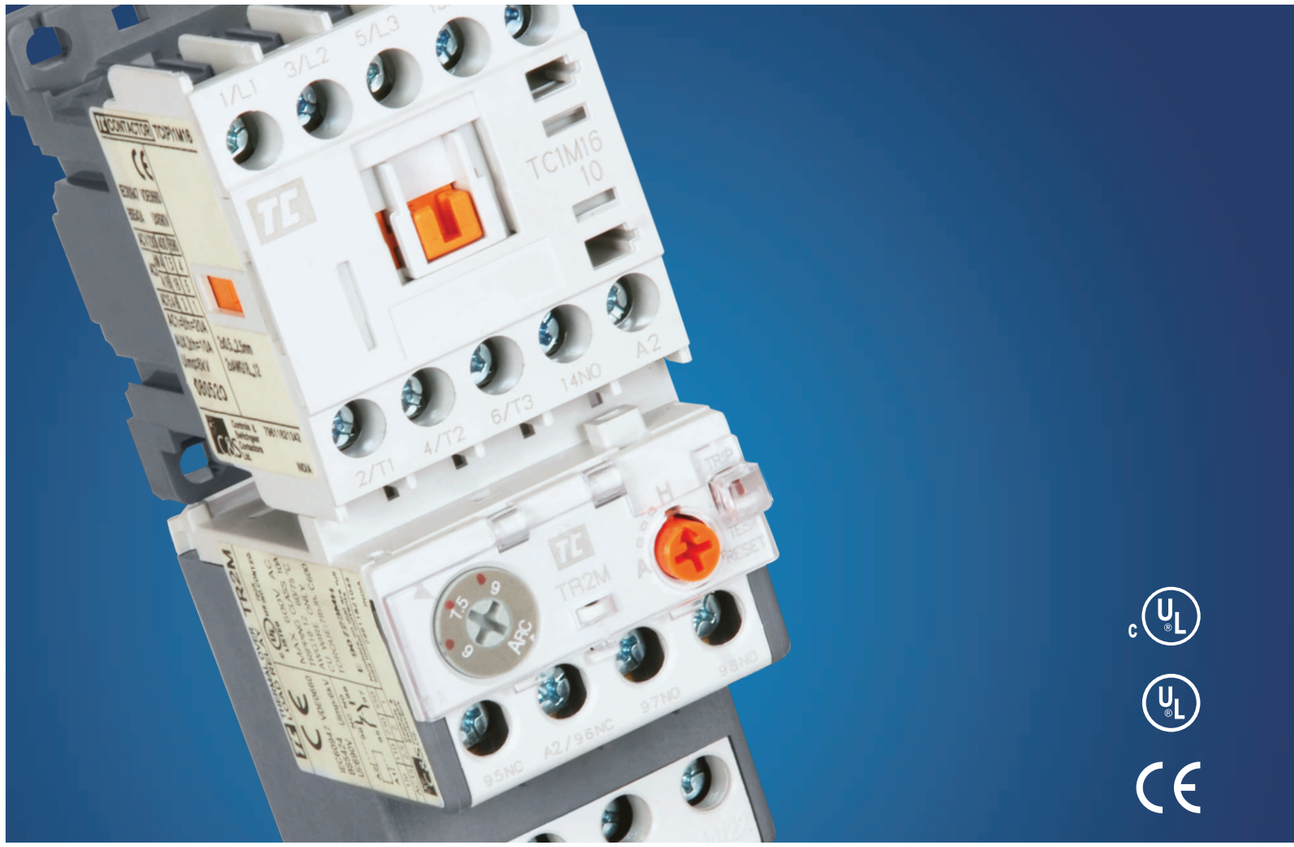
State of the art Manufacturing Facilities

Haridwar, Noida Ph-I
& Noida Ph-II Plant



C&S Electric Limited

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Mini Contactor 02042010

C&S electric

Mini Contactor

Mini Control Relay

Contact Configuration

- 4NO, 3NO+1NC,
- 2NO+2NC,
- 1NO+3NC &
- 4NC

Contact Configuration in AC / DC Variants

Control Relay Selection

Poles	Configeration	Catalogue Reference	
		AC control	DC control
4 Pole	4NO	TCA2-M40*	TCA3-M40*
	3NO+1NC	TCA2-M31*	TCA3-M31*
	2NO+2NC	TCA2-M22*	TCA3-M22*
	1NO+3NC	TCA2-M13*	TCA3-M13*
	4NC	TCA2-M04*	TCA3-M04*

Contact ratings: Thermal Current Ith 16A at 415V AC

		Rated currents		Making/Breaking Currents	
		Inductive Load	Resistive Load	Inductive Load	Resistive Load
AC duty	120V	6.0A	10A	66A	66A
	240V	3.0A	8A	33A	33A
	480V	1.5A	5A	16.5A	16.5A
	600V	2.0A	5A	13.2A	13.2A
DC duty	125V	1.1A	5A	3.7A	
	250V	0.55A	3A	1.8A	
	440V	0.31A	2.5A	1.4A	
	600V	0.2A	1A	0.7A	

Performance Parameters

Operation per hour			1800
Endurance			
Mechanical life			20 mil. opr.
Electrical life	AC15 duty	220V	0.50 mil. opr.
		440V	0.50 mil. opr.
	AC 12 duty	220V	0.25 mil. opr.
		440V	0.25 mil. opr.
	DC13,12 duty	24~220V	0.50 mil. Opr.

Coil Voltage Codes

Volts	24	48	110	220
AC Reference	B	E	F	M
DC Reference	BD	ED	FD	MD

Mini Contactor

3 Main contacts plus 1NO or 1NC Aux. Contact

Mini Contactor Selection

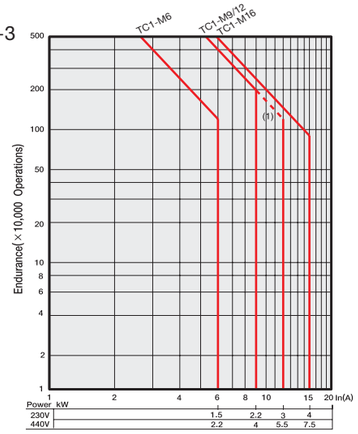
Operational current AC3-415V		6A		9A		12A		16A	
Screw Clamp Type	AC coil	TC1-M6		TC1-M9		TC1-M12		TC1-M16	
	DC coil	TP1-M6		TP1-M9		TP1-M12		TP1-M16	
Ratings / IEC60947-4 / IS13947-4		kw	A	kw	A	kw	A	kw	A
AC1			20		20		20		20
AC3	200/240V	1.5	7	2.2	9	3	12	4	15
	380/440V	2.2	6	4	9	5.5	12	7.5	16
	500/550V	3	5	3.7	6	4	7	5.5	9
	690V	3	4	4	5	4	5	4	5
Ratings / UL508		HP	A	HP	A	HP	A	HP	A
Continuous current		20		25		30		32	
Single phase	115V	0.5		0.5		1		2	
	230V	1		2		3		3	
Three phase	200V	2		3		5		7	
	230V	2		3		5		7.5	
	460V	5		7.5		10		10	
	575V	7.5		10		15		15	
NEMA size		00		00		00		0	
Making current		72A		108A		144A		180A	
Breaking current		60A		90A		120A		150A	
Operation Cycle		1800 Operation / Hours							
Endurance : Electrical/Mechanical		1/12 Million Operation							

Coil Characteristics

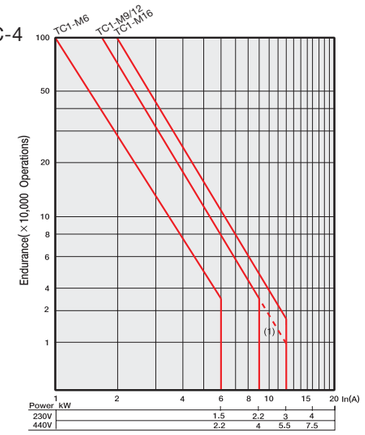
Coil Voltage		AC	DC
Coil consumption	(W)	2	3
Inrush		32VA	3W
Sealed		6VA	3W
Closing Voltage	(%)	80 ~ 110	80 ~ 110
Opening Voltage	(%)	30 ~ 40	10 ~ 30
Closing Time	(ms)	10 ~ 20	40 ~ 50
Opening Time	(ms)	35 ~ 45	35 ~ 45

Electrical Lifespan of Contactors

Use in category AC-3 (Ue≥440V)



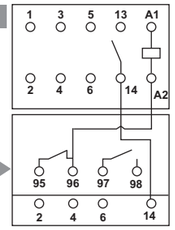
Use in category AC-4 (Ue≥440V)



Mini Overload Relay

- Direct mount on the Mini Contactors
- Ambient compensated -5°C to 40°C
- Provides built-in single phase protection
- Trip free design
- Trip class 10A
- Automatic/Manual reset site selectable
- 1NO+1NC potential free contacts
- Overload Relay provided with 5 prongs, to facilitate easy termination
- DIN rail or screw mountable with the optional base TA7-M0964

Overload connection diagram



Shows pre-wiring inside

Overload Relay Selection

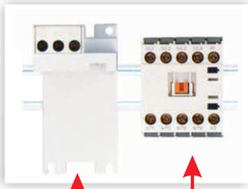
Setting ranges(A)	Reference
0.1 - 0.16	TR2-M0.14A
0.16 - 0.25	TR2-M0.21A
0.25 - 0.4	TR2-M0.33A
0.4 - 0.63	TR2-M0.52A
0.63 - 1.0	TR2-M0.82A
1.0 - 1.6	TR2-M1.3A
1.6 - 2.5	TR2-M2.1A
2.5 - 4.0	TR2-M3.3A
4.0 - 6.0	TR2-M5A
5.0 - 8.0	TR2-M6.5A
6.0 - 9.0	TR2-M7.5A
7.0 - 10.0	TR2-M8.5A
9.0 - 13.0	TR2-M11A
12.0 - 16.0	TR2-M14A

Auxiliary (Trip) contact rating

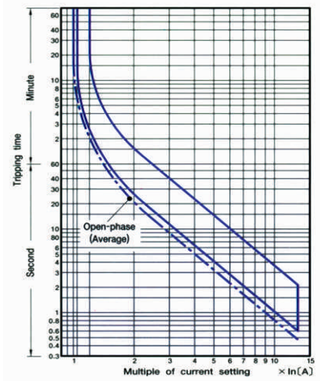
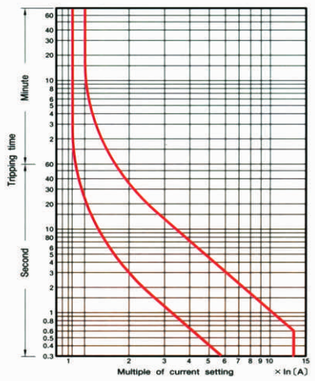
AC15(11)duty			DC13(11) duty	
110V	220V	550V	110V	220V
2.5(0.3)A	2(0.3)A	1(0.3)A	0.28A	0.14A

Note : Values are the ratings of NO contact under auto reset mode.

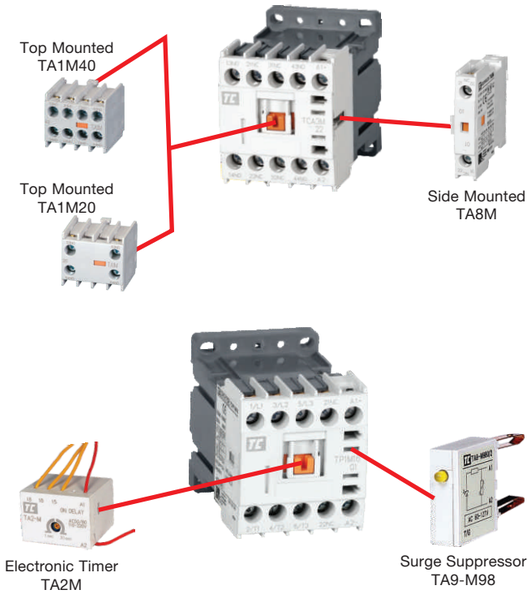
Overload Relay Adaptor
TA9-M980

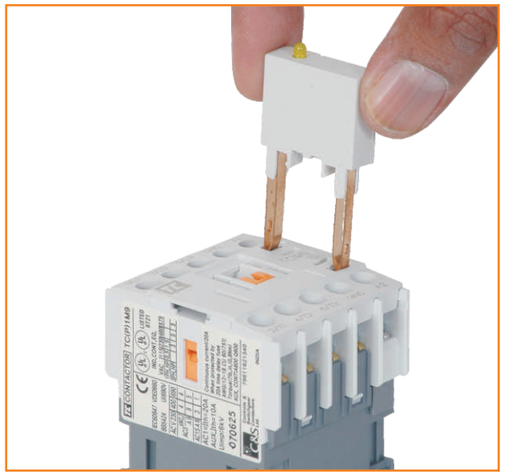


Overload Relay Curves

Differential Type	Cold State	Hot State
TR2-M		

Accessories





Auxiliary Contact Blocks (Ith = 10A)

Mounting	Composition	Catalog no.
Front mount	2NO	TA1-M20
	2NC	TA1-M02
	1NO+1NC	TA1-M11
	4NO	TA1-M40
	3NO+1NC	TA1-M31
	2NO+2NC	TA1-M22
	1NO+3NC	TA1-M13
	4NC	TA1-M04
Side mount	1NO	TA8-M10
	1NC	TA8-M01

Front Mounted Electronic Timers

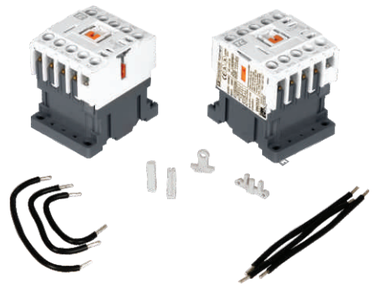
Delay	Time	Voltage	Reference
ON	0.1~30sec	AC/DC	TA2-M/ 1N
OFF	0.1~30sec	24~48V	TA3-M/ 1F
ON	0.1~30sec	AC	TA2-M/ 2N
OFF	0.1~30sec	100~220V	TA3-M/ 2F

Coil Suppressor (Varistor)

Voltage	Reference
AC 24~ 48V	TA9-M980/1
AC 60~ 127V	TA9-M980/2
AC 200~ 240V	TA9-M980/3
DC 12~ 24V	TA9-M980/4
DC 30 ~ 72V	TA9-M980/5
DC 100 ~ 127 V	TA9-M980/6
DC 200~ 250 V	TA9-M980/7

Reversing Contactors Interlock Unit, TA9-M978 Consists of

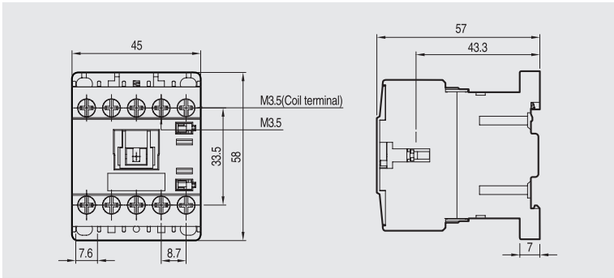
– Mechanical Interlock for Horizontal Mounting
Type TA9-M978



– Cable Kits for line & load side

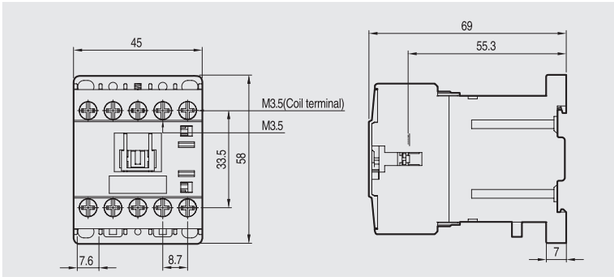
Dimensions

TC1-M06/TCA2-M**
TC1-M09/TCA2-M**
TC1-M12/TCA2-M**
TC1-M16/TCA2-M**



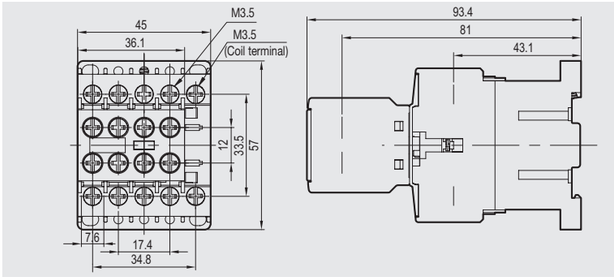
0.17kg

TP1-M06/TCA3-M**
TP1-M09/TCA3-M**
TP1-M12/TCA3-M**
TP1-M16/TCA3-M**



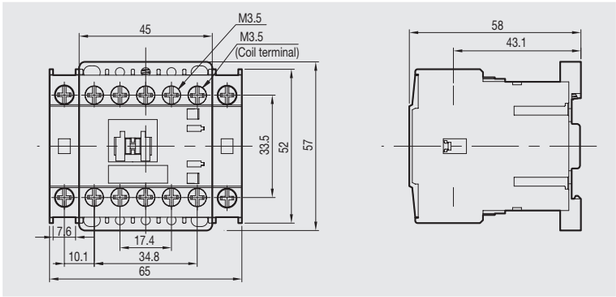
0.23kg

TA1-M**+TC1-M06
TA1-M**+TC1-M09
TA1-M**+TC1-M12
TA1-M**+TC1-M16



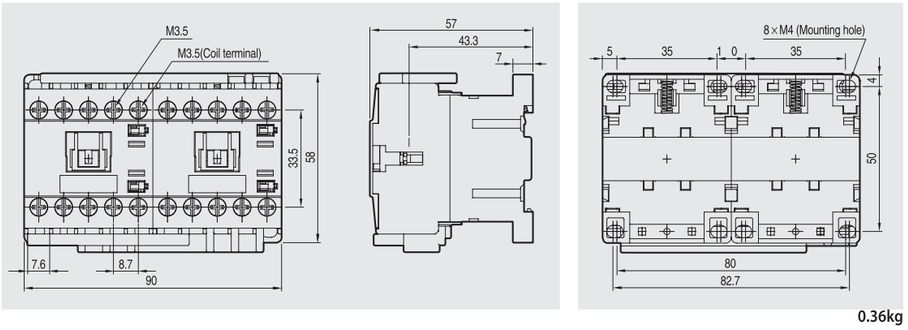
0.21kg

TA8-M**+TC1-M06
TA8-M**+TC1-M09
TA8-M**+TC1-M12
TA8-M**+TC1-M16



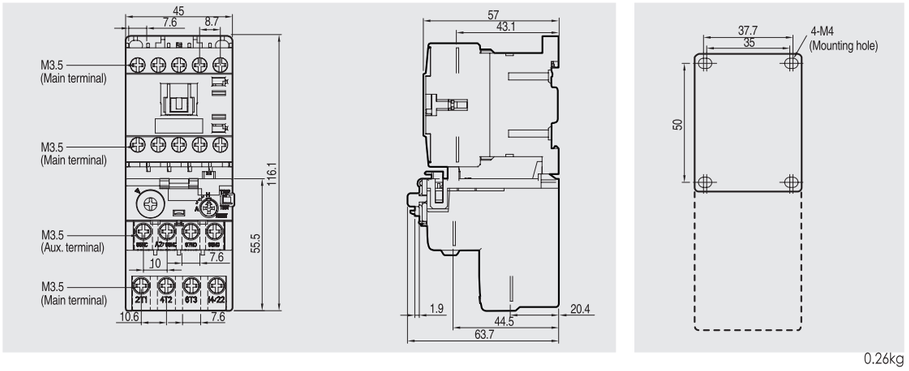
0.21kg

2x(TC1-M06) + TA9-978
2x(TC1-M09) + TA9-978
2x(TC1-M12) + TA9-978
2x(TC1-M16) + TA9-978



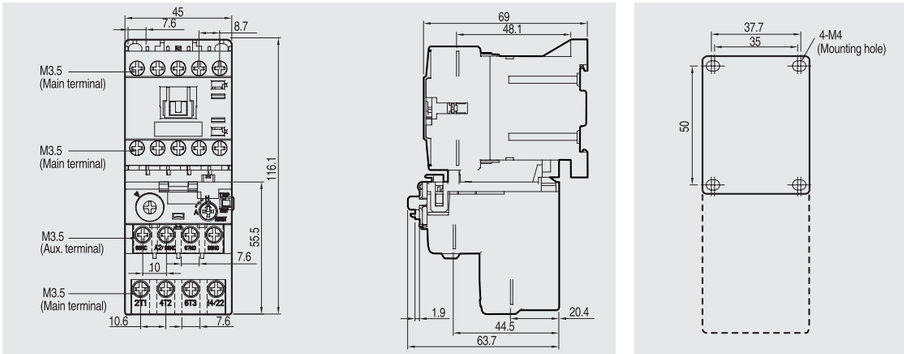
0.36kg

TC1-M06 + TR2-M**
TC1-M09 + TR2-M**
TC1-M12 + TR2-M**
TC1-M16 + TR2-M**



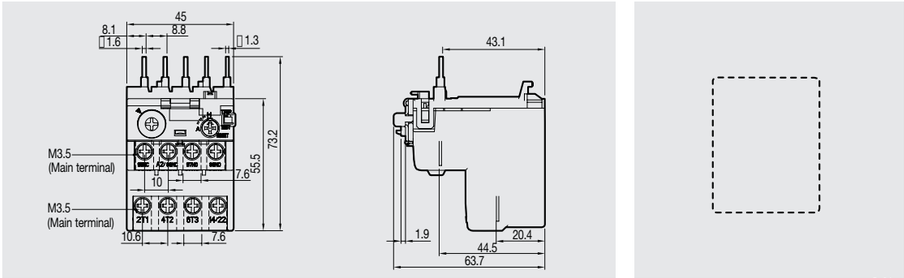
0.26kg

TP1-M06 + TR2-M**
TP1-M09 + TR2-M**
TP1-M12 + TR2-M**
TP1-M16 + TR2-M**



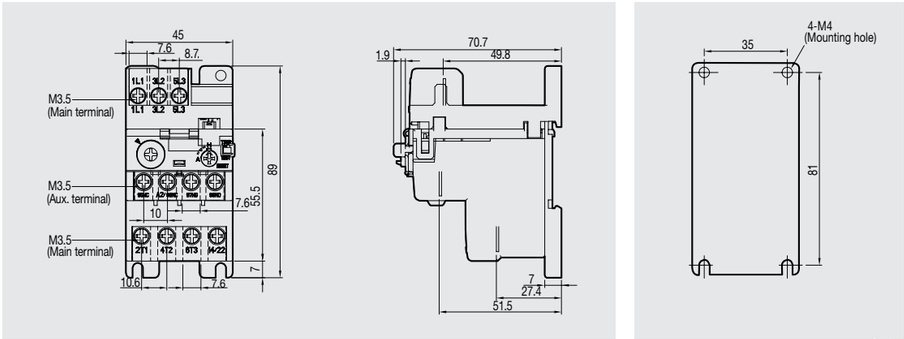
0.39kg

TR2-M**



0.1kg

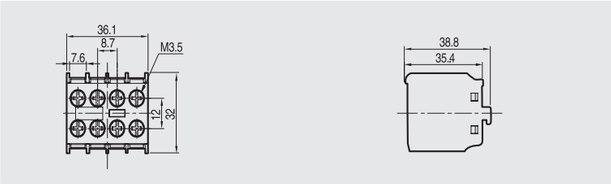
TR2-M** + TA7-M0964



0.4kg

Dimensions

TA1-M**



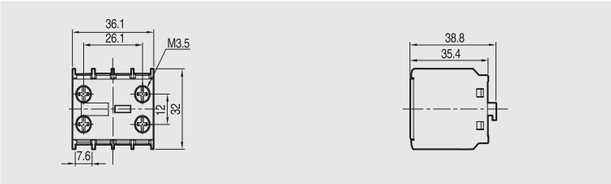
0.04kg

TP1-M6/TCA3-M**

TP1-M9/TCA3-M**

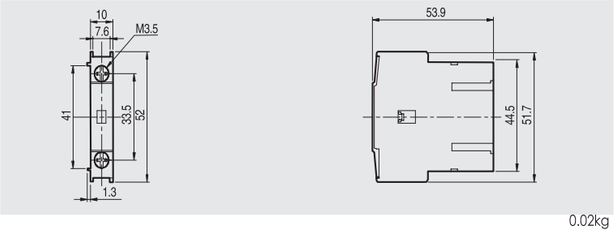
TP1-M12/TCA3-M**

TP1-M16/TCA3-M**



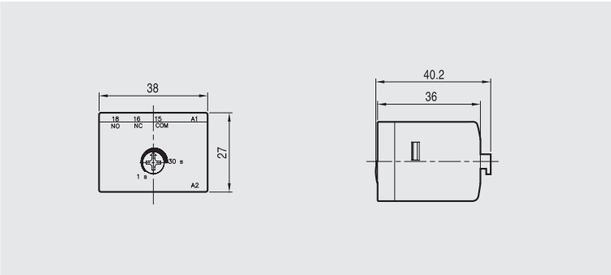
0.03kg

TA8-M**



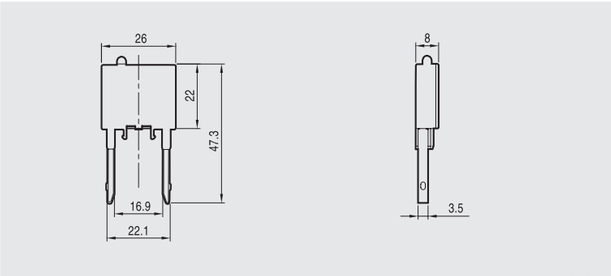
0.02kg

TA2-M/**



0.04kg

TA9-M980



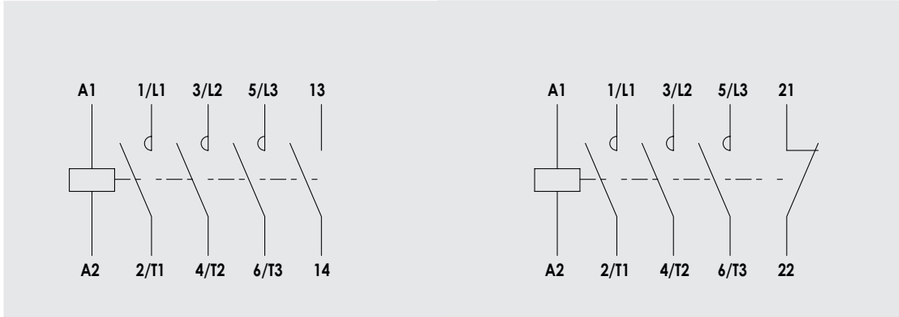
0.005kg

Note : All Dimensions are in mm

Circuit Diagram

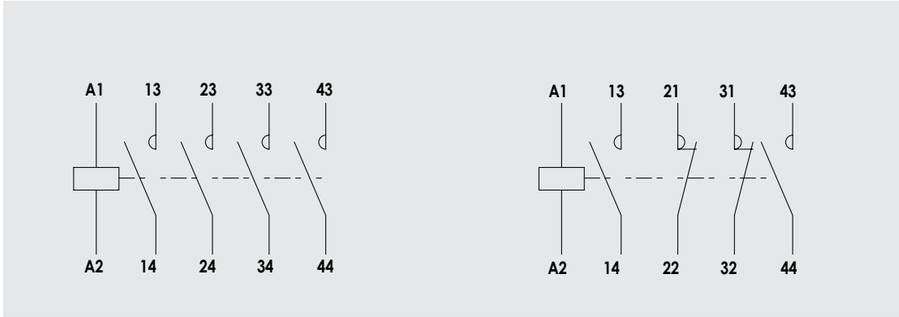
TC1-M6 ~ M16

TP1-M6 ~ M16



TCA2-M**

TCA3-M**



TC Contactors Profile

robusTa Contactors & Overload Relays

- Wide range of Power Contactors 9A to 800A and Control Relays in AC & DC control; Choice of 10 ratings in 3 Pole & 4 Pole versions
- Common add-on accessories - Front / Side Auxilliary Contact Block, Pneumatic Timer - ON/OFF delay & Star Delta, Latch Block, Mechanical Interlock
- Compatible overload relays from 0.1A to 1000A having built-in single phase protection and Auto-Manual reset facility
- Heavy duty application core balance CT operated overload relays; range 2.5A to 400A

Definite Purpose Contactors

- Range; 1, 2 & 3 Pole versions for 20A, 25A, 30A & 40A
- Application: Ventilation & HVAC: Heating elements, Power Supplies etc.
- Maximum operating altitude: 2000 meters above sea level
- Ambient Air Temp: - 40 degree to + 65 degree C
- Ambient air dampness around the device: 45 to 85% RH
- Coil apply voltage: 80% - 105% rate voltage

robusTa Capacitor Duty Contactors

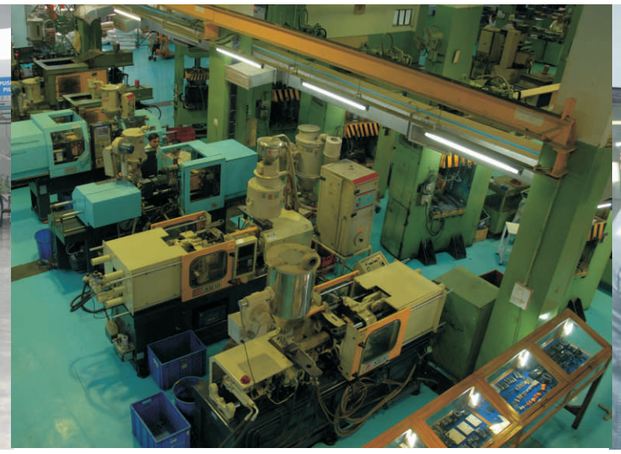
- Range from 10 kVAR to 60 kVAR
- Saves cost of expensive replacements
- High electrical life
- Reduced watt loss during 'ON' condition, saves energy
- Switching of Capacitor bank in parallel without de-rating

Mini Contactors

- Conforms to IEC60947-4-1; IS 13947-4-1
- 3P Power Contactor with 1 built in aux. contact 6A ~ 16A
- Control relays in #5 variants in AC & DC coil
- Common add-on accessories - Front/ Side Auxiliary Contact Block, Electronics Timer, Mechanical Interlock & Coil Suppressor
- Compatible overload relays, Auto/Manual reset, 0.1~16A with built-in single phase protection

D range Contactors

- Conforms to IEC 60947-4-1; IS 13947-4-1
- 3P Power Contactors range 9A ~ 80A & Control Relays
- Common add-on accessories - Front Auxiliary Contact Block, Pneumatic timer, Mechanical Interlock, Latch Block & Coil suppressor
- Compatible overload relays range 0.10A thru 66A with built-in single phase prote

2 Pole Contactors

- Compact & common frame size in four different AC3 Motor duty ratings
- Din-Rail mounting facility
- Snap fit top mounted Aux. contact: 2 NO, 2 NC, 1 NO + 1 NC
- Extra thick inter phase barrier assures long trouble free life
- Dual rated coil 220/240V AC operating range 160~260 Volts
- High 10,00,000 electrical life