10	**SV-LS-X230-1000**	35701	1	0.12	1
	101	**SV-LS-X230-1010**	35702	1	0.12	1
400 V a.c. / 440 V d.c.	10	**SV-LS-X400-1000**	35703	1	0.12	1
	101	**SV-LS-X400-1010**	35704	1	0.12	1

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

SHUNT TRIPS

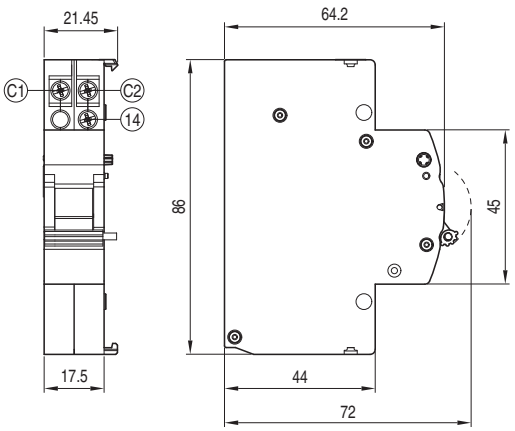
Specifications

Type			SV-LP-..	SV-LS-..
Standards			EN 60947-1	EN 60947-1
Approval marks				
Mounting			on the left side of the device	on the left side of the device
Degree of protection			IP20	IP20
Control circuit (coil)				
Rated voltage	U_c		12 ÷ 60 V a.c. / d.c.	24, 48, 110, 230, 400 V a.c.
			110 ÷ 415 V a.c. / 110 ÷ 220 V d.c.	24, 48, 110, 220, 440 V d.c.
Rated frequency	f_n		40 ÷ 60 Hz	40 ÷ 60 Hz
Break time			max. 15 ms	10 ms
Contact				
Arrangement of contacts [1]			10	10, 101
Rated operating voltage / current	U_e / I_e	AC-1	230 V a.c. / 4 A or 400 V a.c. / 2 A	230 V a.c. / 4 A or 400 V a.c. / 2 A
		AC-15	230 V a.c. / 2 A	230 V a.c. / 2 A
		DC-1	220 V d.c. / 0.5 A	220 V d.c. / 0.5 A
Mechanical endurance			20 000 operating cycles	10 000 operating cycles
Electrical endurance			4 000 operating cycles	4 000 operating cycles
Connection				
Conductor – rigid (solid, stranded)			0.75 ÷ 4 mm²	0.75 ÷ 4 mm²
Conductor – flexible			0.75 ÷ 2.5 mm²	0.75 ÷ 2.5 mm²
Torque			0.8 Nm	0.8 Nm
Top or bottom connection			yes	yes
Operating conditions				
Ambient temperature			-30 ÷ 55 °C	-30 ÷ 55 °C
Working position			arbitrary	arbitrary
Seismic resistance			IEC 980:1993 [2]	IEC 980:1993 [2]

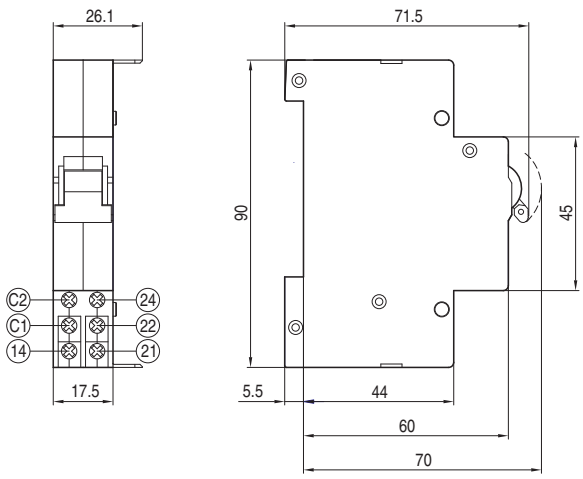
[1] Each digit indicates successively the number of make, break and break-make contacts
[2] It passed the seismic tests for NPP Dukovany and Temelín

Dimensions

SV-LP-..

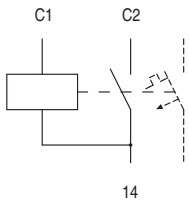


SV-LS-..

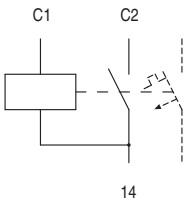


Diagram

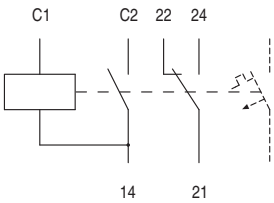
SV-LP-..



SV-LS-..-1000

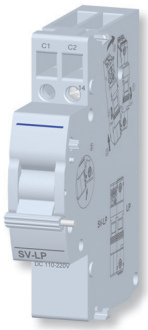


SV-LS-..-1010



SHUNT TRIPS

Installation of shunt trip on circuit breaker (tumbler switch)

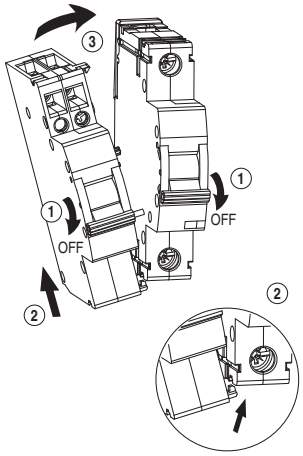


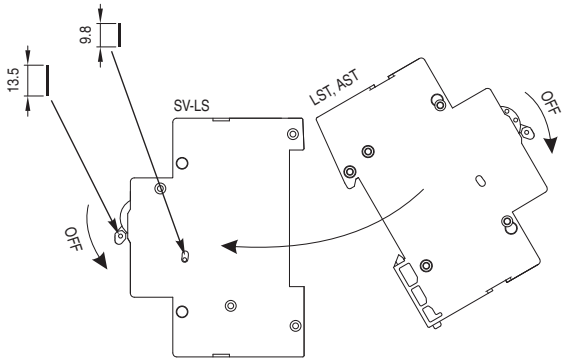
SV-LP-..

1. At mounting the levers of the shunt trip and of the device are in OFF position.
2. Insert the lower fastening catch in the device recess.
3. Press the shunt trip to the device so that the upper fastening latch of the shunt trip snaps in the device recess.
4. Check correct function by switching.

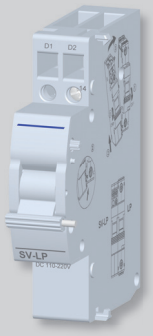
SV-LS-..

1. At mounting the levers of the shunt trip and of the device are in OFF position.
2. From the right slide the longer shaft in the control lever of the shunt trip and shorter one in the hole of the switching system of the shunt trip.
3. From the right slide the device on the shunt trip so that one shaft interconnects control levers and the other the switching systems.
4. Press the device to the shunt trip and snap the side fastening clamps of the shunt trip in the device recess.
5. Check correct function by switching.





UNDERVOLTAGE RELEASES

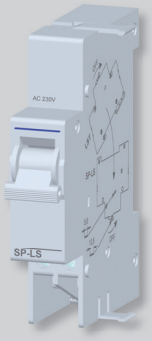


Undervoltage releases SP-LP

- Accessories to: LPE, LPN, APN.
- For tripping the circuit breaker LPE, LPN and tumbler power switch APN at loss of voltage as well as at gradual decrease of voltage between 70 % and 35 % U_c.
- For elimination of closing of circuit breaker LPE, LPN and tumbler power switch APN, if voltage is lower than 35 % U_c (switching is possible at voltage higher than 85 % U_c).
- They are often used for protection against device restart following power blackout.
- Design with 0.2 s, resp. 0.4 s delay for prevention of unwanted tripping at short-time power blackout.

Rated voltage U_c	Delay	Type	Product code	Number of modules	Weight [kg]	Package [pcs]
24 V a.c.	-	**SP-LP-A024**	34327	1	0.125	1
48 V a.c.	-	**SP-LP-A048**	34328	1	0.125	1
110 V a.c.	-	**SP-LP-A110**	34329	1	0.130	1
230 V a.c.	-	**SP-LP-A230**	34330	1	0.125	1
230 V a.c.	0.4 s	**SP-LP-A230-T004**	34331	1	0.130	1
400 V a.c.	-	**SP-LP-A400**	34332	1	0.130	1
24 V d.c.	0 s or 0.2 s [1)]	**SP-LP-D024-Y004**	34333	1	0.130	1
48 V d.c.	0 s or 0.2 s [1)]	**SP-LP-D048-Y004**	34334	1	0.130	1
110 V d.c.	0 s or 0.2 s [1)]	**SP-LP-D110-Y004**	34335	1	0.130	1
220 V d.c.	0 s or 0.2 s [1)]	**SP-LP-D220-Y004**	34336	1	0.125	1
400 V d.c.	0 s or 0.2 s [1)]	**SP-LP-D400-Y004**	34337	1	0.125	1

[1)] Delay is activated by interconnection of terminals 1, 2



Undervoltage releases SP-LS

- Accessories to: LST, AST.
- Can be used also with formerly produced types of circuit breakers LSE, LSN.
- For tripping the circuit breaker LST and tumbler power switch AST at loss of voltage as well as at gradual decrease of voltage between 70 % and 35 % U_c.
- For elimination of circuit breaker LST and tumbler power switch AST, if voltage is lower than 35 % U_c (switching is possible at voltage higher than 85 % U_c).
- They are often used for protection against device restart following power blackout.
- Undervoltage releases SP-LS-....-1010 contain in addition an auxiliary switch with make and break-make contact for position signalling of the main contacts of circuit breaker LST or tumbler power switch AST.

Rated voltage U_c	Arrangement of contacts [1)]	Type	Product code	Number of modules	Weight [kg]	Package [pcs]
24 V a.c.	-	**SP-LS-A024**	35944	1	0.12	1
	101	**SP-LS-A024-1010**	35945	1	0.12	1
48 V a.c.	-	**SP-LS-A048**	35946	1	0.12	1
	101	**SP-LS-A048-1010**	35947	1	0.12	1
110 V a.c.	-	**SP-LS-A110**	35948	1	0.12	1
	101	**SP-LS-A110-1010**	35949	1	0.12	1
230 V a.c.	-	**SP-LS-A230**	35950	1	0.12	1
	101	**SP-LS-A230-1010**	35951	1	0.12	1
400 V a.c.	-	**SP-LS-A400**	35952	1	0.12	1
	101	**SP-LS-A400-1010**	35953	1	0.12	1

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

UNDERVOLTAGE RELEASES

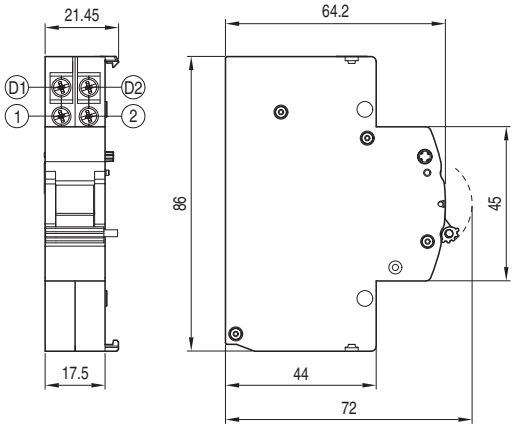
Specifications

Type			SP-LP-..	SP-LS-..
Standards			EN 60947-1	EN 60947-1
Approval marks				
Mounting			on the left side of the device	on the left side of the device
Degree of protection			IP20	IP20
Control circuit (coil)				
Rated voltage	U_c		24, 48, 110, 230, 400 V a.c.	24, 48, 110, 230, 400 V a.c.
			24, 48, 110, 220, 400 V d.c.	
Consumption			2.6 W	2.5 W
Rated frequency	f_n		40 ÷ 60 Hz	40 ÷ 60 Hz
Break time			max. 45 ms [2]	25 ms
Contact				
Arrangement of contacts [1]			-	10, 101
Rated operating voltage / current	U_e / I_e	AC-1	-	230 V a.c. / 4 A or 400 V a.c. / 2 A
		AC-15	-	230 V a.c. / 2 A
		DC-1	-	220 V d.c. / 0,5 A
Mechanical endurance			-	10 000 operating cycles
Electrical endurance			-	4 000 operating cycles
Connection				
Conductor rigid (solid, stranded)			0.75 ÷ 4 mm²	0.75 ÷ 4 mm²
Conductor flexible			0.75 ÷ 2.5 mm²	0.75 ÷ 2.5 mm²
Torque			0.8 Nm	0.8 Nm
Top or bottom connection			yes	yes
Operating conditions				
Ambient temperature			-30 ÷ 55 °C	-30 ÷ 55 °C
Working position			arbitrary	arbitrary
Seismic resistance			IEC 980:1993 [3]	IEC 980:1993 [3]

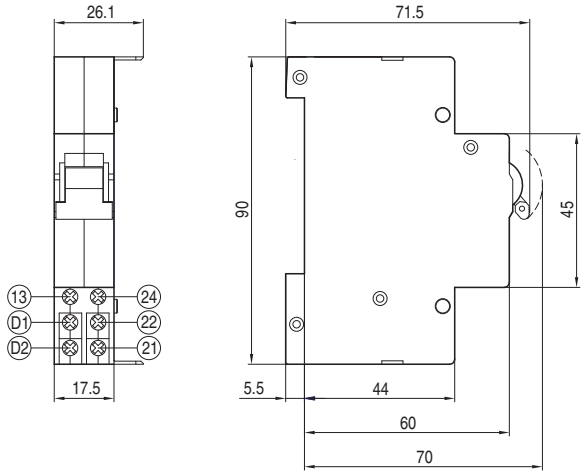
[1] Each digit indicates successively the number of make, break and break-make contacts
[2] The stated time is valid for undelayed undervoltage releases
[3] It passed the seismic tests for NPP Dukovany and Temelín

Dimensions

SP-LP-..

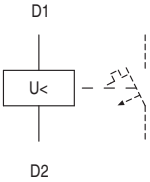


SP-LS-..

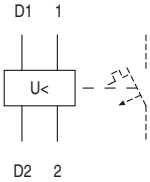


Diagram

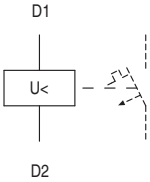
SP-LP-A..



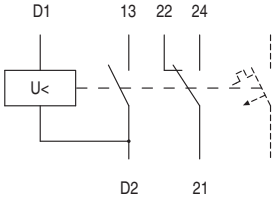
SP-LS-D..



SP-LS-

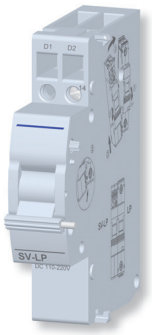


SP-LS-..-1010



UNDERVOLTAGE RELEASES

Installation of undervoltage release on circuit breaker (tumbler switch)



SP-LP-..

1. At mounting the levers of undervoltage release and of the device are in OFF position.
2. Insert the lower fastening catch in the device recess.
3. Press the undervoltage release to the device so that the upper fastening latch of the undervoltage release snaps in the device recess.
4. Check correct function by switching.

SP-LS-..

1. At mounting the levers of undervoltage release and of the device are in OFF position.
2. From the right slide the longer shaft in the control lever undervoltage releases and shorter one in the hole of the switching system of the undervoltage release.
3. From the right slide the device on the undervoltage release so that one shaft interconnects control levers and the other the switching systems.
4. Press the device to the undervoltage release and snap the side fastening latches of the undervoltage release in the device recess.
5. Check correct function by switching.