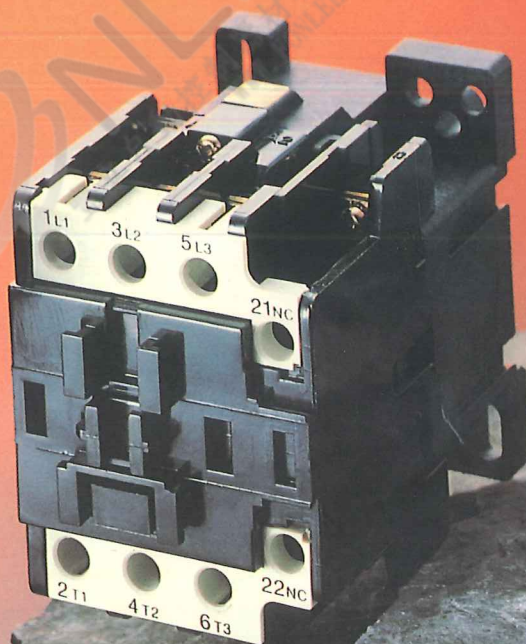


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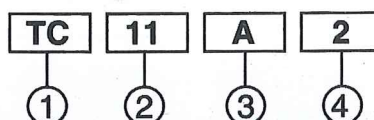
MAGNETIC SWITCHES

ISO 9001



tend CONTACTORS

MODEL DESIGNATION



Designation	Signal	Description
1.Type	TC TCR	Magnetic Contactor Reversing Contactor
2.Model	11 16 21 30 35 40 50 60 80	12A (Rated Capacity Based on AC3 3ph,220VAC) 16A 24A 30A 35A 44A 58A 68A 100A
3.Auxiliary Contacts	(none) A B	1a1b,2a2b(For TC50-80) 1a 1b

Designation	Signal	Description	
		50Hz	60Hz
4.Coil Voltage	1	100VAC	110VAC
	2	200VAC	220VAC
	3	346VAC	380VAC
	4	380-400VAC	440VAC
	5	110VAC	120VAC
	6	240VAC	260VAC
	7	24VAC	24VAC
	8	48VAC	48VAC
	9	415VAC	460VAC
	a	220VAC	240VAC
	b	500VAC	550VAC
	c	32VAC	32VAC

RATING AND CHARACTERISTICS

Type No.	Auxiliary Contacts		Rated Operating Current (AC1) Ith	IEC 60947 Rated Capacity (AC3)					Rated Insulation Voltage	Weight
				1 Phase		3 Phase				
				100V 120V	200V 220V	200V 220V	380V 440V	500V 550V		
	NO	NC	A	A kw hp	A kw hp	A kw hp	A kw hp	A kw hp	V	kg
TC11A	1	—	25	12 0.55 0.75	12 1.1 1.5	12 3 4	12 5.5 7.5	9 5.5 7.5	600	0.32
TC11B	—	1								
TCR11AB	1	1								0.66
TCR112A	2	—								
TCR112B	—	2								
TC16A	1	—	30	16 0.75 1	16 1.5 2	16 4 5.5	16 7.5 10	12 7.5 10	600	0.32
TC16B	—	1								
TCR16AB	1	1								0.66
TCR162A	2	—								
TCR162B	—	2								
TC21	1	1	40	24 1.1 1.5	24 2.2 3	24 5.5 7.5	24 11 15	18.4 11 15	600	0.39
TCR21	2	2								0.79
TC30	1	1	50	30 1.5 2	30 3 4	30 7.5 10	30 15 20	23 15 20	600	0.85
TCR30	2	2								1.72
TC35	1	1	50	35 1.8 2.5	35 4 5	35 9 12	35 15 20	28.5 18.5 25	600	0.85
TCR35	2	2								1.72
TC40	1	1	60	44 2.2 3	44 5.5 7.5	44 11 15	44 22 30	33 22 30	600	0.85
TCR40	2	2								1.72
TC50	2	2	80	58 3 4	58 5.5 7.5	58 15 20	52 30 40	41 30 40	600	1.21
TCR50	4	4								2.57
TC60	2	2	100	68 3.7 5	68 7.5 10	68 19 25	65 37 50	52 37 50	600	1.21
TCR60	4	4								2.57
TC80	2	2	130	—	—	100 25 35	90 50 70	72 50 70	600	1.43
TCR80	4	4								3.00

* Mechanical Service Life: 5,000,000 Operations.

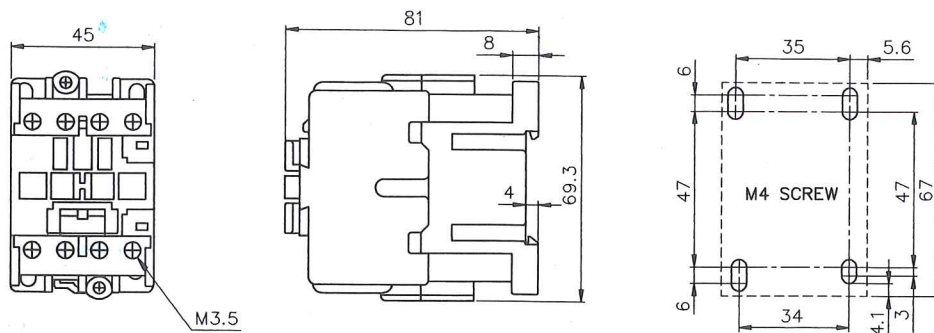
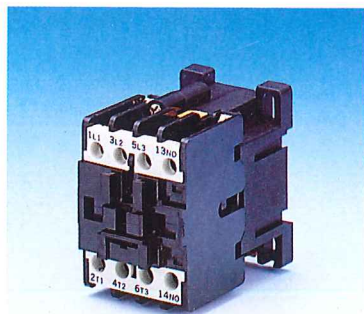
* For track mounting on DIN rail or panel mounting.

* Electrical Service Life: 1,000,000 Operations.

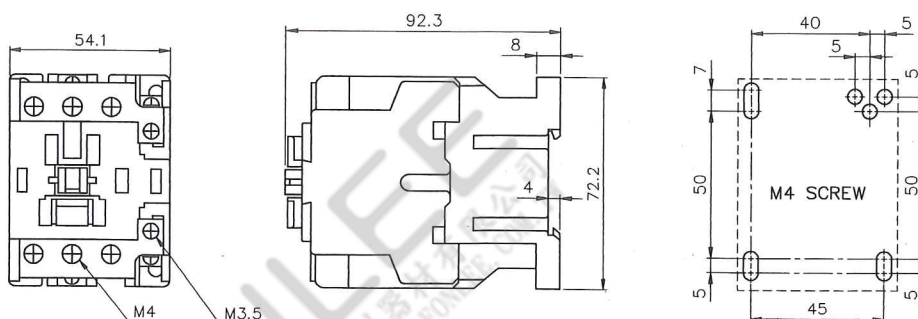
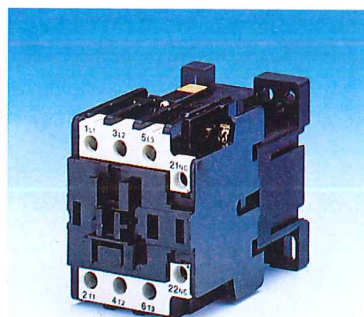
* UL Pending

■ DIMENSIONS

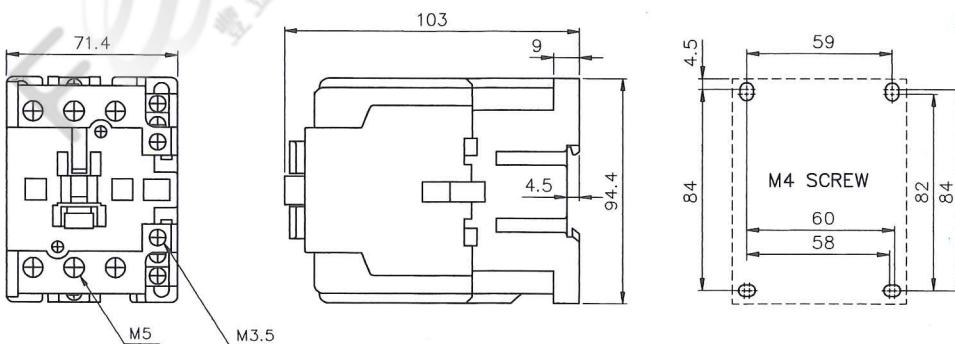
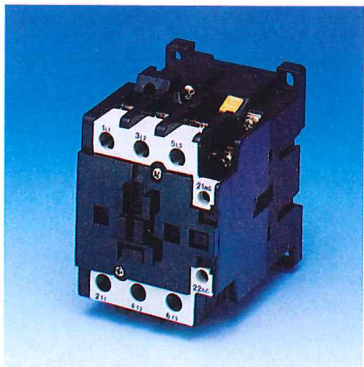
TC11/16



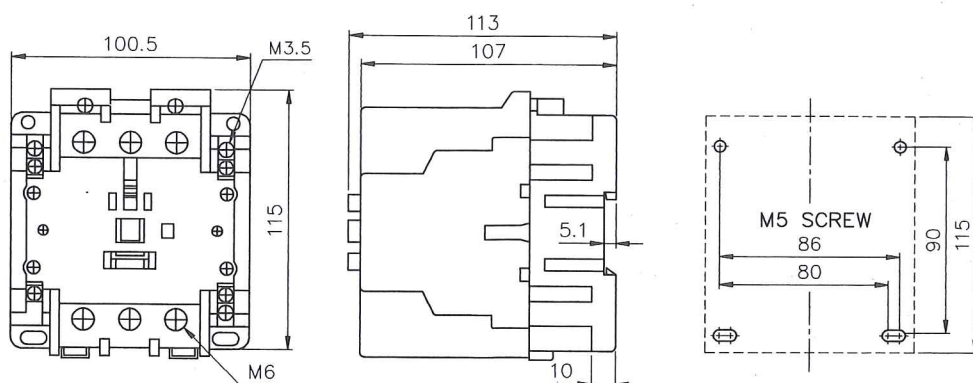
TC21



TC30/35/40

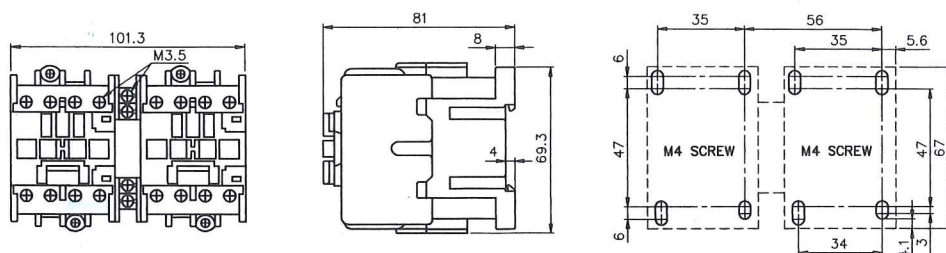
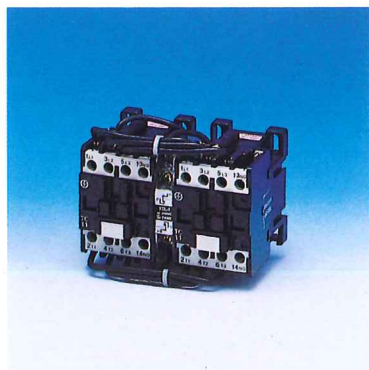


TC50/60/80

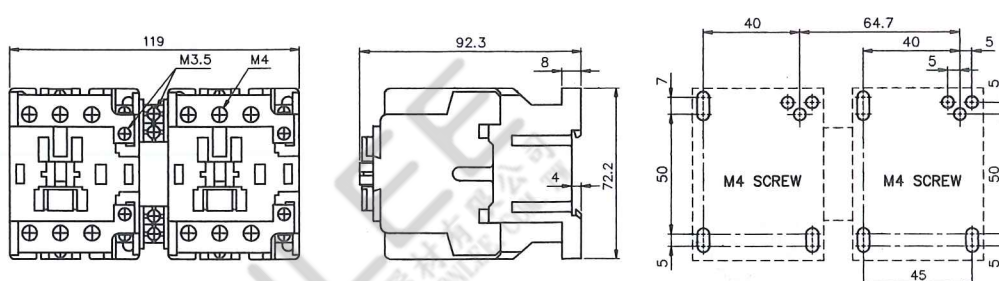
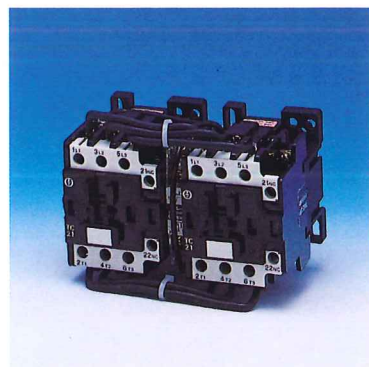


■ DIMENSIONS

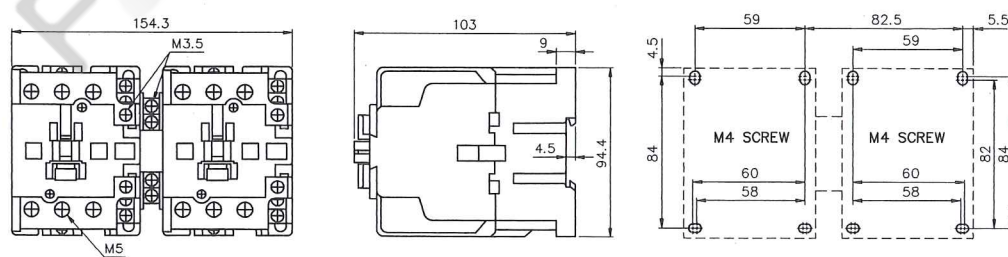
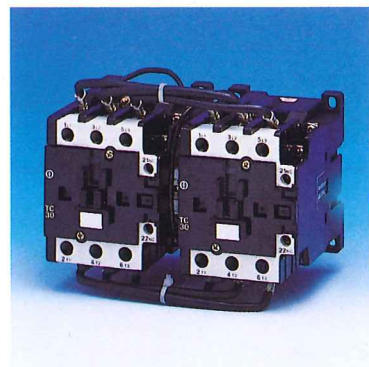
TCR11/16



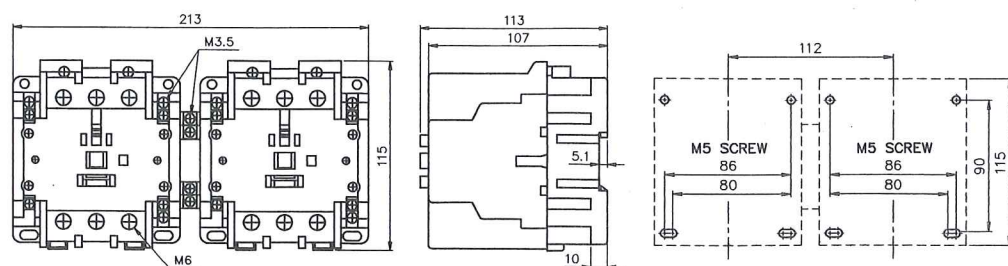
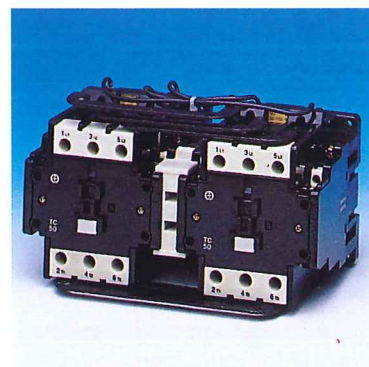
TCR21



TCR30/35/40

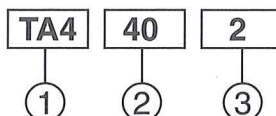


TCR50/60/80



tend CONTACTORS & CONTROL RELAYS

■ MODEL DESIGNATION



Designation	Signal	Description
1.Type	TA4	4P type Contactor for 4Hp
	TB4	4P type Contactor for 5Hp
	TR4	4P type Control relay
2.Contacts	40	4a
	31	3a1b
	22	2a2b

Designation	Signal	Description	
		50Hz	60Hz
3.Coil Voltage	1	100VAC	110VAC
	2	200VAC	220VAC
	3	346VAC	380VAC
	4	380-400VAC	440VAC
	5	110VAC	120VAC
	6	240VAC	260VAC
	7	24VAC	24VAC
	8	48VAC	48VAC
	9	415VAC	460VAC
	a	220VAC	240VAC
	b	500VAC	550VAC
	c	32VAC	32VAC

■ RATING AND CHARACTERISTICS (CONTACTORS)

Type No.	Contacts		Rated Operating Current (AC1) Ith	Rated Capacity(AC3)					Rated Insulation Voltage	Weight
				1 Phase		3 Phase				
				100V 120V	200V 220V	200V 220V	380V 440V	500V 550V		
	NO	NC	A	A kw hp	A kw hp	A kw hp	A kw hp	A kw hp	V	kg
TA440	4	—	25	12	12	12	12	9	600	0.32
TA431	3	1		0.55	1.1	3	5.5	5.5		
TA422	2	2		0.75	1.5	4	7.5	7.5		
TB440	4	—	30	16	16	16	16	12	600	0.32
TB431	3	1		0.75	1.5	4	7.5	7.5		
TB422	2	2		1	2	5.5	10	10		

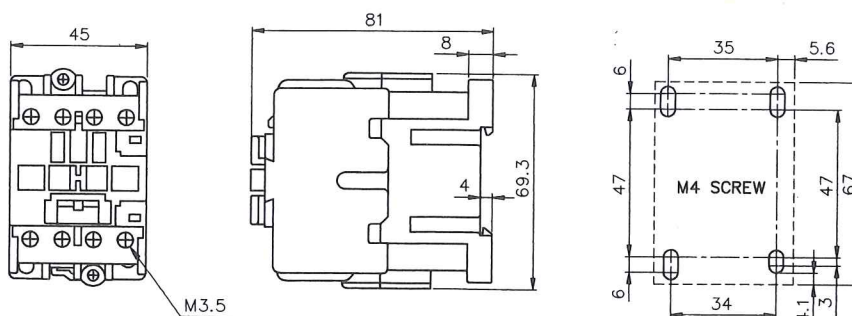
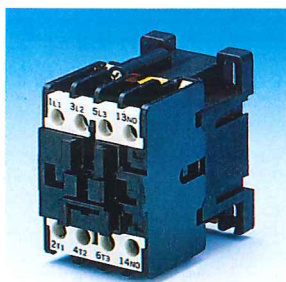
■ RATING AND CHARACTERISTICS (CONTROL RELAYS)

Type No.	Auxiliary Contacts		Rated Operating Current Ith	Rated Capacity(AC15)						Rated Operating Current Ith	Rated Capacity(DC13)					Rated Insulation Voltage	Weight
				120VAC	240VAC	380VAC	480VAC	500VAC	600VAC		125VDC	250VDC	400VDC	500VDC	600VDC		
	NO	NC	A	A	A	A	A	A	A	A	A	A	A	A	A	V	kg
* TR440	4	—	10	6	3	1.9	1.5	1.4	1.2	5	1.1	0.55	0.31	0.27	0.2	600	0.32
* TR431	3	1															
* TR422	2	2															

* : CE mark Pending

■ DIMENSIONS

TA4/TB4/TR4



■ USER'S INSTRUCTION

Attention :

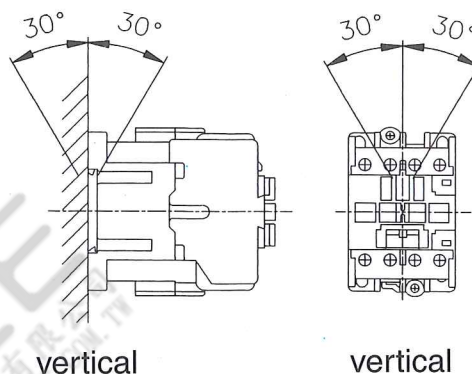
- Turn off power before carrying out any maintenance.
- Please handle carefully and avoid abnormal vibration and shock.
- The dust-proof lable on the side of frame must be tear off clearly, if side-mounted auxiliary contact block or mechanical interlock is used.
- To dismantle the magnetic contactors which is mounted by DIN 35mm rail, right "-" screw driver shall be applied and handled in running direction.
- A minimum clearance of 8mm and a minimum creepage distance of 12mm has to be ensured by the installation.

1. Service Environment:

- 1.1 Operational Temperature: $-20^{\circ}\text{C} \sim 50^{\circ}\text{C}$.
- 1.2 Storage Temperature: $-40^{\circ}\text{C} \sim 70^{\circ}\text{C}$
- 1.3 Relative Humidity: 45%~85%.
- 1.4 Altitude: below 2000m.

2. Installation and wiring:

- 2.1 Ensure that the specifications (Rated power, arrangement of auxiliary contact, rated coil voltage and frequency) meet the requirements.
- 2.2 Mounting positions shall be within the ranges specified below.
- 2.3 Select appropriate conductor and tighten with appropriate torque with right tool.
- 2.4 Tightening torques for contactors are given below:



Type	Item	Screw/blot	Tighting torque(kgf.cm)
TC11	Main Terminal	M3.5	8~12
TC16	Main Terminal	M3.5	8~12
TC21	Main Terminal	M4	12~20
TC30/35/40	Main Terminal	M5	20~25
TC50/60	Main Terminal	M6	35~40
All Series	Auxi contact & coil terminal	M3.5	8~12

Tightening torque shall be within the values given above to avoid deteriorating the screws.

3. Maintenance:

- 3.1 Turn off power before conducting any maintenance.
- 3.2 Disconnect the wires in sequence.
- 3.3 Dismantle contactor as required for maintenance.
- 3.4 Assemble and connect the contactor in reverse procedures conducted in steps 3.3 and 3.2.
- 3.5 Check the contactor in a good condition.

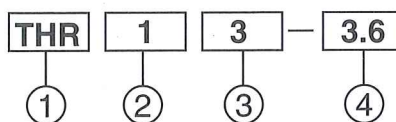
4. Replacement of the coil:

Follow the instructions if replacement of the coil is carried out.

- 4.1 Dismantle the contactor in appropriate means.
- 4.2 Replace the coil to requested coil.
- 4.3 Assemble the contactor in a reverse sequence conducted in step 4.1.
- 4.4 Check that the contactor can be operated normally.

tend THERMAL OVERLOAD RELAYS

■ MODEL DESIGNATION

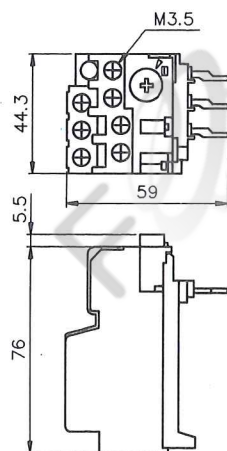
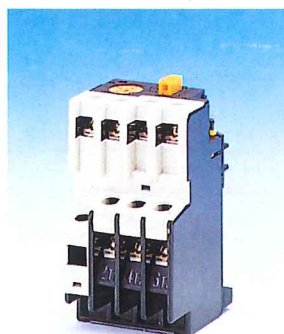


Designation	Signal	Description
1.Type	THR THP	Overload Protection Phase-Failure Protection
2.Contacts	1 2 3 4	for TC11&TC16 for TC21 for TC30/35&40 for TC50&TC60
3.Number of Heaters	2 3	2 Heater Elements 3 Heater Elements
4.Heater Setting Range(A)	0.12 0.2 0.3 0.44 0.6 0.8 1 1.2	0.1 — 0.12 — 0.15 0.16 — 0.2 — 0.24 0.24 — 0.3 — 0.36 0.36 — 0.44 — 0.54 0.48 — 0.6 — 0.72 0.64 — 0.8 — 0.96 0.8 — 1 — 1.2 0.95 — 1.2 — 1.45

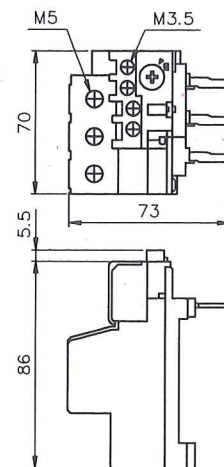
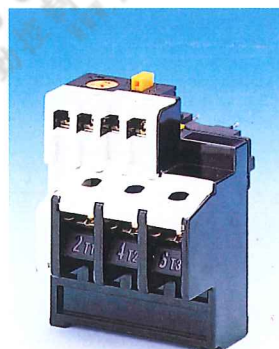
Designation	Signal	Description
	1.8 2.1 2.8 3.6 5 6.5 7.5	1.4 — 1.8 — 2.2 1.7 — 2.1 — 2.6 2.2 — 2.8 — 3.4 2.8 — 3.6 — 4.2 4 — 5 — 6 5 — 6.5 — 8 6 — 7.5 — 9
4.Heater Setting Range(A)	9 11 15 19 23 28 33 40 54 67	7 — 9 — 11 9 — 11 — 13 12 — 15 — 18 16 — 19 — 22 20 — 23 — 26 22 — 28 — 34 28 — 33 — 38 32 — 40 — 48 43 — 54 — 65 54 — 67 — 80

* Range: (THR1: 0.1A-18A, THR2: 1.4A-26A THR3: 7A-48A, THR4: 16A-80A)

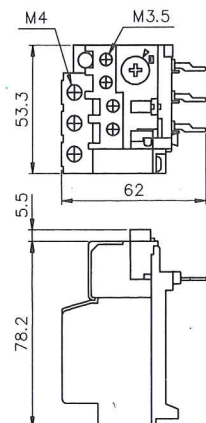
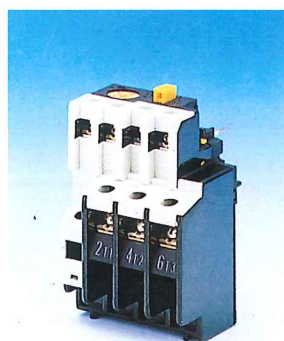
THR1/THP1



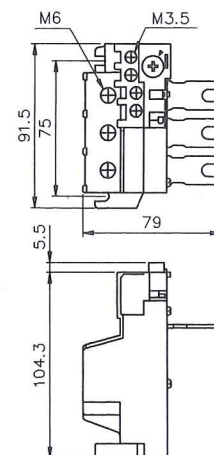
THR3/THP3



THR2/THP2



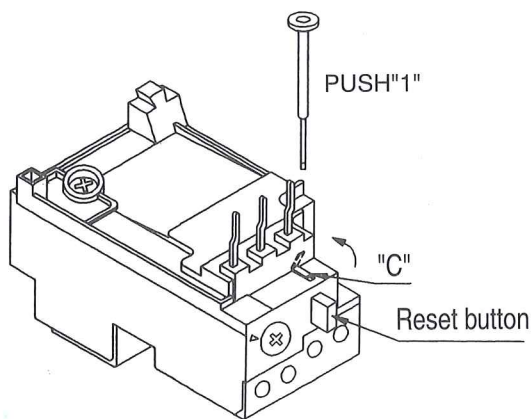
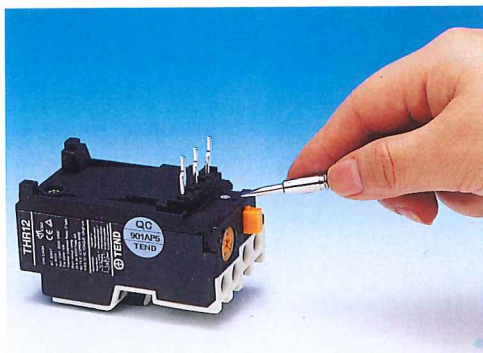
THR4/THP4



* CE mark Pending

tend THERMAL OVERLOAD RELAYS

THR(THP)

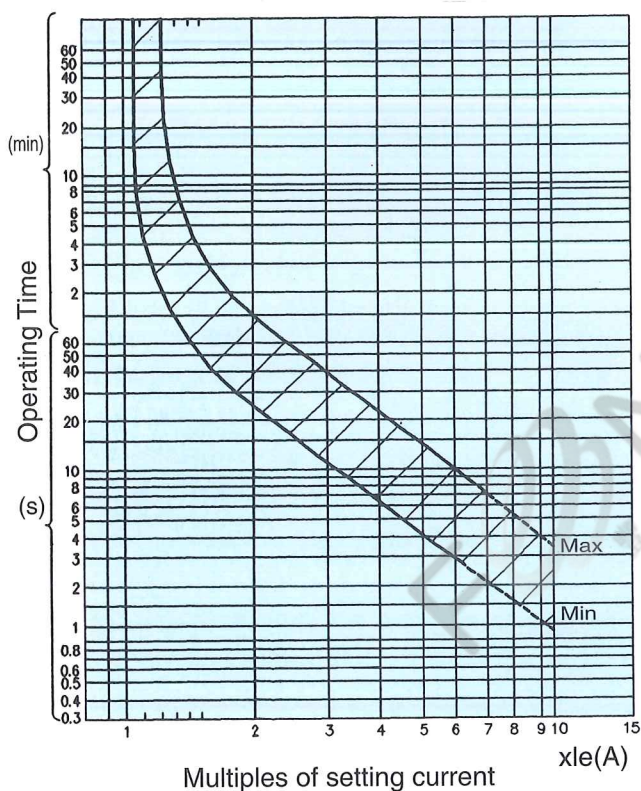


Manual Reset :
Press reset button
to reset the Thermal
Overload Relay

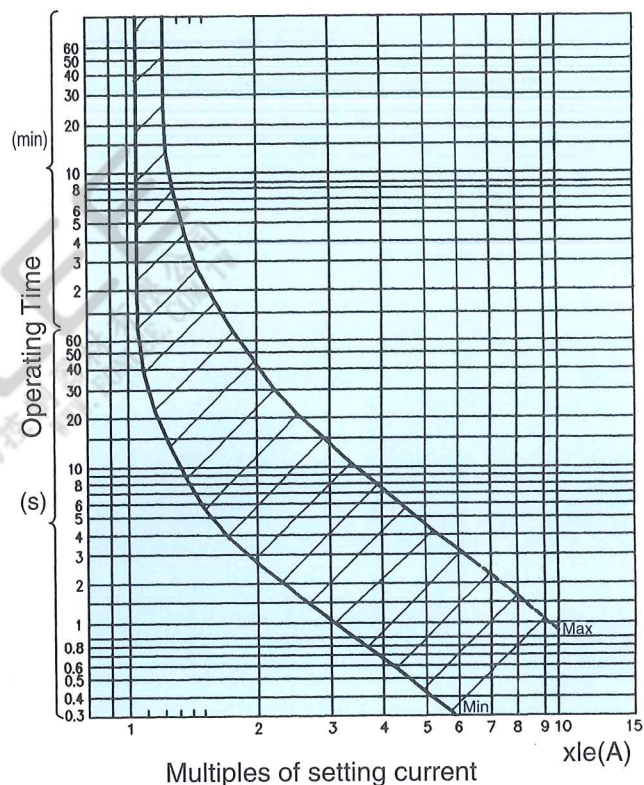
Auto Reset :
Take off "C"
Then press reset button
and push "1" (flat screw
driver) to lock the button
to become autoreset.

Operating Characteristics of Thermal Overload Relays

Cold State Curves



Hot State Curves



Star-Delta Starter Selection Table

Type		Y-TC21	Y-TC35	Y-TC50	Y-TC60
Motor Output KW(HP)	200-220V	11(15)	19(25)	22(30)	30(40)
	380V	19(25)	30(40)	45(60)	55(75)
	440V	19(25)	30(40)	45(60)	55(75)
Contactor Used	MC _M	TC21	TC35	TC50	TC60
	MC _D	TC21	TC35	TC50	TC60
	MC _S	TC11	TC16	TC21	TC21

tend MAGNETIC SWITCHES

■ MODEL DESIGNATION

TMS	11	A	2	2	3.6
①	②	③	④	⑤	⑥

Designation	Signal	Description
1.Type	TMS	Open Type
	TMR	Reversing Type
	TES	Enclosed Type
	TEB	Enclosed with pushbutton
	TEL	Enclosed with indicator
	TEW	Enclosed with rainproof (IEC144 IP65)
2.Model	11	12A (Rated Capacity
	16	16A Based on AC3
	21	24A 3ph, 220VAC)
	30	30A
	35	35A
	40	44A
	50	58A
	60	68A
3.Auxiliary Contacts	(none)	1a1b,2a2b(For TMS50,60)
	A	1a
	B	1b

Designation	Signal	Description	
		50Hz	60Hz
4.Coil Voltage	1	100VAC	110VAC
	2	200VAC	220VAC
	3	346VAC	380VAC
	4	380-400VAC	440VAC
	5	110VAC	120VAC
	6	240VAC	260VAC
	7	24VAC	24VAC
	8	48VAC	48VAC
	9	415VAC	460VAC
	a	220VAC	240VAC
	b	500VAC	550VAC
	c	32VAC	32VAC
5.Number of Heaters	2	2 Heaters	
	3	3 Heaters	
	P	Phase-Failure(3 Heaters)	
6.Heater Setting Range	See Page 6		

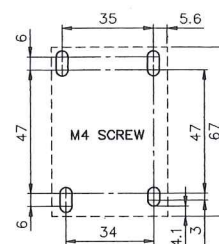
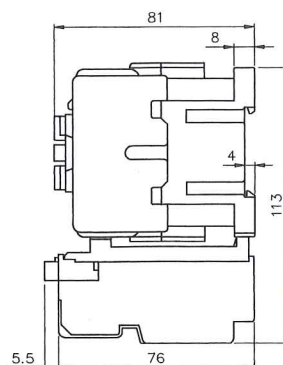
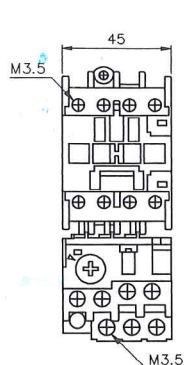
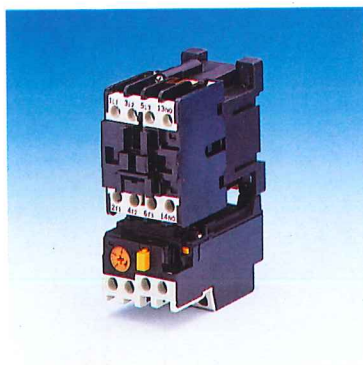
■ RATING AND CHARACTERISTICS

Type No.	Auxiliary Contacts		Rated Operating Current (AC1) Ith	ICE 60947 Rated Capacity (AC3)					Rated Insulation Voltage	Weight
				1 Phase		3 Phase				
				100V 120V	200V 220V	200V 220V	380V 440V	500V 550V		
	NO	NC	A	A kw hp	A kw hp	A kw hp	A kw hp	A kw hp	V	kg
TMS11A	1	—	25	12 0.55 0.75	12 1.1 1.5	12 3 4	12 5.5 7.5	9 5.5 7.5	600	0.43
TMS11B	—	1								
TMR11AB	1	1								0.88
TMR112A	2	—								
TMR112B	—	2								
TMS16A	1	—	30	16 0.75 1	16 1.5 2	16 4 5.5	16 7.5 10	12 7.5 10	600	0.43
TMS16B	—	1								
TMR16AB	1	1								0.88
TMR162A	2	—								
TMR162B	—	2								
TMS21	1	1	40	24 1.1 1.5	24 2.2 3	24 5.5 7.5	24 11 15	18.4 11 15	600	0.51
TMR21	2	2								1.04
TMS30	1	1	50	30 1.5 2	30 3 4	30 7.5 10	30 15 20	23 15 20	600	1.03
TMR30	2	2								2.08
TMS35	1	1	50	35 1.8 2.5	35 4 5	35 9 12	35 15 20	28.5 18.5 25	600	1.03
TMR35	2	2								2.08
TMS40	1	1	60	44 2.2 3	44 5.5 7.5	44 11 15	44 22 30	33 22 30	600	1.03
TMR40	2	2								2.08
TMS50	2	2	80	58 3 4	58 5.5 7.5	58 15 20	52 30 40	41 30 40	600	1.55
TMR50	4	4								2.76
TMS60	2	2	100	68 3.7 5	68 7.5 10	68 19 25	65 37 50	52 37 50	600	1.55
TMR60	4	4								2.76

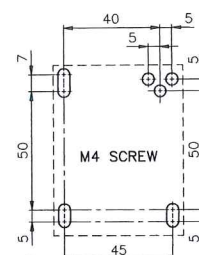
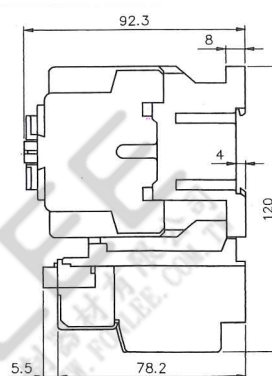
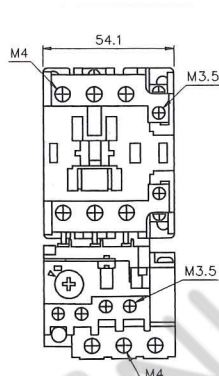
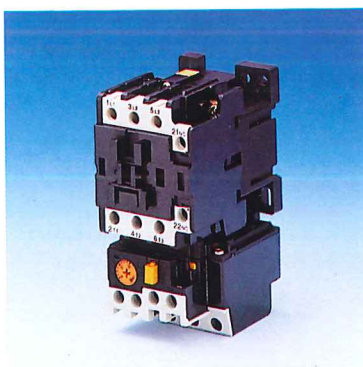
tend MAGNETIC SWITCHES

■ DIMENSIONS

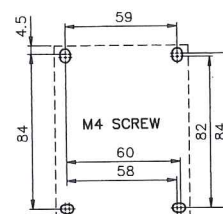
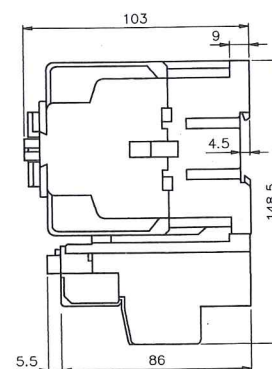
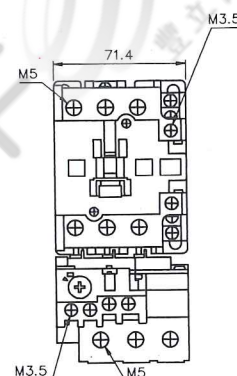
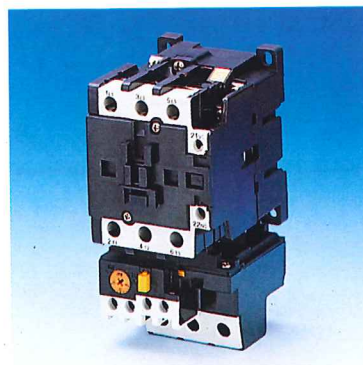
TMS11/16



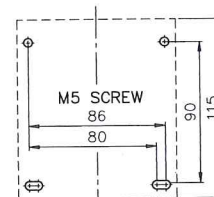
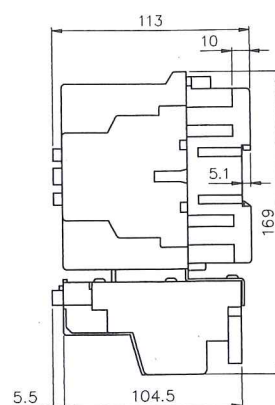
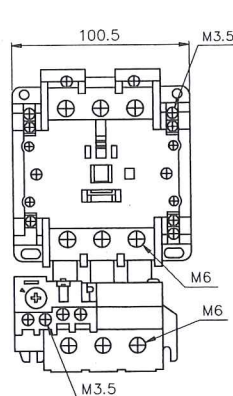
TMS21



TMS30/35/40



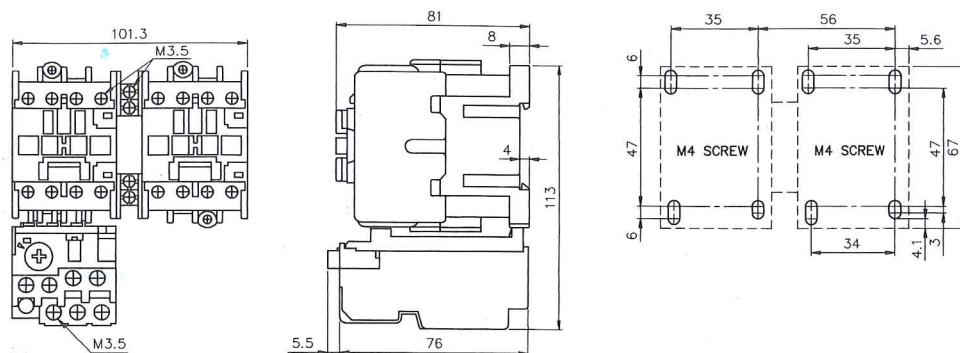
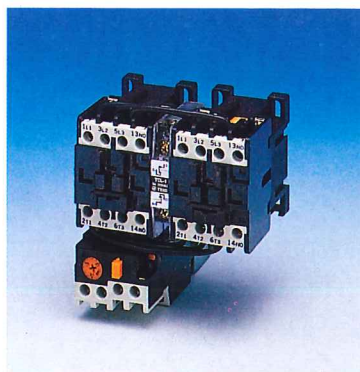
TMS50/60



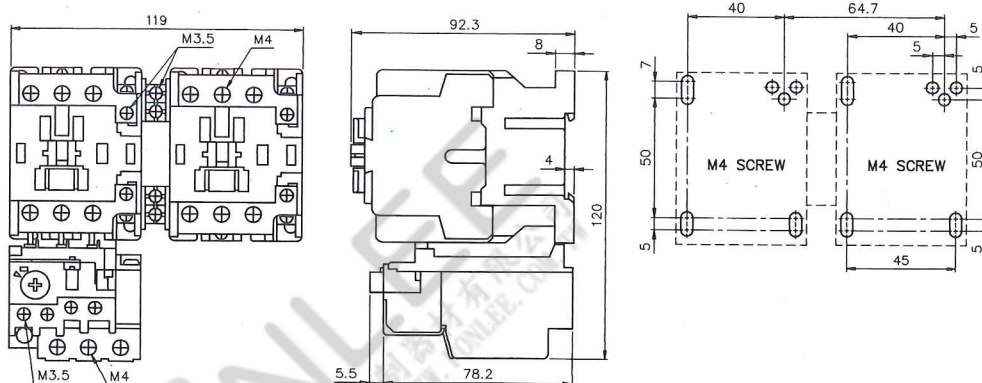
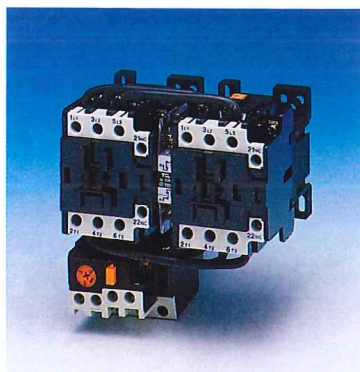
tend MAGNETIC SWITCHES

■ DIMENSIONS

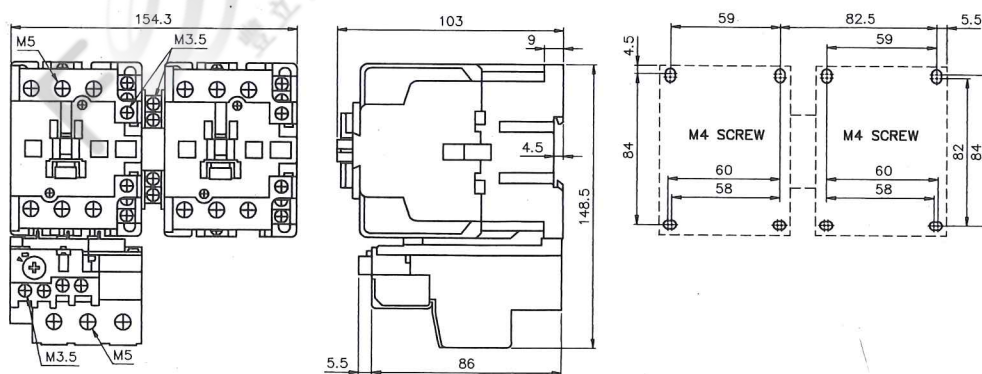
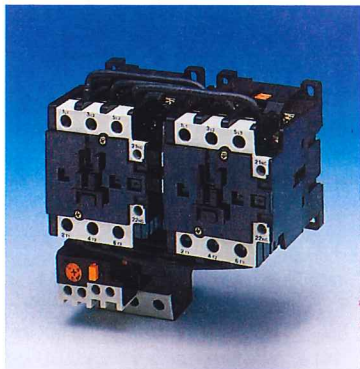
TMR11/16



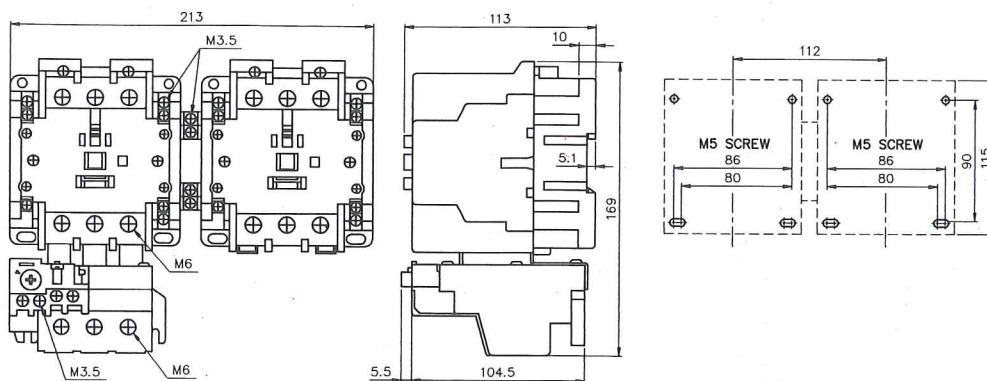
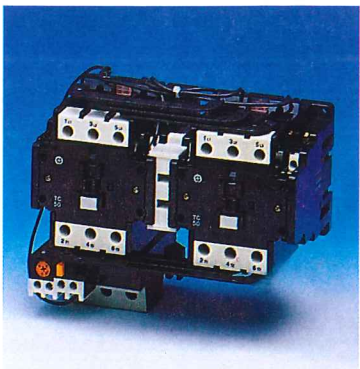
TMR21



TMR30/35/40



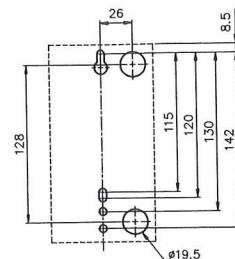
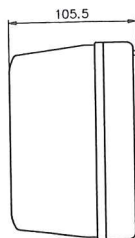
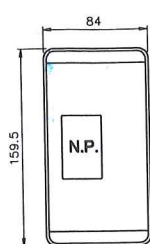
TMR50/60



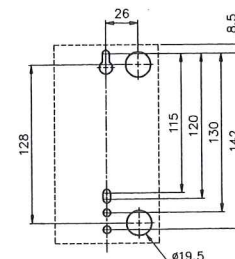
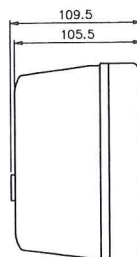
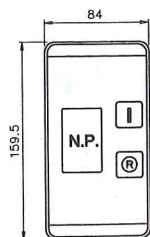
tend MAGNETIC SWITCHES

■ DIMENSIONS

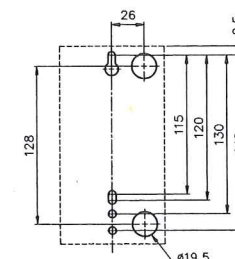
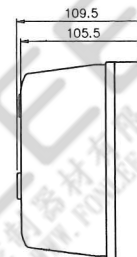
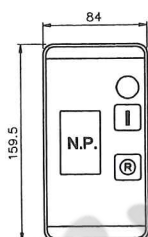
TES11/16



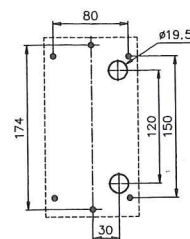
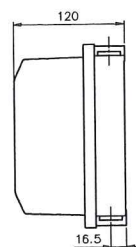
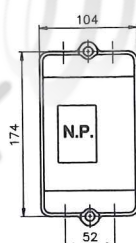
TEB11/16



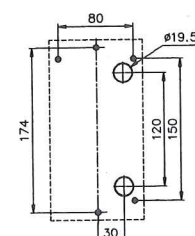
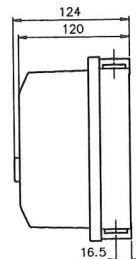
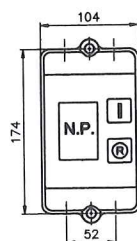
TEL11/16



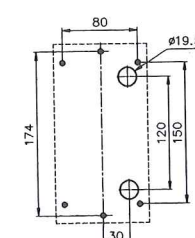
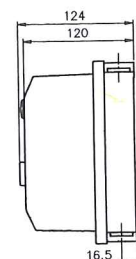
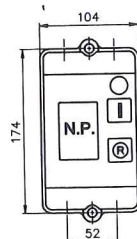
TES21



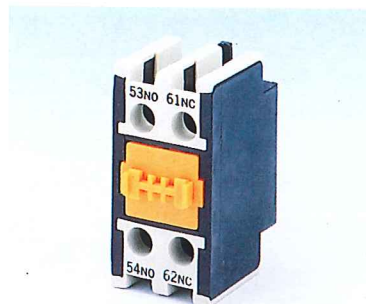
TEB21



TEW11/16/21 TEL21

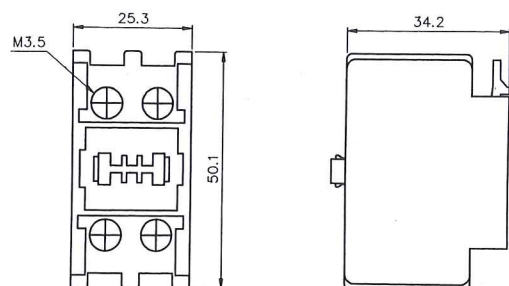


Auxiliary Contact Blocks(Front Mounted)

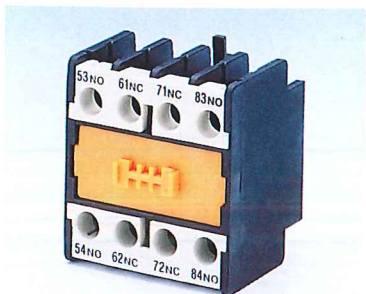


Type NO.	NO	NC
TCF-211	1	1
TCF-220	2	—
TCF-202	—	2

Suitable For:TC11-TC80

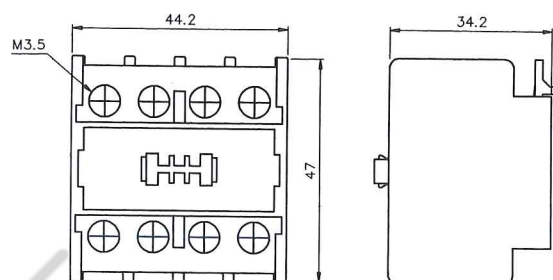


Auxiliary Contact Blocks(Front Mounted)

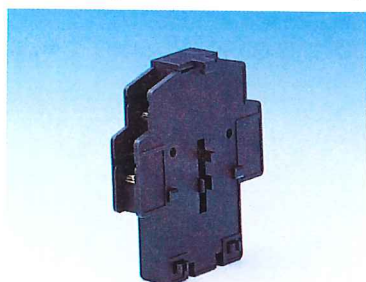


Type NO.	NO	NC
TCF-440	4	—
TCF-431	3	1
TCF-422	2	2
TCF-413	1	3
TCF-404	—	4

Suitable For:TC11-TC80

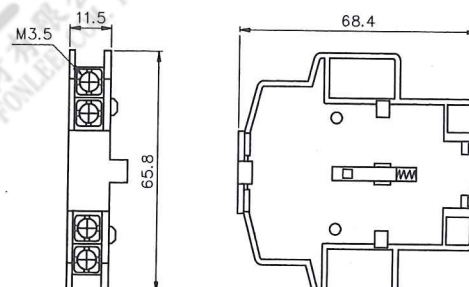


Auxiliary Contact Blocks(Side Mounted)

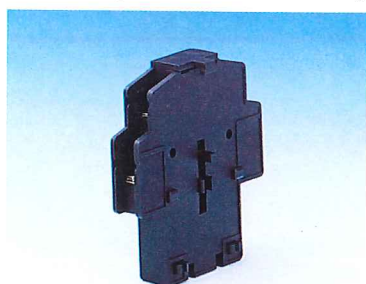


Type NO.	NO	NC
TCS-111	1	1
TCS-120	2	—
TCS-102	—	2

Suitable For:TC11-TC16

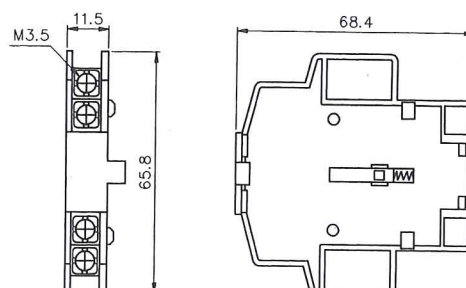


Auxiliary Contact Blocks(Side Mounted)



Type NO.	NO	NC
TCS-211	1	1
TCS-220	2	—
TCS-202	—	2

Suitable For:TC21

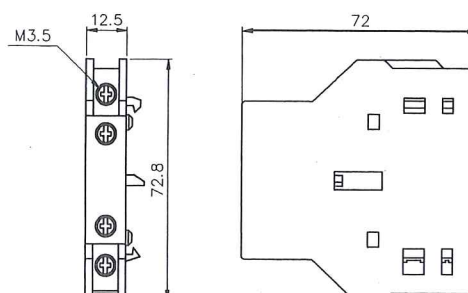


Auxiliary Contact Blocks(Side Mounted)



Type NO.	NO	NC
TCS-311	1	1
TCS-320	2	—
TCS-302	—	2

Suitable For:TC30-TC80

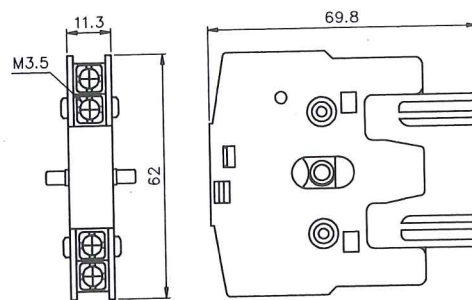


tend ACCESSORIES

Mechanical Interlock



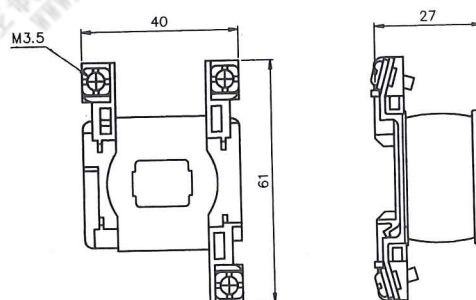
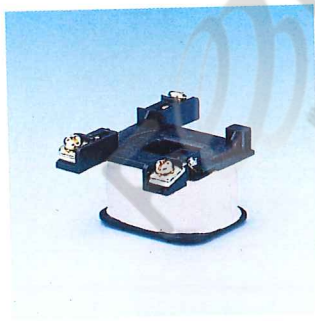
Type No.	NO	NC	Suitable For
*TCL-1	—	2	TC11 - TC21
TCL-1N	—	—	TC11 - TC21
*TCL-3	—	2	TC30 - TC40
TCL-3N	—	—	TC30 - TC40
*TCL-4	—	2	TC50 - TC80
TCL-4N	—	—	TC50 - TC80



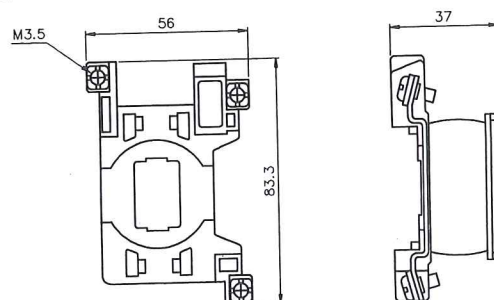
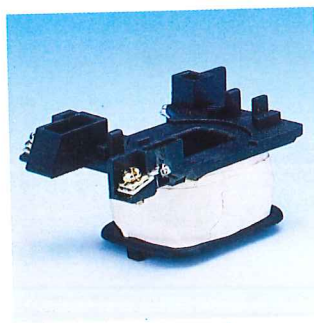
* :with electrical interlock

Type No.	Rated Operating Current Ith	Rated Capacity(AC15)						Rated Operating Current Ith	Rated Capacity(DC13)					Rated Insulation Voltage	Weight
		120VAC	240VAC	380VAC	480VAC	500VAC	600VAC		125VAC	250VAC	400VAC	500VAC	600VAC		
	A	A	A	A	A	A	A	A	A	A	A	A	A	V	kg
TCF-2	10	6	3	1.9	1.5	1.4	1.2	5	1.1	0.55	0.31	0.27	0.2	600	0.034
TCF-4															0.054
TCS-1(2)															0.034
TCS-3															0.040
TCL															0.036

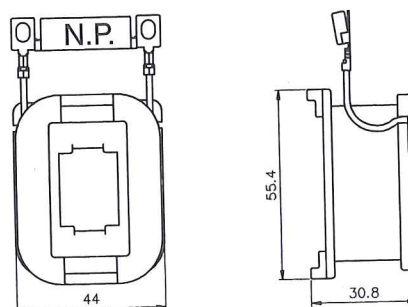
Spare Coil:TCC-11 Suitable For: TC11-21



Spare Coil:TCC-30 Suitable For: TC30-40

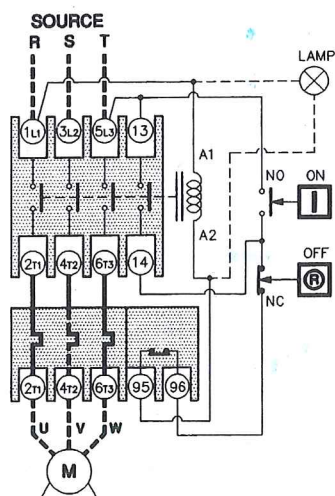


Spare Coil:TCC-50 Suitable For: TC50-80

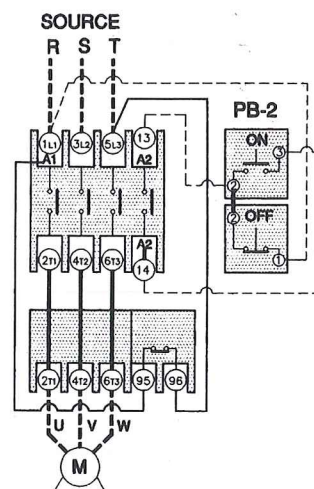


■ CONNECTION DIAGRAMS

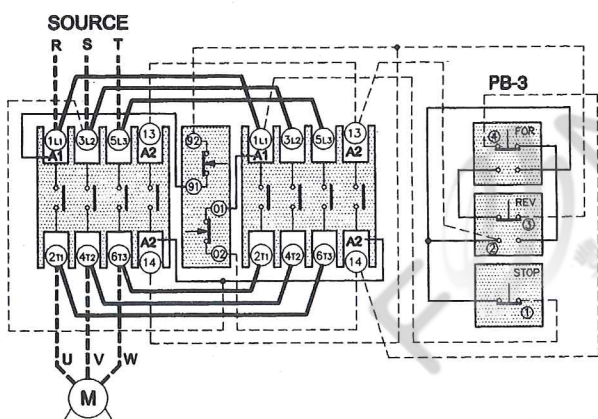
TEB11/16/21
TEL11/16/21
TEW11/16/21



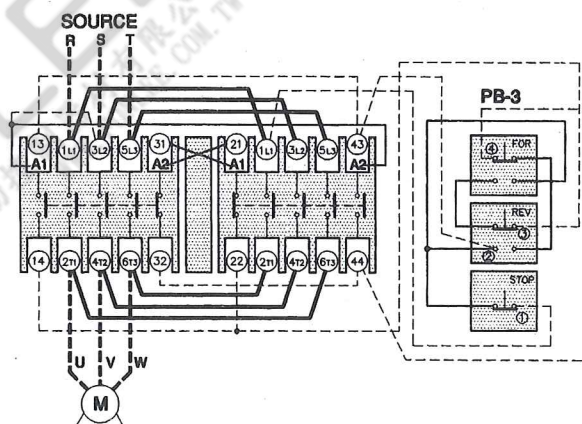
TMS11/16/21
TMS30/35/40
TMS50/60/80
TES11/16/21



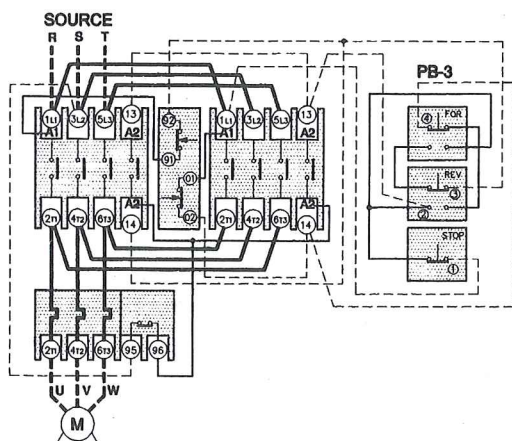
TCR11/16/21, TCR30/35/40



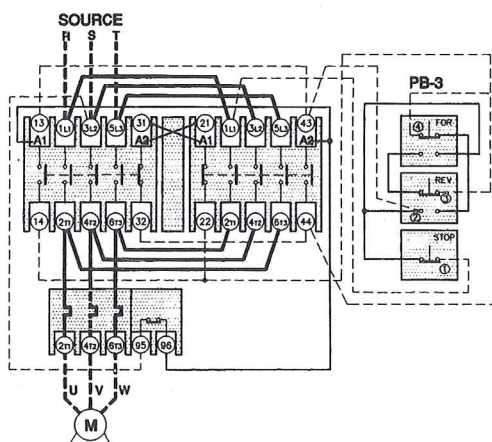
TCR50/60/80



TMR11/16/21, TMR30/35/40

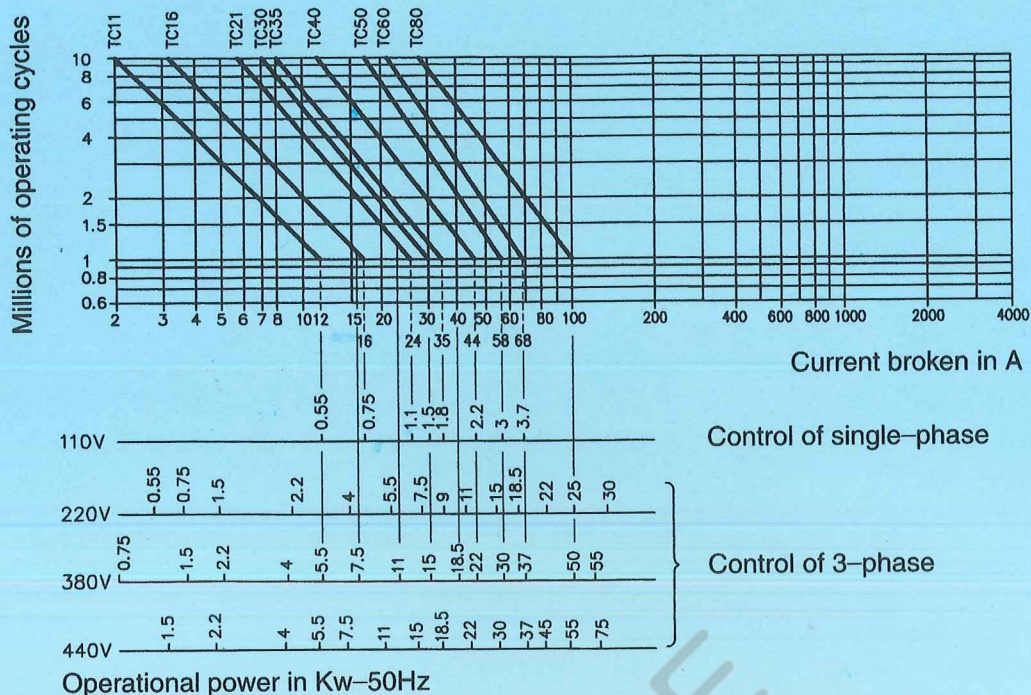


TMR50/60/80

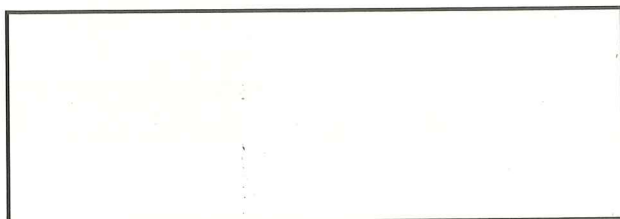
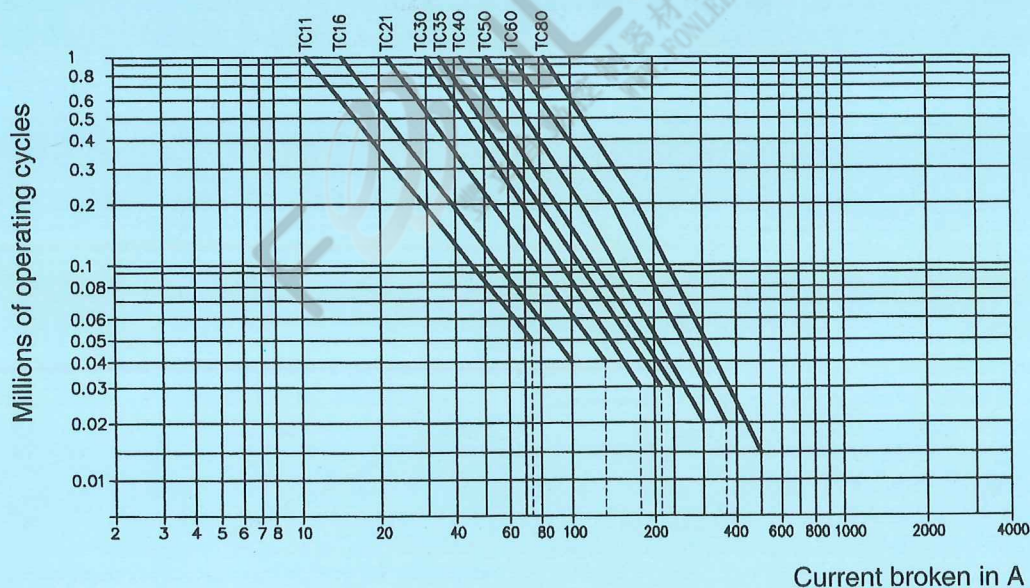


tend CONTACTOR SELECTION GUIDE

Ues in category AC-3($U_e \leq 440V$)



Ues in category AC-4($U_e \leq 440V$)



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