

PROTECTION AGAINST ARC FAULTS

Arc Fault Detection Device DS-ARC1 with integrated RCBO

Data sheet



DS-ARC1 is the new 1P+N AFDD with an integrated residual current circuit breaker with over-current protection (RCBO) in 6 kA and 10 kA breaking capacity.

In only three-module width, DS-ARC1 series offers a complete protection against arc faults overvoltages, overcurrent, earth fault currents.

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01 The arc fault detection device DS-ARC1 with an integrated RCBO

DS-ARC1 is an AFDD compliant to the product standard “IEC 62606 – General requirements for Arc Fault Detection Devices” intended to mitigate the effects of arcing faults by disconnecting the circuit when an arc fault is detected. DS-ARC1 is integrated with an RCBO for a complete protection against overcurrents, earth fault currents and arc faults in only three modules width.

Strongly recommended applications according to the standard IEC 60364-4-42:

- **Sleeping and common rooms** in nurseries, senior and care homes, equipment for disabled persons
- **Places and rooms with existing fire risks and flammable materials**, such as production facilities, barns, carpenter workshops, paper manufacturing plants or printing shops where the fire risk is high
- **Places and rooms with prevalingly flammable building materials** like wood houses, flammable buildings or forced ventilation systems
- **Places and rooms with irreplaceable goods (cultural assets)**, such as those in museums, libraries, galleries, archives or architectural monuments

Recommendation for any room

The use of the AFDD is additionally recommended in any rooms with sleeping facilities in private apartments, houses, hospitals (does not apply in medically use areas) and hotels.

Offers protection against

- Earth arc fault
- Parallel arc fault
- Series arc fault
- Overvoltage (higher than 275 V)
- Overload
- Short-circuit
- Earth fault currents

Application benefits

- Easy cross-wiring and easy installation with System pro *M compact*® busbars without any extra cables
- Supply possible both from top and bottom side: double slots available for connection with cables and busbars
- Family feeling in the System pro *M compact*® range
- Compatible with System pro *M compact*® accessories
- LED for an easy troubleshooting of the network
- Two test button to verify the correct working conditions of AFDD and RCD
- Continuous internal self-test

DS-ARC1 arc fault detection device with integrated RCBO

Technical data

Technical specifications

		DS-ARC1		DS-ARC1 M		
Standards		IEC/EN 62606; IEC/EN 61009-1; IEC/EN 61009-2-1				
Electrical Functions	Type (wave form of the earth leakage sensed)			A		
	Number of poles			1P + N		
	Rated current I_n	A		$6 \leq I_n \leq 20$		
	Rated sensitivity $I\Delta n$	A		0.03		
	Rated voltage U_e	V		230 – 240		
	Insulation voltage U_i	V		500 V AC		
	Overvoltage category			III		
	Pollution degree			2		
	Operating voltage of RCD circuit test U_t	V		170 – 264		
	Threshold for protection against overvoltage	V		275		
	Rated frequency	Hz		50/60		
	Rated breaking capacity acc. to IEC/EN 61009-1	ultimate I_{cn}	A	6000	10000	
	Rated breaking capacity acc. to IEC/EN 60947-2 (only referring to short circuit test)	ultimate I_{cu}	kA	7.5	10	
		service I_{cs}	kA	6	7.5	
	Rated residual breaking capacity $I\Delta m$	A		6000		
	Rated impulse withstand voltage (1.2/50) U_{imp}	kV		4		
	Dielectric test voltage at ind. freq. for 1 min.	kV		2.5 (50/60 Hz, 1 min.)		
	Thermomagnetic release – characteristic	B: $3 I_n \leq I_m \leq 5 I_n$		■		
		C: $5 I_n \leq I_m \leq 10 I_n$		■		
	Energy limiting class			3		
Surge current resistance (wave 8/20)			NA			
Mechanical Main features	Housing		Insulation group I, RAL 7035			
	Toggle		Insulation group II, Orange RAL 2004, sealable in ON-OFF-positions			
	Contact position indication		Green/red window			
	Earth fault trip indication		Blue flag on toggle			
	Electrical life		10000 operations			
	Mechanical life		20000 operations			
	Protection degree acc. to EN 60529	housing		IP4X		
		terminals		IP2X		
	Shock resistance acc. to IEC/EN 60068-2-27		25 g – 2 shocks – 13 ms			
	Vibration resistance acc. to IEC/EN 60068-2-6		0.2 mm or 5 g – 20 cycles at 5 ... 150 ... 5 Hz			
	Environmental conditions (damp heat) acc. to IEC/EN 60068-2-30	°C/ RH	28 cycles with 55°C/90 – 96% and 25°C/95 – 100%			
	Reference temperature for setting of thermal element	°C	30			
	Ambient temperature (with daily average $\leq +35$ °C)	°C	-25 ... +55			
	Storage temperature	°C	-40 ... +70			
	Assembly	Terminal type	top/bottom		failsafe bi-directional cylinder-lift terminal (shock-protected)	
Terminal size for cables		top/bottom	mm ²	25/25		
Terminal size for busbars		top/bottom	mm ²	10/10		
Tightening torque		top/bottom	Nm	2.8		
Stripping length of the cable			mm	12		
Mounting				on DIN rail EN 60715 (35 mm) by means of mounting clip		
Mounting position				any		
Supply from			Top/bottom terminals			
Dimensions and weight	Dimensions (H × D × W)		mm	85 × 69 × 52.5		
	Weight		g	240		

DS-ARC1 AFDD with integrated RCBO

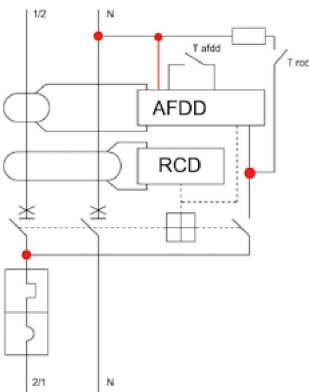
Ordering details, accessories, electrical diagrams and dimensions

DS-ARC1, 6 kA



Number of poles	Rated residual current $I_{\Delta n}$ mA	Charac-teristics	Rated current I_n A	Bbn 8012542 EAN	Ordering details	Order data	Weight 1 pcs kg	Pkg qty pce
					Type code	Order code		
1P+N	30	B	6	736516	DS-ARC1 B6 A30	2CSA255103R1065	0.240	1
			10	735618	DS-ARC1 B10 A30	2CSA255103R1105	0.240	1
			13	736417	DS-ARC1 B13 A30	2CSA255103R1135	0.240	1
			16	735519	DS-ARC1 B16 A30	2CSA255103R1165	0.240	1
			20	736318	DS-ARC1 B20 A30	2CSA255103R1205	0.240	1
1P+N	30	C	6	736110	DS-ARC1 C6 A30	2CSA255103R1064	0.240	1
			10	735212	DS-ARC1 C10 A30	2CSA255103R1104	0.240	1
			13	748311	DS-ARC1 C13 A30	2CSA255103R1134	0.240	1
			16	611110	DS-ARC1 C16 A30	2CSA255103R1164	0.240	1
			20	735113	DS-ARC1 C20 A30	2CSA255103R1204	0.240	1

DS-ARC1 M, 10 kA



Number of poles	Rated residual current $I_{\Delta n}$ mA	Charac-teristics	Rated current I_n A	Bbn 8012542 EAN	Ordering details	Order code	Weight 1 pcs kg	Pkg qty pce
					Type code	Order code		
1P+N	30	B	6	734710	DS-ARC1 M B6 A30	2CSA275103R1065	0.240	1
			10	733812	DS-ARC1 M B10 A30	2CSA275103R1105	0.240	1
			13	734611	DS-ARC1 M B13 A30	2CSA275103R1135	0.240	1
			16	733713	DS-ARC1 M B16 A30	2CSA275103R1165	0.240	1
			20	734512	DS-ARC1 M B20 A30	2CSA275103R1205	0.240	1
1P+N	30	C	6	734314	DS-ARC1 M C6 A30	2CSA275103R1064	0.240	1
			10	733416	DS-ARC1 M C10 A30	2CSA275103R1104	0.240	1
			13	748113	DS-ARC1 M C13 A30	2CSA275103R1134	0.240	1
			16	611011	DS-ARC1 M C16 A30	2CSA275103R1164	0.240	1
			20	748014	DS-ARC1 M C20 A30	2CSA275103R1204	0.240	1

DS-ARC1 AFDD with integrated RCBO

Fault analysis and earth fault indicator



Easy fault analysis

In the case of a fault, the LED displays the different fault indications as soon as the toggle has been reclosed.

LED color	blink/sec	Signal duration	Cause of tripping
Green	permanent	permanent	Manual tripping, test button, overcurrent
Red blinking	1	5 sec	Series arc fault
Red blinking	2	5 sec	Parallel arc fault
Red blinking	3	5 sec	Over-voltage

After the 5 second blinking the LED turns green again.



Earth fault indicator

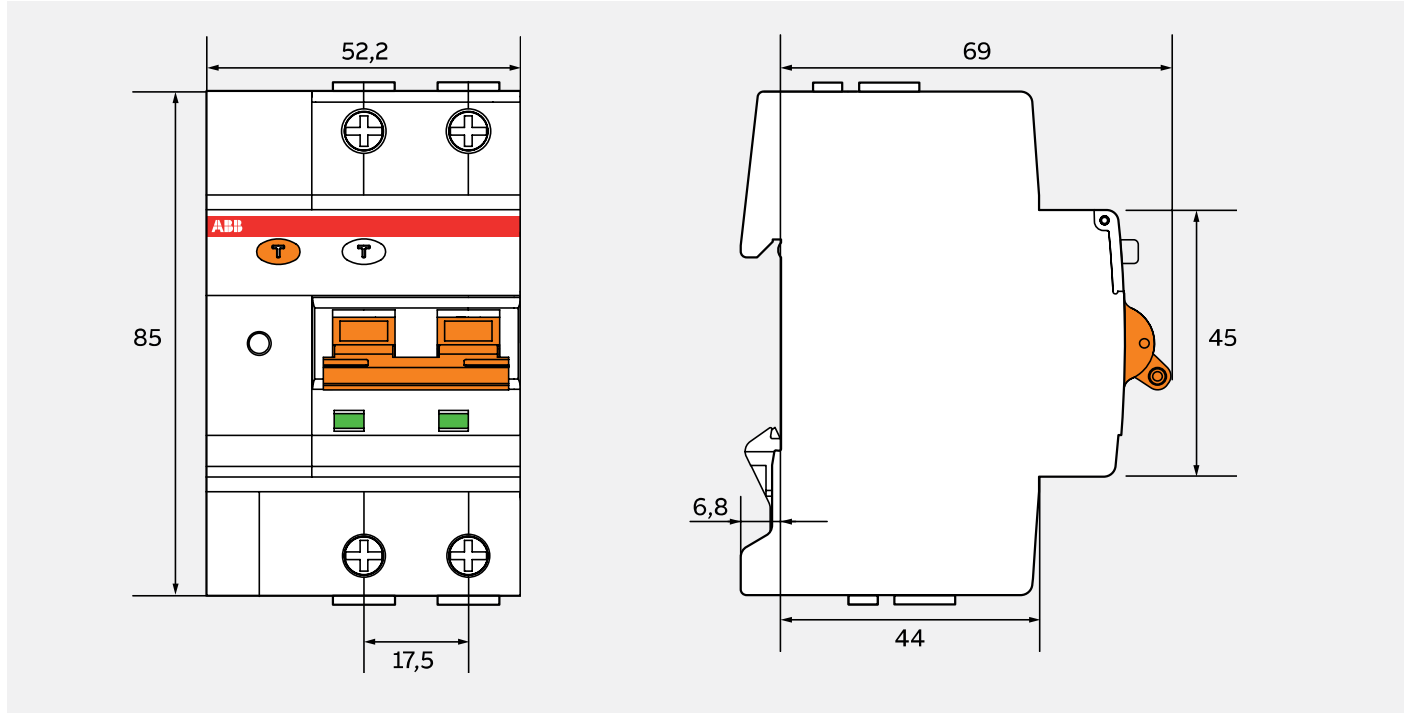
DS-ARC1 is equipped with an earth fault indicator to identify earth fault trips. A blue flag on the toggle will appear making the troubleshooting easier while reducing the downtime for maintenance operations. In case of earth fault trip, the LED becomes green after reclosing the toggle.

DS-ARC1 AFDD with integrated RCBO

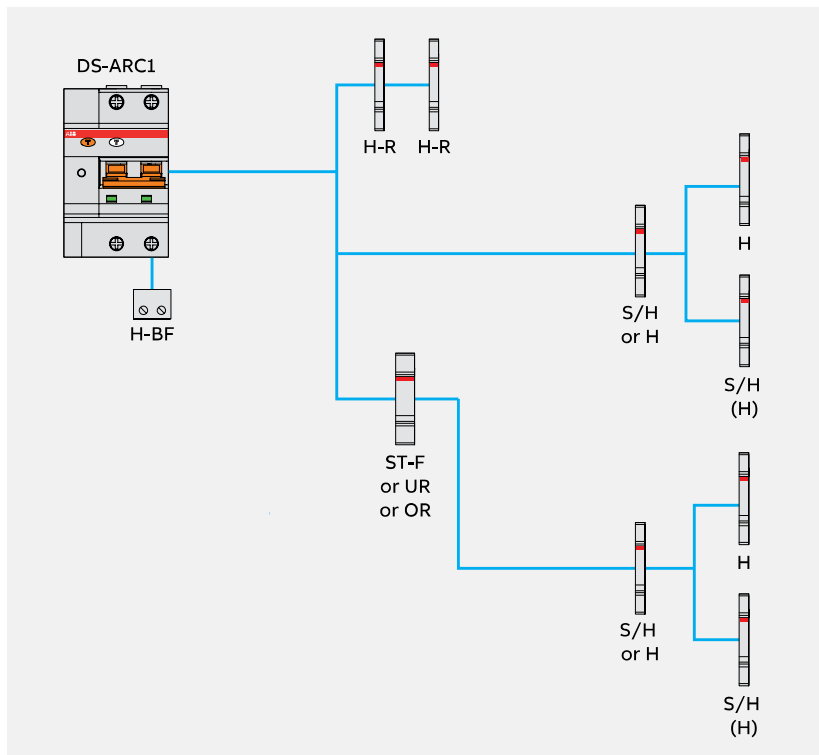
Dimensions and connections

Overall dimensions

All measurements in mm



System pro M compact® accessories – Combinations with accessories



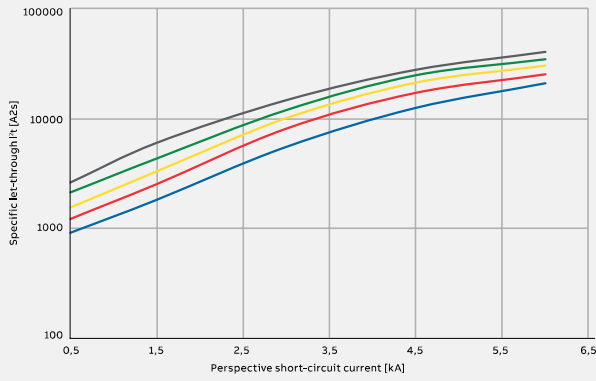
DS-ARC1		
H	Auxiliary contact	S2C-H6R
H-R	Auxiliary contact	S2C-H6-xxR
S/H	Signal/auxiliary contact	S2C-S/H6R
S/H (H)	Signal/auxiliary contact used as auxiliary contact	S2C-S/H6R
ST-F	Shunt Trip	F2C-A
UR	Undervoltage release	S2C-A
OR	Overvoltage release	S2C-OVP
H BF	Auxiliary contact for bottom fitting	S2C-H01/S2C-H10

DS-ARC1 arc fault detection device with integrated RCBO

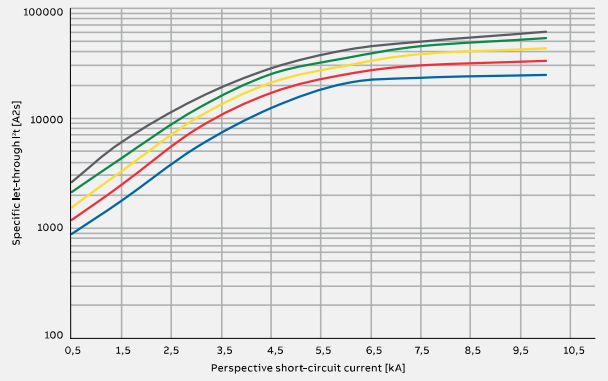
Technical data

Specific let-through energy I^2t DS-ARC1 and DS-ARC1 M

01 I^2t
DS-ARC1
Characteristics C

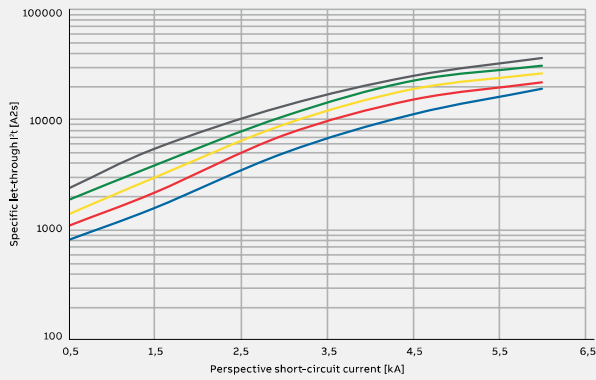


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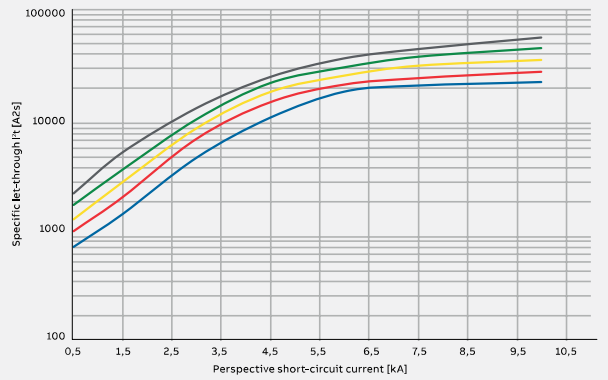


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03 I^2t
DS-ARC1
Characteristics B



03



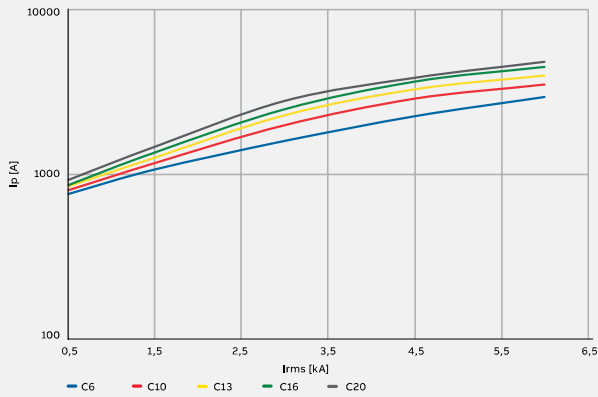
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DS-ARC1 arc fault detection device with integrated RCBO

Technical data

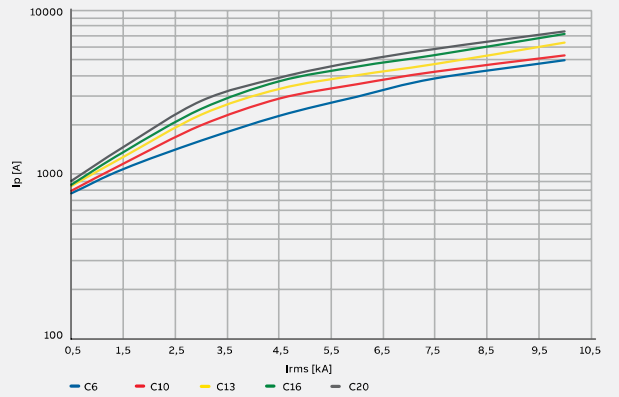
Ipeak DS-ARC1 and DS-ARC1 M

01 Ipeak
DS-ARC1,
Characteristic C



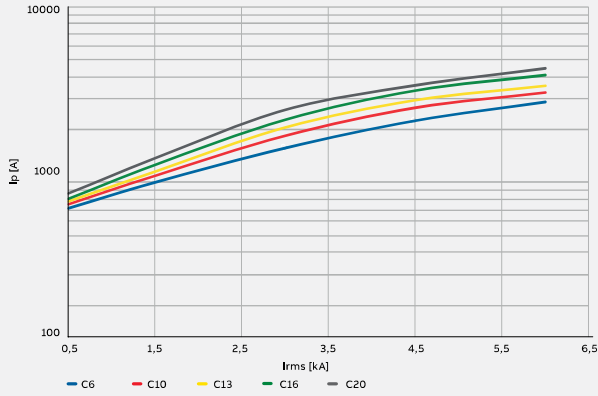
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02 Ipeak
DS-ARC1 M
Characteristics C



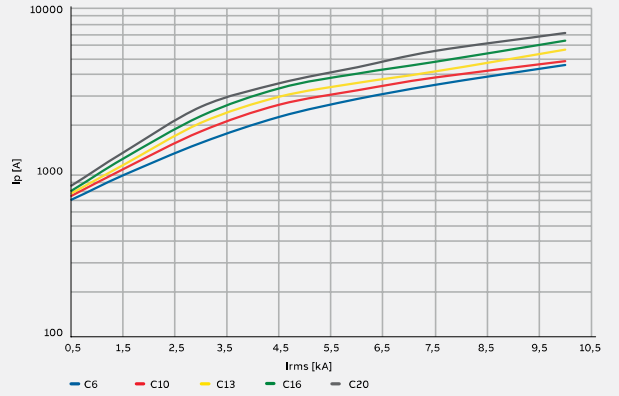
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03 Ipeak
DS-ARC1
Characteristics B



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04 Ipeak
DS-ARC1 M
Characteristics B



04

DS-ARC1 arc fault detection device with integrated RCBO

Technical data

Derating

Influence of adjacent devices	Number of devices	1	3	5	7	9
	Correction factor	1	0.95	0.92	0.9	0.9

Derating in temperature	In (A)	Temperature (°C)										
		-25	-20	-10	0	10	20	25	30	40	50	55
Max operating current depending on the ambient temperature (daily average $\leq +35$ °C) of characteristics type B and C.	6	7.9	7.8	7.7	7.3	6.9	6.3	6.1	6.0	5.9	5.8	5.7
	10	13.3	13.1	12.8	12.3	11.5	10.6	10.3	10.0	9.9	9.8	9.8
	13	17.0	16.7	16.2	15.5	14.5	13.6	13.3	13.0	12.7	12.6	12.5
	16	19.6	19.2	18.5	18.0	17.2	16.7	16.4	16.0	15.9	15.7	15.6
	20	24.3	23.8	23.2	22.3	21.4	20.7	20.3	20.0	19.8	19.5	19.3

Voltage Drop. power loss. internal resistance. own consumption	In (A)	Voltage drop (mV)	Internal resistance (m Ω)	Power loss (W)	Own consumption (W)
		6	408	68	2.5
10	183	18	1.8	0.5	
13	195	20	2.0	0.5	
16	194	12	3.1	0.5	
20	212	11	4.2	0.5	

Performance in altitude	Elevation (m)	3000	4000	5000	6000
		Rated Current (A)	$0.96 \times I_n$	$0.94 \times I_n$	$0.92 \times I_n$
Rated Voltage (V)		$0.877 \times U_n$	$0.775 \times U_n$	$0.676 \times U_n$	$0.588 \times U_n$