Product catalogue

Noark

Contents

Electrical Equipment Supplier for Smart Grid

NOARK provides reliable products and efficient solution to intelligent power and energy system. With series of products and solution,Noark is capable of serving traditional industries including utility,iron & steel manufacturing, building, petrochemicals, telecommunications, mechanical and other industries, also has become expert in some cutting-edge fields,such as solar energy,intelligent power distribution, wind energy, electric vehicle and energy storage. The over-expected performance of these products has been identified especially under an extremely harsh environment.

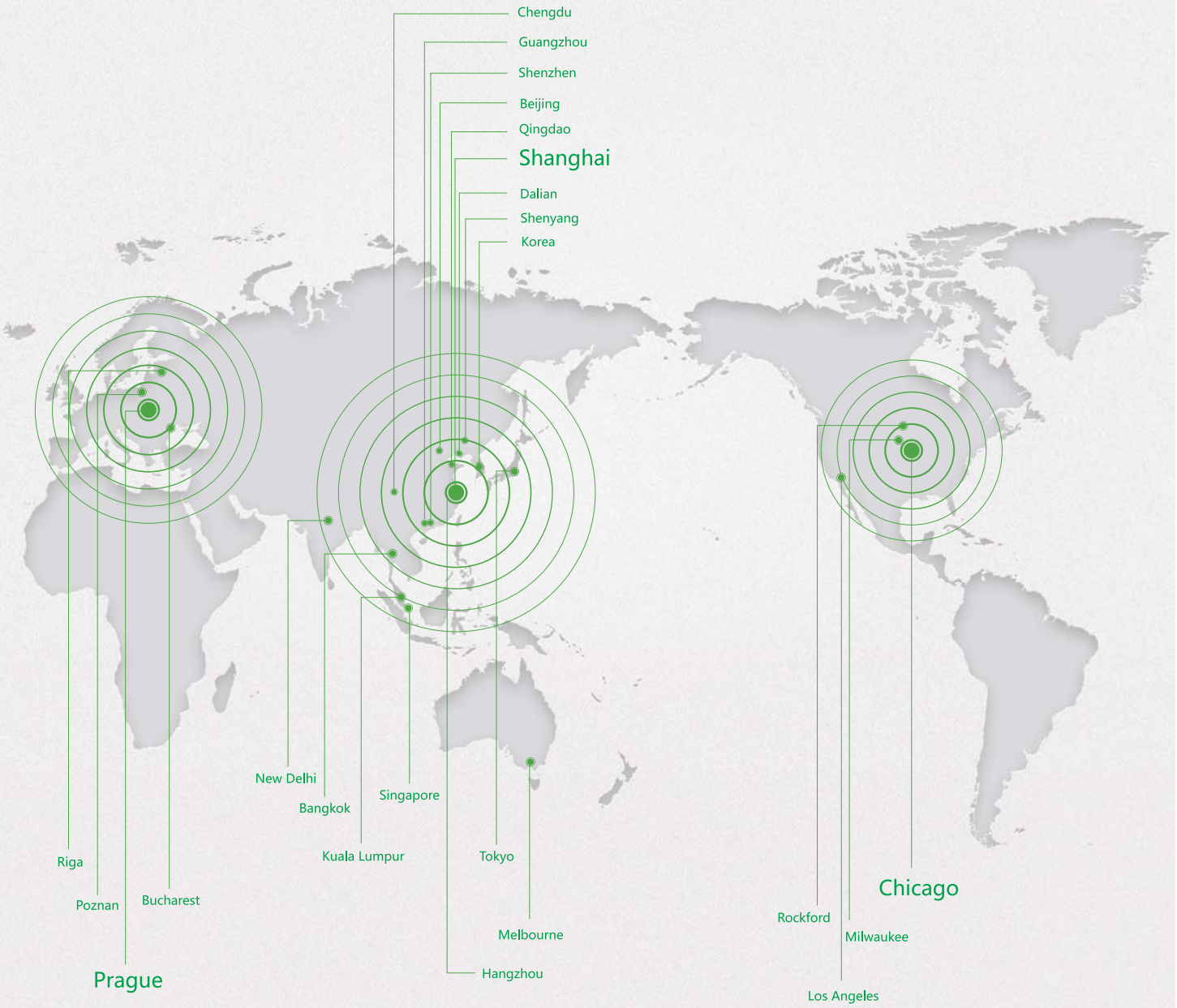
SmartUnit
Is series of intelligent control units embedded in each electrical component, which enable them to communicate with every equipment in smart network. Besides, it has the abilities of self- judgement, storage and prompt react ion to integrate mutually with the entire system. This application can be effectively used in utility, industry, renewable energy and so on.

InPower
(Intelligent power) Distribution System works on two main key components, SmartUnit and InServer(Intelligent Communication Server). The benefit of this integration to user is easy operation and management of power distribution system,through energy monitoring,remote operation,warning alarm,energy analysis,etc.

Solarinel
Is Electrical system solution to photovoltaic system. With a full range of PV products and optimized design of electrical system,it brings high efficiency and performance of the whole solar system. After being applied in over 1GW installation worldwide,Solarinel turns out to be a necessary component and ideal system to several of system application, from residential roof top in hot and humid tropical region to large solar farm in Tibet under extremely harsh environment.

In China, Europe, and the United States, Noark has 4 R&D centers, 3 distribution centers, 15 global sales branches and more than 1,000 employees. We hold the belief that dedicated and professional work manner is the root to bring our customer with complete solution and satisfaction. Noark will continually be committed to reducing cost of operation and maintenance,bringing reliable technology and creating more customer value in long run.

Noark Global Sales Network



Certification & Qualification

These international accredited certifications pave the way of involvement in the world market. It is the foundation of expecting customers' trustiness towards Noark products.

International product performance and safety authentication	
International Quality Certification	
Regional certification	

Application References









Thailand

Lopburi 1.65MW

Saraburi 5.5MW

Nongkhai 1.1MW

Indonesia

Bunaken Island 13MW

Pulau Kodingareng 400kW

Pulau Sabutung 150kW

Pulau Salemo 150kW

Pulau Tiga 75kW

Pulau Manawoka 115kW

Australia

Rooftop Project

Czech

Residential area Prague,
Jahodnice with 110 flats
Residential area Litomyšl,
project Gree Alley with 40 flats

Poland

Stoneczna Morena
with 74 apartments

China

Over 1,000MW application

200MW PV power station in
Golmud in Qinghai Province

Features

Ex9A Series Air Circuit Breaker is used for power distribution and protection of main lines of low-voltage distribution networks with rated current between 400A and 4000A, and also for the protection of motors and generators.

As a new generation of smart product, the Ex9A not only has multiple protective functions, but also performs the functions of measurement, communication, and electric power management, able to give the electric characteristics of the line on which it is mounted, exchange data with other devices, and receive control commands from a higher level.

Characteristic

NOARK's unique high-efficiency arc quenching & extinguishing technology enables the Ex9A to become a genuine zero arcing circuit breaker.
The new design of arcing chamber includes:

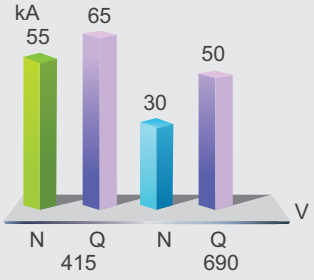
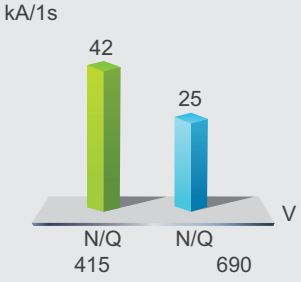
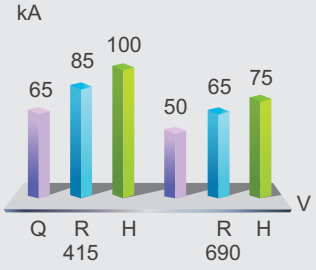
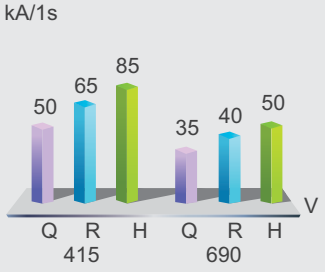
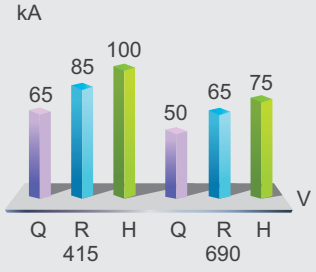
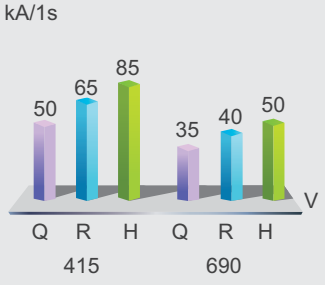
- Magnetic-blow arcing technology: to extend the arc and introduce it into the arcing chamber.
- Metal grid: Split arc, to accelerate heat dissipation and prevent high temperature generated by arc.
- Metal mesh: to filter out and absorb the hazardous substances contained in the gas generated from the arc.

NOARK high-efficiency arc quenching & extinguishing technology brings the circuit breaker with the following features:

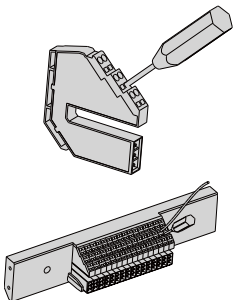
- High breaking capacity
  $I_{cs}=I_{cu}=120kA$
- Saving space

Ex9A Series Circuit Breaker has different structural dimensions for different frame sizes,but every size is characterized in “large capacity and miniature,” saving mounting space and reducing the cost for users.

Each air circuit breaker model covers several breaking capacities and rated current.

	Rated current level	Breaking capacity	Short-time withstand current	Dimension		
				Withdrawable 3P/4P	Fixed 3P/4P	
Ex9A16	400A 630A 800A 1000A 1250A 1600A			352	323	H (mm)
				282/382	254/324	W (mm)
				394	255	D (mm)
Ex9A32	1600A 2000A 2500A 2900A 3200A			430	354	H (mm)
				437/552	424/539	W (mm)
				401	329	D (mm)
Ex9A40	2000A 2500A 2900A 3200A 4000A			430	354	H (mm)
				437/552	424/539	W (mm)
				401	329	D (mm)

Note:Breaking capacity of circuit breaker is:N-55KA,Q-65KA,R-85KA,H-100KA,V-125KA(under Ue=415V)



Wiring Flexibility

The user may experience the flexibility and convenience of Ex9A Air Circuit Breaker even though it is provided on a main or a secondary circuit.

Ex9A Air Circuit Breaker, fixed or withdrawable, is featured by:

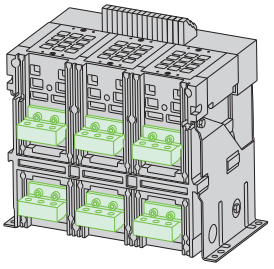
- Control Circuit

The most sophisticated screwless wiring technology,while maintaining its high degree of protection (IP40), enabling a safer & easier operation and maintenance by the user.

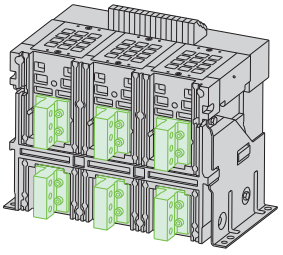
- Several wiring connections for the main circuit:

Flexibility of the Ex9A

*The user may select either horizontal or vertical connection

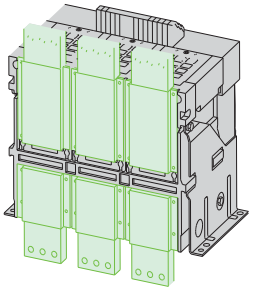


Horizontal Connection



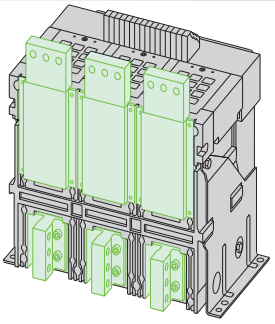
Vertical Connection

*Also, the user may select front connection

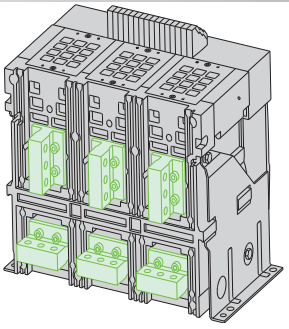


Front Connection

*Hybrid connection supportable and suitable for more stringent mounting conditions and saving space



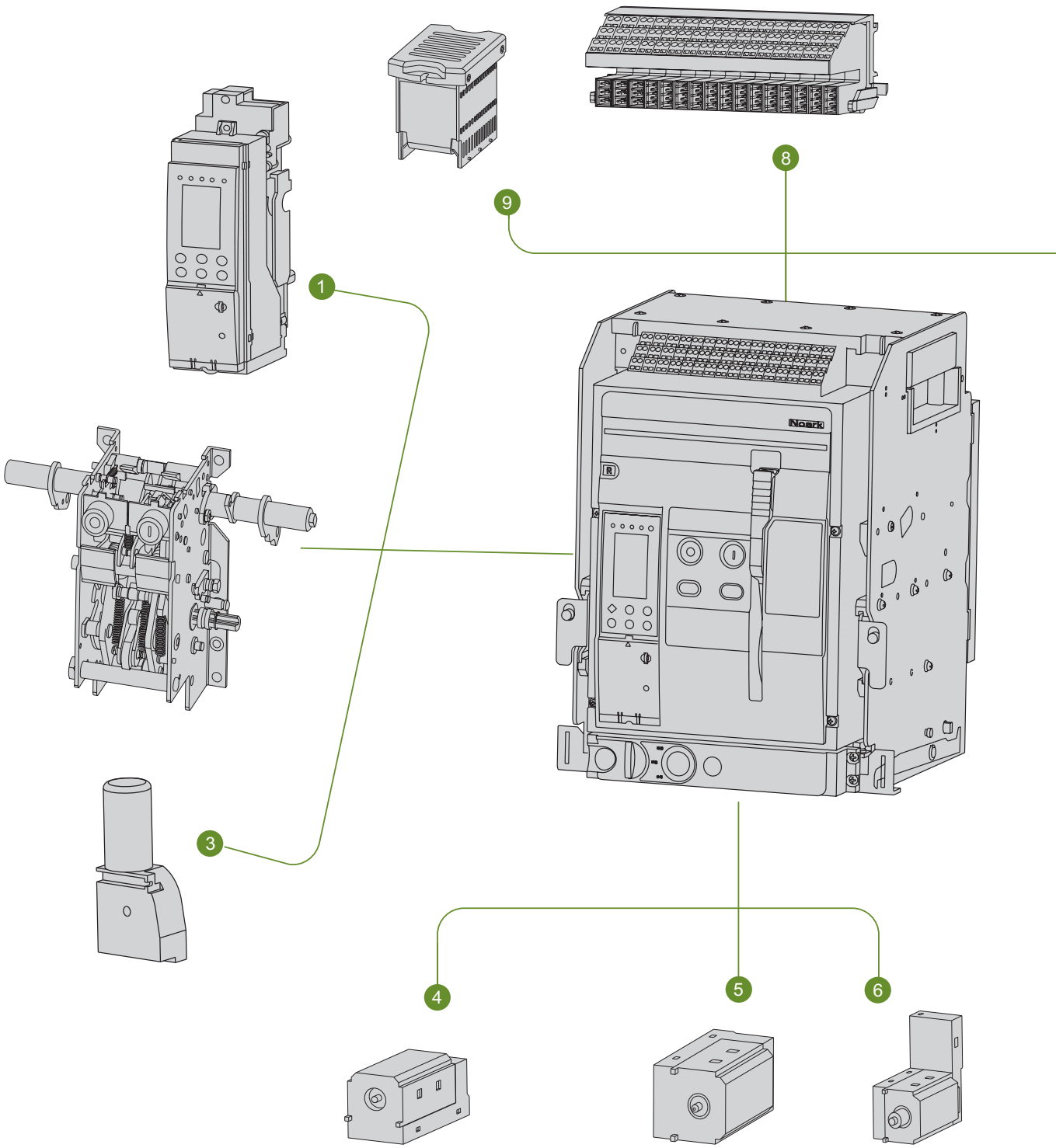
Hybrid Connection

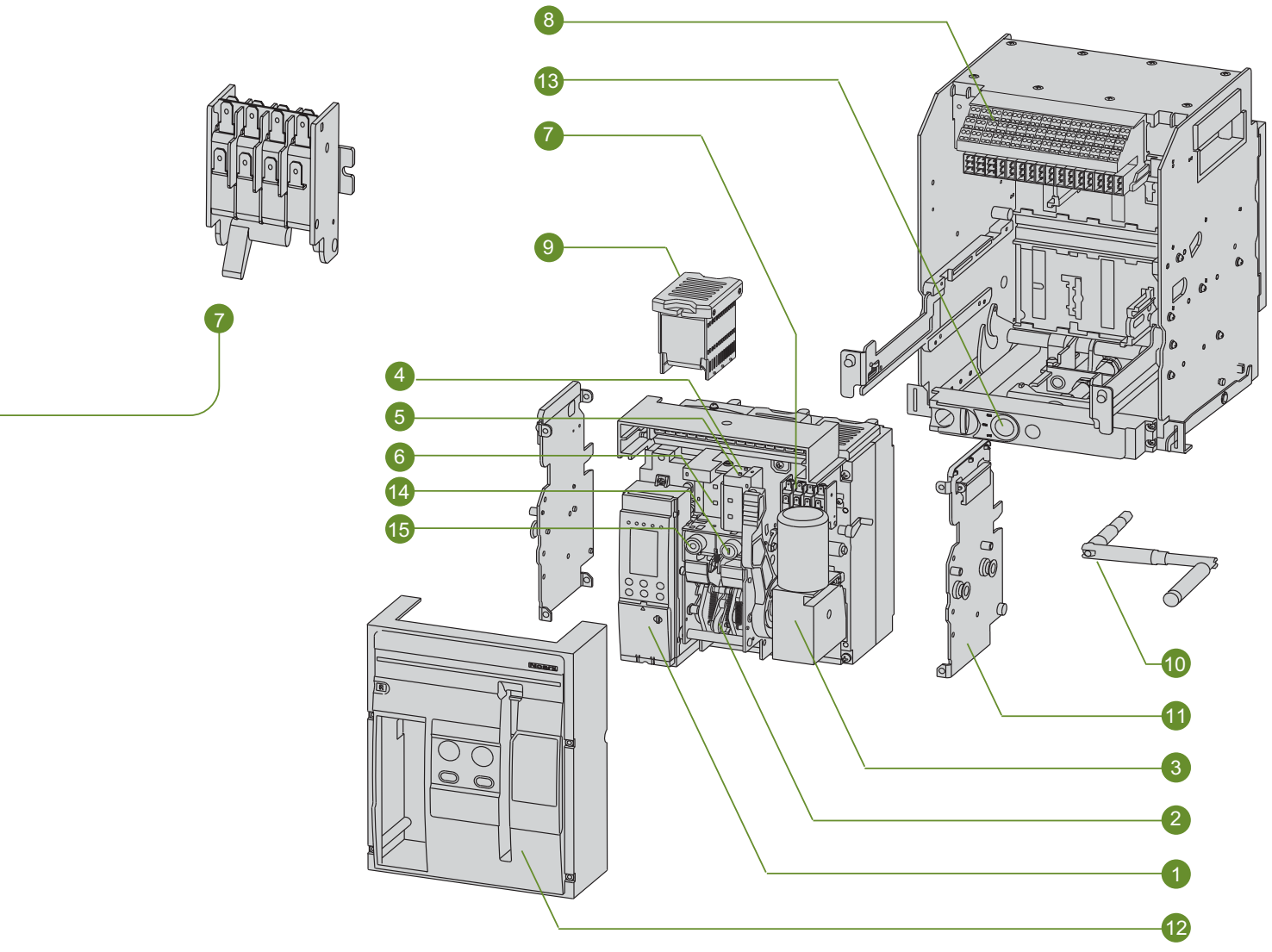


Hybrid Connection

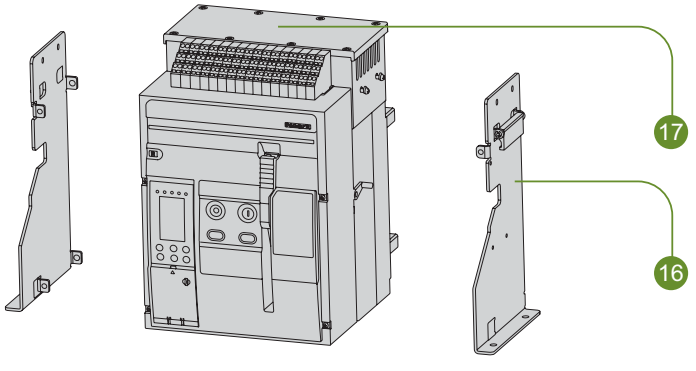
Modularization Design

Withdrawable





Fixed type



1	Smart Unit
2	Operating Mechanism
3	Electric Motor
4	Shunt Release
5	Closing Release
6	Undervoltage Release
7	Auxiliary Contact
8	Wiring Terminal on the Secondary Circuit
9	Arcing Chamber
10	Handle
11	Side Plate
12	Panel
13	Withdrawable Indicator
14	On Button
15	Off Button
16	Retaining Plate
17	Cover

Parameters

Air Circuit Breaker			Ex9A16		Ex9A32		Ex9A40	
IEC 60947-2								
poles			3P	4P	3P	4P	3P	4P
Rated frame current (A)			1600		3200		4000	
Electrical performance								
Operating frequency			50/60 Hz		50/60 Hz		50/60 Hz	
Version			Fixed/Withdrawable		Fixed/Withdrawable		Fixed/Withdrawable	
Rated voltage		Ue (V)	380/400/415/660/690		380/400/415/660/690		380/400/415/660/690	
Rated current		In (A)	400-630-800-1000-1250-1600		1600-2000-2500-2900-3200		2000-2500-2900-3200-4000	
Rated insulation voltage		U_i (V)	1000		1000		1000	
Rated impulse withstand voltage			12		12		12	
Type of breaking capacity			N/Q		Q/R/H		Q/R/H	
Ultimate breaking capacity	Icu (kA)	415V	55/65		65/85/100		65/85/100	
		690V	30		55/65/75		55/65/75	
Rated service breaking capacity	Ics(%Icu)	415V	75%		100%		100%	
		690V	100%		100%		100%	
Short-time withstand current	Icw (kA)	415V	42		50/65/85		50/65/85	
		690V	25		35/40/50		35/40/50	
Rated making current	Icm (kA)	415V	121		143/187/220		143/187/220	
		690V	63		105/143/165		105/143/165	
Breaking and closing time (ms)		breaking	20-30		20-30		20-30	
		closing	<60		<70		<70	
Acring distance			0		0		0	
Service life (C-O)	Mechanical	Without maintenance	12500		10000		8000	
		Maintenance	25000		15000		15000	
	Electrical	415V	6000		5000		3000	
		690V	3000		1500		1000	
Isolation function			■		■		■	
Protection								
Smart unit			■		■		■	
To be used with a fuse			—		—		—	
N-pole protection capacity			—		—		—	
Accessories		Electrical	—		—		—	
		Mechanical	—		—		—	
Connection and Installation								
Service category			B		B		B	
Load type			—		—		—	
Installation category	Circuit breaker (including coil at primary side)		IV		IV		IV	
	Circuit breaker (except coil at primary side)		III		III		III	
Pollution degree			3		3		3	
Connection mode			Horizontal/Vertical/Hybrid					
Power supply			Top/Bottom		Top/Bottom		Top/Bottom	
Installation mode			fixed	withdrawable	fixed	withdrawable	fixed	withdrawable
Dimensions(cm)		W (3/4P)	254/324	282/382	424/539	437/552	424/539	437/552
		H	23	352	354	430	354	430
		D	55	394	329	401	329	401
Weight with inclusive release switch (kg)			22	38	52.5	68	72.5	118
			26.5	55	66.5	121	86.5	141

■ Standard configuration □ Optional — None

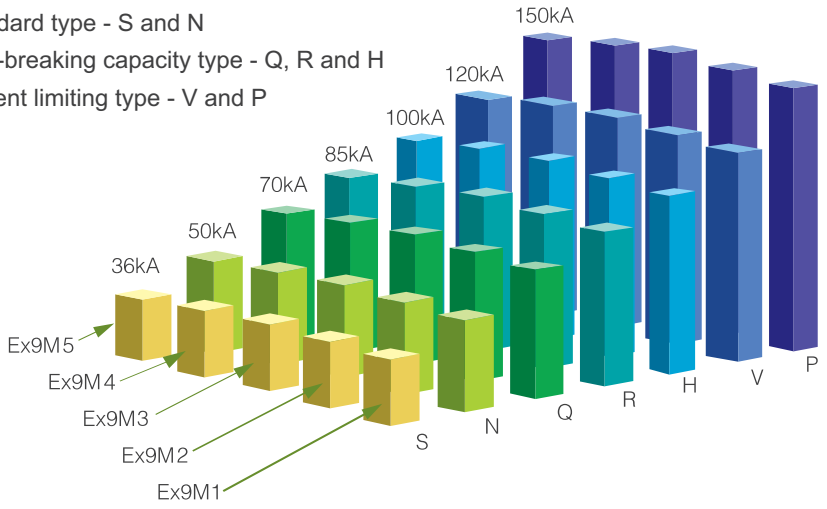
Parameters

Switch Disconnector		Ex9ASD04 Ex9ASD10	Ex9ASD06 Ex9ASD12	Ex9ASD08 Ex9ASD16	Ex9ASD16b Ex9ASD29	Ex9ASD20 Ex9ASD32	Ex9ASD25 Ex9ASD40
IEC / EN 60947-3							
Electrical performance							
poles	(P)	3P/4P					
Operating frequency	(Hz)	50/60					
Version		Fixed/Withdrawable					
Rated voltage U_e	(V)	380/400/415/660/690					
Rated current +40℃ I_n	(A)	400-630-800-1000-1250-1600			1600-2000-2500-2900-3200-4000		
Rated insulation voltage U_i	(V)	1000					
Rated impulse withstand voltage U_{imp}	(kV)	12					
Short-time withstand current I_{cw} (kA) 1s	400V	42			85		
Rated making current I_{cm}(kA)	400V	105			187		
Breaking and closing time (ms)	breaking	20~30					
	closing	<60			<70		
Acring distance		0					
Service life (C~O) Electrical	(415V)	6000			3000		
Isolation function		■					
Connection and Installation							
Load type		AC22A/AC23A					
Installation category		IV					
Pollution degree		3					
Operating freq.(cycles/h)		20					
Connection mode		Horizontal/Vertical/Hybrid					
Power supply		Top/Bottom					
Installation mode		withdrawable		fixed	withdrawable		fixed
Dimensions(cm)	W (3/4P)	254/324		282/382	424/539		437/552
	H	322		352	354		430
	D	255		394	329		401
Weight with inclusive release(kg)	3P	20		36	70/84		116
	4P	24		52	116/138		138

■ Standard configuration □ Optional — None

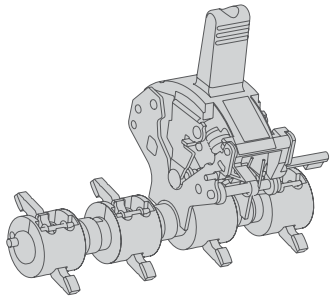
Ex9M1	Ex9M2	Ex9M3	Ex9M4	Ex9M5
Ex9M1M	Ex9M2M	Ex9M3M	Ex9M4M	Ex9M5M
Ex9M1SD	Ex9M2SD	Ex9M3SD	Ex9M1SD	Ex9M5SD
Ex9MD1	Ex9MD2	Ex9MD3	Ex9MD4	Ex9MD5
↓	↓	↓	↓	↓
125A	250A	400A	630A	800A

Standard type - S and N
High-breaking capacity type - Q, R and H
Current limiting type - V and P



Model	Rated current (A)																					
	16	20	25	32	40	50	63	80	100	125	160	180	200	225	250	315	350	400	500	630	700	800
Ex9M(D)1	■	■	■	■	■	■	■	■	■	■												
Ex9M(D)2										■	■	■	■	■	■							
Ex9M(D)3															■	■	■	■				
Ex9M(D)4																		■	■	■		
Ex9M(D)5																				■	■	■

Note:
- Ex9M(D)1 is adjustable for thermal protection, range: 0.8-1.0 In
- Ex9M(D)2 is adjustable for thermal and magnetic protection, range: 0.8-1.0 In, 5-10 In
- Ex9M(D)3,Ex9M(D)4 and Ex9M(D)5 are the same as Ex9M(D)2



Product Advantages

Rotating shaft with bearing

Patented technology

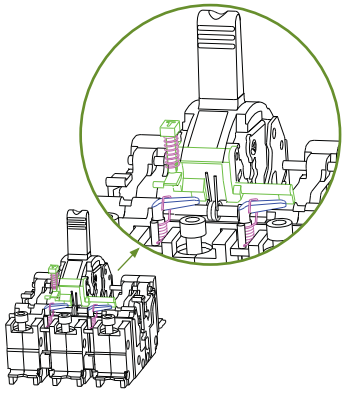
The innovative rotating shaft with bearing allows the circuit breaker to:

- Have a smaller main tension spring force and mechanism friction force
- Have lower mechanism abrasion
- Have a quicker and more flexible mechanism action

The innovative rotating shaft with bearing brings the user:

- A type of high-performance circuit breaker with the smallest operational force

Modle / Operational force	Ex9M(D)1		Ex9M(D)2		Ex9M(D)3		Ex9M(D)4		Ex9M(D)5	
	3P	4P	3P	4P	3P	4P	3P	4P	3P	4P
Closing force	44N	46N	55N	82N	80N	98N	110N	121N	110N	121N
Opening force	24N	24N	39N	55N	77N	89N	98N	115N	98N	115N
Re-tripping force	36N	38N	36N	54N	102N	115N	133N	148N	133N	148N

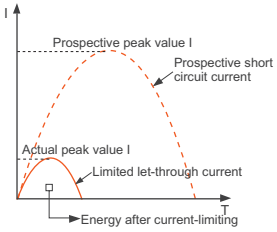


Snap action

Patented technology

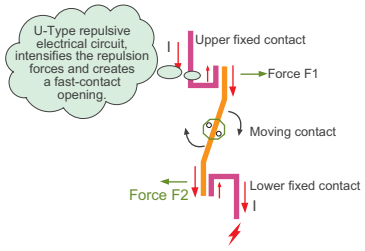
The breaking speed of the circuit breaker is accelerated (breaking time within 2 ms), and its breaking capacity and current limiting capacity are improved by utilizing a gas-flushing principle.

- There are several different breaking capacities for each model of Ex9M circuit breaker. Therefore, users may choose the most optimal breaker as per their actual demands.
- The maximum breaking capacity of each model of Ex9M circuit breaker is up to 150kA.



Current-limiting capacity

Means limiting the increase of the short circuit current in a circuit. In a circuit protected by the Ex9M product series, both the peak value and energy I^2t of the short circuit current generated are far less than expected.



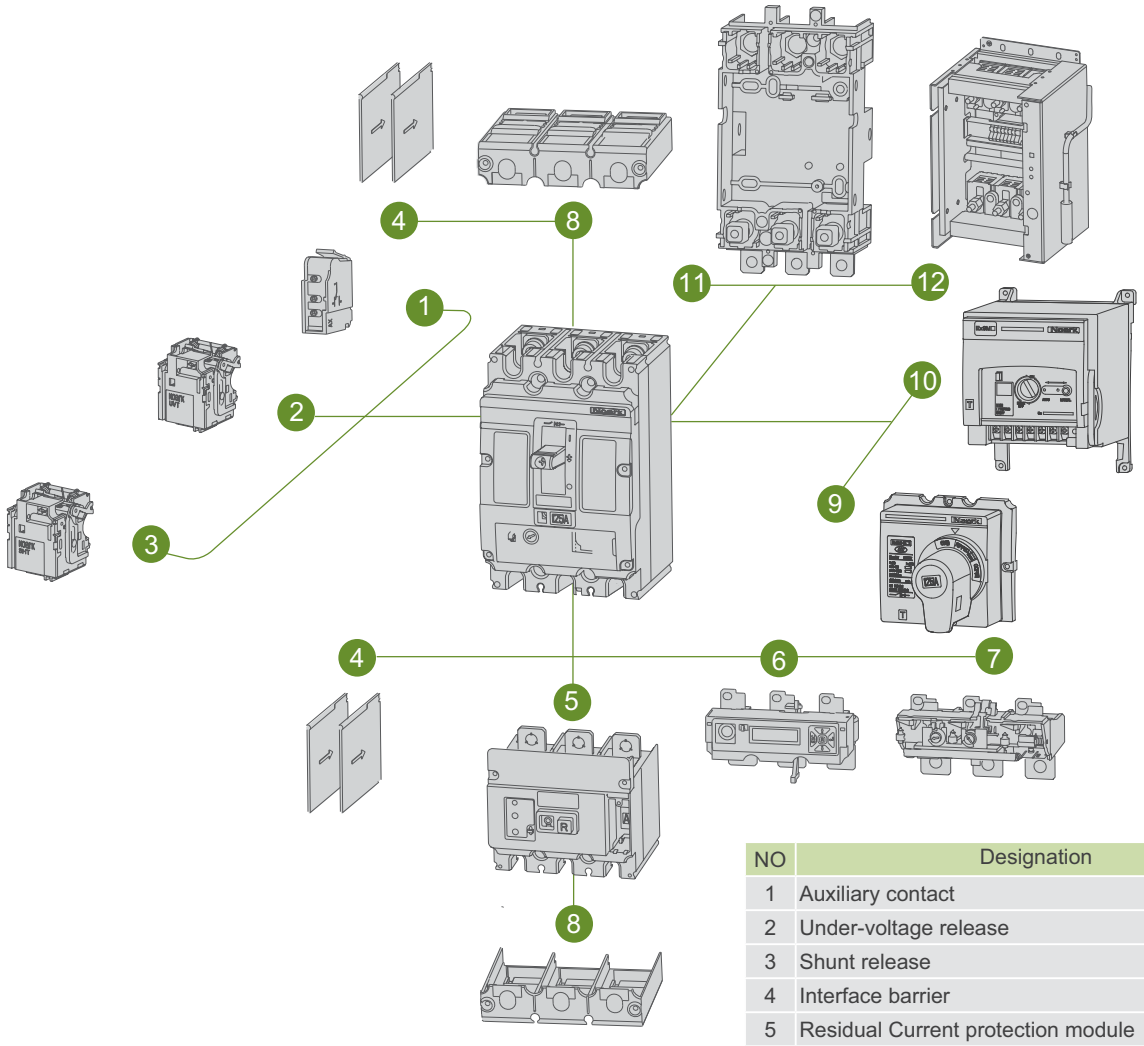
U-Type fixed contact design

The pre-breaking technique may be realised by means of a unique U-Type fixed contact.
The pre-breaking technique refers to that of the electrodynamic force generated through the U-Type fixed contact and that which occurs on the moving contact are mutually repulsed when the short circuit current flows through a contact system. The higher the short circuit current, the bigger the repulsive electrodynamic forces they generate simultaneously. Prior to releasing, the electrodynamic repulsive forces may separate the moving contact from the fixed contact, and the equivalent resistance between these two contacts is increased by stretching the electrical arc.

Double break design

The current-limiting function of the pre-breaking technique is enhanced because of increase in instantaneous arc resistance and arc voltage and a fast drop in the current increase rate.
Reduces the damage and loss of equipment and the power lines caused by a short circuit current, improves the safety, and cuts down on the cost of a secondary protection device.

Compact design, full range of accessories



NO	Designation	
1	Auxiliary contact	AX(AL)
2	Under-voltage release	UVT
3	Shunt release	SHT
4	Interface barrier	PHS
5	Residual Current protection module	Ex9ML
6	Electronic release	SU20
7	Thermo-magnetic release	TM(M)
8	Terminal shield	TCV
9	Manual operating mechanism	ERH/RHD
10	Motor mechanism	MOD
11	Plug-in rear connector	PIA
12	Draw out base	DOB

Ex9M Moulded Case Circuit Breaker

Ex9M	1	S	TM	AC	125	3P
Product Code	Rated Frame Current Code	Breaking Capacity Code	Tripping device code	AC/DC Code	Rated Current (A)	Poles
Ex9M:AC Protection	1:125A	B:25kA (DC)	TM: Thermomagnetic , for protection of general power distribution	AC: Alternating current	125, 100, 80, 63, 50, 40, 32, 25, 20, 16	2P ①
Ex9MD:DC Protection	2:250A	S:36kA		DC: Direct current	250, 225, 200, 180, 160, 125	3P
	3:400A	N:50kA	M: Magnetic type, for motor protection		400,350, 315,250	4P4T: Neutral protected, on-and -off
	4:630A	Q:70kA			630,500,400	4P4I: Neutral protected, without on-and -off ②
	5:800A	R:85kA			800,700,630	4P4U: Neutral unprotected, on-and -off ②
		H:100kA				4P4N: Neutral unprotected, without on-and -off ②
		V:120kA (AC)				
		P:150kA (AC)				

Example:

"Ex9M1S TM DC125 3P": means DC Moulded Case Circuit Breaker of the Ex9M series, frame current 125A, breaking capacity 36kA, 3 poles, rated current 125A with thermal-magnetic distribution protection trip unit.

Notes:①:2P only for Ex9M1, Ex9M2, Ex9MD1, Ex9MD2
②:Special Product – Please contact NOARK before placing an order

Ex9M Moulded Case Circuit Breaker(Electronic type)

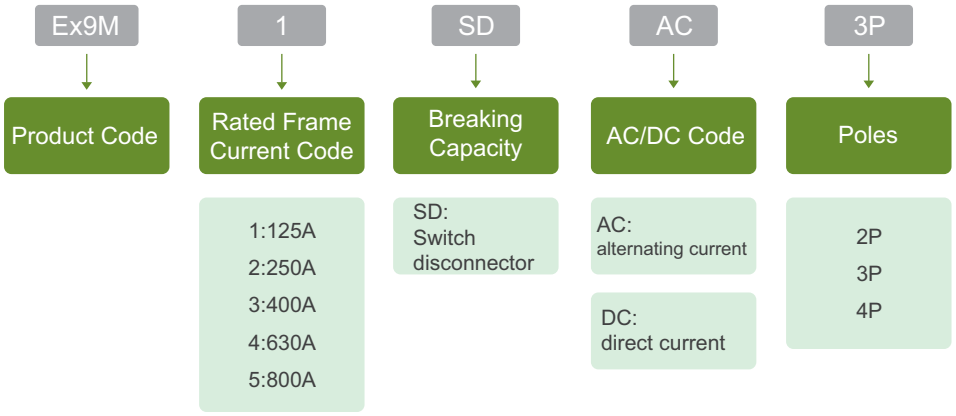
Ex9M	2	S	SU20S	AC	250	3P
Product Code	Rated Frame Current Code	Breaking Capacity Code	Tripping device code	AC/DC Code	Rated Current (A)	Poles
Ex9M: AC Protection	2:250A 3:400A 4:630A 5:800A	S:36kA	SU20S: Basic electronic distribution protection	AC: alternating current	250,160,100, 63,32	3P
		N:50kA	SU20SM: Basic electronic motor protection		400	4P4T: Neutral protected, on-and -off
		Q:70kA			630	4P4I: Neutral protected, without on-and -off ①
		R:85kA			800	4P4U: Neutral unprotected, on-and -off ①
		H:100kA				4P4N: Neutral unprotected, without on-and -off ①
		V:120kA				
		P:150kA				

Example:

Ex9M2S SU20S AC250 3P:Ex9M series MCCB, frame current 250A, breaking capacity 36kA, 3 poles, rated current 250A, with basic electronic distributon proctection trip unit

Notes:①Special Product – Please contact NOARK before placing an order
COM21 communication module is needed to realize the communication between the Ex9M electronic circuit breaker and the upper computer, which could also realize the remote signal, remote adjustment and measurement.MOD motor mechanism is needed to realize the function of remote control.

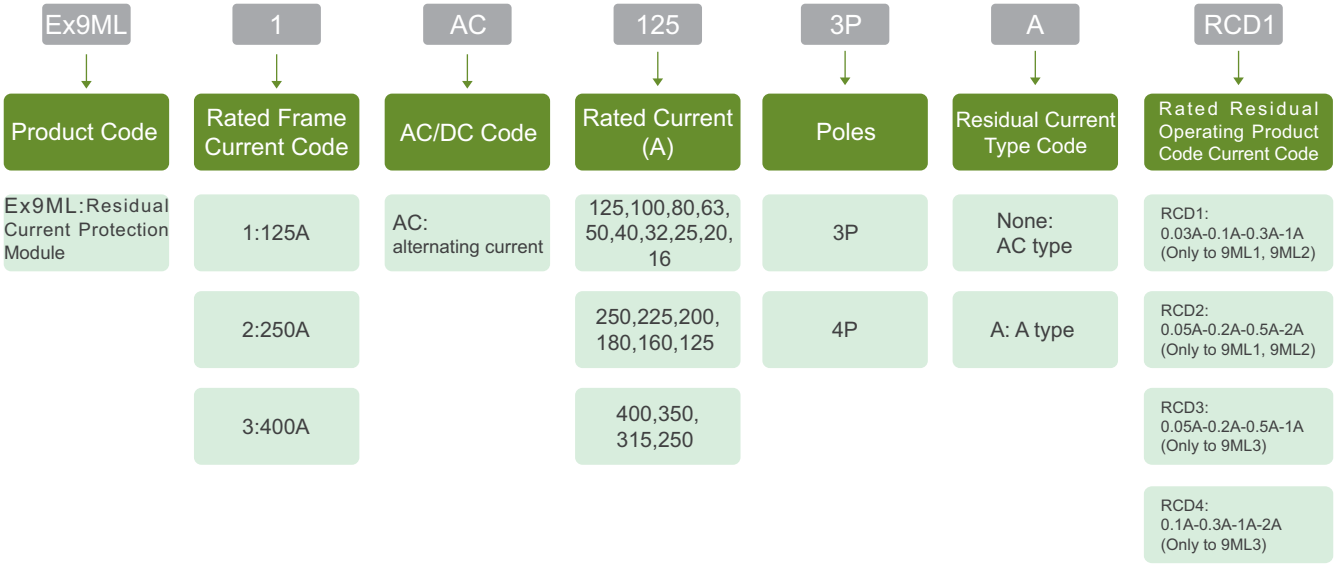
Ex9MSD Switch Disconnector



Example:

Ex9M1SD DC 3P:means an Ex9MSD switch disconnector,frame current 125A,DC,3 poles.

Ex9ML Residual Current Protection Module



Example:

Ex9ML1 AC125 3P RCD1 stands for Ex9ML series AC Residual Current Protection Module, frame current 125A,3 poles,rated current 125A,and four adjustable grades of rated residual operating current: 0.05A-0.2A-0.5A-2A.

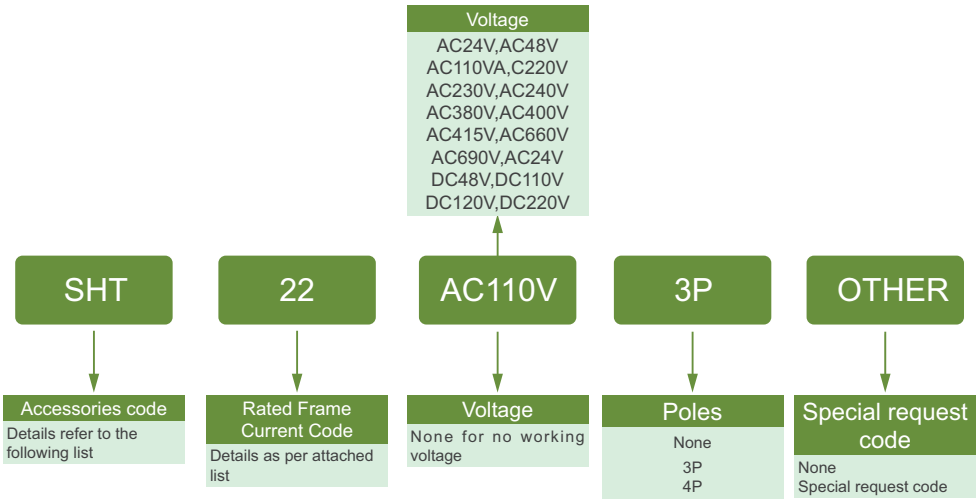
Notes:The series standard delay time: four adjustable grades: 0.1S-0.3S-0.5S-1S.

ELCB:

For any order including Moulded Case Circuit Breaker and Residual Current Protection Module, it is approved to abbreviated two SKU codes as one SKU code.

E.g.: The SKU codes of a Ex9M1 moulded case circuit breaker, 125A, 36KA, 3 poles, with thermal
release, with leakage protection of four adjusted grades: 0.03A-0.1A-0.3A-1A are:Ex9M1 S TM AC 125 3P and Ex9ML1 AC125 3P RCD1,can be abbreviated as Ex9M1 S TM AC125 3P RCD1.

Ex9M Series Products Accessories



Example:
SHT 22 AC110V:shunt release for 9M2, with control voltage of AC110V
RHD 23:direct rotary handle for 9M3

Accessories

Name	Specification	9M1	9M2	9M3	9M4	9M5
Auxiliary contact	AX	AX21				
Alarm contact	AL	AL21				
Shunt release	SHT	SHT21	SHT22			
Under-voltage release	UVT	UVT21	UVT22			
Direct rotary handle	RHD	RHD21	SHT21	RHD23	RHD24	
Extended rotary handle	ERH	ERH21	ERH22	ERH23	ERH24	
Motor mechanism	MOD	MOD21	MOD22	MOD23	MOD24	
Handle lock	KLK	KLK21	KLK22	KLK23	KLK24	
Mechanical interlock	MIT	MIT21	MIT22	MIT23	MIT24	
Terminal shield	TCV	TCV21	TCV22	TCV23	TCV24	
Extended terminal shield	TCE	TCE21	TCE22	TCE23	TCE24	
Rear connection plate	RCP	RCP21	RCP22	RCP23	RCP24	RCP25
Draw-out base	DOB	—	—	DOB23	DOB24	DOB25
Plug-in base	PIA	PIA21	PIA22	PIA23	—	—
Din-rail adaptor	DRA	DRA21	DRA22	—	—	—
Front panel escutcheon	CDP	CDP21	CDP22	CDP23	CDP24	
Communication module	COM	COM21(Used for 9M electronic type)				
Battery module	BAB	BAB21(Used for 9M electronic type)				

■YES □ Optional — NO

Parameters

Ex9M Series Circuit Breaker for Power Distribution Protection			Ex9M1							Ex9M2						
For protection of general power distribution																
Number of poles			2P/3P/4P							2P/3P/4P						
Rated frame current (A)			125							250						
Electrical performance																
Working frequency(Hz)			50/60							50/60						
Rated operational voltage(V)		U_e	380/400/415/660/690							380/400/415/660/690						
Rated current (A)		I_n +40°c	16-20-25-32-40-50-63-80-100-125							125-160①-180-200-225-250①						
Rated insulation voltage (V)		U_i	800							800						
Rated impulse withstand voltage (kV)		U_{imp}	8							8						
Type of breaking			S	N	Q	R	H	V	P	S	N	Q	R	H	V	P
Ultimate breaking capacity (kA)	I_{cu}	380/400/415V	36	50	70	85	100	120	150	36	50	70	85	100	120	150
		660/690/720V	5	5	5	5	6	6	8	6	6	6	6	8	8	10
Service breaking capacity (% I_{cu})	I_{cs}	415V	100%							100%						
		690V	100%							100%						
Isolation function			■							■						
Utilization category			A							A						
Service life (C-O cycle)	Mechanical	Actual mean value	15000							15000						
		Test value	7000							7000						
	Electrical 415V	Actual value	5000							5000						
		Standard value	1000							1000						
Protection																
Thermomagnetic		Long-time delay	(0.8-0.9-1.0)×I_n							(0.8-0.9-1.0)×I_n						
		Instantaneous	10×I_n							(5-6-7-8-9-10)×I_n						
Electronic		Long-time delay	—							(0.4~1.0)×I_n						
		Short-time delay	—							(1.5~10)×I_r						
		Instantaneous	—							(1.5~12)×I_n						
Control and indication																
Control mode	Manual	Direct (RHD)	□							□						
		Extended(ERH)	□							□						
	Motor mechanism(MOD)		□							□						
Shunt release	(SHT)		□							□						
Under-voltage release	(UVT)		□							□						
Auxiliary contact	(AX)		□							□						
Alarm contact	(AL)		□							□						
Connection and installation																
Degree of protection		All sides	IP40							IP40						
		Wiring terminal	IP20							IP20						
Wiring		Wiring assembly	Front/Rear							Front/Rear						
		Plug-in base(PIA)	□							□						
		Draw-out base(DOB)	—							—						
Terminal shield (TCV)		Front	□							□						
		Rear	—							—						
Key lock (KLK)			ON/OFF position							ON/OFF position						
Phase shield (PHS)			■							■						
Mechanical interlock(MIT)			□							□						
External dimensions (mm) W × H × D		a(2*/3/4)	62/90/120							70/105/140						
		b	140							157						
		c	81.6							91.5						
Weight (kg)		2P	0.9							1.2						
		3P	1.2							1.7						
		4P	1.7							2.2						

■ Standard □ Optional — None * only Ex9M1,Ex9M2 have 2P. Note:Rated current of electronic MCCB, rated current of electronic Ex9M2 is 250A, 160A, 100A, 63A and 32A.

	Ex9M3							Ex9M4							Ex9M5						
	 							 							 						
	3P/4P							3P/4P							3P/4P						
	400							630							800						
	50/60							50/60							50/60						
	380/400/415/660/690							380/400/415/660/690							380/400/415/660/690						
	250-315-350-400[①]							400-500-630[①]							630-700-800[①]						
	800							800							800						
	8							8							8						
	S	N	Q	R	H	V	P	S	N	Q	R	H	V	P	S	N	Q	R	H	V	P
	36	50	70	85	100	120	150	36	50	70	85	100	120	150	36	50	70	85	100	120	150
	10	10	10	10	12	12	15	10	10	10	10	12	12	15	10	10	10	10	12	12	15
	100%							100%							100%						
	100%							100%							100%						
	■							■							■						
	A							A							A						
	10000							10000							5000						
	4000							4000							2500						
	2000							2000							1000						
	1000							1000							500						
	$(0.8\text{-}0.9\text{-}1.0)\times I_n$							$(0.8\text{-}0.9\text{-}1.0)\times I_n$							$(0.8\text{-}0.9\text{-}1.0)\times I_n$						
	$(5\text{-}6\text{-}7\text{-}8\text{-}9\text{-}10)\times I_n$							$(5\text{-}6\text{-}7\text{-}8\text{-}9\text{-}10)\times I_n$							$(5\text{-}6\text{-}7\text{-}8\text{-}9\text{-}10)\times I_n$						
	$(0.4\sim1.0)\times I_n$							$(0.4\sim1.0)\times I_n$							$(0.4\sim1.0)\times I_n$						
	$(1.5\sim10)\times I_r$							$(1.5\sim10)\times I_r$							$(1.5\sim10)\times I_r$						
	$(1.5\sim12)\times I_n$							$(1.5\sim12)\times I_n$							$(1.5\sim12)\times I_n$						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	IP40							IP40							IP40						
	IP20							IP20							IP20						
	Front/Rear							Front/Rear							Front/Rear						
	□							—							—						
	□							□							□						
	□							□							□						
	—							—							—						
	ON/OFF position							ON/OFF position							ON/OFF position						
	■							■							■						
	□							□							□						
	140/185							195/260							195/260						
	255							300							300						
	118.5							142							142						
	—							—							—						
	5.0							10.2							10.2						
	6.6							13.5							13.5						

Parameters

Ex9M Series Circuit Breaker for motor protection			Ex9M1M							Ex9M2M						
For motor protection																
Number of poles			2P/3P/4P							2P/3P/4P						
Rated frame current (A)			125							250						
Electrical performance																
Working frequency(Hz)			50/60							50/60						
Rated operational voltage (V) U_e			380/400/415/660/690							380/400/415/660/690						
Rated current (A) I_n			16-20-25-32-40-50-63-80-100-125							125-160①-180-200-225-250①						
Rated insulation voltage (V) U_i			800							800						
Rated impulse withstand voltage (kV) U_{imp}			8							8						
Type of breaking			S	N	Q	R	H	V	P	S	N	Q	R	H	V	P
Ultimate breaking capacity (kA) I_{cu}	380/400/415V		36	50	70	85	100	120	150	36	50	70	85	100	120	150
	660/690/720V		5	5	5	5	6	6	8	6	6	6	6	8	8	10
Service breaking capacity (% Icu) I_{cs}	415V		100%							100%						
	690V		100%							100%						
Isolation function			■							■						
Utilization category			A							A						
Service life (C-O cycle)	Mechanical	Actual mean value	15000							15000						
		Test value	7000							7000						
	Electrical	Actual value	5000							5000						
		Standard value	1000							1000						
Protection																
Magnetic		Long-time delay	—							—						
		Short-time delay	—							—						
		Instantaneous	$12\times I_n$							$(9\text{-}10\text{-}11\text{-}12\text{-}13\text{-}14)\times I_n$						
Electronic		Long-time delay	—							—						
		Instantaneous	—							$(1.5\sim14)\times I_n$						
Control and indication																
Control mode	Manual	Direct(RHD)	□							□						
		Extended(ERH)	□							□						
	Motor mechanism(MOD)		□							□						
Shunt release(SHT)			□							□						
Under-voltage release(UVT)			□							□						
Auxiliary contact(AX)			□							□						
Alarm contact(AL)			□							□						
Connection and installation																
Degree of protection	All sides		IP40							IP40						
	Wiring terminal		IP20							IP20						
Wiring	Wiring assembly		Front/Rear							Front/Rear						
	Plug-in base(PIA)		□							□						
	Draw-out base(DOB)		—							—						
Terminal shield(TCV)	Front		□							□						
	Rear		—							—						
Key lock(KLK)			ON/OFF position							ON/OFF position						
Phase shield(PHS)			■							■						
Mechanical interlock(MIT)			□							□						
External dimensions (mm) W × H × D		a(2*/3/4)	62/90/120							70/105/140						
		b	140							157						
		c	81.6							91.5						
Weight (kg) Fixed before connection	2P		0.9							1.2						
	3P		1.2							1.7						
	4P		1.7							2.2						

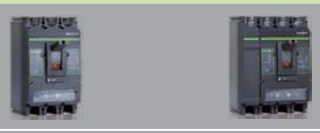
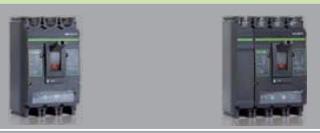
■ Standard □ Optional — None * only Ex9M1,Ex9M2 have 2P. Note①:Rated current of electronic MCCB, rated current of electronic Ex9M2 is 250A, 160A, 100A, 63A and 32A.

	Ex9M3M							Ex9M4M							Ex9M5M						
	 							 							 						
	3P/4P							3P/4P							3P/4P						
	400							630							800						
	50/60							50/60							50/60						
	380/400/415/660/690							380/400/415/660/690							380/400/415/660/690						
	250-315-350-400①							400-500-630①							630-700-800①						
	800							800							800						
	8							8							8						
	S	N	Q	R	H	V	P	S	N	Q	R	H	V	P	S	N	Q	R	H	V	P
	36	50	70	85	100	120	150	36	50	70	85	100	120	150	36	50	70	85	100	120	150
	10	10	10	10	12	12	15	10	10	10	10	12	12	15	10	10	10	10	12	12	15
	100%							100%							100%						
	50%							100%							100%						
	■							■							■						
	A							A							A						
	10000							10000							5000						
	4000							4000							2500						
	2000							2000							1000						
	1000							1000							500						
	—							—							—						
	—							—							—						
	(9-10-11-12-13-14)×I_n							(9-10-11-12-13-14)×I_n							(9-10-11-12-13-14)×I_n						
	—							—							—						
	(1.5~14)×I_n							(1.5~14)×I_n							(1.5~14)×I_n						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	□							□							□						
	IP40							IP40							IP40						
	IP20							IP20							IP20						
	Front/Rear							Front/Rear							Front/Rear						
	□							—							—						
	□							□							□						
	□							□							□						
	—							—							—						
	ON/OFF position							ON/OFF position							ON/OFF position						
	■							■							■						
	□							□							□						
	140/185							195/260							195/260						
	255							300							300						
	118.5							142							142						
	—							—							—						
	5.0							10.2							10.2						
	6.6							13.5							13.5						

Parameters

Ex9M Series Switch Disconnector				Ex9M1SD	Ex9M2SD
Switch disconnector					
Number of poles				2P/3P/4P	2P/3P/4P
Rated frame current (A)				125	250
Electrical performance					
Working frequency(Hz)			f	50/60	50/60
Rated operational voltage (V)Ue			AC	380/400/415/660/690	380/400/415/660/690
			DC	500/750/1000	500/750/1000
Rated working current(A) In			AC	125	250
			DC	125	250
Rated insulation voltage(V)			Ui	1000	1000
Rated impulse withstand voltage			U_{imp}	8	8
Rated shorttime withstand current (A)		(A)	1s	1800	3200
			3s	1800	3200
			20s	700	1350
Isolation function				■	■
Utilization type			AC	AC22A/AC23A	AC22A/AC23A
			DC	DC22A/DC23A	DC22A/DC23A
Service life (C-O)	Mechanical		Actual mean value	15000	15000
			Test value	7000	7000
	Electrical		Actual value	5000	5000
			Standard value	1000	1000
Control and indication					
Control mode	Manual		Direct(RHD)	□	□
			Extended(ERH)	□	□
	Motor mechanism(MOD)			□	□
Shunt release(SHT)				□	□
Under-voltage release(UVT)				□	□
Auxiliary contact(AX)				□	□
Alarm contact(AL)				□	□
Connection and installation					
Degree of protection	All sides			IP40	IP40
	Wiring terminal			IP20	IP20
Wiring	Wiring assembly			Front/Rear	Front/Rear
	Plug-in base(PIA)			□	□
	Draw-out base(DOB)			—	—
Terminal shield(TCV)	Front			□	□
	Rear			—	—
Key lock(KLK)				ON/OFF position	ON/OFF position
Phase shield(PHS)				■	■
Mechanical interlock(MIT)				□	□
External dimensions (mm) W × H × D			a(2*/3/4)	62/90/120	70/105/140
			b	140	157
			c	81.6	91.5
Weight (Kg) (Fixed before connection)	2P			0.6	1.1
	3P			1.0	1.5
	4P			1.5	2.0

■ standard □Optional — None ⁎ Only Ex9M1SD, Ex9M2SD have 2 P; 500V for 2 poles in series connection, 750V for 3 poles in series connection,1000V for 4 poles in series connection

	Ex9M3SD	Ex9M4SD	Ex9M5SD
			
	3P/4P	3P/4P	3P/4P
	400	630	800
	50/60	50/60	50/60
	380/400/415/660/690	380/400/415/660/690	380/400/415/660/690
	750/1000	750/1000	750/1000
	400	630	800
	400	630	800
	1000	1000	1000
	8	8	8
	5000	8000	10000
	5000	8000	10000
	2400	3000	3800
	■	■	■
	AC22A/AC23A	AC22A/AC23A	AC22A/AC23A
	DC22A/DC23A	DC22A/DC23A	DC22A/DC23A
	10000	5000	5000
	4000	4000	2500
	2000	2000	2000
	1000	1000	500
	□	□	□
	□	□	□
	□	□	□
	□	□	□
	□	□	□
	□	□	□
	□	□	□
	IP40	IP40	IP40
	IP20	IP20	IP20
	Front/Rear	Front/Rear	Front/Rear
	□	—	—
	□	□	□
	□	□	□
	—	—	—
	ON/OFF position	ON/OFF position	ON/OFF position
	■	■	■
	□	□	□
	140/185	195/260	195/260
	255	300	300
	118.5	142	142
	—	—	—
	4.5	9.5	9.5
	6.0	12.7	12.7

Parameters

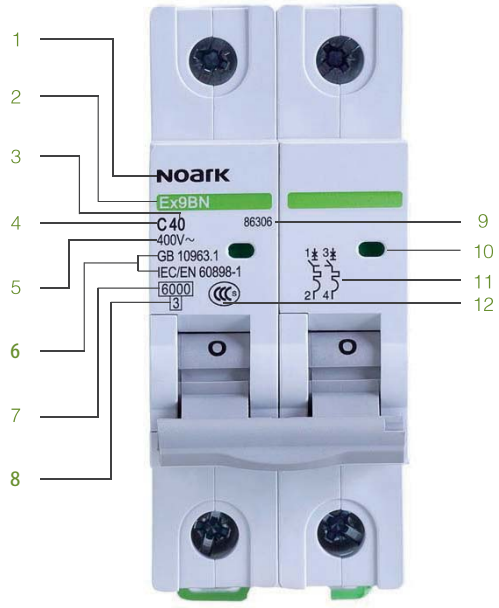
Ex9MD Series DC Circuit Breaker			Ex9MD1						Ex9MD2					
For PV system														
Number of poles			2P/3P/4P						2P/3P/4P					
Rated frame current (A)			125						250					
Electrical performance														
Rated working voltage (V) U_e			500/750/1000						500/750/1000					
Rated current (A) I_n			16-20-25-32-40-50-63-80-100-125						125-160-180-200-225-250					
Rated insulation voltage (V) U_i			1000						1000					
Rated impulse withstand voltage (kV) U_{imp}			8						8					
Type of breaking			B	S	N	Q	R	H	B	S	N	Q	R	H
Ultimate breaking capacity (kA) I_{cu} 1000V DC			25	36	50	70	85	100	25	36	50	70	85	100
Service breaking capacity (% Icu) I_{cs}			100%						100%					
Isolation function			■						■					
Utilization category			A						A					
Service life (C-O cycle)	Mechanical	Actual mean value	15000						15000					
		Test value	7000						7000					
	Electrical	Actual value	5000						5000					
		Standard value	1000						1000					
Protection														
Thermomagnetic		Long-time delay	(0.8-0.9-1.0)×I_n						(0.8-0.9-1.0)×I_n					
		Short-time delay	—						—					
		Instantaneous	10×I_n						(5-6-7-8-9-10)×I_n					
Control and indication														
Control mode	Manual	Direct(RHD)	□						□					
		Extended(ERH)	□						□					
	Motor mechanism(MOD)		□						□					
Shunt release(SHT)			□						□					
Under-voltage release(UVT)			□						□					
Auxiliary contact(AX)			□						□					
Alarm contact(AL)			□						□					
Connection and installation														
Degree of protection	All sides		IP40						IP40					
	Wiring terminal		IP20						IP20					
Wiring	Wiring assembly		Front/rear						Front/rear					
	Plug-in base(PIA)		□						□					
	Draw-out base(DOB)		—						—					
Shorted row(DCB)			■						■					
Key lock(KLK)			ON/OFF position						ON/OFF position					
Phase shield(PHS)			■						■					
Mechanical interlock(MIT)			□						□					
External dimensions (mm) W × H × D		a(2*/3/4)	62/90/120						70/105/140					
		b	140						157					
		c	81.6						91.5					
Weight (kg) (Fixed before connection)	2P		0.9						1.2					
	3P		1.2						1.7					
	4P		1.7						2.2					

■standard □Optional — None

* Only Ex9MD1 Ex9MD2 have 2 P; 500V for 2 poles in series connection, 750V for 3 poles in series connection, 1000V for 4 poles in series connection

	Ex9MD3						Ex9MD4						Ex9MD5					
	 						 						 					
	3P/4P						3P/4P						3P/4P					
	400						630						800					
	750/1000						750/1000						750/1000					
	250-315-350-400						400-500-630						630-700-800					
	1000						1000						1000					
	8						8						8					
	B	S	N	Q	R	H	B	S	N	Q	R	H	B	S	N	Q	R	H
	25	36	50	70	85	100	25	36	50	70	85	100	25	36	50	70	85	100
	100%						100%						100%					
	■						■						■					
	A						A						A					
	10000						10000						5000					
	4000						4000						2500					
	2000						2000						1000					
	1000						1000						500					
	(0.8-0.9-1.0)×I_n						(0.8-0.9-1.0)×I_n						(0.8-0.9-1.0)×I_n					
	—						—						—					
	(5-6-7-8-9-10)×I_n						(5-6-7-8-9-10)×I_n						(5-6-7-8-9-10)×I_n					
	□						□						□					
	□						□						□					
	□						□						□					
	□						□						□					
	□						□						□					
	□						□						□					
	□						□						□					
	IP40						IP40						IP40					
	IP20						IP20						IP20					
	Front/rear						Front/rear						Front/rear					
	□						—						—					
	□						□						□					
	■						■						■					
	ON/OFF position						ON/OFF position						ON/OFFposition					
	■						■						■					
	□						□						□					
	140/185						195/260						195/260					
	255						300						300					
	118.5						142						142					
	—						—						—					
	5.0						10.2						10.2					
	6.6						13.5						13.5					

Appearance



1 Brand
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Characteristics

Instantaneous tripping type

- Curve B
  Protection for pure resistance load and low inductive illuminating system
  Rated current:1-63A(30℃)
  Tripping characteristic:
  instantaneous tripping range(3-5)In
- Curve C
  Protection for inductive load and high inductive illuminating system.
  Rated current:1-63A(30℃)
  Tripping characteristic:
  instantaneous tripping range(5-10)In
- Curve D
  Protection for high inductive load and high inrush current when starting(such as motor and transformer)
  Rated current:1-63A(30℃)
  Tripping characteristic:
  instantaneous tripping range(10-14)InTripping characteristic:
  instantaneous tripping range(3-5)I_n

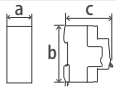
Conformed standard

IEC/EN60898-1

Selection Guide

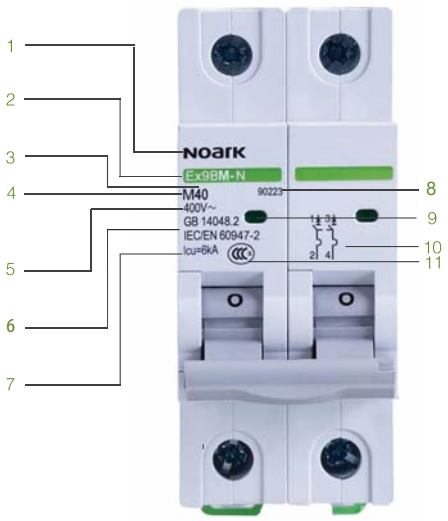
Ordering code 86266	Ex9B	N	3P	B	32A
	Product code	Breaking capacity	Poles	Tripping curve	Rated current
	MCB	N:6kA H:10kA	1P/2P/3P/4P	Ex9BN(6kA) B/C/D Ex9BH(10kA) C/D	1A,2A,3A,4A, 6A,10A,16A, 20A,25A,32A, 40A,50A,63A

Parameters

MCB Ex9B						
For protection of general power distribution (IEC/EN 60898-1)						
Poles			1P	2P	3P	4P
Electrical performance						
Functions			short circuit protection,overload protection,isolation,control			
Rated frequency	f	Hz	50/60			
Rated working voltage	U_e	V AC	230/400			
Rated current	I_n	A	1,2,3,4,6,10,16,20,25,32,40,50,63			
Rated insulated voltage	U_i	V	690			
Impulse withstand voltage	U_{imp}	kV	4			
Current limiting level			3			
Instantaneous tripping type		Ex9BN	B/C/D			
		Ex9BH	C/D			
Rated short circuit Icn (kA)		Ex9BN	6			
		Ex9BH	10			
Release type			Thermal magnetic type			
Service life (O~C)	Mechanical	Actual value	20000			
		Standard value	4000			
	Electrical	Actual value	10000			
		Standard value	4000			
Control and indication						
Auxiliary contact			□			
Alarm contact			□			
Shunt release			□			
Undervoltage release			□			
Overvoltage release			□			
Connection and installation						
Protection degree			IP20			
Padlock			ON/OFF position			
Wire		mm^2	1~35			
Working temperature			-30℃~+70°C			
Resistance to humidity and heat			Class 2			
Altitude above sea		m	≤2000			
Relative humidity			+20°C,≤95%;+40°C,≤50%			
Pollution degree			2			
Installation environment			Avoid obvious shock and vibration			
Installation class			Class III			
Mounting			DIN35 rail			
Dimensions(mm) (WxHxL) 		a	18	36	54	72
		b	89	89	89	89
		c	72	74	74	74
Weight		kg	0.12	0.24	0.36	0.48

■ Standard □ Optional — None

Appearance



1 Brand
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Characteristics

Instantaneous tripping type

- Curve M

Apply to medical, IT power distribution systems, motor protection and building fire systems, etc
Rated current:1-63A (30℃)
Tripping characteristic: instantaneous tripping range (9.6~14.4)In

Conformed standards

IEC / EN60947-2

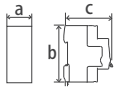
* Ex9BM must be used together with thermal relay or motor starter to achieve the purpose of overload protection

Selection Guide

Ordering code 86266 → Ex9BM | H | 3P | M | 32A | SHT

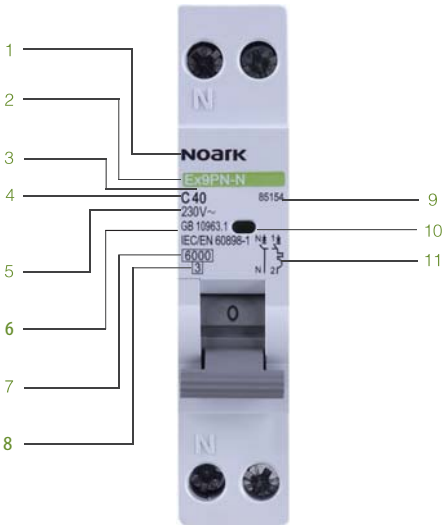
Product code	Breaking capacity	Poles	Tripping curve	Rated current	Electric accessories
Motor protecting miniature circuit breaker	N:6kA H:10kA	1P/2P/3P/4P	M	1A,2A,3A,4A, 6A,10A,16A, 20A,25A,32A, 40A,50A,63A	AX:Auxiliary contact AL:Alarm contact SHT:Shunt release UVT:Undervoltage release

Parameters

MCB Ex9BM						
For protection of motor (IEC/EN 60947-2)						
Poles			1P	2P	3P	4P
Electrical specification						
Functions			short circuit protection,isolation,control			
Rated frequency	f	Hz	50/60			
Rated working voltage	U_e	V AC	230/400			
Rated current	I_n	A	1,2,3,4,6,10,16,20,25,32,40,50,63			
Rated insulated voltage	U_i	V	690			
Impulse withstand voltage	U_{imp}	kV	4			
Instantaneous tripping type			M			
Rated short circuit I_{cn}	(kA)	Ex9BM-N	6			
		Ex9BM-H	10			
Release type			Thermal magnetic type			
Service life (O~C)	Mechanical	Actual value	20000			
		Standard value	8500			
	Electrical	Actual value	10000			
		Standard value	1500			
Control and indication						
Auxiliary contact			□			
Alarm contact			□			
Shunt release			□			
Undervoltage release			□			
Overvoltage release			□			
Connection and installation						
Protection degree			IP20			
Padlock			ON/OFF position			
Wire		mm^2	1~35			
Working temperature			-30℃~+70℃			
Resistance to humidity and heat			Class 2			
Altitude above sea		m	≤2000			
Relative humidity			+20℃,≤95%,+40°C,≤50%			
Pollution degree			2			
Installation environment			Avoid obvious shock and vibration			
Installation class			Class III			
Mounting			DIN35 rail			
Dimensions(mm) (WxHxL) 		a	18	36	54	72
		b	89	89	89	89
		c	72	74	74	74
Weight		kg	0.12	0.24	0.36	0.48

■ Default □ Optional — None

Appearance



1 Brand
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Characteristics

Instantaneous tripping type

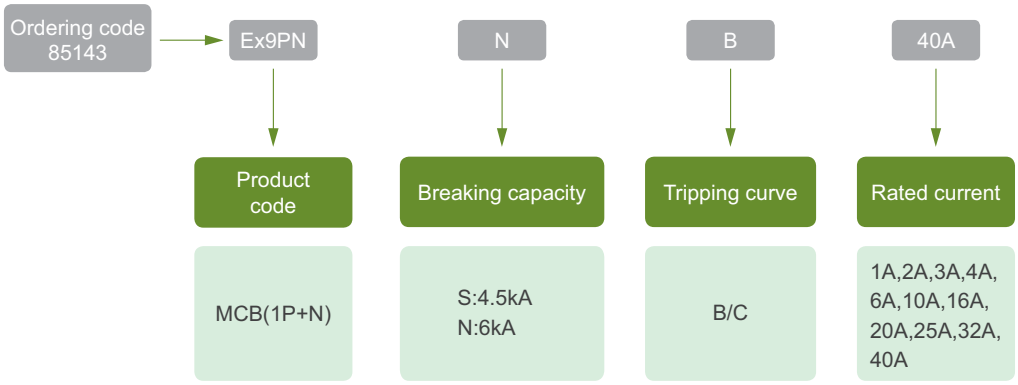
- Curve B
  Protection for pure resistance load and low inductive illuminating system.
  Rated current:1~40A(30℃)
  Tripping characteristic:
  instantaneous tripping range(3-5)In

- Curve C
  Protection for inductive load and high inductive illuminating system.
  Rated current:1~40A(30℃)
  Tripping characteristic:
  instantaneous tripping range(5-10)In

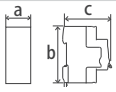
Conformed standards

IEC / EN60898-1

Selection Guide

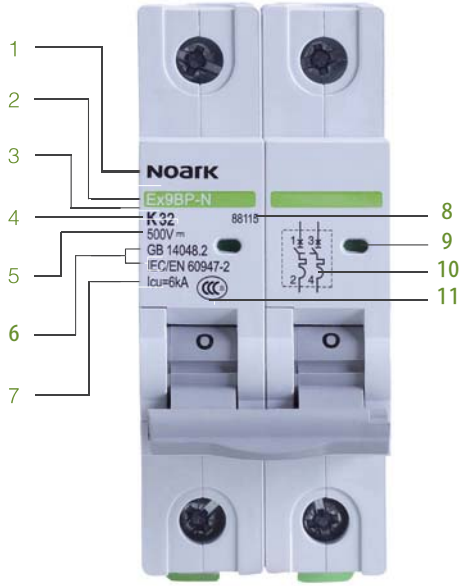


Parameters

MCB Ex9PN				
For protection of general power distribution (IEC/EN 60898-1)				
Poles				1P+N
Electrical performance				
Functions				short circuit protection,overload protection,isolation,control
Rated frequency	f		Hz	50/60
Rated working voltage	U_e		V AC	230
Rated current	I_n		A	1,2,3,4,6,10,16,20,25,32,40
Rated insulated voltage	U_i		V	400
Impulse withstand voltage	U_{imp}		kV	4
Current limiting level				3
Instantaneous tripping type			Ex9PN-S	B/C
			Ex9PN-N	B/C
Rated short circuit Icn (kA)			Ex9PN-S	4.5
			Ex9PN-N	6
Release type				Thermal magnetic type
Service life (O~C)	Mechanical		Actual value	20000
			Standard value	4000
	Electrical		Actual value	10000
			Standard value	4000
Control and indication				
Auxiliary contact				□
Alarm contact				□
Shunt release				□
Undervoltage release				□
Overvoltage release				□
Connection and installation				
Protection degree				IP20
Padlock				ON/OFF position
Wire			mm^2	1~16
Working temperature				-30℃~+70℃
Resistance to humidity and heat				Class 2
Altitude above sea			m	≤2000
Relative humidity				+20°C,≤95%,+40°C,≤50%
Pollution degree				2
Installation environment				Avoid obvious shock and vibration
Installation class				Class III
Mounting				DIN35 rail
Dimensions(mm) (WxHxL)			a	18
			b	89
			c	72
Weight			kg	0.12

■ Standard □ Optional — None

Appearance



1 Brand
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Characteristics

Instantaneous tripping type

- Curve C
  Protection for low PV module perceptual load and photovoltaic line system
  Rated current:1~63A(30℃)
  Tripping characteristic:
  instantaneous tripping range(7-14)In
- Curve K
  Protection for high PV module perceptual load and photovoltaic line system,and have a higher impact resistant current ability
  Tripping characteristic:
  instantaneous tripping range(14-20)In

Features

The product can realize non-polarity wiring,and ensure the safety of equipment

Conformed standards

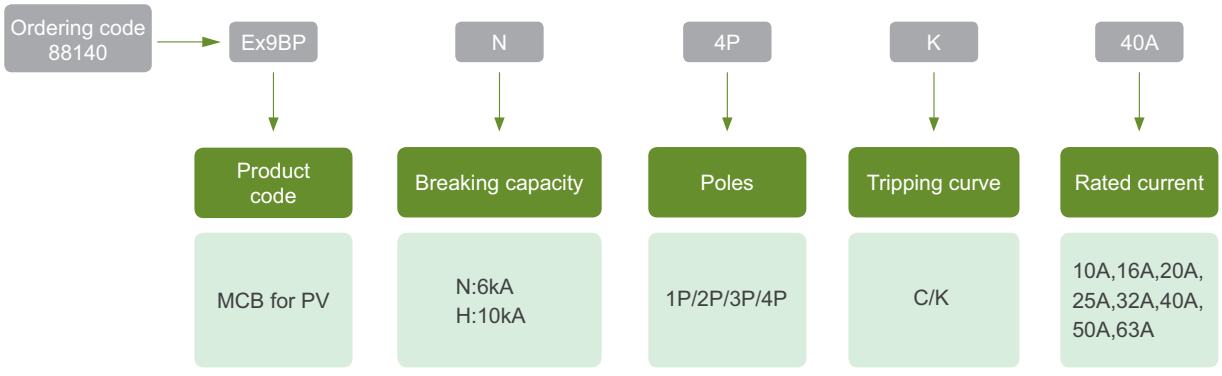
IEC / EN60898-1

Altitude

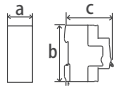
Ex9BP Series products have passed the high-altitude test and the test data are as follows.

Altitude(m)	2000	3000	4000	5000
Dielectric(V DC)	3110	2799	2550.2	2332.5
Max working voltage for 4P tandem connection (VDC)	1000	900	820	750
40℃ thermal rating(A)	$1\times I_n$	$0.96\times I_n$	$0.93\times I_n$	$0.9\times I_n$
Rated impulse withstand voltage Uimp(kV)	4	3.6	3	2.2

Selection Guide



Parameters

MCB Ex9BP for PV						
For PV system only (IEC/EN 60947-2)						
Poles			1P	2P	3P	4P
Rated frame current (A)			63			
Electrical performance						
Rated working voltage U_e		V DC	250	500	750	1000
Rated current I_n		A	10,16,20,25,32,40,50,63			
Rated insulated voltage U_i		V	1000			
Rated implused voltage U_{imp}		kV	4			
Type of breaking			N/H			
Ultimate breaking capacity		kA	6/10			
Service breaking capacity (%Icu)			100%			
Curve type			C/K			
Tripping type			Thermal magnetic type			
Service life (C-O)	Mechanica	Actual value	20000			
		Standard value	8500			
	Electrical	Actual value	10000			
		Standard value	1500			
Control and indication						
Auxiliary contact			□			
Alarm contact			□			
Shunt release			□			
Undervoltage release			□			
Overvoltage release			□			
Connection and installation						
Protection degree	All sides		IP40			
	Connection terminal		IP20			
Padlock			ON/OFF position			
Wire		mm^2	1~35			
Working temperature			-30℃~+70℃			
Resistance to humidity and heat			Class 2			
Altitude above sea		m	≤2000			
Relative humidity			+20°C,≤95%;+40°C,≤50%			
Pollution degree			3			
Installation environment			Avoid obvious shock and vibration			
Installation class			Class III			
Mounting			DIN35 rail			
Dimensions(mm) (WxHxL) 		a	18	36	54	72
		b	89	89	89	89
		c	72	74	74	74
Weight		kg	0.12	0.24	0.36	0.48

■ Standard □ Optional — None

Accessories Overview

Ex9B/Ex9PN/Ex9BP have five kinds of accessories

- **Alarm contact AL3111/AXL31**

Function
When MCB trips because of faults,the mechanical indicator on the panel can indicate the fault trip.AXL31 has the function of auxiliary and alarm also.

- **Auxiliary contact AX3111/AX3122**

Function
To indicate ON or OFF status of the circuit breaker

- **Shunt release SHT31/SHT3111**

Function
SHT should be combined with MCB to realize the function of remote trip.

- **Undervoltage release UVT31/ UVT3101/UVT3110**

Function
UVT should be combined with MCB to realize the following function: When the voltage decrease to 70%-35%Ue,the release make the breaker trip;only when the voltage resume to 85%-110%Ue,it ensures the breaker ON

- **Overvoltage release OVT31**

Function
When the voltage ranges to 280V ±5% for fault or some other reasons,overvoltage release make the circuit breaker disconnect;Overvoltage release can be used together with undervoltage release to provide comprehensive protection.

Technical specifications

Rated current of AL31/AXL31/AX31:

working voltage(V)		rated current(A)
AC	240	6
	415	3
DC	24	6
	48	2
	130	1

Conformed standards

IEC/EN 60947-1
IEC/EN 60947-5-1

Assembly of MCB and accessories

Contacts (maximum width:18mm)

Release (maximum width: 36mm)

Alarm contact AL31/AXL31 | Auxiliary contact AX31 | Shunt release SHT31 | Undervoltage release UVT31 | Overvoltage release OVT31 | Circuit breaker Ex9B

Introduction

- Full range of accessories,realize the function of remote monitoring
- Modular design and convenient installation
- The special design makes it easy to realize the function
- Each MCB can be assembled with 2 release,3 indicating accessories with 1 group of contact or 2 indicating accessories with 2 release accessories

Appearance

- Residual Current Circuit Breakers according to IEC / EN 61008-1
- Conditional rated short circuit strength I_{cn} 6kA,10kA
- 2 and 4-pole versions
- Rated residual current 30, 100, 300 mA
- Rated current up to 100 A
- Suitable for domestic as well as industrial applications
- AC, A, S and S+A types Rated

Characteristics

Rated operational voltage 230/400 V AC

Rated frequency 50/60 Hz

Ex9CL residual current circuit breakers are based on permanent magnet principle. It brings the advantage of Voltage independent function. Nonzero Voltage is only necessary when testing of the RCCB with the T test button. Magnetic RCCBs should be tested regularly with a period of one month.

Selection Guide

Ordering code	Ex9CL	-H	2P	63A	A	300mA	S
	Product	Conditional short circuit strength	Poles	Rated current	Sensitivity to type of current	Rated residual current	Time delay (insensivity)
	CL: RCCB	-N:6kA(63A case) -H: 10 kA(63A case) -100: 10 kA(100A case)	2,4	25A, 40A, 63A, 80A, 100 A	_ : AC A : A	30mA, 100mA, 300 mA	_ : 0 ms (63A case) S : 40 ms (100A case)

Parameters

Electrical parameters	Ex9CL-H	Ex9CL-100	Ex9CL-N
Tested according to	IEC/EN 61008		
Rated op. voltage Ue	230/400 V AC		240/415V AC
Min. voltage for RCD function	voltage independent		
Voltage range of the test button T	150 — 254 V AC (2-pole), 150 — 440 V AC (4-pole)		
Rated frequency	50/60 Hz		50 Hz
Conditional short circuit strength I_{nc}	10 kA		6 kA
Rated current	25, 40, 63 A	60,80,100	25, 40, 63
Rated residual current	30, 100, 300 mA	100, 300 mA	30, 300 mA
Sensitivity to residual current	AC type - AC residual current A type - residual AC and pulsating DC current		AC type - AC residual current
Time characteristic	undelayed type	selective S type with insensitivity 40 ms	undelayed type
Rated impulse withstand voltage U_{imp}	6 kV		
Rated insulation voltage Ui	500 V		
Mechanical service life	2 000 operation cycles		
Electrical service life	2 000 operation cycles		
Back-up fuse for overload	I_n = 25, A max. 25 A gG	I_n = 63, A max.40 A gG	I_n = 25, A max. 25 A gG
	I_n = 40, A max. 25 A gG	I_n= 80, A max. 50 A gG	I_n = 40, A max. 25 A gG
	I_n = 63, A max. 40 A gG	I_n= 100, A max. 63 A gG	I_n = 63, A max. 40 A gG
Back-up fuse for short circuit			
Back-up fuse for short circuit	I_n = 25, max. 63 A gG	I_n = 63, max. 63 A gG	I_n = 25, max. 63 A gG
	I_n = 40, max. 63 A gG	I_n = 80, max. 80 A gG	I_n = 40, max. 63 A gG
	I_n = 63, max. 63 A gG	I_n =100, max. 100 A gG	I_n = 63, max. 63 A gG
Rated making capacity I_m (rated residual making capacity I_{cm})	I_n = 25,500A	I_n = 63,500A	I_n = 25,500A
	I_n = 25,500A	I_n = 80,500A	I_n = 25,500A
	I_n = 25,630A	I_n = 100,630A	I_n = 25,630A
Line voltage connection	arbitrary above or below		

Appearance

- Residual Current Breakers with Overload protection according to IEC / EN 61009
- Rated breaking capacity Icn 6 kA
- 1+N-pole version
- Rated residual current 30 mA
- Rated currents up to 40 A
- Tripping characteristics of installed circuit breaker B and C
- Suitable for domestic as well as industrial applications
- AC and A type of RCD
- 2-module width

Characteristics

Rated operational voltage 230/400 V AC

Rated frequency 50/60 Hz

Ex9CBL residual current circuit breakers are based on combination of residual current device with permanent magnet principle and circuit breaker with thermal overload release and magnetic short circuit current release. It brings the advantage of Voltage independent function of the residual current device. Nonzero Voltage is only necessary when testing of the RCD with the T test button. Magnetic RCDs should be tested regularly with a period of one month.

Selection Guide

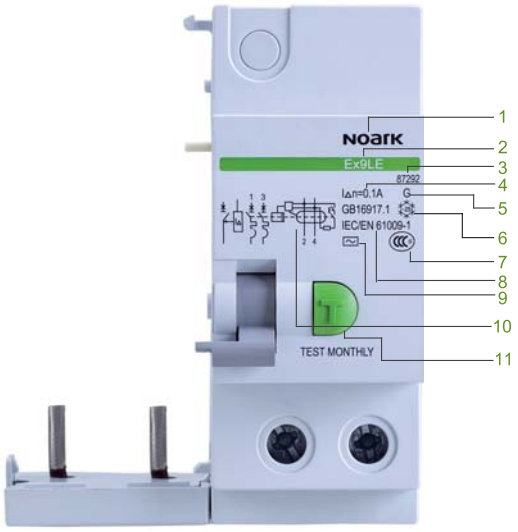
Ordering code	Ex9CBL	-H	1P+N	B	16	A	S
	Product	Rated breaking capacity	Poles	Tripping characteristicof MCB	Rated current	Sensitivity to type of current	Rated residual current
	CBL: RCBO	-H: 10 kA -N:6kA	1+N	B,C	6 —40 A	_ : AC A : A	30 mA

Parameters

Electrical parameters	Ex9CBL-H	Ex9CBL-N
Tested according to	IEC/EN 61009	
Rated op. voltage Ue	230 V AC	
Min. voltage for RCD function	voltage independent	
Voltage range of the test button T	110 — 254 V AC	
Rated frequency	50/60 Hz	
Conditional short circuit strength I_{nc} (kA)	10	6
Rated current (A)	6 — 40	
Rated residual current (mA)	30	
Sensitivity to residual current	AC type - AC residual current A type - residual AC and pulsating DC current	
Time characteristic of RCD	undelayed type	
Tripping characteristics of MCB	B, C	
Rated impulse withstand voltage U_{imp}	4 kV	
Rated insulation voltage Ui	500 V	
Mechanical service life	2 000 operation cycles	
Electrical service life	2 000 operation cycles	
Selectivity class	3	
Back-up fuse/breaker	max. 125 A gG	
Line voltage connection	arbitrary above or below	

Mechanical parameters	Ex9CBL-H	Ex9CBL-N
Device width	36 mm	36 mm (2-pole), 72 mm (4-pole)
Device height	85 mm including rail clip)	
Frame size	45 mm	
Mounting	easy fastening onto 35 mm device rail (DIN)	
Degree of protection	IP20	
Terminals	combined lift + open mouthed	
Terminal capacity	1 — 35 mm^2	
Fastening torque of terminals	1.5 — 2.5 Nm	
Busbar thickness	0.8 — 2 mm	
Ambient temperature	-5 — +40°C	
Altitude	≤ 2000 m	
Relative humidity	≤ 95 %	
Resistance to humidity and heat	class 2	
Pollution degree	2	
Installation class	III	

Appearance



1 Brand
2 Type
3 Ordering code
4 rated residual operating current
5 With delay-time action S or over-valtage protection G
6 Temperature
7 Conformed standards
8 Certificates
9 Type of residual current
10 Electrical diagram
11 Test button

Characteristics

When Ex9LE assembled with Ex9B,the following functions can be realized:

- Leakage protection for direct contact
- Leakage protection for indirect contact
- Insulation protection(for short circuit,electrical fire,etc)
- Complementary protection when other protection doesn't work
- "G" type over-voltage protection

Conformed standards

IEC / EN61009-1

Instantaneous residual trip

When residual current is bigger than the action value,the RCD block trips

Type S

Delay-time protection: 0.13~0.5s

Type G

Protection for over-voltage: AC280±5%V

Manual operation

Two reset modes:

- MCB and RCD block reset at the same time.
- MCB resets first and then the RCD block.

Usage Introduction

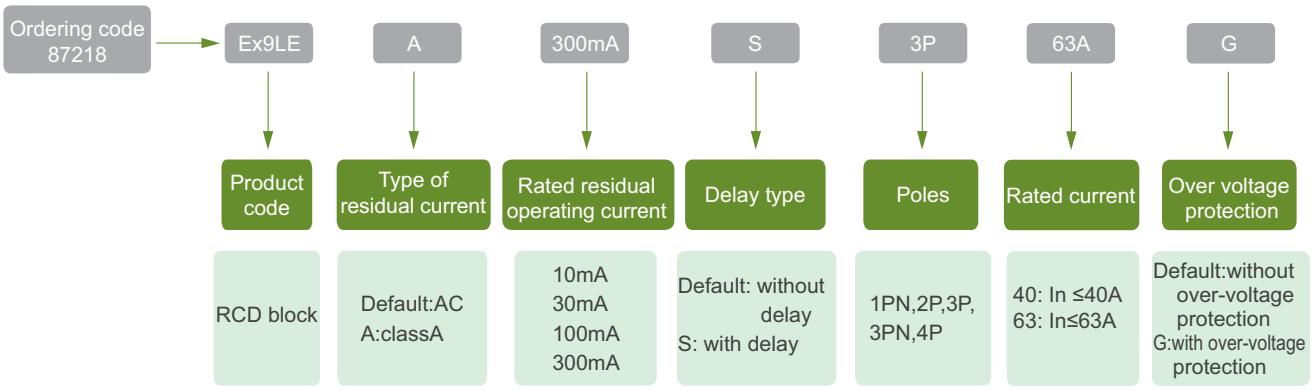
Assembly with MCB

	MCB Ex9B	RCD block Ex9LE
Poles	1P	1PN
	2P	2P
	3P	3P/3PN
	4P	4P

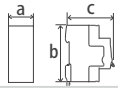
Application guide

- Check the device monthly by pushing the test button to see whether the product trips.
- When selecting the products,please choose the MCB of corresponding rated current according to the ratio between control load(total power of load) and power voltage.Choose the rated residual action current according to the situation of residual current.
- For your safety,please do not test the RCD with residual current,overload or short circuit which casued by dangerous circuit.

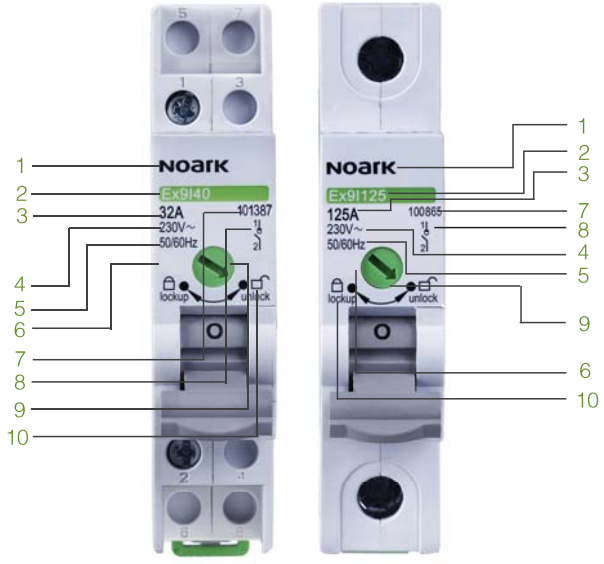
Selection Guide



Parameter

RCD block Ex9LE							
For protection of general power distribution (IEC/EN 60947-2)							
Poles			1PN	2P	3P	3PN	4P
Electrical performance							
Functions			Protection against short current,overload,leakage,over-voltage,isolation and control				
Type of residual current			AC and A				
Rated frequency	f	Hz	50/60				
Rated working voltage	Ue	V	230/400				
Rated residual current	$I_{\triangle n}$	mA	10,30,100,300				
Rated residual operating current			In≤40,In≤63				
Over-voltage protection of G type		In A	AC 280±5%V (Only for 1PN and 2P)				
Delaytime protection of S type			0.13~0.5s (Only for 100mA and 300mA)				
Service life (C-O)		Mechanica	16000				
		Electrical	8000				
Connection and installation							
Protection degree			IP20				
Mounting			DIN35 rail				
Wire		mm^2	In≤32A,1~25; In≥40A,10~35				
Working temperature			-25°C~+40°C				
Resistance to humidity and heat			Class 2				
Altitude above sea		m	≤2000				
Relative humidity			+20°C,≤95%;+40°C,≤50%				
Pollution degree			2				
Installation environment			Avoid obvious shock and vibration				
Installation class			Class III				
Dimensions(mm) (WxHxL) 		a	54	72	117	117	135
		b	89.5	89.5	89.5	89.5	89.5
		c	73	73	73	73	73

Appearance



1 Brand
2 Type
3 Rated current
4 Rated voltage
5 Running frequency
6 Signal of certificates
7 Ordering code
8 Electrical diagram
9 Locker
10 Locking device for OFF position

Characteristic

Ex9I40,Ex9I125 are based on Ex9B platform .Appearance dimension is the same as Ex9B products

Function:

- Break and connect circuit on load
- Isolation

Status indication

According to status of inner contact, Red/Green indication makes ON/OFF status visual.

Conformed standard

IEC/EN 60947-3

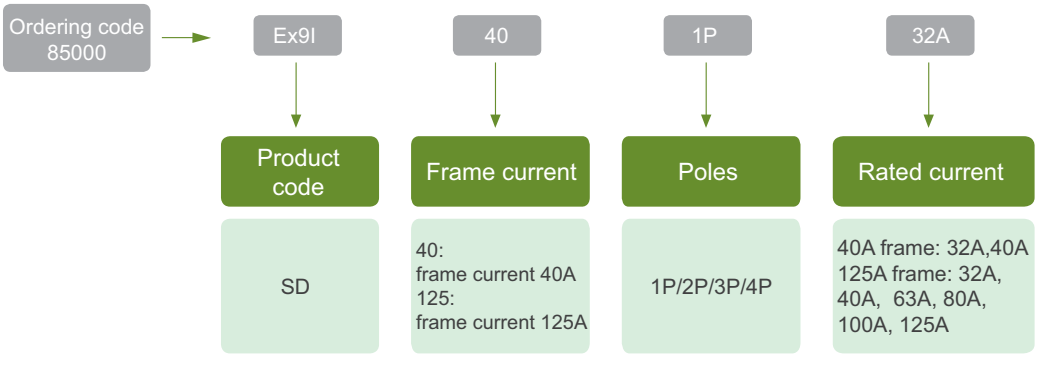
Operation mechanism is safer and more reliable.

Lock design of ON/OFF position

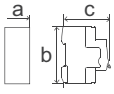
Optimized dimension design

Ex9I40,width of 1P-4P are all 18mm

Selection Guide



Parameters

Ex9I Switch Disconnector									
For protection of general distribution system (IEC/EN 60947-3)									
Poles			1P	2P	3P	4P	1P	2P	3P	4P
Rated frame current		A	40				125			
Electrical performance										
Rated working voltage	Ue	VAC	230/400							
Rated insulated voltage	Ui	V	500							
Rated current	In	A	32,40				32,40,63,80,100,125			
Rated short-time withstand current	Ie 1s		12							
Rated short-current making capacity	Ie (t=0.1s)		20							
Service life (C-O)	Mechanical	Actual value	20000							
		Standard value	8500							
	Electrical	Actual value	4000							
		Standard value	1500							
Connection and Installation										
Protection degree		All sides	IP40							
		Connection terminal	IP20							
Mounting			TH35-7.5/DIN35 rail							
Utilization category			AC-22A							
Wire		mm^2	Hard cable/Flexible calbe: 1~10				Hard cable: 10~50;Flexible calbe:10~40			
Working temperature			-30°C~+70°C							
Resistance to humidity and heat			Class 2							
Altitude above sea		m	≤2000							
Relative humidity			+20°C,≤95%;+40°C≤50%							
Pollution degree			2							
Installation category			Class III							
Installation environment			Avoid obvious shock and vibration							
Appearance dimension (mm) (WxHxL) 		a	18				18	36	54	72
		b	89				89			
		c	80				80			
Weight		kg	0.06				0.09	0.18	0.27	0.36

Appearance

1 Brand
2 Type
3 Rated current
4 Rated voltage
5 Conformed standard
6 Utilization category
7 Ordering code
8 Electrical diagram
9 Status indicator
10 Signal of certificates

Characteristic

Ex9IP are based on Ex9B platform. Appearance dimension is the same as Ex9B products

Function:

- Break and connect circuit on load
- Isolation

Status indication

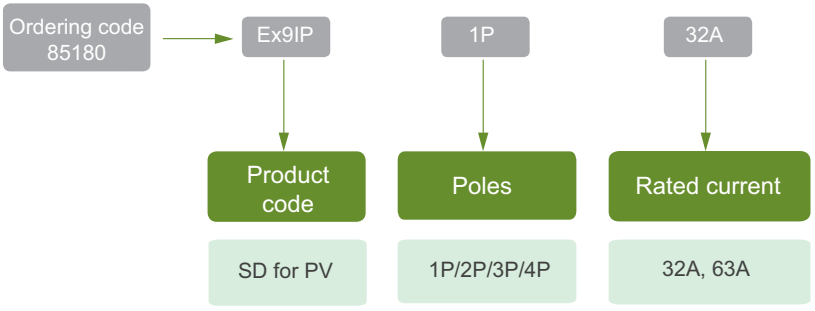
According to status of inner contact, Red/Green indication makes ON/OFF status visual.

The working voltage which topped 1000VDC can provide a more reliable protection for PV system

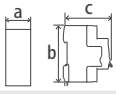
Conformed standard

IEC/EN 60947-3

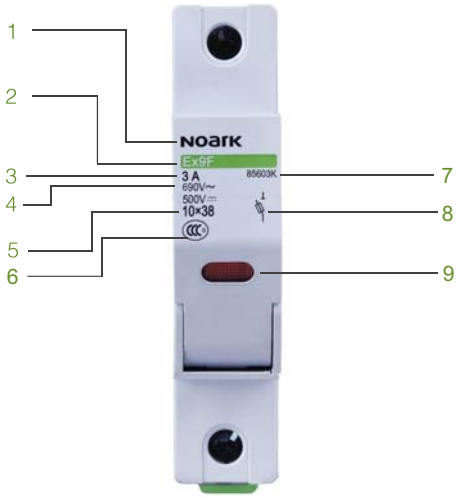
Selection Guide



Parameters

SD Ex9IP for PV						
For PV DC (IEC/EN 60947-3)						
Poles			1P	2P	3P	4P
Electrical performance						
Rated working voltage	Ue	VDC	250	500	750	1000
Rated current	In	A	32,63			
Rated insulated voltage	Ui	V	1000			
Rated short-time withstand current	Ie 1s		12			
Rated short-current making capacity	Ie 0.1s		20			
Service life (C-O)	Mechanical	Actual value	10000			
		Standard value	1700			
	Electrical	Actual value	1000			
		Standard value	300			
Connection and Installation						
Protection degree	All sides		IP40			
	Connection terminal		IP20			
Utilization category			DC-22B			
Wire		mm^2	1~35			
Working temperature			-30°C~+70°C			
Resistance to humidity and heat			Class 2			
Altitude above sea			≤2000			
Relative humidity			+20°C,≤95%,+40°C,≤50%			
Pollution degree			3			
Installation environment			Avoid obvious shock and vibration			
Installation category			Class III			
Installation class			TH35-7.5/DIN35 rail			
Appearance dimension (mm) (WxHxL)		a	18	36	54	72
		b	89			
		c	80			
Weight	kg		0.12	0.24	0.36	0.48

Appearance



1 Brand
2 Type
3 Rated current
4 Rated voltage
5 Fuse size
6 Signal of certificates
7 Ordering code
8 Electrical diagram
9 Status indicator

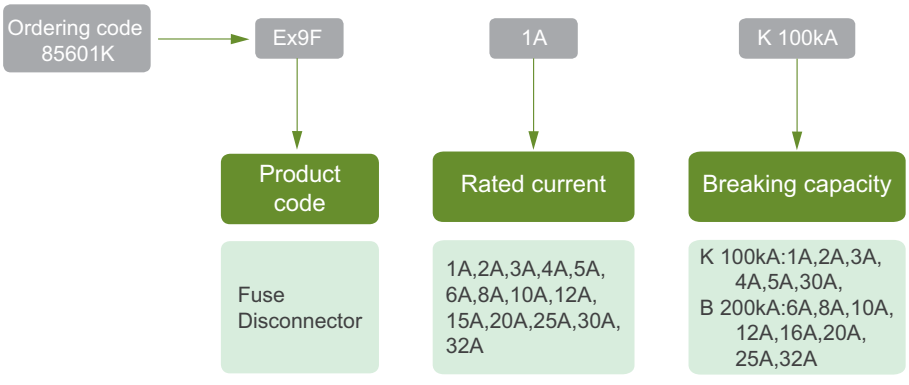
Characteristic

- The range of voltage: 690V AC,500V DC
- Maximum of breaking capacity is 200KA to provide a reliable protection
- The innovation way of fuse replacing make the operation
- Fault indication will be on the light constantly when a fault occur,and to remind the customer replace the fuse timely
- The size of applicable fuse: 10×38mm

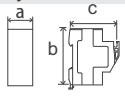
Conformed standard

IEC/EN 60947-3

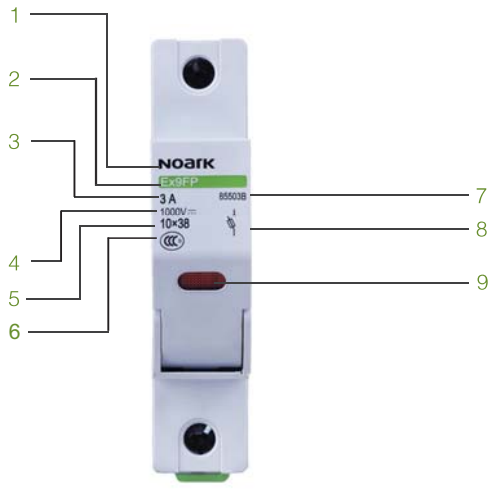
Selection Guide



Parameter

Ex9F Fuse Disconnector				
For AC/DC (IEC/EN 60269)				
Poles			1P	
Electrical performance				
Rated working voltage	Ue	V AC/V DC	690V AC/500V DC	600V AC/400V DC
Rated current	In	A	1,3,4,5,30	6,8,10,12,16,20,25,32
Breaking capacity	kA		100	200
Max power dissipation	w		7.5	
Connection and Installation				
Protection degree			IP20	
Wire	mm^2		2.5~10	
Working temperature			$-30^{O}C$~$+70^{O}C$	
Resistance to humidity and heat			Class 2	
Altitude above sea			≤2000	
Relative humidity			$+20^{o}C$,≤95%;$+40^{o}C$,≤50%	
Pollution degree			3	
Installation environment			Avoid obvious shock and vibration	
Installation class			Class III	
Installation category			TH35-7.5/DIN35 rail	
Appearance dimension (mm) (WxHxL) 	a		18	
	b		89	
	c		80	
Fuse size	mm		10x38	
Weight	kg		0.07	

Appearance



1 Brand
2 Type
3 Rated current
4 Rated voltage
5 Fuse size
6 Signal of certificates
7 Ordering code
8 Electrical diagram
9 Status indicator

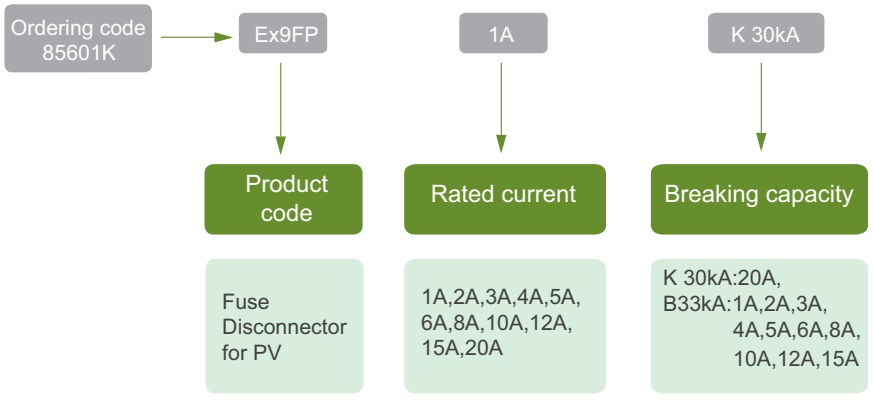
Characteristic

- The range of voltage: 1000V DC
- Maximum of breaking capacity is 33KA to provide a reliable protection
- The innovation way of fuse replacing make the operation safer
- Fault indication will be on the light constantly when a fault occur,and to remind the customer replace the fuse timely
- The size of applicable fuse: 10×38mm

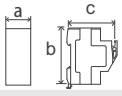
Conformed standard

IEC/EN 60269

Selection Guide



Parameter

Ex9FP Fuse Disconnector for PV				
For PV DC (IEC/EN 60269)				
Poles			1P/2P	
Electrical performance				
Rated working voltage	Ue	VDC	1000	
Rated current	In	A	1,2,3,4,5,6,8,10,12 ,15	20
Breaking capacity	kA		33	30
Max power dissipation	w		3	
Connection and Installation				
Protection degree			IP20	
Wire	mm^2		2.5~10	
Working temperature			-30°C~+70°C	
Resistance to humidity and heat			Class 2	
Altitude above sea			≤2000	
Relative humidity			+20°C,≤95%;+40°C,≤50%	
Pollution degree			3	
Installation environment			Avoid obvious shock and vibration	
Installation class			Class III	
Installation category			TH35-7.5/DIN35 rail	
Appearance dimension (mm) (WxHxL)		a	18	
		b	89	
		c	80	
Fuse size	mm		10x38	
Weight	kg		0.07	

Characteristic

Surge Protective Device

Surge Protective Device is a kind of protecting equipment which can protect protect from surge which influenced by Indirect and direct lightning thunder and other transient overvoltage.

Test classification of SPD

- Ex9U1 level I
  The test is done with In 1.2/50μs and Iimp 10/350μs. The SPD level I can protect the power supply of low voltage distribution system from the direct lightning thunder. It is used in the high risk areas of lightning and installed in main distribution panels.

- Ex9U2 level II
  The test is done with In 1.2/50μs and Imax 8/20μs. The SPD level II can support the impaction in a short time and protect the circuit comprehensively.

- Ex9U3 level III
  The test do with composite wave (Uoc 1.2/50μs and Isc 8/20μs). The SPD level III is installed in the equipment as close as possible to protect extremely sensitive equipment.

Parameter definitions of SPD

- Nominal discharge current In:
  The peak current flow past the protector with 8/20μs current wave. It is used in test level II, and in the pretreatment of test level I and II moreover.

- Maximum discharge current Imax:
  The max discharging peak current flow past the protector with 8/20μs standard ray wave. It is difined by the program of load level II.

- Max impulse current Iimp:
  The parameter indicated the SPD with test level I. It means the protector can receive a max impulse current 10/350μs; it is determined by Ipeak and Q.

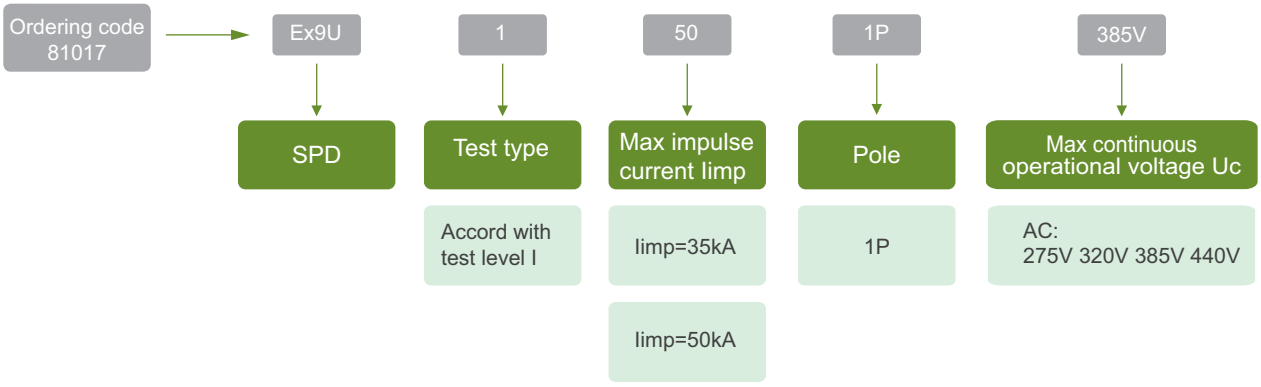
- Max continuous operational voltage Uc:
  abidingly applied in the specified end of protector which do not cause the performance change of the protector and do not make the protection components act inaccurate. Uc equals to rated voltage.

- Open voltage Uoc:
  The parameter indicated the SPD with test level III. It means this kind of SPD can receive the impluse voltage which end voltage is 1.2/50μs wave when the composite wave generator virtual intrinsic impedance is 2Ω outlet open circuit, theamplitude must less than 20kV (We must test level II if overstep).

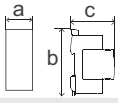
- Short circuit current Isc:
  The parameter indicated the SPD which accord with test level III. It means this kind of SPD can receive the current Isc is 8/20μs wave when the composite wave generator virtual intrinsic impedance is 2Ω outlet short circuit, the amplitude is 0.5Uoc.

- Voltage protection level Up:
  the ability of SPD to control the surge, meaning the max voltage of protector in the follow test.
  1. Test by the nominal discharge current.
  2. Test by the composite wave after the surge voltage being limited.

Selection Guide



Parameter

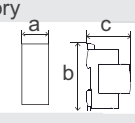
SPD Ex9U1			Ex9U1 35	Ex9U1 50
For protection of general power distribution (IEC 61643-1/EN 61643-11)				
Poles			1P	
Electrical performance				
Test type			I	
Frequency	f	Hz	50/60	
Nominal discharge current	In	kA	35	50
Max impulse current	Iimp(10/350us)	kA	35	50
Voltage protection level	Up	kV	4.0	
Max continuous operational voltage	Uc	V	3.5	
Control and indication				
Instruction			——	
Insertable module			——	
Remote contact			——	
Connection and Installation				
Wire	Hard cable	mm^2	4~35	
	Flexible calbe	mm^2	4~25	
Stripping length		mm	10	
Protection degree		All sides	IP40	
		Connection terminal	IP20	
Installation environment			Avoid obvious shock and vibration	
Altitude above sea			≤2000	
Working temperature			-30°C~+70°C	
Relative humidity			30%~90%	
Installation category			TH35-7.5/DIN35 rail	
Appearance dimension (mm) (WxHxL) 	a		18	
	b		91	
	c		67.6	
Weight	kg		0.17	

■ Standard □ Optional — None

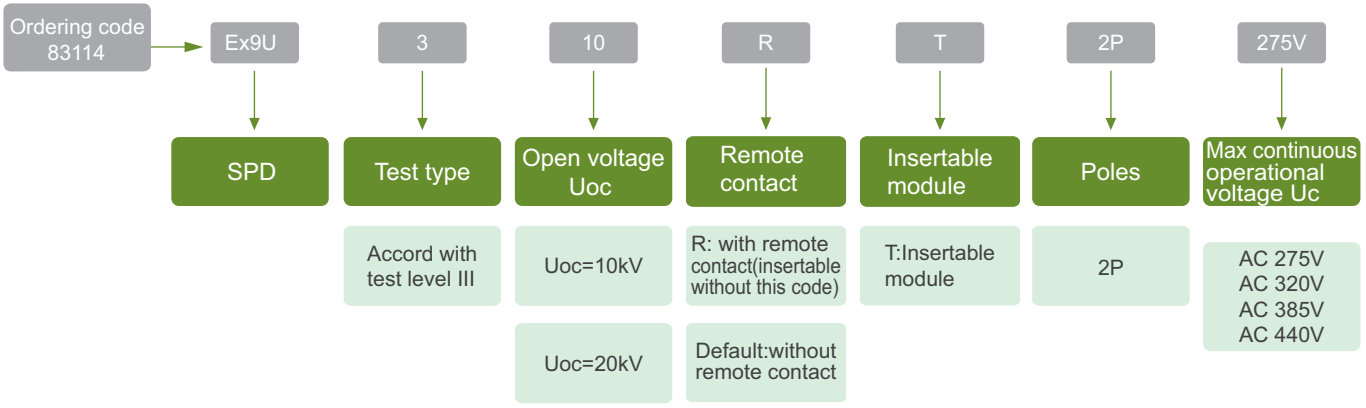
Selection Guide

Ordering code 82166	Ex9U	2	30	R	T	1P	275V
	SPD	Test type	Max discharge current Imax	Remote contact	Insertable module	Poles	Max continuous operational voltage Uc
		Accord with test level I	30:30kA 40:40kA 65:65kA 120:120kA	R: with remote contact(insertable without this code) Default: without remote contact	T:Insertable module	1P/2P 3P/4P	AC 275V AC 320V AC 385V AC 440V

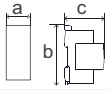
Parameter

SPD Ex9U2				Ex9U2 30	Ex9U2 40	Ex9U2 65	Ex9U2 120
For protection of general power distribution (IEC 61643-1/EN 61643-11)							
Poles				1P/2P/3P/4P			
Electrical performance							
Test type				II			
Frequency		f	Hz	50/60			
Norminal discharge current	In		kA	15	20	30	65
Max impulse current	Iimp	kA		30	40	65	120
Voltage protection level	Up		kV	1.3-1.5-1.8-2.2		1.5-1.8-2.0-2.5	2.0-2.5-2.8-3.0
Max continuous operational voltage	Uc		V	3.5			
Control and indication							
Instruction				■			
Insertable module				■			
Remote contact				□			
Remote contact	Max working voltage		V	250V AC / 30V DC			
	Max working current (Resistive/ Inductive)			1A (250V AC)			
	Max working current (Resistive/ Inductive)			1A (30V DC)			
Connection and Installation							
Wire	Hard calbe		mm^2	input terminal : 0.2~10; outlet terminal: 2.5~25			
	Flexible calbe		mm^2	input terminal :0.2~6; outlet terminal: 2.5~16			
Stripping length			mm	10			
Protection degree			All sides	IP40			
			Connection terminal	IP20			
Installation environment				Avoid obvious shock and vibration			
Altitude above sea				≤2000			
Working temperature				-30°C~+70°C			
Relative humidity				30%~90%			
Installation category				TH35-7.5/DIN35 rail			
Appearance dimension (mm) (WxHxL) 			a	18			
			b	102			
			c	67.6			
Weight			kg	0.12			

Selection Guide



Parameter

SPD Ex9U3			Ex9U3 10	Ex9U3 20
For protection of general power distribution (IEC 61643-1/EN 61643-11)				
Poles			2P	
Electrical performance				
Test type			III	
Frequency		f Hz	50	60
Open voltage	Uoc(1.2/50us)	kV	10	20
Short circuit current	Isc(8/20us)	kA	5	10
Voltage protection level	Up	kV	1-1.2-1.5	1.2-1.5-1.6
Control and indication				
Instruction			■	
Insertable module			■	
Remote contact			□	
Remote contact	Max working voltage (V)		250V AC / 30V DC	
	Max working current(Resistive/ Inductive)		1A (250V AC)	
	Max working current(Resistive/ Inductive)		1A (30V DC)	
Connection and Installation				
Wire	Hard calbe	mm^2	input terminal : 0.2~10; outlet terminal: 2.5~25	
	Flexible calbe	mm^2	input terminal : 0.2~6; outlet terminal: 2.5~16	
Stripping length		mm	10	
Protection degree	All sides		IP40	
	Connection terminal		IP20	
Installation environment			Avoid obvious shock and vibration	
Altitude above sea			≤2000	
Working temperature			-30°C~+70°C	
Relative humidity			30%~90%	
Installation category			TH35-7.5/DIN35 rail	
Appearance dimension (mm) (WxHxL)		a	18	
		b	102	
		c	67.6	
Weight		kg	0.12	

■ Standard □ Optional — None

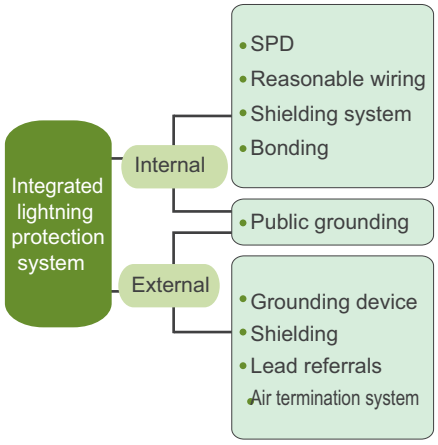


Figure 1

The integrated lightning protection measures and the functiong of the SPD

Nowadays, designing a system of lightning protection is involved in choosing different lightning protection equipment like the SPD. Lightning protection system is complex and huge, and the SPD plays a crucial role in it.Figure 1 shows the SPD position in the lightning protection system.

The overvoltage of the power circuit can be devided into three protection levels:

- Protection level 1 is installed in the entrance of a house or the main distribution box. Because of the residual voltage is still too high to bear to the follow-up equipment, the other protector must be installed according to the definition of protection scope.
- If the follow-up equipment as floor distribution panel cabinets or junction box of large electronic equipment, the overvoltage lightning protection device should be installed as protection level 2.
- The overvoltage protector should be installed in front of the equipment as protection level 3.
- Multi-level protection combined organically to achieve the optimization of overall protection performance.

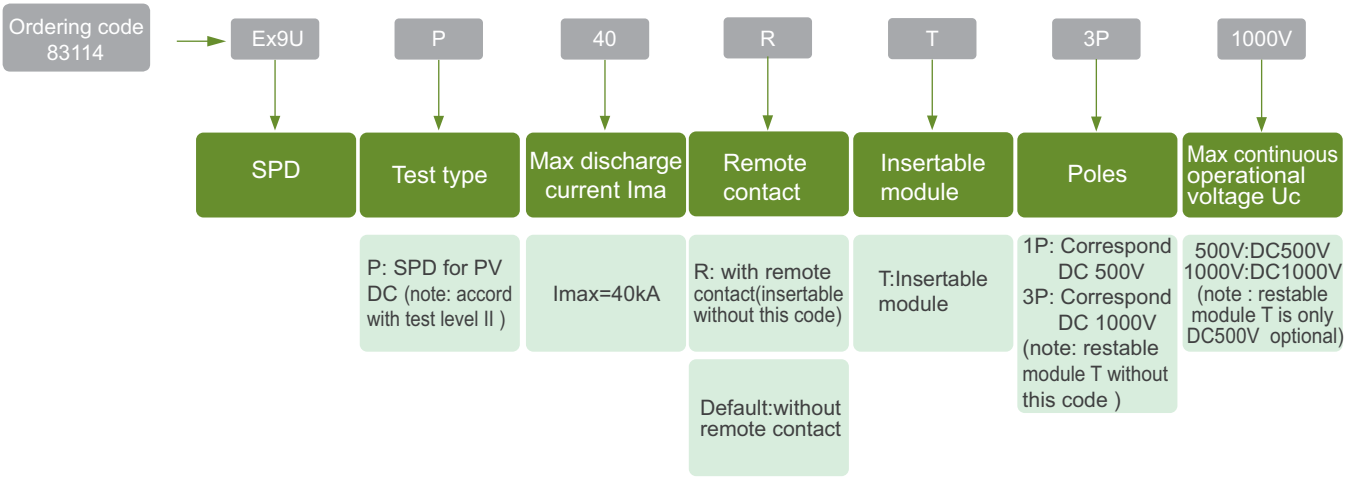
The choice of Uc

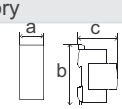
With use security of SPD, the choice of Uc must satisfy the following rules : Uc should be higher than Ucs(k×U0) which may produce in system (Minimum table below: the relationship between Uc and system nominal voltage). Considering the complexity of the system fault, Uc at least be 1.5Uo recommended.

Uc according to IEC 60364-5-534			
SPD is installed between PE and PEN in TN system or between phase and neutral in TT system	SPD is installed between phase and ground or between neutral and ground in TT system Uc min	SPD is installed between phase and ground or between neutral and ground in IT system Uc min	SPD is installed between phases in TT , TN or IT system Uc min
Voltage regulation is equal to 10%	The value of 1.5xU has been used	The value of $\sqrt{3}xU_0$ has been used	Voltage regulation is equal to 10%
V	V	V	V
132	180		229
140	191	220	242
		240	264
		347	382
253	345	400	440
286	390	415	484
305	416	480	528

a- Maybe require a higher value in some cases(For example,the neutral line break in the TT system)

Selection Guide



SPD Ex9UP				Ex9UP	
For PV DC (IEC 61643-1/ EN 61643-11)					
Poles				1P	3P
Electrical performance					
Test type				II	
Open voltage	Uoc max	V DC		500	1000
Max continuous operational voltage	Uc	V DC		500	1000
Nominal discharge current	In(8/20)us		kA	20	
Maximum discharge current	Imax (8/20)us		kA	40	
Voltage protection level	Up	kV		2.0	3.8
Control and indication					
Instruction				■	
Insertable module				■	
Remote contact				□	
Remote contact	Max working voltage (V)			250V AC / 30V DC	
	Max working current(Resistive/ Inductive)			1A (250V AC)	
	Max working current (Resistive/ Inductive)			1A (30V DC)	
Connection and Installation					
Wire	Hard calbe	mm^2		4~25	
	Flexible calbe	mm^2		4~16	
Stripping length	mm			10	
Terminal screws				M5	
Torque (Nm)	Main circuit			3.5	
	Remote contact			0.25	
Protection degree	All sides			IP40	
	Connection terminal			IP20	
Installation environment				Avoid obvious shock and vibration	
Altitude above sea				≤2000	
Working temperature				-30°C~+70°C	
Relative humidity				30%~90%	
Installation category				TH35-7.5/DIN35 rail	
Appearance dimension (mm) (WxHxL)		a		18	54
		b		102	99
		c		67.6	67.6
Weight	kg			0.12	0.36

■ Standard □ Optional — None

Characteristic

- Busbars for connection of installation devices
- 1 and 3-phase versions
- 10 mm2 for 63 A and 16 mm2 for 80 A
- Lengths 1 meter (54 modules) or 12 modules
- Fork version of connection points
- Step 1 module (18 mm)

Rated operational voltage 230/400 V AC

Rated frequency 50 Hz

Busbars for simple and reliable interconnection of installation devices. Shortened versions for 12 modules are equipped with end caps. There are available separately packed end caps for busbars with length of 1 m.

Selection Guide

BBU	3L	10	M12	EC
Product family	Number of separate conductors	Cross section	Length in modules	End cap
BBU: Busbars	1L: 1 way 3L: 3 ways	10: 10 mm^2 16: 16 mm^2	M12: 12 modules M54: 54 modules (1 m)	_: without EC: with

Technical Data Busbars BBU

General parameters	
1 and 3-phase busbars	
Length 1 meter (with 54 connection points, can be shortened) or 12 modules (with 12 connection points)	
Delivered without end caps (1 m / 54 modules) or with end caps (12 modules)	
Electrical parameters	
Tested according to	EN 60439-1
Rated op. voltage	230 / 400 V AC
Rated current	63 A (10 mm^2), 80 A (16 mm^2)
Rated frequency	50 Hz
Mechanical parameters	
Busbar cross section	10 or 16 mm^2
Connection point step	1 module (18 mm)

Characteristic

- Installation relays Ex9CH20
- Meet requirements of IEC / EN 61095
- Rated current up to 20 A
- Control coil voltage 24, 230 or 240 V AC
- Rated frequency 50/60 Hz
- 2 or 4-contact versions
- Various contact combinations

Modular relays Ex9CH20 are suitable for household and building modular distribution boards. They are mainly used in building automation processes for switching and controlling lightings, heating systems, ventilations, pumps, heating pumps and other applications.

Optical indicator on the front side indicates status of the contacts and voltage on control coil.

Selection Guide

Ex9	CH20	11	230V	50/60Hz
Product family	Product	NO+NC main contacts	Rated voltage	Rated frequency
Ex9	CH20: Installation relays 20A	20 11 02 40 22	24V 230V 240V	50/60Hz

Parameter

Ex9CH20 Installation relays

General parameters	
2 and 4-contact versions, various contact combinations	
Indication window help users to know the status of device	
Low operating noise level	
Electrical parameters	
Tested according to	IEC / EN 61095
Rated operational voltage U_e	230/400 V AC
Rated insulation voltage U_i	500 V
Rated impulse withstand voltage U_{imp}	4 kV
Rated conventional thermal current I_{th}	20 A
Rated current I_e AC-1, AC-7a	20 A
Rated current I_e AC-7b	9 A
Controlled power AC-7a	4 kW
Electrical service life	100 000 operating cycles
Max. switching frequency	300 per hour
Making and breaking conditions AC-7a	
I_c/I_e	1.0
U_r/U_e	1.05
cos φ	0.8
Ambient temperature	-5 — +40 °C (+40 — +70 °C derated)
Rated thermal current in different ambient temperature (derating)	
40°C	20 A
50°C	18 A
60°C	16 A
70°C	14 A
Mechanical parameters	
Device width	2-contact versions: 18 mm (1MU) 4-contact versions: 36 mm (2MU)
Device height	81 mm (84.5 including rail clip)
Frame size	45 mm
Mounting	easy fastening onto 35 mm device rail (DIN)
Degree of protection	IP20
Terminals	M3.5 screws
Terminal capacity	1 — 4 mm^2
Fastening torque of terminals	0.8 Nm
Controll coil terminal	M3.5 screws
Controll coil terminal capacity	1 — 4 mm^2
Fastening torque of controll terminals	0.8 Nm
Mechanical service life	1 000 000 operating cycles
Pollution degree	2
Installation class	III

Characteristic

- Installation contactors Ex9CH
- Meet requirements of IEC / EN 61095
- Rated current up to 25, 40, 63 A
- Control coil voltage 24, 230 or 240 V AC
- Rated frequency 50/60 Hz
- 2 or 4-contact versions
- Various contact combinations

Modular contactors Ex9CH are suitable for household and building modular distribution boards. They are mainly used in building automation processes for switching and controlling lightings, heating systems, ventilations, pumps, heating pumps and other applications. Optical indicator on the front side indicates status of the contacts and voltage on control coil.

Selection Guide

Ex9	CH	40	11	230V	50/60Hz
Product family	Product	Rated current	NO+NC main contacts	Rated voltage	Rated frequency
Ex9	CH: Installation contactors	25A 40A 63A	20 11 02 40 22	24V 230V 240V	50/60Hz

Parameter

Ex9CH Installation contactors

General parameters			
Modular design			
Indication window help users to know the status of device			
Low operating noise level			
Electrical parameters			
	ExCH25	ExCH40	ExCH63
Tested according to	IEC / EN 61095		
Rated operational voltage U_e	230/400 V AC		
Rated insulation voltage U_i	500 V		
Rated impulse withstand voltage U_{imp}	4 kV		
Rated conventional thermal current I_{th}	25 A	40 A	63 A
Rated current AC-1, AC-7a I_e	25 A	40 A	63 A
Controlled power AC-7a	16 kW	40 kW	40 kW
Electrical service life	100 000 operating cycles		
Max. switching frequency	300 per hour		
Making and breaking conditions AC-7a			
I_c/I_e	1.0		
U_r/U_e	1.05		
cos φ	0.8		
Ambient temperature	-5 — +40 °C (+40 — +70 °C derated)		
Rated thermal current in different ambient temperature			
40°C	25 A	40 A	63 A
50°C	22 A	38 A	57 A
60°C	18 A	36 A	50 A
70°C	16 A	32 A	46 A
Mechanical parameters			
	Ex9CH25	Ex9CH40/Ex9CH63	
Modules	4-contact: 36 mm (2MU)	2-contact: 36 mm (2MU) 4-contact: 54 mm (3MU)	
Device width	18 mm (per module)		
Device height	81 mm (84.5 including rail clip)	85 mm	
Frame size	45 mm		
Mounting	easy fastening onto 35 mm device rail (DIN)		
Degree of protection	IP20		
Terminals	M3.5 screws	M5 screws	
Terminal capacity	1 — 4 mm^2	2.5 — 16 mm^2	
Fastening torque of terminals	0.8 Nm	2 Nm	
Controll coil terminal	M3.5 screws		
Controll coil terminal capacity	1 — 4 mm^2		
Fastening torque of controll terminals	0.8 Nm		
Mechanical service life	1 000 000 operating cycles		
Pollution degree	2		
Installation class	III		

Features

Ex9C Series AC Contactor

- Products with exquisite appearance ,compact structure ,well arrangement and easy installation
- Modular design for easy extension of product features
- With more normally open and closed contacts
- Two mounting ways by standard card and mounting screws
- Mechanical service life of 10 million times, AC-3 electrical service life of 1.2 million times
- Meet the safety standards of straight-acting double-contact design
- Comes with dust-proof device, able to adapt to harsh environment
- Application of environmental temperature range (-20°C ~ 60°C)
- Have proprietary intellectual property rights with 5 inventive patents, 7 new practical patents and 5 appearance patents
- Special small contactor (6A~12A),suitable for small capacity motor load

Specification	Length(mm)	Width(mm)	Thickness(mm)
Ex9CS06	59	45	58
Ex9CS09			
Ex9CS012			

- Machine with semi-automatic production line model
- Process testing,product commissioning and product testing etc.are controlled by computer and do the full check
- Key processes are using advanced manufacturing engineering such as laser welding and auto wiring etc.

Operating Conditions

Temperature

- -20°C - +60°C

Altitude

- altitude 2,000 m.

Humidity

The following conditions must be met during normal operation:

- If the ambient air temperature is +40°C, the atmospheric relative humidity can not exceed 50%. If the temperature is lower, use it under the conditions for a higherdegree of humidity
- The monthly mean relative humidity needs to be below 90% in the dampest month
- The effects of condensation on the product surface impacts its performance and needs to be taken into consideration

Pollution Level

- Level 3

Installation

- Contactors with rated current <100A could be either installed by screw of Din-rail.(DIN Rail(35mm)/DIN Rail(75mm))
- Contactors with rated current between 115A~500A should be installed with screws.
- Inclination between mounting and vertical plane shoule be less than ±30°

Accessories

Accessories of Ex9C Series AC Contactor including:
AX4 series auxiliary contacts, TDD series pneumatic time block, CCU series surge suppressor

Conventional Contactor

CCU Surge suppressor

(Function)
Suppress the transient state high frequency voltage
(Type)
- CCU41
- CCU42
- CCU43

AX43 Auxiliary Contact

AX43 Auxiliary Contact

(Function)
Control solenoid load
(Type)
- 1N/O+1N/C

AX42 Auxiliary Contact(2 poles)

(Function)
Control solenoid load
(Type)
- AX4202 2NC
- AX4211 1NO+1NC
- AX4220 2NO

AX42 Auxiliary Contact (4 poles)

(Function)
Control solenoid load
(Type)
- AX4204 4NC
- AX4213 1NO+3NC
- AX4222 2NO+2NC
- AX4231 3NO+1NC
- AX4240 4NO

TDD Pneumatic Time Block

(Function)
Electricity delay
Delay Operation
(Type)
- TDD41
  Electricity delay
- TDD42
  Delay Operation

Minitype Contactor

CCU Surge suppressor

(Function)
CCU41

AX41Auxiliary contacts(4 poles)

(Models)
- AX4104 4NC
- AX4113 1NO+3NC
- AX4122 2NO+2NC
- AX4131 3NO+1NC
- AX4140 4NO

Parameters

Ex9C Series AC Contactor			Ex9CS06	Ex9CS09	Ex9CS12	Ex9C09	Ex9C12	Ex9C18
IEC 60947-4-1								
Poles			3P/4P			3P		
Electrical performance								
Operation frequency			50/60			50/60		
Rated conventional heating current		I_{th}(A)θ≤60°C	20			25		32
Rated operational current(A)	AC-1		20			25		32
	380V/400V	AC-2/AC-3/AC-4	6	9	12	9	12	18
	660V/690V	AC-3	3.8	4.9		6.7	9	10.6
		AC-4/AC-2	3.8	4.9		4.9		6.7
Rated insulation voltage	U_i(V)		690			690		
Max. power of 3-phase motor(kW)	380V/400V	AC-3/AC-4	2.2	4	5.5	4	5.5	7.5
	660V/690V	AC-3	3	4		5.5	7.5	9
		AC-4	3	4		4		5.5
Electrical durability ($\times10^3$cycles)	380V/400V	AC-3	120			120		
		AC-4	50	40		50	40	
Mechanical cycles ($\times10^3$cycles)			1000			1000		
Holding power		9C Eries(VA)	7.5			9.5		
Control voltage U_C(V)			AC:24,36,42,48,110,127,220,230,240,380,400,415					
Connection and installation								
Auxiliary contacts			1NO/1NC			1NO+1NC/2NO+2NC		
Mounting type			DIN Rail(35mm)			DIN Rail(35mm)		
Dimension(L×W×H)			59×45×58			89×45×94		
Weight (Kg)			0.18			0.35		
Safe area(mm)			0			3		
Matched thermal overload relay								
Models			Ex9R12			Ex9R38		
Matched mechanical interlocking device								
Models			MIT41			MIT42		
Add-on auxiliary contact blocks								
Top mounting		4NC	AX4104			AX4204		
		1NO+3NC	AX4113			AX4213		
		2NO+2NC	AX4122			AX4222		
		3NO+1NC	AX4131			AX4231		
		4NO	AX4140			AX4240		
		2NC	—			AX4202		
		1NO+1NC	—			AX4211		
		2NO	—			AX4220		
Side mounting		1NO+1NC	—			AX4311		

	Ex9C25	Ex9C32	Ex9C38	Ex9C40	Ex9C50	Ex9C65	Ex9C80	Ex9C100
								
	3P			3P			3P	
	50/60			50/60			50/60	
	40	50		60	80		125	
	40	50		60	80		125	
	25	32	38	40	50	65	80	100
	17.3	21.9		34	39	42	49	
	14	17.3		34	39	42	49	
	690			1000			1000	
	11	15	18.5	18.5	22	30	37	45
	15	18.5		30	33	37	45	
	11	15		30	33	37	45	
	120			120			120	
	50	40		35	30		25	
	1000			1000			1000	
	10.5			25.0			30.0	
	AC:24,36,42,48,110,127,220,230,240,380,400,415							
	1NO+1NC/2NO+2NC			1NO+1NC			1NO+1NC	
	DIN Rail(35mm)			DIN Rail(35mm)/DIN Rail(75mm)			DIN Rail(35mm)/DIN Rail(75mm)	
	100×45×108			122×76×123			130×87×130	
	0.4			1.23			1.5	
	5			12			12	
	Ex9R38			Ex9R100			Ex9R100	
	MIT42			MIT43			MIT43	
	AX4204							
	AX4213							
	AX4222							
	AX4231							
	AX4240							
	AX4202							
	AX4211							
	AX4220							
	AX4311							

Parameters

Ex9C Series AC Contactor			Ex9C115	Ex9C150	Ex9C185	
IEC 60947-4-1						
Poles				3P		
Electrical performance						
Operation frequency(Hz)				50/60		
Rated conventional heating current I_{th}(A)θ≤40°C			160	185	215	
Rated operational current (A)	AC-1		160	185	215	
	380V/400V	AC-3	115	150	185	
		AC-4	54	68	81	
	660V/690V	AC-3	115	150	170	
		AC-4	48	57	65	
	1000V	AC-3	53	65	65	
		AC-4	34	38	42	
Rated insulation voltage U_e(V)				1000		
Controlrated power of 3-phase motor(kW)	380V/400V	AC-3	55	75	90	
		AC-4	30	37	45	
	660V/690V	AC-3	110	132	160	
		AC-4	50	55	63	
	1000V	AC-3	75	90	90	
		AC-4	50	55	63	
Electrical durability (×10^4cycles)	380V/400V	AC-3		100		
		AC-4	20	20	20	
Holding power(VA)				10		
Control voltage(V) AC/DC				24,36,42,48,110,127,220,230,240,380,400,415		
Auxiliary contacts				2NO+2NC		
Dimension(L×W×H)(mm)				173x120x174		
Weight(Kg)				3		
Matched thermal overload relay						
Models				Ex9R185		
Matched mechanical interlocking device						
Models				MIT44		
Add-on auxiliary contact blocks:Use categories for AC-15 and DC-13						
Top mounting	4NC			AX4204		
	1NO+3NC			AX4213		
	2NO+2NC			AX4222		
	3NO+1NC			AX4231		
	4NO			AX4240		
	2NC			AX4202		
	1NO+1NC			AX4211		
	2NO			AX4220		
Side mounting	1NO+1NC			AX4411		
	2NC			AX4402		
	2NO			AX4420		

	Ex9C225	Ex9C265	Ex9C300	Ex9C400	Ex9C500
					
	3P			3P	
	50/60			50/60	
	275	330	330	430	610
	275	330	330	430	610
	225	265	300	400	500
	96	117	125	150	175
	225	265	280	400	450
	85	105	115	135	150
	68	95	95	180	200
	42	57	57	80	80
	1000			1000	
	110	132	160	220	250
	55	63	75	90	100
	200	250	250	355	400
	80	100	110	132	150
	90	132	132	250	315
	63	80	80	110	110
	100			100	
	20	20	20	20	20
	10			10	
	24,36,42,48,110,127,220,230,240,380,400,415			24,36,42,48,110,127,220,230,240,380,400,415	
	2NO+2NC				
	213x145x208			216x160x229	
	6			9.5	
	Ex9R500			Ex9R500	
	MIT44			MIT44	
	AX4204			AX4204	
	AX4213			AX4213	
	AX4222			AX4222	
	AX4231			AX4231	
	AX4240			AX4240	
	AX4202			AX4202	
	AX4211			AX4211	
	AX4220			AX4220	
	AX4411			AX4411	
	AX4402			AX4402	
	AX4420			AX4420	

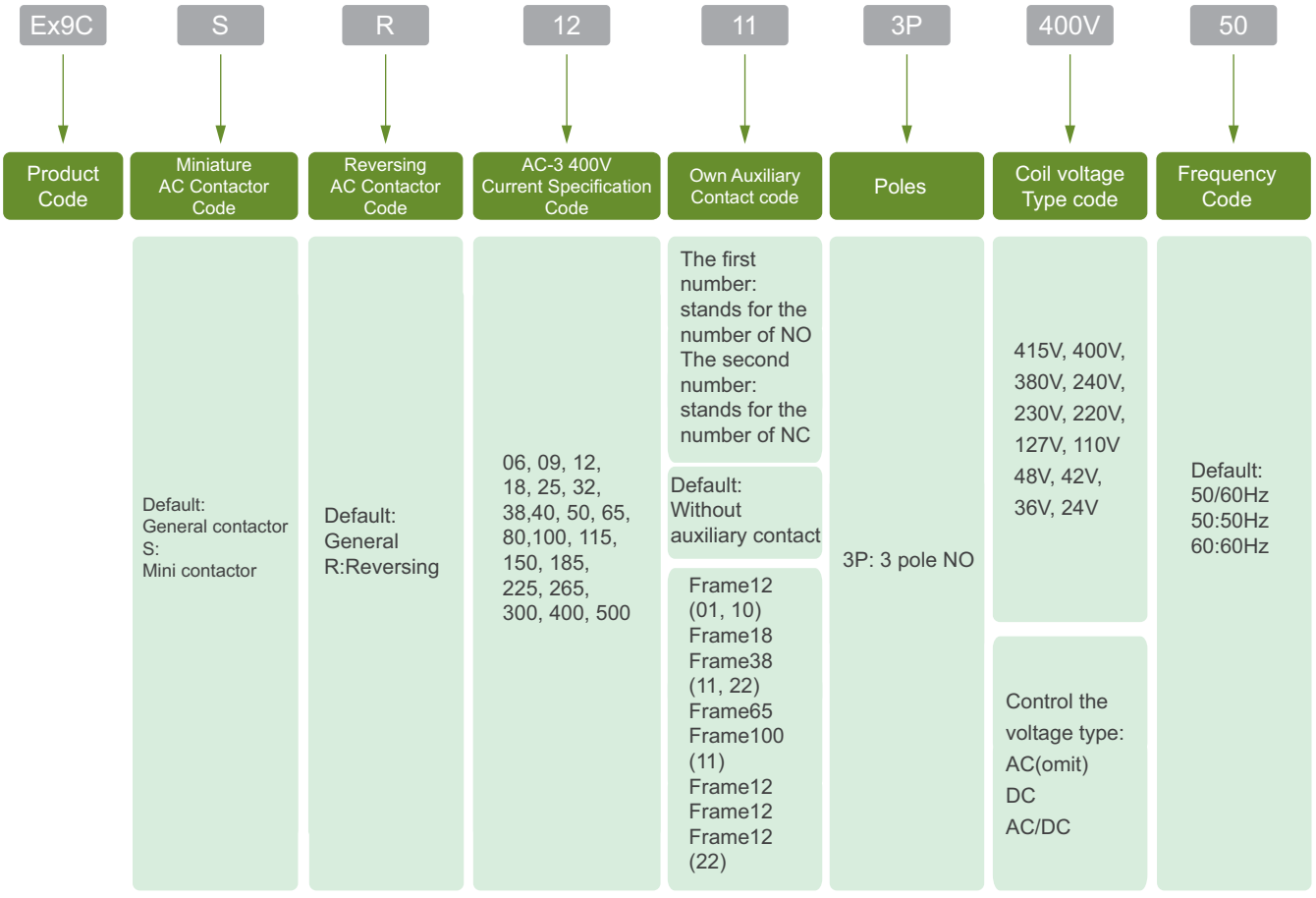
Parameters

Ex9Ci Intelligent Contactor			Ex9C09i	Ex9C12i	Ex9C18i	Ex9C25i	Ex9C32i	Ex9C38i
Ex9Ci Intelligent Contactor								
Electrical performance								
Operation frequency(Hz)			50/60			50/60		
Rated conventional heating current I_{th}(A)			25		32	40	50	
Rated operational current (A)	AC-1		25		32	40	50	
	380V/400V	AC-2/AC-3/AC-4	9	12	18	25	32	38
	660V/690V	AC-3	6.7	9	10.6	17.3	21.9	
		AC-4/AC-2	4.9		6.7	14	17.3	
Rated insulation voltage	U_i(V)		690			690		
Rated control power 3-phase motor(kW)	380V/400V	AC-3/AC-4	4	5.5	7.5	11	15	18.5
	660V/690V	AC-3	5.5	7.5	9	15	18.5	
		AC-4	4		5.5	11	15	
Electrical durability ($\times10^3$cycles)	380V/400V	AC-3	1200			1200		
		AC-4	50	40		50	40	
Machinery durability ($\times10^6$cycles)			10			10		
Connection and installation								
Auxiliary contacts			1NO+1NC/2NO+2NC			1NO+1NC/2NO+2NC		
Mounting type		Screw installation	Details See Instruction					
		Rail installation	DIN Rail(35mm)			DIN Rail(35mm)		
Dimension(L×W×H)(mm)			45×89×94			45×100×108		
Weight(Kg)			0.35			0.4		
Holding power(VA)			2.4			2.4		
Control voltage(V) AC/DC			DC: 12,24,48,110,220					
Safety zone(mm)			3			5		
Matched thermal overload relay								
Models			Ex9R38			Ex9R38		
Matched mechanical interlocking device								
Models			MIT42			MIT42		
Add-on auxiliary contact blocks								
Top mounting	4NC		AX4204					
	1NO+3NC		AX4213					
	2NO+2NC		AX4222					
	3NO+1NC		AX4231					
	4NO		AX4240					
	2NC		AX4202					
	1NO+1NC		AX4211					
	2NO		AX4220					
Side mounting	1NO+1NC		AX4311					

Parameters

Ex9Ci Intelligent Contactor			Ex9C40i	Ex9C50i	Ex9C65i	Ex9C80i	Ex9C100i
Ex9Ci Intelligent Contactor							
Electrical performance							
Operation frequency(Hz)			50/60			50/60	
Rated conventional heating current I_{th}(A)			60	80		125	
Rated operational current (A)	AC-1		60	80		125	
	380V/400V	AC-2/AC-3/AC-4	40	50	65	80	100
	660V/690V	AC-3	34	39	42	49	
		AC-4/AC-2	34	39	42	49	
Rated insulation voltage	U_i(V)		1000			1000	
Rated control power 3-phase motor(kW)	380V/400V	AC-3/AC-4	18.5	22	30	37	45
	660V/690V	AC-3	30	33	37	45	
		AC-4	30	33	37	45	
Electrical durability ($\times10^3$cycles)	380V/400V	AC-3	1200			1200	
		AC-4	35	30		25	
Machinery durability ($\times10^6$cycles)			10			10	
Connection and installation							
Auxiliary contacts			1NO+1NC			1NO+1NC	
Mounting type		Screw installation	Details See Instruction				
		Rail installation	DIN Rail(35mm)/DIN Rail(75mm)			DIN Rail(35mm)/DIN Rail(75mm)	
Dimension(L×W×H)(mm)			76×122×123			87×130×130	
Weight(Kg)			1.23			1.5	
Holding power(VA)			3.6			1	
Control voltage(V) AC/DC			DC: 12, AC/DC: 24,48,110,220			DC: 12, AC/DC: 24,48,110,220,380	
Safety zone(mm)			12			12	
Matched thermal overload relay							
Models			Ex9R100			Ex9R100	
Matched mechanical interlocking device							
Models			MIT43			MIT43	
Add-on auxiliary contact blocks							
Top mounting	4NC		AX4204				
	1NO+3NC		AX4213				
	2NO+2NC		AX4222				
	3NO+1NC		AX4231				
	4NO		AX4240				
	2NC		AX4202				
	1NO+1NC		AX4211				
	2NO		AX4220				
Side mounting	1NO+1NC		AX4311				

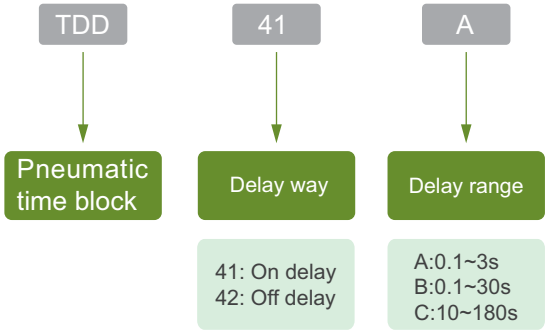
Selection Guide for Ex9C



Example:

Ex9CSR12 10 3P 400V 50"is for ordering an Ex9CSR mini reversing AC contactor, 3P, @ AC-3 400V,50Hz, with auxiliary contact 1NO+1NC.

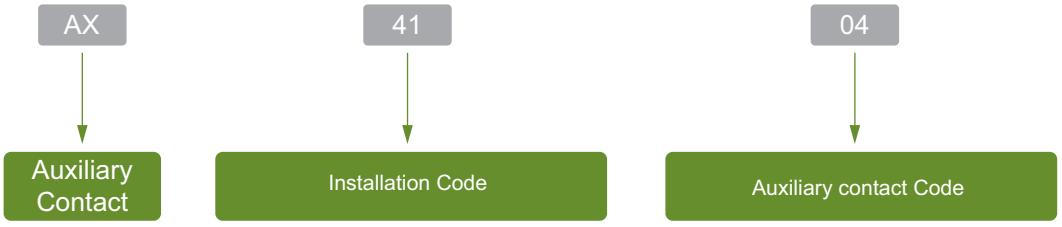
Pneumatic time block Selection



Example:

"TDD41A"is for ordering an time delay current range of 0.1 ~ 3 s air delay contacts.

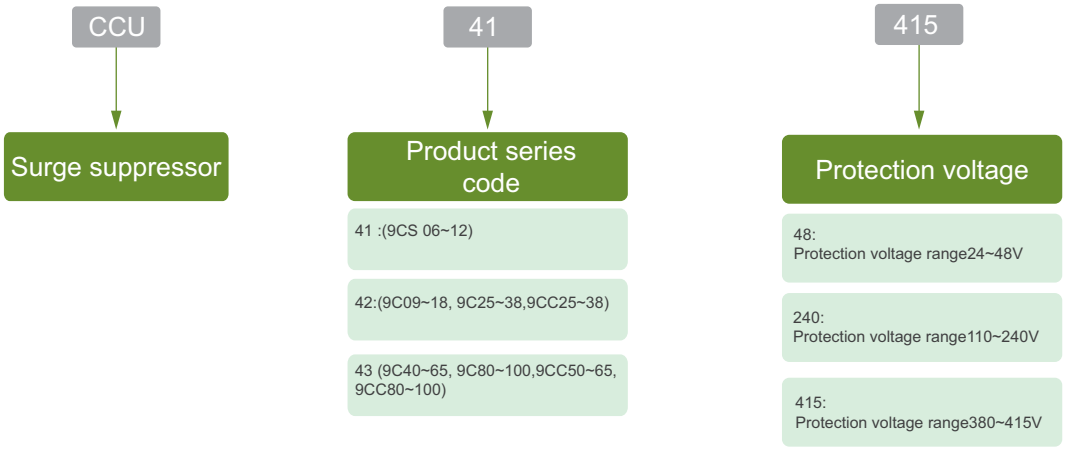
Accessories Selection



Example:

"AX4104"is for ordering an 4NC AX4 series auxiliary contacts.

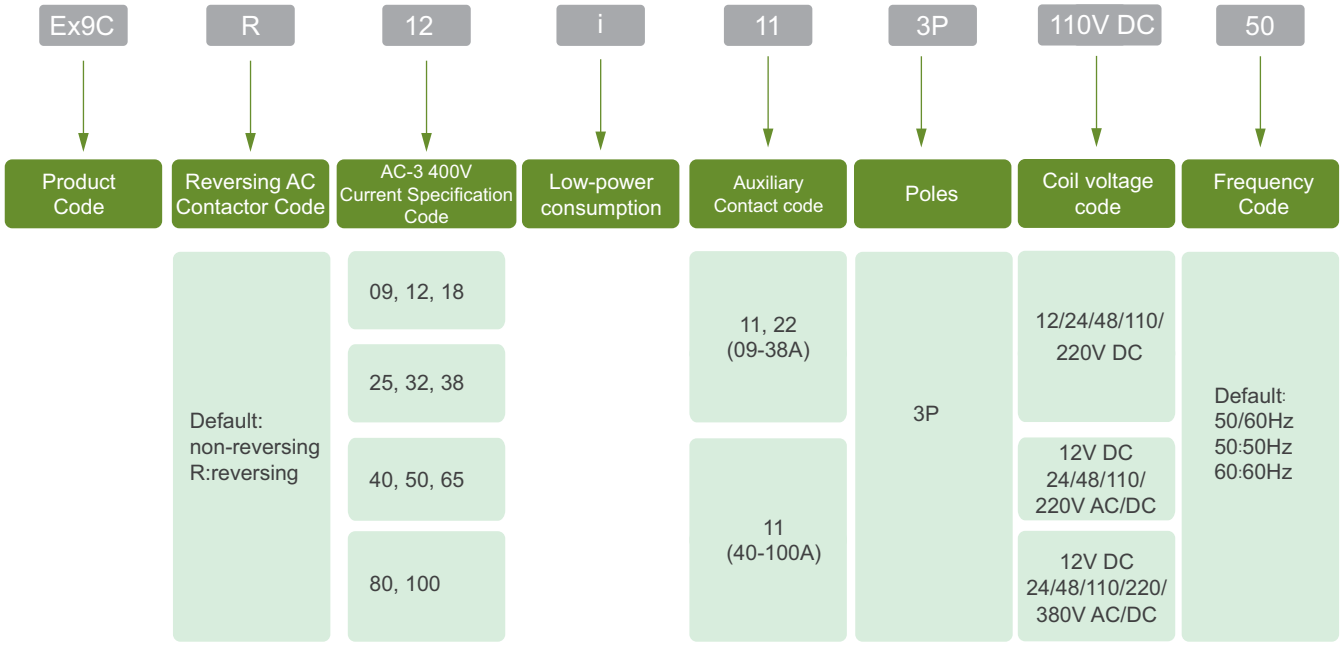
Surge Suppressor Selection



Example:

"CCU41 415"is for ordering an apply to 9CS06 ~ 12 AC contactor,and protect coil voltage range for 380 V-415 V surge suppressor.

Selection Guide for Ex9Ci



Example:

"Ex9CR12i 11 3P 110V DC 50" is for ordering a reversing low-consumption contactor with rated current 12A @AC-3 400V, 1NO+1NC, 3P, 50Hz

Features

Ex9R Series Thermal Overload Relay

- Rated current range(0.1A~100A),three frames
- Materials such as bimetal,plastic are imported
- One frame overload can use with many frames of contactor
- Function:overload protection,phase failure protection,temperature compensation etc
- Low power consumption,the max power consumption of Ex9R38 is just 4.5W
- 2 inventive patents,2 new practical patents,1 appearance patent
- Products with light weight, stable and reliable performance, exquisite appearance

Type	Ex9R12	Ex9R38	Ex9R100
Weight(kg)	0.16	0.14	0.51

- Machine with semi-automatic production line model
- Process testing, product testing, product testing and other aspects of computer control and the use of all seized by Taiwan
- Processing of the key process using laser welding, auto and other advanced manufacturing processes around the wire

Five kinds of shell frame current level

Ex9R12

Frame current: 12A

Ex9R38

Frame current: 38A

Ex9R100

Frame current: 100A

Ex9R185

Frame current: 185A

Ex9R500

Frame current: 500A

For each type of Ex9R thermal overload relays can match various types of Ex9C ac contactor,Chart:

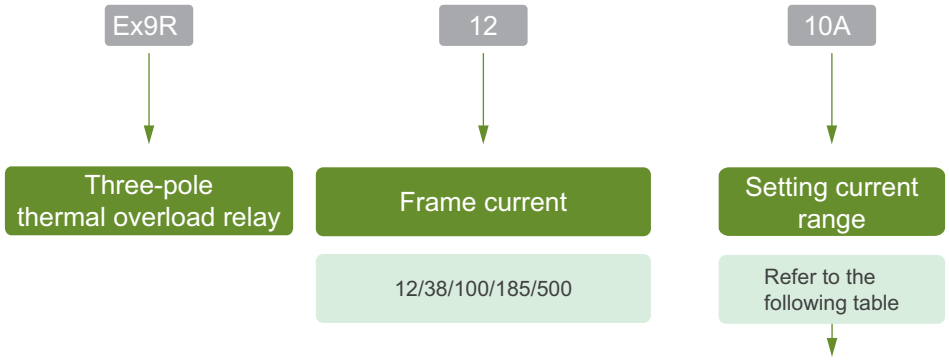
Ex9R Model	Ex9R12	Ex9R38		Ex9R100		Ex9R185	Ex9R500	
Matched contactor	Ex9CS06	Ex9C09	Ex9C25	Ex9C40	Ex9C80	Ex9C115	Ex9C225	Ex9C400
	Ex9CS09	Ex9C12	Ex9C32	Ex9C50	Ex9C100	Ex9C150	Ex9C265	Ex9C500
	Ex9CS12	Ex9C18	Ex9C38	Ex9C65		Ex9C185	Ex9C300	

Note: Ex9R12 setting current range: (0.1 ~ 12) A; Ex9R38 setting current range: (2.5 ~ 38) A; Ex9R100 setting current range: (23-100) A. Ex9R185 setting current range: (80 ~ 185) A; Ex9R500 setting current range: (160 ~ 500) A.

Parameters

Ex9R SeriesThermal Overload Relay	Ex9R12	Ex9R38	Ex9R100	Ex9R185	Ex9R500
IEC 60947-4-1					
Electrical performance					
Operation frequency(Hz)	50/60				
Tripping class	10A				
Rated insulation voltage(V)	690				
Setting current range(A)	0.1~12	2.5~38	23~100	80~185	160~500
Tripping threshold	$1.14\pm0.06I_n$				
Sensitivity to phase failure	Tripping current 30% of In on one phase,the others at In				
Protection functions	Overload,phase failure				
conformed standards	IEC 60947-4-1				
Operational environment					
Ambient air temperature for normal operation(°C)	-20~+55				
Mounted position	Mounting surface and vertical plane is not more than 30 °				
Protection					
Seismic performance (accord with IEC68-2-6 allow acceleration)	2gn-5 to 300Hz				
Shock resistance (accord with IEC68-2-27 allow acceleration)	15gn-11ms				
Degree of protection	IP20				
Protection degree	“TH”				
Outline structure					
Reset	Manual or Automatic				
Auxiliary contact	1NO+1NC				
Dimension (L xW ×H) (mm)		65×46×69	117×72×80		
Weight (kg)	0.16	0.14	0.51	136×120×133	146×145×149
Matched contactor					
Model	Ex9CS06,09,12	Ex9C09,12,18,25,32,38	Ex9C40,50,65,80,100	Ex9C115,150,185	Ex9C225,265,300,400,500
Matched mounting base					
Model	AD51	AD52	AD53	AD54	AD55

Selection Guide

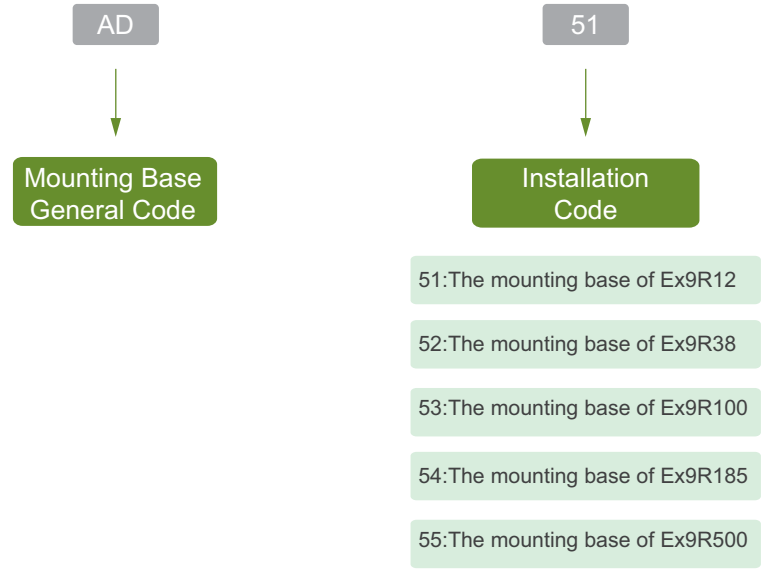


Ex9R12	Current Setting Range (A)	Ex9R38	Current Setting Range (A)	Ex9R100	Current Setting Range (A)	Ex9R185	Current Setting Range (A)	Ex9R500	Current Setting Range (A)
0.16A	0.1~0.16	4A	2.5~4	32A	23-32	115A	80~115	225A	160~225
0.25A	0.16~0.25	6A	4~6	40A	30-40	150A	110~150	300A	210~300
0.4A	0.25~0.4	8A	5.5~8	50A	37-50	185A	140~185	400A	280~400
0.63A	0.4~0.63	10A	7~10	65A	48-65			500A	380~500
1A	0.63~1	13A	9~13	70A	55-70				
1.6A	1~1.6	18A	12~18	80A	63-80				
2.5A	1.6~2.5	24A	16~24	100A	80-100				
4A	2.5~4	32A	23~32						
6A	4~6	38A	30~38						
8A	5.5~8								
10A	7~10								
12A	9~12								

Table of setting current range

Example:

"Ex9R12 10A"is for ordering a thermal overload relay with three-pole,frame current in 12A,setting current range in 7A~10A.



Example:

"AD51"is for ordering a mounting base only applied to Ex9R12.

Features

The product is used for breaking the capacitor bank in low voltage reactive compensation,whose rated working voltage is 690V,utilization category is AC-6b in the power system. It is for connecting and breaking the power capacitor whose shunt capacitance points to 90k Var and to adjust electric power system for numerical. The contactor with current suppression device can effectively reduce the current impact of the capacitors and operational over voltage.

Ex9CC has three shell frame current levels, six types:

Frame current: 38A

Ex9CC25

Ex9CC38

Frame current: 65A

Ex9CC50

Ex9CC65

Frame current: 100A

Ex9CC80

Ex9CC100

Standards and Certifications

IEC/EN 60947-4-1

Operating Conditions

Temperature

- -20°C - +40°C

Altitude

- altitude 2,000 m.

Humidity

The following conditions must be met during normal operation:

- If the ambient air temperature is +40°C, the atmospheric relative humidity can not exceed 50%. If the temperature is lower, use it under the conditions for a higher degree of humidity
- The monthly mean relative humidity needs to be below 90% in the dampest month
- The effects of condensation on the product surface impacts its performance and needs to be taken into consideration

Pollution Level

- Level 3

Installation

- Screws
- Din-rail35/75
- Inclination between mounting and vertical plane shoule be less than ±5°

Parameters

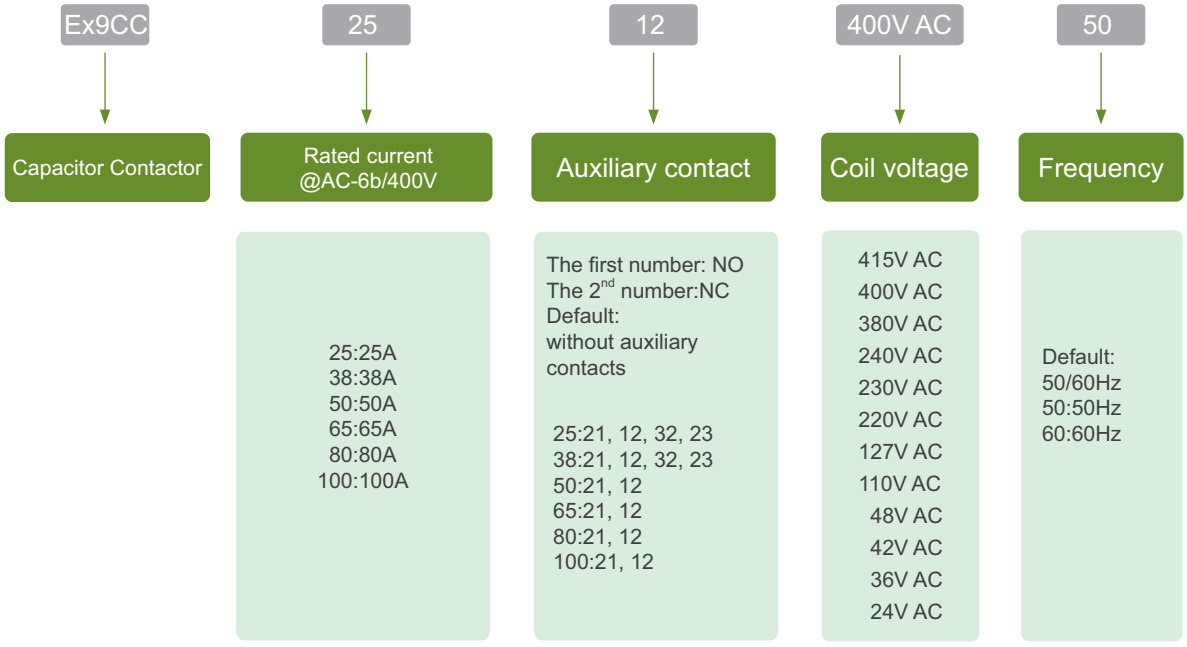
Main contact parameters

Ex9CC Series Capacitor Contactor		Ex9CC25	Ex9CC38	Ex9CC50	Ex9CC65	Ex9CC80	Ex9CC100
Electrical performance							
Rated conventional heating current		50	50	80	80	125	125
Rated current	AC-6b	25	38	50	65	80	100
AC-6b Kvar	220~240V	8	15	20	25	30	40
	400~440V	16	25	30	40	50	60
	690V	25	40	50	60	80	90
Rated insulation voltage Ui(V)		690					
Inhibit current ability(current limiting multiples)		30					
Electrical durability($\times10^6$cycles)		2		1			
Mechanical life($\times10^6$cycles)		10					
Operation frequency(cycles/h)		180		100			
Auxiliary contacts		2NO+1NC	2NO+1NC	2NO+1NC	2NO+1NC	2NO+1NC	2NO+1NC
		1NO+2NC	1NO+2NC	1NO+2NC	1NO+2NC	1NO+2NC	1NO+2NC
		3NO+2NC	3NO+2NC	—	—	—	—
		2NO+3NC	2NO+3NC	—	—	—	—

Auxiliary contacts Parameters

Utilization Category		AC-15	DC-13
Rated conventional heating current (A)		10	
Rated voltage	(V)	415	250
Rated current	(A)	1.9	0.31
Control capacity	connecting	7200VA	69W
	breaking	720VA	69W

Selection Guide



Example:

"Ex9CC25 12 400V AC 50"is for ordering a capacitance contactor in AC-400 V use category, rated current 25A, 50 Hz, coil voltage of AC 400 V, with 1NO and 2 NO auxiliary contacts.

Features

The product is mainly used to control all kinds of electromagnetic coils, amplifier and transfer the signals. Rated working voltage up to 690V. Featured by compact structure, easy installation and multionfiguration of auxilliary contacts.

Ex9RC 5 kinds of models:

Ex9RC
Ex9RC04
Ex9RC13
Ex9RC22
Ex9RC31
Ex9RC40

Standards and Certifications

IEC/EN 60947-5-1

Operating Conditions

Temperature

- -20℃ - +55℃

Altitude

- altitude 2,000 m.

Humidity

The following conditions must be met during normal operation:

- If the ambient air temperature is +40°C, the atmospheric relative humidity can not exceed 50%. If the temperature is lower, use it under the conditions for a higher degree of humidity
- The monthly mean relative humidity needs to be below 90% in the dampest month
- The effects of condensation on the product surface impacts its performance and needs to be taken into consideration

Pollution Level

- Level 3

Installation

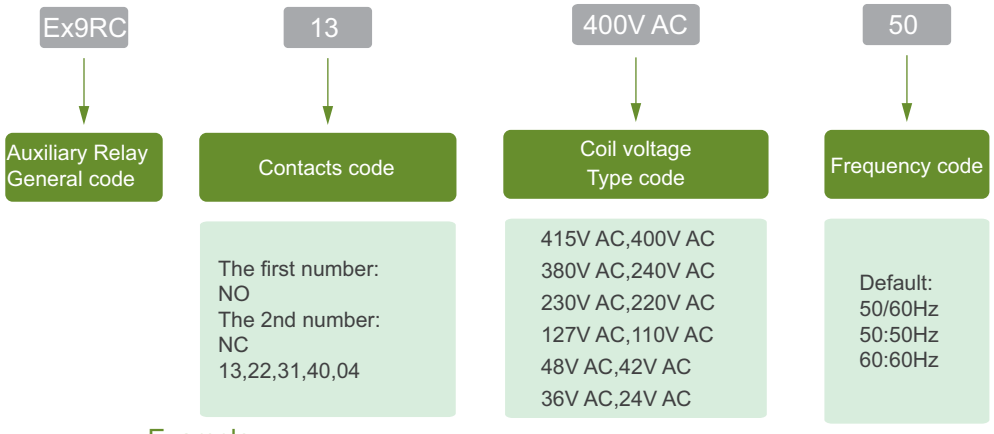
- Screws
- Din-rail 35/75
- Inclination between mounting and vertical plane shoule be less than± 30°

Parameters

Ex9RC Series Contactor Relay			Ex9RC04/Ex9RC22/Ex9RC31/Ex9RC40	
IEC/EN 60947-5-1				
Electrical performance				
Utilization category			AC-15	DC-13
Rated voltage	U_e	(V)	415	250
Rated current	I_e	(A)	1.9	0.31
Rated conventional heating current	I_{th}	(A)	10	10
Rated control capacity			720VA	69W
Electrical durability($\times 10^6$cycles)			12	
Mechanical life($\times 10^6$cycles)			100	
Rated insulation voltage	U_i	(V)	690	
Rated impulse withstand voltage Uimp	U_{imp}	(kV)	6	
Shell protection grade			IP20	
Protection degree			3	
Minimum hige voltage			17V	
Minimum hige current			5mA	
Coil Power(VA)	Start		35	
	Keep		7.5	
Action time(ms)	Actuation		6~20	
	Release		4~16	
Root number			1~2	
wire		(mm^2)	1~2.5	
Connection screws specifications			M3	
Tighten the torque		(N.m)	0.8	
Matched auxiliary contact				
Top mounted	4NC		AX4104	
	1NO+3NC		AX4113	
	2NO+2NC		AX4122	
	3NO+1NC		AX4131	
	4NO		AX4140	

Note: The product size is the same as that of the Ex9CS12

Selection Guide



Example:

"Ex9RC 13 400V AC 50"is for ordering an Ex9RC series Contactor Relay with frequency 50Hz,1 NO+3NC,coil voltage of AC 400V.

Features

Electromagnetic starter is used to control the making or breaking of contactor by external signaland thermal relay combination and installed in the same metal box, the external switch signals to control according to the contact device connected and points to break, mainly used for exchange 50/60 Hz, rated voltage to 415 V, in AC-3 use category rated power to control under 18.5 kW circuit, used as a control motor start and stop, thermal relay to protect the motor of overload and the role of the broken phase.

Ex9QC have 2 kinds of models:

Ex9QC05

Ex9QC18

Operating Conditions

Temperature

- -5°C - +40°C

Altitude

- altitude 2,000 m.

Humidity

The following conditions must be met during normal operation:

- If the ambient air temperature is +40°C, the atmospheric relative humidity can not exceed 50%. If the temperature is lower, use it under the conditions for a higher degree of humidity
- The monthly mean relative humidity needs to be below 90% in the dampest month
- The effects of condensation on the product surface impacts its performance and needs to be taken into consideration

Pollution Level

- Starter generally applied in pollution level III (conductivity, or due to pollution to dry the conductive gel pollution into the conductivity of the) environment

Installation

- Mounting surface and the slope of the vertical plane no more than ± 30°
- Screw the installation, and additional corresponding spring washer, flat gasket

Parameters

Ex9QC Series Electromagnetic Starter		Ex9QC05	Ex9QC18
Output of motors at 380V/415VAC		5.5	18.5
Rated current	(A)	up to 12	up to 38
Rated insulation voltage	(V AC)	690	
Rated voltage	(V AC)	up to 415	
Operating frequency		30times/h	
Protection degree		IP65	
Conformed standards		IEC/EN60947-4-1	

Selection Guide

Model	Rated current Ie(A)	Rated power(kW)		Contactor type	Thermal relay type
		Ue:380/415V	Ue:220/240V		
Ex9QC05 0.16A	0.16	0.04	0.03	Ex9CS1210	Ex9R12 0.16A
Ex9QC05 0.25A	0.25	0.06	0.04		Ex9R12 0.25A
Ex9QC05 0.4A	0.4	0.09	0.06		Ex9R12 0.4A
Ex9QC05 0.63A	0.63	0.18	0.09		Ex9R12 0.63A
Ex9QC05 1A	1	0.25	0.12		Ex9R12 1A
Ex9QC05 1.6A	1.6	0.55	0.25		Ex9R12 1.6A
Ex9QC05 2.5A	2.5	0.75	0.37		Ex9R12 2.5A
Ex9QC05 4A	4	1.1	0.55		Ex9R12 4A
Ex9QC05 6A	6	2.2	1.1		Ex9R12 6A
Ex9QC05 8A	8	3	1.5		Ex9R12 8A
Ex9QC05 10A	10	4	2.2		Ex9R12 10A
Ex9QC05 12A	12	5.5	3		Ex9R12 12A
Ex9QC18 4A	4	1.5	0.75	Ex9C1811	Ex9R38 4A
Ex9QC18 6A	6	2.2	1.1		Ex9R38 6A
Ex9QC18 8A	8	3	1.5		Ex9R38 8A
Ex9QC18 10A	10	4	2.2		Ex9R38 10A
Ex9QC18 13A	13	5.5	3		Ex9R38 13A
Ex9QC18 18A	18	7.5	4		Ex9R38 18A
Ex9QC18 24A	24	11	5.5	Ex9C3811	Ex9R38 24A
Ex9QC18 32A	32	15	7.5		Ex9R38 32A
Ex9QC18 38A	38	18.5	9		Ex9R38 38A

Selection Guide

Ex9QC	05	0.16A		400V AC	50
Electromagnetic starter General code	Maximum rated motor power	Setting current range		Rated control voltage	Frequency code
	05:5.5kW 18:18.5kW	Frame current 05: 0.16A:0.1~0.16 0.25A:0.16~0.25 0.4A:0.25~0.4 0.63A:0.4~0.63 1A:0.63~1 1.6A:1~1.6 2.5A:1.6~2.5 4A:2.5~4 6A:4~6 8A:5.5~8 10A:7~10 12A:9~12	Frame current 18: 4A:2.5~4 6A:4~6 8A:5.5~8 10A:7~10 13A:9~13 18A:12~18 24A:16~24 32A:23~32 38A:30~38	415V AC 400V AC 380V AC 240V AC 230V AC 220V AC 127V AC 110V AC 48V AC 42V AC 36V AC 24V AC	Default: 50/60Hz 50:50Hz 60:60Hz

Features

Ex9QS star-delta starter is used to start and control the 3-phase squirrel-cage motor with frequency of AC Hz 50/60, rated voltage up to 415V, rated power up to 85 kW (current up to 160A) . The starter could realize the switch of Y-△ to reduce the starting current and impact on the grid.

Ex9QS have four shell frame current levels, 11 models:

Frame current: 18A

Ex9QS09
Ex9QS12
Ex9QS18

Frame current: 38A

Ex9QS25
Ex9QS32
Ex9QS38

Frame current: 65A

Ex9QS40
Ex9QS50
Ex9QS65

Frame current: 65A

Ex9QS80

Ex9QS100

Operating Conditions

Temperature

- -5°C- +40°C

Altitude

- altitude 2,000 m.

Humidity

The following conditions must be met during normal operation:

- If the ambient air temperature is +40°C, the atmospheric relative humidity can not exceed 50%. If the temperature is lower, use it under the conditions for a higher degree of humidity
- The monthly mean relative humidity needs to be below 90% in the dampest month
- The effects of condensation on the product surface impacts its performance and needs to be taken into consideration

Pollution Level

- Starter generally applied in pollution level III (conductivity, or due to pollution to dry the conductive gel pollution into the conductivity of the) environment

Installation

- Mounting surface and the slope of the vertical plane no more than ± 30°
- Screw installation, with relative spring washer and flat gasket.

Parameters

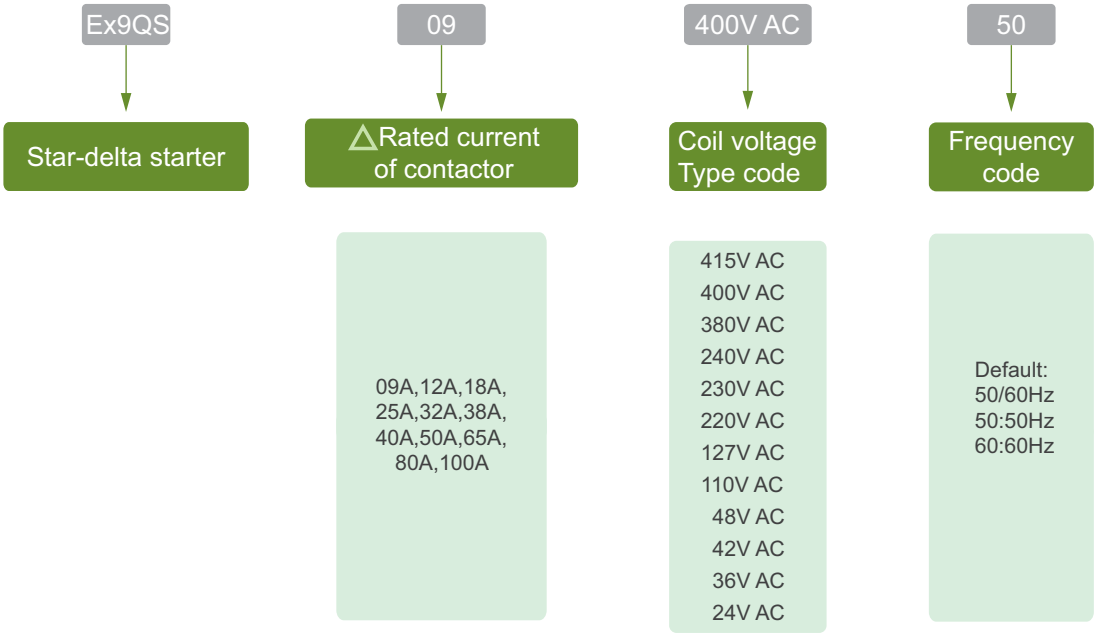
Ex9QS series star-delta starter parameter table

Ex9QS Series Star-delta motor starters	Ex9QS09	Ex9QS12	Ex9QS18	Ex9QS25	Ex9QS32	Ex9QS38	Ex9QS40	Ex9QS50	Ex9QS65	Ex9QS80	Ex9QS100
Output of motors at 380V/415V (kW)	7.5	9	15	18.5	25	30	33	45	59	75	85
Rated current(A)	15.5	20	31	43	55	65	69	86	112	138	160
Rated insulation voltage VAC	690						1000				
Rated voltage VAC	To 415										
Electrical durabilityAC-3 380V($\times10^6$cycles)	0.5			0.4			0.3			0.3	
Mechanical life ($\times10^6$cycles)	3										
Conformed standards	IEC/EN60947-4-1										
Coil VoltageU_s (V)	24,36,42,48,110,127,220,230,240,380,400,415										

Selection Guide

Specification	Rated voltage U_e(V)	Rated current I_e(A)	Rated power P_e(kW)	Rated insulation voltage U_i(V)	Ac contactor		Pneumatic Time Block
					Main, delta (KM1,KM2)	Star (KM3)	
Ex9QS09	220/240	15.5	4	690	Ex9C0911	Ex9C0911	TDD41B
	380/415		7.5				
Ex9QS12	220/240	20	5.5		Ex9C1211	Ex9C0911	
	380/415		9				
Ex9QS18	220/240	31	7.5		Ex9C1811	Ex9C1211	
	380/415		15				
Ex9QS25	220/240	43	11		Ex9C2511	Ex9C1211	
	380/415		18.5				
Ex9QS32	220/240	55	15		Ex9C3211	Ex9C2511	
	380/415		25				
Ex9QS38	220/240	65	18.5		Ex9C3811	Ex9C2511	
	380/415		30				
Ex9QS40	220/240	69	18.5	1000	Ex9C4011	Ex9C4011	
	380/415		33				
Ex9QS50	220/240	86	25		Ex9C5011	Ex9C4011	
	380/415		45				
Ex9QS65	220/240	112	30		Ex9C6511	Ex9C4011	
	380/415		59				
Ex9QS80	220/240	138	40		Ex9C8011	Ex9C5011	
	380/415		75				
Ex9QS100	220/240	160	45		Ex9C10011	Ex9C6511	
	380/415		85				

Selection Guide



Example:

"Ex9QS09 400V AC 50"is for ordering an Ex9QS series star-delta motor starter with frequency 50Hz,rated current of contactor 09A,coil voltage AC400V.

Product Overview

PVBx Series Photovoltaic Combiner Box

PVBx series PV combiner box functions of combining circuit and surge protection between PV modules and inverters.

PVBx Z Series Smart Photovoltaic Combiner Box

PVBX Z series intelligent PV combiner box could upload and monitor the status of current, voltage, switch and SPD. Electrical data is displayed by LED and transferred by the means of RS485

Characteristics

ALL components are PV specialized by Noark, voltage of which is up to 1000VDC

Different size of combiner box and different solution to meet different demands of customers.

Number of mounting units are from 1 to 20.

Protection degree of IP 65

Selection Guide

PVBx	Z	8	1
Product Code	Model of PVBx	Loop Number	PV assembly type
	Z: Smart _: Standard	1: 1 loop tank 2: 2 loop tank 3: 3 loop tank 4: 4 loop tank 6: 6 loop tank 8: 8 loop tank 10: 10 loop tank 12: 12 loop tank 14: 14 loop tank 16: 16 loop tank 18: 18 loop tank 20: 20 loop tank 22: 22 loop tank 24: 24 loop tank 26: 26 loop tank 28: 28 loop tank 30: 30 loop tank 32: 32 loop tank 34: 34 loop tank 36: 36 loop tank 38: 38 loop tank 40: 40 loop tank	1:used for solar cell in crystalline silicon 125 2:used for solar cell in crystalline silicon 156 3:used for sin film solar cell 4:used for other solar cells

Parameters

Model	Standard	Smart
Electrical performance		
Voltage range of PV array(V DC)	1000	
Max.string input in parallel	40	
Max.current of each fuse input(A)	30	
Max diameter of each input cable(mm)	6.5	
Max diameter of each output cable(mm)	17	
Protection function		
Input fuse/breaker for PV DC	■	
Output breaker for PV DC	■	
Lightning protection module for PV	■	
preventing reverse current	□	
Environmental Adaptability		
Protection degree	IP65	
Relative humidity	0~99%	
Installation temperature	-25°C~+70°C	
Anti-corrosion	corrosin of rain,hail and snow	
Temperature resistance(Box)	-40(°C)to +120(°C)	
Position-free materials	exclusive of silicon and halogen	
Flame retardant	conform to IEC 60695-2-11,UL Subject 94V-2	
Chemical resistance	Prevent 10% of acid,alkali,gasoline and heavy oil	
UV resistance	UV resistance tested for outdoor installation	
Degree of resistance to impact	Degree of resistance to impact IK08(5 Joule)	
Smart communication		
Communication interface	—	RS485
Each circuit current measurement	—	■
Voltage measurement system	—	■
Switch state upload	—	□
Surge protector state upload	—	□
Temperature measurement inside box	—	□
Alarm	—	□

■ Standard □ Optional — None

Product Overview

SUP

PVPS

Monitoring string current and voltage, providing the Modbus RTU output, making combiner box "smart".

- Standardized products, 4~20strings, the same dimensions of all products
- Double-layer wiring, large aperture thread design
- Easy installation, simple operation
- High accuracy: ±1%RDG+2DGT
- Low-power consumption
- Relay signal output function
- With power-supply module PVP, the monitoring device SUP could be supplied by PV power instead of grid

Selection of monitoring device

SUP	4S
Product code	strings number
Smart monitoring device	4S: 4 strings 16S: 16 strings 5S: 5 strings 17S: 17 strings 6S: 6 strings 18S: 18 strings 7S: 7 strings 19S: 19 strings 8S: 8 strings 20S: 20 strings 9S: 9 strings 10S: 10 strings 11S: 11 strings 12S: 12 strings 13S: 13 strings 14S: 14 strings 15S: 15 strings

Selection of power-supply module

PVPS	DC 1000V
Product code	Input Voltage
Power-supply module	DC230V: Input voltage DC 230V DC400V: Input voltage DC 400V DC1000V: Input voltage DC 1000V

Parameters

Electrical Specification for Monitoring device		ELECTRICAL SPECIFICATION			
Power					
Input Power		24VDC, 350mA, Required (not included)			
Max. Power Consumption (W)		8(Input Voltage 24VDC, 20 Channels)			
Monitoring					
Max. Quantity of Channels		20			
Max. String Current (A)		20			
Range of Current Monitoring (A)		0.5~18 per channel			
Accuracy of Current Monitoring		±(1%RDG+2DGT)			
Range of Voltage Monitoring (V)		100~1200			
Accuracy of Voltage Monitoring		±(1%RDG+3DGT)			
Output					
Alarm		Over Voltage200V~1200V(Adjustable)			
		Under Voltage50V~800V(Adjustable)			
		Over load protection1.0A~18.0A(Adjustable), default13.6A			
		Reverse Current-18.0A~-1.0A(Adjustable)			
Status Monitoring		SPD			
		Fuse			
		Breaker			
Communication					
Protocols		ModBus-RTU			
Baud rate		4800bps/9600bps/19200bps(Adjustable), default value 9600bps			
Addressing		1~247			
Communication Distance 1200		1200m(shielded twisted-pair cable)			
Environment					
Operation Temperature (°C)		-25~+70			
Humidity (%)		0~95			
Storage Temperature (°C)		0~+85			
Altitude (m)		≤2500			
Pollution Degree		2			
Physical					
Dimension(mm)		10.25”×3.2”×2.8” (260mm×80mm×70mm)			
Weight (kg)		0.575(Full Function, 20 Channels)			
Electrical Specification for Power-supply module		ELECTRICAL SPECIFICATION			NOTES
Maximum ratings		Min.	Typ.	Max.	
Input Voltage (Vdc)		-0.3		1200	
Operating Temperature (°C)		-25		70	
Storage Temperature (°C)		-40		85	
Output Current (mA)				350	
Input Characteristics					
Operating Input Voltage (Vdc)		100		1000	
Maximum Input Current (mA)				120	Vout=24V, Full load
Output Characteristics					
Output Voltage Set Point (%Vset)		-3		+3	With a 1.0% trim resistor
Output Voltage Regulation (%Vset)	Over Line	-1		+1	Vin=100~1000Vdc
	Over Load	-2		+2	Io=Min to Full Load
	Over Temperature	-2		+2	Ta=-25°C to 70°C
	Total output range	-2		+2	Over load, line, temperature regulation
Output Voltage Ripple and Noise(mV) (5Hz~20MHz bandwidth)	Peak-to-Peak			500	Full Load
	RMS			100	Full Load
Output Voltage Over-shoot at Start-up (%Vset)				5	Vin=400V, Turn on
Output Voltage Under-shoot at Power-Off (mV)				100	Vin=400V, Turn OFF
Efficiency (%)			75		Vin=400V, Vout=24V, Full load
Physical					
Dimension (mm)		4.72"×1.8"×3.23" (120×46×82)			
Weight (kg)			0.24		

Noark

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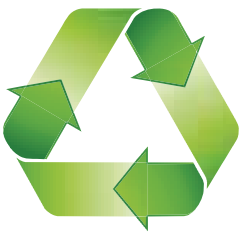

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