ARC FAULT DETECTION DEVICE (AFDD)

The new Arc Fault Detection Device S-ARC1

Maximum safety – easy installation

The S-ARC1 is the new 1P+N Arc Fault Detection Device (AFDD) with an integrated Miniature Circuit Breaker (MCB) in only two module width. Besides the overcurrent protection of the MCB, the S-ARC1 provides additional protection against parallel and series arc faults.

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01 The Arc Fault Detection Device S-ARC1 with an integrated Miniature Circuit Breaker

The S-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. Integrated with an MCB in 6kA and 10kA breaking capacity, S-ARC1 and S-ARC1 M offer protection against overcurrents and arc faults in only two modules width. Combined with a Residual Current Circuit Breaker (RCCB) as upstream device, the S-ARC1 series provides the best solution for complete protection in the switchboard, for people, buildings, and irreplaceable goods.

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 prevailingly 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

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

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
- Test button to verify the correct working conditions of the device
- Continuous internal self-test

S-ARC1 arc fault detection device with integrated MCB

Technical data

Technical specifications

				S-ARC1	S-ARC1 M
	Standards			IEC/EN 62606; IEC/EN 60898-1	
Electrical functions	Number of poles			1P + N	
	Rated current I_n		A	6 ≤ In ≤ 20	
	Rated voltage U_e		V	230 – 240	
	Insulation voltage U_i		V	500 V AC	
	Overvoltage category			III	
	Pollution degree			2	
	Min. operating voltage		V	170	
	Threshold for protection against overvoltage		V	275	
	Rated frequency		Hz	50/60	
	Rated breaking capacity acc. to IEC/EN 60898-1	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 IΔm		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 ≤ I_m ≤ 5 I_n		■	
		C: 5 I_n ≤ I_m ≤ 10 I_n		■	
	Energy limiting class			3	
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	
	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		°C	30	
	Ambient temperature (with daily average ≤ +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	mm²	25/25	
	Terminal size for busbars	top/bottom	mm²	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 x D x W)		mm	85 × 69 × 35	
	Weight		g	180	

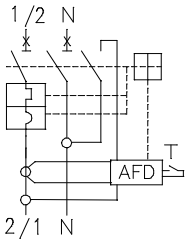
S-ARC1 AFDD with integrated MCB

Ordering details, accessories, electrical diagrams and dimensions

Ordering details

S-ARC1, 6kA

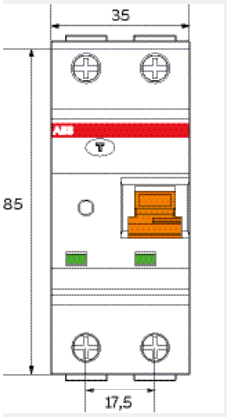
Number of poles	Charac-teristics	Rated current I_n A	Bbn 8012542 EAN	Ordering details Type code	Ordering details Order code	Weight 1 pcs kg	Pkg qty pce
1P+N	B	6	750130	S-ARC1 B6	2CSA255901R9065	0.180	1
		10	178132	S-ARC1 B10	2CSA255901R9105	0.180	1
		13	750031	S-ARC1 B13	2CSA255901R9135	0.180	1
		16	178033	S-ARC1 B16	2CSA255901R9165	0.180	1
		20	749936	S-ARC1 B20	2CSA255901R9205	0.180	1
1P+N	C	6	177937	S-ARC1 C6	2CSA255901R9064	0.180	1
		10	749837	S-ARC1 C10	2CSA255901R9104	0.180	1
		13	500735	S-ARC1 C13	2CSA255901R9134	0.180	1
		16	886136	S-ARC1 C16	2CSA255901R9164	0.180	1
		20	175438	S-ARC1 C20	2CSA255901R9204	0.180	1

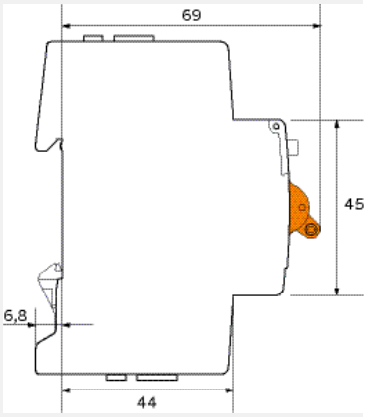


S-ARC1 M, 10kA

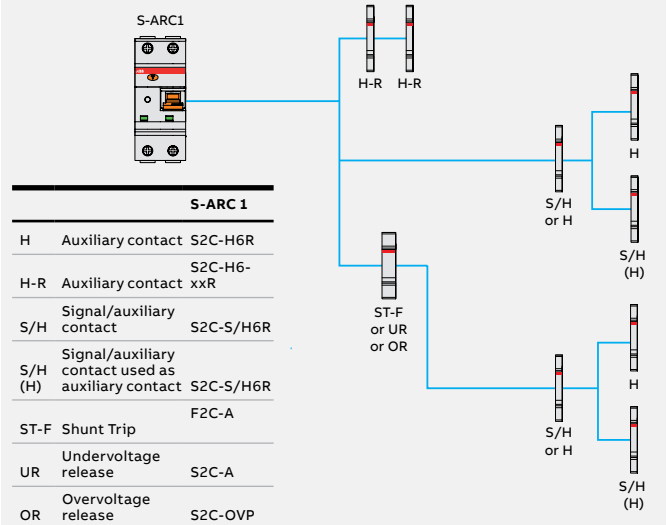
Number of poles	Charac-teristics	Rated current I_n A	Bbn 8012542 EAN	Ordering details Type code	Ordering details Order code	Weight 1 pcs kg	Pkg qty pce
1P+N	B	6	374312	S-ARC1 M B6	2CSA275901R9065	0.180	1
		10	342113	S-ARC1 M B10	2CSA275901R9105	0.180	1
		13	342014	S-ARC1 M B13	2CSA275901R9135	0.180	1
		16	342212	S-ARC1 M B16	2CSA275901R9165	0.180	1
		20	341215	S-ARC1 M B20	2CSA275901R9205	0.180	1
1P+N	C	6	339816	S-ARC1 M C6	2CSA275901R9064	0.180	1
		10	339717	S-ARC1 M C10	2CSA275901R9104	0.180	1
		13	339618	S-ARC1 M C13	2CSA275901R9134	0.180	1
		16	340416	S-ARC1 M C16	2CSA275901R9164	0.180	1
		20	340317	S-ARC1 M C20	2CSA275901R9204	0.180	1

Overall dimensions in mm





System pro *M* compact® accessories – Combinations with accessories



		S-ARC 1
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

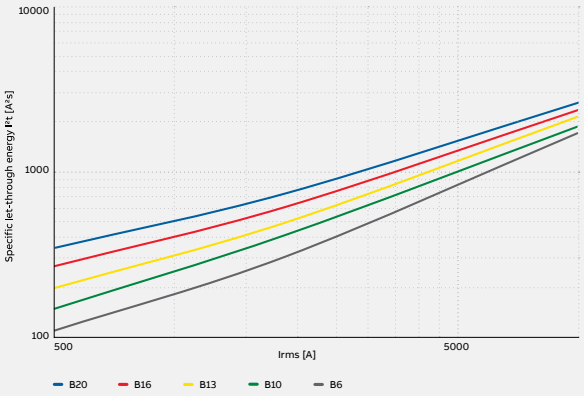
S-ARC1 arc fault detection device with integrated MCB

Technical data

Specific let-through energy I²t S-ARC1 and S-ARC1 M

01 I²t
S-ARC1 Tripping
Characteristics B

02 I²t
S-ARC1 Tripping
Characteristics C



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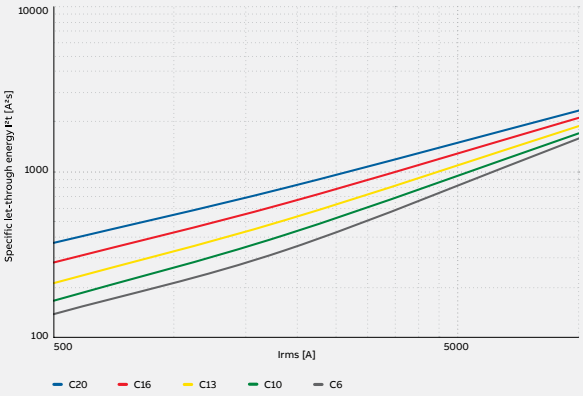
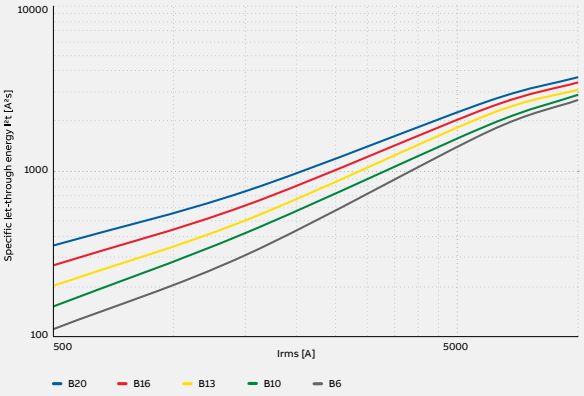


02

03 I²t
S-ARC1 M Tripping
Characteristics B

04 I²t
S-ARC1 M Tripping
Characteristics C



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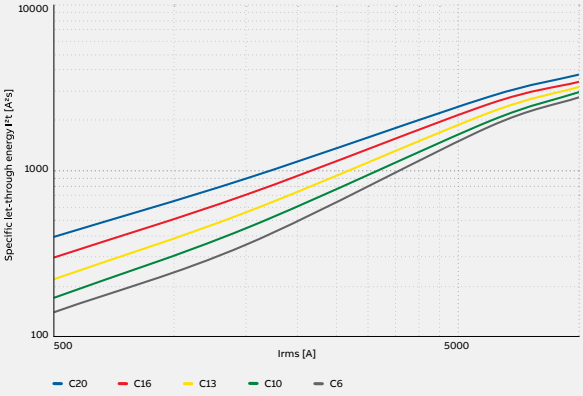

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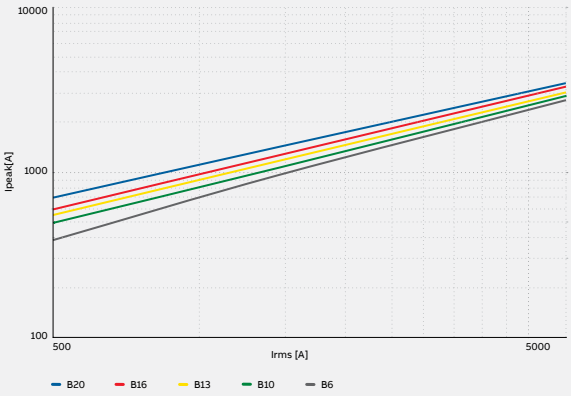
S-ARC1 arc fault detection device with integrated MCB

Technical data

Ipeak S-ARC1 and S-ARC1 M

01 Ipeak
S-ARC1 Tripping
Characteristics B

02 Ipeak
S-ARC1 Tripping
Characteristics C



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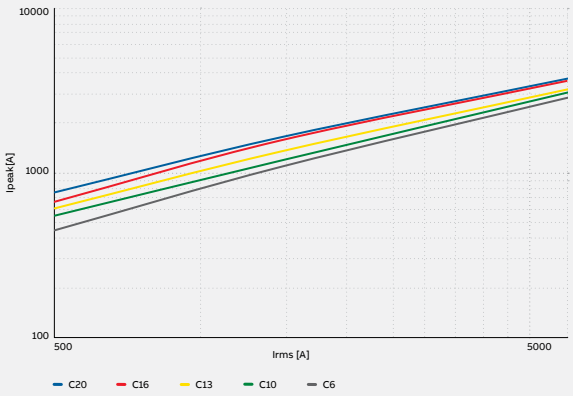
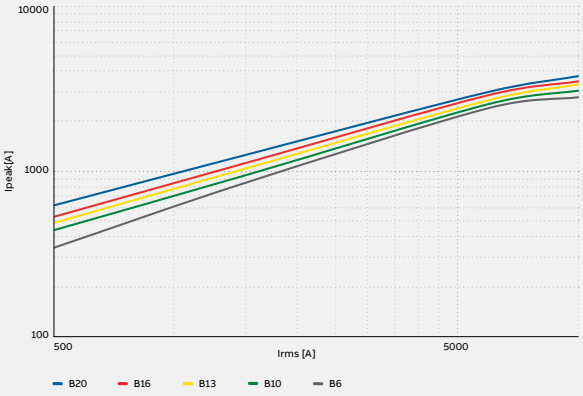


02

03 Ipeak
S-ARC1 M Tripping
Characteristics B

04 Ipeak
S-ARC1 M Tripping
Characteristics C



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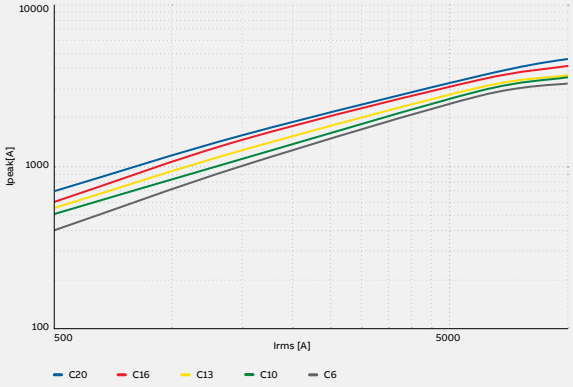

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S-ARC1 arc fault detection device with integrated MCB

Technical data

Technical data

Influence of adjacent devices	Number of devices	1	3	5	7	9
	Correction factor	1	0.92	0.88	0.85	0.84

Derating in temperature	**In (A)**	**Temperature (°C)**									
Max operating current depending on the ambient temperature (daily average ≤ +35 °C) of characteristics type B and C.		**-25**	**-20**	**0**	**10**	**20**	**25**	**30**	**40**	**50**	**55**
	6	7.2	6.8	6.4	6.3	6.1	6.0	6.0	6.0	5.8	5.8
	10	12.2	11.9	10.8	10.7	10.5	10.2	10.0	10.0	9.8	9.6
	13	15.6	15.2	14.2	13.8	13.4	13.2	13.0	12.9	12.7	12.6
	16	19.5	18.9	17.9	17.3	16.7	16.3	16.0	15.8	15.5	15.4
	20	24.4	24.0	22.4	21.6	21.0	20.4	20.0	19.8	19.5	19.4

Voltage Drop, power loss, internal resistance, own consumption	**In (A)**	**Voltage drop (mV)**	**Internal resistance (mΩ)**	**Power loss (W)**	**Own consumption (W)**
	6	380	63.3	2.3	0.5
	10	203	20.3	2.0	0.5
	13	166	12.8	2.2	0.5
	16	175	10.9	2.8	0.5
	20	182	9.1	3.6	0.5

Performance in altitude	**Elevation (m)**	**3000**	**4000**	**5000**	**6000**
	Rated Current (A)	0.96 xIn	0.94 x In	0.92 x In	0.90 x In
	Rated Voltage (V)	0.877 x Un	0.775 x Un	0.676 x Un	0.588 x Un

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