

NEXT SOLUTION EXPERT SOLUTION EXCELLENT SOLUTION



Susol
Super Solution

LS Industrial Systems
www.lsis.biz

Super Solution

For power distribution

- ▶ By great performance
- ▶ By securing the highest breaking capacity
- ▶ By optimum coordination technique (cascading & discrimination)



For controlling, switching and protecting motors & circuits

- ▶ By great performance and reliance
- ▶ By optimum coordination between circuit breaker and contactor
- ▶ By superior quality and long lifespan
- ▶ By providing an ideal solution where space is limited through perfect combination with MMS

For extensive applications

- ▶ By providing a wide range of optimized auxiliaries and accessories

Global Leading Products



*This is
what we want ...*
Susol MCCB

The image shows a white Susol MCCB (Molded Case Circuit Breaker) with a label that includes technical specifications such as 'TS 250L', 'UL 750V Uimp 8kV', and various current ratings. A large, faint number '4' is visible in the background.



*More compact
more valuable ...*
Susol Contactor & TOR

The image shows a white Susol Contactor & TOR (Thermal Overload Relay) with a label that includes technical specifications such as 'S/3/L2', 'T/5/L3', and 'Susol'. A large, faint number '10' is visible in the background.



*Advanced technology
compact solution ...*
Meta-MEC MMS

The image shows a white Meta-MEC MMS (Magnetic Motor Starter) with a label that includes technical specifications such as 'MEC', 'MMS-32H', and 'LS'. A large, faint number '14' is visible in the background.

*This is
what we want...*

Susol MCCB



150kA

The circuit breaker will supply more stable, reliable, upgraded systems to customer with high breaking capacity.

Susol TD and TS series



Molded Case Circuit Breakers



Susol MCCB

■ Simplified product range

- AF: 160AF, 250AF, 630AF, 800AF
- Ampere Range: 16A ~ 800A

■ High performance

- Ultimate breaking capacity (kA rms)
Icu: Max 150kA @415VAC
- Service breaking capacity
Ics: 100% of Icu
- Uimp: 8kV
- Ui: 750V
- Ue: 690VAC, 500VDC

■ Technical support

- Total & Partial Selectivity
- Cascading
- Type 2 coordination

■ Variable accessories

- Common use of electrical auxiliaries
- Motor operator
- Plug-in kit
- Rotary handles
- Locking devices
- Terminals
- Mechanical interlocking device
- Communication module

■ Interchangeable trip units

- FTU: Fixed thermal & Magnetic unit
- ATU: Adjustable thermal & Magnetic unit
- FMU: Adjustable thermal, Fixed magnetic unit
- MTU: Magnetic only trip unit
- DSU: Disconnecting switch unit
- ETS: Electronic trip unit standard
- ETM: Electronic trip unit Multi-function
- RTU: Earth-leakage trip unit
(Under development)

MCCB

24 Models in 4 Frames

Susol TD and TS circuit breakers are rated from 16 through 800 amperes and are available in four frame sizes.

Real World-Class Circuit Breakers Family TD/TS

Ics = 100%Icu : 50, 65, 85, 100, 150kA at 415VAC / 24 models in 4 frames



TD100/160

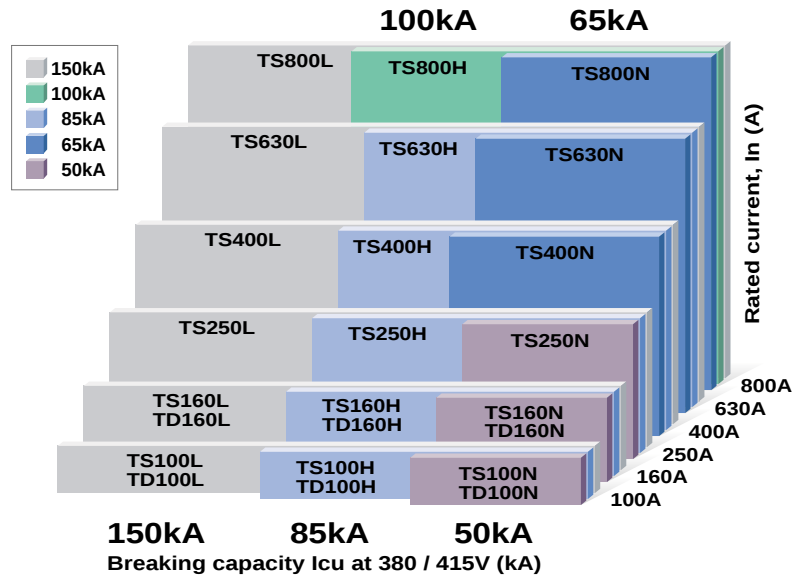
In 16~160A
Icu: 50kA(N), 85kA(H), 150kA(L)
Ics=100% of Icu
90(W) x 140(H) x 86mm(D)



Enhancement of high performance

N Type - 50, 65kA, H Type - 85, 100kA, L Type - 150kA

Maximum breaking capacity for all Ampere Frame is 150 kV at 415VAC.
And Ics is 100% of Icu.



TS100/160/250

In 40~250A
Icu: 50kA(N), 85kA(H), 150kA(L)
Ics=100% of Icu
105(W) x 160(H) x 86mm(D)



TS400/630

In 300~630A
Icu: 65kA(N), 85kA(H), 150kA(L)
Ics=100% of Icu
140(W) x 260(H) x 110mm(D)



TS800

In 700, 800A
Icu: 65kA(N), 100kA(H), 150kA(L)
Ics=100% of Icu
210(W) x 320(H) x 135mm(D)





MCCB Accessories

A complete range of convenient inner and external accessories for Susol TD and TS series

Simplicity & Flexibility

Various kinds of accessories for user convenience

Inner auxiliaries (AX, AL, SHT, UVT) are the same for all frame size. And trip units, mounting & connection accessories, terminals are the same for a given frame size.



Alarm Switch
(AL)



Fault Alarm Switch
(FAL)



Auxiliary Switch
(AX)

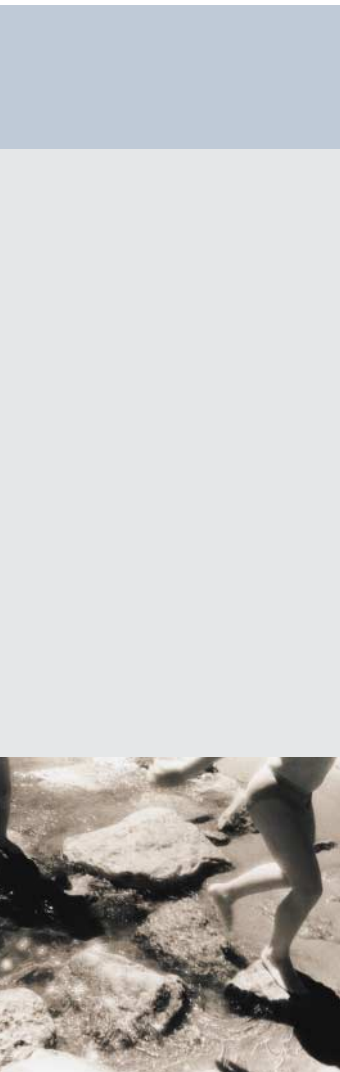
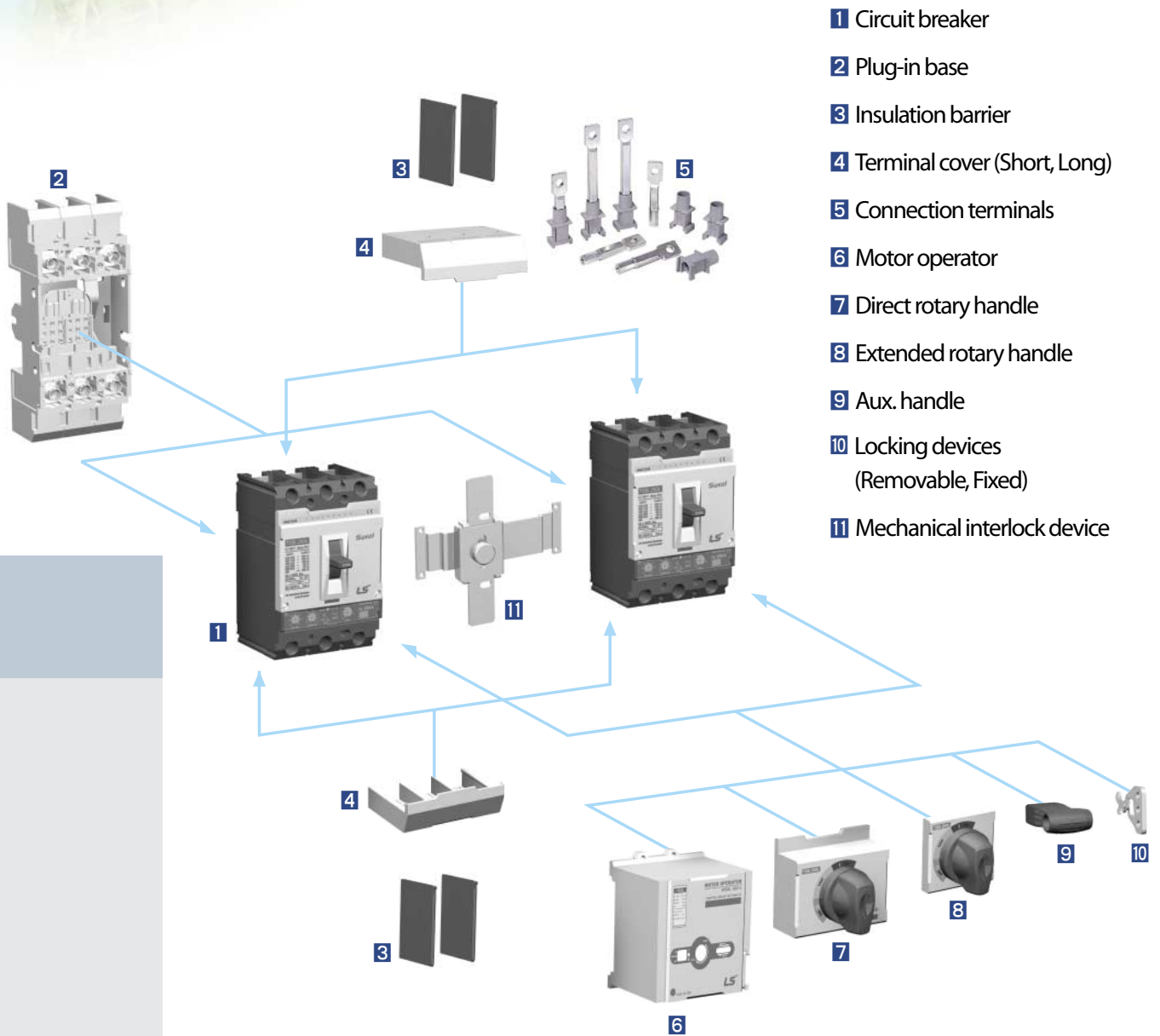


Undervoltage trip
(UVT)



Shunt Trip
(SHT)

Susol Circuit Breaker System Overview



More Compact
More valuable...

Susol Contactor & TOR



Real World-Class Contactor Family



Contactors & Overload Relays



Susol Contactor & TOR

■ General

- Frame
 - Contactor: 9A~95A
(3AF - 21 models)
 - TOR: 0.1A~95A (3AF)
- Control voltage: AC or DC
- Insulation voltage (Ui): 1000V
- Connection
 - Screw type: 32, 63, 95AF
 - Lug type: 63, 95AF

■ High performance

- Conductivity of Aux. contacts: 17V 5mA

■ User convenience

- Terminal block kit (Module type)
- Preventive from screw stepping out
- Common use of accessory:
 - Surge unit, UA, Interlock unit
- Four terminals for coil connection

■ Accessories

- Side-mounting auxiliary contact (UA)
- Interlock unit
- Reversing Kit
- Surge unit
- Remote reset unit for TOR
- Separate mounting unit for TOR
- Direct connector with MMS & Contactor
- Mounting base for contactor & MMS
- Capacitor unit

Contactors

21 Models in 3 Frames

Susol Contactor is rated from 9 through 95 amperes at 415VAC AC3 duty and is available in three frame sizes, and has a broad range of DC and other AC applications.



Susol Contactor and Overload Relay

For protection of the environment, LS used recyclable material for Susol products. And production facilities are not polluting environment in compliance with ISO14001.

■ Contactors

Airtight structure and safety cover will supply great safety and the product, is composed of recycle material, will be environmental friendly one.

MC	9	R	AC220	6	11	S					
Rated current		Applied model		Coil voltage		Frequency	Aux. contact	Terminal type			
9	9A	-	Standard	AC220	AC220V	5	50Hz	-	None	S	Screw
		R	Reversing	DC24	DC24V	6	60Hz	11	1a1b	L	Lug
						7	50/60Hz	22	2a2b		
								33	3a3b		
95	95A							44	4a4b		

■ Overload relays

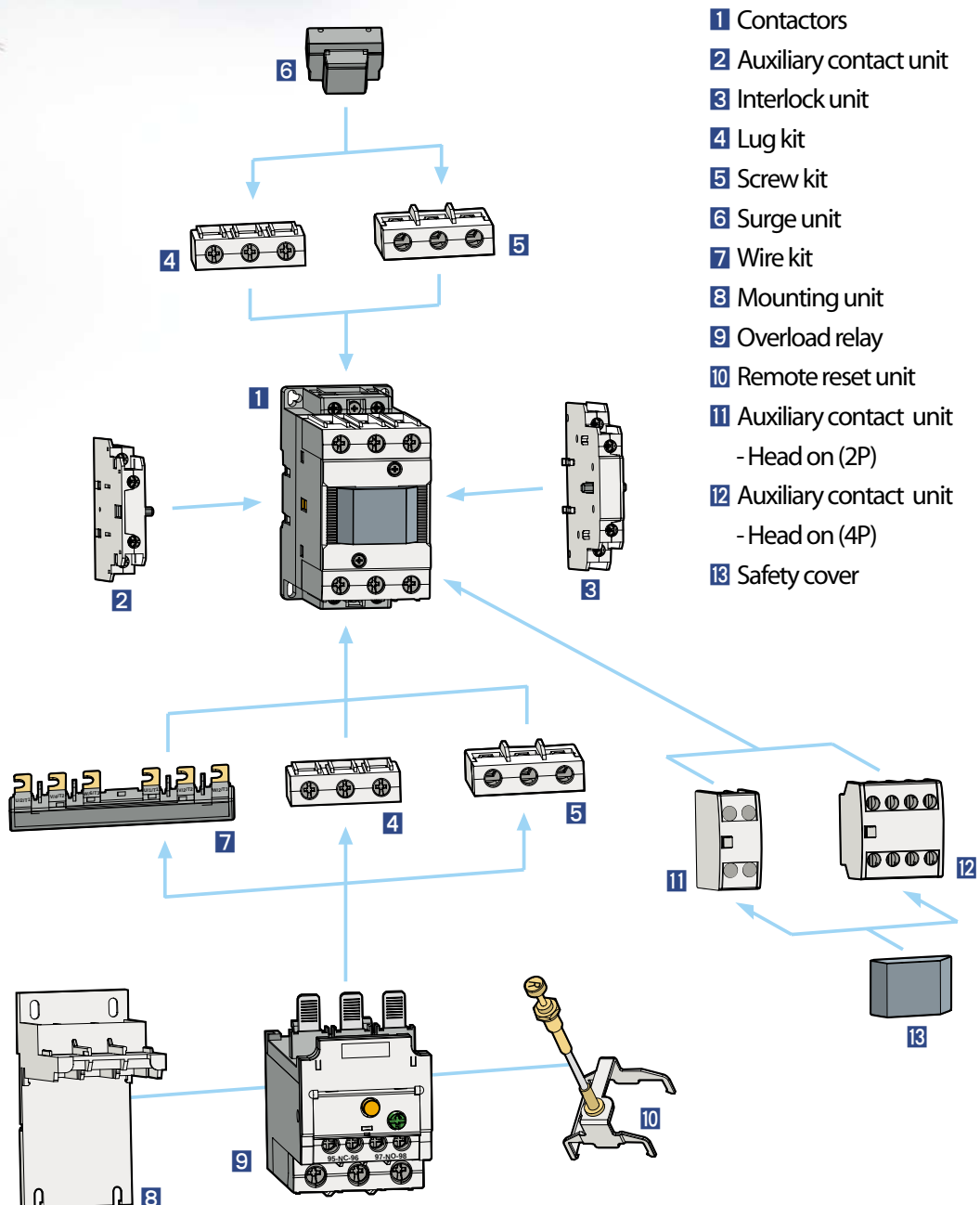
Products strengthen phase loss protection function are very strong against the internal vibration and impact.

MT	32	3H	0.13	S																																
	<table><tr><th colspan="2">Frame</th></tr><tr><td>32</td><td>32AF</td></tr><tr><td>63</td><td>63AF</td></tr><tr><td>95</td><td>95AF</td></tr></table>	Frame		32	32AF	63	63AF	95	95AF	<table><tr><th colspan="2">Applied model</th></tr><tr><td>2H</td><td>Standard (2 Heaters)</td></tr><tr><td>3H</td><td>Standard (3 Heaters)</td></tr><tr><td>3K</td><td>Differential (3 Heaters)</td></tr><tr><td>3D</td><td>Class 20 (3 Heaters)</td></tr></table>	Applied model		2H	Standard (2 Heaters)	3H	Standard (3 Heaters)	3K	Differential (3 Heaters)	3D	Class 20 (3 Heaters)	<table><tr><th colspan="2">Setting current</th></tr><tr><td>0.13</td><td>0.1~0.16A</td></tr><tr><td></td><td>⋮</td></tr><tr><td>83</td><td>70~95A</td></tr></table>	Setting current		0.13	0.1~0.16A		⋮	83	70~95A	<table><tr><th colspan="2">Terminal type</th></tr><tr><td>S</td><td>Screw</td></tr><tr><td>L</td><td>Lug</td></tr></table>	Terminal type		S	Screw	L	Lug
Frame																																				
32	32AF																																			
63	63AF																																			
95	95AF																																			
Applied model																																				
2H	Standard (2 Heaters)																																			
3H	Standard (3 Heaters)																																			
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S	Screw																																			
L	Lug																																			

Accessories

Common use of main accessories for all frames.

(Auxiliary contact, Interlock unit, Surge unit and Safety cover)



Advanced technology Compact solution...

LS Manual Motor Starters provide completed ranges up to 100A.

And also we deliver more efficiency through various functions and compact design.



Compact design and the most-effective solutions for the motors



Manual Motor Starters



Meta-MEC MMS

■ Function

- Protection of group installation
- Protection of circuits
- Motor protection
- Starter protection
- Wide range of ambient temperature compensation
- Phase failure protection

■ Standard

- Comply with the specifications in accordance with IEC 60947-2 & IEC 60947-4-1
- UL508 (Manual motor controller)
- UL508 (Combination motor controller Type E starter)
- CSA C22.2 NO.14
- GB14048

■ Certification

- KEMA CB Type certificate
- EC-Declaration of Conformity
- UL listed
- CSA certified
- CCC

■ Feature

- 45mm width up to 32A, 55mm width up to 63A and 70mm width rated to 100amps
- Three position operator ON-OFF-TRIP (Only 100AF is applied)
- Complete range of common accessories
- Handle lock in the OFF position
- Class 10 overload trip characteristics
- Trip test
- Finger safe terminal
- Din rail & Screw mounting

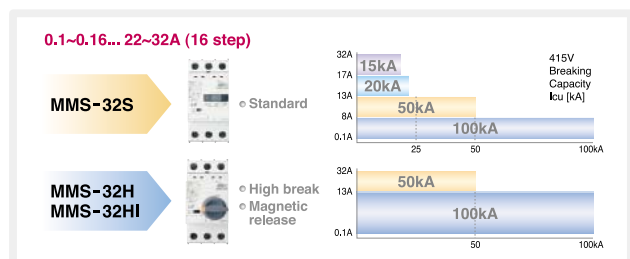
MMS 11 Models

Manual motor starter includes short-circuit , overload, phase loss protection functions with high performance and reliability. And also this manual motor starter, complying with IEC, UL standard , is a global product.

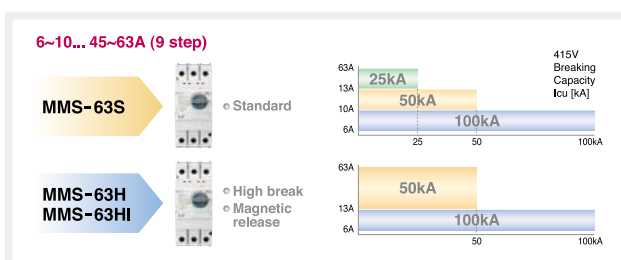
High performance

The breaking capacity of high breaking , current limiting type(32AF~63AF) is 50kA, 100kA and 100AF is 75kA, 100kA with high breaking performance.

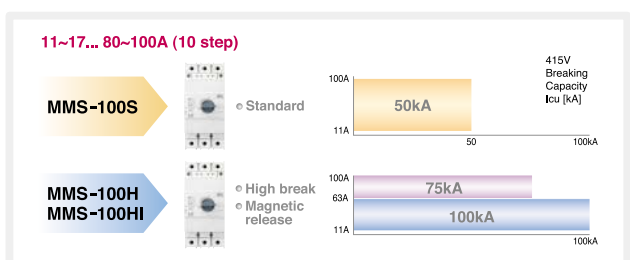
32AF



63AF



100AF



Handle Lock



Dial cover



Terminals

MMS-32



MMS-63

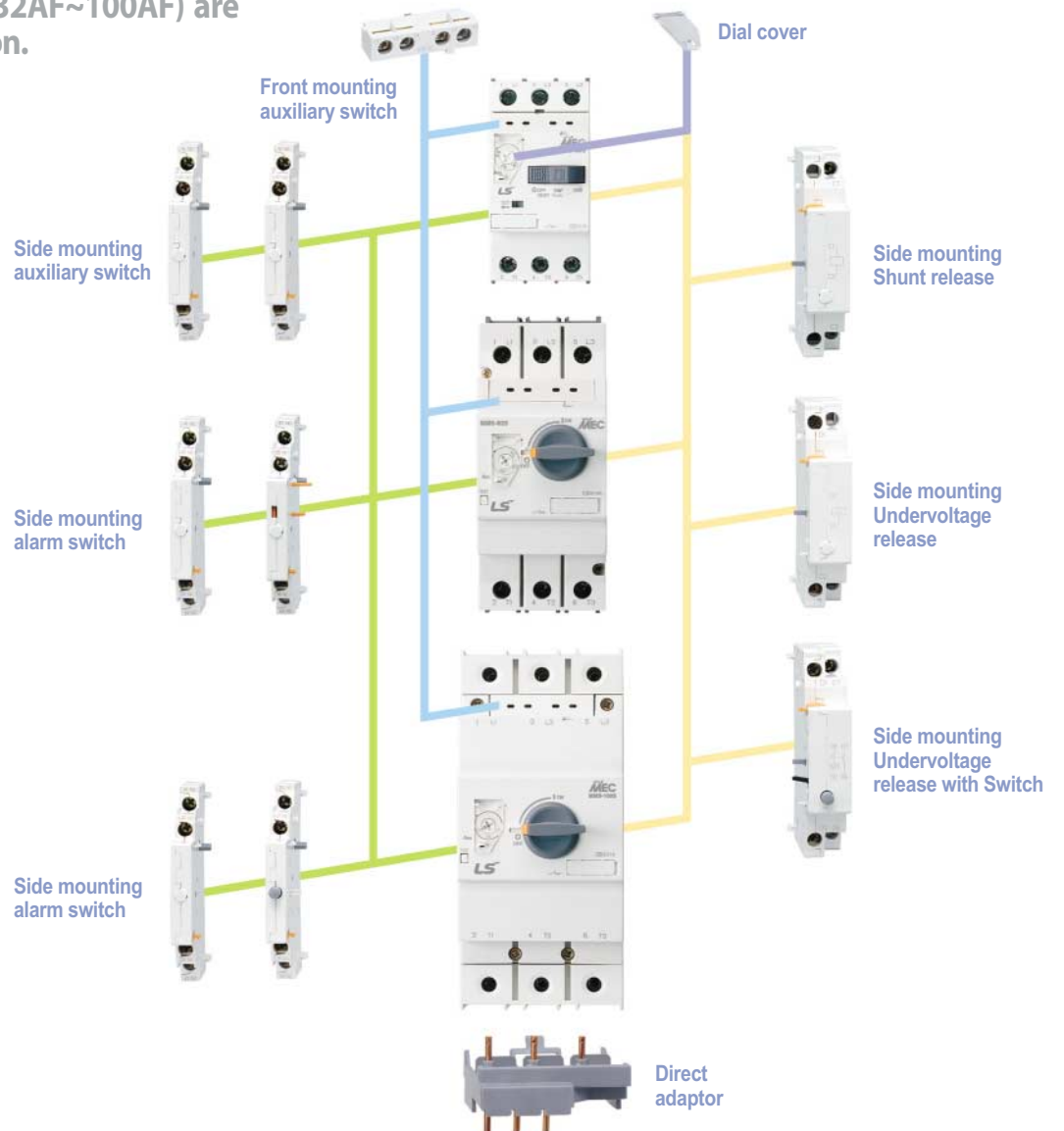


MMS-100



Accessories

All sizes are same from standard type to instantaneous time type and various accessories(32AF~100AF) are able to use in common.



Susol MCCB

Frame size			[AF]
Rated current, In [★]			[A]
No. of poles			
Rated operational voltage, Ue		AC	[V]
		DC	[V]
Rated impulse withstand voltage, Uimp			[kV]
Rated insulation voltage, Ui			[V]
Rated ultimate short-circuit breaking capacity, Icu			
AC 50/60Hz		220/240V	[kA]
		380/415V	[kA]
		440/460V	[kA]
		480/500V	[kA]
		660/690V	[kA]
DC		250V	[kA]
DC(2poles in series)		500V	[kA]
Rated service breaking capacity, Ics			[%Icu]
Category of utilisation			
Isolation behavior			
Reference standard			
Trip unit (release)			
Thermal-Magnetic			
● fixed-thermal, fixed-magnetic			FTU
● adjustable-thermal, fixed-magnetic			FMU
● adjustable-thermal, adjustable-magnetic			ATU
● magnetic only			MTU ^{★★★}
Electronic			
● LSI			ETS ^{★★★}
● LSI			ETM ^{★★★}
	Option	Earth-fault protection, Ig	
		Zone selective interlocking, ZSI	
		Ammeter	
		Communication	
		Earth-leakage protection module ^{★★★★}	
Connection	fixed	front-connection	
		rear-connection	
	plug-in	front-connection	
		rear-connection	
Mechanical life			[operations]
Electrical life @ 415 V AC			[operations]
Basic dimensions, W × H × D (front connection)		3-pole	[mm]
		4-pole	[mm]
Weight (front connection)		3-pole	[kg]
		4-pole	[kg]

TD series



TD100			TD160			TS100		
100			160			100		
16~100			100, 125, 160			40~100		
2*, 3, 4			2*, 3, 4			2*, 3, 4		
690			690			690		
500			500			500		
8			8			8		
750			750			750		
N	H	L	N	H	L	N	H	L
85	100	200	85	100	200	100	120	200
50	85	150	50	85	150	50	85	150
50	70	130	50	70	130	50	70	130
30	50	65	30	50	65	42	65	85
5	8	10	5	8	10	10	15	20
42	65	100	42	65	100	50	85	100
42	65	100	42	65	100	50	85	100
100%	100%	100%	100%	100%	100%	100%	100%	100%
A			A			A		
●			●			●		
IEC60947-2			IEC60947-2			IEC60947-2		
●			●			●		
●			●			●		
-			-			-		
-			-			●		
-			-			●		
-			-			-		
-			-			-		
-			-			-		
●			●			●		
●			●			●		
●			●			●		
25000			25000			25000		
10000			10000			10000		
90 × 140 × 86			90 × 140 × 86			105 × 160 × 86		
120 × 140 × 86			120 × 140 × 86			140 × 160 × 86		
1.5			1.5			2		
1.8			1.8			2.6		

* Applicable to MCCBs equipped with FTU, FMU, ATU

* 2 pole MCCB in 3pole frame size ** 700A only available for TS800FTU

*** Available for 3pole circuit breakers **** Under development

TS series



TS160			TS250			TS400			TS630			TS800		
160			250			400			630			800		
100, 125, 160			125, 160, 200, 250			300, 400			500, 630			700 [★] , 800		
2 [★] , 3, 4			2 [★] , 3, 4			2 [★] , 3, 4			2 [★] , 3, 4			2 [★] , 3, 4		
690			690			690			690			690		
500			500			500			500			500		
8			8			8			8			8		
750			750			750			750			750		
N	H	L	N	H	L	N	H	L	N	H	L	N	H	L
100	120	200	100	120	200	100	120	200	100	120	200	100	120	200
50	85	150	50	85	150	65	85	150	65	85	150	65	100	150
50	70	130	50	70	130	65	85	130	65	85	130	65	100	130
42	65	85	42	65	85	42	65	85	42	65	85	42	85	100
10	15	20	10	15	20	10	20	35	10	20	35	10	20	35
50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
50	85	100	50	85	100	50	85	100	50	85	100	50	85	100
100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
A			A			A			A			A		
●			●			●			●			●		
IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2			IEC60947-2		
●			●			●			●			●		
●			●			●			●			●		
●			●			●			●			●		
●			●			●			●			●		
●			●			●			●			●		
-			-			●			●			●		
-			-			▲(Option)			▲(Option)			▲(Option)		
-			-			▲(Option)			▲(Option)			▲(Option)		
-			-			▲(Option)			▲(Option)			▲(Option)		
-			-			▲(Option)			▲(Option)			▲(Option)		
-			-			▲(Option)			▲(Option)			▲(Option)		
●			●			●			●			●		
●			●			●			●			●		
●			●			●			●			●		
●			●			●			●			●		
25000			25000			20000			20000			10000		
10000			10000			6000			6000			3000		
105 × 160 × 86			105 × 160 × 86			140 × 260 × 110			140 × 260 × 110			210 × 320 × 135		
140 × 160 × 86			140 × 160 × 86			185 × 260 × 110			185 × 260 × 110			280 × 320 × 135		
2			2			5.4			5.4			15.1		
2.6			2.6			7.2			7.2			19.6		

Susol Contactor & TOR



Contactors

Type	Model		
	Connection by screws clamp terminals		
	Connection by lugs		
Number of poles			
Rated operational voltage (Ue)			
Rated insulation voltage (Ui)			
	Conforming to IEC947-4-1		
	Conforming to UL, CSA		
Rated impulse withstand voltage (Uimp)			
Degree of pollution (IEC947-4-1)			
Rated operational current Ie ($\theta \leq 55^{\circ}\text{C}$)			
	AC-1	Ue max 690V	A
	AC-3	200/240V	A
		380/400V	A
		415V	A
		440V	A
		500V	A
		690V	A
Rated operational power ($\theta \leq 55^{\circ}\text{C}$)			
	AC-3	200/240V	kW
		380/400V	kW
		415V	kW
		440V	kW
		500V	kW
		690V	kW
According to IEC947-4-1			
	Rated making capacity AC-3		
	Rated breaking capacity AC-3		
Mechanical durability in millions of operating cycles			
Maximum operating rate In operating cycles per hour			
Mechanical durability in millions of operating cycles			
Maximum operating rate In operating cycles per hour			
Electrical life for Ie/AC-3 Max in millions of operating cycles			
Maximum operating rate in operating cycles per hour			
AC control coil voltage operated contactors			
	Weight		kg
	Basic dimensions (W × H × D)		mm
DC control coil voltage operated contactors			
	Weight		kg
	Basic dimensions (W × H × D)		mm

Manual Motor Starters

Type			
	Rated operational current (Ie)		
	Rated breaking capacity (Icu)		
	Rated service short-circuit breaking capacity (Ics)		

Thermal Overload Relays

Class 10A	Differential type		
	Non-differential type	2 Heaters	
		3 Heaters	
Class 20	Differential type		
Setting range		A	

32AF

MC-9	MC-12	MC-18	MC-25	MC-32
●	●	●	●	●
-				
3				
690V				
1000V				
600V				
8kV				
3				
25	25	40	40	50
11	13	18	25	32
9	12	18	25	32
9	12	18	25	32
9	12	18	25	32
7	12	16	22	28
5	9	11	18	20
2.5	3.5	4.5	5.5	7.5
4	5.5	7.5	11	15
4	5.5	7.5	11	15
4	5.5	7.5	11	15
4	7.5	7.5	15	18.5
4	7.5	7.5	15	18.5
250				
200				
15	15	15	15	15
1800	1800	1800	1800	1800
8.07	8.07	8.07	8.07	8.07
7200	7200	7200	7200	7200
2.5	2.5	2.5	2.5	2.5
1800	1800	1800	1800	1800

0.45

45×83×93

0.63

45×83×118

32AF

MMS-32S, MMS-32H, MMS-32HI

0.1~32A

Max. 100

100%

32AF

MT-32 3K

MT-32 2H

MT-32 3H

MT-32 3D

0.1~32A



63AF

MC-35	MC-40	MC-50	MC-63
●	●	●	●
●	●	●	●
3			
690V			
1000V			
600V			
8kV			
3			
55	60	70	75
35	40	55	63
35	40	50	60
35	40	50	60
35	40	50	60
30	32	43	43
21	23	28	30
11	11	15	15
18.54	18.5	22	25
18.5	18.5	22	25
18.5	18.5	22	25
22	22	30	30
22	22	30	30
250			
200			
12	12	12	12
1200	1200	1200	1200
5.97	5.97	5.97	5.97
7200	7200	7200	7200
2	2	2	1.3
1200	1200	1200	1200

0.94

55 × 106 × 122

1.2

55 × 106 × 160.5

63AF

MMS-63S, MMS-63H, MMS-63HI

6~63A

Max. 100

100%

63AF

MT-63 3K

MT-63 2H

MT-63 3H

MT-63 3D

4~65A



95AF

MC-65	MC-75	MC-85	MC-95
●	●	●	●
●	●	●	●
3			
690V			
1000V			
600V			
8kV			
3			
100	110	135	140
65	75	85	95
65	75	85	95
65	75	85	95
65	75	85	95
60	64	75	85
35	42	45	50
18.5	22	25	25
30	37	45	45
30	37	45	45
30	37	45	45
33	37	45	50
33	37	45	50
250			
200			
12	12	12	12
1200	1200	1200	1200
5.97	5.97	5.97	5.97
7200	7200	7200	7200
2	2	2	2
1200	1200	1200	1200

1.82

70 × 140 × 137

2.7

70 × 140 × 172.5

100AF

MMS-100S, MMS-100H, MMS-100HI

11~100A

Max. 100

100%

95AF

MT-95 3K

MT-95 2H

MT-95 3H

MT-95 3D

7~95A



Type		Frame	
		Current adjustable type	
		Instantaneous type	
Breaking capacity			
Handle Type			
Number of poles			
Rated operational voltage (Ue)			
Rated frequency			
Rated insulation voltage (Ui)			
Rated impulse voltage (Uimp)			
Utilization category		IEC 60 947-2 (Breaker)	
		IEC 60 947-4 (Motor starter)	
Mechanical endurance (Operating)			
Electrical endurance (Cycles)			
Max operating frequency per hour (Ope./h)			
Temperature compensation (Operation)			
Instantaneous short circuit release			
Overload protection			
Phase failure function			
Trip indicating function			
Test function			
Weight (g)			
Rated breaking capacity (kA)	Rated operational current (Ie)		Thermal release Adjustment range (A)
	0.16		0.1~0.16
	0.25		0.16~0.25
	0.4		0.25~0.4
	0.63		0.4~0.63
	1		0.63~1
	1.6		1~1.6
	2.5		1.6~2.5
	4		2.5~4
	6		4~6
	8		5~8
	10		6~10
	13		9~13
	17		11~17
	22		14~22
	26		18~26
	32		22~32
40		28~40	
50		34~50	
63		45~63	
75		55~75	
90		70~90	
100		80~100	

[illegible]



63AF															100AF														
MMS-63S										MMS-63H					MMS-100S										MMS-100H				
-										MMS-63HI					-										MMS-100HI				
Standard										High break					Standard										High break				
Rotary										Rotary					Rotary										Rotary				
3										3					3										3				
Up to 690V										Up to 690V					Up to 690V										Up to 690V				
50/60 Hz										50/60 Hz					50/60 Hz										50/60 Hz				
1,000V										1,000V					1,000V										1,000V				
8kV										8kV					8kV										8kV				
Cat. A										Cat. A					Cat. A										Cat. A				
AC 3										AC 3					AC 3										AC 3				
50,000										50,000					50,000										50,000				
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-20 ~ +60℃										-20 ~ +60℃					-20 ~ +60℃										-20 ~ +60℃				
13 × I _e max.										13 × I _e max.					13 × I _e max.										13 × I _e max.				
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