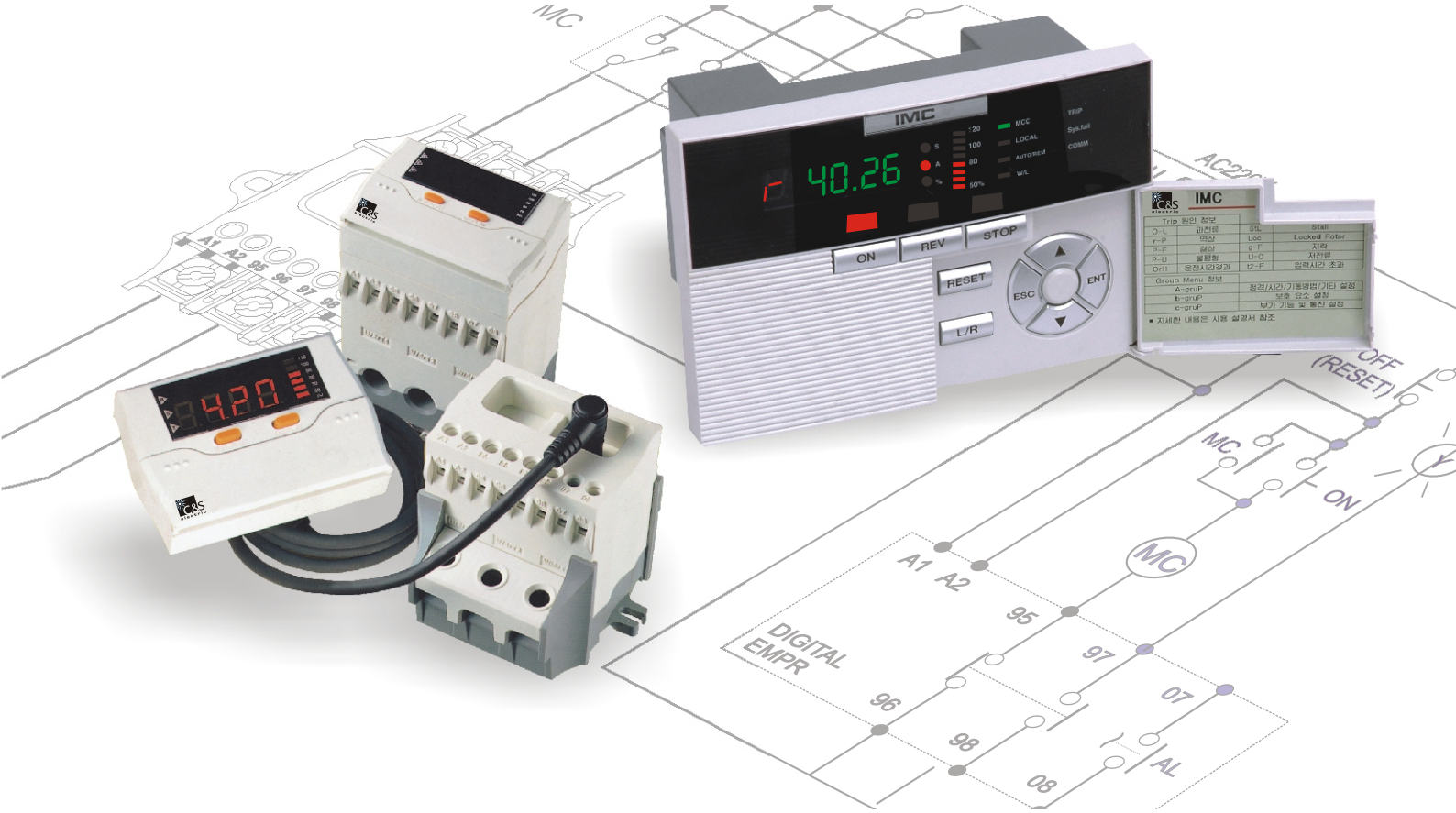


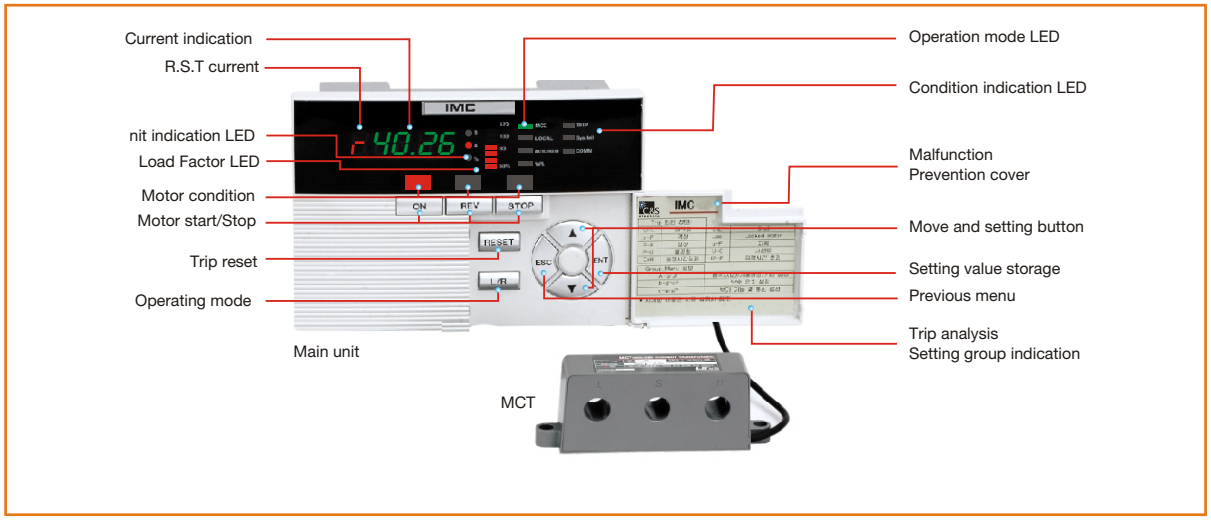
Electronic Motor Protection Relays

C&S electric

Intelligent Motor Controller (with communication)

Features

- Over load, Under load, Reverse phase, Phase loss, Locked rotor, Unbalance, E/F protection function
- Current range 0.125A~60A within one device
- Different functions selectable within one device, e.g Direct starter, Reversing starter, Y-D starter, Reactor / Inverter starter
- MCC, Local, Auto, Water level, Remote control
- Instantaneous under voltage compensation, Auto re-starter function
- Fault analysis, Fault value storing(Fault recording)
- Total operating time recording, Setting function
- Modbus, RS-485 / RS - 422 port



Motor Protection

		Operating condition	Time	Remark
Over current	Inverse	Over 110% setting current	1~60S	600% standard operating time
	Definite time	Over 105% setting current	1~60S	Delay time 1~200S
Phase loss		Over 70% current phase unbalance	Within 1.5S	
Unbalance		Current phase unbalance 30~50%	Within 5S	
Reversal phase		Reverse the current phase	Within 0.1s	Over 110% minimum ratings
Under current		Rating current 30~70%	Within 3s	
Holding	Stall	Rating current 150%~300%	Within 5s	Detection after over current setting time
	Lock	Rating current 200%~700%	Within 0.5s	
Earth fault		The current rating 0.1~2.5A setting	0.05s~1.0s	Ground fault delay operation
Pre-alarm		Over 120% setting value		Bar-LED blinking

Indications

Fault analysis indication

Indication	Description	Setting Value
O-L	Over current trip	Check Rating current and time
U-C	Under current trip	Check rating current
P-F	Phase loss trip	Check wiring / contactor
P-U	Unbalance trip	Check Wiring/contactor/motor coil
Loc	Rotor locked trip	Check Rating current / time / motor inside
StL	Stall trip	Check motor axis
r-P	Phase reversal trip	Check wiring
g-F	Earth fault trip	Check Wiring and earth fault
T2-F	No input within time setting	Check wiring and time
OrH	Reaching the operation setting time	

Self supervision

Indication	Description
Err1	Output contact OFF, Mc condition input contact ON
Err2	Output contact ON, MC condition input contact OFF
Err3	Simultaneous Input 'FOR' input and 'REV' input
Err4	EEPROM

1. IMC-III does not indicate current value on the Phase reversal trip.
2. Ground current is indicated mA on the earth fault trip.

Operation and setting

1. Total operation and operation time check
   - Total operation time ; Working -> Hour, minute
   - Operation time ; Operation time-> working->Hour, minute
   - After reaching the setting operation time, “OrH” is indicated.
   - In nor mode, Alarm contact (20-21 terminal) is going out.
2. Auto returning function is applied to only over current trip.
3. When the contactor check function is OFF, you are not able to check contactor,.
4. On/OFF timer is able to do a t-d / F-S choice setting.
5. 12,13 menu are indicated in only Modus bus communication mode.
6. I/O information is like below
   - First, second 7-segment is DI information and is like below ;
7. Setting mode operation
8. Setting mode
   - If you push the UP/DOWN button, you can find 3 groups.
   - After indicating group you want, ENT button goes to the next group.
   - In the next group, if you push the ENT button, you can find setting contents.
   - After showing the contents you want, ENT button goes to the appropriate contents.
9. Setting value storing
   - If you push the UP/DOWN button, you can find 3 groups.
   - After indicating group you want, ENT button goes to the next group.
   - In the next group, if you push the ENT button, you can find setting contents.
   - After showing the contents you want, ENT button goes to the appropriate contents.
   - As you push the UP/DOWN button, the setting value is changed.
   - After changing the setting value, if you push the ENT button, setting values are stored.
10. Changing to Normal operating mode

    After changing the setting contents, If you enter the ENT button, it will be returned normal operating mode.
11. Setting value searching
    - If you push the UP/DOWN button, you can find 3 groups.
    - After indicating group you want, ENT button goes to the next group.
    - In the next group, if you push the ENT button, you can find setting contents.
    - After showing the contents you want, ENT button goes to the appropriate contents.
12. Operation mode choice function

Note:

1. Notice that changing setting is possible only during motor operation.
2. If you will not operate for a while (10s), HMI will come back current measurement mode.

Operation priority ranking ; LOCAL > MCC > Auto, W/L > Remote

1) Local – Local operation mode (LOP ; Local Operation Panel)
Local operation mode is maximum priority mode, it is possible to control motor at emergency situation in local site. You are able to close only in Local site, IMC-III blinks local LED at that time. In this time, you can operate on the another mode. If you are not able to operate by IMC-III, check the switch is closed to LOP.

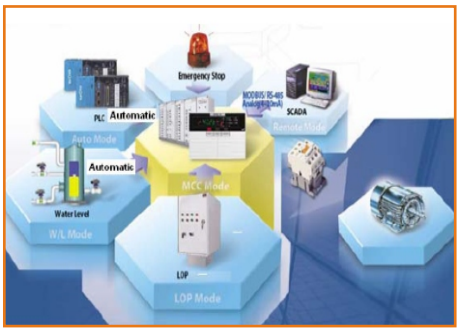
2) MCC – MCC operation mode (Motor Control Center) You are able to control by IMC-III of MCC panel. When the MCC LED blinks by handling L/R button, it is possible to control motor by IMC-III.

3) Auto , W/L – PLC auto operation mode IMC-III is able to be auto operation and remote control. When the Auto/Remote, W/L LED blinks by handling L/R button, it is possible to control motor by IMC-III. By operation priority, it is possible to control in MCC and IMC-III motor operation mode is changed to MCC.

4) Remote – Communication operation mode IMC-III has function of remote monitoring control by Data communication. When the Auto/Remote LED blinks by handling L/R button, it is possible to do a remote control and monitoring by RS485, RS422. By operation priority, it is possible to control in MCC and IMC-III motor operation mode is changed to MCC.

A-Group Operation and setting

Menu	contents	Setting value	Basic values
1. CHR	Operating characteristic (Inverse/Definite time)	Ind/dEF	Inu
2. O-t	Operating time	1~60/1(S)	60
3. d-t	Operating delay time (Definite time; dEF)	1~200/1(s)	200 (In case of Inu, do not indicate)
4. r-C	Rating current setting	0.5~6/0.1A 5~60/1(A)	6/60
5. Ctr	CT ratio setting	0.25, 0.5, 1~200/1 Dir/y-d/	1 Dir
6. dru	Operating mode	F-r/Ind/Iut	
7. d-t	Y operating time	1~120/1(s)	Reactor operating time
8. ydt	Y-D changing time	0.05, 0.1, 0.2(s)	-
9. s-t	Under voltage compensation time	OFF, 1~10/1(s)	OFF
10 .sd	Re-start time	0~300/1(s)	



1. Inu ; Inverse characteristic, dEF ; Definite time characteristic
2. No 4 menu is changed to 0.5~6A or 5 ~ 60A by rating type setting SLIDE S/W setting
3. dir ; Direction start, y-d ; y-delta start , F-r ; Forward/reverse start, Ind ; Inductor start , Iut ; Inverter start
4. You are not able to do a setting No.5 menu in case of 60A type.
5. No10 menu does not indicate in case of No.9 function is OFF.

B-Group

Menu	Contents	Setting value	Basic values
1.Loc	Lock protection	OFF, 200~700/100(%)	OFF
2. StL	Stall protection	OFF, 150,200,300	OFF
3. P-F	Phase Loss protection	OFF/ON	ON
4.P-U	Unbalance Protection	OFF, 30,40,50%	OFF
5.r-P	Phase reversal protection	OFF/ON	OFF
6.U-C	Under current protection	OFF, 30 ~ 70 / 5(%)	OFF
7.g-F	Earth fault protection	OFF/ON	OFF
8.g-C	Earth fault operating current	0.1,0.2,0.5,1.0,1.5,2.0,2.5(A)	0.1
9.g-t	Earth fault operating time	0.05,0.1 ~ 1.0 / 0.1(s)	0.05
10.gd	Earth fault delay	OFF/ON	OFF

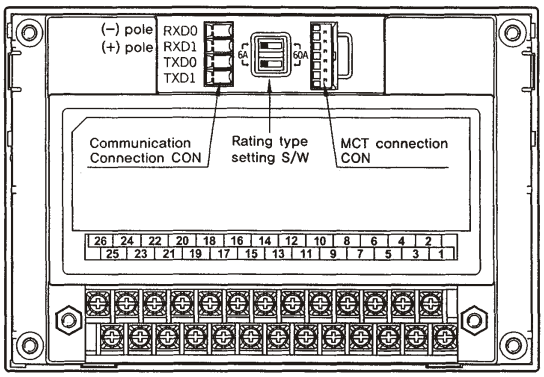
1. When the INVERTER operates, turn off the earth fault function
2. Phase reversal protection operates only in a starting time.

C-Group

Menu	Contents	Setting value	Basic values
1. I-O	Input/Output information	4 SEG indication	Time check, setting disabled
2. trt	Total operating time	Check total operating time	Time check, setting disabled
3. r-t	Operating time	Check operating time	
4. srt	Operating time setting	OFF, 10~8760/10(H)	-
5.Cch	Contactor check	OFF/ON	ON
6.n-F	User contact point	Nor /t-d /F-S	nor
7.tOn	ON DELAY TIMER	0~300/1(s)	
8.tOF	OFF DELAY TIMER	0~300/1(s)	
9.t-c	Compare timer	0~300/1(s)	
10.Ar	Auto - return	OFF, 1~20/1(M)	OFF
11.Ad	Communication address	1~255	1
12.bS	Communication address	96, 192,384	96
13.SP	SWAP	ON/OFF	ON

Sequence Function

			Contents	Remarks
Operating type	Direct operation		Non-reversible direct operation	
	Y-D operation	Y operating time	1~120sec/1sec	
		Y-D switching time	0.05, 0.1, 0.2S	
	Forward/Reverse operation		Reversible direct operation	
	Reactor	Reactor Time	1~120S/1S	
	Inverter		Inverter, Soft Starter operation	Bypass circuit
Instantaneous under voltage compensation	Compensation time		OFF 1~10S setting	
	Re-operation delay time		0~300S setting	
	Under voltage detection		(Rating control voltage x 65%)±10%	
	Recovering voltage detection		(Rating control voltage x 65%)±10%	
User contact point Mode	Normal		Normal mode	
	Time Delay	ON Delay	0~300S/1S	
		OFF Delay		
	Flow Switch	ON Delay	0~300S/1S	Comparing time > ON Delay timer
		OFF Delay		
		Comparing timer		
Remote control	Local		LOP (Local Operation Panel)	
	MCC		Motor Control Center	
	Auto		PLC, DCC, DCS auto operation	
	W/L		Water Level	
	Remote		Modbus/RS-485 communication	



1. Connect the MCT terminal to CON.
2. In case of using RS485/RS422/4~20mA output, after wiring cable to 4 pin connector which is attached to communication connection CON, connect to communication connection CON.

Terminal composition

Terminal No.	Input/Output	Function
1	INPUT	Choice LOP operation mode S/W
2		1,3,4,5,6 Terminal COMM(COM1)
3		External ON S/W
4		Reverse rotation input at Forward/Reverse start
5		External STOP S/W
6		External RESET S/W
7		External M/C condition input
8		F-S Mode external input
9		7,8,10,11 Terminal COMM(COM2)
10		External input trip1
11		External trip2
12	OUTPUT	Motor ON output (F/R start / Forward rotation output)
13		Y-DELTA start ; Y contact output
		INVERTER start ; INVERTER contact output
		Direct start ; Not in use
		Forward / reverse start ; not in use
		REACTOR start ; Not in use
14	OUTPUT	Y-DELTA start ; Y contact output
		Forward/reverse start ; reverse rotation
		REACTOR start ; Reactor (R)output
		INVERER start ; BYPASS contact output
		Direct start ; Not in use
15		12,13,14,16 terminal COMM(VCC1)
16		LOP condition signal output
17		Auto condition signal output
18		W/L condition signal output
19		Trip output (1a)
20		17,18,19,21,22 Terminal COMM(VCC2)
21		ON DELAY TIMER
22		OFF DELAY TIMER
23	INPUT	Operation power supply
24		Operation power supply
25		ZCT input
26		ZCT input

CSMPM (Digital Motor Protection Relays)

Salient Features

- Digital Relay with built-in MCU (Micro Processor Control Unit).
- Multiple protection: Over load / Phase failure / Stall /Asymmetry / Phase reverse/ Earth Fault.
- Current setting 0.5-6A & 5-60A.
  Current setting 0.5-6A can be used upto 600A with external Ct's
- Fault diagnostic seven segment display of fault & values.
- Digital Ammeter function.
- Time setting : Inverse time (0-60 sec), Definite time (0-60 sec) starting & Delay time (0-30 sec) operating time.
- Accuracy : Current / Time ±5% of setting.
- Fail safe operation
- Alert function (60-110% of set current).
- Inverse / Definite time characteristics, site selectable.
- C.T. ratio setting in CSMPM-06 frame only.

Technical Specification

Model No.			CSMPM06-S/SI/SZ	CSMPM60-S/SI/SZ
Wiring			Screw type (S)/Tunnel (T)	
Panel mount			Unit or Extension Note1)	
Operation time characteristics			Select either reverse time characteristics or definite time	
Protection		Over current	According to the setting time	
		Phase failure	3 sec.	
		Reverse phase	Within 0.1 sec.	
		Asymmetry	5 sec.	
		Stall	5 sec.	
		Lock	Within 0.5 sec.	
		Under current	3 sec.	
		Ground fault (for SZ model*)	Within 0.05~1 sec. Selectable (0.05~1.0sec)	
		Short circuit (for SI model*)Note2)	Within 50ms	
Alarm (for S model*)			Variable (60~110% of the setting current)	
Current setting range (A)			0.5~6	5~60
Motor capacity		220~240V	0.09~0.75	1.1~11
(KW)		380~440V	0.12~1.5	2.2~22
Time setting	Definite	Delay in starting	0~60sec	
range (sec)	time	Delay in operating	0~30sec	
	Inverse time		0~60sec	
	Reset		Manual reset	
Tolerance		Current	±5%	
		Time	±5% (or±0.5sec)	
Operating power		Voltage	AC 190~250V	
Note3)		Frequency	60Hz (50Hz)	
Aux. Contact	OL	2-SPST	3A/250VAC Resistive load	
	AL	SPST	3A/250VAC Resistive load	
Insulation resistance			Over DC500V 100MW	
Surge impulse voltage(IEC1000-4-5)			1.2x50ms 6kV (Apply standard wave form)	
Fast transient burst(IEC1000-4-4)			2.5kV/5min	
Environment	Temperature	Operation	-25~70°C	
		Storage	-30~80°C	
	Humidity		30~90% RH (No freezing)	
Display		7-Segment	3 phase current, cause of a fault	
		Bar-Graph	60~110% of real load current	
Mounting type			35mm Din-rail/Panel mounting	

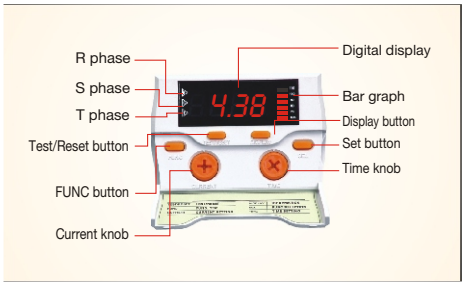
Note1) In extension type, the Digital Relay is calibrated with combining the display port and main body so, please cautious not to combine the display part and main body with different part No.
Note2) Instantaneous short circuit protection is optional
Note3) Operational voltage of AC 110V and 50Hz is optional
* Exclusive for each model

CSMPM (Digital Motor Protection Relays)

Protect Function

Over current	Depend on setting time	Selectable the inverse / definite
Phase loss	Within 3 seconds	Over 70% of the rate of unbalance
Phase unbalance	Within 5 seconds	Over 50% of the rate of unbalance
Phase reverse	Within 1seconds	Function enable
Stall	Within 5 seconds	Over 180% of the setting current
Lock	Within 0.5 seconds	Setting 200~900% of rated current
Under current	Within 3 seconds	Setting 30~70% of rated current
Instantaneous current *	Within 50m seconds	Setting 300~1800% of rated current
Ground fault *	Within 0.05 to 1 seconds	Setting 100~2500 mA

* Optional Protection

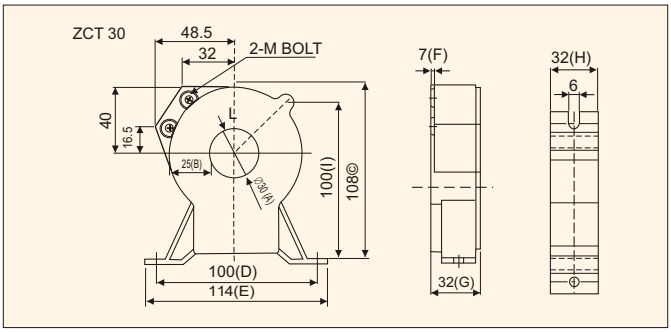


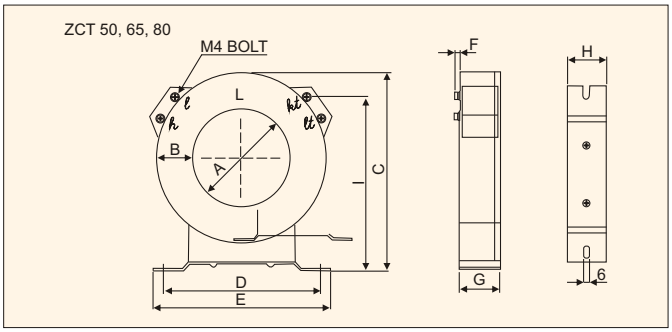
Multiple Protection

Function	Selection	Function	Note
1.CHA	1nu/dEF	Inverse or definite time Characteristics	Default inverse time Characteristics
2.dEF	0~30	Set the O - time (Definite time only)	For D - time setting, Use the time knob phase
3. r.P	oFF/on	Reverse phase protection	Default is “Off”
4.Und	oFF/30~70(%)	Under current (Dry run)	Default is “Off”
5.ALt	oFF/60~110 (%)	Alarm function (With pre-alarm signal)	Default is “Off”
6.StL	oFF/on	Stall function	Default is “Off”
7.Loc	oFF/200~900(%)	Lock function	Default is “Off”
8. Ct	1~120	CT ratio	Default is 1:1
9. P.F	on/oFF	Phase failure	Default is “ On”
Sto	Sto	Function Store	Push the SEL button to Store

Note :1) Do not change the CT ratio in 60 type (Default is 10:1).

ZCT (Zero-Phase Sequence Current Transformer)





Model	A	B	C	D	E	F	G	H	Ø
Z - CT D30	30	25	108	100	114	7	32	32	6
Z - CT D50	50	25	131	100	122	7	32	36	6
Z - CT D65	65	26	143	114	133	7	39	37	6
Z - CT D80	80	34	174	160	180	7	40	40	6

NOTE :
1) Ratio 200mA/100mV.
2) One Z-CT with suitable ID(A) to be ordered with each CSMPM-06/60 SZ model.

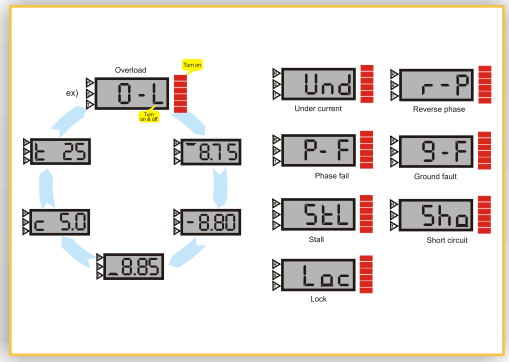
Setting - CSMPM

Before operating a motor, set the CSMPM as follows

1. Check the operation of the "TEST/RESET" button

- Check the operation when it is tripped
  1) Check the wiring method (Refer to page no. 9)
  2) Press the "TEST/RESET" button and then test is displayed on the LED and the CSMPM is tripped.
  3) Press the "TEST/RESET" button again and then it is reset.

  Note: In order to avoid the trip fault, the push operation of "TEST/RESET" is not available when a motor is rotating.



2. Shift the mode by pressing the FUNC key and then select the values by press the SEL key.

- You can finish the setting by pressing the SEL key in the Sto mode
- To protect the operation under the motor rotating, setting is allowed only in the "TEST" mode.
  1) First shift to the "TEST" mode by press the "TEST/RESET" button and then set thefunctions by press the "FUNC" button.
  2) Each time you press the "FUNC" button, the FUNC mode switches from 1.CHA mode to S to mode. When the mode that you want to change is displayed, push the "Sel" button to select the value you want.

     After you select the value, press the "FUNC" button to finish the settings and it displays the next mode.
  3) If no button is pressed in the SEL mode, it remains in that mode.
  4) If you select the inverse time characteristics it skips the mode 2 .dEF and go to the mode 3.rP.
  5) 5. ALT is the alert setting mode. It displays the load rate of the current setting value by the bar LED (60~110%)
     - If the current is higher than the setting value, the bar LED is switched on and off and the AL relay (07-08) make close and open in 1sec interval until the relay is tripped (Pre- alarm function).
     - If the 5. ALT mode is set to OFF, the AL relay make close after the relay is tripped (Normal open contact).
  6) To finish the settings you have to press the "SEL" button in the Sto mode.

Selection of Ground Fault sensitive current

Sensitive Current (mA)	Dip s/w			
	1	2	3	4
100	○	○	○	○
200	1	○	○	○
500	○	1	○	○
1000	○	○	1	○
1500	○	○	○	1
2000	○	○	1	1
2500	1	1	1	1

g-F : OFF / 0.05~1.0(S) - Ground fault enable and setting

3. Ajust the operating time by the time knob

Inverse time characteristics

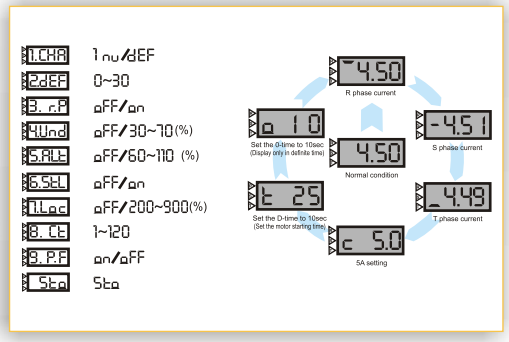
1) Select the inverse time in the 1.CHA mode, the default operating time is 600% of the rated current.
2) The setting range of the operating time is 0~60sec. Set the time by considering the motor start time.
3) When it is over the setting time, the relay operate in accord with the hot curve.

Definite time characteristics

1) Select the dEF in the 1.CHA mode, it is operated by the definite time characteristics.
2) D-time means the time that delays the operating time when the motor is starting.
3) The setting range of the operating time is 0~60sec. Set the time by considering the motor start time.
4) Set the 0-time at the setting mode 2.dEF and the range is 0~30sec.

4. Adjust the operating current by the current knob

1) Set the operating current based on the rated current that is described in the name plate. Generally set the 110~115% of the real load current in the normal load condition.
2) There are 2 CT types according to the current range (0.6/60). When you use the external CT you can see the real current by set the CT ratio (In 60CT type the default CT ratio is 10:1).
3) You can easily set the current value by refer to the load rate which is displayed on the bar graph (Approx. 90% load rate).



5. Check the setting state by the display key

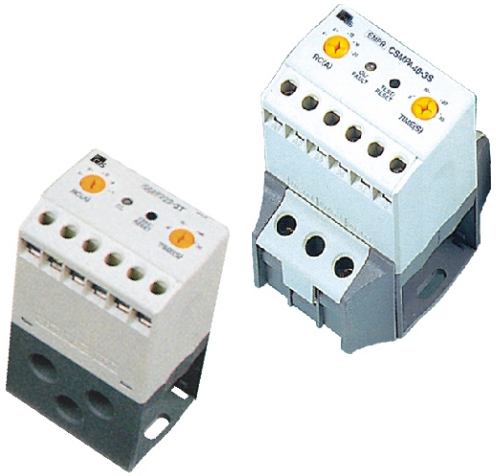
1) In normal condition it display the maximum current among the three phase current.
2) Each time you press the "DISPLAY" button you can see the current and values as PIG X.
3) If no button is pressed for 3-4 seconds. it returned to the normal condition.

6. Check the causes of the fault by look at the display unit (7-segment)

- The causes of the fault is switched on and off for 0.5 sec interval. If you press the "Display" button at this time, display you can see the values and the causes of the fault.

Features (Inverse Time Characteristics Type - CSMPA22/40/80)

- Multiple protection: Over current / Phase failure / Stall /Asymmetry / Phase reverse.
- Current setting upto 80A in 3 frame sizes.
- Fault diagnose by LEDs indication.
- Time setting 0 - 30 sec.
- Accuracy : Current / Time ±5%.
- Relays with built-in MCU (Micro Processor Control Unit)
- Environment operational temperature (-25°C to +70° C).
- Compact design & Elegant outlook.
- Common use of the Screw type & Tunnel type.
- Applicable to the inverter circuit (20 - 200 Hz).
- Mounting options : 35mm Din-rail or Screw.
- Fail safe operation.



Technical Specification

Model No.		CSMPA22-2S	CSMPA22-3S/3SR	CSMPA40-2S	CSMPA40-3S/3SR	CSMPA80-2S	CSMPA80-3S/3SR
Type		Screw Type					
No. Of CT		2CT	3CT	2CT	3CT	2CT	3CT
Protection	Overcurrent	●	●	●	●	●	●
	Phase failure	●	●	●	●	●	●
	Stall	●	●	●	●	●	●
	Asymmetry	–	●	–	●	–	●
	Reverse phase	–	●(3SR)	–	●(3SR)	–	●(3SR)
Current setting range (A)		0.3~1.5		4~20		16~80	
		1~5		8~40			
		4.4~22					
Operating time characteristics		Inverse time characteristics (CSMPA22-2PD: Definite time Characteristics)		Inverse time characteristics			
Time setting (Sec)	Inverse time	0~30 sec					
	Reset time	Manual Reset (Prompt); Reset after 1min (optional)*					
Tolerance	Current	±5%					
	Time	±5 (or±0.5sec)					
Control Power	Voltage	AC 100~260V					
	Frequency	50/60Hz					
Aux. Contact	Contact	2SPST (When power applied, 1a1b)					
	Rating	3A/250VAC Resistive load					
	Operate	(95 ⊣⊢96Close) (97 ⊣⊢ 98 Open)					
Insulation resistance		Min 100MW at 500V DC					
Surge endurance (IEC 1000-4-5)		1.2 x 50 ms 6kV Apply the standard wave					
Fast transient burst (IEC 1000-4-4)		2.5kV / 5min.					
Environment Temperature	Operation	-25~70°C					
	Storage	-30~80°C					
	Relative humidity	30~90%RH (No freezing)					
Trip indicator		Red LED	Red/Green LED	Red LED	Red/Green LED	Red LED	2Red LEDs
Dimension (mm) W x H x D		53 x 68 x87.5				89 x 77.5 x 97.4	
Mounting type		Separate Mount (Screw or DIN-Rail)				Direct /Separate Mount (Screw or DIN-Rail)	

* Auto Reset version available on special request only

Operating & Setting of CSMPA22/40/80

1. **Check the rated voltage and apply the control supply to A1 and A2 terminal.**

   CAUTION : Do not apply 220 V to 110 V model.

2. **Check the "TEST/RESET" button operation.**
   - Check the operation of the output contact.
   - Check if the control voltage and wiring method is correct (Refer to the contact configuration).
   - When you press the "TEST/RESET" button, the "O.L" LED is turned ON (Red) and the relay is tripped.
   - When you press the "TEST/RESET" button under the relay is tripped, the "O.L" LED is turned OFF and the relay is reset.
   - Auto reset function : When it is tripped by the over current, it is reset after 1 Min. (Optional).

     CAUTION : For safety, when the motor is operating the "Test/Reset" button do not work.

3. **Set the operating time**

   The operating time is set on the base of 600% of the rated current in the characteristic curve.
   - Set the operating time by considering the operating time and start current according to the types of the load.

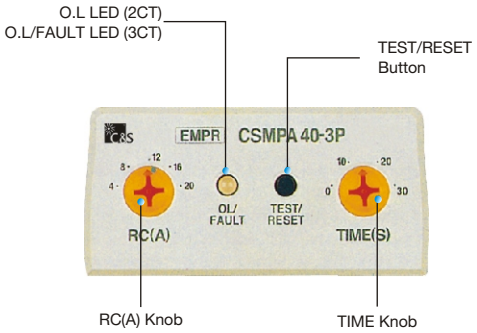
     (Ex.: If the start current is 600% of the normal operating current and the starting is 10sec., set the time knob around 11~12sec. with 10~20% margin)
   - Operating time range is 0~30sec.
   - If the time knob is set to 10sec, the relay is tripped when the start current (600% of the rated current) is applied for 10sec.

     CAUTION : The relay with inverse time characteristics can be tripped to protect the motor when the motor is started a few times continuously. When a motor is frequently changing the rotating direction (forward and reverse), set the operating time longer. For the crane and hoist use, select the relay with definite time characteristics.

4. **Set the operating current**

   Set the current by considering the rated current of a motor to protect from the over current.
   - Check if the rated current of a motor is within the current setting range of relay.
   - Set the 'RC(A)' (Rated current) knob to the maximum value and then start a motor.
   - Under normal motor operation, rotate the 'RC' knob to the counterclockwise until the 'O.L' LED turned ON&OFF. The current at this point in the 100% current rating under real load.
   - At this point, rotate the 'RC' knob to the clockwise until the 'O.L' LED turned OFF. In general case the setting value is around 110-120% of the rated current. (Ex.: When the 'O.L' LED flickering at 20A, the setting current will be 22A (=20x1.1)

     Note : The brackets for connection is offered standard.



Indicate the cause of the fault by the LEDs

When it is tripped, you can check the causes of the fault by seeing the LED on it and you can troubleshoot the causes in a short time

Condition			Red O.L LED		Green Fault LED		Note
Operation	Normal		Off		Off		
	Over current		On & Off		Off		0.4 second interval
	Over current		On		Off		
Trip	Phase failure (3CT)	R	On		On & Off		1 Times for 3 second
		S	On		On & Off		2 Times for 3 second
		T	On		On & Off		3 Times for 3 second
	Phase failure(2CT)		On & Off		Protect 2phases of3phases, trips within 3sec.		
	Reverse phase(3CT)		On & Off		On & Off		One after the other

Features (Definite Time Characteristics Type - CSMPA-6OT)

- Protection : Over current & phase failure
- Time setting : Starting time (0.2-30 sec)
  : Operating time(0.2-15 sec)
- Accuracy : Current/Time ±5% / (±0.5 sec)
- Compact Size, Economical
- Realys with built-in MCU (Micro Pressesor Control Unit)
- Current setting: 0.5-6A or 5-60A options
  Current setting 0.5-6A can be used upto 600A with external CT's
- Looping option is available for FHP Motors
- Fault diagonstic by LED indication
- Mounting option: 35mm Din-rail or Screw

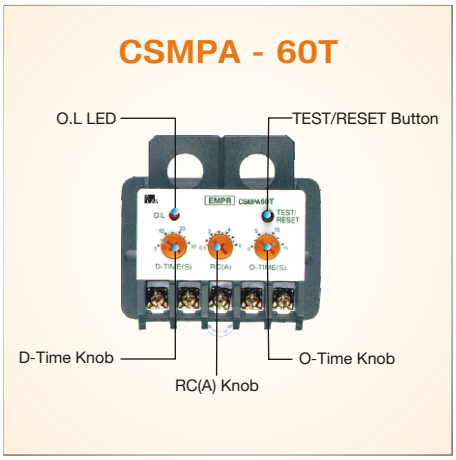
Operating & Setting of CSMPA-6OT

1. Tunnel type mounting

- Check if the relay operate in overcurrent

- Check the "TEST/RESET" button operation
  - Check if the wiring is correct (Refer to the wiring diagram).
  - Set the 'D-time' and 'O-time' knob to the min. ratings.
  - When the "TEST" button is pressed under tripped condition, the 'O.L' LED is turned off.
  - When you press the "TEST" button again then the lamp turned off and the relay reset.

  Note : In operation, even though you press the "TEST/RESET" button, the relay do not trip.

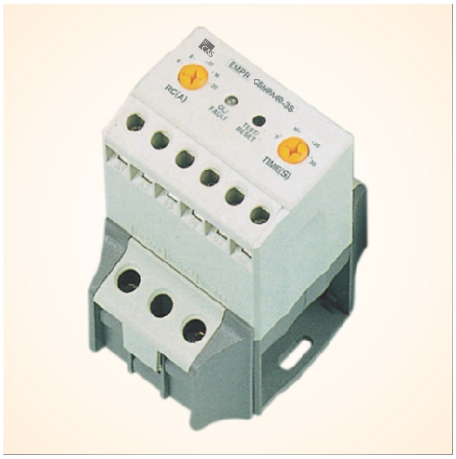


2. Set the operating time (Definite time characteristics)

- D-TIME (Delay time) : 0.2~30sec.

  The motor starting current, which flows when the motor is starting, is generally 600~800% of the rated current and the delay time varies according to the load condition. It is the time during which the relay do not operate by over-current during the starting time.
  - Set the delay time by use of the 'D-TIME' knob.
  - In case you do not know the delay time, start the motor by setting the 'D-time' knob to the max. position and after checking the time during which the starting current become stable, set the 'D-TIME' (In general pump, the setting time is 3-5 seconds)

    Note : The time delay is forced time delay type, therefore if you make a mistake to select the time, the motor may burn.

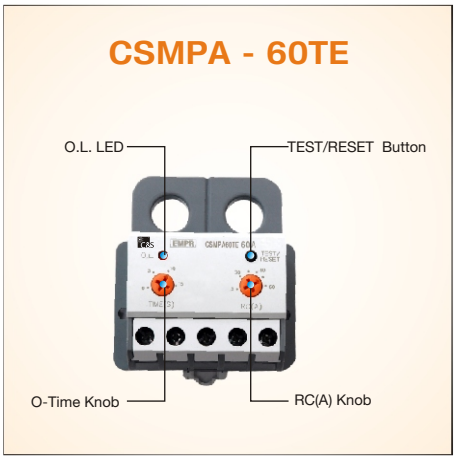


- The operating time is the time during which the relay tripped by the over-current. The relay is tripped after the selected operating time.
  - Set the operation time by the 'O-TIME' knob.
  - In special case such as for mechanical shock relay, if you set the 'O-TIME' to the min value, the relay is tripped at once.

  Note : Generally set it to 4~6 seconds.

3. Set the operating current (Similar to that of the screw type)

- Set the operation current to protect from over current. Set the current by considering the rated current
  - Start the motor by setting the 'RC (A)' knob to the maximum position.
  - Under operating condition, rotate the 'RC(A)' knob to the counterclockwise until the 'O.L' LED turned on & off. The current at this point is the value (100%) under real load condition.
  - Rotate the 'RC(A)' knob to the clock-wise until the 'O.L' LED turned off. In general case the setting is 110~120% of the rated current.



4. Check the LED condition during the operation

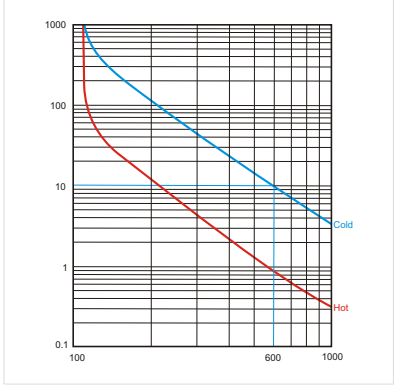
- Over current
  - The relay is not tripped during the 'D-TIME' under over-current but the O.L LED turned on and off to indicate that the over-current flows.
  - If the relay is tripped after 'D-TIME' the 'O.L' LED turned on.

- Phase failure
  - If a motor does not rotate under phase failure, the high current may flow. At this time a motor is protected by the over-current protection function.

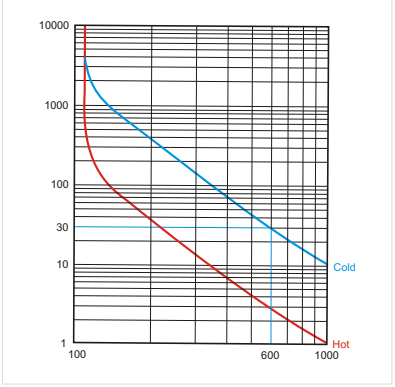
Characteristics Curve - CSMPA & CSMPM Series

Analog Relay: CSMPA 22/40/80

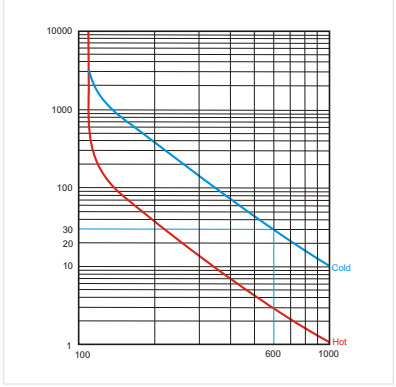
Class 10 (10 Sec.)



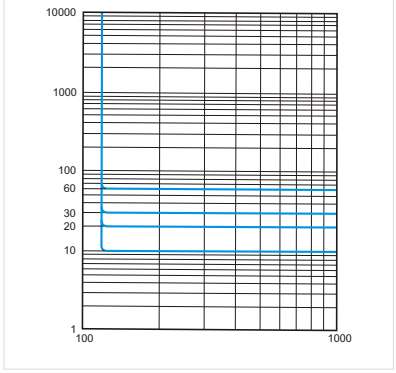
Digital Relay: CSMPM 6/60



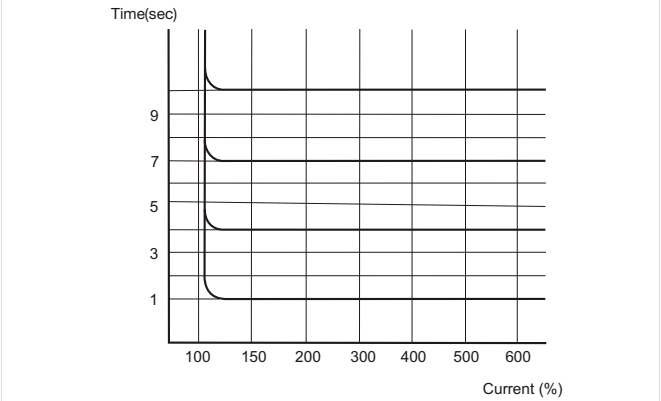
Class 20/30 (20/30sec.)



Definite time characteristics



Definite time characteristics-CSMPA-60T/TE

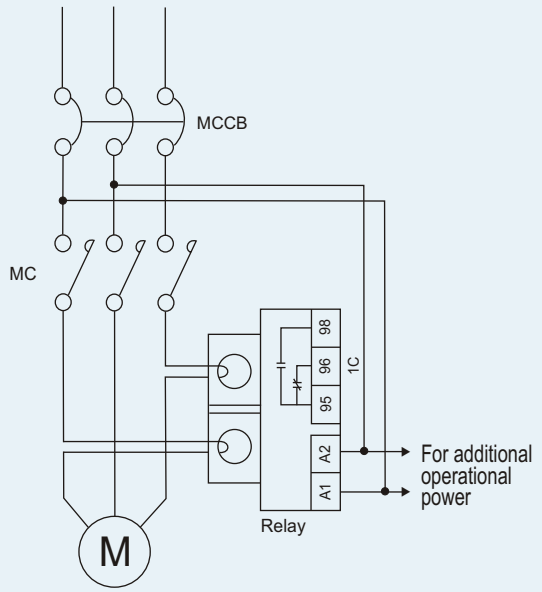


Technical Specification

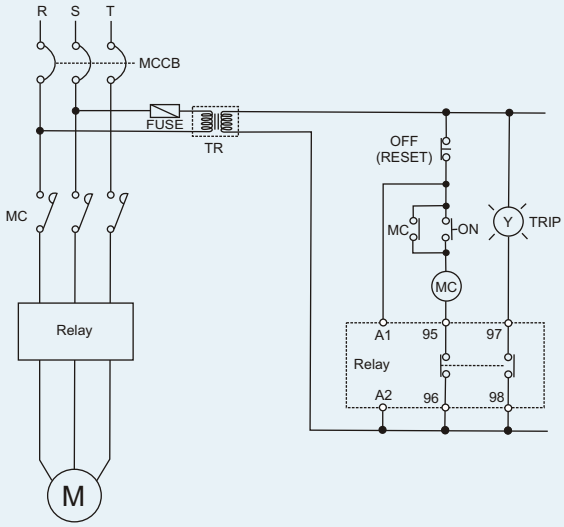
Model No.				IMC
Operating time characteristic				Inverse/Definite time
Current range (A)				0.125~60A (One device)
Time Setting(s)	Inverse time			1~60sec/1sec (Class)
	Definite time	D-Time		1~200sec/1sec
		O-Time		1~60sec/1sec
	Auto returning time (R-T)			1~20min/1min, OFF (Manual returning)
Control Power	Voltage			AC 110V or AC 220V (±15%)
	Frequency			50/60Hz
	Power Consumption			Under 6W
Output Contact (9Nos)	Capacity			5A/250VAC
	Construction	Digital contact	3a	Direct, Reversing, Y-D, Reactor, Inverter starter
		Signal contact	3a	Local, Auto, W/L condition
		Timer contact	2a	ON Delay, OFF Delay
		Trip contact	1a	Fault output
Output Contact (9Nos)	Operation input			Local, Auto, Water level, Flow switch
	MC condition signal input			Monitoring of sequence (LED)
	External trip		2a	Emergency, Sequence
	ZCT	Ratings		200mA/0. 1mA
		Specification		25Æ, 40Æ, 80Æ
Indication	7-segment			3-phase current, Trip analysis, setting indication
	LED			Operation, Trip, System fail, Communication, Remote control
				Condition
Self supervision				System Fail LED, Error indication
Communication				MODBUS/RS-485
Installation				Panel inside installation/Door mounting
Withdrawable cable				Basic cable 2m
Weight				0.6kg (MCT 0.35kg)
Dimension	Main unit			148(W) x 100(H) x 74(D) mm
	MCT			151(W) x 55(H) x 33(D) m

Wiring Diagram of CSMPA Series

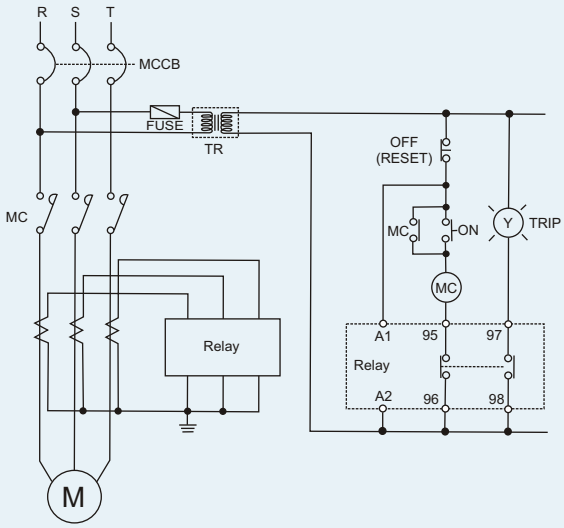
CSMPA-60TE, CSMPA-60T



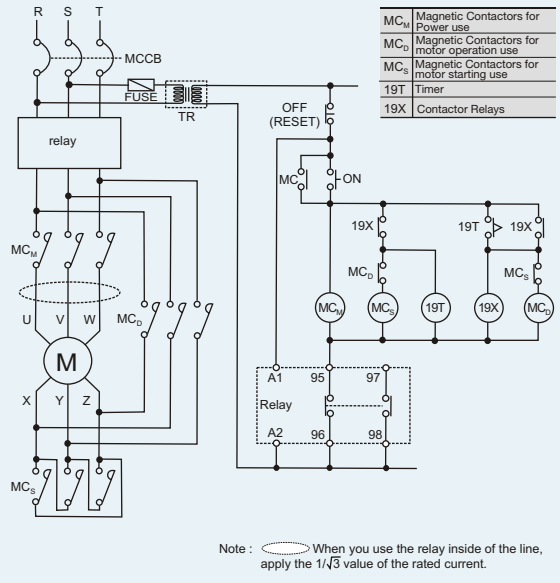
CSMPA-22/40/80 (2S/3S/3SR)



CSMPA-22 IN 5A (2S/3S/3SR) With External Current Transformers

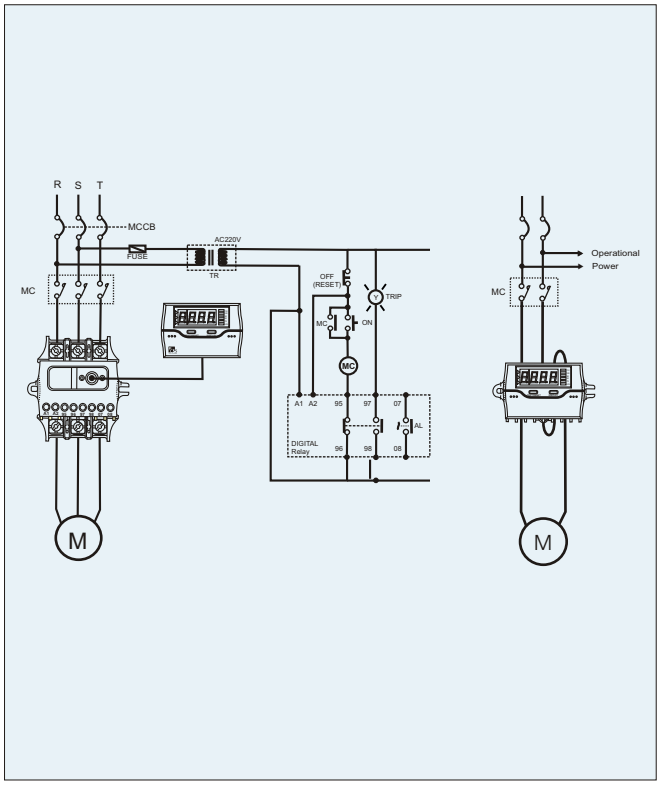


CSMPA-22/40/80(2S/3S/3SR) (For Y-D Wiring)

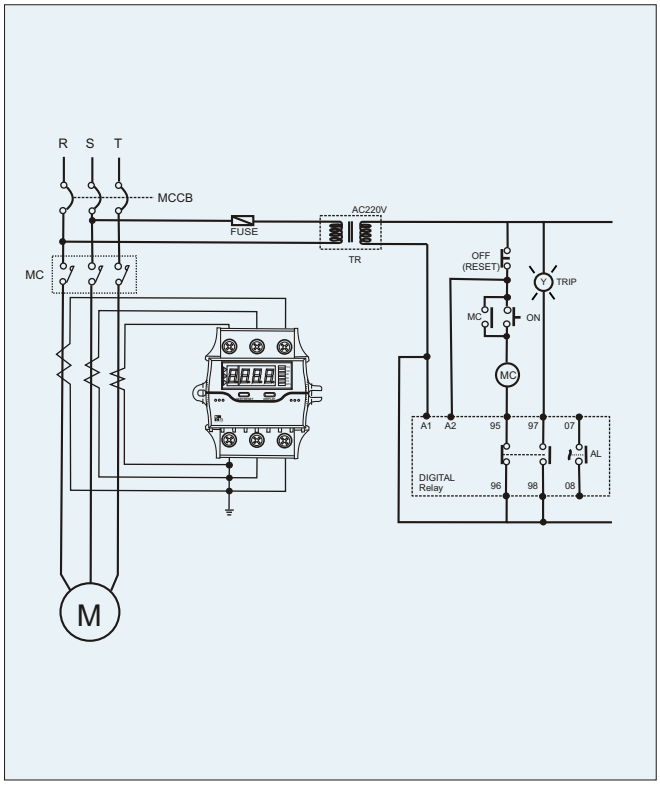


Note : When you use the relay inside of the line, apply the $1/\sqrt{3}$ value of the rated current.

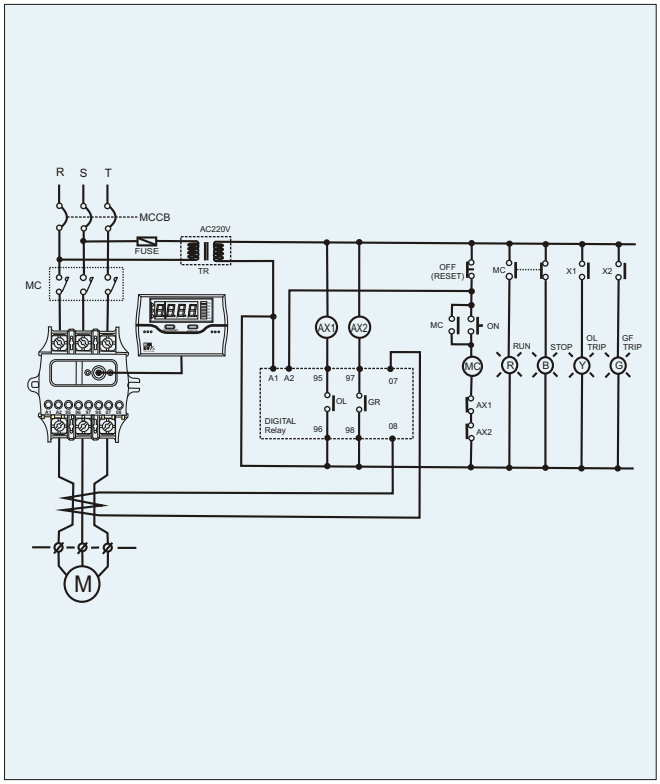
CSMPM-06/60-S/SE



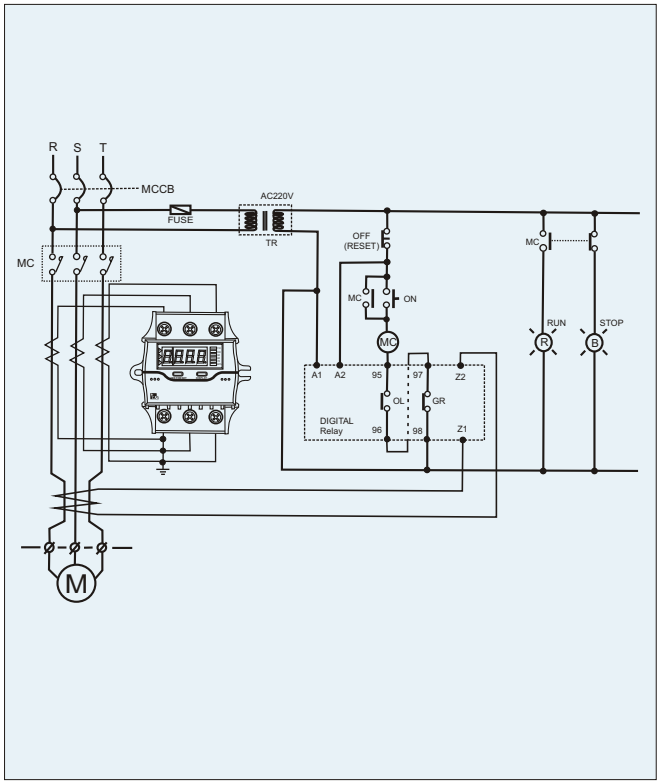
CSMPM-06-S/SE (With External Current Transformers)



CSMPM-06/60-SZ/SEZ/TZ/TEZ (2a Type)

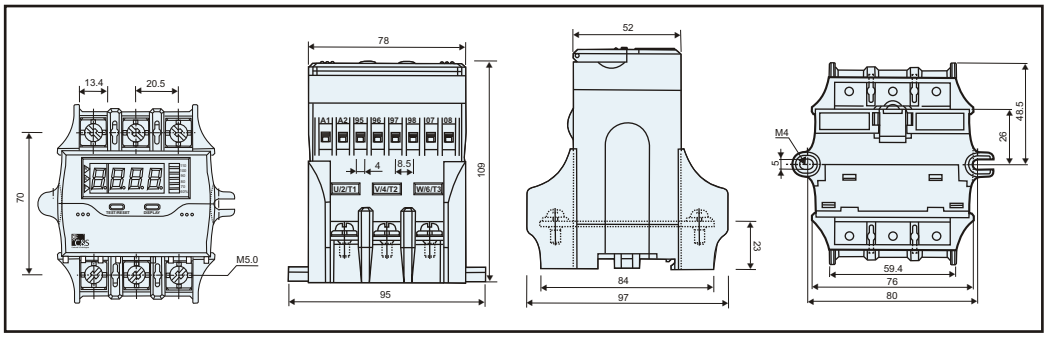


CSMPM-06-SZ/SEZ/TZ/TEZ (2b Type) With External Current Transformers

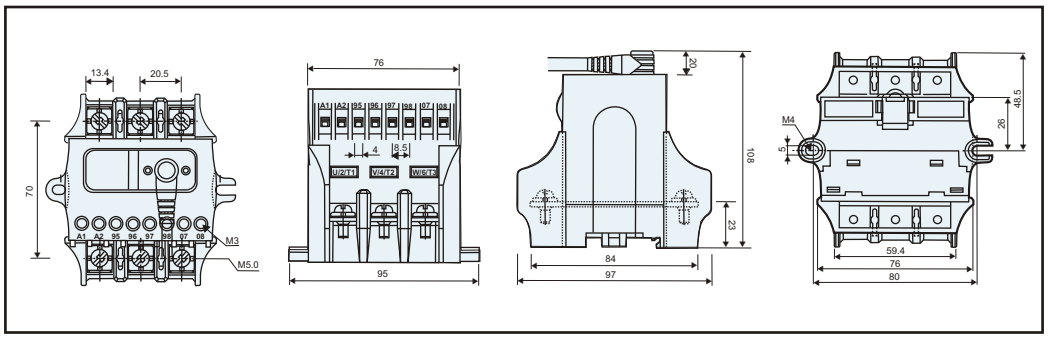


Dimensions (mm) - Digital Relay : CSMPM Series

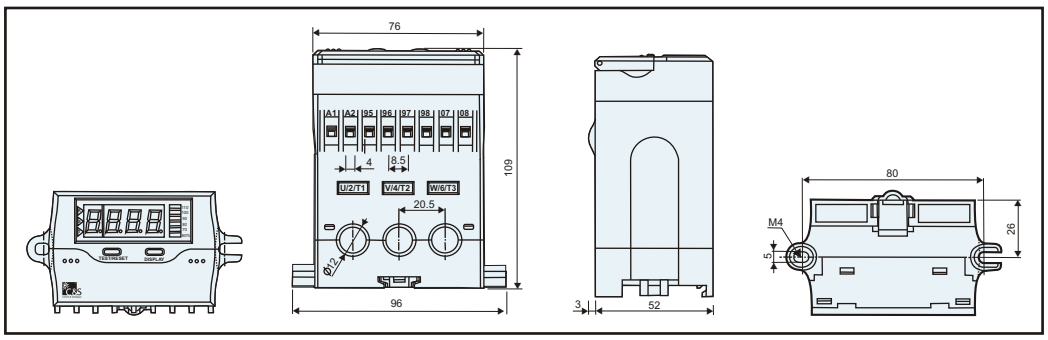
CSMPM-S
CSMPM-SZ
CSMPM-SI



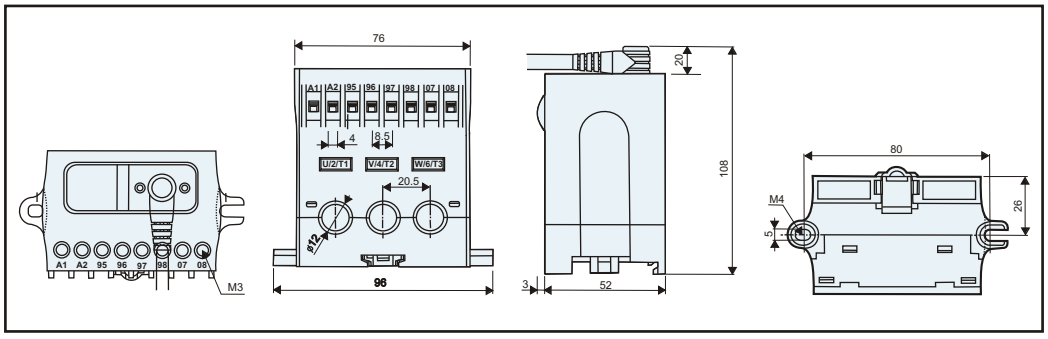
CSMPM-SI
CSMPM-SE
CSMPM-SEZ



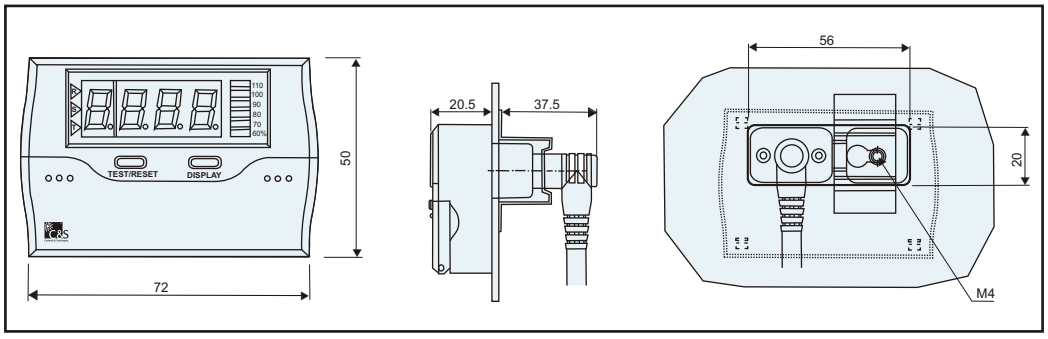
CSMPM-T
CSMPM-TZ
CSMPM-TI



CSMPM-TE
CSMPM-TEZ
CSMPM-TEI

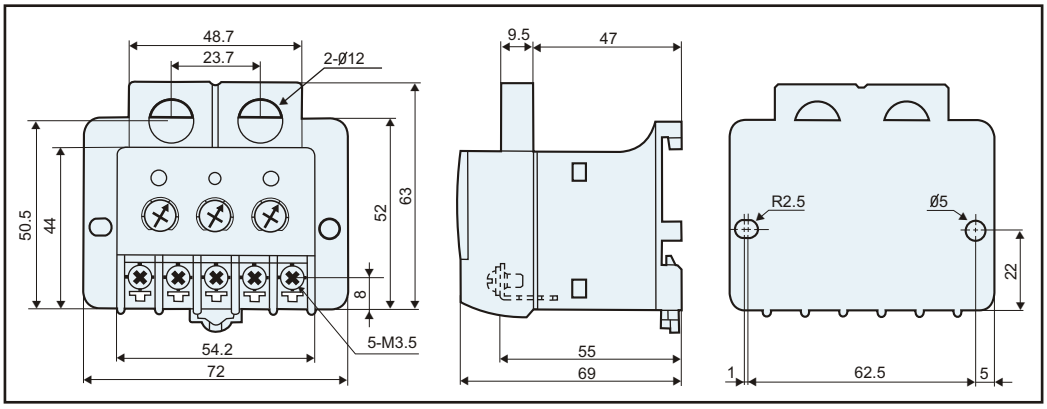


CSMPM-SE/S
CSMPM-SEZ/SZ
CSMPM-SEI/SI
CSMPM-TE/T
CSMPM-TEZ/TZ
CSMPM-TEI/TI



CSMPA-60T

CSMPA-60TA



CSMPA-22-2S

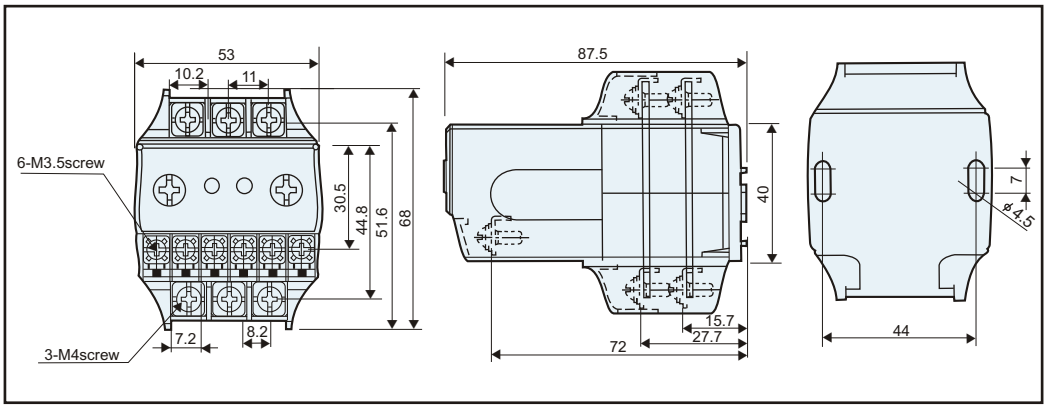
CSMPA-22-3S

CSMPA-22-3SR

CSMPA-40-2S

CSMPA-40-3S

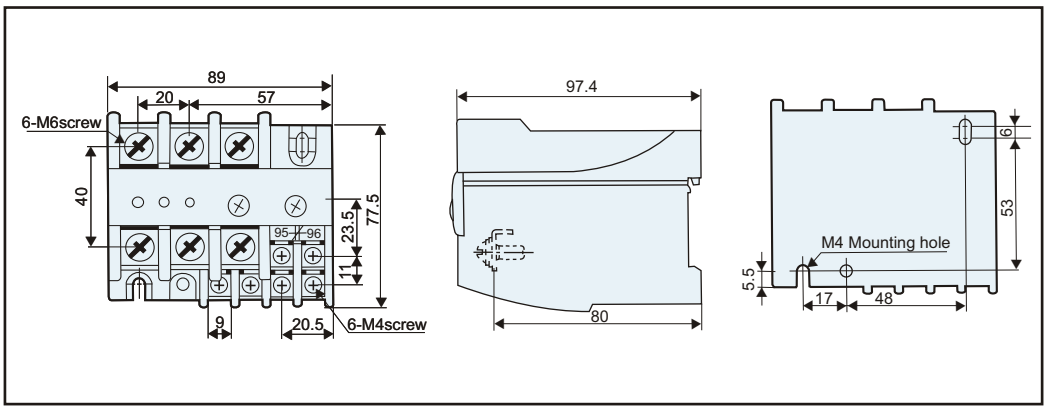
CSMPA-40-3SR



CSMPA-80-2S

CSMPA-80-3S

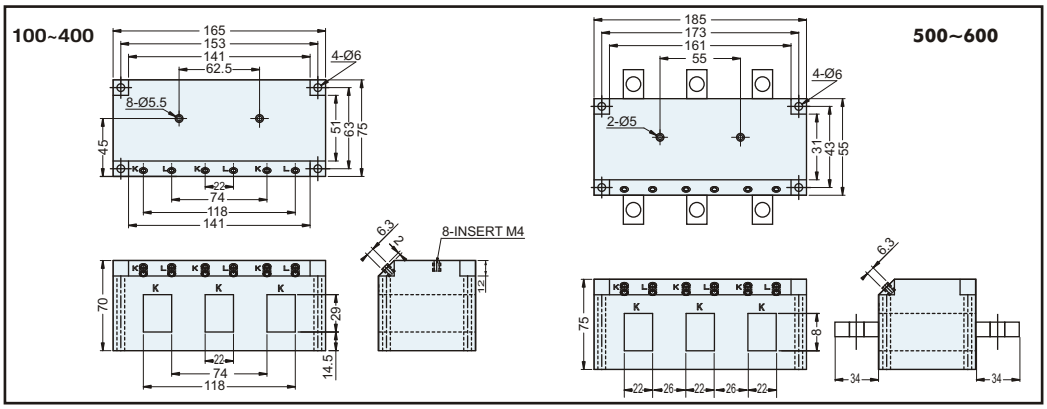
CSMPA-80-3SR



3 - CT

Technical Specification

Particular	Specification
Class	1.0
Burden	5VA
Insulation Voltage	600VAC
Insulated impulse Voltage	2kV
Insulation Resistance	10MΩ (DC 500V Megger)
Mounting	Panel



'E' - with extension cable available 1.5~4m length

Range of Motor Protection Relay

Quick Selection Table

Product code	Range	Control Voltage AC	Remote Operation
Intellegent Motor Controller with communication			
IMC	0.125~60A	110 V/220 V	**Communication through Models RS-485/RS-422**
Product code	Range	Control Voltage AC	Aux. Contact
Inverse/Definite Time Characteristics - Comprehensive Digital Model			
CSMPM06-S	0.5 - 6 A	110/ 220 V	2a1b
CSMPM60-S	5 - 60 A	110/ 220 V	2a1b
CSMPM06-SI	0.5 - 6 A	110/ 220 V	2a1b
CSMPM60-SI	5 - 60 A	110/ 220 V	2a1b
CSMPM06-SZ	0.5 - 6 A	110/ 220 V	2a/2b/1a1b
CSMPM60-SZ	5 - 60 A	110/ 220 V	2a/2b/1a1b
Inverse Time Characteristics - Analog Model			
CSMPA22-2S	0.3 - 1.5A	100 ~ 260 V	1a1b
CSMPA22-2S	1 - 5 A	100 ~ 260 V	1a1b
CSMPA22-2S	4.4 - 22 A	100 ~ 260 V	1a1b
CSMPA22-3S	0.3 - 1.5A	100 ~ 260 V	1a1b
CSMPA22-3S	1 - 5 A	100 ~ 260 V	1a1b
CSMPA22-3S	4.4 - 22 A	100 ~ 260 V	1a1b
CSMPA22-3SR	0.3 - 1.5A	100 ~ 260 V	1a1b
CSMPA22-3SR	1 - 5 A	100 ~ 260 V	1a1b
CSMPA22-3SR	4.4 - 22 A	100 ~ 260 V	1a1b
CSMPA40-2S	4 - 20 A	100 ~ 260 V	1a1b
CSMPA40-2S	8 - 40 A	100 ~ 260 V	1a1b
CSMPA40-3S	4 - 20 A	100 ~ 260 V	1a1b
CSMPA40-3S	8 - 40 A	100 ~ 260 V	1a1b
CSMPA40-3SR	4 - 20 A	100 ~ 260 V	1a1b
CSMPA40-3SR	8 - 40 A	100 ~ 260 V	1a1b
CSMPA80-2S	16 - 80 A	100 ~ 260 V	1a1b
CSMPA80-3S	16 - 80 A	100 ~ 260 V	1a1b
CSMPA80-3SR	16 - 80 A	100 ~ 260 V	1a1b
Definite Time Characteristics - Analog Model			
CSMAP60-T	0.5- 6 A	110/220/415 V	1c
CSMPA60-T	5- 60 A	110/220/415 V	1c
CSMPA60-TE	0.5- 6 A	110/220 V	1c
CSMPA60-TE	5- 60 A	110/220 V	1c

* 'a' denotes NO,'b' denotes NC & 'c' denotes Changeover Contacts

NOTE:

1) All auxiliary contacts are standard supply with relays indicated above except CSMPM-06/60 SZ model. Select one of the three options (2a/2b/1a1b)for this model.
2) All above Motor Protection Relay model CSMP06-S/SI/SZ with current range 0.5-6A / 1-5 A & CSMPA with current range 0.5 - 6 can be used upto 600 A with suitable ratio CTs* having 5A secondary current,class 1 accuracy.

* Refer page (13 for 3CT technical specifications)

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C&S Electric Ltd.
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Works : 44, Okhla Industrial Estate, New Delhi - 110 020
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Corporate Office : 222, Okhla Industrial Estate, New Delhi - 110 020
Tel. : +91-11-3088 7520 - 29, **Fax:** +91-11-2684 7154, 2682 9063