

BD2 System – 160 ... 1250 A

General data

Technical specifications

General system data

Type	BD2-...	
Standards and specifications	IEC/EN 60439-1 and -2 (IEC/EN 61439-1 and -6 as from 2015)	
Rated insulation voltage U_i	V AC/DC	690/800
Rated operational voltage U_e	V AC	690
Frequency	Hz	50
Rated current I_n		
• Aluminum busbars	A	160 ... 1000
• Copper busbars	A	160 ... 1250
Climatic proofing		
• Damp heat, constant, according to IEC 60068-2-78	40 °C/93 %RH/56d	
• Damp heat, cyclic, according to IEC 60068-2-30	56 x (25 ... 40 °C/3 h; 40 °C/9 h; 40 ... 25 °C/3..._6 h; 25 °C/6 h) 95 % RH	
• Cold according to IEC 60068-2-1	-45 °C, 16 h	
• Temperature change according to IEC 60068-2-14	-45 ... 55 °C; 5 cycles (1 °C/min); holding time min. 30 min	
• Salt spray test according to IEC 60068-2-52	Severity grade 3	
• Ice formation according to IEC 60068-2-52	Composite test of damp heat, cyclic [56x (25-40 °C/3 h; 40 °C/9 h; 40-25 °C/3-6 h; 25 °C/6 h)/95 %RH] + cold [-45 °C, 16 h]	
Ambient temperature min./max./24h average	°C	-5/+40/+35
Environment classes were derived from climatic proofing tests		
• Climatic	1K5 (storage) = 3K7L (operation without exposure to the sun); 2K2 (transport)	
• Chemically active	Salt spray, more contaminants optional 1C2 (storage) = 3C2 (operation) = 2C2 (transport)	
• Biological	Is covered by IP degrees of protection and type of packaging 1B2 (storage) = 3B2 (operation) = 2B2 (transport)	
• Mechanically active	Is covered by IP degrees of protection and type of packaging 1S2 (storage) = 3S2 (operation) = 2S2 (transport)	
Degree of protection according to IEC/EN 60529 (installation type 2)		
• Trunking units	IP52	
• Trunking units with optional equipment on the busbar run	IP54, IP55	
• Feeding units, tap-off units	IP54	
• Feeding units and tap-off units with accessories	IP55	
Material		
• Trunking units, feeding units, tap-off units	Hot-galvanized, painted sheet steel, light gray (RAL 7035)	
• Exception: BD2-AK1/... tap-off units	Molded-plastic enclosure, light gray (RAL 7035)	
• Busbars		
- Aluminum	Nickel-plated and tinned aluminum busbars	
- Copper	Tinned copper busbars	
Mounting position	Edgewise, flat, tap-off points on side	
Weights	See "Selection and Ordering Data"	

Tap-off units

Type	BD2-AK...					
Rated current I_n	25 A	63 A	125 A	250 A	400 A	630 A
Switching capacity of contact system	AC-22B	--	--	--	--	--
Switching capacity of the built-in switch-disconnector according to IEC/EN 60947-3 at 400 V	--	AC-22B	AC-21B	--	--	--
Max. admissible rated prospective short-circuit withstand current when tap-off units with miniature circuit breakers are used:	10 kAeff: For higher prospective short-circuit currents the "back-up protection" ¹⁾ for the miniature circuit breakers must be noted. 25 kAeff: For higher rated prospective short-circuit currents the upstream protective device must limit to: – max. let-through energy $I^2t = 12 \times 10^4 \text{ A}^2\text{s}$; – max. let-through current $I_D = 9.5 \text{ kA}$					

¹⁾ Back-up protection, see page 4/75.

Important configuring notes

Not every tap-off unit has a rated voltage of 690 V and a short-circuit rating according to the system value.

The short-circuit rating and rated voltage of the tap-off units used in a system must be appropriate for it.

If the rated voltage of a tap-off unit does not match, choose one equipped with the appropriate components. Higher short-circuit currents must be limited by upstream protective devices (e.g. circuit breakers).

Trunking units with copper conductor

Type			BD2C--160	BD2C--250	BD2C--400
Conducting paths					
Rated insulation voltage U_i	V AC/DC		690/800	690/800	690/800
Rated operational voltage U_e	V AC		690	690	690
Frequency	Hz		50 ... 60	50 ... 60	50 ... 60
Rated current I_n	A		160	250	400
Impedance per unit length of conducting paths with 50 Hz and 20 °C ambient temperature (cold bars)					
• Equivalent resistance	R_{20}	mΩ/m	0.303	0.295	0.144
• Positive reactance	X_{20}	mΩ/m	0.157	0.158	0.119
• Impedance	Z_{20}	mΩ/m	0.341	0.335	0.187
Impedance per unit length of conducting paths with 50 Hz and 20 °C ambient temperature (bar under operating conditions warm)					
• Equivalent resistance	R_1	mΩ/m	0.333	0.383	0.181
• Positive reactance	X_1	mΩ/m	0.157	0.159	0.120
• Impedance	Z_1	mΩ/m	0.368	0.419	0.217
Impedance of conducting paths in event of a fault					
• AC resistance per unit length	R_F	mΩ/m	0.666	0.674	0.364
• Positive reactance per unit length	X_F	mΩ/m	0.511	0.530	0.461
• Impedance per unit length	Z_F	mΩ/m	0.839	0.858	0.587
Zero sequence impedance acc. to IEC/EN 60909 (VDE 0102)					
Phase to N	R_0	mΩ/m	1.419	1.429	0.718
	X_0	mΩ/m	0.691	0.703	0.658
	Z_0	mΩ/m	1.579	1.593	0.974
Phase to PE	R_0	mΩ/m	1.027	1.139	0.672
	X_0	mΩ/m	0.641	0.530	0.503
	Z_0	mΩ/m	1.211	1.256	0.839
Short-circuit rating					
• Rated peak withstand current I_{pk}		kA	17	32	40
• Rated short-time withstand current I_{cw}	$t = 1$ s	kA	5.5	10	16
	$t = 0.1$ s	kA	10	16	20
Number of conductors			5	5	5
Conductor cross-section					
	L1, L2, L3	mm ²	63	63	234
	N	mm ²	63	63	234
	PE	mm ²	63	63	234
	1/2 PE	mm ²	63	63	234
Conductor material			Cu	Cu	Cu
Max. interval between trunking unit at normal mechanical loading					
• Edgewise		m	4	4	4
• Edgewise with BD2-BD ¹⁾		m	4	4	4
• Flat		m	3.5	3.5	3.5
Fire load ²⁾		kWh/m	1.32	1.32	1.32

1) When using BD2-BD spacer bracket.

2) Values for trunking units with tap-off points.
For more values, see page 4/21.

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Trunking units with copper conductor

Type			BD2C--630	BD2C--800	BD2C--1000	BD2C--1250
Conducting paths						
Rated insulation voltage U_i	V AC/DC		690/800	690/800	690/800	690/800
Rated operational voltage U_e	V AC		690	690	690	690
Frequency	Hz		50 ... 60	50 ... 60	50 ... 60	50 ... 60
Rated current I_n	A		630	800	1000	1250
Impedance per unit length of conducting paths with 50 Hz and 20 °C ambient temperature (cold bars)						
• Equivalent resistance	R_{20}	mΩ/m	0.053	0.053	0.043	0.032
• Positive reactance	X_{20}	mΩ/m	0.064	0.064	0.056	0.054
• Impedance	Z_{20}	mΩ/m	0.083	0.083	0.071	0.063
Impedance per unit length of conducting paths with 50 Hz and 20 °C ambient temperature (bar under operating conditions warm)						
• Equivalent resistance	R_1	mΩ/m	0.076	0.076	0.056	0.041
• Positive reactance	X_1	mΩ/m	0.064	0.064	0.056	0.054
• Impedance	Z_1	mΩ/m	0.100	0.100	0.079	0.068
Impedance of conducting paths in event of a fault						
• AC resistance per unit length	R_F	mΩ/m	0.102	0.102	0.118	0.094
• Positive reactance per unit length	X_F	mΩ/m	0.146	0.146	0.234	0.229
• Impedance per unit length	Z_F	mΩ/m	0.178	0.178	0.262	0.248
Zero sequence impedance acc. to IEC/EN 60909 (VDE 0102)						
Phase to N	R_0	mΩ/m	0.280	0.280	0.234	0.186
	X_0	mΩ/m	0.377	0.377	0.286	0.275
	Z_0	mΩ/m	0.470	0.470	0.370	0.332
Phase to PE	R_0	mΩ/m	0.289	0.289	0.230	0.174
	X_0	mΩ/m	0.321	0.321	0.278	0.265
	Z_0	mΩ/m	0.431	0.431	0.361	0.317
Short-circuit rating						
• Rated peak withstand current I_{pk}		kA	64	84	90	90
• Rated short-time withstand current I_{cw}	$t = 1$ s	kA	26	32	34	34
	$t = 0.1$ s	kA	32	40	43	43
Number of conductors						
Conductor cross-section			5	5	5	5
	L1, L2, L3	mm ²	415	415	468	699
	N	mm ²	415	415	468	699
	PE	mm ²	415	415	468	699
	1/2 PE	mm ²	415	415	415	468
Conductor material						
			Cu	Cu	Cu	Cu
Max. interval between trunking unit at normal mechanical loading						
• Edgewise		m	4	3.5	3	2
• Edgewise with BD2-BD ¹⁾		m	2	1.75	1.5	1
• Flat		m	3.5	3	2.5	1.5
Fire load ²⁾						
			kWh/m	2	2	2

1) When using BD2-BD spacer bracket.

2) Values for trunking units with tap-off points.

For more values, see page 4/21.