

Catalogue  
2009



**Susol**  
Super Solution

**Contactors and  
Overload relays**

**LS** Industrial Systems  
[www.lsis.biz](http://www.lsis.biz)

The Challenges and Growth achieved by LG  
will continue with New Will of LS Industrial Systems.

**New Name for LG Industrial Systems,  
New Take-off for LS Industrial Systems**

**LS** Industrial Systems

To advance to the next level,  
LG Industrial Systems is reborn as LS Industrial Systems.  
LS Industrial Systems will continue to lead the future  
of industrial electrics and automation by providing  
Total Solution, a core essential  
for competition in the 21<sup>st</sup> century industrial era.





# A brief company chronology

Super Solution Contactors and Overload relays

2000'S



- Mar. 2005** | Official Declaration of NEW Corporate Identification (LS)
- Feb. 2004** | Signed investment agreement to build electricity/automation equipment factory in Usi City, Jangssu Province, China
- Jan. 2004** | Opening U.A.E branch office
- Dec. 2001** | Established trading company in Shanghai, China
- Jun. 2001** | Unveiled a New Vision including Mid- and Long-Term Strategies
- Sept. 2000** | Completion of Power Testing & Technology Institute

1990'S



- Dec. 1999** | Transfer of building equipment business to LG-OTIS
- Nov. 1999** | Completion of electricity power plant in Vietnam
- Jun. 1997** | Established joint venture in Vietnam
- Sept. 1995** | LG Industrial Systems Co., Ltd. Goldstar Instrument & Electric Co., Ltd. and Goldstar Electric Machinery Co., Ltd. merged into one company.
- July. 1994** | Completion of Dae-Ryun factory in China

1980'S ~  
1970'S



- July. 1984** | LG Industrial Systems Co., Ltd. opened to public
- July. 1974** | Established LG Industrial Systems Co., Ltd.

1960'S ~  
1950'S



- 1958** | **LGIS laid foundations for the Electric Power Industry**
- ~ 1973** | After Goldstar Co. was established in 1958, we started to produce WHM (Watt Hour Meter) units for the first time in Korea in 1964. We then proceeded to lay the foundation for the electric power and electronics industries, which were very important bases for industrial development of Korea.



# R&D chronology



Susol series



Meta-MEC series



Green series



CH series

- 2006** | • Developed Susol series Contactors and overload relays
- 2004** | • Developed Meta-MEC Manual Motor Starters up to 100A
- 2002** | • Developed Meta-MEC 4pole Magnetic Contactor  
• Developed the newest Power Equipment Diagnosis System
- 2001** | • Developed Meta-MEC series low AF MCCB and obtained CE certificate  
• Developed high voltage GIS 362kV, 63kA and 8000A
- 1999** | • Developed Meta-MEC series low AF contactors & overload relays and obtained CE certificate according to IEC60947 by KEMA  
• Developed Korea's first DPR (Digital Protection Relay)
- 1998** | • Developed Meta-MEC series high AF contactors & overload relays and obtained CE certificate according to IEC60947 TUV certificate  
• Developed Digital EMPR and obtained EMPR CE certificate
- 1997** | • Obtained the CE certificate (IEC 60947, TUV certificate) on MCCB, MS for the first time in Korea
- 1996** | • LGIS Cheongju Plant obtained the ISO14001
- 1995** | • Developed Demand Controller
- 1993** | • Obtained ISO9001  
• Obtained ISO9002 for low voltage equipment  
• Developed EMPR (Electronic Motor Protection Relay)  
• Developed Korea's first GIMAC (Digital Integrated Meter)
- 1992** | • Developed IMC (Intelligent Motor Controller)
- 1989** | • Developed Korea's first high-performance Hi-MEC MCCB & ELCB
- 1975** | • Initiated the switchgear project
- 1973** | • Initiated low & high voltage equipment project
- 1964** | • Initiated WHM project

# Super Solution



GCOD DESIGN  
산업자원부선정



product  
design  
award

2007

## ■ Design for technical strong point: The Susol Design

SuSol Series MCCB is available for world best breaking capacity up to 150kA, and MS is seal structure for hidden electricity Arc.

SuSol product represents simultaneously simple and complicated design for using cut diamond motive to emphasis on the hardness of industrial product.

And we applied the identity of product image by designing same concept MCCB and MS which is installed to cubicle.

SuSol Series acquire the competitive power through getting the picking up GD product and winning IF Design Award.



### For power distribution

- ▶ The highest breaking capacity
- ▶ Optimum coordination technique (Cascading & discrimination)
- ▶ Powerful engineering tools

### For protection of motor & its control device

- ▶ Optimal overload protection
- ▶ Guaranteed type-2 coordination between circuit breaker and contactor, relay

### For controlling and disconnecting circuits

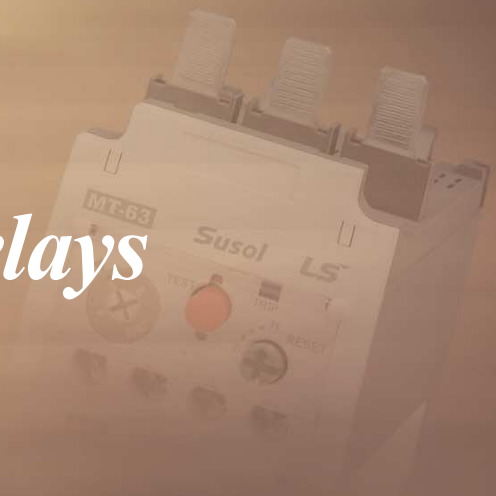
### For extensive applications

- ▶ Wide range of optimized auxiliaries and accessories

# *Global Leading Products*



*Magnetic contactors*



*Thermal overload relays*



*Combination starters*

## Top-Class Contactor Family



## Contactors & Overload Relays

LSIS contactor/overload relay meets IEC, UL, CSA, CCC and CE standards, it is the perfect product solution for applications all over the world. Including non-reversing and reversing contactors and starters as well as overload relays and accessories, contactor/overload relay brings LSIS to a whole new level.

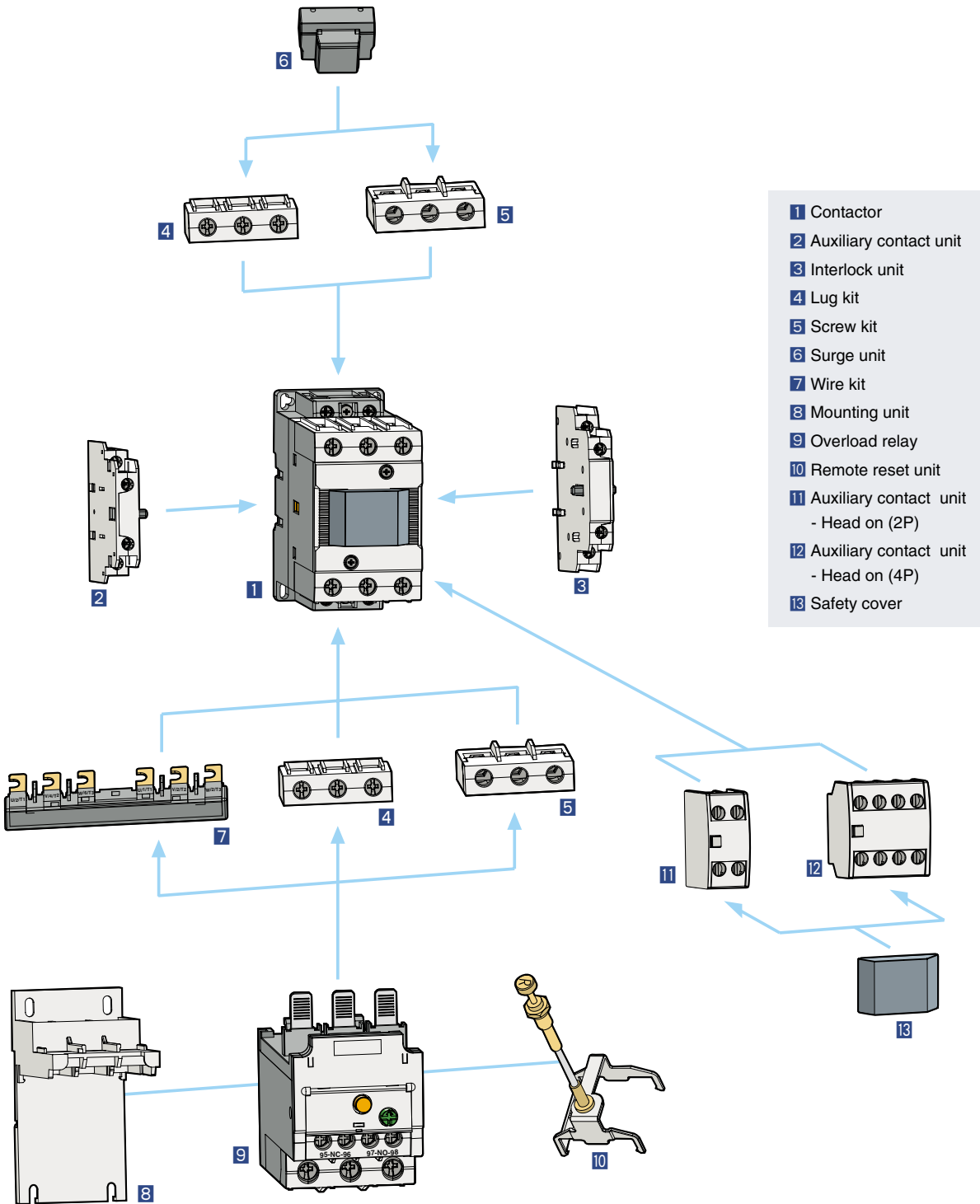
The space saving and easy-to-install MC contactors and starters is the efficient and effective solution for customer applications from 9-95A. Enclosed control options include metallic and non-metallic enclosures.

Only three frame sizes cover contactor ratings up to 95A, making it easier for OEMs to lay out panels. With a broad line of application specific designs, contactor/overload relay allows customers to select the right tool for the job.



# Overview

Susol



- 1 Contactor
- 2 Auxiliary contact unit
- 3 Interlock unit
- 4 Lug kit
- 5 Screw kit
- 6 Surge unit
- 7 Wire kit
- 8 Mounting unit
- 9 Overload relay
- 10 Remote reset unit
- 11 Auxiliary contact unit - Head on (2P)
- 12 Auxiliary contact unit - Head on (4P)
- 13 Safety cover

## Combination with Manual Motor Starters

The perfect solution to reducing the installation time of panel controls.

- DIN rail mounting adapter
- Easy to combine by using adapter and wiring kit
- Space saving
- Removing contactor easily
- Finger-proof wiring links



### Combinations

Manual Motor Starter		Contactor
Type	Setting range	Type
MMS-32	0.1~32A	MC-9
		MC-12
		MC-18
		MC-25
		MC-32
MMS-63	6~63A	MC-35
		MC-40
		MC-50
		MC-63
MMS-100	11~100A	MC-65
		MC-75
		MC-85
		MC-95

# Overview

Susol

## Combination with Overload relays

The space-saving and easy-to-install contactors and overload relays are the efficient and effective solution for customer applications up to 95A.

### Combinations

Overload Relay		Contactor
Type	Setting range	Type
MT-12	0.1~12A	MC-9a
		MC-12a
MT-32	0.1~32A	MC-9
		MC-12
		MC-18
		MC-25
		MC-32
MT-63	4~65A	MC-35
		MC-40
		MC-50
		MC-63
MT-95	7~95A	MC-65
		MC-75
		MC-85
		MC-95



# Contactors

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## Specifications



			12AF		32AF				
			MC-9a	MC-12a	MC-9	MC-12	MC-18	MC-25	MC-32
Type	Model								
	Connection by screws clamp terminals		•	•	•	•	•	•	•
	Connection by lugs		-	-	-	-	-	-	-
Number of poles			3		3				
Rated operational voltage, Ue			690V		690V				
Rated insulation voltage, Ui									
			1000V		1000V				
			600V		600V				
Rated impulse withstand voltage, Uimp			8kV		8kV				
Degree of pollution (IEC60529)			IP20		IP20				
Rated operational current Ie ( $\theta \leq 55^\circ\text{C}$ )									
	AC-1	Ue max 690V [A]	25	25	25	25	40	40	50
	AC-3	200/240V [A]	11	13	11	13	18	25	32
		380/400V [A]	9	12	9	12	18	25	32
		415V [A]	9	12	9	12	18	25	32
		440V [A]	9	12	9	12	18	25	32
		500V [A]	7	12	7	12	13	22	28
		690V [A]	5	9	5	9	9	18	20
Rated operational power ( $\theta \leq 55^\circ\text{C}$ )									
	AC-3	200/240V [kW]	2.5	3.5	2.5	3.5	4.5	5.5	7.5
		380/400V [kW]	4	5.5	4	5.5	7.5	11	15
		415V [kW]	4	5.5	4	5.5	7.5	11	15
		440V [kW]	4	5.5	4	5.5	7.5	11	15
		500V [kW]	4	7.5	4	7.5	7.5	15	18.5
		690V [kW]	4	7.5	4	7.5	7.5	15	18.5
Rated operational current(440V AC-3) [A]			9	12	9	12	18	25	32
According to IEC 947-4-1	Rated making capacity AC-3 (I/Ie) [440V]		90	120	90	120	180	250	320
	Rated breaking capacity AC-3 (Ic/Ie) [440V]		72	96	72	96	144	200	256
Mechanical durability in millions of operating cycles			15	15	15	15	15	15	15
Maximum operating rate In operating cycles per hour			1800	1800	1800	1800	1800	1800	1800
Mechanical durability in millions of operating cycles			8.07	8.07	8.07	8.07	8.07	8.07	8.07
Maximum operating rate In operating cycles per hour			7200	7200	7200	7200	7200	7200	7200
Electrical life for Ie/AC-3 Max in millions of operating cycles			2.5	2.5	2.5	2.5	2.5	2.5	2.5
Maximum operating rate in operating cycles per hour			1800	1800	1800	1800	1800	1800	1800
AC control coil voltage operated contactors									
	Weight [kg]		0.26		0.45				
	Basic dimensions (W × H × D) [mm]		45 × 74 × 82		45 × 83 × 93				
DC control coil voltage operated contactors									
	Weight [kg]		0.47		0.63				
	Basic dimensions (W × H × D) [mm]		45 × 74 × 114		45 × 83 × 118				

# Contactors

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## 63AF

MC-35	MC-40	MC-50	MC-63
•	•	•	•
•	•	•	•
3			
690V			
1000V			
600V			
8kV			
IP20			
55	60	70	75
35	40	55	63
35	40	50	63
35	40	50	63
35	40	50	63
35	40	50	63
30	32	43	45
21	23	28	30
11	11	15	15
18.5	18.5	22	25
18.5	18.5	22	25
18.5	18.5	22	25
22	22	30	30
22	22	30	30
35	40	50	63
350	400	500	630
280	320	400	504
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			

## 95AF

MC-65	MC-75	MC-85	MC-95
•	•	•	•
•	•	•	•
3			
690V			
1000V			
600V			
8kV			
IP20			
100	110	135	140
65	75	85	95
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	45
65	75	85	95
650	750	850	950
520	600	680	760
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			

## 3-pole contactors

for motor control up to 45kW at 440V in category AC-3



MC-32□



MC-63□S



MC-95□S



MC-63□L



MC-95□L

### Connection by screw clamp terminals

AC-3 operational power ratings 3-phase motors ( $\theta \leq 55^\circ\text{C}$ )						Rated operational current at AC-3	Built-in auxiliary contacts		Type	Weight
200 240V	380 400V	415V	440V	500V	690V		440V	NO	NC	Connection by screw clamp terminals
kW	kW	kW	kW	kW	kW	A				
2.5	4	4	4	4	4	9	1NO or 1NC		MC-9a	0.26
3.5	5.5	5.5	5.5	7.5	7.5	12	1NO or 1NC		MC-12a	0.26
2.5	4	4	4	4	4	9	-	-	MC-9	0.45
3.5	5.5	5.5	5.5	7.5	7.5	12	-	-	MC-12	0.45
4.5	7.5	7.5	7.5	7.5	7.5	18	-	-	MC-18	0.45
5.5	11	11	11	15	15	25	-	-	MC-25	0.45
11	18.5	18.5	18.5	22	22	32	-	-	MC-32	0.45
7.5	15	15	15	18.5	18.5	35	-	-	MC-35□S	0.94
11	18.5	18.5	18.5	22	22	40	-	-	MC-40□S	0.94
15	22	22	22	30	30	50	-	-	MC-50□S	0.94
15	25	25	25	30	30	63	-	-	MC-63□S	0.94
18.5	30	30	30	33	33	65	-	-	MC-65□S	1.82
22	37	37	37	37	37	75	-	-	MC-75□S	1.82
25	45	45	45	45	45	85	-	-	MC-85□S	1.82
25	45	45	45	50	45	95	-	-	MC-95□S	1.82

### Connection by lugs

AC-3 operational power ratings 3-phase motors ( $\theta \leq 55^\circ\text{C}$ )						Rated operational current at AC-3	Built-in auxiliary contacts		Type	Weight
200 240V	380 400V	415V	440V	500V	690V		440V	NO	NC	Connection by lugs terminals
kW	kW	kW	kW	kW	kW	A				
7.5	15	15	15	18.5	18.5	35	-	-	MC-35□L	0.94
11	18.5	18.5	18.5	22	22	40	-	-	MC-40□L	0.94
15	22	22	22	30	30	50	-	-	MC-50□L	0.94
15	25	25	25	30	30	63	-	-	MC-63□L	0.94
18.5	30	30	30	33	33	65	-	-	MC-65□L	1.82
22	37	37	37	37	37	75	-	-	MC-75□L	1.82
25	45	45	45	45	45	85	-	-	MC-85□L	1.82
25	45	45	45	50	45	95	-	-	MC-95□L	1.82

### Accessories

Auxiliary contact blocks and modules: see pages 27 to 31.

### Mounting

Clip-on mounting on 35 mm  $\square$  rail or screw fixing.  
MC-65 to MC-95 types are mountable on 70mm DIN rail.

### Standard control circuit voltage, Coil voltage

- AC circuit 50/60Hz
  - 50Hz : 24, 32, 36, 42, 48, 80, 100, 110, 220, 230, 240, 380, 400, 415, 440, 500, 550V
  - 60Hz : 24, 48, 100, 110, 120, 200, 208, 220, 230, 240, 277, 380, 440, 480, 600V
  - 50/60Hz : 24, 48, 100, 110, 120, 200, 220, 230, 240, 380, 415, 440, 500, 550V
- DC circuit
  - 12, 20, 24, 48, 60, 80, 100, 110, 125, 200, 220, 250V

Overloads to suit contactors are on page 20

# Contactors

Susol

## 3-pole contactors

for control in utilization category AC-1, 25 to 140 A



MC-32□



MC-63□S



MC-95□S



MC-63□L



MC-95□L

### Connection by screw clamp terminals

AC-1 Non inductive loads maximum current ( $\theta \leq 55^\circ\text{C}$ )	Number of poles	Built-in auxiliary contacts		Type	Weight
		NC	NO	Connection by screw clamp terminals	AC control kg
AC-1 (A)	NO	NC	NO		
25	3	1NO or 1NC		MC-9a	0.26
25	3	1NO or 1NC		MC-12a	0.26
25	3	-	-	MC-9	0.45
25	3	-	-	MC-12	0.45
40	3	-	-	MC-18	0.45
40	3	-	-	MC-25	0.45
50	3	-	-	MC-32	0.45
55	3	-	-	MC-35□S	0.94
60	3	-	-	MC-40□S	0.94
70	3	-	-	MC-50□S	0.94
75	3	-	-	MC-63□S	0.94
100	3	-	-	MC-65□S	1.82
110	3	-	-	MC-75□S	1.82
135	3	-	-	MC-85□S	1.82
140	3	-	-	MC-95□S	1.82

### Connection by lugs

AC-1 Non inductive loads maximum current ( $\theta \leq 55^\circ\text{C}$ )	Number of poles	Built-in auxiliary contacts		Type	Weight
		NC	NO	Connection by lugs terminals	AC control kg
AC-1 (A)	NO	NC	NO		
55	3	-	-	MC-35□L	0.94
60	3	-	-	MC-40□L	0.94
70	3	-	-	MC-50□L	0.94
75	3	-	-	MC-63□L	0.94
100	3	-	-	MC-65□L	1.82
110	3	-	-	MC-75□L	1.82
135	3	-	-	MC-85□L	1.82
140	3	-	-	MC-95□L	1.82

### Accessories

Auxiliary contact blocks and modules: see pages 27 to 31.

### Mounting

Clip-on mounting on 35 mm  $\square$  rail or screw fixing.  
MC-65 to MC-95 types are mountable on 70mm DIN rail.

### Standard control circuit voltage, Coil voltage

- AC circuit 50/60Hz
  - 50Hz : 24, 32, 36, 42, 48, 80, 100, 110, 220, 230, 240, 380, 400, 415, 440, 500, 550V
  - 60Hz : 24, 48, 100, 110, 120, 200, 208, 220, 230, 240, 277, 380, 440, 480, 600V
- 50/60Hz : 24, 48, 100, 110, 120, 200, 220, 230, 240, 380, 415, 440, 500, 550V
- DC circuit
  - 12, 20, 24, 48, 60, 80, 100, 110, 125, 200, 220, 250V

Overloads to suit contactors are on page 20

## Reversing contactors

for motor control up to 45kW at 440V in category AC-3



MC-32/RS



MC-63/RS



MC-95/RS

### Connection by screw clamp terminals

AC-3 operational power ratings 3-phase motors ( $\theta \leq 55^\circ\text{C}$ )						Rated operational current at AC-3	Built-in auxiliary per contactor		Type	Weight
200 240V	380 400V	415V	440V	500V	690V		NO	NC		
kW	kW	kW	kW	kW	kW	A				
2.5	4	4	4	4	4	9	1NO or 1NC		MC-9a/RS	0.57
3.5	5.5	5.5	5.5	7.5	7.5	12	1NO or 1NC		MC-12a/RS	0.57
2.5	4	4	4	4	4	9	-	-	MC-9/RS	0.95
3.5	5.5	5.5	5.5	7.5	7.5	12	-	-	MC-12/RS	0.95
4.5	7.5	7.5	7.5	7.5	7.5	18	-	-	MC-18/RS	0.95
5.5	11	11	11	15	15	25	-	-	MC-25/RS	0.95
11	18.5	18.5	18.5	22	22	32	-	-	MC-32/RS	0.95
7.5	15	15	15	18.5	18.5	35	-	-	MC-35/RS	1.73
11	18.5	18.5	18.5	22	22	40	-	-	MC-40/RS	1.73
15	22	22	22	30	30	50	-	-	MC-50/RS	1.73
15	25	25	25	30	30	63	-	-	MC-63/RS	1.73
18.5	30	30	30	33	33	65	-	-	MC-65/RS	3.25
22	37	37	37	37	37	75	-	-	MC-75/RS	3.25
25	45	45	45	45	45	85	-	-	MC-85/RS	3.25
25	45	45	45	50	45	95	-	-	MC-95/RS	3.25

### Connection by lugs

AC-3 operational power ratings 3-phase motors ( $\theta \leq 55^\circ\text{C}$ )						Rated operational current at AC-3	Built-in auxiliary per contactor		Type	Weight
200 240V	380 400V	415V	440V	500V	690V		NO	NC		
kW	kW	kW	kW	kW	kW	A				
7.5	15	15	15	18.5	18.5	35	-	-	MC-35/RL	1.73
11	18.5	18.5	18.5	22	22	40	-	-	MC-40/RL	1.73
15	22	22	22	30	30	50	-	-	MC-50/RL	1.73
15	25	25	25	30	30	63	-	-	MC-63/RL	1.73
18.5	30	30	30	33	33	65	-	-	MC-65/RL	3.25
22	37	37	37	37	37	75	-	-	MC-75/RL	3.25
25	45	45	45	45	45	85	-	-	MC-85/RL	3.25
25	45	45	45	45	45	95	-	-	MC-95/RL	3.25

Note :

- Pre-wired power connections.
- Mechanical interlock without electrical interlocking.
- Please contact LSIS for reversing contactors with electrical interlocking pre-wired at the factory.

### Accessories

Auxiliary contact blocks and modules: see pages 27 to 31.

### Mounting

Clip-on mounting on 35 mm  $\sqcup$  rail or screw fixing.  
MC-65 to MC-95 types are mountable on 70mm DIN rail.

### Standard control circuit voltage, Coil voltage

- AC circuit 50/60Hz  
50Hz : 24, 32, 36, 42, 48, 80, 100, 110, 220, 230, 240, 380, 400, 415, 440, 500, 550V  
60Hz : 24, 48, 100, 110, 120, 200, 208, 220, 230, 240, 277, 380, 440, 480, 600V  
50/60Hz : 24, 48, 100, 110, 120, 200, 220, 230, 240, 380, 415, 440, 500, 550V
- DC circuit  
12, 20, 24, 48, 60, 80, 100, 110, 125, 200, 220, 250V



# Contactors

Susol

## General technical data

For utilization categories AC-3

### Operational current and power conforming to IEC ( $\theta \leq 55^\circ \text{C}$ )

Contactor size			MC-9	MC-12	MC-18	MC-25	MC-32	MC-35	MC-40	MC-50	MC-63	MC-65	MC-75	MC-85	MC-95
Max. operational current in AC-3	$\leq 440\text{V}$	A	9	12	18	25	32	35	40	50	63	65	75	85	95
Rated operational power P (standard motor power ratings)	220/240V	W	2.5	3.5	4.5	5.5	7.5	11	11	15	15	18.5	22	25	25
	380/440V	W	4	5.5	7.5	11	15.8	18.5	18.5	22	25	30	37	45	45
	500/550V	W	4	7.5	7.5	15	18.5	22	22	30	30	33	37	45	50
	690V	W	4	7.5	7.5	15	18.5	22	222	30	30	33	37	45	45
	1000V	W	-	-	-	-	-	-	-	-	-	-	-	-	-

### Operational current and power conforming to UL,CSA ( $\theta \leq 55^\circ \text{C}$ )

Contactor size			MC-9	MC-12	MC-18	MC-25	MC-32	MC-35	MC-40	MC-50	MC-63	MC-65	MC-75	MC-85	MC-95
Max. operational current in AC-3	$\leq 440\text{V (A)}$		9	12	18	25	32	35	40	50	63	65	75	85	95
Rated operational power P (standard motor power ratings)	1ph	100~120V	0.5	0.75	1	2	2.2	2	3	3	5	5	5.5	7.5	10
		220~240V	1.5	2	3	3	5	5	7.5	10	10	15	15	15	20
Rated operational power P (standard motor power ratings)	3ph	200~240V	2	3	5	7.5	7.5	10	15	20	20	25	25	30	30
		220~240V	3	5	7.5	10	10	15	20	25	25	30	30	40	40
		440~480V	5	7.5	10	15	20	25	30	40	40	50	50	60	75
50/60Hz		550~600V	7.5	10	15	20	25	30	40	50	50	60	60	75	100

### Maximum operating rate in operating cycles/hour

Contactor size			MC-9	MC-12	MC-18	MC-25	MC-32	MC-35	MC-40	MC-50	MC-63	MC-65	MC-75	MC-85	MC-95
Max. operational current in AC-3	$\leq 440\text{V (A)}$		9	12	18	25	32	35	40	50	63	65	75	85	95
operating cycles	1/Hr		1800	1800	1800	1800	1800	1200	1200	1200	1200	1200	1200	1200	1200

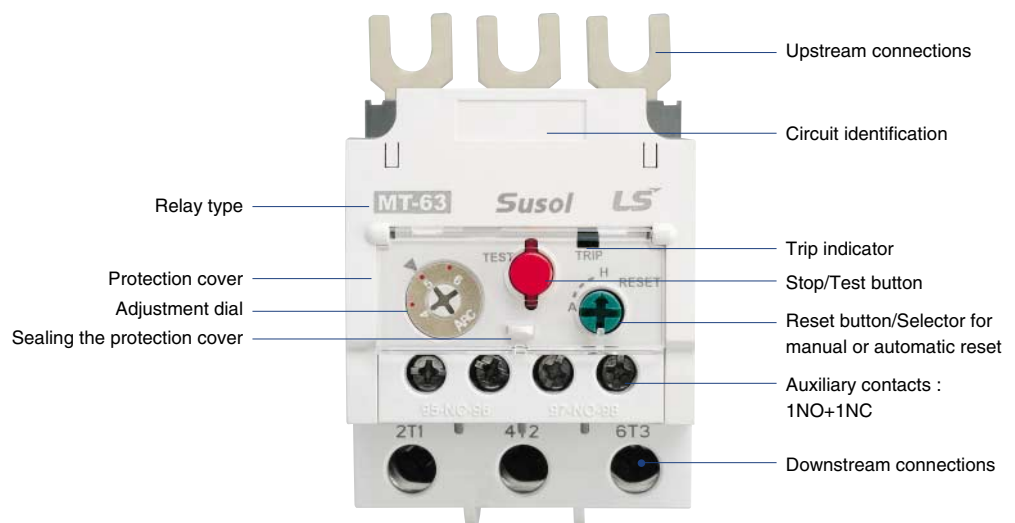
# Overload relays

Susol

## Specifications

Type MT, bimetal-style, overload relays are designed to protect AC circuits and motors against overloads, phase failure, long starting times and prolonged stalling of the motor.

## Configuration



**Note :**

- Relays are supplied with the selector in the manual position.
- Test button allows:
  - checking of control circuit wiring,
  - simulation of relay tripping (actuates both the NO and NC contacts).
- Push the button(stop function)
- Pull the button(test function)

	Stop	Test/ Trip	Reset
NC 95-96			
NO 97-98			



# Overload relays

Susol

## Specifications

### Combinations

Overload Relay		Contactor
Type	Setting range	Type
MT-12	0.1~12A	MC-9a
		MC-12a
MT-32	0.1~32A	MC-9
		MC-12
		MC-18
		MC-25
		MC-32
		MC-35
		MC-40
MT-63	4~65A	MC-50
		MC-63
		MC-65
MT-95	7~95A	MC-75
		MC-85
		MC-95



Environment		
Standards	EN 60947-1, EN 60947-4-1	
Product certifications	CE, CSA, UL	
Degree of protection (IEC 60 529)	IP 20	
Ambient air temperature	Storage	-60 ... +70°C
	Normal operation	-5 ... +55°C
Operating positions	In relation to normal, vertical mounting plane	
Shock resistance (IEC 68-2-7)	15gn - 11ms	
Vibration resistance (IEC 68-2-6)	6gn	
Dielectric strength at 50 Hz (IEC 255-5)	6kV	
Impulse withstand voltage (IEC 801-5)	6kV	
Auxiliary contact characteristics		
Rating	1NO + 1NC	
Thermal current	C600, R300	
Connection to screw clamp terminals	1 or 2 conductors	
	- Flexible cable with cable end	1~2.5mm <sup>2</sup>
	- Flexible cable with end	1~2.5mm <sup>2</sup>
	- Solid cable without cable end	1~2.5mm <sup>2</sup>
	- Tightening torque	2.3N.m

# Overload relays

Susol

## Specifications

### Electrical characteristics of power circuit

Relay type		
Type	Differential type(Phase failure protection)	
	Non-differential type	3 heater 2 heater
Tripping class(IEC 60947-4-1)		
Terminal type		
Number of poles		
Rated operational voltage (Ue)		
Rated insulation voltage (Ui)		
Rated impulse voltage (Uimp)		
Setting range		
Degree of protection (IEC 60 529)		
Temperature compensation (°C)		
Functions		
	Trip indicating	
	Stop	
	Test	
	Manual/Automatic Reset	
Applied contactors		

### Detail setting range and connection cable

MT-12		MT-32	
12AF		32AF	
MT-32/3K□	MT-32/3D□	MT-32/3K□	MT-32/3D□
MT-32/3H□	-	MT-32/3H□	-
MT-32/2H□		MT-32/2H□	
10A	20	10A	20
Screw clamp		Screw clamp	
3		3	
Up to 690V		Up to 690V	
690V		690V	
6kV		6kV	
0.1~12A	1~12A	0.1~32A	1~32A
IP 20		IP 20	
-5 ~ +40		-5 ~ +40	
●		●	
●		●	
●		●	
●		●	
MC-9a, 12a		MC-9, 12, 18, 25, 32	

Note) □ is rated current.

12AF		32AF	
Class			
10A	20	10A	20
●		●	
●		●	
●		●	
●		●	
●		●	
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
●	●	●	●
		●	●
		●	●
		●	●
		●	●

# Overload relays

Susol

## MT-63



### 63AF

63AF		63AF	
MT-63/3K□S	MT-63/3D□S	MT-63/3K□L	MT-63/3D□L
MT-63/3H□S	-	MT-63/3H□L	-
MT-63/2H□S	-	MT-63/2H□L	-
10A	20	10A	20
Screw clamp		Lug	
3		3	
Up to 690V		Up to 690V	
690V		690V	
6kV		6kV	
4~65A		4~65A	
IP 20		IP 20	
-5 ~ +40		-5 ~ +40	
•		•	
•		•	
•		•	
•		•	
MC-35, 40, 50, 63			

## MT-95



### 95AF

95AF			
MT-95/3K□S	MT-95/3D□S	MT-95/3K□L	MT-95/3D□L
MT-95/3H□S	-	MT-95/3H□L	-
MT-95/2H□S	-	MT-95/2H□L	-
10A	20	10A	20
Screw clamp		Lug	
3		3	
Up to 690V		Up to 690V	
690V		690V	
6kV		6kV	
7~95A		7~95A	
IP 20		IP 20	
-5 ~ +40		-5 ~ +40	
•		•	
•		•	
•		•	
•		•	
MC-65, 75, 85, 95			

63AF	95AF	Current Setting range(A)	Wire		Type	Max. number of conductors	Short circuit "I"								
			Size												
			mm <sup>2</sup>	AWG											
10A, 20	10A, 20	0.1~0.16	1	18	65/75°C Cu-wire only	2	-								
		0.16~0.25													
		0.25~0.4													
		0.4~0.63													
		0.63~1													
		1~1.6													
		1.6~2.5													
		2.5~4													
		• 4~6													
		• 5~8													
• 6~9	1~1.5	18 ~ 16	-												
• 7~10															
• 9~13				1.5~2.5	16~14	-									
• 12~18															
• 16~22							2.5	14~12	-						
• 18~25															
• 22~32										2.5~4	12~10	-			
• 24~36															
• 28~40													4~6	10	-
• 34~50															
• 45~65	4~10	10~8	-												
• 54~75															
• 63~85				6~10	10~8	-									
• 70~95															
• 10~16							10	8	-						
• 16~25															
• 6~4										8~6	-	-			
• 4~3															
• 5~8													16~25	6~4	-
• 6~9															
• 9~13	25~35	4~3	-												
• 12~18															
• 16~22															
• 18~25															
• 22~32															
• 24~36															
• 28~40															
• 34~50															
• 45~65															
• 54~75															
• 63~85															
• 70~95															

# Overload relays

Susol

## Characteristics class 10A

for direct mounting beneath contactors  
with connection by screw clamp terminals



MT-12/3K □



MT-32/3K □



MT-63/3K □S



MT-95/3K □S

Corresponding contactors	Relay setting range	Relay types			Weight
		Differential	Non-differential		
Type	A	3Heaters	3Heaters	2Heaters	kg
MC-9a MC-12a	0.1~0.16 0.16~0.25 0.25~0.4 0.4~0.63 0.63~1 1~1.6 1.6~2.5 2.5~4 4~6 5~8 6~9 7~10 9~13	MT-12/3K 0.14 MT-12/3K 0.21 MT-12/3K 0.33 MT-12/3K 0.52 MT-12/3K 0.82 MT-12/3K 1.3 MT-12/3K 2.1 MT-12/3K 3.3 MT-12/3K 5 MT-12/3K 6.5 MT-12/3K 7.5 MT-12/3K 8.5 MT-12/3K 11	MT-12/3H 0.14 MT-12/3H 0.21 MT-12/3H 0.33 MT-12/3H 0.52 MT-12/3H 0.82 MT-12/3H 1.3 MT-12/3H 2.1 MT-12/3H 3.3 MT-12/3H 5 MT-12/3H 6.5 MT-12/3H 7.5 MT-12/3H 8.5 MT-12/3H 11	MT-12/2H 0.14 MT-12/2H 0.21 MT-12/2H 0.33 MT-12/2H 0.52 MT-12/2H 0.82 MT-12/2H 1.3 MT-12/2H 2.1 MT-12/2H 3.3 MT-12/2H 5 MT-12/2H 6.5 MT-12/2H 7.5 MT-12/2H 8.5 MT-12/2H 11	0.1
MC-9 MC-12 MC-18 MC-25 MC-32	0.1~0.16 0.16~0.25 0.25~0.4 0.4~0.63 0.63~1 1~1.6 1.6~2.5 2.5~4 4~6 5~8 6~9 7~10 9~13 12~18 16~22 18~25 22~32	MT-32/3K 0.14 MT-32/3K 0.21 MT-32/3K 0.33 MT-32/3K 0.52 MT-32/3K 0.82 MT-32/3K 1.3 MT-32/3K 2.1 MT-32/3K 3.3 MT-32/3K 5 MT-32/3K 6.5 MT-32/3K 7.5 MT-32/3K 8.5 MT-32/3K 11 MT-32/3K 15 MT-32/3K 19 MT-32/3K 21.5 MT-32/3K 27	MT-32/3H 0.14 MT-32/3H 0.21 MT-32/3H 0.33 MT-32/3H 0.52 MT-32/3H 0.82 MT-32/3H 1.3 MT-32/3H 2.1 MT-32/3H 3.3 MT-32/3H 5 MT-32/3H 6.5 MT-32/3H 7.5 MT-32/3H 8.5 MT-32/3H 11 MT-32/3H 15 MT-32/3H 19 MT-32/3H 21.5 MT-32/3H 27	MT-32/2H 0.14 MT-32/2H 0.21 MT-32/2H 0.33 MT-32/2H 0.52 MT-32/2H 0.82 MT-32/2H 1.3 MT-32/2H 2.1 MT-32/2H 3.3 MT-32/2H 5 MT-32/2H 6.5 MT-32/2H 7.5 MT-32/2H 8.5 MT-32/2H 11 MT-32/2H 15 MT-32/2H 19 MT-32/2H 21.5 MT-32/2H 27	0.17
MC-35 MC-40 MC-50 MC-63	4~6 5~8 6~9 7~10 9~13 12~18 16~22 18~25 24~36 28~40 34~50 45~65	MT-63/3K 5S MT-63/3K 6.5S MT-63/3K 7.5S MT-63/3K 8.5S MT-63/3K 11S MT-63/3K 15S MT-63/3K 19S MT-63/3K 21.5S MT-63/3K 30S MT-63/3K 34S MT-63/3K 42S MT-63/3K 55S	MT-63/3H 5S MT-63/3H 6.5S MT-63/3H 7.5S MT-63/3H 8.5S MT-63/3H 11S MT-63/3H 15S MT-63/3H 19S MT-63/3H 21.5S MT-63/3H 30S MT-63/3H 34S MT-63/3H 42S MT-63/3H 55S	MT-63/2H 5S MT-63/2H 6.5S MT-63/2H 7.5S MT-63/2H 8.5S MT-63/2H 11S MT-63/2H 15S MT-63/2H 19S MT-63/2H 21.5S MT-63/2H 30S MT-63/2H 34S MT-63/2H 42S MT-63/2H 55S	0.31
MC-65 MC-75 MC-85 MC-95	7~10 9~13 12~18 16~22 18~25 24~36 28~40 34~50 45~65 54~75 63~85 70~95	MT-95/3K 8.5S MT-95/3K 11S MT-95/3K 15S MT-95/3K 19S MT-95/3K 21.5S MT-95/3K 30S MT-95/3K 34S MT-95/3K 42S MT-95/3K 55S MT-95/3K 65S MT-95/3K 74S MT-95/3K 83S	MT-95/3H 8.5S MT-95/3H 11S MT-95/3H 15S MT-95/3H 19S MT-95/3H 21.5S MT-95/3H 30S MT-95/3H 34S MT-95/3H 42S MT-95/3H 55S MT-95/3H 65S MT-95/3H 74S MT-95/3H 83S	MT-95/2H 8.5S MT-95/2H 11S MT-95/2H 15S MT-95/2H 19S MT-95/2H 21.5S MT-95/2H 30S MT-95/2H 34S MT-95/2H 42S MT-95/2H 55S MT-95/2H 65S MT-95/2H 74S MT-95/2H 83S	0.48

### Accessories

Separate mounting adapters and remote reset unit : see pages 31.

### Mounting

Direct mounting on to a contactor with screw clamp terminals

# Overload relays

Susol

## Characteristics class 10A

for direct mounting beneath contactors  
with connection by lug terminals



MT-63/3K □L



MT-95/3K □L

Corresponding contactors	Relay setting range	Relay types			Weight	
		Differential	Non-differential			
Type	A	3Heaters	3Heaters	2Heaters	kg	
MC-35	4~6	MT-63/3K 5L	MT-63/3H 5L	MT-63/2H 5L	0.33	
MC-40	5~8	MT-63/3K 6.5L	MT-63/3H 6.5L	MT-63/2H 6.5L		
MC-50	6~9	MT-63/3K 7.5L	MT-63/3H 7.5L	MT-63/2H 7.5L		
MC-63	7~10	MT-63/3K 8.5L	MT-63/3H 8.5L	MT-63/2H 8.5L		
	9~13	MT-63/3K 11L	MT-63/3H 11L	MT-63/2H 11L		
	12~18	MT-63/3K 15L	MT-63/3H 15L	MT-63/2H 15L		
	16~22	MT-63/3K 19L	MT-63/3H 19L	MT-63/2H 19L		
	18~25	MT-63/3K 21.5L	MT-63/3H 21.5L	MT-63/2H 21.5L		
	24~36	MT-63/3K 30L	MT-63/3H 30L	MT-63/2H 30L		
	28~40	MT-63/3K 34L	MT-63/3H 34L	MT-63/2H 34L		
	34~50	MT-63/3K 42L	MT-63/3H 42L	MT-63/2H 42L		
	45~65	MT-63/3K 55L	MT-63/3H 55L	MT-63/2H 55L		
MC-65	7~10	MT-95/3K 8.5L	MT-95/3H 8.5L	MT-95/2H 8.5L		0.50
MC-75	9~13	MT-95/3K 11L	MT-95/3H 11L	MT-95/2H 11L		
MC-85	12~18	MT-95/3K 15L	MT-95/3H 15L	MT-95/2H 15L		
MC-95	16~22	MT-95/3K 19L	MT-95/3H 19L	MT-95/2H 19L		
	18~25	MT-95/3K 21.5L	MT-95/3H 21.5L	MT-95/2H 21.5L		
	24~36	MT-95/3K 30L	MT-95/3H 30L	MT-95/2H 30L		
	28~40	MT-95/3K 34L	MT-95/3H 34L	MT-95/2H 34L		
	34~50	MT-95/3K 42L	MT-95/3H 42L	MT-95/2H 42L		
	45~65	MT-95/3K 55L	MT-95/3H 55L	MT-95/2H 55L		
	54~75	MT-95/3K 65L	MT-95/3H 65L	MT-95/2H 65L		
	63~85	MT-95/3K 74L	MT-95/3H 74L	MT-95/2H 74L		
	70~95	MT-95/3K 83L	MT-95/3H 83L	MT-95/2H 83L		

### Accessories

Separate mounting adapters and remote reset unit : see pages 31.

### Mounting

Direct mounting on to a contactor with lug terminals

# Overload relays

Susol

## Characteristics class 20

for direct mounting beneath contactors  
with connection by screw clamp terminals



MT-12/3D □



MT-32/3D □



MT-63/3D □S



MT-95/3D □S

Corresponding contactors	Relay setting range	Relay types	Weight
		Differential	
Type	A	3Heaters	kg
MC-9a MC-12a	1~1.6 1.6~2.5 2.5~4 4~6 5~8 6~9 7~10 9~13	MT-12/3D 1.3 MT-12/3D 2.1 MT-12/3D 3.3 MT-12/3D 5 MT-12/3D 6.5 MT-12/3D 7.5 MT-12/3D 8.5 MT-12/3D 11	0.1
MC-9 MC-12 MC-18 MC-25 MC-32	1~1.6 1.6~2.5 2.5~4 4~6 5~8 6~9 7~10 9~13 12~18 16~22 18~25 22~32	MT-32/3D 1.3 MT-32/3D 2.1 MT-32/3D 3.3 MT-32/3D 5 MT-32/3D 6.5 MT-32/3D 7.5 MT-32/3D 8.5 MT-32/3D 11 MT-32/3D 15 MT-32/3D 19 MT-32/3D 21.5 MT-32/3D 27	0.17
MC-35 MC-40 MC-50 MC-63	4~6 5~8 6~9 7~10 9~13 12~18 16~22 18~25 24~36 28~40 34~50 45~65	MT-63/3D 5S MT-63/3D 6.5S MT-63/3D 7.5S MT-63/3D 8.5S MT-63/3D 11S MT-63/3D 15S MT-63/3D 19S MT-63/3D 21.5S MT-63/3D 30S MT-63/3D 34S MT-63/3D 42S MT-63/3D 55S	0.31
MC-65 MC-75 MC-85 MC-95	7~10 9~13 12~18 16~22 18~25 24~36 28~40 34~50 45~65 54~75 63~85 70~95	MT-95/3D 8.5S MT-95/3D 11S MT-95/3D 15S MT-95/3D 19S MT-95/3D 21.5S MT-95/3D 30S MT-95/3D 34S MT-95/3D 42S MT-95/3D 55S MT-95/3D 65S MT-95/3D 74S MT-95/3D 83S	0.48

### Accessories

Separate mounting adapters and remote reset unit : see pages 31.

### Mounting

Direct mounting on to a contactor with screw clamp terminals



# Overload relays

**Susol**

## Characteristics class 20

for direct mounting beneath contactors  
with connection by lug terminals



Corresponding contactors	Relay setting range	Relay types	Weight	
		Differential		
Type	A	3Heaters	kg	
MC-35	4~6	MT-63/3D 5L	0.33	
MC-40	5~8	MT-63/3D 6.5L		
MC-50	6~9	MT-63/3D 7.5L		
MC-63	7~10	MT-63/3D 8.5L		
	9~13	MT-63/3D 11L		
	12~18	MT-63/3D 15L		
	16~22	MT-63/3D 19L		
	18~25	MT-63/3D 21.5L		
	24~36	MT-63/3D 30L		
	28~40	MT-63/3D 34L		
	34~50	MT-63/3D 42L		
	45~65	MT-63/3D 55L		
MC-65	7~10	MT-95/3D 8.5L		0.50
MC-75	9~13	MT-95/3D 11L		
MC-85	12~18	MT-95/3D 15L		
MC-95	16~22	MT-95/3D 19L		
	18~25	MT-95/3D 21.5L		
	24~36	MT-95/3D 30L		
	28~40	MT-95/3D 34L		
	34~50	MT-95/3D 42L		
	45~65	MT-95/3D 55L		
	54~75	MT-95/3D 65L		
	63~85	MT-95/3D 74L		
	70~95	MT-95/3D 83L		

### Accessories

Separate mounting adapters and remote reset unit : see pages 31.

### Mounting

Direct mounting on to a contactor with lug terminals

# Control circuit characteristics

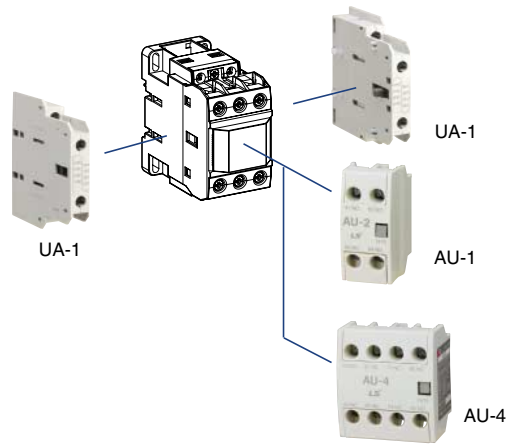
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Type		32AF	63AF	95AF
Contactor types		MC-9	MC-35	MC-65
		MC-12	MC-40	MC-75
		MC-18	MC-50	MC-85
		MC-25	MC-63	MC-95
		MC-32		
AC control circuit characteristics				
Rated control circuit voltage [Uc]		24, 32, 36, 42, 48, 80, 100, 110, 220, 230, 240, 380, 400, 415, 440, 500, 550V		
	50Hz [V]	24, 48, 100, 110, 120, 200, 208, 220, 230, 240, 277, 380, 440, 480, 600V		
	60Hz [V]	24, 48, 100, 110, 120, 200, 220, 230, 240, 380, 415, 440, 500, 550V		
	50/60Hz [V]			
Control voltage limits		0.85 ... 1.1 Uc on 50 Hz		
	Operational	0.85 ... 1.1 Uc on 60 Hz		
	Drop-out	0.3 ... 0.6 Uc		
Coil consumption at 20°C		80	120	220
	Inrush [VA]	9	11	16
	Holding [VA]	2.2	2.2	5.1
Heat dissipation [W]				
Operating time		12 ... 22	12 ... 22	15 ... 30
	Closing [ms]	4 ... 19	4 ... 19	15 ... 30
	Opening [ms]			
DC control circuit characteristics				
Rated control circuit voltage [Uc]		12, 20, 24, 48, 60, 80, 100, 110, 125, 200, 220, 250		
Control voltage limits		0.7 ... 1.1Uc		
	Operational	0.1 ... 0.3 Uc		
	Drop-out			
Coil consumption at 20°C		7	9	18
	Inrush [W]	7	9	18
	Holding [W]	28	65	75
Time constant (L/R) [ms]				
Operating time		12 ... 22	12 ... 22	100 ... 120
	Closing [ms]	4 ... 19	4 ... 19	10 ... 25
	Opening [ms]			

# Auxiliary contacts/contact blocks characteristics

Susol



Contactor frame	
Contactor types	
Number of auxiliary contact	
Normally open	[EA]
Normally closed	[EA]

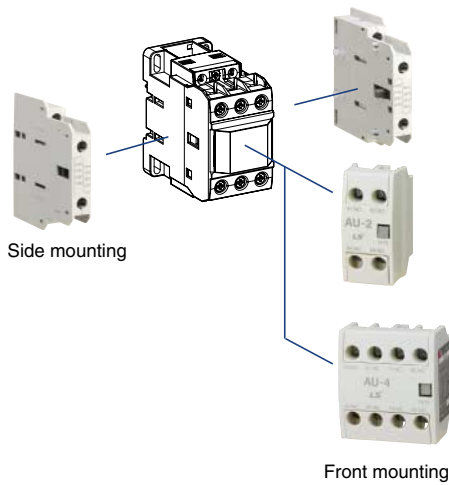
Auxiliary contact blocks, optional	
Type	
Number of auxiliary contact	
Normally open	[EA]
Normally closed	[EA]
Characteristics	
Rated operational voltage, Ue	[V]
Rated insulation voltage, Ui	
Conforming to IEC 947-1	[V]
Conforming to UL, CSA	[V]
Operating current frequency	[Hz]
Short-circuit protection	
Minimum switching capacity	
U min. DC	[V]
I min.	[mA]
Thermal current, Ith	[A]
Operational current	
AC15 duty (A600)	120V [A]
	240V [A]
	380V [A]
	480V [A]
	600V [A]
DC13 duty (P600)	125V [A]
	250V [A]
	440V [A]
	500V [A]
	600V [A]
Lifetime (mil.operations)	
AC15 duty	220V
	440V
DC13 duty	220V
	440V
Operation cycles per hour	

12AF	32AF	63AF	95AF
MC-9a MC-12a	MC-9 MC-12 MC-18 MC-25 MC-32	MC-35 MC-40 MC-50 MC-63	MC-65 MC-75 MC-85 MC-95

										AU-2	AU-4				UA-1
Normally open		Normally closed		Normally open		Normally closed		Normally open		Normally closed		Normally open		Normally closed	
2	1	0	4	3	2	1	0	0	1	2	3	4	1		
0	1	2	0	1	2	3	4	1							
Rated operational voltage, Ue [V]										690					
Rated insulation voltage, Ui										600				1000V	
Operating current frequency [Hz]										25-400					
Short-circuit protection										gLgG fuse: 16A (conforming to IEC EN947-5-1)					
U min. DC [V]		I min. [mA]		Thermal current, Ith [A]		Operational current		Lifetime (mil.operations)		Operation cycles per hour					
24		10		16		6		0.5		1800					
17		5		6		3		0.5		1800					
1.9		1.5		1.2		1.1		0.5		1800					
1.5		1.2		1.1		0.55		0.5		1800					
1.2		1.1		0.55		0.31		0.5		1800					
1.1		0.55		0.31		0.27		0.5		1800					
0.55		0.31		0.27		0.2		0.5		1800					
0.31		0.27		0.2		0.2		0.5		1800					
0.27		0.2		0.2		0.2		0.5		1800					
0.2		0.2		0.2		0.2		0.5		1800					

## Auxiliary contact blocks

for contactors and reversing contactors



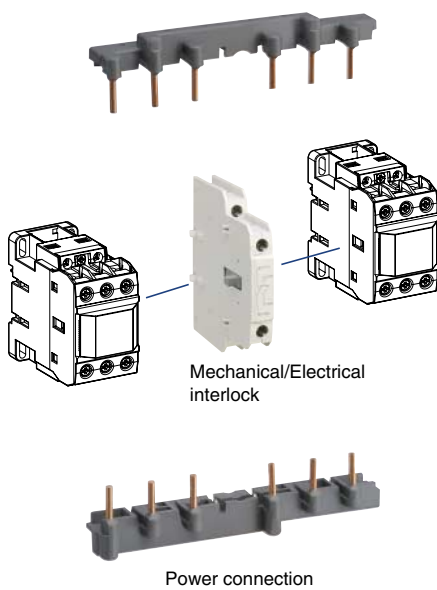
Using contactors	Mounting	Number of contacts per block	Composition		Type	Weight
			NO	NC		g
Contactors and reversing contactors MC-9 to 95 MC-9R to 95R	Front	2	1	1	AU-2	28
			2	-		
		4	2	2	AU-4	50
			1	3		
4	-					
3	1					
Side	2	1	1	UA-1	53	

## Mechanical/Electrical interlocks

for reversing contactors

for motor control

To be assembled by customer



Using contactors with screw clamp terminals	Set of power connections		Mechanical/Electrical interlock	
	Type	Weight g	Type	Weight g
MC-9 MC-12 MC-18 MC-25 MC-32	UW-32	45	UR-02	64
MC-35 MC-40 MC-50 MC-63	UW-63	12.5		
MC-65 MC-75 MC-85 MC-95	UW-95	325		

**Note :**

- Component parts for assembling by customer
- Mechanical interlock with 2NC contacts for electrical interlocking
- UR-02 provides both mechanical and electrical interlocks

## Capacitor units

### Description

- MC-□(D), a contactor or special use, is adjusted for switching single-step or multiple-step condenser bank.
- It is standardized by IEC-60947-4941, UL and CSA.

### Operation condition

Operating times	MC-9(D)~32(D)	240 times/h
	MC-35(D)~95(D)	100 times/h
Electrical endurance	MC-9(D)~32(D)	200,000 times/h
	MC-35(D)~95(D)	100,000 times/h

- When the switch is closed condenser must be discharged before recharged.  
(Maximum residual voltage at terminals  $\leq 50V$ )
- In working voltage 500V( $U_e=500V$ ), 100,000 times for MC-9(D)~32(D) and 80,000 times for MC-35(D)~95(D).
- To prevent short current, gG type fuse must be 1.5~2 times than rated current.
- It must be separated from resistant wire

### Rating

Type	Maximum operating power at (kvar)			Rated current (A)	Applied unit
	220~240V	400~440V	600~550V		
MC-9(D)	5	9.7	14	14	AC-9
MC-12(D)	6.7	12.5	18	18	AC-9
MC-18(D)	8.5	16.7	24	24	AC-9
MC-25(D)	10	18	26	26	AC-9
MC-32(D)	15	25	36	36	AC-9
MC-35(D)	18	30	42	42	AC-50
MC-40(D)	20	33.3	48	48	AC-50
MC-50(D)	20	40	58	58	AC-50
MC-63(D)	23	42	60	60	AC-50
MC-65(D)	25	45.7	66	66	AC-50
MC-75(D)	29.7	54	78	78	AC-50
MC-85(D)	35	60	92	92	AC-50
MC-95(D)	37	62	94	94	AC-50

Note) 1. Circumstance Temp.  $\theta \leq 55^\circ C$   
 2. The average temperature over a 24-hour period, in accordance with standards IEC 70 and 831 is  $45^\circ C$



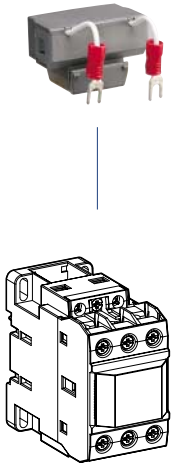
### Mounting unit

Phase-bus devices, Type MU, followed by MMS-32, 63 and 100  
 These devices are attached module to connect joined Manual Motor Starter with Contactor.

Type	Model	Description	Applied type
Mounting unit	MU-45	Width 45mm	MMS-32S/H/Hi+MC-9~32 or GMC(D)-M
	MU-55	Width 55mm	MMS-63S/H/Hi+MC-35~63
	MU-70	Width 70mm	MMS-100S/H/Hi+MC-65~95

## Surge suppressor units

for contactors and reversing contactors



Using contactors	Rating	V	Type	Internal element	Weight
					g
Contactors and reversing contactors MC-9 to 95	AC	24~48V	US-1	Varistor+RC	20
		100~125V	US-2	Varistor+RC	
		200~240V	US-3	RC	
		380~440V	US-14	Varistor+RC	
	DC	24~48V	US-4	Varistor+RC	
		100~125V	US-5	Varistor+RC	
		200~220V	US-6	Varistor+RC	
	AC/DC common	24~48V	US-11	Varistor	
		100~125V	US-12	Varistor	
		200~240V	US-13	Varistor	

- Rated insulation voltage (Ui) : AC 1000V
- Rated impulse voltage (Uimp) : 8kV
- Degree of protection (IEC 60 529) : IP20

## Direct adapters

for connection element to combine

a Manual Motor Starter(MMS) with a Contactor



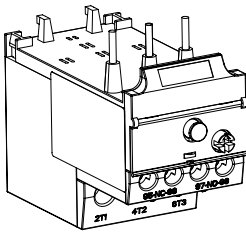
Using contactors	Using manual motor starters		Type	Weight
	Type	Setting range		g
MC-9 with AC coil MC-12 with AC coil MC-18 with AC coil MC-25 with AC coil MC-32 with AC coil	MMS-32S	0.1~32A	DA-32SA	27
	MMS-32H	0.1~32A	DA-32HA	
MC-9 with DC coil MC-12 with DC coil MC-18 with DC coil MC-25 with DC coil MC-32 with DC coil	MMS-32S	0.1~32A	DA-32SD	36
	MMS-32H	0.1~32A	DA-32HD	
MC-35 with AC coil MC-40 with AC coil MC-50 with AC coil MC-63 with AC coil	MMS-63	6~63A	DA-63A	56
MC-35 with DC coil MC-40 with DC coil MC-50 with DC coil MC-63 with DC coil	MMS-63	6~63A	DA-63D	69
MC-65 with AC coil MC-75 with AC coil MC-85 with AC coil MC-95 with AC coil	MMS-100	11~100A	DA-95A	94
MC-65 with DC coil MC-75 with DC coil MC-85 with DC coil MC-95 with DC coil	MMS-100	11~100A	DA-95D	118

# Accessories

Susol

## Separate mounting adapters for 3-pole Thermal overload relays


Separate mounting adapter



Overload relay  
MT-32

Corresponding relay	Adapter type	Terminal type	Weight
			g
MT-32/3K MT-32/3H MT-32/2H MT-32/3D	UZ-32	Screw type	68
MT-63/3K MT-63/3H MT-63/2H MT-63/3D	UZ-63/S	Screw type	134
MT-63/3K MT-63/3H MT-63/2H MT-63/3D	UZ-63/L	Lug type	134
MT-95/3K MT-95/3H MT-95/2H MT-95/3D	UZ-95/S	Screw type	230
MT-95/3K MT-95/3H MT-95/2H MT-95/3D	UZ-95/L	Lug type	230

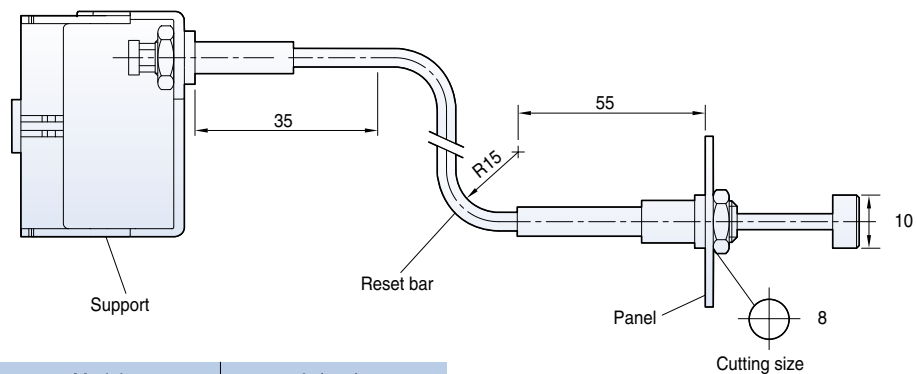
### Mounting

Clip-on mounting on 35 mm  rail or screw fixing.

## Remote reset units for overload relays



Remote reset unit



Model	L (mm)
UM-4R	400
UM-5R	500
UM-6R	600

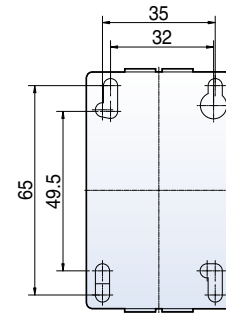
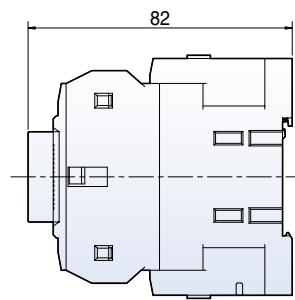
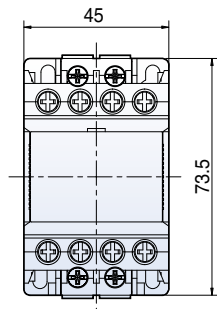
# Overall dimensions

Susol

## Contactors

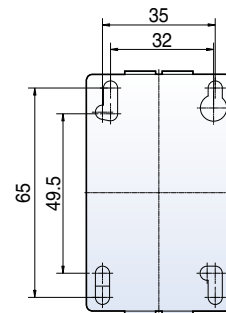
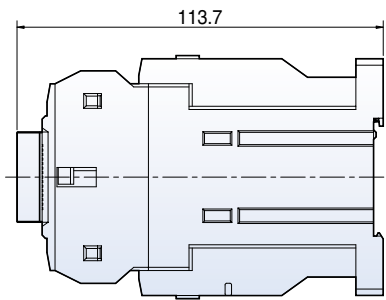
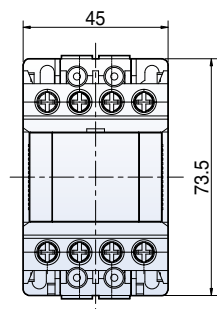
[mm]

MC-9a, 12a AC



0.262kg

MC-9a, 12a DC



0.468kg



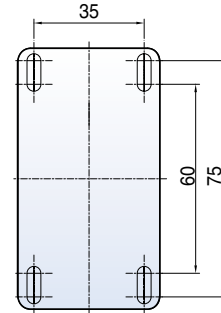
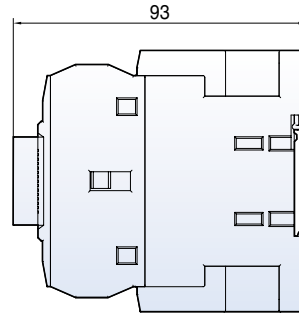
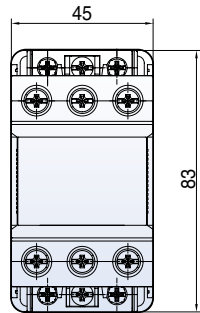
# Overall dimensions

Susol

## Contactors

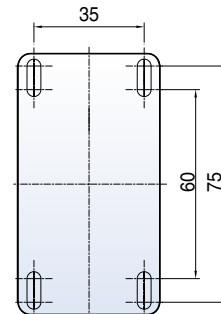
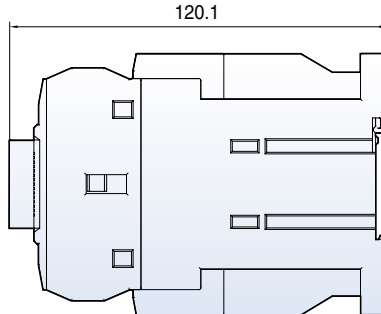
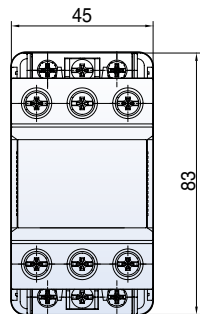
[mm]

MC-9-32 AC



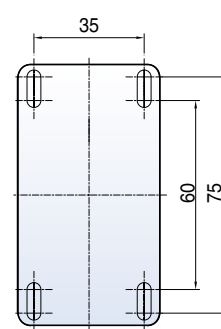
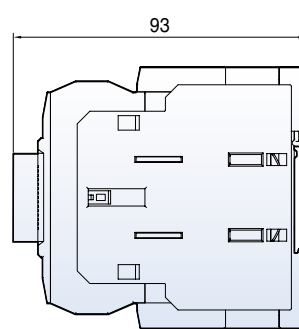
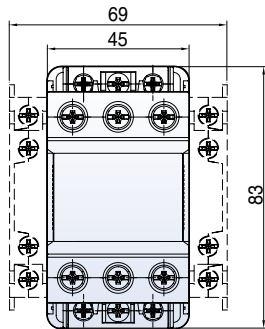
0.442kg

MC-9-32 DC



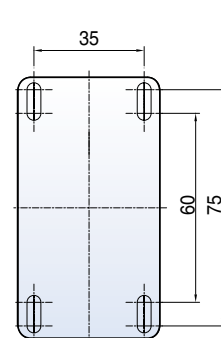
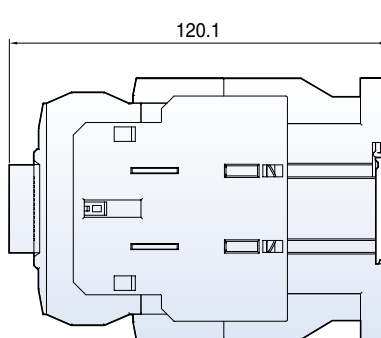
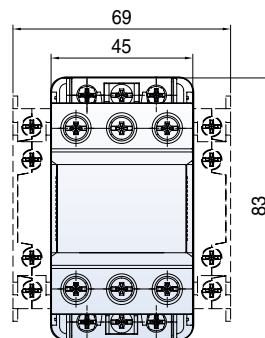
0.628kg

MC-9-32 AC  
2a2b



0.549kg

MC-9-32 DC  
2a2b



0.765kg

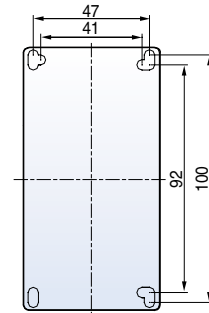
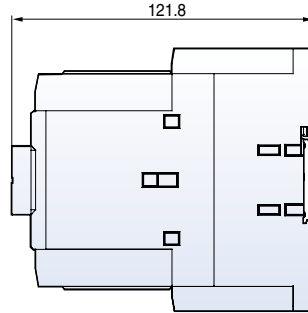
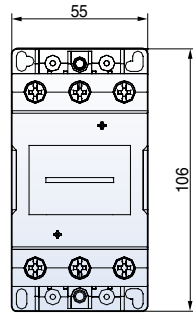
# Overall dimensions

Susol

## Contactors

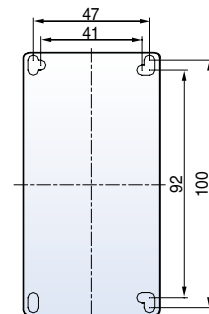
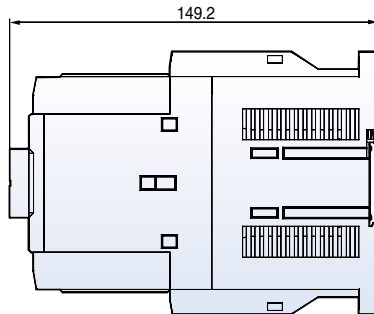
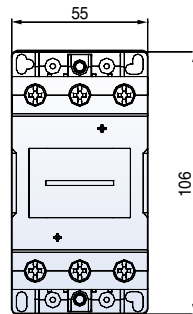
[mm]

MC-35~63 AC



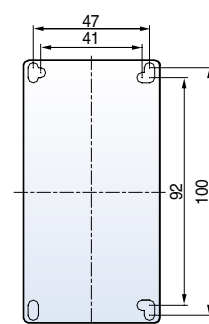
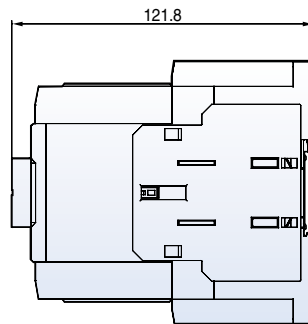
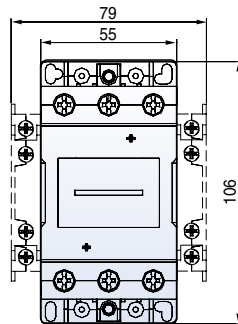
0.940kg

MC-35~63 DC



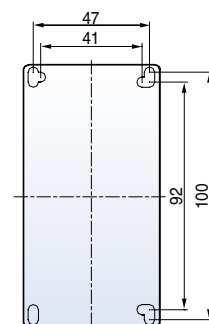
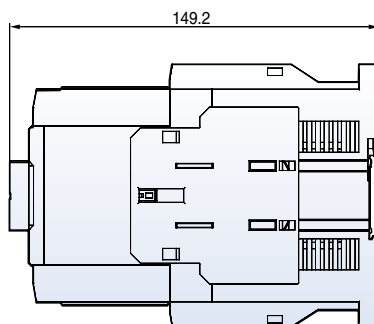
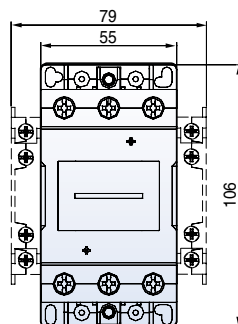
1.196kg

MC-35~63 AC  
2a2b



1.045kg

MC-35~63 DC  
2a2b



1.301kg

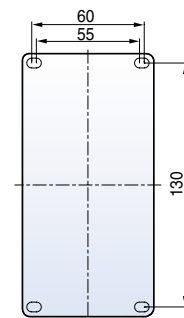
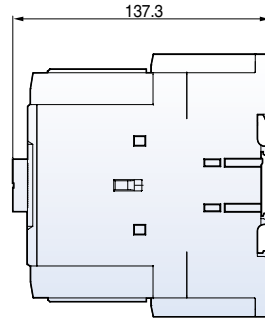
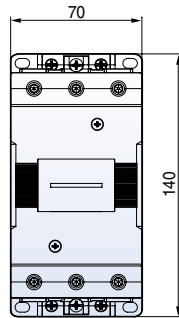
# Overall dimensions

Susol

## Contactors

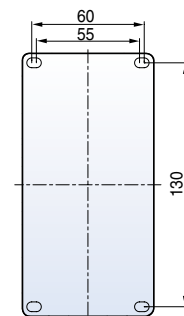
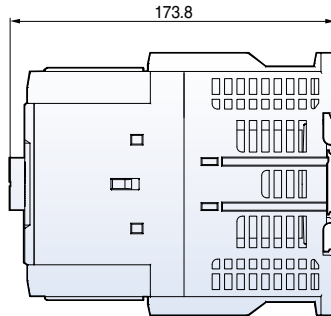
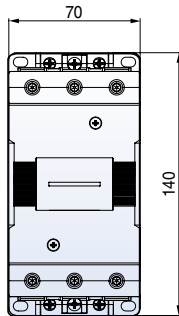
[mm]

MC-65~95 AC



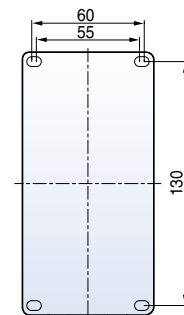
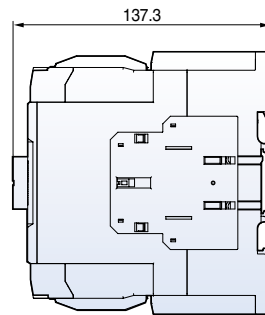
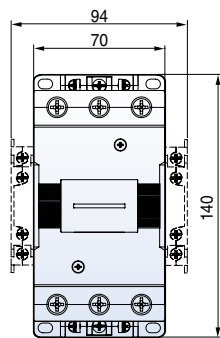
1.820kg

MC-65~95 DC



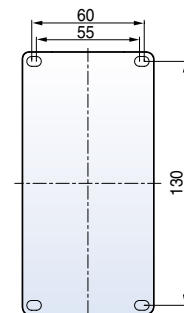
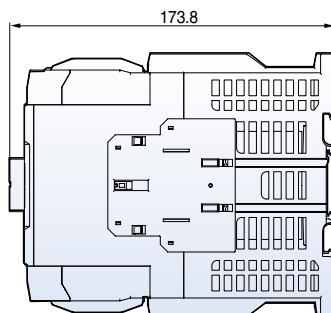
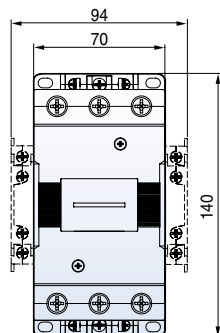
2.700kg

MC-65~95 AC  
2a2b



1.925kg

MC-65~95 DC  
2a2b



2.805kg

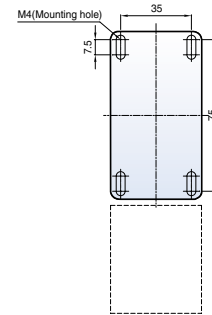
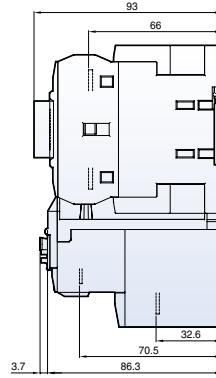
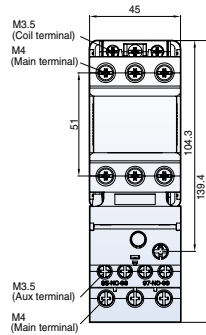
# Overall dimensions

Susol

## Motor starters (Screw type)

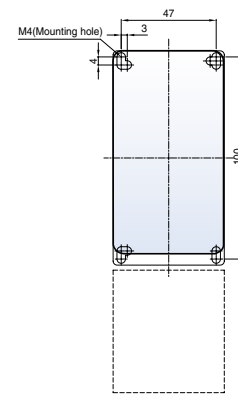
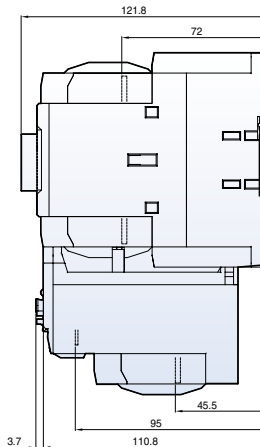
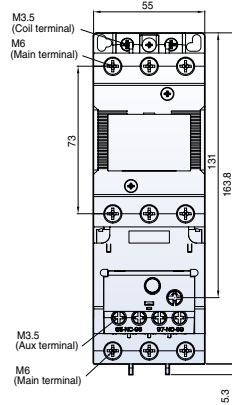
[mm]

- MS-9
- MS-12
- MS-18
- MS-25
- MS-32



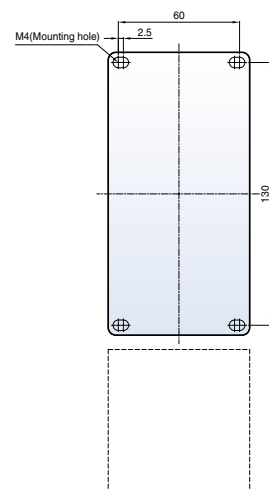
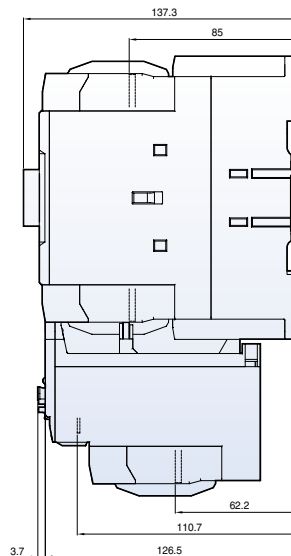
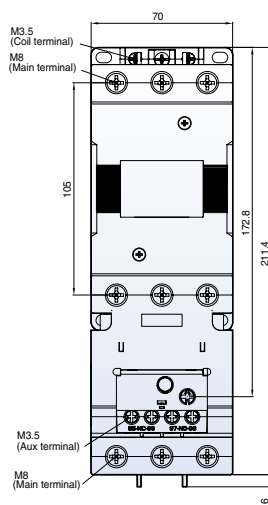
0.61kg

- MS-35
- MS-40
- MS-50
- MS-63



1.14kg

- MS-65
- MS-75
- MS-85
- MS-95



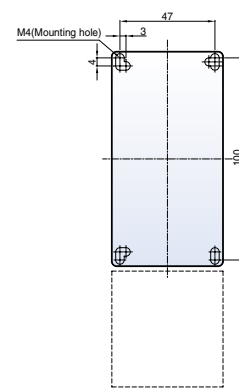
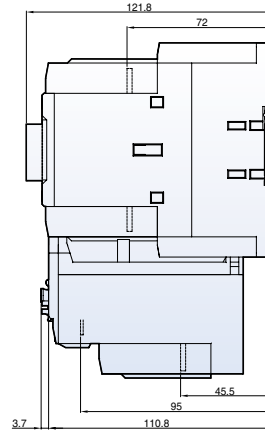
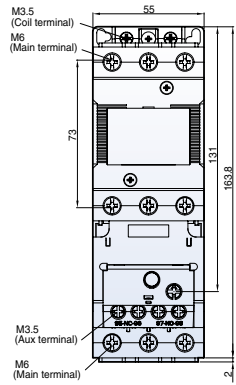
2.19kg

# Overall dimensions

Susol

## Motor starters (Lug type)

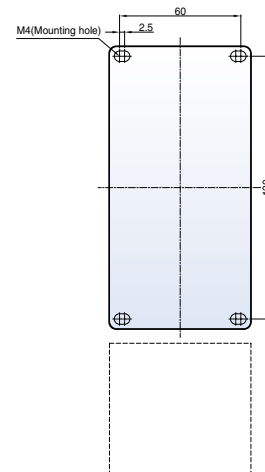
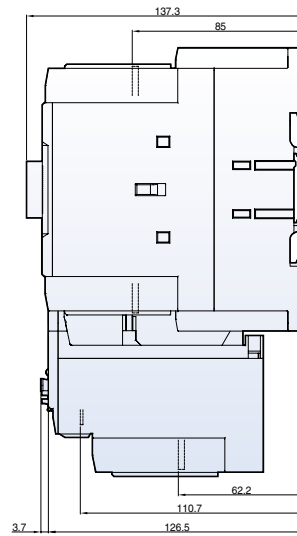
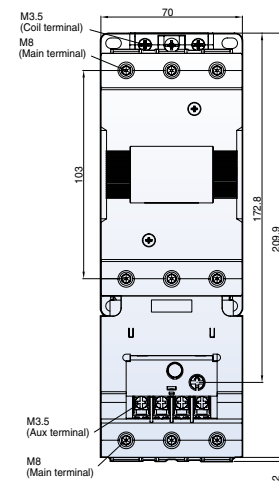
- MS-35
- MS-40
- MS-50
- MS-63



[mm]

1.14kg

- MS-65
- MS-75
- MS-85
- MS-95



2.19kg

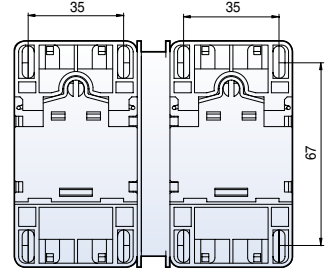
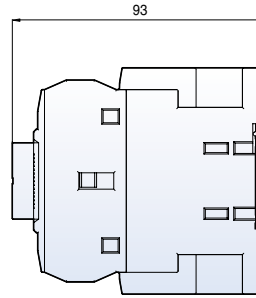
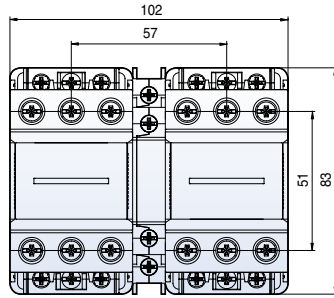
# Overall dimensions

Susol

## Reversing contactors and starters

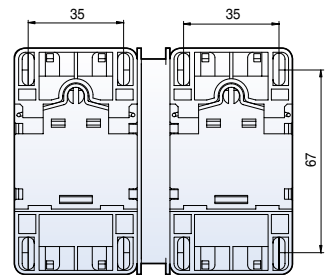
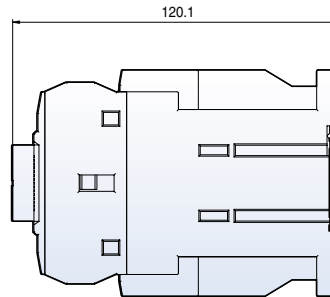
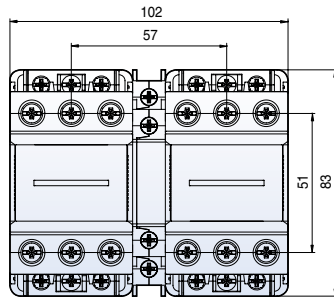
[mm]

MC-9R~32R AC



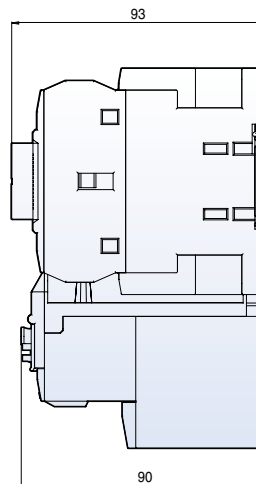
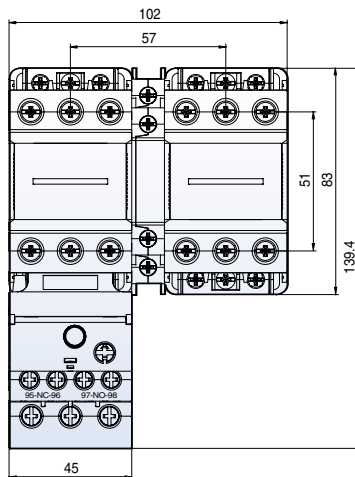
0.095kg

MC-9R~32R DC



0.147kg

MS-9R~32R AC



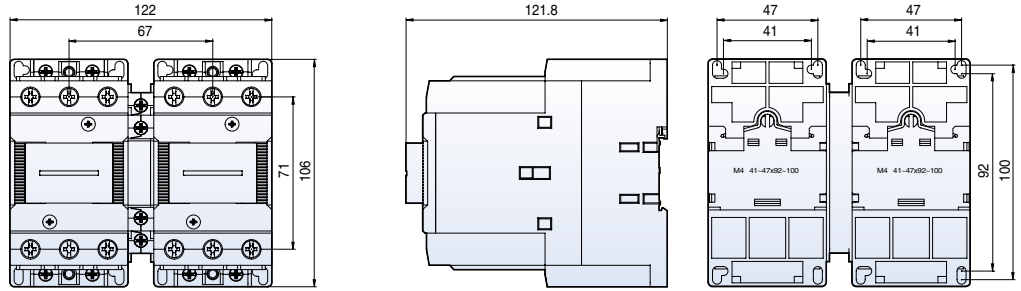
# Overall dimensions

Susol

## Reversing contactors and starters

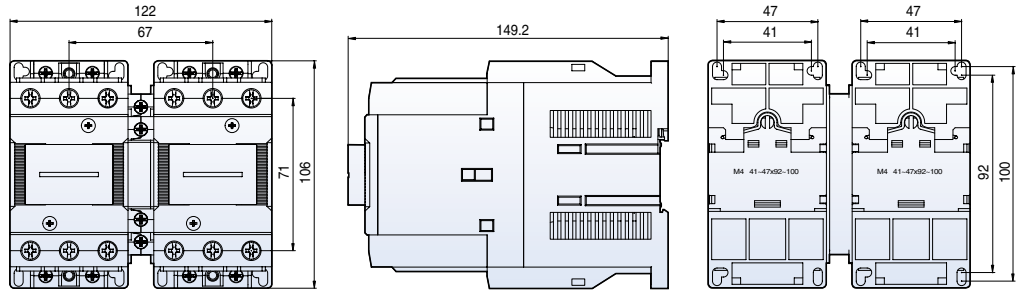
[mm]

MC-35R~65R AC



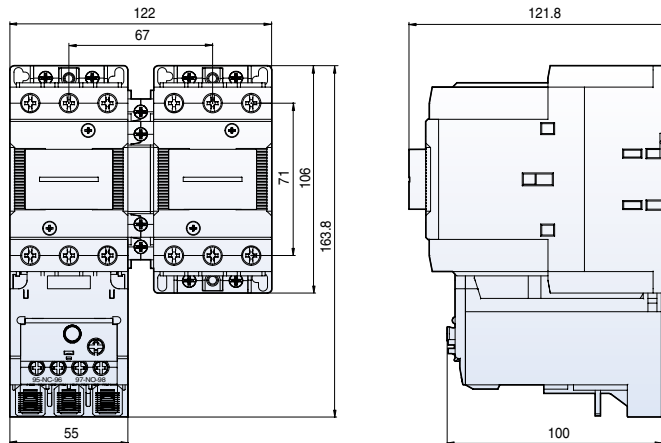
1.73kg

MC-35R~65R DC



2.27kg

MS-35R~65R AC



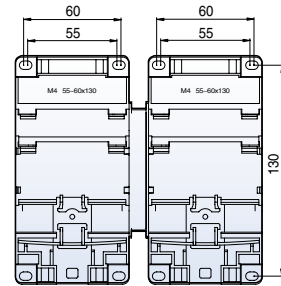
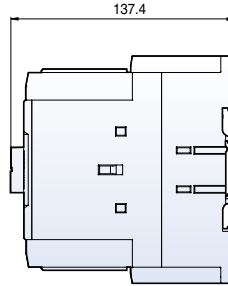
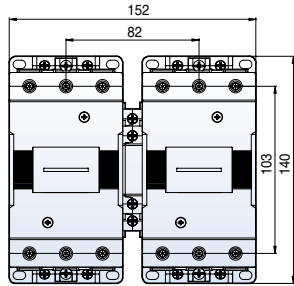
# Overall dimensions

Susol

## Reversing contactors and starters

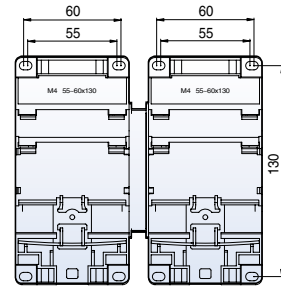
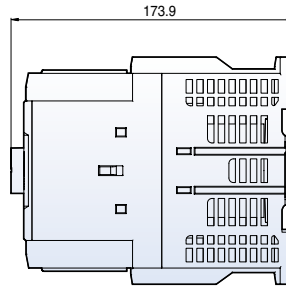
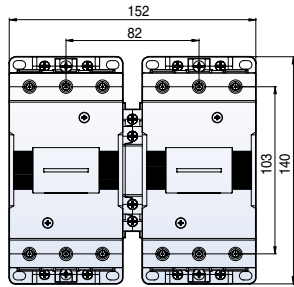
[mm]

MC-65R-95R AC



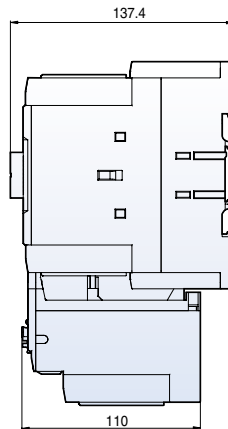
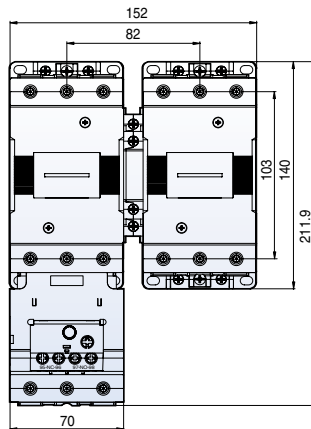
3.25kg

MC-65R-95R DC



5.27kg

MS-65R-95R AC





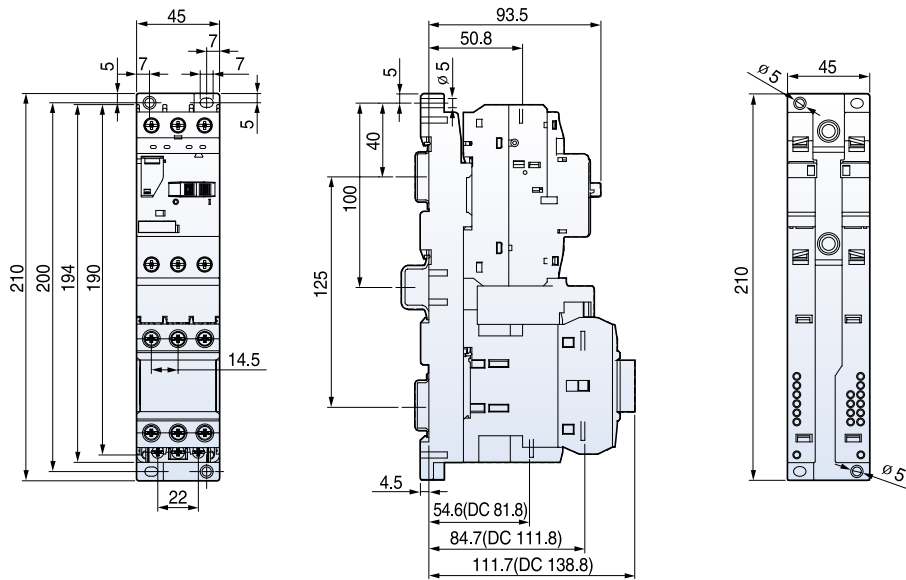
# Overall dimensions

Susol

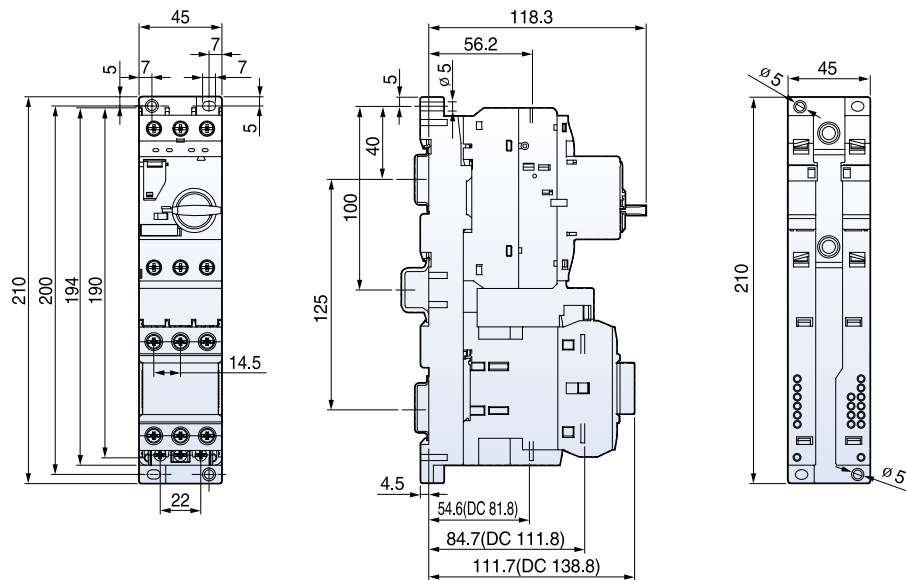
## Combination Manual motor starters and contactors

[mm]

MMS-32S  
+  
MC-32AF



MMS-32H  
+  
MC-32AF



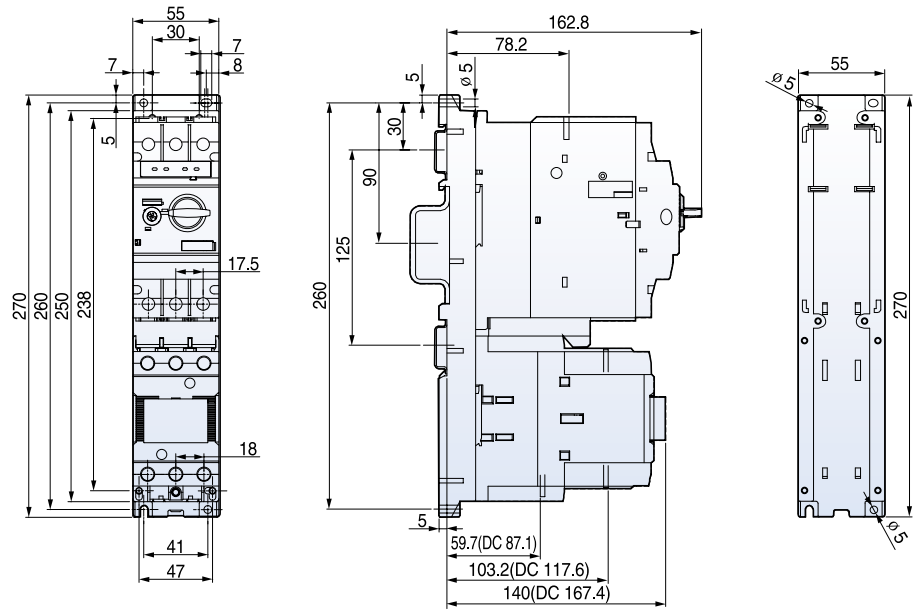
# Overall dimensions

Susol

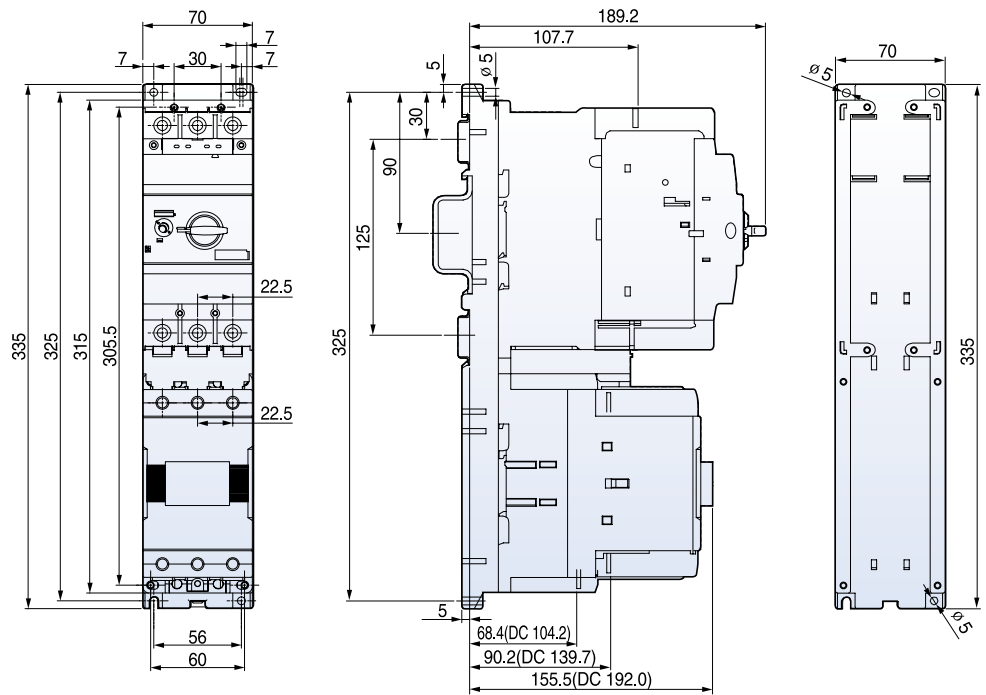
## Combination Manual motor starters and contactors

[mm]

MMS-63H  
+  
MC-63AF



MMS-100H  
+  
MC-95AF



# Overall dimensions

Susol

## Overload relays (Screw type)

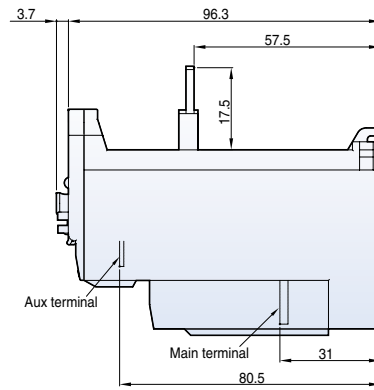
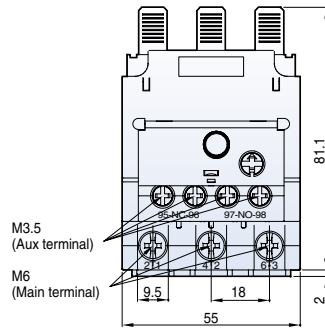
Model	Front View Dimensions [mm]	Side View Dimensions [mm]	Weight [kg]
MT-12	<p>45 73.2 60.1 2T1 4T2 6T3 14T2</p>	<p>63.7 43.1</p>	0.1kg
MT-32	<p>45 74.6 11.8 14.3 M3.5 (Aux terminal) M4 (Main terminal) 2T1 4T2 6T3</p>	<p>86.3 66 3.7 17.5 Aux terminal Main terminal 70.5 32.6</p>	0.167kg
MT-63	<p>55 80.6 14 18 M3.5 (Aux terminal) M6 (Main terminal) 2T1 4T2 6T3</p>	<p>96.3 57.5 3.7 17.5 Aux terminal Main terminal 80.5 31</p>	0.303kg
MT-95	<p>70 97.2 17 22.5 M3.5 (Aux terminal) M8 (Main terminal) 2T1 4T2 6T3</p>	<p>106.3 64.8 3.7 17.5 Aux terminal Main terminal 90.5 42</p>	0.474kg

# Overall dimensions

Susol

## Overload relays (Lug type)

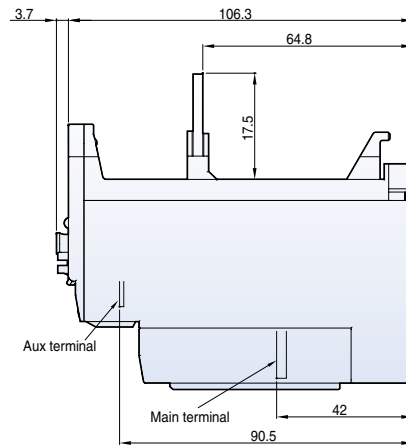
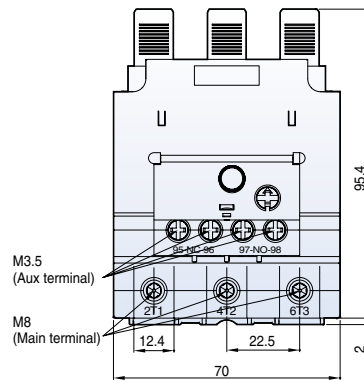
MT-63



[mm]

0.326kg

MT-95



0.491kg

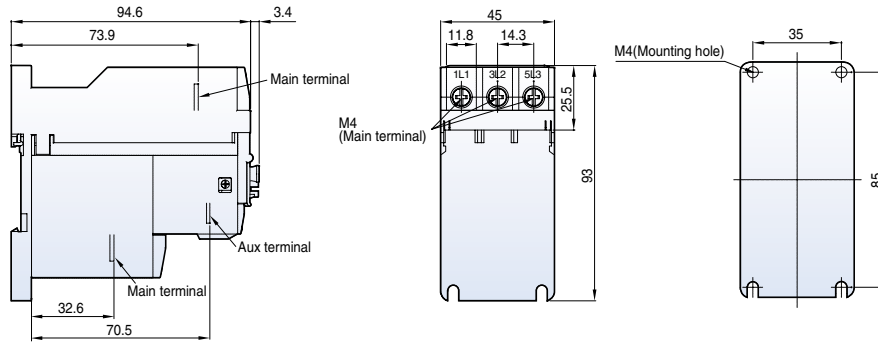
# Overall dimensions

Susol

## Separate mounting units for overload relays (Screw type)

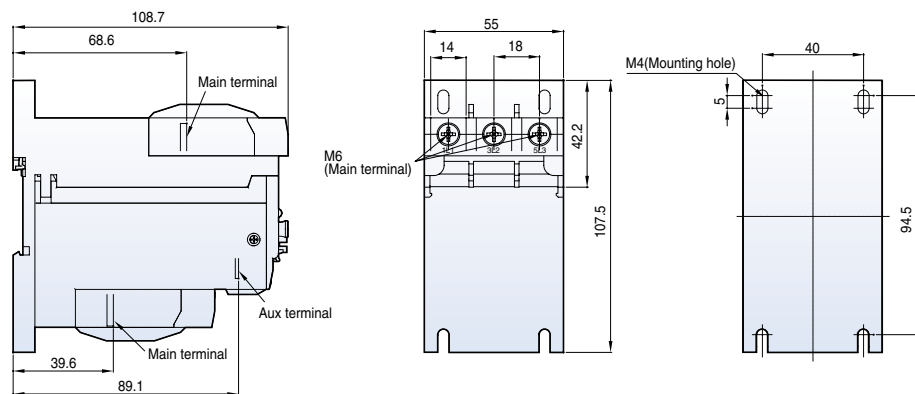
[mm]

UZ-32



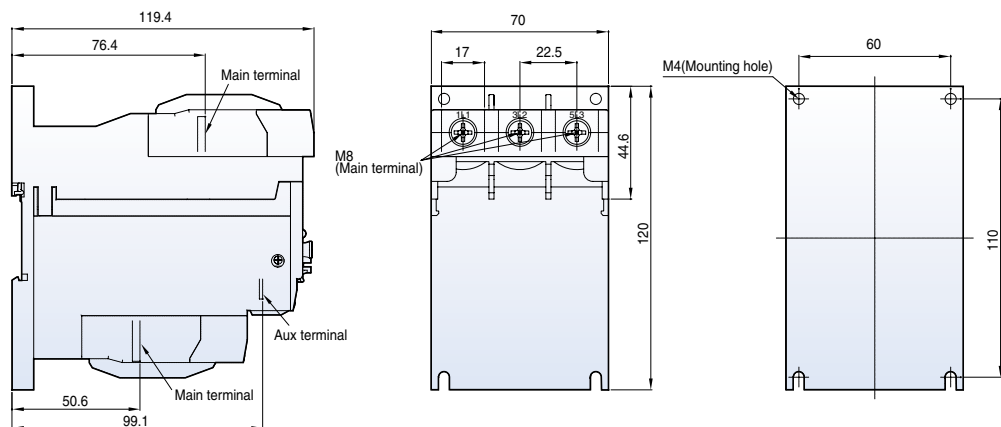
0.068kg

UZ-63/S



0.134kg

UZ-95/S



0.230kg

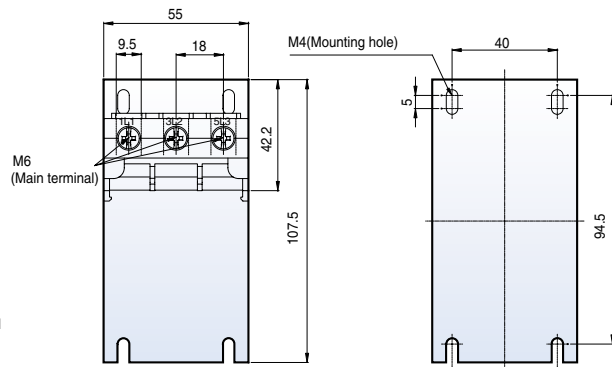
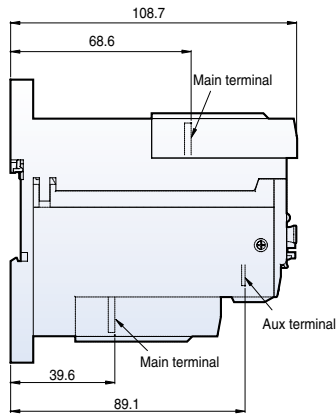
# Overall dimensions

Susol

## Separate mounting units for overload relays (Lug type)

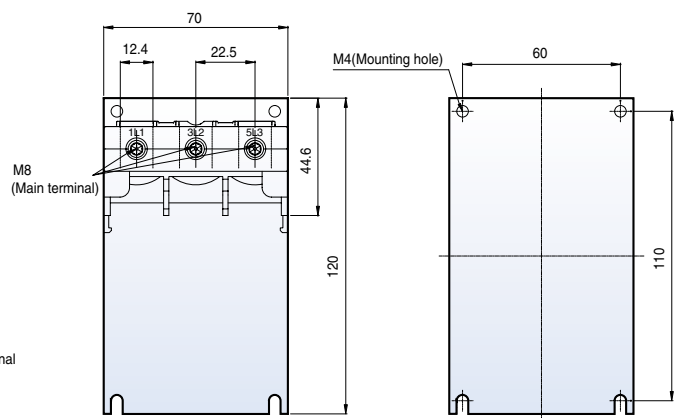
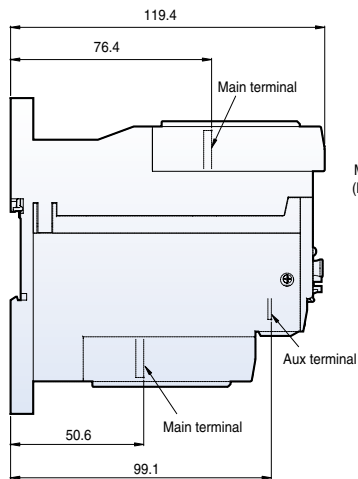
[mm]

UZ-63/L



0.152kg

UZ-95/L

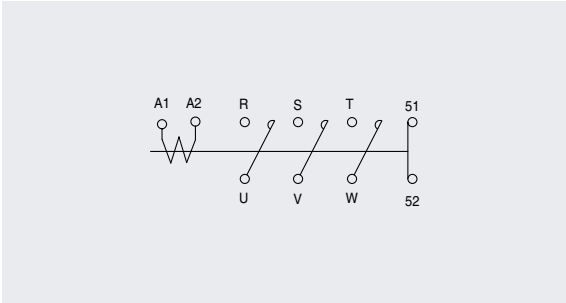


0.226kg

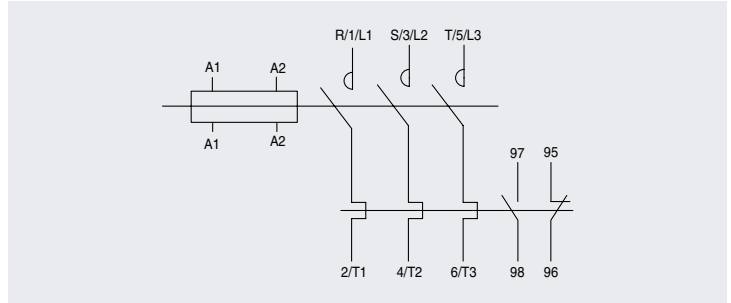
# Circuit diagram

Susol

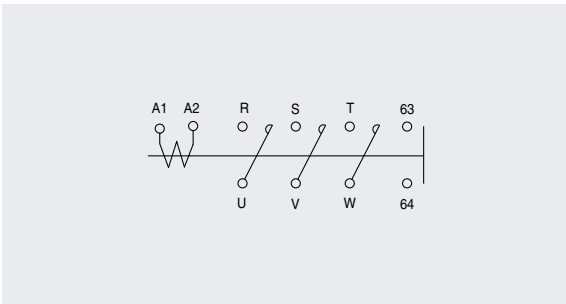
MC-9a, 12a 1NC



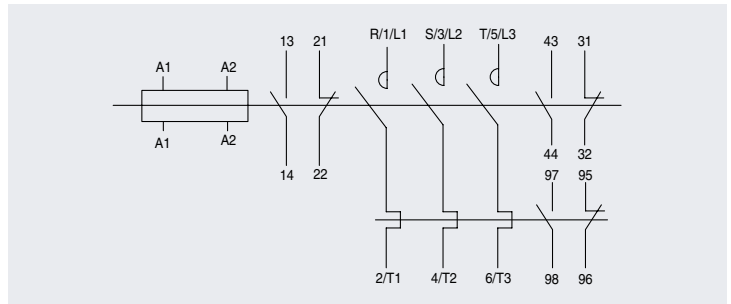
MS-9~95



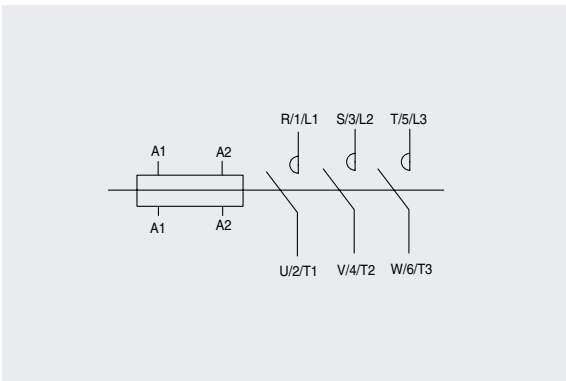
MC-9a, 12a 1NO



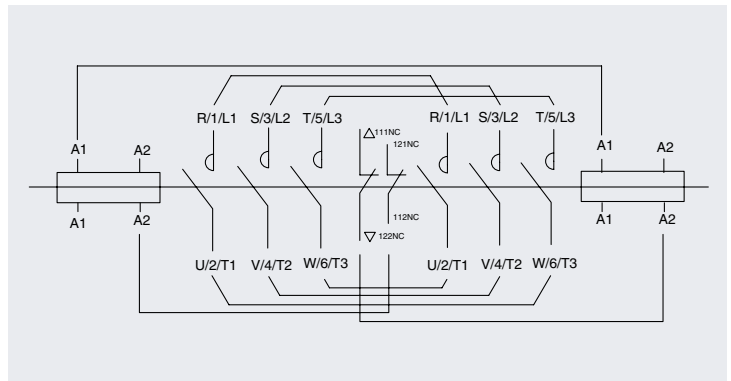
MS-9~95 2NO2NC



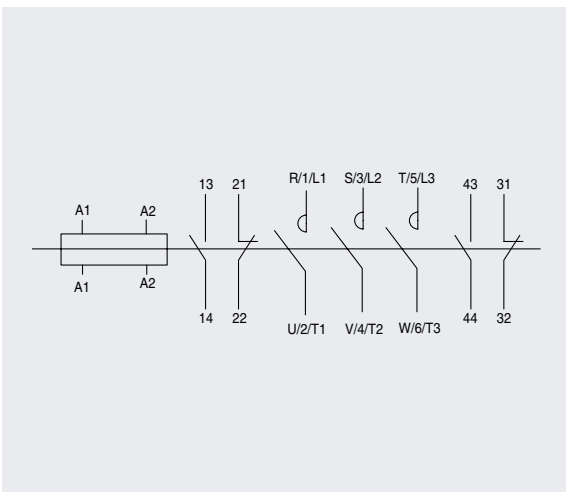
MC-9~95



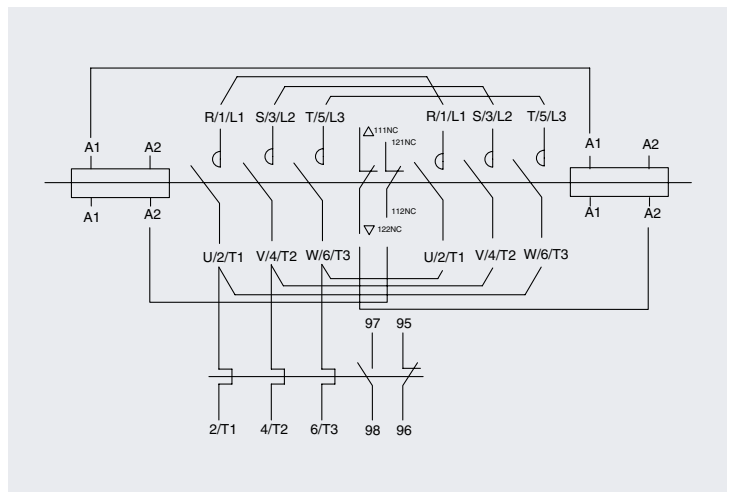
MC-9/R~95/R



MC-9~95 2NO2NC



MS-9/R~95/R



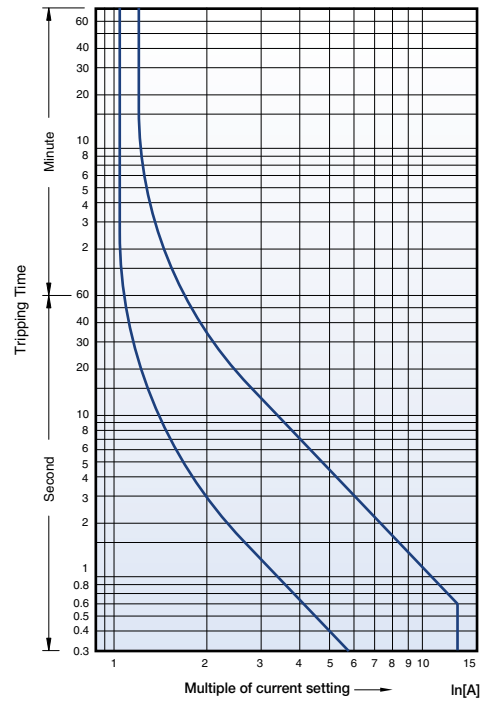
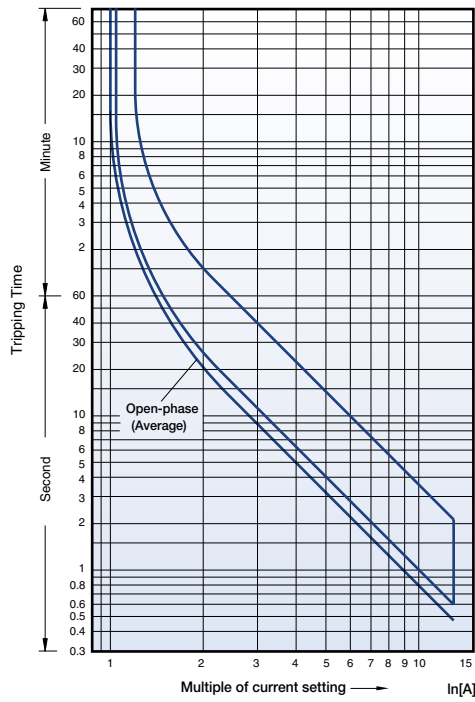
# Tripping characteristics

Susol

Cold starting

Hot starting

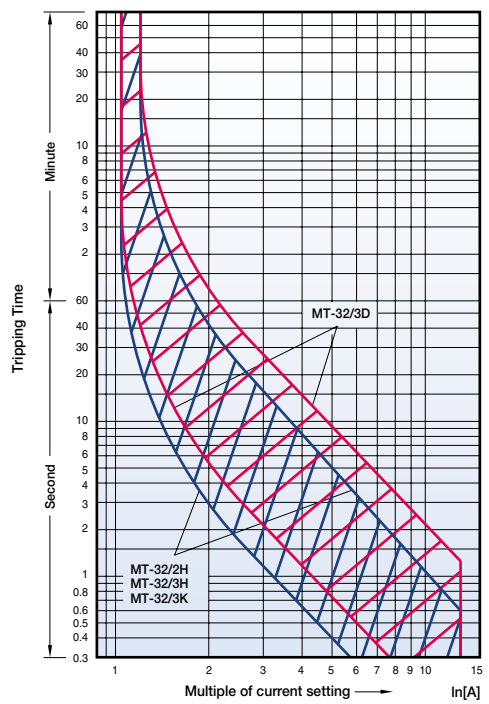
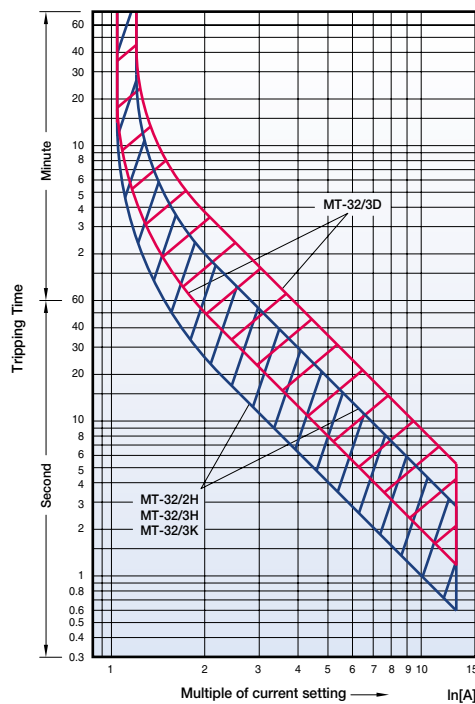
- MT-12/2H
- MT-12/3H
- MT-12/3K
- MT-12/3D



Cold starting

Hot starting

- MT-32/2H
- MT-32/3H
- MT-32/3K
- MT-32/3D





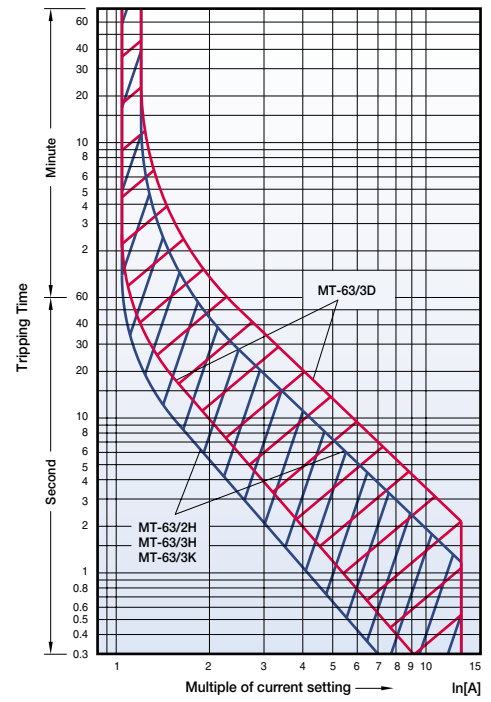
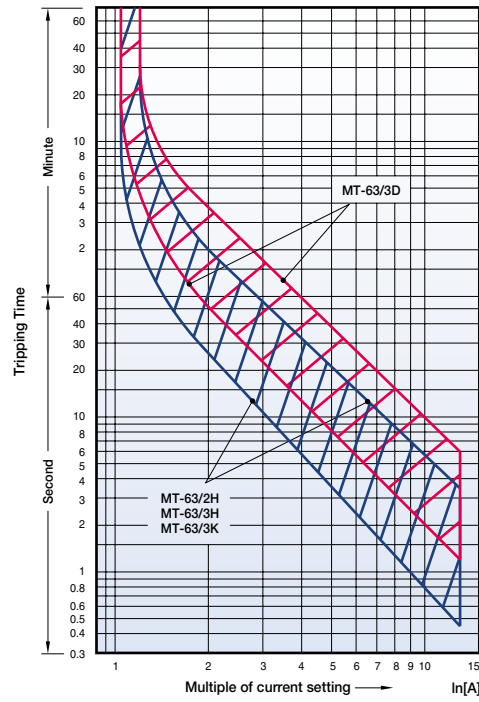
# Tripping characteristics

Susol

Cold starting

Hot starting

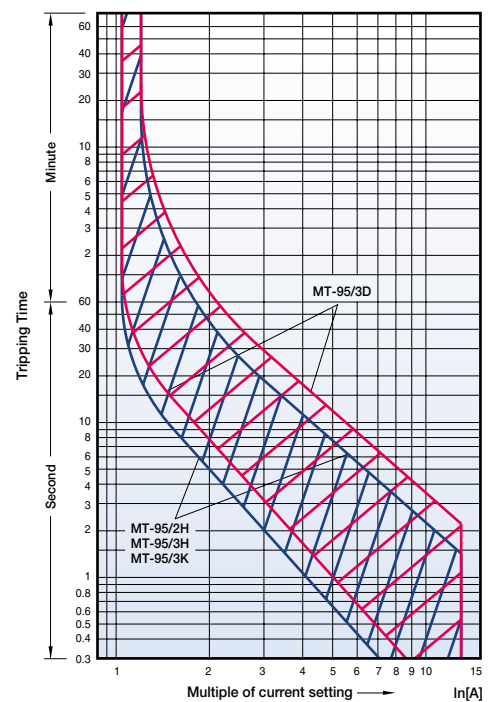
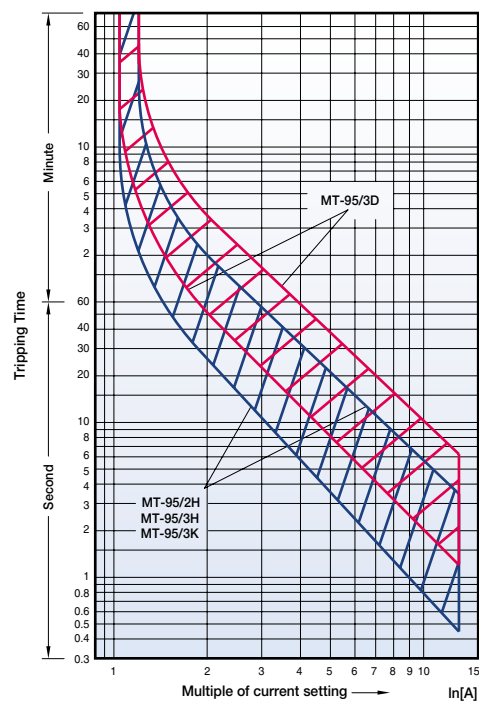
- MT-63/2H
- MT-63/3H
- MT-63/3K
- MT-63/3D



Cold starting

Hot starting

- MT-95/2H
- MT-95/3H
- MT-95/3K
- MT-95/3D



# Environment

Susol



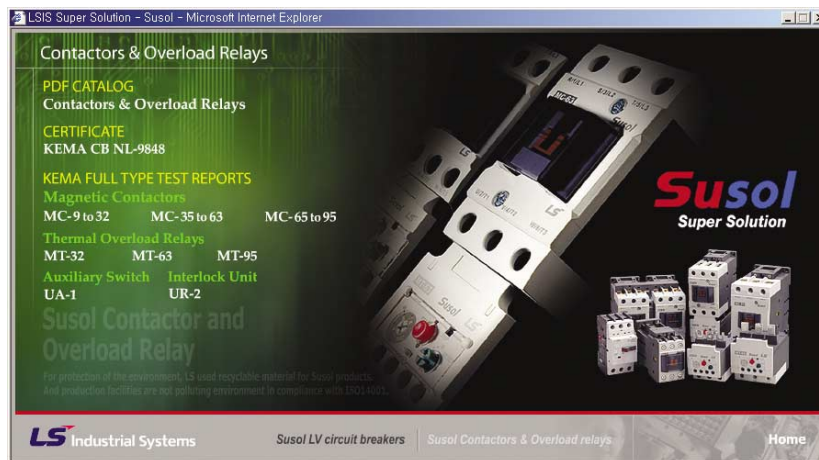
Environment		
Standards	EN 60947-1, EN 60947-4-1	
Product certifications	CE, CCC, UL	
Degree of protection (IEC 60 529)	Power terminals IP20	
	Coil terminals IP20	
Ambient air temperature	Storage	-55 ... +80°C
	Normal operation	-5 ... +60°C
Operating altitude	Maximum 3000m	
Operating positions(without derating)	±30° possible, in relation to normal vertical mounting plane	
Shock resistance (IEC 68-2-7) (1/2 sine wave = 11ms)	Contactor open	8 gn
	Contactor closed	10 gn
Vibration resistance (IEC 68-2-6) (5...300 Hz)	Contactor open	2 gn
	Contactor closed	4 gn
Flame resistance	Conforming to UL 94	Vo
	Conforming to IEC 695-2-1	960°C

# Electronic catalogue

**Susol**



This electronic catalogue enables the customer to search a product by function, range or product type. It contains all catalogues for Susol series circuit breakers, contactors, overload relays. KEMA CB certification and full type test reports are also available.



To obtain the electronic catalogue, please ask our authorized distributor in your country.  
Or it is available on the Internet ([www.lsis.biz](http://www.lsis.biz)).



Should you require further information, please visit our English website ([www.lsis.biz](http://www.lsis.biz)). You will find everything you need to know about products, systems and services.

# Ordering information

Susol

## Contactor












<b>MC</b>	<b>9</b>	<b>R</b>	<b>AC220</b>	<b>6</b>	<b>11</b>	<b>S</b>					
<b>Rated current</b>		<b>Applied model</b>		<b>Coil voltage</b>		<b>Frequency</b>		<b>Aux. contact</b>		<b>Terminal type</b>	
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		
95	95A							33	3a3b		
								44	4a4b		

## Overload relays

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

# Certifications and approvals












Susol

Type	Type of device	Approvals				Certificates	Certification of ship classification societies					
	Abbreviation	IEC	UL & CSA		GB	IEC	KR	LR	BV	NK	ABS	DNV
	Approved in											
	Area	Europe	U.S.A	Canada	China	Netherlands	Korea	U.K	France	Japan	U.S.A	Norway
MC	MC-9	●	●	●	○	●	○	○	○	○	▲	▲
	MC-12	●	●	●	○	●	○	○	○	○	▲	▲
	MC-18	●	●	●	○	●	○	○	○	○	▲	▲
	MC-25	●	●	●	○	●	○	○	○	○	▲	▲
	MC-32	●	●	●	○	●	○	○	○	○	▲	▲
	MC-35	●	●	●	○	●	○	○	○	○	▲	▲
	MC-40	●	●	●	○	●	○	○	○	○	▲	▲
	MC-50	●	●	●	○	●	○	○	○	○	▲	▲
	MC-65	●	●	●	○	●	○	○	○	○	▲	▲
	MC-75	●	●	●	○	●	○	○	○	○	▲	▲
	MC-85	●	●	●	○	●	○	○	○	○	▲	▲
	MC-95	●	●	●	○	●	○	○	○	○	▲	▲
MT	MT-32H	●	●	●	○	●	○	○	○	○	▲	▲
	MT-63H	●	●	●	○	●	○	○	○	○	▲	▲
	MT-95H	●	●	●	○	●	○	○	○	○	▲	▲
	MT-32L	●	●	●	○	●	○	○	○	○	▲	▲
	MT-63L	●	●	●	○	●	○	○	○	○	▲	▲
	MT-95L	●	●	●	○	●	○	○	○	○	▲	▲
	MT-32D	●	●	●	○	●	○	○	○	○	▲	▲
	MT-63D	●	●	●	○	●	○	○	○	○	▲	▲
	MT-95D	●	●	●	○	●	○	○	○	○	▲	▲

- Approved in 2005
- Approved in 2006
- ▲ Approved in 2007

# Certifications and approvals

Susol

Type	Type of device	Approvals				Certificates	Certification of ship classification societies					
	Abbreviation	IEC	UL & CSA		GB	IEC	KR	LR	BV	NK	ABS	DNV
	Approved in											
	Area	Europe	U.S.A	Canada	China	Netherlands	Korea	U.K	France	Japan	U.S.A	Norway
MS	MS-9	●	●	●	○	●	○	○	○	○	▲	▲
	MS-12	●	●	●	○	●	○	○	○	○	▲	▲
	MS-18	●	●	●	○	●	○	○	○	○	▲	▲
	MS-25	●	●	●	○	●	○	○	○	○	▲	▲
	MS-32	●	●	●	○	●	○	○	○	○	▲	▲
	MS-35	●	●	●	○	●	○	○	○	○	▲	▲
	MS-40	●	●	●	○	●	○	○	○	○	▲	▲
	MS-50	●	●	●	○	●	○	○	○	○	▲	▲
	MS-65	●	●	●	○	●	○	○	○	○	▲	▲
	MS-75	●	●	●	○	●	○	○	○	○	▲	▲
	MS-85	●	●	●	○	●	○	○	○	○	▲	▲
	MS-95	●	●	●	○	●	○	○	○	○	▲	▲
Reversing - MC	MC-9R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-12R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-18R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-25R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-32R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-35R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-40R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-50R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-63R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-65R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-75R	●	●	●	○	●	○	○	○	○	▲	▲
	MC-85R	●	●	●	○	●	○	○	○	○	▲	▲
MC-95R	●	●	●	○	●	○	○	○	○	▲	▲	
Reversing - MS	MS-9R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-12R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-18R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-25R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-32R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-35R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-40R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-50R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-63R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-65R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-75R	●	●	●	○	●	○	○	○	○	▲	▲
	MS-85R	●	●	●	○	●	○	○	○	○	▲	▲
MS-95R	●	●	●	○	●	○	○	○	○	▲	▲	

● Approved in 2005  
○ Approved in 2006  
▲ Approved in 2007

## Test certifying organizations

### Introduction

Power Testing & Technology Institute (PT & T)



PT&T is operating high-power laboratory, high-voltage laboratory reliability testing laboratory and calibration laboratory to aid technical development in product performance and reliability through its sound technical background and impartial operation in testing and evaluation process. PT&T, as a KOLAS-accredited testing and calibration laboratory, would continue its contribution to promote technical development and competence of electrical industry.

### Standard recognition

Type of Test Reports

- KS Korea industrial standards
- IEC International Electrotechnical Commission
- ES, PS Korea Electric Power Corporation (Provisional) Standards
- KEMC Korea Electric Manufacturers Cooperative Standards
- ANSI American National Standard Institute
- Others Other standards as dictated by the clients

### Laboratory Recognition

- KOLAS accredited testing and calibration laboratory (Korea Laboratory Accreditation Scheme per ISO 17025). Other Certification Bodies KEMA, CESI, UL etc. are in close cooperative relation. Registered testing laboratory for electrical appliances safety certification

# Production sites

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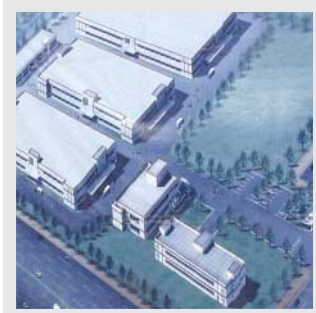
Cheongju Plant (Korea)



Dalian Plant (China)



Hanoi Plant (Vietnam)



Wuxi Plant (China)



Chonan Plant (Korea)



Wuxi Plant (China)



Janghang Plant (Korea)

## Electric Power Industry

### Electric Equipment & Systems

The electric equipment and systems of LS Industrial Systems, ranging from low to high voltage products, have not only acquired ISO 9001 and 14001 certification for their efficient design and excellent quality, but many other certificates, including KEMA, TÜV, CESI, ASTA, and KERI. The outstanding quality of the products that we are manufacturing conforms to international standards such as IEC, UL, ANSI, CCC, JIS, and KS.

We also provide Total Solutions that encompass customized designs and more advanced technology, as well as efficient production and installation, and highly accurate testing and analysis of power equipment.

## Automation Industry

### Automation Equipment, Industrial IT & RFID

LS Industrial Systems, a leading pioneer of the domestic automation business, developed the first ever PLC, Inverter (AC Drive), and DCS in Korean automation history. We now provide Total Solutions through the diverse application of our own products, ranging from controllers to control systems that are based on sophisticated technology and proven experience, to bring innovative change to distribution systems and logistics.

## Industrial Equipment Industry

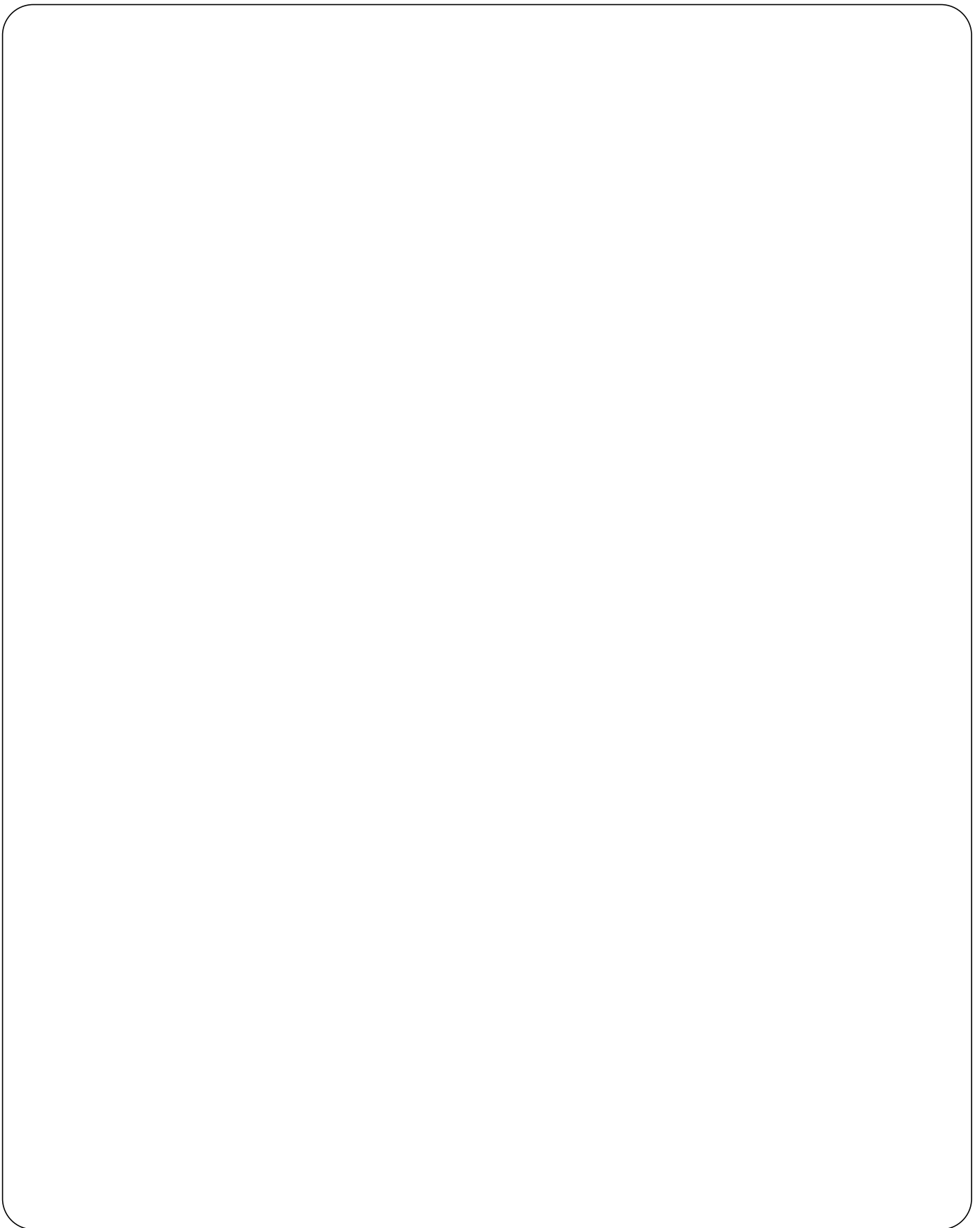
### Metal Processing

In addition to supplying basic industrial material, such as copper tubes and STS pipes to the electronics and chemical industries, LS Industrial Systems also manufactures and supplies electric power tools that have been recognized for their excellent performance capabilities in over 38 countries.



# Memo

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# Global Networks

## LS Industrial System's global network provides the highest quality of products and services

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Dalian LS Industrial Systems Co.,Ltd

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