



Operating Instructions of Servo Controller Three Phase with One/Three Motor Control PSR-1/PSR-3



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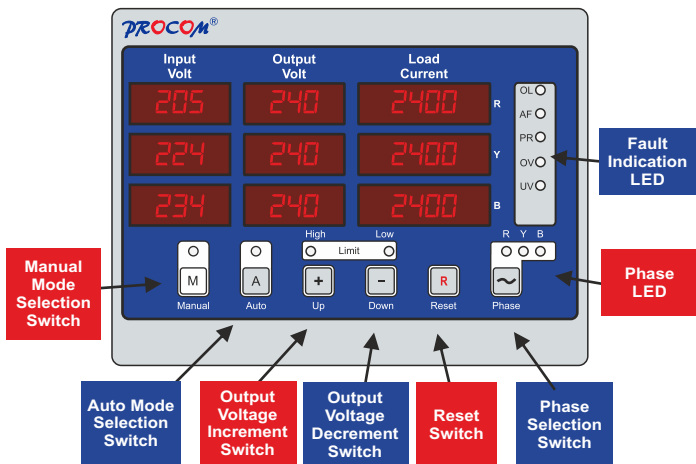
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□ 1.0 Introduction

PSR-3/PSR-1 is digital controller equipped with 3 row alphanumeric seven segment display and 6 navigator keys simplifies configuration of controller.

□ 2.0 Salient Features:

- 32 Bit RISC floating point microprocessor.
- Response time 60mSec.
- Fast Fourier Transformation to eliminate Harmonics & Surges/Sag.
- High performance & Accuracy.
- Simultaneous display of all measured quantity.
- Password protection for user programmable parameters.
- Mode saving after disconnection of power will return to the mode selected (AUTO/ MANUAL) before power interruption
- Contact polarity configurable for both input and output trip contact and hence can use MCCB with shunt trip or contactor (site configurable)
- Motor lock protection
- Input under & over voltage protection (Available in PSR-A & PSR-C)
- Output under & over voltage protection
- Phase sequence / phase reversal protection
- Over load protection
- Auto function fail protection
- RS-485 Modbus Communication (optional)
- Optional small instrumentation C.T
- Auxiliary supply switches on from any of the three phase
- Voltage withstand limit max. 600 volt AC (phase-phase)
- KW & P.F display via RS-485 Communication
- Fault data recording with RTC via RS-485 Communication
- Six 3 digit & three 4 digit seven segment display
- Separate contact for hooter & trip
- Up to six input for high cut & low cut servo motor
- Voltage display can be selected as phase-phase or phase-neutral
- Voltage, over load, phase reversal, neutral break protection can be independently enabled & disabled at site
- Plug in connection
- Interconnection between servo controller & relay card through ribbon cable which results in reduction & ease of wiring
- IP-54 protection from front



□ 3.0 Display/Front Panel:

- Fault Indication LEDs
- Limit switches LEDs
- Manual/Auto selection switch.
- Output voltage Increment/Decrement switch.
- Manual /Auto mode LEDs
- Phase Selection LEDs
- Phase selection switch
- Reset switch.

□ 4.0 Technical Specifications:

Measurement Accuracy	: Class 1 ($\pm 1\%$ Of Full Scale)
Input Voltage	: Vr, Vb, Vy, Vn
Input Voltage Measured Range	: 40-600V AC (L-L) / 10-350V AC (L-N)
Voltage Withstand	: 800V L-L Max., 1000V for 1 Minute
Isolation Between Terminal & Body:	2kV
Input Current	: Ir, Iy, Ib
Input Current Range	: 0-5 A(For instrumentation CT upto 150 A)
Current Withstand	: 10A Continuous, 50A for 1 Second
Input Frequency	: 45 To 55 Hz
Auxiliary Supply	: 3 P3W/3P4W (115-550v AC/DC) Works With Any Two Wire
Input/output Voltage Display	: 3 Row 3 Digit
Input Current Display	: 3 Row 4 Digit
Response Time	: 60msec
Operating Temperature	: -20°C to $+70^{\circ}\text{C}$
Storage Temperature	: -25°C to $+80^{\circ}\text{C}$

Mounting
Cut out Dimensions
Weight

: Panel Mount
: 155mm X 117mm
: 500gm

□ **5.0 Different models of PSR:**

- A. PSR-A1
- B. PSR-A3
- C. PSR-B1
- D. PSR-B3
- E. PSR-C3

5.1 Descriptions about each model:

A. PSR-A1: .

Suitable for three phase balance / single motor control. It has Input voltage, output voltage, phase reversal, neutral break, motor lock , auto function failure protection & also has two input i.e. low cut and high cut control for one motor. Correction is done on only phase -phase voltage. Any two phase can be selected and are configurable. The input & output trip contact can be configurable as per MCCB with shunt trip & contactor on site.

B. PSR-A3:

Suitable for three phase unbalance / three motor control. It has Input voltage, output voltage, phase reversal, neutral break, motor lock, auto function failure protection & also has six input i.e. low cut and high cut control for each of three motor. Correction is done on both phase - phase & phase-neutral voltage. The input & output trip contact can be configurable as per MCCB with shunt trip & contactor on site.

C. PSR-B1:

Suitable for three phase balance/single motor control. It has output voltage, phase reversal, auto function failure protection & also has two input i.e. low cut and high cut for single motor. Correction is done on phase-phase voltage only. Any two phase can be selected and are configurable.

D. PSR-B3:

Suitable for three phase unbalance/three motor control. It has output voltage, phase reversal, auto function failure protection & also has six input i.e. low cut and high cut control for each of three motor. Correction is done on both phase -phase & phase-neutral voltage.

E. PSR-C3: Suitable for three phase unbalance/three motor control. It has Input voltage, output voltage, phase reversal, neutral break, motor lock , auto function failure protection & also has six input i.e. low cut and high cut control for each of three motor. Correction is done on both phase -phase & phase-neutral voltage. The input & output trip contact can be configurable as per MCCB with shunt trip & contactor on site.

□ **6.0 Relay Card Description:**

6.1 For PSR-A & PSR-C:

● **For PSR-A1 five potential free output contacts are provided :**

1. Phase Increase
2. Phase Decrease
3. Hooter
4. Input Trip
5. Output Trip

● **For PSR-A3 & PSR-C3 nine potential free output contacts are provided:**

1. R Phase Increase
2. R Phase Decrease
3. Y Phase Increase
4. Y Phase Decrease
5. B Phase Increase
6. B Phase Decrease
7. Hooter
8. Input Trip
9. Output Trip

6.2 For PSR-B:

● **For PSR-B1 four potential free output contacts are provided:**

1. Phase Increase
2. Phase Decrease
3. Hooter
4. Output trip

For PSR-B3 eight potential free output contacts are provided:

1. R Phase Increase
2. R Phase Decrease
3. Y Phase Increase
4. Y Phase Decrease
5. B Phase Increase
6. B Phase Decrease
7. Hooter
8. Output trip

• Relay Specifications

Contact Arrangement	: 1 C/O
Contact Rating	: 10A @ 230 VAC
Mechanical life expectancy	: 10^6
Electrical life expectancy	: 10^5

Relay card selection(No. Of output contact):

• For PSR-A1:

Five channel is to be used. One for control the motor in forward direction, one for control the motor in backward direction, one for hooter, one for input trip, and the last one for output trip.

• For PSR-A3:

Nine channel is to be used. Two each for three phase (R, Y, B) forward and reverse direction for three motor, one each for hooter, input trip & output trip respectively.

• For PSR-B1:

Four channel is to be used. One for control the motor in forward direction, one for control the motor in backward direction, one for hooter, one for output trip.

• For PSR-B3:









Eight channel is to be used. Two each for three phase (R, Y, B) forward and reverse direction for three motor, one each for hooter, output trip respectively.

• For PSR-C3:

Thirteen channel is to be used. Two each for three phase (R, Y, B) forward and reverse direction for three motor, one for hooter, three for input trip for three phases (R,Y,B) individual trip & three for output trip for three phases (R, Y, B) individual trip.



□ 7.0 Switches Description:

PSR-3/PSR-1 has 6 switches provided on its front panel. The table below describes the operation of these:

Switch Symol	Switch Function	Description
	Manual Mode	By pressing the Manual switch, controller enters in manual mode.
	Auto Mode	By pressing the Auto switch, controller enters in Auto Mode.
	Increment	By pressing the increment switch, the output voltage limit can be increased.
	Decrement	By pressing the decrement switch, the output voltage limit can be decreased.
	Reset	By pressing the Reset switch, hooter and fault signals are reseted.
	Phase/Prog.	In PSR-3 by pressing the Phase switch, phase can be selected as per LED RYB phase indication. In PSR-1 by pressing the Prog. Switch, the controller enters into programming mode.
 & 	Programming Mode entry Next	By pressing both switches (Dec. & Phase) the controller will enter in programming mode. After entering in programming mode the Reset switch is used to select the next parameter to be programmed.

□ 8.0 LEDs Description

PSR-1 has 9 LEDs provided on its front panel. PSR-3 has 12 LEDs provided on its front panel. The table below describes the operation of these.

Nomenclature	Symbol	Description
Auto		Auto LED glows continuously when controller is in Auto Mode.
Manual		Manual LED glows continuously when controller is in Manual Mode.
Low		Low LED glows continuously when low voltage limit is reached.
High		High LED glows continuously when high voltage limit is reached.
R *		R LED glows continuously when R phase is selected. (Not provided in PSR-1)
Y *		Y LED glows continuously when Y phase is selected.(Not provided in PSR-1)
B *		B LED glows continuously when B phase is selected.(Not provided in PSR-1)
OL		OL LED glows continuously when overload is perceived.
AF		AF LED glows continuously when auto correction of set system output voltage is not perceived.
PR		PR LED glows continuously when Phase reversal is perceived.
OV		OV LED glows continuously when Over Voltage is perceived.
UV		UV LED glows continuously when Under Voltage is perceived.

***Available only in unbalance model**

□ 9.0 Setting Procedure: How to Enter in Parameter Mode

- Press Dec. & Phase/Prog switches simultaneously. The controller shall display, "Edt".
- To enter in edit parameter mode

Press Keys above Together

Edt

Press Dec. & Phase switch together



Edt appears on display.




Press "Reset" switch to move forward 

Ent PAS 1

Display will show PAS 1



Press INC or DEC switch to reach 1 which is the default password. Once 1 is set Press "Reset" switch to move forward 

PAS OK

Display will show PAS Ok



Press "Reset" switch to move forward 

DIS TYP 3P 3Y

Display will show DIS TYP 3P3W




Press INC or DEC switch to choose 3P3W or 3P4W display format.

Press "Reset" switch to move forward 

SET VOL 231

Display will show SET VOL 231




Press INC or DEC switch to select the desired Output voltage. Press "Reset" switch to move forward 

SVL HYS 1

Display will show SVL HYS 1



Press INC or DEC switch to select the desired Hystereresis. Press "Reset" switch to move forward 

CT PRI 01

Display will show CT PRI 01



CT SEC 1

Press INC or DEC switch to select the desired CT Primary turns .Press "Reset" switch to move forward



VIN ENB*

Display will show CT SEC 1

Press INC or DEC switch to select the desired CT Secondary turns. Press "Reset" switch to move forward



VIN DLY*

Display will show VIN ENB

Press INC or DEC switch to select the input voltage protection enable/disable. Press "Reset" switch to move forward



INP OV*

Display will show VIN DLY

Press INC or DEC switch to select the input voltage protection delay. Press "Reset" switch to move forward



INP OV HYS*

Display will show INP OV

Press INC or DEC switch to select the input over voltage . Press "Reset" switch to move forward



INP OV DLY*

Display will show INP OV HYS

Press INC or DEC switch to select the desired input over voltage hysteresis. Press "Reset" switch to move forward



Display will show INP OV DLY

Press INC or DEC switch to select the desired input over voltage delay. Press "Reset" switch to move forward

***Will not show in PSR-B**

INP UV*

Display will show INP UV

Press INC or DEC switch to select the desired input under voltage . Press "Reset" switch to move forward

INP UV HYS*

Display will show INP UV HYS

Press INC or DEC switch to select the desired input under voltage hysteresis . Press "Reset" switch to move forward

INP UV DLY*

Display will show INP UV DLY

Press INC or DEC switch to select the desired input under voltage delay . Press "Reset" switch to move forward

OUT OV 270

Display will show OUT OV 270

Press INC or DEC switch to select the desired output Over Voltage limit.
Press "Reset" switch to move forward

OUT OV HYS 5

Display will show OUT OV HYS 5

Press INC or DEC switch to select the desired output Over voltage Hysteresis.
Press "Reset" switch to move forward

OUT OV DLY 5

Display will show OUT OV DLY 5

Press INC or DEC switch to select the desired output Over voltage fault delay. Press "Reset" switch to move forward.

OUT UV 200

Display will show OUT UV 200

Press INC or DEC switch to select the desired output Under voltage limit. Press ""Reset" switch to move forward

***Will not show in PSR-B**

OUT UV HYS 5

Display will show OUT UV HYS 5

Press INC or DEC switch to select the desired output Under voltage Hysteresis.

Press "Reset" switch to move forward

OUT UV DLY 5

Display will show OUT UV DLY 5

Press INC or DEC switch to select the desired output Under voltage fault delay.

Press "Reset" switch to move forward

OL 05

Display will show OL 05

Press INC or DEC switch to select the desired Over Load limit. Press "Reset" switch to move forward

OL DLY 5

Display will show OL DLY 05

Press INC or DEC switch to select the desired Over Load fault delay.

Press "Reset" switch to move forward.

Pr DIS

Display will show Pr DIS

Press INC or DEC switch to choose Phase reversal Enable or Disable.

Press "Reset" switch to move forward.

HOT 120

Display will show HOT 120

Press INC or DEC switch to select the desired Hooter enable time.

Press "Reset" switch to move forward.

DEC ID**

Display will show DEC ID

Press INC or DEC switch to select the desired device ID

Press "Reset" switch to move forward. R

BUD RTE**

Display will show BUD RTE

Press INC or DEC switch to select the desired BAUD RATE

Press "Reset" switch to move forward. R

COM PAR**

Display will show COM PAR

Press INC or DEC switch to select the desired communication parity

Press "Reset" switch to move forward. R

STP BIT**

Display will show STP BIT

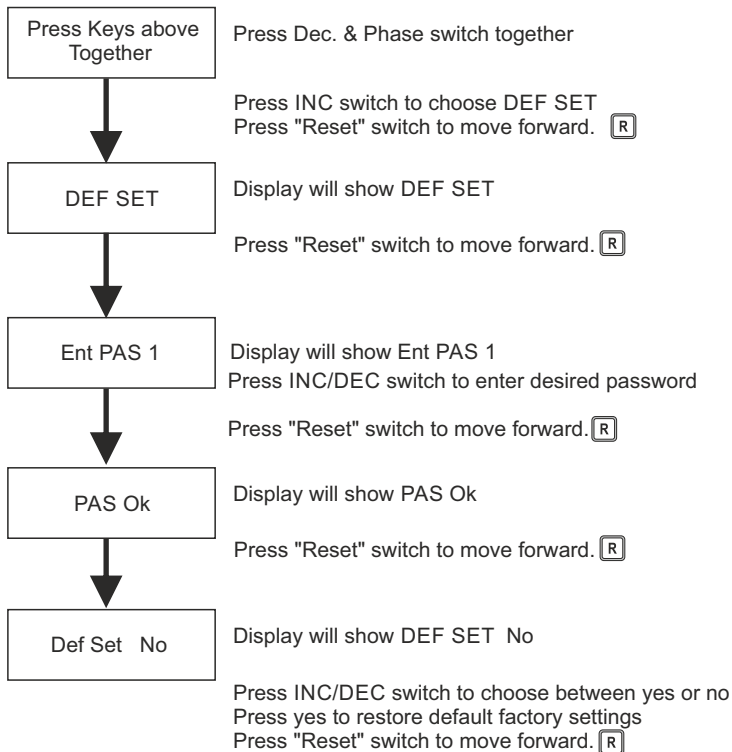
Press INC or DEC switch to select the desired stop bit

Press "Reset" switch to move forward. R

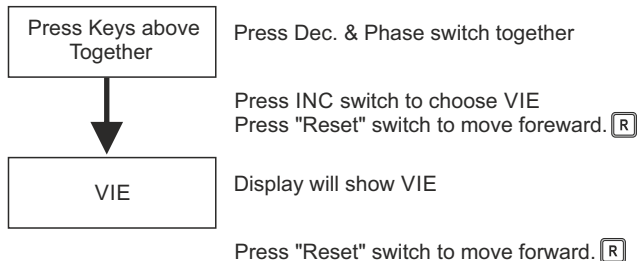
***Will not show in PSR-B**

****Will show in model with RS-485 Communication**

□ 10.0 Setting Procedure: How to Restore Factory Settings

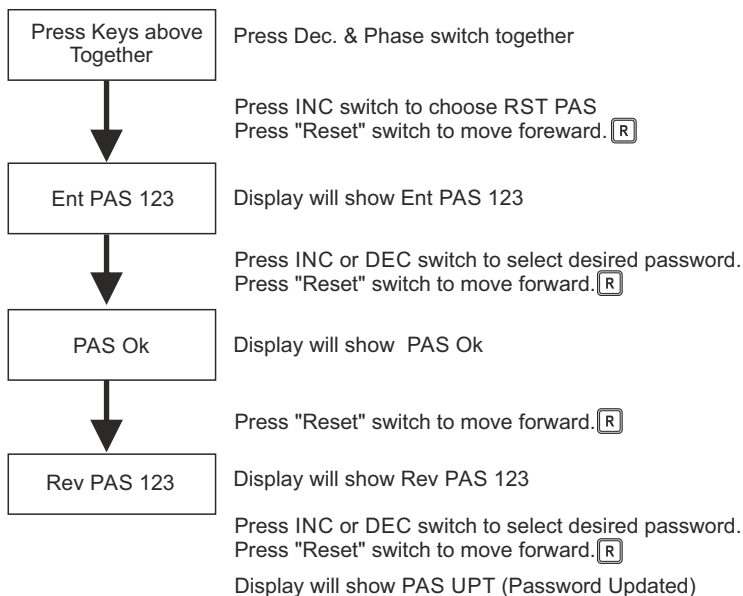


□ 11.0 Setting Procedure: How to Enter in View Mode



By pressing "Reset" switch browse through all the set parameters one by one.

□ 12.0 Setting Procedure: How to Reset Password



□ 13.0 Parameter Mode for PSR

The following tables gives the detailed descriptions of parameter name/settings

Parameter Name on Display	Explanation of Parameter	Factory Setting	Setting Range
Ent PAS (Enter password)	System settings are password protected. Password is a three digit number.	1	1-999
Dis typ	Display type is configured to show in either 3P3W format or in 3P4W format.	3P3W	3P3W; 3P4W
Cor PH (available only in PSR A1, PSR B1)	Select from Phase R/Y/B for correction	RY	RY; YB; BR
Set Vol (Set output voltage limit)	Set the desired output voltage.	230	100-300
Set Vol Hys	The desired output voltage hysteresis. E.g. If the voltage is set as 230 volt & hysteresis as 3 volt, then voltage is assumed healthy between 227 volt-233 volt. Whenever motor moves for correction brings the voltage at centre of the range & corrects the voltage again if the voltage goes below 227 volt or above 233 volt.	3	1-20
CT Pri	The desired primary turns of CT	1500	1-9999
CT Sec	The desired secondary turns of CT	5	1-10
VIN ENB	Select input voltage protection	ENB	ENB/DIS
IVN DLY	Input voltage protection delay	05	02-20
INP OV	The desired input over voltage	270	100-300
INP OV HYS	Input over voltage hysteresis.	10	1-20
INP OV DLY	Input over voltage delay	3	1-20
INP UV	The desired input under voltage	200	100-300
INP UV HYS	Input under voltage hysteresis.	10	1-20
INP UV DLY	Input under voltage delay	3	1-20

Not Available In PSR-B

OUT OV	The desired output over voltage limit	248	100-300	
OUT OV HYS	The desired over voltage hysteresis.	10	1-20	
OUT OV DLY	The desired over voltage fault delay.	3	1-20	
OUT UV	The desired under voltage limit	214	100-300	
OUT UV HYS	The desired under voltage hysteresis.	10	1-20	
OUT UV DLY	The desired under voltage fault delay.	3	1-20	
OL	The desired over load limit	1500	1-9999	
OL DLY	The desired over load fault delay.	5	1-20	
Pr	Phase reversal	DIS	ENB/DIS	
Hot DLY	Hooter on time	120	1-999	
DEC ID	Device ID	1	1-247	
BUD RTE	Baud Rate	9600	19200 9600 4800 2400 1200	Available only in model with RS-485 Communication
COM PAR	PARITY	None	NONE ODD EVEN	
STP BIT	STOP BIT	1	1-2	

□ 14.0 Terminal Details:

Terminal No.	Description
1	CT R S1
2	CT R S2
3	CT Y S1
4	CT Y S2
5	CT B S1
6	CT B S2
7	D(-)
8	D(+)
9	NC
10	Down
11	UP
12	COM.
13	Neutral
14	V _O B
15	V _O Y
16	V _O R
17	V _I R
18	V _I Y
19	V _I B
20	Neutral
21	R-High limit
22	R-Low limit
23	Y-High limit
24	Y-Low limit
25	B-High limit
26	B-Low limit

□ 15.0 Connection Diagram:

CT R	CT Y	CT B
1	2	3
4	5	6
7	8	9

(-)D	(+)D	(-)N	(+)N
7	8	6	

Relay Card

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26	25	24	23	22	21
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*B-L *B-H *Y-L *Y-H R-L R-H

MRM *PROCOM* Pvt. Ltd.
www.mrmprocom.com
 PSR-3

20	19	18	17
----	----	----	----

N V/B V/Y V/R

10	11	12
----	----	----

DownUp Com.

13	14	15	16
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N V₀B V₀Y V₀R

CT R	CT Y	CT B
1	2	3
4	5	6
7	8	9

(-)D	(+)D	(-)N	(+)N
7	8	6	

Relay Card

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22	21
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R-L R-H

MRM *PROCOM* Pvt. Ltd.
www.mrmprocom.com
 PSR-1

20	19	18	17
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N V/B V/Y V/R

10	11	12
----	----	----

DownUp Com.

13	14	15	16
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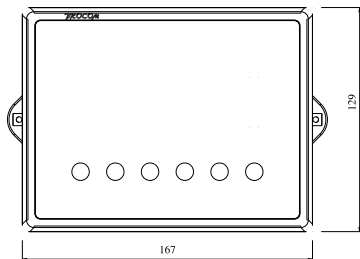
N V₀B V₀Y V₀R

□ 16.0 Model Selection

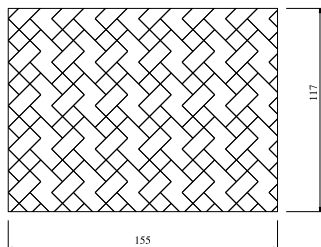
MODEL	DESCRIPTION	U/O Voltage Protection on Input Side	Individual Disconnection on U/O Voltage	COM
PSR-B-1	Three Phase Balance single Motor Control	—	—	—
PSR-B-1-485	Three Phase Balance single Motor Control	—	—	✓
PSR-A-1	Three Phase Balance single Motor Control	✓	—	—
PSR-A-1-485	Three Phase Balance single Motor Control	✓	—	✓
PSR-B-3	Three Phase Unbalance Three Motor Control	—	—	—
PSR-B-3-485	Three Phase Unbalance Three Motor Control	—	—	✓
PSR-A-3	Three Phase Unbalance Three Motor Control	✓	—	—
PSR-A-3-485	Three Phase Unbalance Three Motor Control	✓	—	✓
PSR-C-3	Three Phase Unbalance Three Motor Control with under and over voltage protection on input side	✓	✓	—
PSR-C-3-485	Three Phase Unbalance Three Motor Control with under and over voltage protection on input side	✓	✓	✓
PSR-B-1-6500T	Three Phase Balance single Motor Control	—	—	—
PSR-B-1-485-6500T	Three Phase Balance single Motor Control	—	—	✓

MODEL	DESCRIPTION	U/O Voltage Protection on Input Side	Individual Disconnection on U/O Voltage	COM
PSR-A-1-6500T	Three Phase Balance single Motor Control	✓	—	—
PSR-A-1-485-6500T	Three Phase Balance single Motor Control	✓	—	✓
PSR-B-3-6500T	Three Phase Unbalance Three Motor Control	—	—	—
PSR-B-3-485-6500T	Three Phase Unbalance Three Motor Control	—	—	✓
PSR-A-3-6500T	Three Phase Unbalance Three Motor Control	✓	—	—
PSR-A-3-485-6500T	Three Phase Unbalance Three Motor Control	✓	—	✓
PSR-C-3-6500T	Three Phase Unbalance Three Motor Control with under and over voltage protection on input side	✓	✓	—
PSR-C-3-485-6500T	Three Phase Unbalance Three Motor Control with under and over voltage protection on input side	✓	✓	✓
Relay Card-8 Ch-unbalance	8 ch for PSR B3 and PSRA3			
Relay Card - 4 Ch-Balance	4Ch for PSR B1 and PSR A1			
Relay Card-9 Ch-unbalance	9Ch relay Card for PSR PSR-C3 and PSRD3			
Relay Card - 12 Ch	12 ch relay card For PSR D3 and E3			
CT 6500T	Instrumentation CT up to 160Aamp			

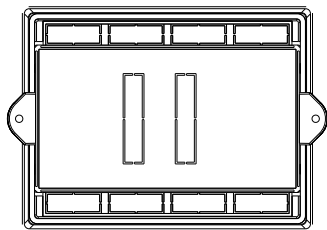
□ 17.0 Dimensional Detail



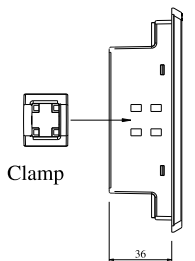
Front View



Cut Out



Rear View



Side View

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