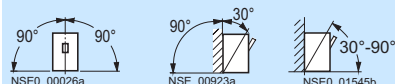


Technical specifications

Type		VL150X UL CG frame	VL150 UL DG frame	VL250 UL FG frame	VL400 UL JG frame	VL400X UL LG frame	VL800 UL MG frame	VL1200 UL NG frame	VL1600 UL PG frame
Max. rated current I_n		A 150	150	250	400	600	800	1200	1600
Rated insulation voltage U_i only according to IEC 60947-2									
Main current paths	AC V	800	800	800	800	800	800	800	800
Auxiliary circuits	AC V	690	690	690	690	690	690	690	690
Rated operational voltage U_e									
NEMA 50/60 Hz	AC V	600	600	600	600	600	600	600	600
	DC ¹⁾ V	250	500	500	500	500	500	500	500
IEC 50/60 Hz	AC V	690	690	690	690	690	690	690	690
Utilization category		A	A	A	A	A B ²⁾	A B ²⁾	A B ²⁾	A B ²⁾
Permissible ambient temperature									
Operation	°C	-25 ... +70	-25 ... +70	-25 ... +70	-25 ... +70	-25 ... +70	-25 ... +70	-25 ... +70	-25 ... +70
Storage	°C	-40 ... +80	-40 ... +80	-40 ... +80	-40 ... +80	-40 ... +80	-40 ... +80	-40 ... +80	-40 ... +80
Permissible load at various ambient temperatures									
Close to the circuit breaker, related to the rated current of the circuit breaker									
• Circuit breakers for system protection	TM/ETU up to 40 °C	% 100	100/100	100/100	100/100	100/100	--/100	--/100	--/100
	TM/ETU at 50 °C	% 93	93/95	93/95	93/95	93/95	--/95	--/95	--/95
	TM/ETU at 60 °C	% 86	86/80	86/80	86/80	86/80	--/80	--/80	--/80
• Circuit breakers for starter combinations and non-automatic circuit breakers	up to 40 °C	% 100	100	100	100	100	100	100	100
	at 50 °C	% 93	93	93	93	93	93	93	93
	at 60 °C	% 86	86	86	86	86	86	86	86
Weights of 3-pole circuit breakers									
Basic unit without electronic trip unit	kg	--	1.5	1.6	4.2	7.8	14.2	21	27.3
Thermal-magnetic overcurrent trip unit	kg	--	0.7	0.7	1.5	1.2	--	--	--
Solid-state overcurrent trip unit	kg	--	0.9	0.9	1.7	1.5	1.8	4.0	4.0
Basic unit									
• With thermal-magnetic overcurrent trip unit	kg	2.5	2.2	2.3	5.7	9.0	--	--	--
• With solid-state overcurrent trip unit	kg	--	2.4	2.5	5.9	9.3	16.0	25.0	31.3
Rated short-circuit breaking capacity		For rated short-circuit breaking capacity see table under "Overview".							

1) Rated DC data apply only for thermal-magnetic overcurrent trip units.

2) On request.

Type		VL150X UL CG frame	VL150 UL DG frame	VL250 UL FG frame	VL400 UL JG frame	VL400X UL LG frame	VL800 UL MG frame	VL1200 UL NG frame	VL1600 UL PG frame
Endurance	Operating cycles	20000	20000	20000	20000	10000	10000	3000	3000
Electrical endurance	Operating cycles	10000	10000	10000	10000	5000	3000	1500	1500
Max. switching frequency	1/h	120	120	120	120	60	60	30	30
Connection types		See "Main Circuit Connections, Basic Equipment and Options"							
Conductor cross-sections for stranded cable									
Box terminals (Cu)	AWG/kcmil	1 x (14-1/0)	1 x (8-1/0)	1 x (3-250)	1 x (1/0-600)	--	--	--	--
	mm ²	1 x (2.5-50)	1 x (10-50)	1 x (35-120)	1 x (70-300)	--	--	--	--
Circular conductor terminals (Cu/Al)	AWG/kcmil	1 x (6-3/0)	1 x (6-3/0)	1 x (4-350)	1 x (250-750)	1 x (250-750)	--	--	--
	mm ²	1 x (16-70)	1 x (16-70)	1 x (25-150)	1 x (150-300)	1 x (150-300)	--	--	--
Multiple feed-in terminals terminals (Cu/Al)	AWG/kcmil	--	--	--	2 x (3/0-250)	2 x (2-600)	2 x (500-750)	--	--
	mm ²	--	--	--	2 x (95-120)	2 x (35-300)	2 x 300	--	--
	AWG/kcmil	--	--	--	--	--	3 x (1/0-500)	3 x (500-750)	--
	mm ²	--	--	--	--	--	3 x (70-240)	3 x 300	--
	AWG/kcmil	--	--	--	--	--	--	4 x (1/0-500)	--
	mm ²	--	--	--	--	--	--	4 x (70-240)	--
	AWG/kcmil	--	--	--	--	--	--	--	6 x (1/0-750)
	mm ²	--	--	--	--	--	--	--	6 x (70-300)
	mm	17 x 7	22 x 7	24 x 7	32 x10	32 x 10	2 x 40 x 10	2 x 50 x 10	2 x 60 x 10
	Metric	M 6	M 6	M 8	M 8	M10	M 8	M8	M8
	Inch	--	10-32 UNF	5/16	--	3/8	5/16	5/16	5/16
Power loss per circuit breaker at max. rated current									
System protection	TM 0.8-1.0	W	--	15-48	32-80	60-175	85-230	--	--
System protection	ETU or LCD ETU	W	--	40	60	90	160	250	260
For starter combinations or non-automatic air circuit breaker	CO	--	40	60	90	160	250	210	260
Permissible mounting position ¹⁾									
Auxiliary and alarm switches									
Continuous free-air thermal current I _{th}		A 10	10	10	10	10	10	10	10
Rated making capacity		A 10	10	10	10	10	10	10	10
AC									
Rated operational voltage		V 24	48	110	230	400	600		
Rated operational current	AC-12	A 10	10	10	10	10	10		
	AC-15	A 6	6	6	6	3	1		
DC									
Rated operational voltage		V 24	48	110	230				
Rated operational current	DC-12	A 10	5	2.5	1				
	DC-13	A 3	1.5	0.7	0.3				
Back-up fuse/ miniature circuit breaker		A 10 TDz / 10	10 TDz / 10	10 TDz / 10	10 TDz / 10	10 TDz / 10	10 TDz / 10	10 TDz / 10	10 TDz / 10
Leading auxiliary switch with rotary operating mechanism									
Rated thermal current I _{th}	A	2	2	2	2	2	2	2	2
Rated making capacity	A	2 (ind. 0.5)	2 (ind. 0.5)	2 (ind. 0.5)	2 (ind. 0.5)	2 (ind. 0.5)	2 (ind. 0.5)	2 (ind. 0.5)	2 (ind. 0.5)
Rated operational voltage	V AC	230	230	230	230	230	230	230	230
Rated operational current	A	2	2	2	2	2	2	2	2
Rated breaking capacity, inductive, p.f. = 0.7	A	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Rated switching capacity	A	2	2	2	2	2	2	2	2
Back-up fuse, quick	A	2	2	2	2	2	2	2	2
Position indicator switches									
Rated thermal current I _{th}	A	16	16						
Rated making capacity	A	16	10						
Rated operational voltage	V AC	250	400						
Rated operational current	A	16	10						
Rated breaking capacity, inductive, p.f. = 0.7	A	4	4						
Rated switching capacity	A	16	10						
Back-up fuse, quick	A	16	10						

¹⁾ For VL800 UL (MG frame) to VL1600 UL (PG frame) circuit breakers with guide frame in lateral mounting position. Adapter set on request.

²⁾ Permissible current load factor 0.9; only with internal accessories.

Type	VL150X UL CG frame	VL150 UL DG frame	VL250 UL FG frame	VL400 UL JG frame	VL400X UL LG frame	VL800 UL MG frame	VL1200 UL NG frame	VL1600 UL PG frame
Trip units	Group 1: VL150X UL (CG frame) to VL400X UL (LG frame)					Group 2: VL800 UL (MG frame) to VL1600 UL (PG frame)		
Undervoltage release								
Response voltage:								
Release (circuit breaker is tripped)	V $0.35-0.70 \times U_s$					0.35-0.70 $\times U_s$		
Pick-up (circuit breaker can be closed)	V $0.85-1.1 \times U_s$					0.85-1.1 $\times U_s$		
Power consumption (continuous duty) at:								
AC 50/60 Hz 24 V ¹⁾	VA 1.4					1.2		
AC 50/60 Hz 110-127 V	VA 1.0					1.8		
AC 50/60 Hz 220-250 V	VA 1.0					1.8		
AC 50/60 Hz 208 V	VA 1.0					1.8		
AC 50/60 Hz 277 V	VA 1.0					1.8		
AC 50/60 Hz 380-415 V	VA 1.0					1.8		
AC 50/60 Hz 440-480 V	VA 1.0					1.8		
AC 50/60 Hz 500-525 V	VA 1.0					1.8		
AC 50/60 Hz 600 V ¹⁾	VA 1.0					1.8		
12 V DC	W 0.8					1.5		
24 V DC	W 0.8					1.5		
48 V DC	W 0.8					1.5		
60 V DC	W 0.8					1.5		
110-127 V DC	W 0.8					1.5		
220-250 V DC	W 0.8					1.5		
Max. opening time	ms 50					50		
Shunt trip unit								
Response voltage:	U_s					U_s		
Pick-up (circuit breaker is tripped)	V 0.7-1.1					0.7-1.1		
Power consumption (short time) at:								
AC 50/60 Hz 24 V	VA 310					330		
AC 50/60 Hz 48-60 V	VA 335-465					380-460		
AC 50/60 Hz 110-127 V	VA 470-630					330-430		
AC 50/60 Hz 208-277 V	VA 585-1000					520-800		
AC 50/60 Hz 380-600 V	VA 180-500					228-750		
24 V DC	W 360					385		
48-60 V DC	W 380-590					480-720		
110-127 V DC	W 506-680					362-424		
220-250 V DC	W 470-580					418-476		
Max. opening time	ms 50					50		
Max. duration of operational voltage	s interrupts automatically, less than 10 ms					interrupts automatically, less than 10 ms		

1) On request.

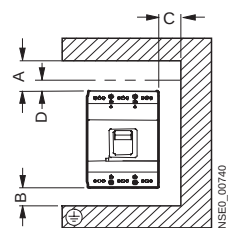
Type			VL150X UL CG frame	VL150 UL DG frame	VL250 UL FG frame	VL400 UL JG frame	VL400X UL LG frame	VL800 UL MG frame	VL1200 UL NG frame	VL1600 UL PG frame
Motorized operating mechanisms			--	--	--	--	--	--	x	x
Motorized operating mechanism with spring energy store (synchronizable)			x	x	x	x	x	x	--	--
Motorized operating mechanisms										
Power consumption	VA/W		--	--	--	--	--	--	< 250	< 250
Rated control supply voltage U_s	AC 50/60 Hz V		--	--	--	--	--	--	42-48 / 60	110-127 / 220-250
	V DC		--	--	--	--	--	--	24 / 42-48 / 60	110-127 / 220-250
Melting fuse (gG operational class, characteristic slow)	A		--	--	--	--	--	--	4	2
Miniature circuit breakers (MCBs)	A		--	--	--	--	--	--	4	2
Operating range	V		--	--	--	--	--	--	0.85 - 1.1 x U_s	0.85 - 1.1 x U_s
Minimum command duration at U_s	ms		--	--	--	--	--	--	50	50
Max. command duration, depends on circuit ¹⁾			Non-maintained or continuous command			--	--	--	Non-maintained or continuous command	
Total make-time	s		--	--	--	--	--	--	< 5	< 5
Break-time	s		--	--	--	--	--	--	< 5	< 5
Interval time between OFF and ON commands	s		--	--	--	--	--	--	> 5	> 5
Interval time between ON and OFF commands	s		--	--	--	--	--	--	> 5	> 5
Max. permissible switching frequency	1/h		--	--	--	--	--	--	30	30
Motorized operating mechanism with spring energy store (synchronizable)										
Power consumption	VA/W		< 100	< 100	< 100	< 200	< 250	< 250	--	--
Rated control supply voltage U_s	AC 50/60 Hz V		42-48 / 60			110-127 / 220-250			--	--
	V DC		24 / 42-48 / 60			110-127 / 220-250			--	--
Melting fuse (gG operational class, characteristic slow)	A		4			2			--	--
Miniature circuit breakers (MCBs)	A		4			2			--	--
Operating range	V		0.85 - 1.1 x U_s	0.85 - 1.1 x U_s	0.85 - 1.1 x U_s	0.85 - 1.1 x U_s	0.85 - 1.1 x U_s	0.85 - 1.1 x U_s	--	--
Minimum command duration at U_s	ms		50	50	50	50	50	50	--	--
Max. command duration, depends on circuit ¹⁾			Non-maintained or continuous command						--	--
Total make-time	ms		< 100	< 100	< 100	< 100	< 100	< 100	--	--
Break-time	s		< 5	< 5	< 5	< 5	< 5	< 5	--	--
Interval time between OFF and ON commands	s		> 5	> 5	> 5	> 5	> 5	> 5	--	--
Interval time between ON and OFF commands	s		> 1	> 1	> 1	> 1	> 1	> 1	--	--
Max. permissible switching frequency	1/h		120	120	120	120	60	60	--	--

x Available

-- Not available

¹⁾ Changeover contact also permissible, note dead times between ON and OFF commands

Space requirements above arc chutes, safety clearance



Arcing spaces

Minimum clearances from adjacent grounded parts and from non-insulated live parts.

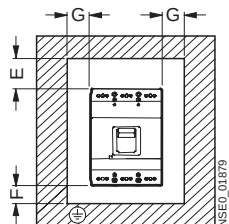
Plain conductors and busbars must be insulated with interphase barriers within the arcing space.

The specific mounting instructions for the various sizes must be observed for plain conductors and busbars outside the arcing space.

For mounting instructions refer to the Internet

Space requirements above arc chutes according to IEC 60947-2

Circuit breaker	Switching capacity	Minimum enclosure volume	A			B	C	D
			≤ 415 V	>415 – 690 V	>415 – 690 V	≤ 690 V	≤ 690 V	≤ 690 V
Type		m ³	Without/with terminal cover	Without terminal cover	With terminal cover			
VL150X UL (CG frame)	Standard High Very high	0.011	35	70	35	25	25	35
VL150 UL (DG frame)	Standard High Very high	0.011	50	100	50	25	25	35
VL250 UL (FG frame)	Standard High Very high	0.015	50	100	50	25	25	35
VL400 UL (JG frame)	Standard High Very high	0.036	50	100	50	25	25	35
VL400X UL (LG frame)	Standard High Very high	0.18	50	100	50	25	25	35
VL800 UL (MG frame)	Standard High Very high	0.22	50	100	50	25	25	35
VL1200 UL (NG frame)	Standard High Very high	0.22	70	100	70	30	30	50
VL1600 UL (PG frame)	Standard High Very high	0.264	100	100	100	100	30	100



Permissible safety clearance between circuit breaker and enclosure according to UL 489

Circuit breaker	Switching capacity	E	F	G	
Type					
VL150X UL (CG frame)	Standard High Very high	on request	on request	on request	
VL150 UL (DG frame)	Standard High Very high	168	229	58	
VL250 UL (FG frame)	Standard High Very high	306	495	61	
VL400 UL (JG frame)	Standard High Very high	366	367	127	
VL400X UL (LG frame)	Standard High Very high	527	494	214	
VL800 UL (MG frame)	Standard High Very high	200	25	25	
VL1200 UL (NG frame)	Standard High Very high	100	30	50	
VL1600 UL (PG frame)	Standard High Very high	100	100	30	

Definition of the permissible safety clearances

Clearance between

A: Circuit breaker and busbars (bare metal and grounded metal); terminal cover required above 600 V AC, 500 V DC

B: Circuit breaker connection and floor

C: Side of the circuit breaker and the side panels (bare metal and grounded metal)

D: Circuit breaker and non-conducting parts with an insulation thickness of at least 3 mm (insulator, insulated busbar, painted plate)

E: Circuit breaker and top of enclosure

F: Circuit breaker and bottom of enclosure

G: Circuit breaker and side of enclosure