

MCB INS1

Data Sheet V1.0



The SEP INS1 in a miniature circuit breaker is a high performance MCB suitable for domestic, utility as well as industrial applications. The rather small size for the 80-125 Amperes with the high short-circuit value make it a unique product. The INS1 design is based on the SEP PRO range of products and is therefore easy to combine together. The extended range of busbars is also available to connect the items together.

The INS1 has a breaking capacity of 10kA, is available in a range of current up to 125A (in just 4 modules width) and in characteristics B, C or D.

INS1 miniature circuit breaker

CE

UK
CA

CB

KEMA
EUR

RoHS

INS1 is a MCB compliant to product standard IEC/EN 60898 and with the following main technical features

- Breaking capacity 10kA (60898-1)
- Breaking capacity 15kA (60947-2)
- Rated current up to 125A
- 1p, 1p+n, 2p, 3p, 3p+n, 4p
- Characteristics B, C, D

Application benefits

- Supply possible from top and bottom
- Pin and fork type busbar connection (above and below) up to 30mm² and cable connection up to 50mm² cables.
- Terminal cover with sealing possibility for operator safety
- Locking possibility for the handle in off position by attribute
- Family feeling in the SEP Pro range modular components

MCB INS1

Technical Data



Type	INS1		
Standards	IEC/EN 60898-1		
Certification	CE, UKCA, CB, KEMA KEUR		
Country of origin	CN		
RoHS Compliance Status	Compliant, No Exemption		
Number of poles	1p, 2p, 3p, 4p, 1p+n, 3p+n		
Tripping characteristics	B, C, D		
Rated current	I_n	A	$1 \leq I_n \leq 125A$
Rated voltage	U_e	V	230/415
Min. operating voltage		V	12
Max. operating voltage		V	264/440
Insulation voltage	U_i	V	500 V AC
Overvoltage category	III		
Pollution degree	2		
Rated frequency		Hz	50 - 60
Rated breaking capacity acc. to IEC/EN 60898	I_{cu}	A	10.000
Rated breaking capacity acc. to IEC/EN 60947-2 (only referring to short circuit test)	Ultimate I_{cu}	kA	15*
	Service I_{cs}	kA	11.25*
Tripping characteristics acc. To IEC/EN 60947-2	4x I_n , 8x I_n , 12x I_n		
Category acc. to IEC/EN 60947-2	A		
Rated impulse withstand voltage (1.2/50)	U_{imp}	kV	6
Dielectric test voltage at ind. freq. for 1 min.		kV	4 kV (50 / 60Hz, 1 min.)
Thermomagnetic release – characteristics	B: $3 I_n \leq I_n \leq 5 I_n$		■
	C: $5 I_n \leq I_n \leq 10 I_n$		■
	D: $10 I_n \leq I_n \leq 20 I_n$		■
Energy limiting class acc. to EN 60898-1	3		
Mechanical features	Housing	Insulation group I - II, RAL 7035	
	Toggle	Insulation group II, RAL 5017	
	Contact position indication	Green / Red window	
	Electrical life	operations	10.000
	Mechanical life	operations	20.000
	Protection degree acc. to EN 60529	housing	IP4X
		terminals	IP2X
	Shock resistance acc. to IEC/EN 60068-2-27	25g – 2 shocks - 13ms	
	Vibration resistance acc. to IEC/EN 60068-2-6	0.35 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

* IEC/EN 60947-2 certificate and test-report are not available at present, the use of these values is the responsibility of the user

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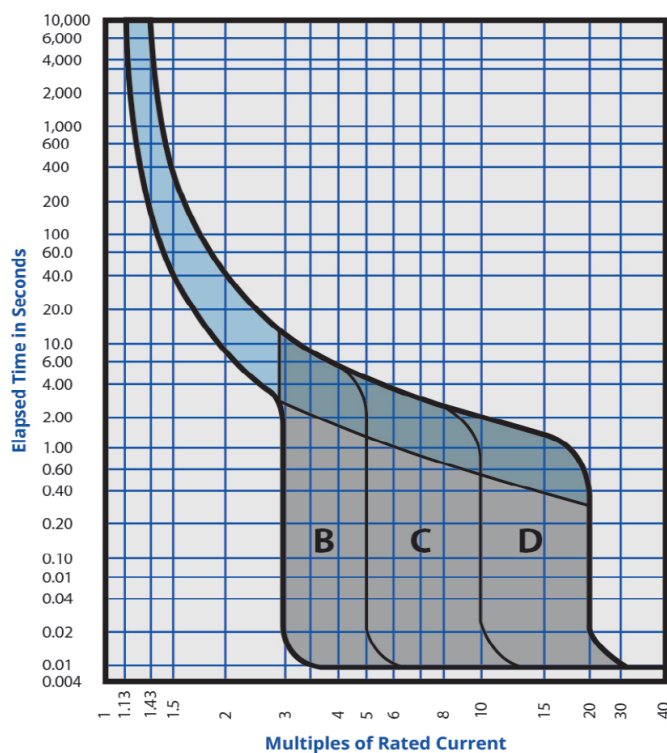
Type			INS1			
Installation	Terminal type	bottom / top	Twin-purpose terminal (lift / open-mouthed)			
	Terminal size for cables	bottom / top	50/35			
	Terminal size for PIN busbar	bottom / top	10/16/30			
	Terminal size for FORK busbar	bottom / top	M6 - 10/16/30			
	Solid /stranded wiring		1x 1.5mm ² - 50mm ² 2 x 1.5mm ² - 25mm ² *			
	Flexible wires with or without ferrules		1x 1.5mm ² - 35mm ² 2 x 1.5mm ² - 16mm ² *			
	Tightening torque	bottom / top	2.5 Nm			
	Stripping length of the cable		10mm			
	Mounting		on DIN rail EN 60715 (35mm) by means of mounting clip			
	Mounting position		Any			
	Supply from		Top / bottom terminals			
			1p	2p (1p+n)	3p	4p (3p+n)
Packing	Dimensions	Height	mm			
		Width	mm			
		Depth	mm			
	Weight	kg	0.133	0.266	0.4	0.533
	Packing A	QTY	12	6	4	3
		Dimensions (H x W x D)	mm			
		Weight	kg			
	Packing B (x A)	QTY	120	60	40	30
		Dimensions (H x W x D)	mm			
		Weight	kg			
	CN-code		85362010			
Combination with auxiliary elements	Auxiliary contact		Yes			
	Alarm contact		NA			
	Shunt trip		NA			
	Auxiliary contact for bottom fitting		NA			
	Undervoltage release		NA			
	Overvoltage release		NA			
	Motor operating device		NA			

* Check local installation rules, this type of connection is not advised. Special add-on terminals are available.

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Tripping Characteristics



Performance in altitude*

Elevation [m]	2000	3000	4000	5000	6000
Rated current [A]	1 x In	0,95 x In	0,92 x In	0,90 x In	0,88 x In
Rated voltage [V]	1 x Un	0,85 x Un	0,75 x Un	0,65 x Un	0,55 x Un

* the MCB is designed for standard level operations, performance information on higher altitude is not available

Influence of adjacent devices

Number of devices	1	2-3	4-5	6-9	≥10
Correction factor	1	0,9	0,8	0,7	0,6

These values are provided by recommendation IEC 61439-1 and standards EN 61439-1. In order to avoid having to use these coefficients there must be good ventilation and the devices must be kept apart using the spacing element article number 2119000010 (0.5 module).

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Derating in temperature *INS1*

Max operating current depending on the ambient temperature (daily average $\leq +35\text{ }^{\circ}\text{C}$)

In [A]	Ambient temperature [°C]										
	-25	-15	-5	10	30	40	45	55	60	65	70
1	1,2	1,17	1,13	1,08	1	0,95	0,93	0,88	0,85	0,82	0,8
2	2,35	2,29	2,23	2,13	2	1,93	1,89	1,82	1,78	1,73	1,67
3	3,52	3,43	3,34	3,2	3	2,88	2,82	2,70	2,64	2,56	2,48
4	4,75	4,62	4,49	4,29	4	3,85	3,77	3,61	3,53	3,42	3,32
6	7,59	7,32	7,10	6,62	6	5,64	5,48	5,28	4,99	4,84	4,70
8	10,00	9,70	9,30	8,70	8	7,53	7,3	6,79	6,51	6,31	6,13
10	11,75	11,45	11,14	10,67	10	9,65	9,47	9,09	8,90	8,63	8,37
13	16,29	15,74	15,17	14,29	13	12,24	11,86	11,04	10,59	10,27	9,96
16	19,30	18,74	18,17	17,27	16	15,32	14,97	14,25	13,87	13,45	13,05
20	24,09	23,40	22,69	21,58	20	19,16	18,73	17,82	17,32	16,80	16,30
25	29,36	28,62	27,86	26,67	25	24,12	23,67	22,74	22,25	21,58	20,94
32	38,93	37,76	36,56	34,68	32	30,57	29,83	28,28	27,48	26,66	25,86
40	47,81	46,48	45,13	43,00	40	38,41	37,59	35,89	35,01	33,96	32,94
50	61,42	58,50	57,26	54,50	50	47,50	46,55	44,25	43,36	42,06	40,80
63	79,10	75,70	82,78	68,41	63	60,16	58,96	56,37	55,35	53,69	52,08
80	97,76	94,78	91,20	86,82	80	76,80	75,26	71,85	70,41	68,30	66,25
100	122,5	119,39	114,80	107,80	100	96,00	94,27	90,50	88,78	86,12	83,53
125	151,08	145,35	139,90	133,76	125	118,25	116,11	113,36	111,36	108,02	104,78

Power loss INS1

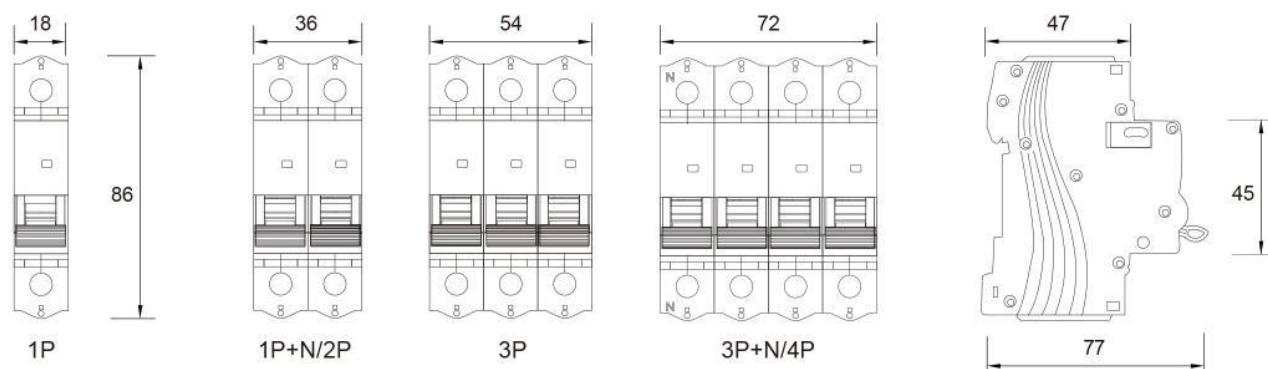
In [A]	1p	2p	3p	4p	1p+n	3p+n
1	1,31	2,62	3,93	5,24	1,97	4,59
2	1,17	2,34	3,51	4,68	1,76	4,10
3	1,98	3,96	5,94	7,92	2,97	6,93
4	2,44	4,88	7,32	9,76	3,66	8,54
6	1,14	2,28	3,42	4,56	1,71	3,99
8	1,52	3,04	4,56	6,08	2,28	5,32
10	1,70	3,40	5,10	6,80	2,55	5,95
13	2,34	4,68	7,02	9,36	3,51	8,19
16	1,76	3,52	5,28	7,04	2,64	6,16
20	2,60	5,20	7,80	10,40	3,90	9,10
25	3,75	7,50	11,25	15,00	5,36	13,13
32	2,56	5,12	7,68	10,24	3,84	8,96
40	3,20	6,40	9,60	12,80	4,80	11,20
50	4,50	9,00	13,50	18,00	6,75	15,75
63	6,30	12,60	18,90	25,20	9,48	22,08
80	9,60	19,20	28,20	38,40	14,40	33,33
100	12,00	24,00	36,00	48,00	18,00	42,00
125	16,00	32,00	48,00	64,00	24,00	56,00

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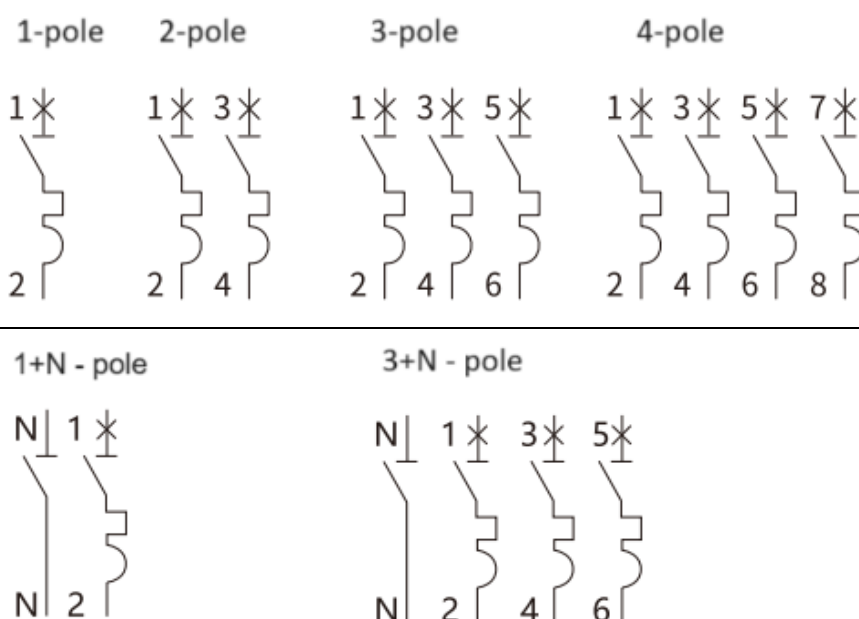
Overall dimensions

All measurements in mm







INS1 (dimensions)

Connection diagram



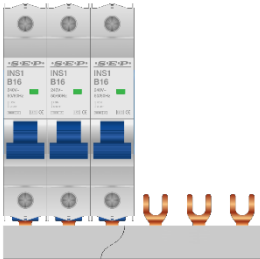
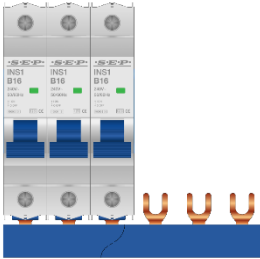
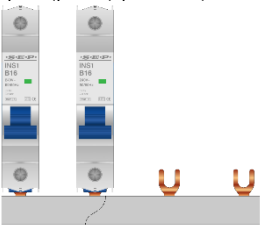
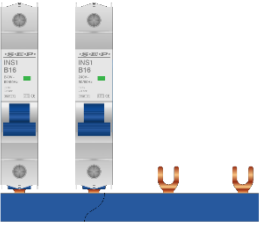
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Order codes

							
Char.	Inom	1p	1p+n	2p	3p	3p+n	4p
B	1 A	3111000010	3111002170	3111000550	3111001090	3111002710	3111001630
	2 A	3111000020	3111002180	3111000560	3111001100	3111002720	3111001640
	3 A	3111000030	3111002190	3111000570	3111001110	3111002730	3111001650
	4 A	3111000040	3111002200	3111000580	3111001120	3111002740	3111001660
	6 A	3111000050	3111002210	3111000590	3111001130	3111002750	3111001670
	8 A	3111000060	3111002220	3111000600	3111001140	3111002760	3111001680
	10 A	3111000070	3111002230	3111000610	3111001150	3111002770	3111001690
	13 A	3111000080	3111002240	3111000620	3111001160	3111002780	3111001700
	16 A	3111000090	3111002250	3111000630	3111001170	3111002790	3111001710
	20 A	3111000100	3111002260	3111000640	3111001180	3111002800	3111001720
	25 A	3111000110	3111002270	3111000650	3111001190	3111002810	3111001730
	32 A	3111000120	3111002280	3111000660	3111001200	3111002820	3111001740
	40 A	3111000130	3111002290	3111000670	3111001210	3111002830	3111001750
	50 A	3111000140	3111002300	3111000680	3111001220	3111002840	3111001760
	63 A	3111000150	3111002310	3111000690	3111001230	3111002850	3111001770
	80 A	3111000160	3111002320	3111000700	3111001240	3111002860	3111001780
	100 A	3111000170	3111002330	3111000710	3111001250	3111002870	3111001790
	125 A	3111000180	3111002340	3111000720	3111001260	3111002880	3111001800
C	1 A	3111000190	3111002350	3111000730	3111001270	3111002890	3111001810
	2 A	3111000200	3111002360	3111000740	3111001280	3111002900	3111001820
	3 A	3111000210	3111002370	3111000750	3111001290	3111002910	3111001830
	4 A	3111000220	3111002380	3111000760	3111001300	3111002920	3111001840
	6 A	3111000230	3111002390	3111000770	3111001310	3111002930	3111001850
	8 A	3111000240	3111002400	3111000780	3111001320	3111002940	3111001860
	10 A	3111000250	3111002410	3111000790	3111001330	3111002950	3111001870
	13 A	3111000260	3111002420	3111000800	3111001340	3111002960	3111001880
	16 A	3111000270	3111002430	3111000810	3111001350	3111002970	3111001890
	20 A	3111000280	3111002440	3111000820	3111001360	3111002980	3111001900
	25 A	3111000290	3111002450	3111000830	3111001370	3111002990	3111001910
	32 A	3111000300	3111002460	3111000840	3111001380	3111003000	3111001920
	40 A	3111000310	3111002470	3111000850	3111001390	3111003010	3111001930
	50 A	3111000320	3111002480	3111000860	3111001400	3111003020	3111001940
	63 A	3111000330	3111002490	3111000870	3111001410	3111003030	3111001950
	80 A	3111000340	3111002500	3111000880	3111001420	3111003040	3111001960
	100 A	3111000350	3111002510	3111000890	3111001430	3111003050	3111001970
	125 A	3111000360	3111002520	3111000900	3111001440	3111003060	3111001980
D	1 A	3111000370	3111002530	3111000910	3111001450	3111003070	3111001990
	2 A	3111000380	3111002540	3111000920	3111001460	3111003080	3111002000
	3 A	3111000390	3111002550	3111000930	3111001470	3111003090	3111002010
	4 A	3111000400	3111002560	3111000940	3111001480	3111003100	3111002020
	6 A	3111000410	3111002570	3111000950	3111001490	3111003110	3111002030
	8 A	3111000420	3111002580	3111000960	3111001500	3111003120	3111002040
	10 A	3111000430	3111002590	3111000970	3111001510	3111003130	3111002050
	13 A	3111000440	3111002600	3111000980	3111001520	3111003140	3111002060
	16 A	3111000450	3111002610	3111000990	3111001530	3111003150	3111002070
	20 A	3111000460	3111002620	3111001000	3111001540	3111003160	3111002080
	25 A	3111000470	3111002630	3111001010	3111001550	3111003170	3111002090
	32 A	3111000480	3111002640	3111001020	3111001560	3111003180	3111002100
	40 A	3111000490	3111002650	3111001030	3111001570	3111003190	3111002110
	50 A	3111000500	3111002660	3111001040	3111001580	3111003200	3111002120
	63 A	3111000510	3111002670	3111001050	3111001590	3111003210	3111002130
	80 A	3111000520	3111002680	3111001060	3111001600	3111003220	3111002140
	100 A	3111000530	3111002690	3111001070	3111001610	3111003230	3111002150
	125 A	3111000540	3111002700	3111001080	3111001620	3111003240	3111002160

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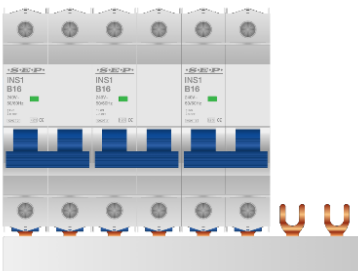
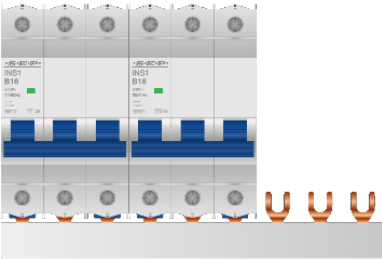
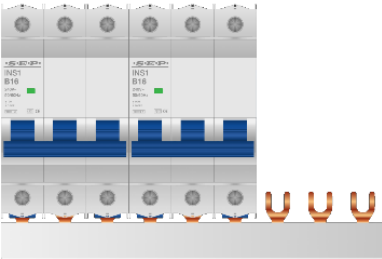
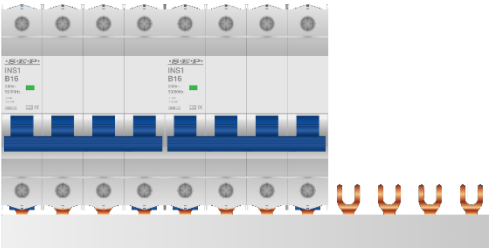

Order codes for connective rail

Busbar / connective rail type	No. devices	10mm ² (closed end - non cuttable)		16mm ² (cut to size with end- caps)	
		PIN	FORK	PIN	FORK
1 pole (phase) L-L-L ... (17.8mm) 	2x 1p	2305101002	2305111002	-	-
	3x 1p	2305101003	2305111003	-	-
	4x 1p	2305101004	2305111004	-	-
	5x 1p	2305101005	2305111005	-	-
	6x 1p	2305101006	2305111006	2306010006	2306110006
	7x 1p	2305101007	2305111007	-	-
	8x 1p	2305101008	2305111008	-	-
	9x 1p	2305101009	2305111009	2306010009	2306110009
	10x 1p	2305101010	2305111010	-	-
	11x 1p	2305101011	2305111011	-	-
	12x 1p	2305101012	2305111012	2306010012	2306110012
	13x 1p	2305101013	2305111013	-	-
	15x 1p	-	-	2306010015	2306110015
	18x 1p	-	-	2306010018	2306110018
	21x 1p	-	-	2306010021	2306110021
	24x 1p	-	-	2306010024	2306110024
	54x 1p	-	-	2306160100	2306161100
1 pole (neutral) N-N-N ... (17.8mm) 	2x 1p	2305101902	2305111902	-	-
	3x 1p	2305101903	2305111903	-	-
	4x 1p	2305101904	2305111904	-	-
	5x 1p	2305101905	2305111905	-	-
	6x 1p	2305101906	2305111906	2306019006	2306119006
	7x 1p	2305101907	2305111907	-	-
	8x 1p	2305101908	2305111908	-	-
	9x 1p	2305101909	2305111909	2306019009	2306119009
	10x 1p	2305101910	2305111910	-	-
	11x 1p	2305101911	2305111911	-	-
	12x 1p	2305101912	2305111912	2306019012	2306119012
	13x 1p	2305101913	2305111913	-	-
	15x 1p	-	-	2306019015	2306119015
	18x 1p	-	-	2306019018	2306119018
	21x 1p	-	-	2306019021	2306119021
	24x 1p	-	-	2306019024	2306119024
	54x 1p	-	-	2306160101	2306161101
1 pole (phase) L-L-L ... (35.6mm) 	2x 1p	2305171002	2305181002	-	-
	3x 1p	2305171003	2305181003	-	-
	4x 1p	2305171004	2305181004	-	-
	5x 1p	2305171005	2305181005	-	-
	6x 1p	2305171006	2305181006	2306010206	2306110206
	9x 1p	-	-	2306010209	2306110209
	12x 1p	-	-	2306010212	2306110212
	27x 1p	-	-	2306160120	2306161120
1 pole (phase) N-N-N ... (35.6mm) 	2x 1p	2305171902	2305181902	-	-
	3x 1p	2305171903	2305181903	-	-
	4x 1p	2305171904	2305181904	-	-
	5x 1p	2305171905	2305181905	-	-
	6x 1p	2305171906	2305181906	2306019206	2306119206
	9x 1p	-	-	2306019209	2306119209
	12x 1p	-	-	2306019212	2306119212
	27x 1p	-	-	2306160121	2306161121

* pictures are indicative – other combinations are possible

MCB INS1

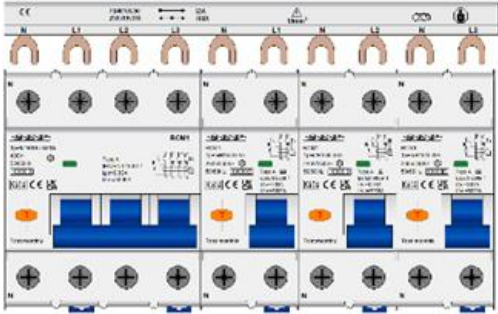
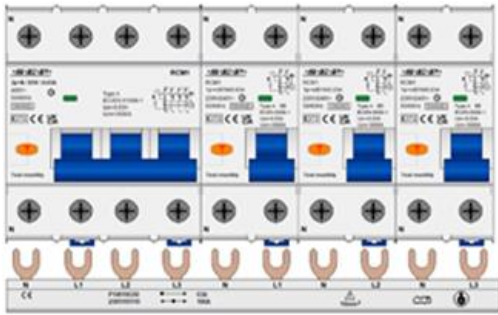
Order codes for connective rail

Busbar / connective rail type	No. devices	10mm ² (closed end - non cuttable)		16mm ² (cut to size with end- caps)	
		PIN	FORK	PIN	FORK
2 pole (phase neutral) N1-N1-N1... 12-12-12.. 	2x 2p	2305102004	2305112004	-	-
	3x 2p	2305102006	2305112006	2306020006	2306120006
	4x 2p	2305102008	2305112008	2306020008	2306120008
	5x 2p	2305102010	2305112010	2306020010	2306120010
	6x 2p	2305102012	2305112012	2306020012	2306120012
	7x 2p	2305102014	2305112014	2306020014	2306120014
	8x 2p	2305102016	2305112016	2306020016	2306120016
	9x 2p	2305102018	2305112018	2306020018	2306120018
	10x 2p	-	-	2306020020	2306120020
	11x 2p	-	-	2306020022	2306120022
	12x 2p	-	-	2306020024	2306120024
	27x 2p	-	-	2306160200	2306161200
3N pole (3 phase neutral) N1-N2-N3... 	6x 2p	2305105012	2305115012	2306050012	2306150012
	9x 2p	2305105018	2305115018	2306050018	2306150018
	12x 2p	-	-	2306050024	2306150024
	28x 2p	-	-	2306160500	2306161500
3 pole (3 phase) 123-123-123... 	2x 3p	2305103006	2305113006	2306030006	2306130006
	3x 3p	2305103009	2305113009	2306030009	2306130009
	4x 3p	2305103012	2305113012	2306030012	2306130012
	5x 3p	2305103015	2305113015	2306030015	2306130015
	6x 3p	2305103018	2305113018	2306030018	2306130018
	7x 3p	-	-	2306030021	2306130021
	8x 3p	-	-	2306030024	2306130024
	18x 3p	-	-	2306160300	2306161300
4 pole (4 phase) N123-N123... 123N-123N... 	2x 4p	2305104008	2305114008	2306040008	2306140008
	3x 4p	2305104012	2305114012	2306040012	2306140012
	4x 4p	2305104016	2305114016	2306040016	2306140016
	5x 4p	-	-	2306040020	2306140020
	6x 4p	-	-	2306040024	2306140024
	14x 4p	-	-	2306160400	2306161400
	Open mouth covers for busbar PIN	2115900010			

* pictures are indicative – other combinations are possible

MCB INS1


Order codes for connective rail


Busbar / connective rail type	No. devices	10mm ² (closed end - non cuttable)		16mm ² (cut to size with end- caps)	
		ΣI <div> <div>→ 63A</div> <div>→ 100A</div> </div>		ΣI <div> <div>→ 80A</div> <div>→ 125A</div> </div>	
		PIN	FORK	PIN	FORK
Top Combi-rail N123-N1-N2-N3-(N1)	1x4p + 3x2p	2305195310	2305195010	-	-
	1x4p + 4x2p	2305195312	2305195012	-	-
Bottom Combi-rail N123-N1-N2-N3-(N1)	1x 4p + 3x 2p	2305195110	2305195210	-	-
	1x 4p + 4x 2p	2305195112	2305195212	-	-


* pictures are indicative – other combinations are possible


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Order codes accessories

Add-on terminals Reference image	Wire size	PIN		FORK	
		Grey	Blue	Grey	Blue
	1x50mm2 solid/stranded 1x35mm2 flexible	2115900060	2115900120	2115900090	2115900150
	2x25mm2 solid/stranded 2x16mm2 flexible	2115900070	2115900130	2115900100	2115900160
	3x16mm2 solid/stranded 3x10mm2 flexible	2115900080	2115900140	2115900110	2115900170

Auxiliary contact Reference image	Description	Code
	Auxiliary contact 1CO	3104500001

Marker – spacer Reference image	Description	Code
	Component Spacer 0,5mm	2119000010

Lockout Reference image	Description	Code
	Lockout set - complete	2115909099
	Locking devices adaptor	2115909015
	Locking device screw adaptor	2115909010
	Padlock with 2 identical keys	2115909020
	Warning tag (English)	2115909030

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