Get high performance control in high power applications from *Thytron Battery Charger* which perform fast battery chargers developed specifically to meet the needs of today's industrial battery system.

Principle of Operation

THYTRON Battery Charger uses Thyristor switching technology for achieving the desired DC output. It basically consists of a isolation transformer, a semi conductor SCR bridge, a filter circuit with choke and capacitor to smooth out the DC output, and a control circuit. The AC mains voltage is transformed to a suitable level and fed to the SCR bridge which rectifies the AC input and feeds controlled DC output to the battery and load, after being smoothened by the filter circuit. The power output requirement is adjusted by using phase control technique which is provided by the control circuit. The feedback signals from the output to the control circuit are used for maintaining voltage regulation and current limit.

Application

- Switch Gear Protection
- Transmission/Distribution
- Telecommunication
- Onshore/Offshore
- Process Control
- Defense
- Emergency Lighting
- Airport
- Engine Starting
- Power Station
- Power Station Control
- Turbine Control

Advantages

THYTRON Battery Chargers offer numerous advantages which are listed below:-

- High Reliability:
  Extra overload factor an use high quality components in design to ensure absolute reliability of the equipment and fail safe operation.

- Extensive Range:
  THYTRON Battery Chargers can be supplied in voltage outputs up to 500V DC and power outputs up to 500KW in a wide range of standard and customized models

- Minimal Maintenance:
  Specially designed for low maintenance and remote operation. THYTRON Battery Charger work with long life span without any special attention.

- User Friendly:
  With cautiously conceived alarms and audible alarm, easily accessible component layout, well designed Operation Manual and easy availability of spare parts, In the unlikely event of a fault arising ,user can quickly attend to the equipment with minimal down time .

- System Solutions:
  Designs, service and manufactures under one roof, the complete DC System consisting of Nickel Cadmium Batteries, VRLA, Battery Chargers and Distribution Panels. These facilities enable the company to offer better integrated systems solution to meet individual customer need.

Types of Chargers

- Float charger (FC):
  Rectifies the input AC to DC, with dual function of float or trickle charging the battery and supplying DC power to load at the same time.

- Boost Charger (BC):
  Is required for quick recharge of a discharged battery.

- Float Cum Boost Charger (FCBC):
  Is a two-in-one functional combination of a float charger and a Boost charger, All along, it supplied uninterrupted DC power to the load. Under normal condition FCBC works as a float Charger. When the mains fail, battery supply power to the load.

On resumption of power supply, FCBC switches to the "Boost Mode", it remains "Boost" until the battery is restored to full charge. All along, it supplied uninterrupted DC power to the load , tap cell diodes and change over contactor is used for protecting the load from high boost voltage.

Redundant Systems

With using more that one rectifier and one or more battery banks, operating either paralley or independently. THYTRON offer a variety of such redundant systems with various combinations of interlocks and features. Each of these systems differ from the other, depending on the level of redundancy and function features required by the user.

Hot Standby Redundant System

It consists of a single battery bank and two charger systems, one designated as 'Main' and other a 'Standby'. Each of these charger systems consists of one float charger and one boost charger. Interlocks are provided in such a way as to enable the standby float charger or standby boost charger to take over respectively, in the event of failure of the main float charger or main boost charger Tap cell connection provides uninterrupted DC Power to the load, should the mains fail during boost charging.

Optional Function

Battery Low Disconnection:
To protect the battery from over discharged, a battery low disconnection device to be incorporated to isolate the battery from the load when its voltage drops to its safe limit. It is due to an inherent setback of lead acid battery is that when it is discharged too deeply for several times, it is difficult to recover its original capacity.

Alarm Buzzer:
For local annunciation of a selected alarm function or as a group alarm.

Battery Current Limit:
To limit excessive current to the battery when the battery rated capacity is low (compared to the rectifier output current) as a load reduction could result in a high charging current to the battery.

Degree of Radio Frequency Interference (RFI):
According to VDE 0875 level N.

Extended Enclosure:
Other degree of protection class available and other color options available upon request.

Instruments:
AC input voltage, current, frequency load/battery current.

Load Sharing Circuit:
Load sharing circuits are designed into the systems together with facilities for synchronising the systems to each other. The output current of the charger/rectifier is adjusted so that load sharing balance is equal/within approximately 5%.

Ripple Filter:
I% RMS without battery connected.

Selective Remote Alarm Contacts:
For remote signalling of each alarm condition through individual relays (max. contact voltage: 125 VDC/ 250 VAC; contact rating; 5A; max, switching capacity: 1 00VA/ 1 20W).

Telecom Filter:
A 0. 1% filter corresponding to 2 mV psophometric value.

Alarms with Red LEDs Indicators:-

Rectifier Fail:
Used for sensing failures in the charger by monitoring the voltage and current functions.

AC Fail:
Used for sensing low mains voltage.

Fuse Failure:
Indication of blown mains and/or auxiliary fuses.

Earth Fault:
Discriminate sensing of positive and negative earth faults in ungrounded systems. Fault current adjustment set at 1 0mA. Hystersis: 2%

High DC Voltage:
Used for sensing high voltage.
Adjustment: 70-150% V nominal Hystersis: 2%
Usual settings: battery high voltage -
1.7 volts per cell (Nicad)
2.5 volts per cell (Lead acid)

High Temperature and/or Shutdown:
The alarm indicates excessive high temperature and initiates charger shutdown by interrupting the power to the rectifier bridge.

Low DC Voltage:
Used for sensing low voltage.
Adjustment: 70-150% V nominal
Hystersis: 2%
Usual settings: battery low voltage -
1. 1 volts per cell (Nicad)
1 .8 volts per cell (Lead acid)

Low Electrolyte Level Alarm:
An alarm module in conjunction with a probe installed into a pilot cell of the battery bank will signal low electrolyte levels.

Low Voltage Disconnect Alarm:
The load is disconnected when battery voltage decreases below a preset level.

Standard Features

DC Low Volt Alarm:
LED indication of low DC voltage with adjusting range of
-20% of float voltage.

DC High Volt Alarm:
LED indication of the DC voltage with adjusting range of +20% of Float Voltage.

Battery Earth Fault Alarm:
LED indication on positive or negative to earth fault failure.

Mains Failure Alarm:
LED indication when mains voltage is abnormal or when there is a loss of any phase in a 3 phase supply.

Charger Failure Alarm:
LED indication when charger output voltage drops abnormally.

Load Open Alarm:
Provide LED indication when load current is below 5% of output rating.

Low Electrolyte Alarm:
Provide LED indication when electrolyte needs topping up.

Summary Remote Alarm Contact Output:

Individual Remote Alarm Contact Output:
Provide individual change-over volt-free contact rated at AC240 3A for each and every alarm condition.

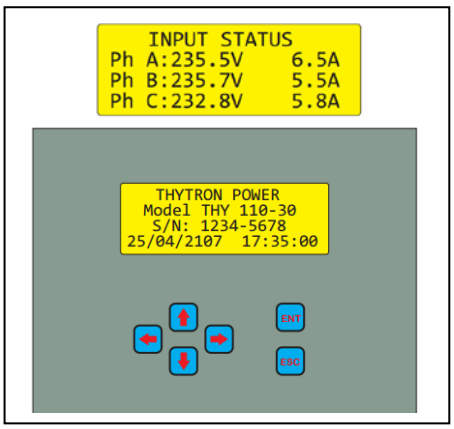
Manual Boost Charger Timer:
When manually activated high-rate charge, a timer automatically revert to float charge when preset time is up.

Automatically Boost Charging With Timer Control:
Automatically switch charger to high rate charge when battery low condition is detected. A timer is built in to revert to float charge when preset time is up.

Battery C

Standard electrical components

Input terminals
Internal input MCCB
Input isolation transformer
SCR Controlled rectifier
Control card CCPCP
Output filter L1-C1 ripple voltage < 5 % RMS without battery
Rectifier fuse
Rectifier shunt
Common fault remote alarm
Standard Analogue LED and Meter display
Optional LCD display with keypad



Display: 5 mm character height, four line by 20 character alpha numeric LCD with LED backlight (Optional)

Standard mechanical components

Floor mounted cabinet
Cabinet protection degree IP21(Option for Other IP)
Colour RAL 7035 - Powdered textured painting
Cabinet with natural cooling , Optional for force air cooling
Swing door 180 degrees with three key locks
Bottom cable entry
Cable gland plate on the roof
Standard labelling/nameplate
Standard PVC cable
Standard cable marking
None isolated copper earth bar
TCPIP / MODBUS (Optional)

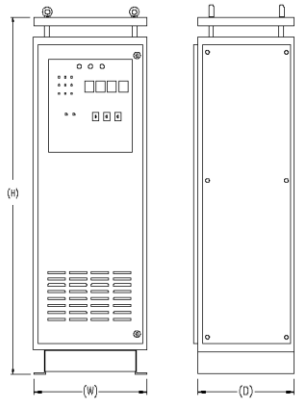
Dual Charger with DC Distribution Panel

Specification

Charger Type	:	Transformer Isolated with IEC 60076 and Thyristor control comply to IEC 60146
Input Voltage	:	220, 230 or 240V +/- 10% 1 phase or 415V +/- 10% 3phase 4 wire .,
Input Frequency	:	50 /60 Hz +/- 5%.
Output voltage	:	12V, 24V, 30V, 48V 110V or 220V (Nominal)
Output Voltage Stability	:	+ 1 % with DC load connected and input voltage of +/- 10% and frequency of +/- 5 variation.
Output Current Stability	:	+/- 2 %.
Float V adjust	:	80~115% of Nominal
Boost V adjust	:	80% to approx. 135% of Nominal
Ripple Voltage	:	less than 5%.rms (without battery connected)
Control	:	Constant voltage with current limiting.
Current Limit	:	10 % ~ 110% adjustable.
Metering	:	72 x 72mm or 96 x 96 mm 1.5% accuracy 90° deflection. (option with LCD 4 line x 20 character Alphanumeric display)
Led / Indicator	:	Mains on Charger Fail Float voltage Boost voltage High Voltage Low Voltage Positive Earth Fault Negative Earth Fault Low electrolyte.
Input/Output Protection	:	MCCB , Surge protection device comply to IEC 61643-1
Overload Setting	:	Current limited to 110% of the rated current.
Safety Feature	:	Output Short Circuit Protection. Current Limiting. Reverse Polarity Protection. Soft Start Input Surge Protection
Radio Frequency interference	:	In accordance with IEC 61000-4
Ingress Protection	:	IP 21/IP31 (option for IP 41 and others IP class).
Acoustic Noise Level	:	Less than 60db measured at 1 meter away and 1 meter height.
Cubicle	:	Standard with frame structure, 2 mm thickness mild steel ,epoxy based coated with anti rust protection material.
Cable entry	:	Bottom entry
Operation Temperature	:	0-45 Degree
Humidity	:	0~90 % without condensation.
Ventilation	:	Natural Convection (option with Force Air cooling)
Construction	:	Component access from front
Alarm	:	Voltage Free alarm contact for each and every alarm condition and summary of all alarm condition.
Color	:	RAL 7035

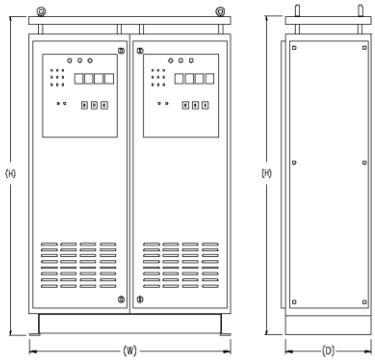
Dimension and Cubicle Type

Single Unit Charger



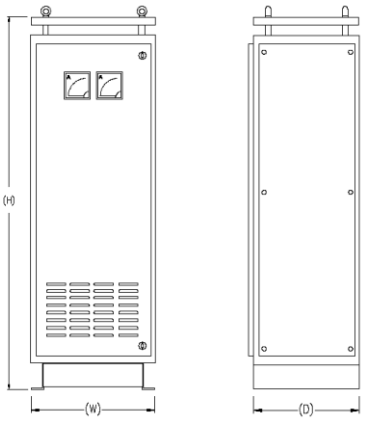
CABINET TYPE	H (MM)	W (MM)	D (MM)
TH1-S1	1280	670	490
TH2-S1	1680	670	490
TH2-S2	1680	670	625
TH3-S3	2000	840	625

Dual Unit Charger



CABINET TYPE	H (MM)	W (MM)	D (MM)
TH1-D1	1280	1300	490
TH2-D1	1680	1300	490
TH2-D2	1680	1300	625
TH2-D3	1680	1300	800
TH3-D4	2000	1640	625
TH3-D5	2000	1640	800

Distribution Board (DB)



CABINET TYPE	H (MM)	W (MM)	D (MM)
DB-TH1-S1	1280	670	490
DB-TH2-S1	1680	670	490
DB-TH2-S2	1680	670	625
DB-TH3-S2	2000	670	625
DB-TH1-X1	1280	250	490
DB-TH2-X1	1680	250	625
DB3-TH3-X1	2000	250	800

THY SERIES- Single Phase Charger

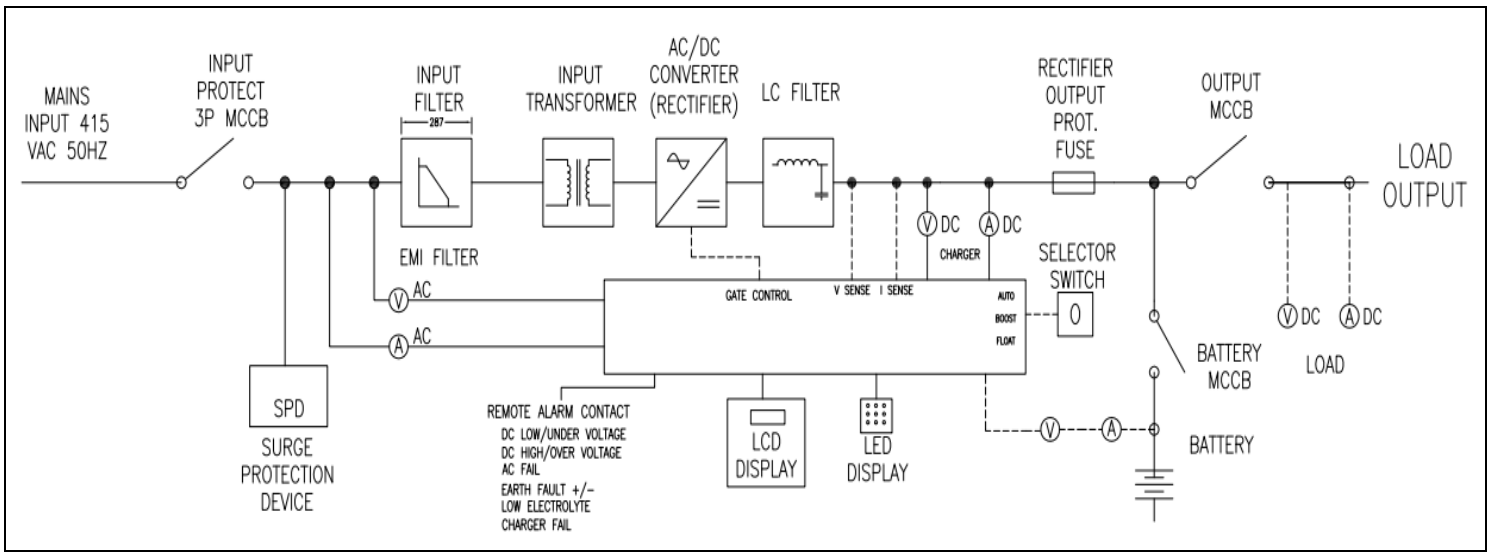
	12V	24V	30V	48V	110V	220V
Output Rating	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)
5A	TH1-S1/20	TH1-S1/24	TH1-S1/30	TH1-S1/30	TH1-S1/40	TH1-S1/42
10A	TH1-S1/24	TH1-S1/25	TH1-S1/40	TH1-S1/45	TH1-S1/56	TH1-S1/86
15A	TH1-S1/30	TH1-S1/40	TH1-S1/46	TH1-S1/68	TH1-S1/95	TH2-S1/152
20A	TH1-S1/35	TH1-S1/45	TH1-S1/58	TH1-S1/75	TH2-S1/105	TH2-S1/195
25A	TH1-S1/39	TH1-S1/58	TH1-S1/63	TH1-S1/85	TH2-S1/130	TH2-S1/230
30A	TH1-S1/42	TH1-S1/52	TH1-S1/69	TH1-S1/95	TH2-S1/150	TH2-S2/255
35A	TH1-S1/46	TH1-S1/58	TH1-S1/72	TH1-S1/103	TH2-S1/165	TH2-S2/270
40A	TH1-S1/51	TH1-S1/65	TH1-S1/78	TH1-S1/125	TH2-S1/180	TH2-S2/306
50A	TH1-S1/53	TH1-S1/73	TH1-S1/85	TH1-S1/139	TH2-S1/230	TH2-S2/346
60A	TH1-S1/60	TH1-S1/82	TH1-S1/94	TH1-S1/143	TH2-S1/255	*
75A	TH1-S1/65	TH2-S1/92	TH1-S1/103	TH2-S1/150	TH2-S1/295	*
90A	TH1-S1/83	TH2-S1/105		TH2-S1/243	TH2-S2/330	
100A	TH1-S1/85	TH2-S1/115		TH2-S1/250	TH2-S2/365	
125A		TH2-S1/130		TH2-S1/273		
150A		TH2-S1/145		TH2-S1/350		
200A		TH2-S1/152		TH2-S2/375		
250A		TH2-S2/165				
300A		TH2-S2/170				
400A		TH2-S2/190				

*Subject To Design

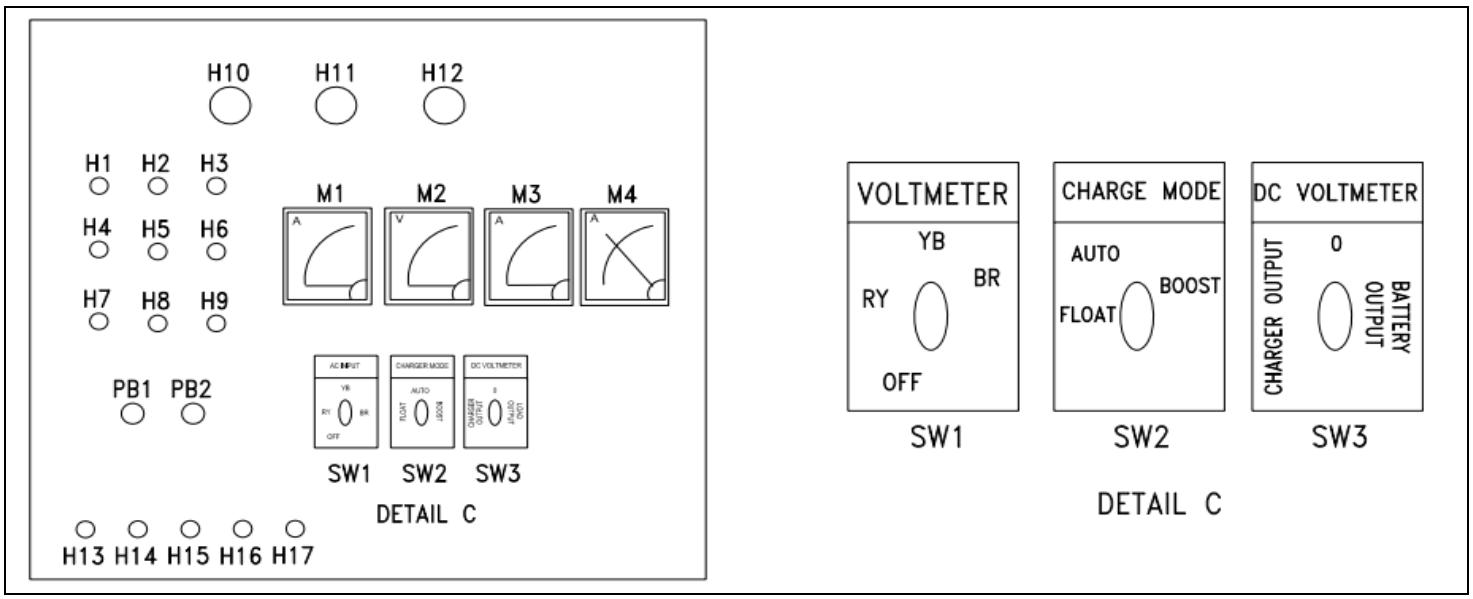
THY SERIES- Three Phase Charger

	12V	24V	30V	48V	110V	220V
Output Rating	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)	Cubicle Type/ Weight (KG)
5A					TH1-S1/45	TH1-S1/42
10A					TH1-S1/71	TH1-S1/86
15A					TH1-S1/104	TH2-S1/152
20A					TH2-S1/110	TH2-S1/195
25A					TH2-S1/137	TH2-S1/230
30A					TH2-S1/157	TH2-S2/255
35A			TH1-S1/60		TH2-S1/175	TH2-S2/270
40A		TH1-S1/65	TH1-S1/70	TH1-S1/125	TH2-S1/190	TH2-S1/306
50A		TH1-S1/135	TH1-S1/140	TH1-S1/143	TH2-S1/241	TH2-S1/346
60A		TH1-S1/160	TH1-S1/165	TH1-S1/170	TH2-S1/265	*
75A		TH2-S1/190	TH1-S1/200	TH2-S1/210	TH2-S1/309	*
90A		TH2-S1/195		TH2-S1/225	TH2-S2/353	*
100A		TH2-S1/200		TH2-S1/270	TH2-S2/385	*
125A		TH2-S1/220		TH2-S1/295	*	*
150A		TH2-S1/225		TH2-S1/381	*	*
200A		TH2-S1/270		TH2-S2/418	*	*
250A		TH2-S2/335		TH2-S2/453	*	*
300A		TH2-S2/380		*	*	*
400A		TH2-S2/490		*	*	*
500A		*		*	*	*
600A		*		*	*	*

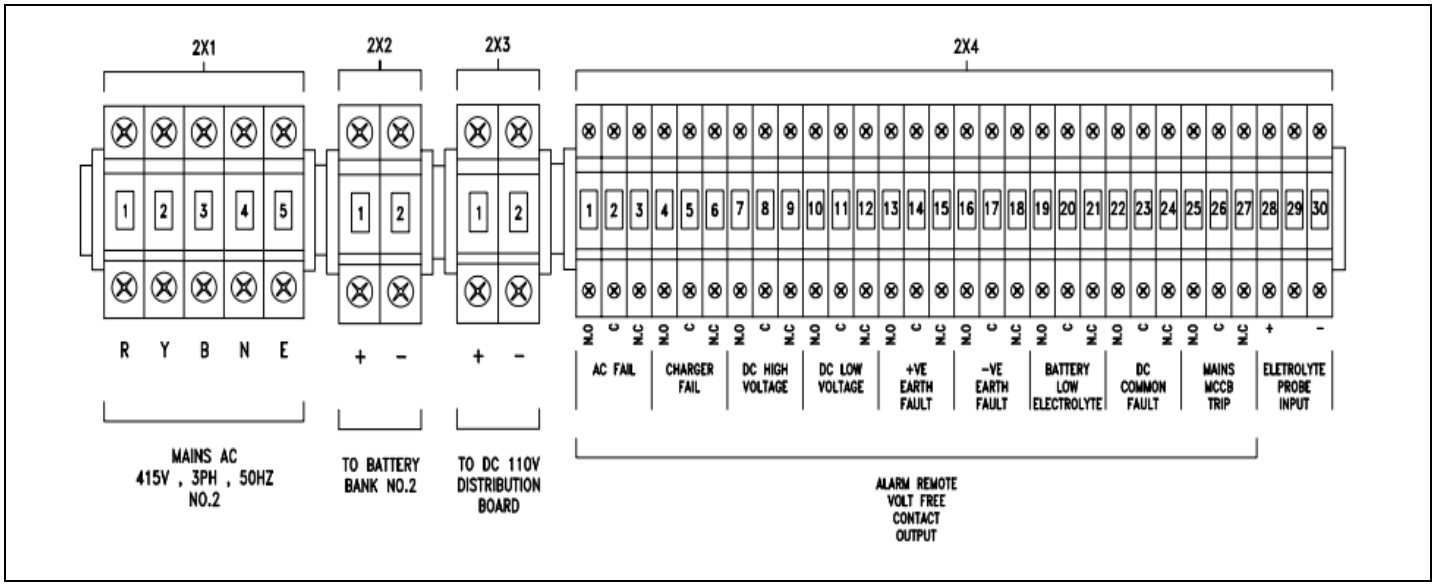
*Subject To Design



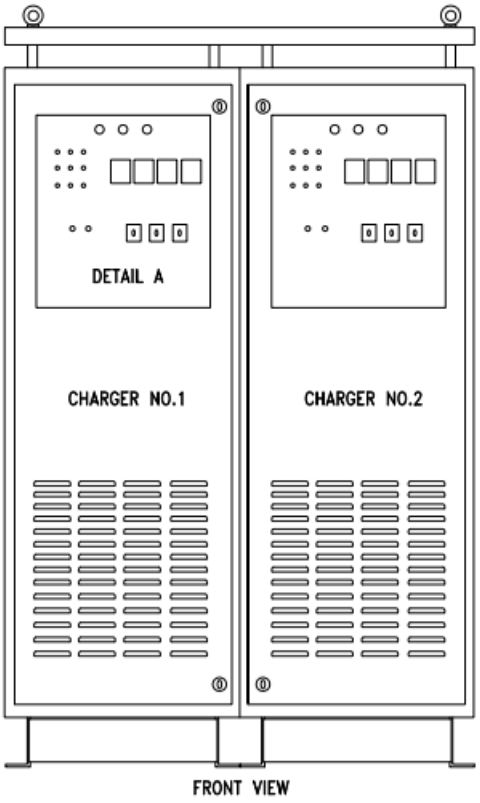
Rectifier Block diagram



LED Display with Analogue Meter



Cable terminal and alarm contact



Dual Charger Cubicle Diagram

NO	LEGEND	LEGEND	DESCRIPTION
1	1H1	2H1	MAINS ON (RED)
2	1H2	2H2	HIGH VOLTAGE (RED)
3	1H3	2H3	LOW ELECTROLYTE (RED)
4	1H4	2H4	FLOAT (GREEN)
5	1H5	2H5	LOW VOLTAGE (RED)
6	1H6	2H6	CHARGER FAIL (RED)
7	1H7	2H7	BOOST (YELLOW)
8	1H8	2H8	EARTH FAULT (RED)
9	1H9	2H9	AC FAIL (RED)
10	1H10	2H10	AC INPUT INDICATOR (RED)
11	1H11	2H11	AC INPUT INDICATOR (YELLOW)
12	1H12	2H12	AC INPUT INDICATOR (BLUE)
13	1SW1	2SW1	AC INPUT VOLTAGE SELECTOR SWITCH
14	1SW2	2SW2	CHARGER MODE SELECTOR SWITCH
15	1SW3	2SW3	DC VOLTMETER SELECTOR SWITCH
16	1M1	2M1	INPUT VOLTMETER
17	1M2	2M2	CHARGER VOLTMETER
18	1M3	2M3	CHARGER AMMETER
19	1M4	2M4	BATTERY AMMETER
20	1PB1	2PB1	LED TEST PUSH BUTTON
21	1PB2	2PB2	ALARM RESET BUTTON
22	1H13	2H13	AUTO FLOAT (WHITE)
23	1H14	2H14	AUTO BOOST (ORANGE)
24	1H15	2H15	MANUAL FLOAT (WHITE)
25	1H16	2H16	MANUAL BOOST (ORANGE)
26	1H17	2H17	COMMISSIONING CHARGE (ORANGE)

Legend Table

Ordering Information

THY-X1 V- X2 A-X3-X4

X1 : 24,48,72,110,120,220 (specify if others voltage) VDC

X2 : 5A to 600A (specify if others current) A DC

X3 : SP (Single Phase) / TP (three Phase)

X4 : None (Stand alone Charger) / D (Dual Charger)

Example : THY-110 V -50 A –TP-D (110 VDC 50A dual charger with three Phase input.
Example : THY-220 V -20 A –SP (220 VDC 20A Single charger with Single Phase input.)

Authorize Distributed by:

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