We touch your electricity everyday!

mPRO-200-V2

Electronic Motor Protection Relay

Catalog

C&S electric

PMD Division

CONTENTS

1)	Introduction
2)	Features & Protections
3)	Application
4)	Functional Diagram
5)	Functional Description
6)	Protection function description
7)	Records
8)	Human Machine Interfaces
9)	Setting Parameters
	Protection
	Common
	RTC
	Communication
	Advance
	DO Matrix
	DI Matrix
10)	Thermal Inverse characteristics
11)	Technical Data
12)	Rated Current Range Selection
13)	Connection Diagram
14)	Dimension Details
15)	CBCT Details
16)	Terminal Description
17)	Ordering Information

1) Introduction

The mPRO-200 protective relay is an advanced current based numeric relay that provides multi protection and monitoring in compact Din-rail enclosure. The relay offers reliable protection for LV and MV motors which are either operated via power contactors or power circuit breakers.
mPRO-200 comprises of DIN Rail mountable Base Module and Panel mountable Display Module.

mPRO-200 offers following features in a compact, modular & smart design.

2) Features & Protections

Multi protection functions

Over Load, Short Circuit, Under Current, Unbalance, Phase Loss, Phase Reversal, Stall, Locked Rotor, Earth Fault (Residual/CBCT), Over Temperature, External Fault

Metering & monitoring information

Three Phase RMS current, Thermal content (%), Unbalance current (%)

Date & Time information

In-built Real Time clock available. Fault gets registered with date and time to identify the time/date of failure.

Records & History

- Last 5 Fault/Failure records to identify the history of failure
- Accumulated Trip Counter
- Max Starting Current
- Last 3 START/STOP records

Motor Run Hour

Accumulation of motor operating hour to analyze motor service factors like bearing check, refueling cycling etc.

High reliability

In-built Fail safe operation feature available for trip contact

Multiple Reset functions

Programmable Automatic/Manual/Remote reset functions available for different schemes.

Thermal / Temperature monitoring

- Thermal over-load protection with different trip class
- External PTC thermistor interface available to monitor & protect motor bearing, winding from over heating

Communication

- MODBUS RTU over RS-485
- 4-20mA output for PLC

DI / DO Matrix

Digital input & Digital output programmability

Password setting

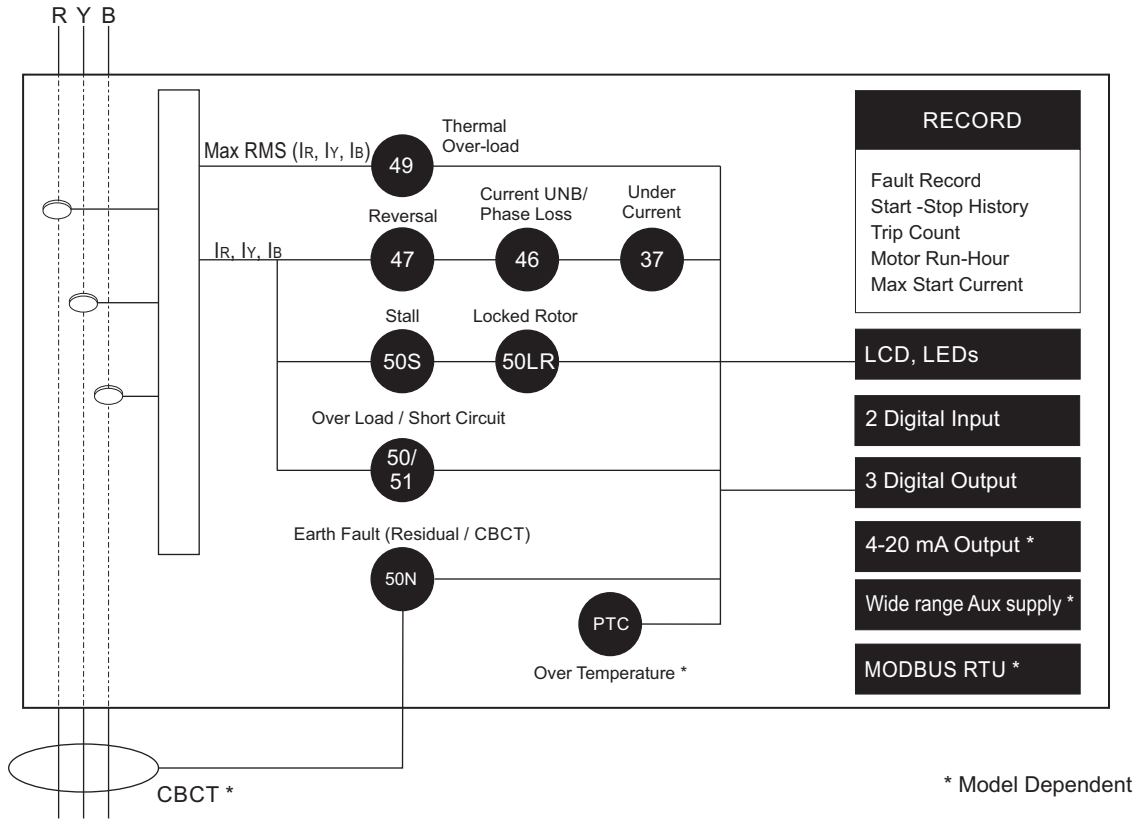
All parameter settings protected via password protection to avoid the unauthorized access

3) Application

Every motor failure causes a production stop and costs for service. A cable cut, phase failure, short circuit or overload can destroy the motor or pose danger for the whole production line and for the people who work there. This is the reason why a reliable motor protection is very important and thus mPRO works as a safe guard. It can be used in following areas :

- Motor Control Center (MCC) application.
- Integrated Process & Electrical Control with Protection.
- Can be used in inverter control circuit (20-200Hz)

4) Functional Diagram



5) Functional Description

Motor State Recognition
The mPRO monitors the flow of the current from which the following operational conditions of the motor are gathered:-

- STOP
- START
- RUNNING

Fail Safe Operation
mPRO allows user to enable fail safe operation for DO-1 contacts. Following occurs when fail safe mode is enabled.

- DO-1 relay coil is energized.
- When mPRO generates a trip signal, the DO-1 relay coil is de-energized.
- DO-1 relay is also de-energized, if the auxiliary power is removed or fails.

If trip contact is appropriately connected to the motor breaker or contactor, the motor is automatically tripped, if auxiliary power fails.

Failsafe Mode		Non Failsafe Mode	
A3-A5	A3-A4	A3-A5	A3-A4
NO contact	NC contact	NC contact	NO contact

6) Protection Function Description

Under Current Protection (I<)
This protection covers the Loss of load condition like V-belt split or shaft failure or a pump running un-primed.
If in running condition, the phase currents in all the three phases are below the selected value of undercurrent setting I< for a t< (Under current trip delay time) selected delay, then mPRO will trip to stop the motor.

Over Current Protection (I>)
Over-current protection is provided by tripping the relay when motor operating current in any of the three phases exceeds over-current setting I> of mPRO for a period greater than the selected operating time t> under DEFT (Definite time over-current protection) .

Short Circuit Protection (I>>)
Short circuit protection is provided by tripping the relay when the motor operating current in any of the three phases exceeds the value corresponding to Short circuit setting I>> for the set interval (t>>).

Phase Loss or Single Phase Protection
During a phase loss, the motor winding current will increase by 150% or more. As the motor winding current increases, the winding temperature will increase and possibly damage the winding insulation.When the relay detects loss of phase it will trip after expiry of set time tPhLos. The quick trip time on mPRO helps to prevent over-current damage to the windings.

Phase Unbalance (46)
The phase unbalance condition is checked only during running condition of the motor. The unbalance % between the three phase currents is calculated by [(MAX Current-MIN current)/MAX current] x100[%] .If the calculated value exceeds the set unbalance value Iub for the selected time tIub the relay will trip.

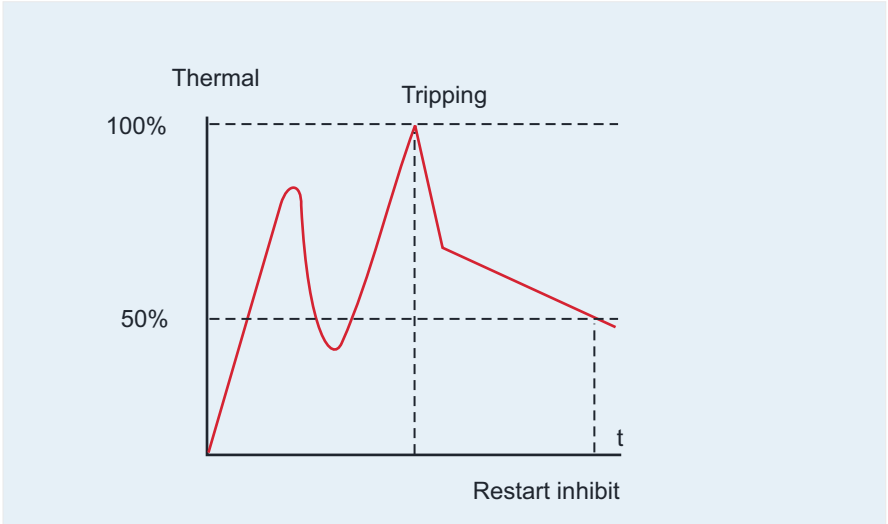
Phase Reversal (47)
In the event of phase reversal, the relay trips after set time tPhRev. It helps to protect a three phase motor while installation.

Locked Rotor (50LR)
During motor start-up, a locked rotor is detected with the state of increased phase current above the set value (LKR) even after the set start time (tLKR). This protection is available under motor start condition only.

Earth / Ground Fault (50N)
A large percentage of motor insulation failures result in ground/earth fault currents. Early detection keeps damage to a minimum, thereby shortening repair times and minimizing repair costs. This fault will be detected with the help of CBCT or internal residual method (model dependent). Once fault is detected (Ie above the set value), the relay will trip after expiry of set time (te).

Earth fault detection delay (EdLy) to delay the detection of earth fault during motor start-up.

Thermal Over load (49)
Provides reliable protection for motor against over-heating.



Protection Function Description contd..

The protection feature is based on mathematical model of motor thermal image. The motor thermal overload protection function calculates the heat accumulated in the rotor and stator based on the effective heating current, integrated over a time tInv>. The relay appropriately takes in to account cooling of the winding by gradually emptying the accumulated current bucket. The relay displays the status of thermal condition of motor windings as a % of maximum permissible Thermal capacity.

If inverse overload characteristic (INV) is selected then only the effect of thermal memory phenomenon is enabled. If current in any of the three phases exceeds over-current setting I> as well as accumulated thermal capacity (Thermal MEM) is >=100% then mPRO will trip the motor. If thermal memory is accumulated then Relay Contact Reset depends on Relay Reset selection (AUTO/MANUAL) and Thermal Reset selection (Disable/Enable) as given in following table.

Relay Reset	Thermal Reset	Relay Trip Output Contact Reset
Auto	Enable	When Thermal capacity (Thermal MEM) <50%
Auto	Disable	When Thermal capacity (Thermal MEM) =0%
Manual	Enable	When Thermal capacity (Thermal MEM) <50% &
		Front Reset key is pressed
Manual	Disable	When Front Reset key is pressed

The effect of thermal memory can be erased by using the Thermal Memory Erase option from RECORD MENU.

CAUTION: * Make sure that at the time of installation of mPRO relay, motor is in complete cold state having no thermal content otherwise thermal modeling of relay will not be in synchronization with actual thermal state of motor.

Stall (50S)
Mechanical equipments such as pumps or fans can be quickly damaged if it jams, resulting in a locked rotor stall. The MPro will trip when the running current exceeds the set value (Stall) value after the Stalled Rotor Time (tStall). Set this value to 'OFF', if stall protection of driven equipment is not required since the thermal overload protection will protect the motor. This feature is blocked during the inrush of motor starting.

Over Temperature
mPRO provides protection against over temperature by monitoring the temperature in the motor winding. High winding temperature is caused by phase unbalance, phase fail, high torque starting, insufficient cooling etc. mPRO will trip the motor in running condition after PTC trip time (tPtc) expires, once temperature monitored via external PTC thermistor exceeds the PTC Trip value (PtcTrp).

External Fault *
External Fault is sensed through Digital Input (DI). Once this DI is active relay will trip after expiry of set time (tExtFlt).

All the protection functions are effective after the expiry of start time except Phase loss, Phase reversal, Locked rotor & Earth fault which are effective on the motor START condition also.

NOTE: Phase Loss, Phase Reversal, Short Circuit, Earth Fault protection can be available under motor start condition also, if configured. Rest other protection available under motor running condition including the above.

Protection Function Description contd..

Circuit Breaker Failure (CBFAIL)
After a fault is detected mPRO generates a trip signal via trip relay to stop the motor. If motor current does not get cutoff on expiration of CB Fail set time (tCBFL), mPRO will declare it as CBFail.

In this condition trip contact will be released only after manual acknowledgment by RESET push button / External RESET option of DI.

Analog Output (4-20mA)
mPRO converts measured value of HMI selectable parameter (Ir/Iy/Ib/ %Iub) into DC 4mA to 20mA current.

- When there is no current or measured current is upto 10% of IFL (or upto 5% of unbalance), 4mA is sent.
- When current (or % unbalance) goes beyond the predefined value (200% of IFL or 100% of unbalance), 20mA is sent.

7) Records

mPRO-200 Model stores following records in its non-volatile memory.

(a) Fault Record (b) Motor Start-Stop Record (c) Motor Run Hour (d) Motor Trip Count (e) Max Starting Current.

(a) Fault Record
mPRO records last 5 faults in its non-volatile memory with time stamp :

- Phase and earth fault current level
- Date and time of fault
- Origin of fault (over current, short circuit, stall etc.)
- Faulty phase

Fault Records helps the user to identify and analyze the cause of fault. User can view the complete fault information by entering the Fault Record No. 1 to 5. When the available memory space is exhausted, the new fault automatically overwrites the oldest Fault.

When the relay trips, the description of fault in the motor will appear on the LCD screen automatically.

(b) Motor Start-Stop Record *
The mPRO stores the last 3 Start-Stop time events in non volatile memory. When the available memory space is exhausted, the new event automatically overwrites the oldest record.

(c) Motor Run-Hour
mPRO accumulates the total RUN Hour of motor. Update time resolution is 5 min.

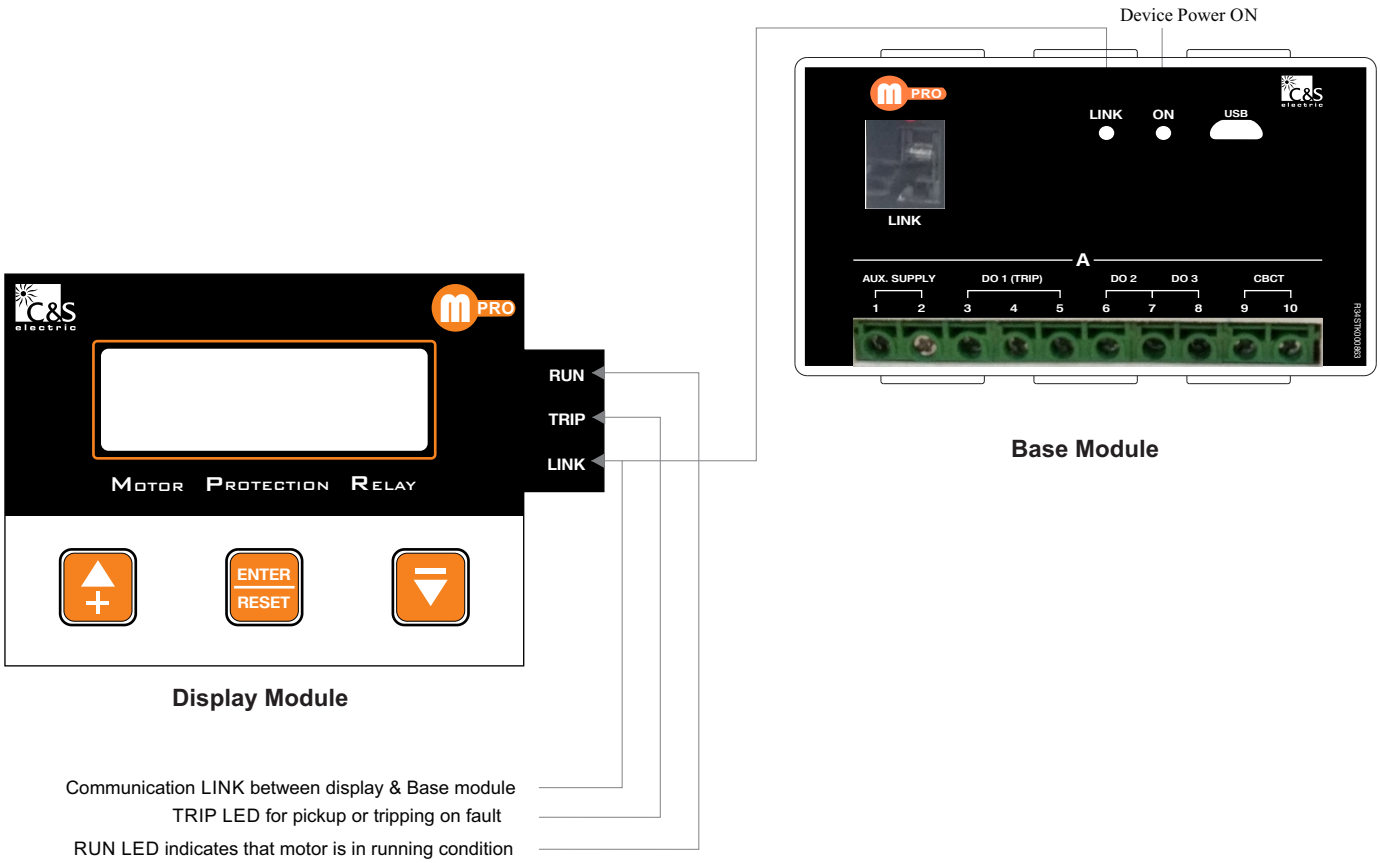
(d) Motor Trip Count *
mPRO accumulates the total Trip Count of motor.

(e) Max. Starting Current *
mPRO logs max. current during motor start.

8) Human Machine Interfaces

It comprises of 12x2 Alpha Numeric LCD display :-

- 3 Push buttons for setting & other operations for local access. one push button for fault acknowledgment / Reset.
- 1 LED for PICKUP / TRIP on fault, which require Manual reset through RESET key.
  1 LINK LED for communication link between Base & display indication.
  1 RUN LED for motor Start / Run indication.
- Motor State Indicator: Flashing of RUN LED for Motor Start & glowing steady of RUN LED for run condition.



Base Module

Display Module

Keys	Description
ENTER RESET	used as ENTER key in Edit / Setting / View menu
	Long press to enter in Edit menu
	used as Fault RESET/ acknowledgment key with single press
+	used as scroll key / increment key
−	used as scroll key / decrement key

NOTE : Cable length between Base to Display Module is 1.5 meter

9) Setting parameters

Protections Setting Parameter

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Overload Pickup	I>	50%	150%	1%	% IFL (Amp)	110%
Overload Characteristic	Char	DEFT	INV	-	-	DEFT
Overload Definite Time [5]	t>	0.1	60.0	0.1	Sec	10
Overload Operating Time [6]	tInv>	5	60.0	5	-	5
Short Circuit Pickup	I>>	200%	1500%[9]	50%	% IFL (Amp)	OFF
Short Circuit Trip Time	t>>	0.05	5.0	0.01	Sec	0.08
Earth Fault Pick up (Residual)[7]	Ie>	10%	50%	1%	% IFL (Amp)	OFF
Earth Fault Trip Time (Residual)[7]	te>	0.2	10	0.1	Sec	1
Earth Fault Pick up (CBCT) [8]	IeCT	0.03	3.00	0.01	Amp	OFF
Earth Fault Trip Time (CBCT) [8]	teCT	0.05	10	0.01	Sec	1
Under Current Pick up	I<	20%	90%	5%	% IFL (Amp)	OFF
Under Current Trip Time	t<	1.0	300.0	0.1	Sec	3
Unbalance Current Pick up	Iub	5%	50%	2.5%	%	OFF
Unbalance Current Trip Time	tIub	1	30	1	Sec	3
Phase Reversal Trip Time	tPhRev	0.5	10.0	0.1	Sec	OFF
Locked Rotor Pick up	ILR	200%	1000%[10]	50%	% IFL (Amp)	OFF
Locked Rotor Trip Time	tLKR	1	50	1	Sec	1
Phase Loss Trip Time	tPhLos	0.5	5.0	0.1	Sec	OFF
Stall Rotor Pick up	IStl	150%	600%	5%	% IFL (Amp)	OFF
Stall Rotor Trip Time	tStall	1	20	1	Sec	3
External Fault Trip Time*	tExFlt	0.5	60	0.1	Sec	1
PTC Trip Value*	PtcTrp	2500	3600	10	Ohm	OFF
PTC Reset Value	Ptc Rst	1000	1650	10	Ohm	1500
PTC Trip Time	tPtc	0.5	10.0	0.1	Sec	1
Trip CB Fail Detection Time	tCBFL	0.5	10	0.1	Sec	0.5

Note:

- All above protection are available with disable option (OFF) & in % of IFL (except Earth Fault with CBCT).
- All protection settings which are in % of IFL can be displayed on HMI (Display module) in Amp also.
- mPRO will allow change in IFL setting only if motor is in stop condition and there is no fault pickup.
- [5] Definite time is applicable when DEFT characteristic is selected.
- [6] Operating time is applicable when INV characteristic is selected. This is the tripping time at I = 6 x I>.
- [7] Earth Fault Residual Internal Calculation (model dependent).
- [8] Earth Fault calculation using externally connected CBCT (model dependent).
- [9] Max. protection setting :
  60A Model 1500% for external primary CT selection (EXCT)
  800% for built in CT selection.
  5A Model 800%
- [10] Max. protection setting :
  60A Model 1000% for external primary CT selection (EXCT)
  800% for built in CT selection.
  5A Model 800%

* Model Dependent

Setting parameters contd...

Common Setting Parameter

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Max. Rated Current Range Selection	IR	[1]* 5 / 10 / 60 / EXCT [2]* 1.25 / 2.5 / 5.0 / EXCT			Amp	60 5
Full Load Current [3]	IFL	1.00 [1]*/0.25[2]*	60.00[1]* / 5.00[2]*	0.01[5]	Amp	60/5
Motor start time	tstart	1.0	200.0	1.0	Sec	8
External CT Ratio [4]	CT_RATIO	1	999	1	-	1
DO Reset (ATO: Auto, MAN: Manual)	DOReset	ATO	MAN	-	-	MAN
Thermal Memory Reset (Enable: ON, Disable: OFF)	ThmRes	OFF	ON	-	-	OFF
DO-1 Fail Safe Mode (Enable: ON, Disable: OFF)	TpRyFlSf	OFF	ON	-	-	ON
Analog Output (4-20mA) selection*	4_20mA	Ir, Iy, Ib, %Iub		-	-	-

Note:

- Model Dependent [1]* : - 60A model, [2]* : 5A model. In case of EXCT selection, IFL value will be multiplied by CT_RATIO
- [3] Max.Current Selection & Full Load Current setting will be model dependent. Refer section **Rated Current Range Selection**
- [4] CT ratio parameter will come into picture only when external primary CT is required to be used. This settings will only be displayed, when EXCT is selected in Max. Current Selection.
- [5] When External CT (EXCT) is selected, Step size will be as per CT ratio value. Step size=CT_Ratio/100

RTC Setting Parameter

Date and Time can be set by editing HOUR, MIN, SEC, DATE, MONTH & YEAR parameters.

Communication Setting Parameter

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Slave Address	SlaveAdd	1	247	1	-	1
Baud Rate	Baudrt	9600	19200	-	bps	19200
Parity	Parity	NONE or ODD or EVEN		-	-	NONE

Advanced Setting Parameter

Parameter	Display	Setting Range		Step Size	Unit	Default Setting
		Min.	Max.			
Short Circuit detection state	SCstate	ON / RUN		-	-	RUN
Phase Reverse detection state	RPstate	ON / STRT / RUN		-	-	ON
Earth Fault detection delay time	Edly	0.0	200.0	0.1	Sec	E model: 8.0 Z model: 0.0
Motor Type (1Ph or 3Ph)	MotorTyp	3Ph	1Ph	-	-	3Ph
Protection setting display	ProSet	AMPR	%IFL	-	-	%IFL

Note:

- ON - Protection active during both motor start and run state.
- STRT - Protection active during motor start state only.
- RUN - Protection active during motor run state only.
- Selecting motor type to 1 Ph then Phase loss, Unbalance, Earth fault & Reversal function will not work.

Setting parameters contd...

Setting Parameters (DO Matrix)

There are 3 programmable DOs available which can be assigned to different Motor Fault as per the table below:

Fault
Short Circuit
Overload
Earth Fault
Unbalance
Phase Reversal
Lock Rotor
Stall
Under Current
Phase Loss
External Fault *
Over Temperature *
Trip CB Fail

*** Model Dependent**

Setting Parameters (DI Matrix) *

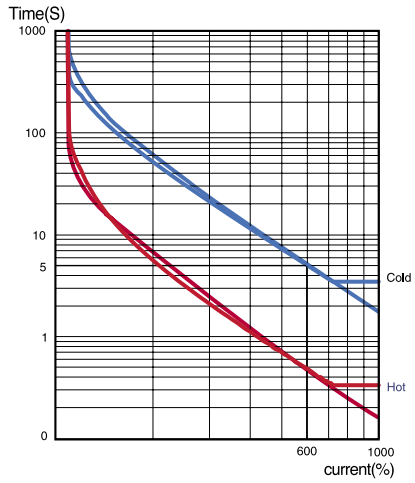
There are 2 programmable Digital Input (DI) available which can be used as External Fault, External Reset & Protection Blocking purpose as per table below:

Function
External Fault
External Reset
Over load Block
Short circuit Block
Earth Fault Block
Locked Rotor Block
Stall Block
Under current Block
Phase Loss Block
Phase Reversal Block
Unbalance Block
Thermal Block
External Fault Block *
Over Temperature Block *

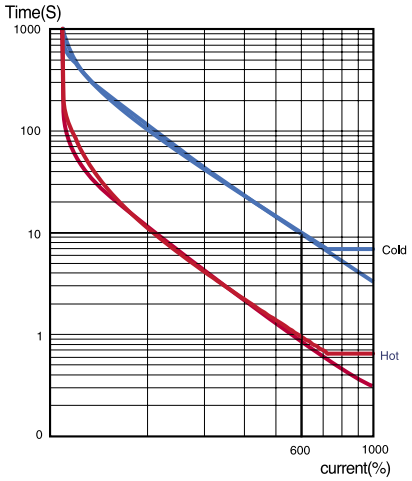
*** Model Dependent**

10) Thermal (Inverse) Curve

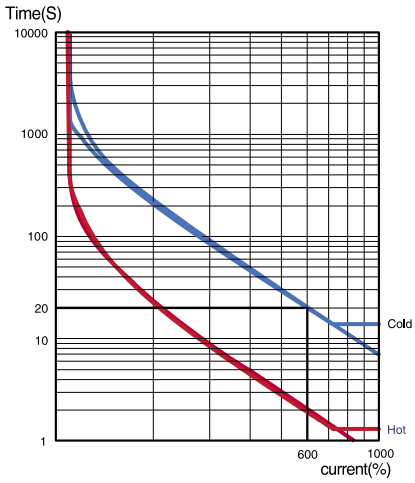
Class5



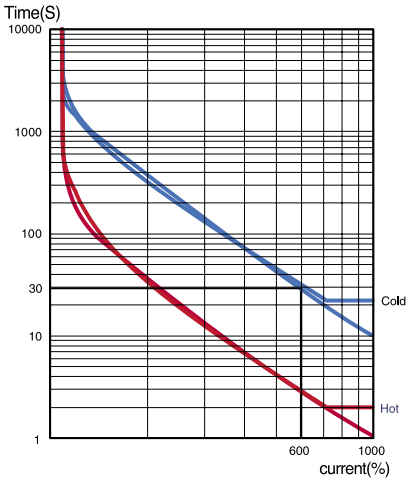
Class10



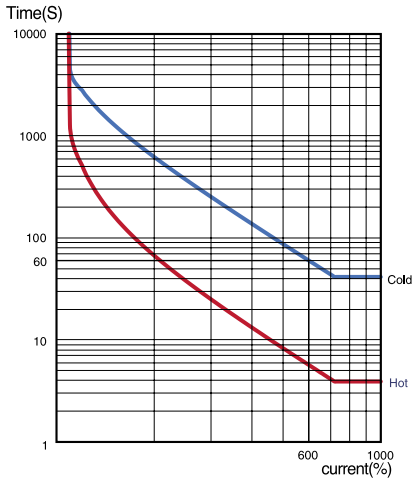
Class20



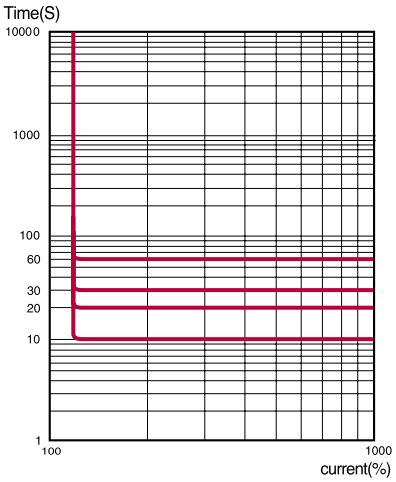
Class30



Class60



Definite time characteristic



11) Technical Data

Parameter		Description
Operational Current		0.2 - 8.0 x IFL
Frequency Range		50 / 60 Hz
Phase Current Measurement		Accuracy : ± 5% [0.5 - 6.0 x IFL (5Amp model) / 0.25 - 6.0 x IFL (60 Amp model)]
Protection		Over-Load, Under-Current, Short Circuit, Lock Rotor, Stall, Unbalance,
		Phase Loss, Phase Reversal, Earth Fault, Over Temperature, CB Failure
Design Standards (As per IEC 60947)		
	IEC 60947-4-1	Radiated Electromagnetic Field (Class A)
		Mains Terminal Disturbance Voltage (Class A)
	IEC 61000-3-2	Harmonic Current Emissions
	IEC 61000-3-3	Voltage changes, Voltage fluctuations & Flicker
		Electrostatic Discharge Immunity (Class A)
	IEC 60947-4-1	Radiated RF E-Field (80 to 1000 MHZ) (Class A)
		Electrical Fast Transient / Burst Immunity (Class A)
		Surge Immunity (Class A)
Accuracy		
	Trip Time	± 5% (or ± 100 mSec) (which ever is higher)
	Trip Current (Phase)	± 5% (or ± 0.020 Amp) (which ever is higher)
	Trip Current (Earth)	± 5% (or ± 0.020 Amp) (which ever is higher) - (Z model i.e CBCT model)
		± 10% (or ± 0.040 Amp) (which ever is higher) - (E model)
Display		
	LCD Display	Metering and Fault information
	LED	Base Module : ON, LINK
		Display Module : RUN, TRIP & LINK.
Auxiliary Supply (Refer Ordering Information)		L: 110V AC (100-160V) / H: 220V AC (190-260V)
Power Consumption		Approx. 6W
Contact Rating		
	DO Contact	1 C/O Contact - N/O contact, 5A / 250V AC or 24V DC ;
		N/C contact, 2A / 250V AC or 24V DC
		2 N/O Contact with 1 common, 5A / 250V AC or 24V DC
CBCT		30 mA to 3 Amp : CT Ratio 1:1500 (available when CBCT is used)
DO Reset		Automatic / Manual
DI Input *		Active : 40 - 160V AC (L model) / 80 - 260V AC (H model)
Analog Output (4-20mA) *		Max Load Resistance 300 Ohm
Temperature Sensor (PTC) *		Total Resistance in cold State : 1500 Ohm
		Return Value:1.5 kOhm to 1.65 kOhm, Response Value:2.7kOhm to 3.6 kOhm
Mounting		35 mm Din-rail / Panel mount
Temperature	Operation	0^{0}C to 70^{0}C
Temperature	Storage	-10^{0}C to 85^{0}C
Wiring Connection		
	For current	Penetration / Tunnel Type
For Others (Aux sup, Relay contact etc.)		Screwed Terminal

12) Rated Current Range Selection

mPRO-200 supports 0.25 to 60 Amp rated current (built-in-CT) and supports CT ratio upto 999 external CT as per following configuration: -

Model 1 (60 Amp)		Model 2 (5 Amp)		No.of times wire passes through Built-in CT
Max Rated Current	Rated Current Range	Max Rated Current	Rated Current Range	
60	5 - 60 Amp	5	1 to 5 Amp	Once
Ext CT	5 Amp	Ext CT	1Amp / 5 Amp	Once
Above are the recommended range of Current range. However optionally mPRO-200 can be used for extended current range with following option.				
5	1 - 5 Amp	0.25	0.25 - 1.25 Amp	4 times
10	2.5 - 10 Amp	0.5	0.5 - 2.5 Amp	2 times

mPRO-200 supports motor current above 60 Amp with external CT with rated secondary current of 5 Amp. e.g : 100 : 5, 200:5, 800 : 5 etc.

Note : C&S recommend to use Model-2, when using External CT.

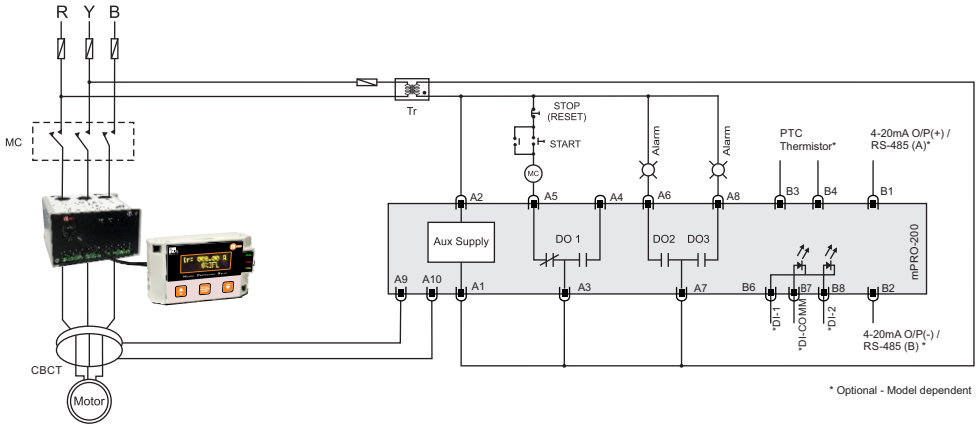
Cable Selection

The mPRO relay is provided with built-in CT operated for current up to 60 Amp.
Following are the recommended cable size

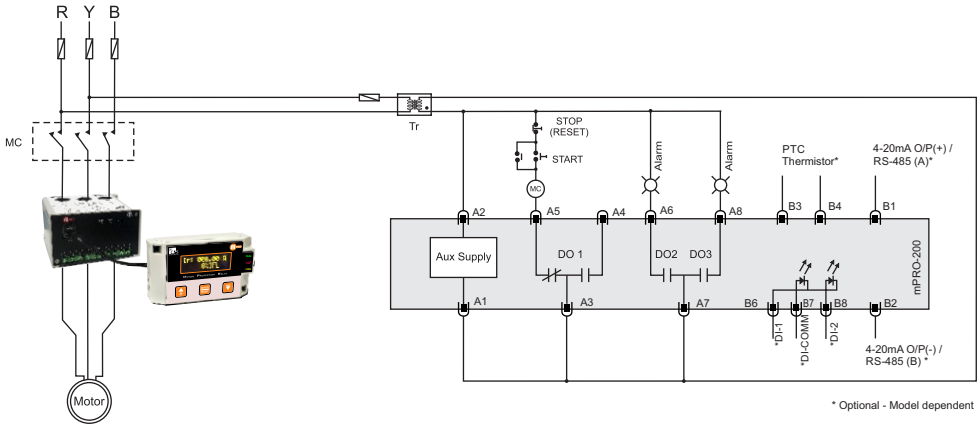
Material	Size (mm^2)	Current (A)
Copper PVC	1.5	23
	2.5	30
	4	38
	6	48
	10	64
	13	70

13) Connection Diagram

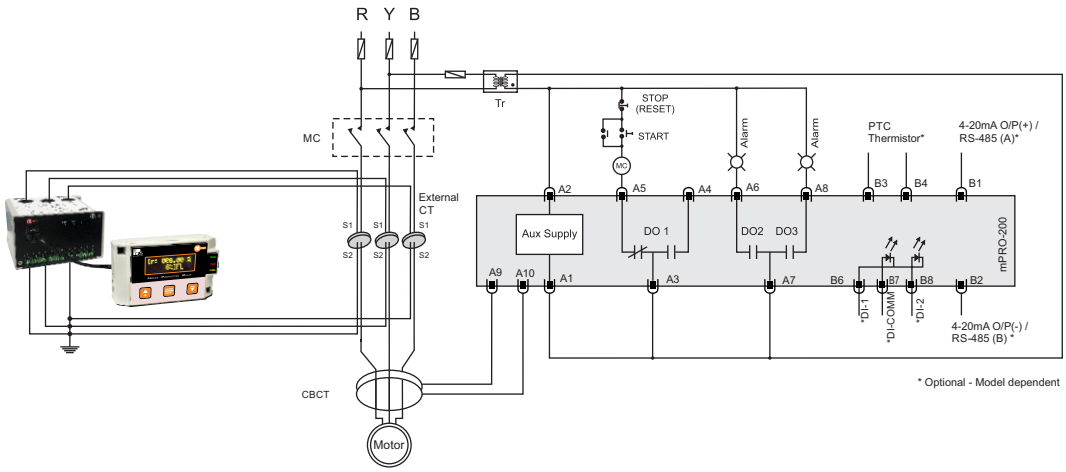
mPRO-200 with **external CBCT** for **Earth fault** detection



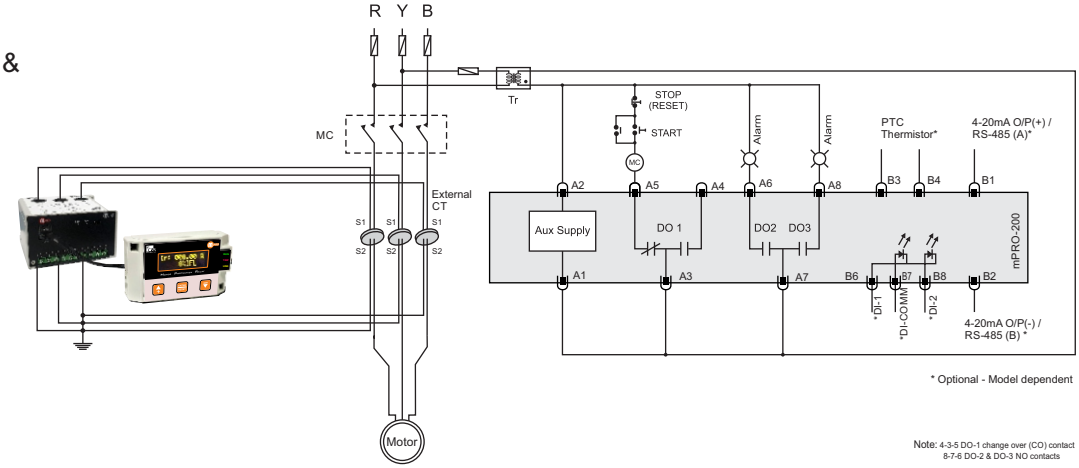
mPRO-200 with **'Built in Earth fault'** detection



mPRO-200 with **External Phase CT** & **external CBCT** for **Earth fault** detection



mPRO-200 with **External Phase CT** & **Built in Earth fault** detection

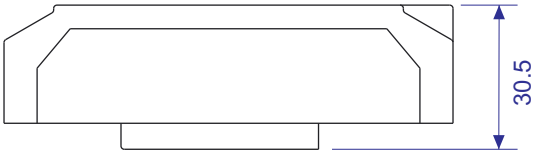


Note: 4-3-5 DO-1 change over (CO) contact
8-7-6 DO-2 & DO-3 NO contacts

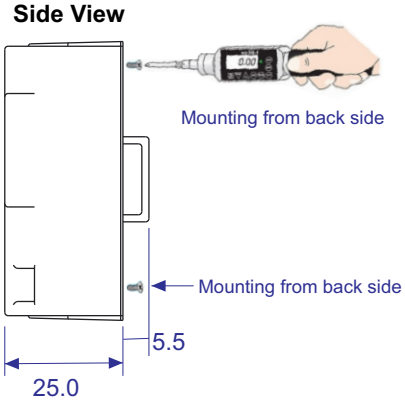
14) Dimension Details

Display Module

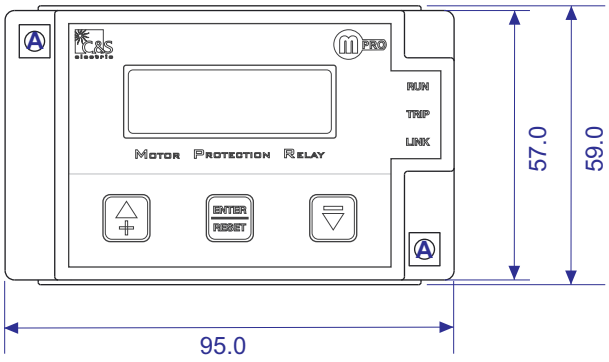
Top View



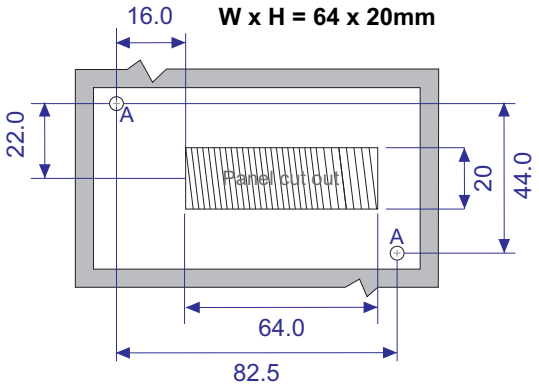
Side View



Front View



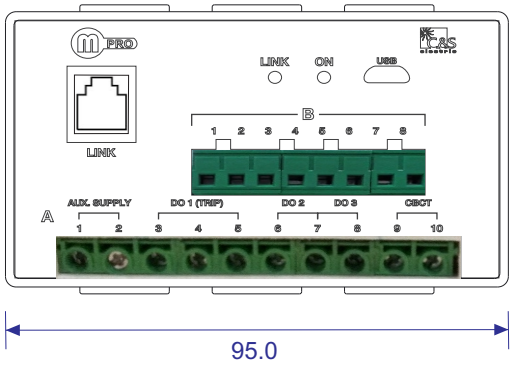
Panel cut out dimension
W x H = 64 x 20mm



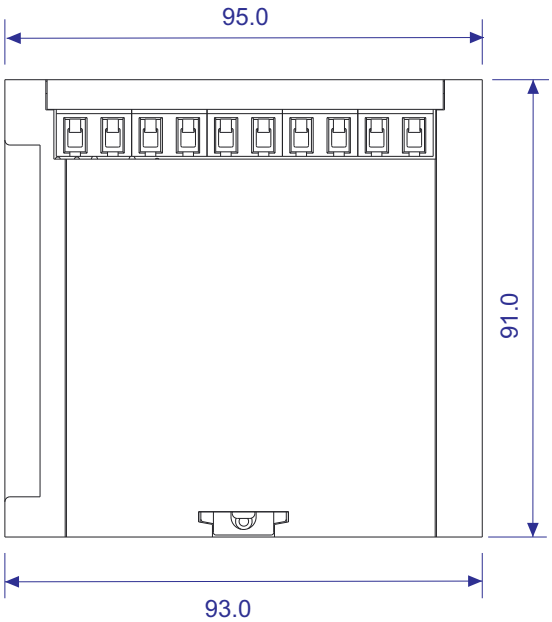
A (mounting hole) → Hole dia 3.0 mm ± 0.2.
Mounting holes of Display Module required M2.5 screw.

Base Module

Front view



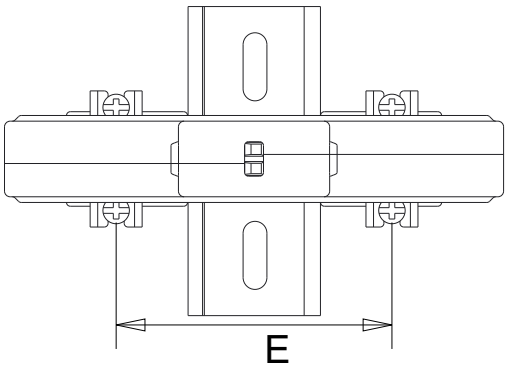
Top View

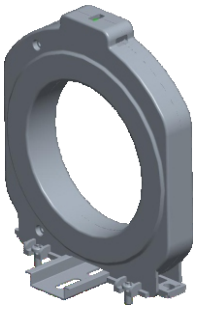


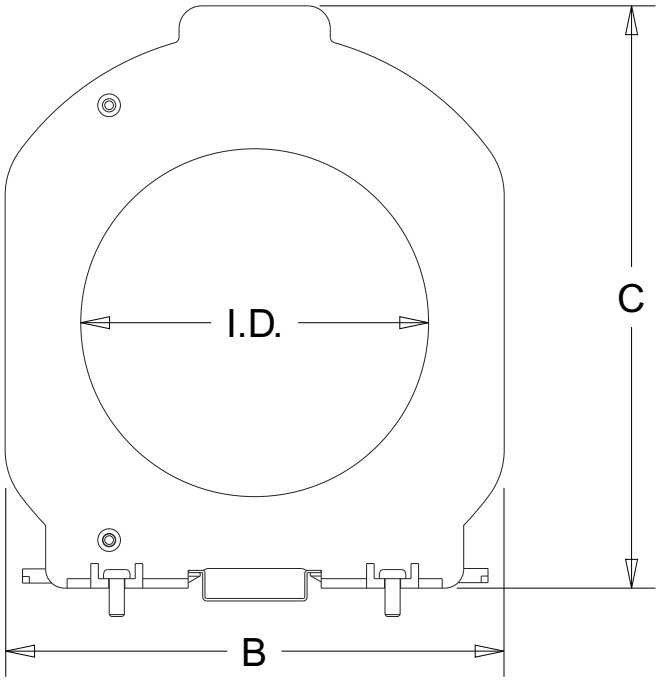
Side view

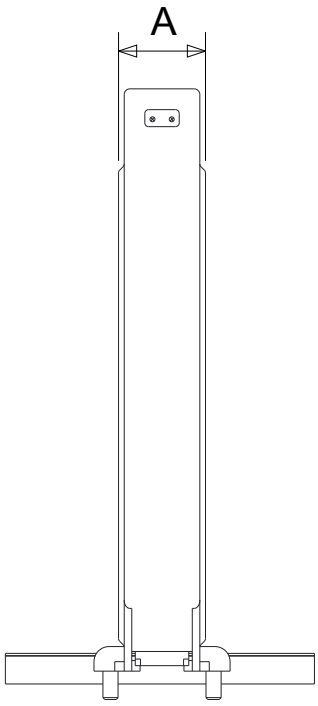
15) CBCT Details

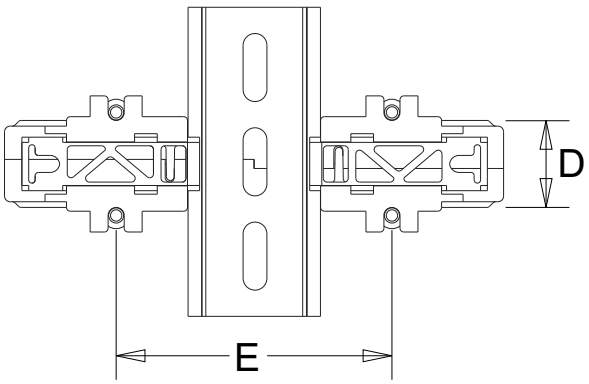
All the Dimensions are in mm. (Tolerance : ± 2.0 mm)

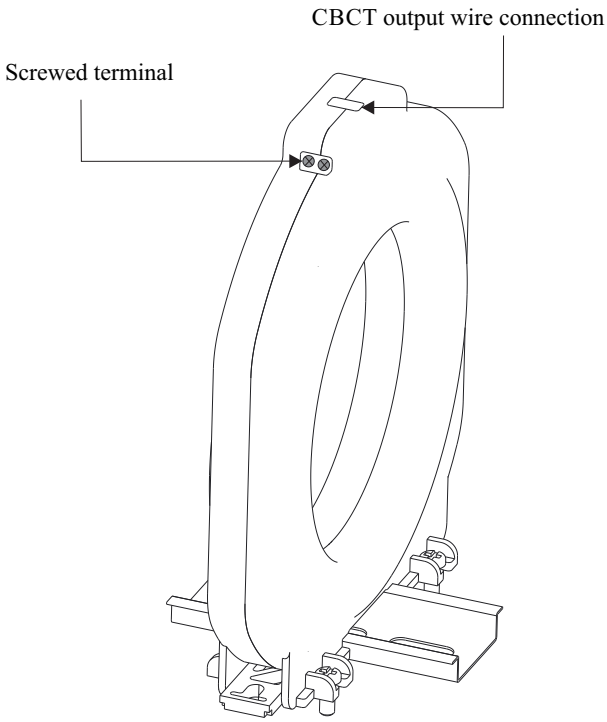










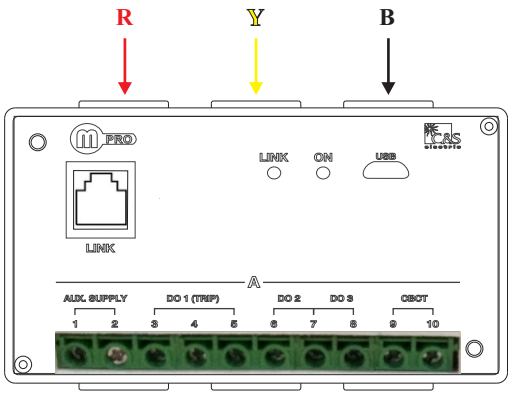


Ordering code	I.D. (min.)	A	B	C	D	E
CBCT55	57	20	97	117	22	55
CBCT70	70	20	109	133	22	59
CBCT90	92	20	132	155	22	73
CBCT120	120	20	153	176	22	73

16) Terminal Description

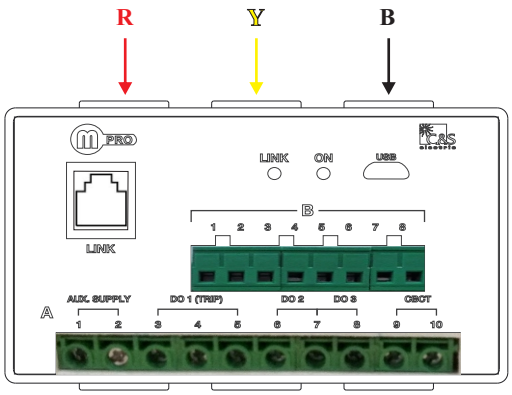
Base Module

Front View



mPRO-200 Basic Model

Front View



mPRO-200 with Advance option

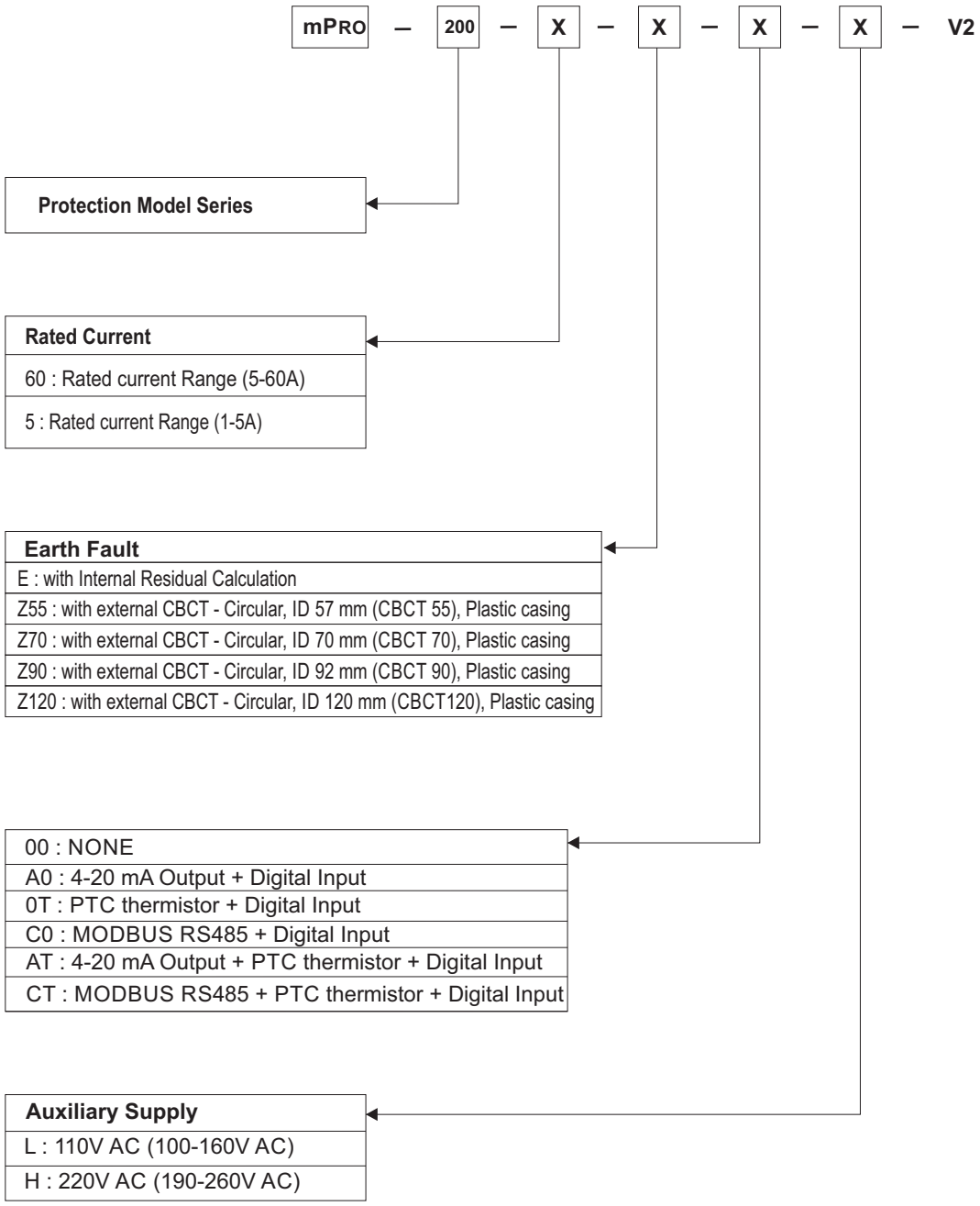
	Term No.	Terminal Description
A	1	Aux Supply (N)
	2	Aux Supply (L)
	3	DO-1 (Common)
	4	DO-1 (NO)
	5	DO-1 (NC)
	6	DO-2 (NO)
	7	DO-2 & DO-3 (Common)
	8	DO-3 (NO)
	9	CBCT-1 Input
	10	CBCT-1 Input

	Term No.	Terminal Description
B	1	RS-485 (A) / 4-20mA output (+)
	2	RS-485 (B) / 4-20mA output (-)
	3	PTC Thermistor
	4	PTC Thermistor
	5	x
	6	Digital Input-1
	7	Digital Input 1 & 2 Common
	8	Digital Input-2

* Model dependent

Terminal no. B1 to B8 is available with advance model only.

17) Ordering Information



* CBCT Ordering Information (To be selected for mPRO-200-x-Z-x-x model)

CBCT SIZE
Z55 : Circular, ID 57 mm (CBCT 55), Plastic casing
Z70 : Circular, ID 70 mm (CBCT 70), Plastic casing
Z90 : Circular, ID 92 mm (CBCT 90), Plastic casing
Z120 : Circular, ID 120 mm (CBCT 120), Plastic casing

Revision History

S.No.	Rev.No.	Details	Date
01	01	Change in CBCT ordering code & ID on Pg. 17 & in ordering information Pg.19	24.04.19
02	02	Change in CBCT ordering code & ID on Pg. 17 & in ordering information Pg.19	25.04.19
03	03	Change in terminal numbering of conn. diagram scheme on page 15 of the catalog	10.06.19
04	04	Change in dimension details of the product	25.06.19
05	05	CBCT dimension D changed now it is 22mm for all IDs	09.07.19
06	06	Advance settings, Product Photograph changed in the catalog	24.07.19
07	07	Add metering accuracy in tech data on page 13	19.09.19
08	08	Change in HMI on page 8 and change in ordering information	25.01.20
09	09	Include Note for Protection on page 6	11.09.20
10	10	Panel cut out dimension changed on page 16	23.09.20
11	11	Removed standard LCD, OLED Display option & 'W' aux power supply option from ordering info & from Tech data	20.11.20
12	12	Change in Ordering information for CBCT details	24.11.20
13	13	Include NOTE : Cable length between Base to Display Module is 1.5 meter in HMI section on page 8	24.11.20
14	14	Change in Thermal Inverse Curve on page 12	12.06.21
15	15	Mounting hole details of display module added on page 16	02.01.24
16	16	Change in Thermal Inverse curve on page 12	04.12.24

NOTE

The content in this document are not binding and is for general information.
C&S reserves the right to change the design, content or specification contained in this document without prior notice.

For further information, please contact:

C&S Electric Ltd.
(Protection & Measurement Devices)

C-60, Wing-A, Phase-II, Noida-201 305, Dist: Gautam Budh Nagar (U.P) INDIA
Phone : +91-120-38748 00 / 01 Fax: +91-120-3874802

Technical Question or After-sales Service

Customer Center Quick Response Service, Excellent Technical Support

1800 572 2012

Issue Date: 19.04.19, Rev. No: 16, Rev. Date: 04.12.24

Branch office

Branch	Phone	Fax	E-mail
Ahmedabad:	+91-79-615651 22/23/24	+91-79-61565130	ahmedabad@cselectric.co.in
Bangalore:	+91-80-305703 72/73, 30570347	+91 2558 4839	bangalore@cselectric.co.in
Bhubaneswar:	+91-674-2507265	+91 674 2507265	bhubaneswar@cselectric.co.in
Chennai:	+91-44-33534501,33534521-23	----	chennai@cselectric.co.in
Cochin:	+91-484-3071717	+91 0484 3071716	cochin@cselectric.co.in
Delhi:	+91-11-338490 00/10/11	+91 11 30838826	delhi@cselectric.co.in
Hyderabad:	+91-40-485340 80/82	----	hyderabad@cselectric.co.in
Kolkata:	+91-33-392121 19-21	----	----
Mumbai:	+91-22-241147 27/28	----	cspc.mumbai@cselectric.co.in
Pune:	+91-20-242505 18/19	+91 20 30283244	pune@cselectric.co.in