

iBAT

A TECHNICAL PRESENTATION ON:

NEXT GENERATION INTELLIGENT MODULAR & COMMUNICABLE BATTERY CHARGER



SelMounl
QUALITY WITH INTEGRITY

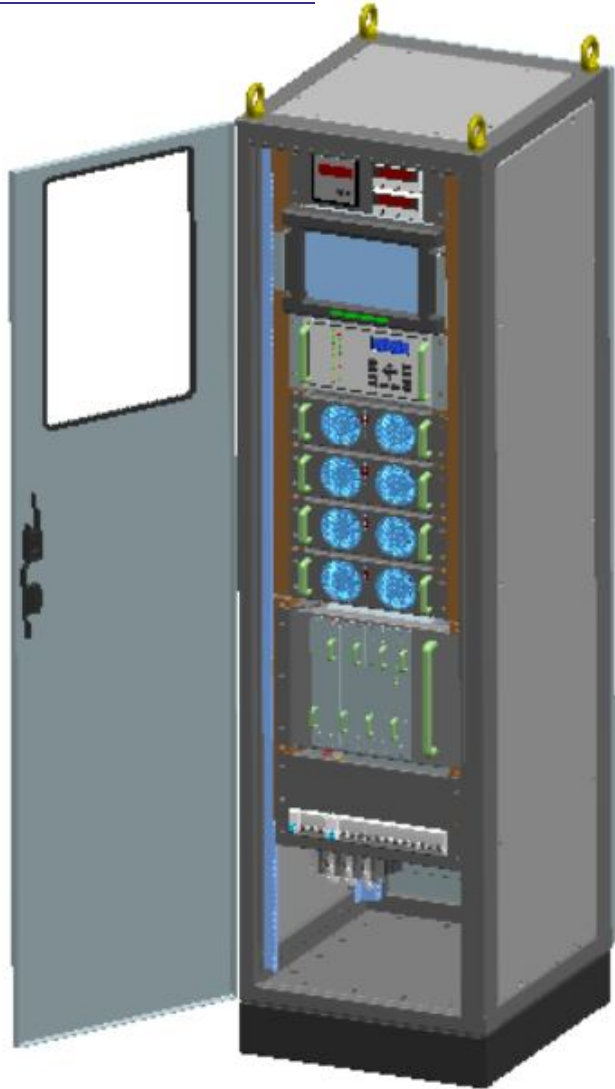
INTRODUCTION

SELMOUNT presents the next generation modular, redundant and communicable battery charger. It incorporates the latest switchmode topologies to form a very versatile and rugged industrial battery charging solution.

It provides all the operator interfaces which are commonly used in the traditional charging system and in addition has a suite of high end diagnostics and other user interfaces.



MEET YOUR PRODUCT



**FRONT VIEW
(DOOR OPEN)**

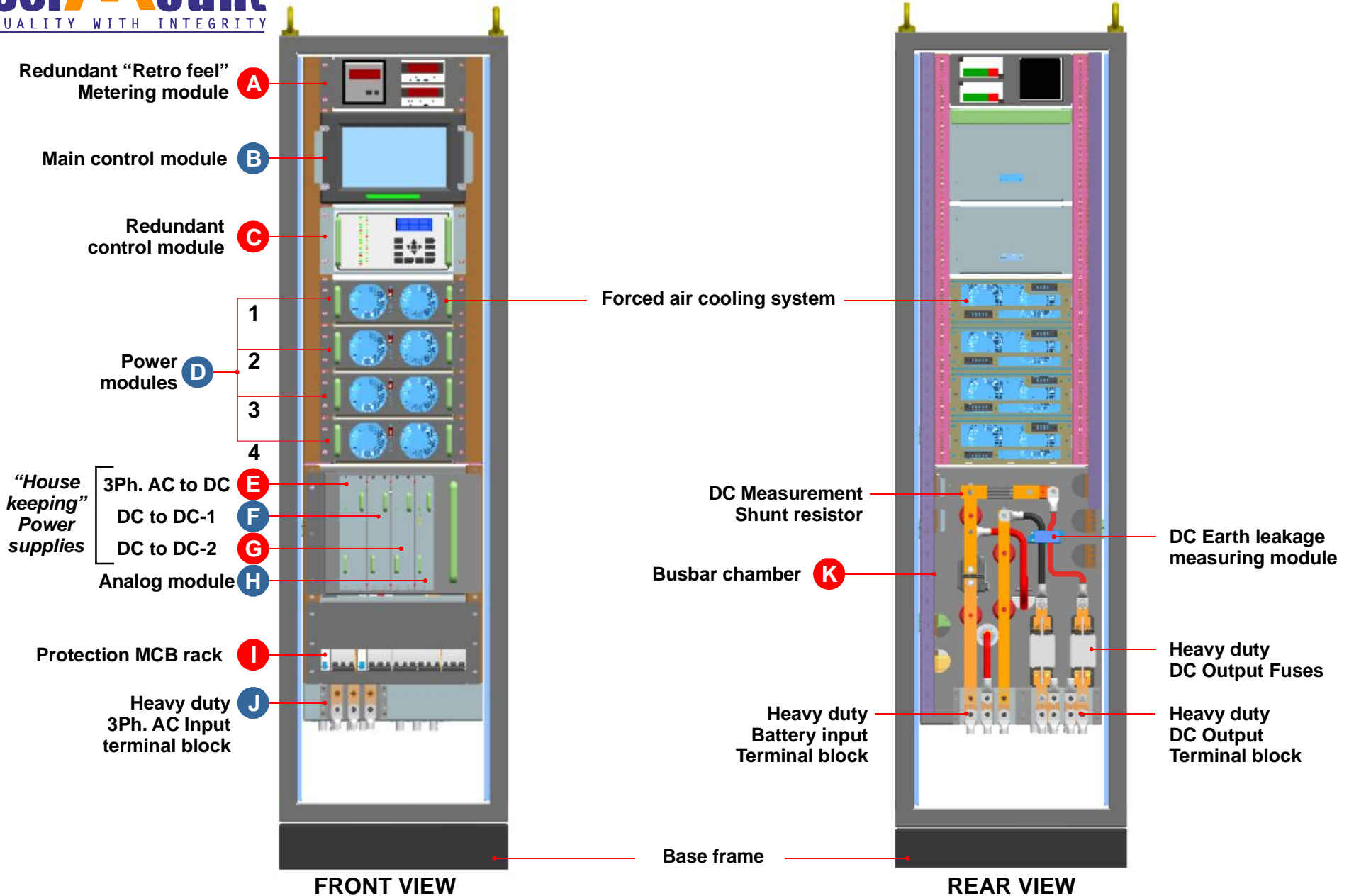


**FRONT VIEW
(DOOR CLOSED)**



**REAR VIEW
(DOOR OPEN)**

PRODUCT DETAILS



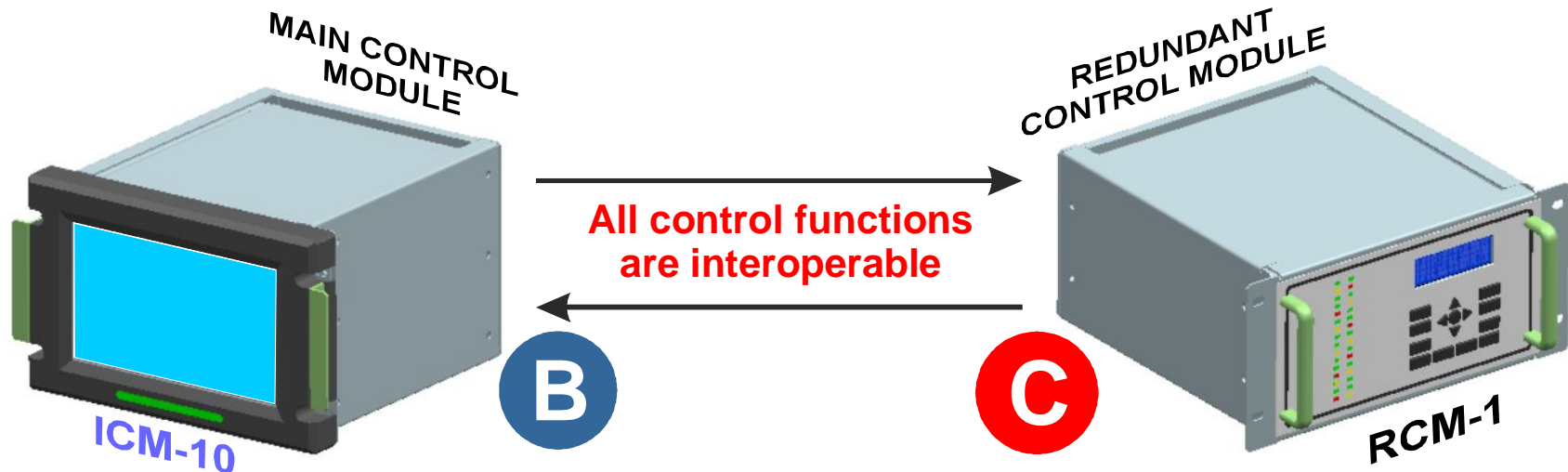
SALIENT FEATURES

- > Fully modular construction
- > User friendly 10 inch color TFT display
- > Rugged & reliable, high MTTR, low down time
- > No service interruption during maintenance & repair
- > High electrical performance
- > Wide input operating voltages
- > Configurable output voltage & current
- > High efficiency & near unity power factor
- > Comprehensive communication facility like, RS-485 Modbus, CAN, IEC 61850
- > Quick response to dynamic load variations
- > Both active & passive protection systems
- > Ultra compact form factor & light weight design
- > N+1, N+N redundancy features
- > Compliance to global EMI/EMC standards
- > Compliance to PE-7 & PE-5 NEMA battery charger standards
- > Wide range of diagnostic features & user friendly alarms

**WITH BUILT-IN
EARTH LEAKAGE
DETECTION !!**

MODULE DETAILS

Control Module (N+N Redundant)



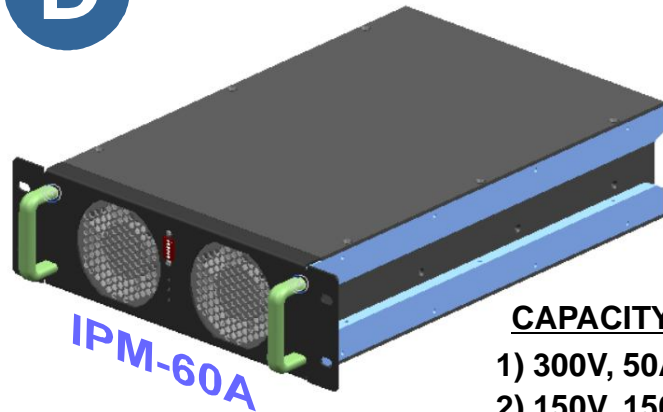
- 10.5 inch color LCD
- Touch panel interface
- Diagnostics on LCD
- Controller Area Network interface for communication to down stream modules
- Plug & play operation
- IEC 61850 compatibility
- DC & AC parameters monitoring
- On board BOOST mode control logic

- 20 x 4 monochrome LCD
- Diagnostics on LCD
- Controller Area Network interface for communication to down stream modules
- Plug & play operation
- Annunciation functions via LED bank
- DC & AC parameters monitoring
- On board BOOST mode control logic

MODULE DETAILS

Power Module (N+N OR N+1 Redundant)

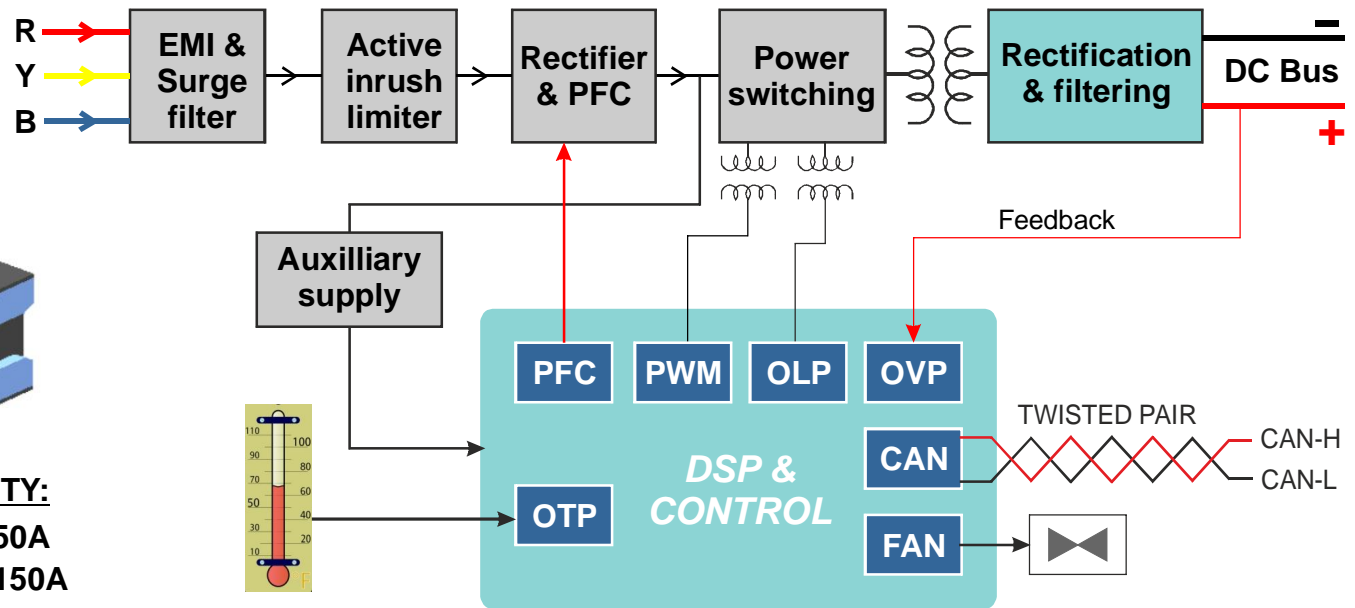
D



IPM-60A

CAPACITY:

- 1) 300V, 50A
- 2) 150V, 150A
- 3) 60V, 200A

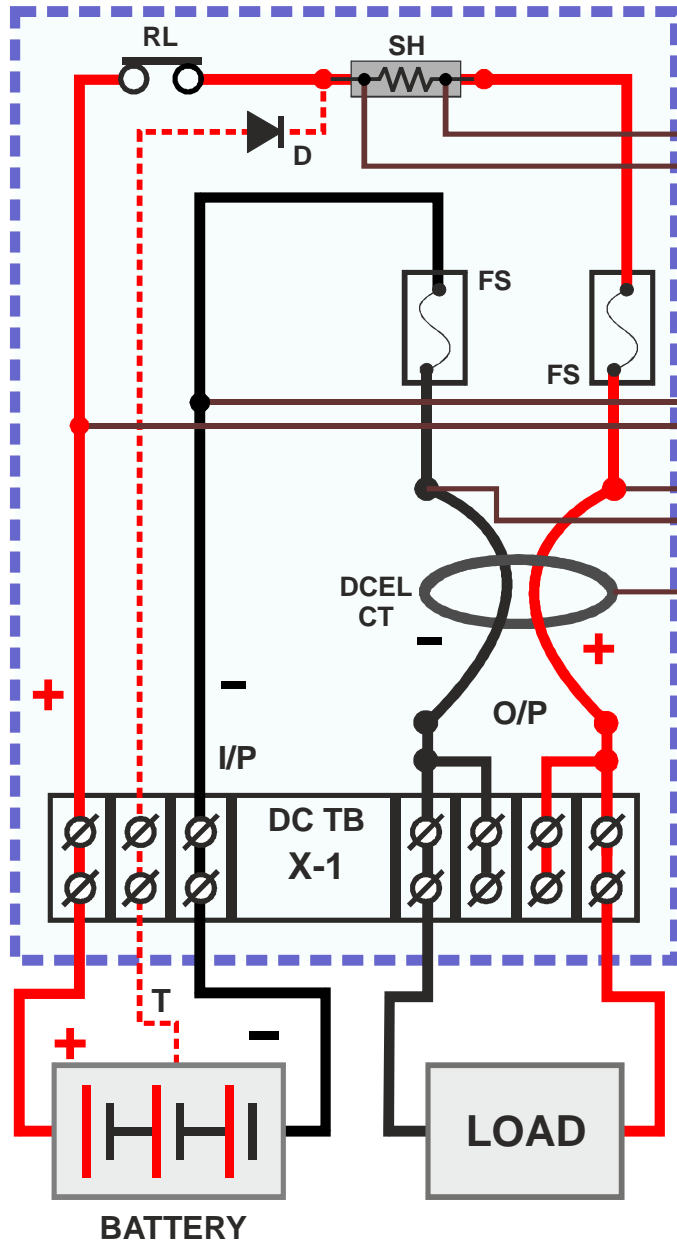


- Wide input voltage tolerance
- 3Ph. 3wire input
- Digital voltage & current control
- Near unity power factor
- Low inrush current
- Built-in soft start
- Low THDi **rejection**
- Very high efficiency
- Built-in reverse blocking diode

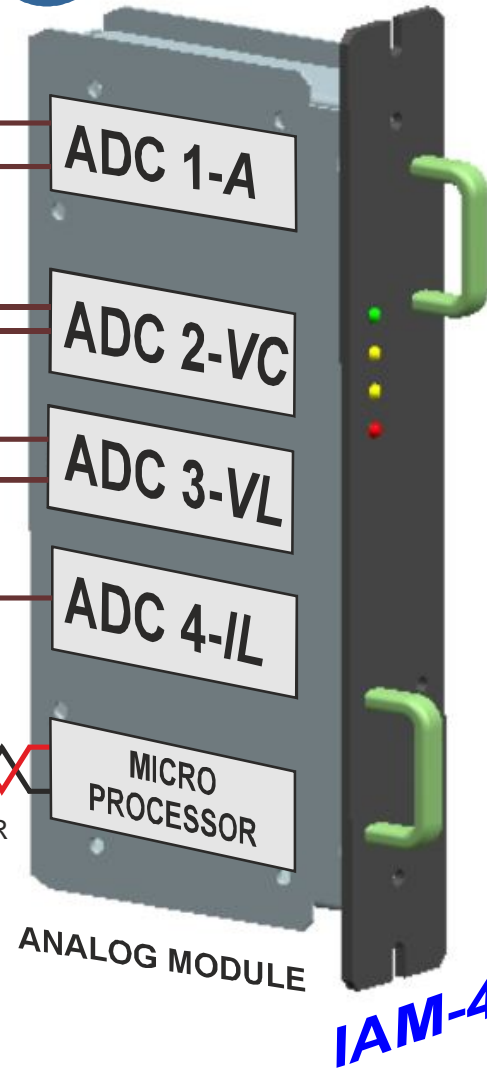
- Easy paralleling options
- Galvanically isolated output
- Low ripple content
- Integral conduction fans
- Plug & play operation
- Over voltage input protection
- Under voltage input protection
- Extremely high power to weight ratio
- Suitable for multi chemistry batteries

MODULE DETAILS

Analog Module



CAN-H
CAN-L
TWISTED PAIR



Plug & play operation

Galvanically isolated measurements

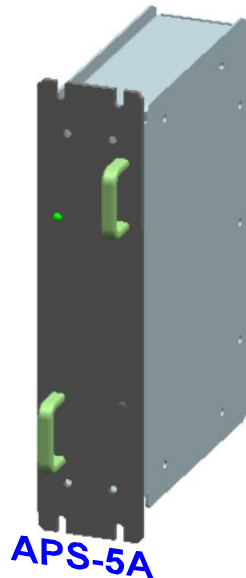
High accuracy analog to digital converter

Dual channel voltage, current & earth leakage measurements

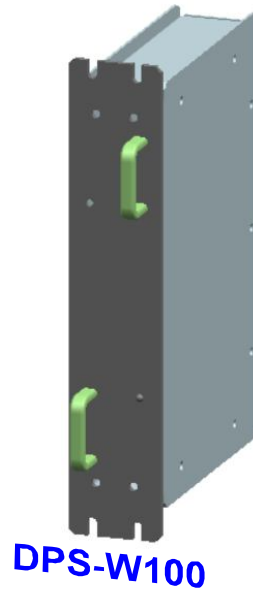
MODULE DETAILS

House Keeping Power Supplies [N(N+N) Redundancy]

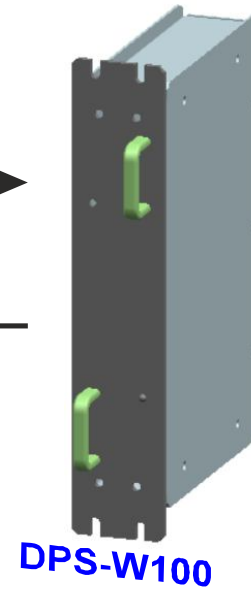
E AC-DC



F DC-DC1



G DC-DC2



N+1 Fully Redundant

N+N Fully Redundant

3Ph. 3Wire input

Ultra wide operation
260-600V AC

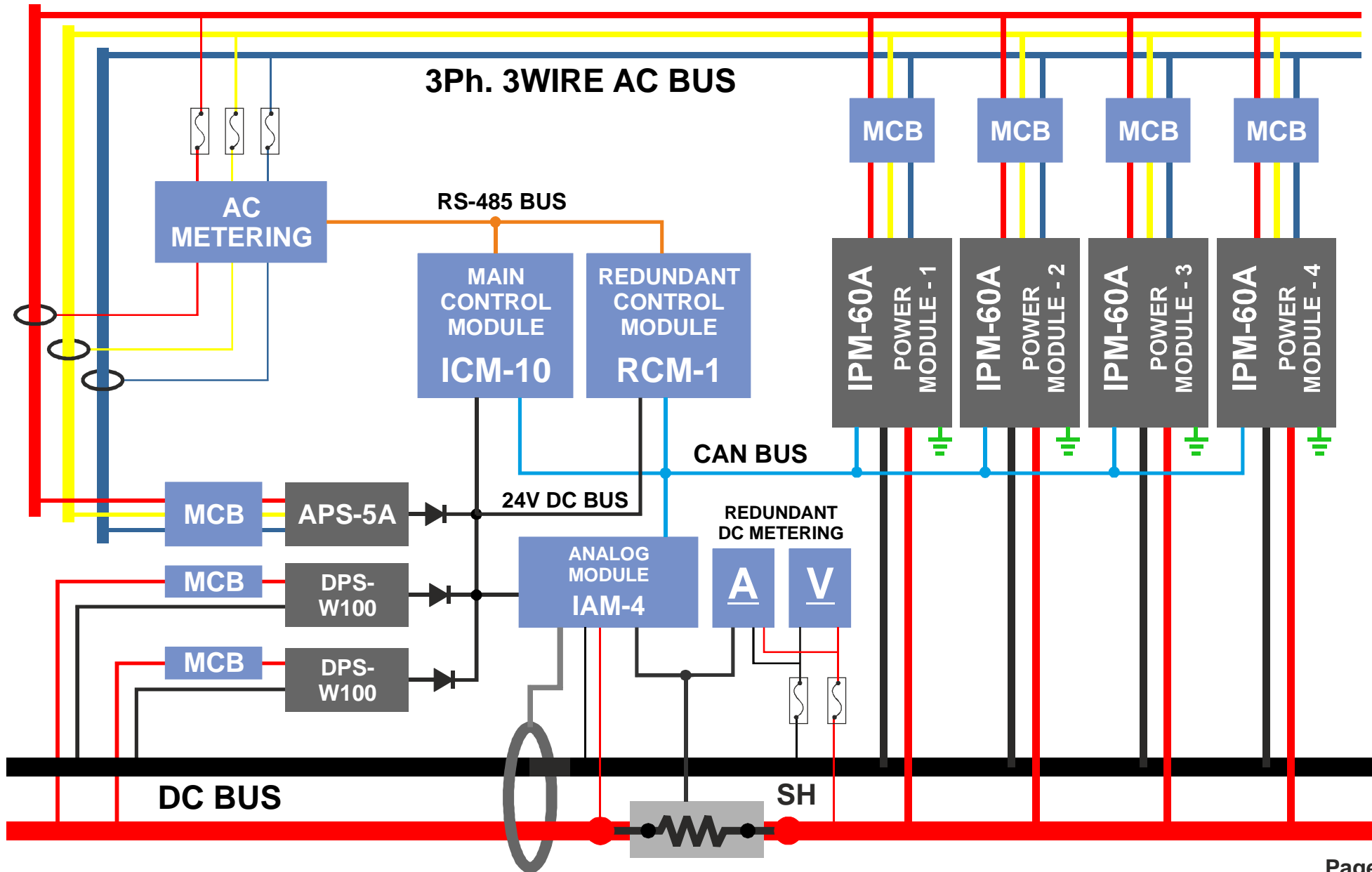
24V DC Output for
house keeping
operations

DC input

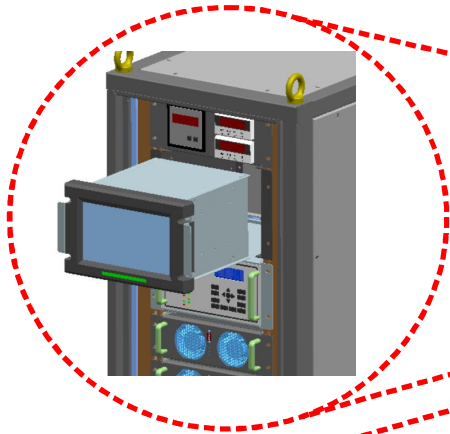
Ultra wide operation
90-370V DC

24V DC Output for
house keeping
operations

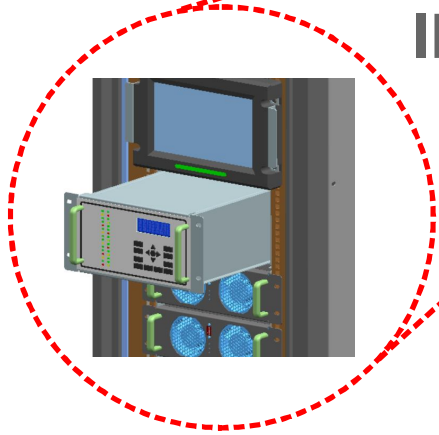
SCHEMATIC & CONTROL STRUCTURE



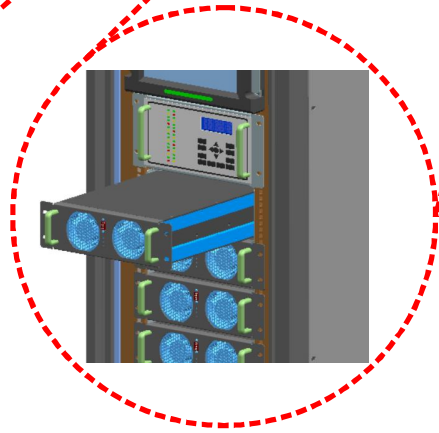
MODULARITY QUOTIENT



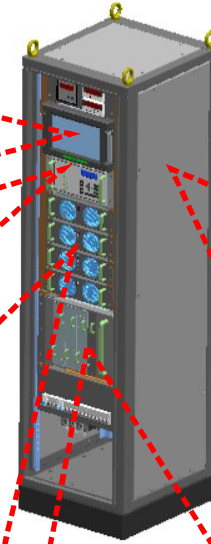
ICM-10



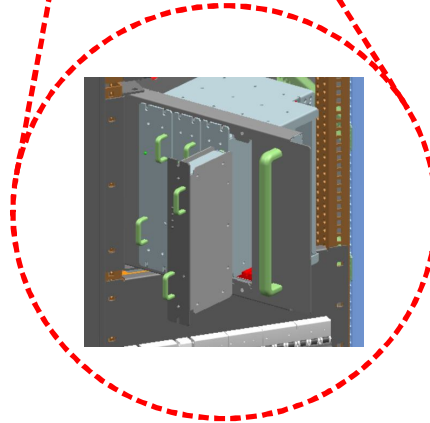
IPM-60A



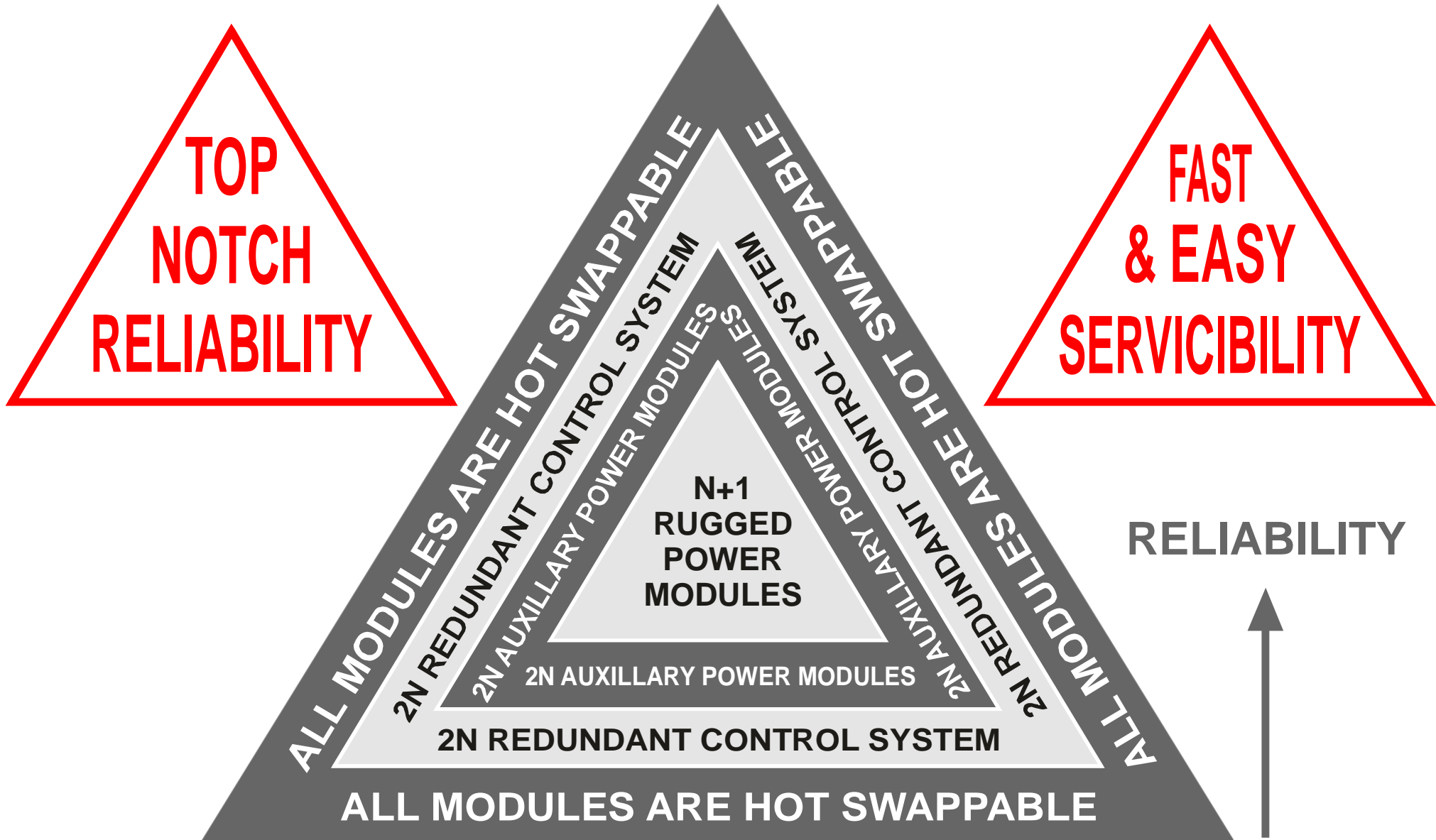
RCM-1



**DPS-100W
APS-5A
IAM-4**



**ALL
MODULES ARE
HOT SWAPPABLE,
TRUE PLUG &
PLAY**



ADVANTAGES/ BENEFITS OF REDUNDANT & MODULAR CHARGERS

Redundancy and modularity ensures that the service related functions are easy and the maintainability quotient is very high. The loss of function in any one of the modules will not affect the functionality of the entire system. There will not be a service interruption to the user.

The diagnostic suite present inside the charger provides up-to-date and continuous monitoring of all the modules in the system. Hence a service/maintenance personnel can easily identify the faulty parts and swap in new modules within minutes without de-energising the charger or the DC System. All required parameters for the newly inserted module are automatically updated by the onboard embedded microprocessor system without any user intervention.



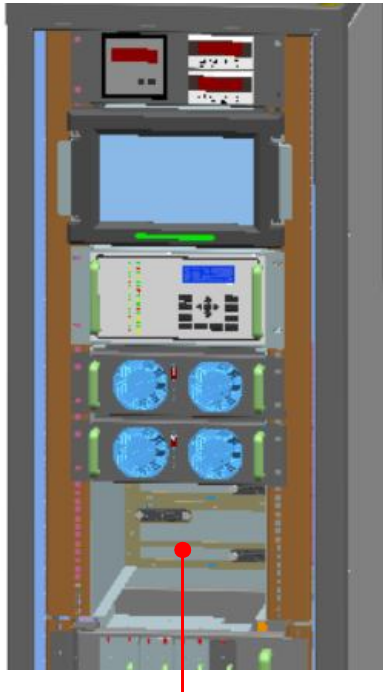
N+1 redundancy refers to the number of power modules or control modules required to handle the application load or function plus one extra module. This ensures that if any of the modules in the system is faulty, the rest of the modules can still handle the system load.

In a conventional system, failure of any one of the module or components will result in an emergency situation within the substation.

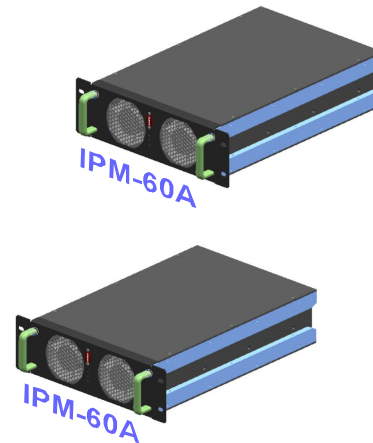
Our system also has provision for N+N (2N) redundancy which ensures very high reliability by having twice the number of power or control modules required to handle the application load. This type of redundancy can easily accommodate more than one faulty power or control module.



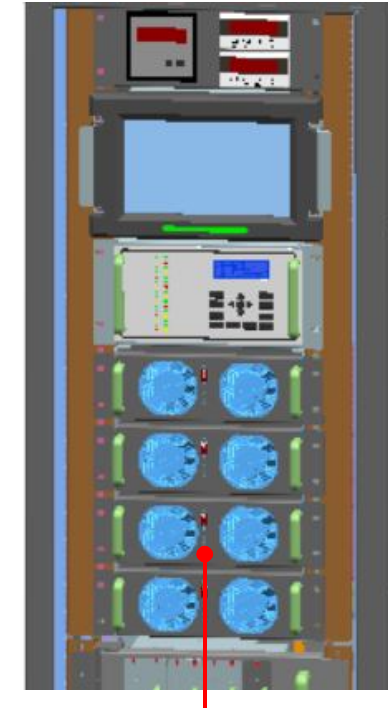
ADDITION OF POWER MODULES (IPM-60A)



Assigned slots for increasing the current (with necessary pre wired connectors)



Additional IPM-60A modules to increase the charger current.



Additional modules are added without any special tools or any software up gradation

Additional power modules can be easily added in N+1 system if an extra load is required during up gradation of the existing scheme.

REMOTE CONTROL & MONITORING

CONTROL ROOM



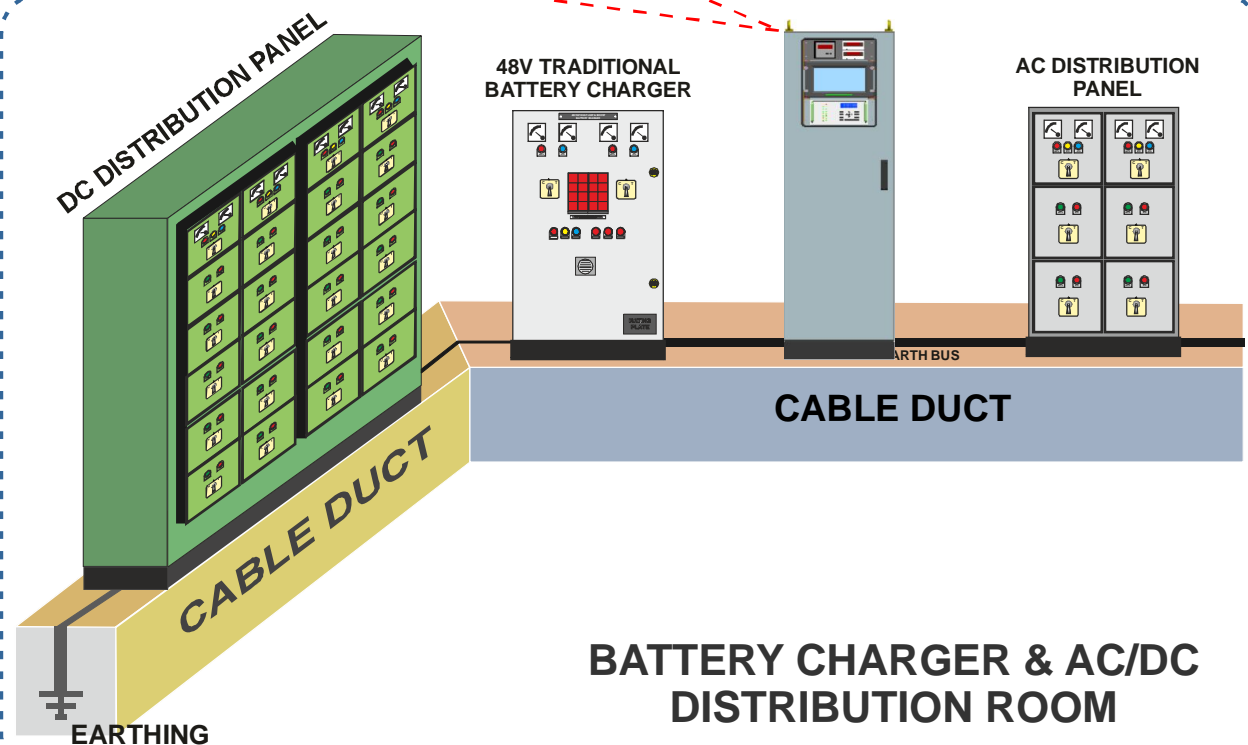
2 WIRE CAN OR WIRELESS
COMMUNICATION

PRESENT SCENARIO

Remote monitoring & control is not available in the current traditional or conventional system. Operator has to personally go to the battery charger room to attend any alarm or fault events.

WITH NEW GEN I BAT CHARGER

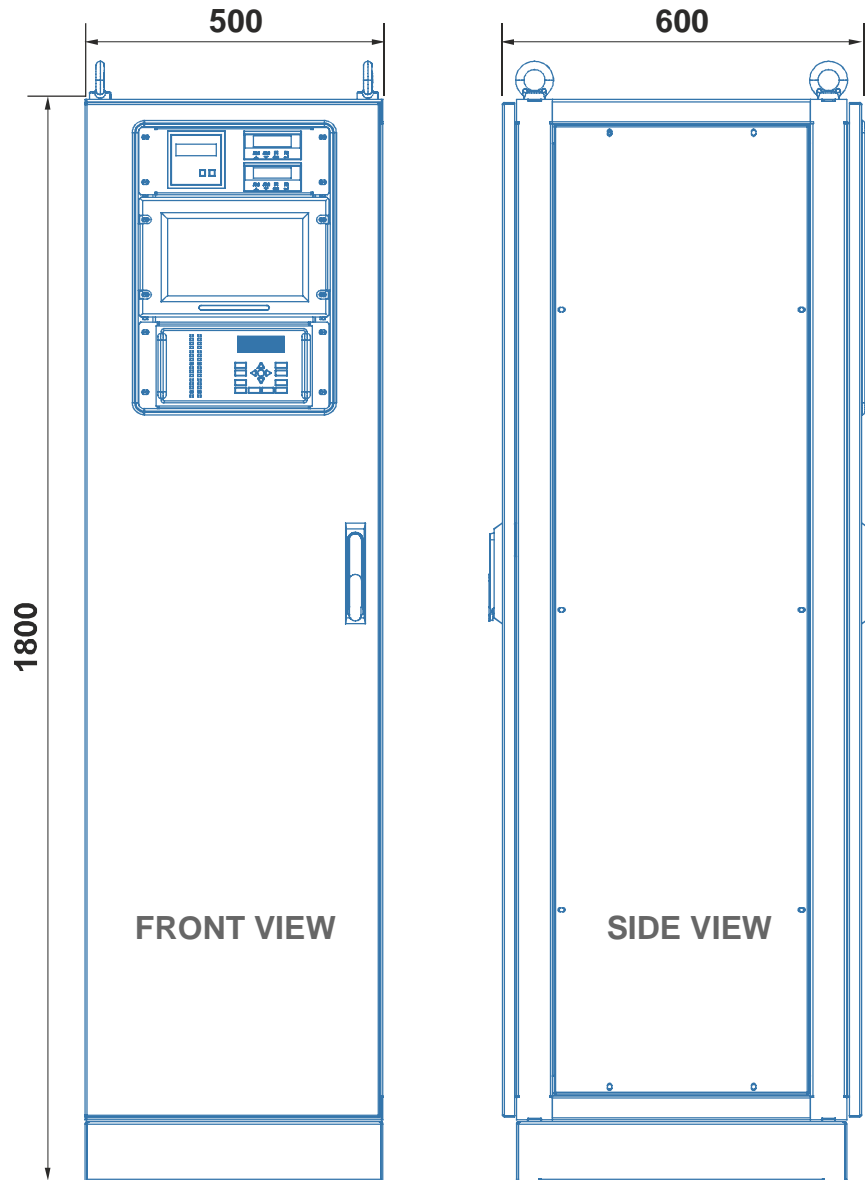
With our new gen “I BAT” charger, the remote monitoring & control of the battery charger is made available at the control room via wireless or two wire communication system. With this advanced system of communication, the operator can monitor & control the battery charger safely without going near to it.



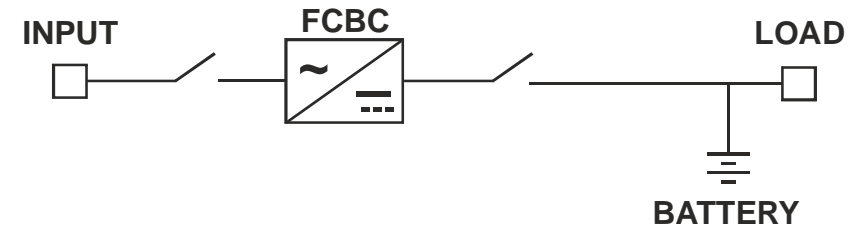
COMPARISION STATEMENT

FEATURES	THYRISTOR /SCR/ CONVENTIONAL CHARGER	NEX GEN I-BAT CHARGER
SIZE / WEIGHT	HIGH	LOW
EFFICIENCY	POOR	ABOVE 90%
POWER FACTOR	UNSTABLE	STABLE (NEAR UNITY)
HARMONIC DISTORTION	HIGH	VERY LOW
REDUNDANCY	NIL	VERY HIGH (N+1 & N+N)
CAPITAL COST	AT PAR ==	AT PAR ==
RETURN ON INVESTMENT	LOW	VERY HIGH
SERVICEABILITY	TEDIOUS	EASY & HOT SWAPPABLE
DOWN TIME	VERY HIGH	LOW
RIPPLE CONTENT (PEAK TO PEAK)	HIGH	LOW <2%
INPUT OPERATING VOLTAGE	NARROW OPERATING REGION	ULTRA WIDE RANGE
DYNAMIC RESPONSE	AVERAGE	EXCELLENT
PROTECTION ON I/P & O/P	MCB/FUSE (PASSIVE PROTECTION)	SMART ACTIVE PROTECTION
VOLTAGE & CURRENT STABILITY	POOR <2%	GOOD (<0.5 & <1.0%)
DIAGNOSTICS & COMMUNICATION	LOW/POOR	INTELLIGENT

DIMENSIONS & APPLICATIONS



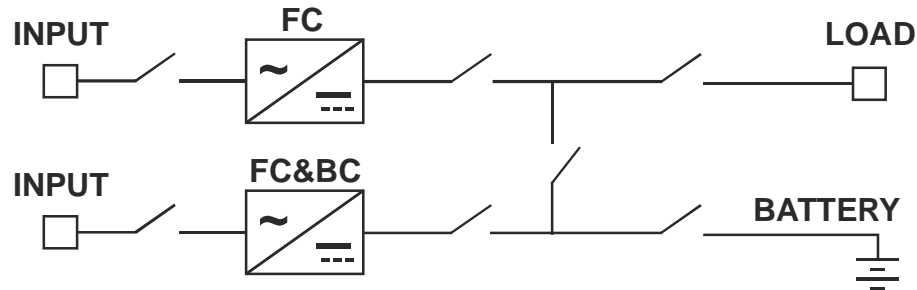
1. FCBC



In this configuration, charger is connected directly to battery and load. Normally, the charger will be in float mode trickle charging the battery and supplying the load. When AC mains fail the battery will supply the load. On restoration of power, the charger will switch to boost mode, charging the battery and supplying the load. In the mode, boost voltage will appear across the load terminal. There is also an option for integral DC distribution board.

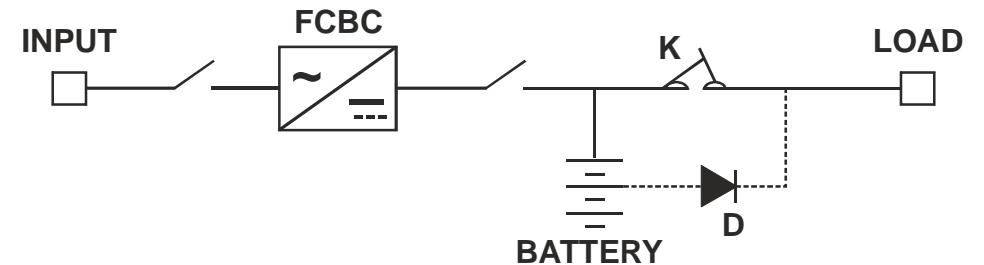
APPLICATIONS

2. FC & FCBC



Here, one charger will always be in float mode (FC) and the other charger switches between float and boost modes based on battery condition (FCBC). When AC mains are ON, both chargers will be in float mode sharing the total load and trickle charging the battery. When AC mains fail, then contactor will be ON and load will be supplied by battery. Upon resumption of power, FCBC will switch to boost mode to boost charge the battery. Simultaneously, the contactor will be OFF. In this condition, both the charges will be working separately, FC supplying to load and FCBC boost charging the battery.

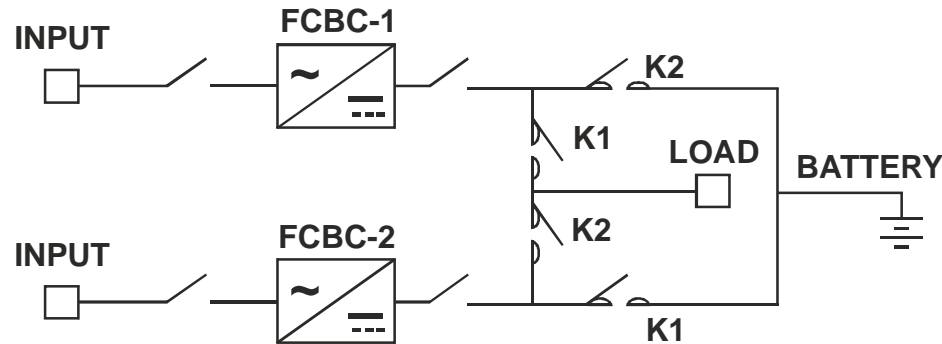
3. FCBC WITH BATTERY CELL TAP CHANGER



In this configuration, charger is connected directly to battery and load is connected via contactor (K) NC contact. Normally, the charger will be in float mode trickle charging the battery and supplying the load. When AC mains fail the battery will supply the load. On restoration of power, the charger will switch to boost mode and contactor (K) will be open to supply the 80% tap voltage of the battery to load. This arrangement will make the battery to charge in boost voltage and also supply the controlled voltage to the load simultaneously. Diode (D) will block the reverse flow of end cell voltage to tap cell.

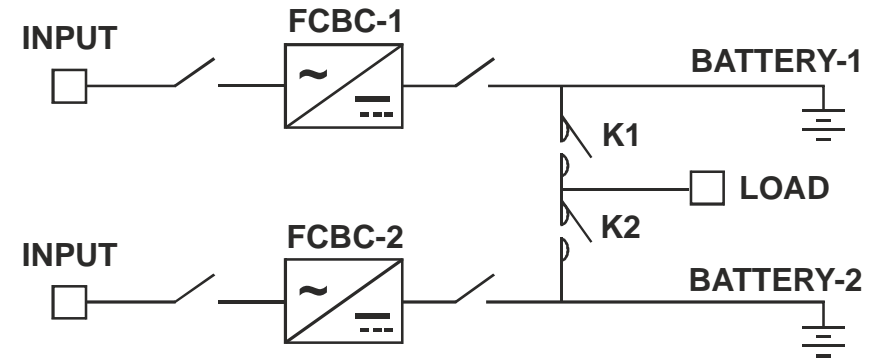
APPLICATIONS

4. DUAL FCBC WITH 1X100% BATTERY, COMMON LOAD



Both the chargers are Float cum Boost Chargers (FCBC). However, only one FCBC can go to boost mode at one time. Normally, both the charges will be in float mode sharing the total load and trickle charging the battery. When AC mains fail, both the contactors will be ON and load will be supplied by battery. Upon resumption of AC mains, one of the FCBCs will switch to boost mode and the respective contactor will be OFF (K1 for FCBC 1 and K2 for FCBC2), whilst the other FCBC will be in float mode supplying the load.

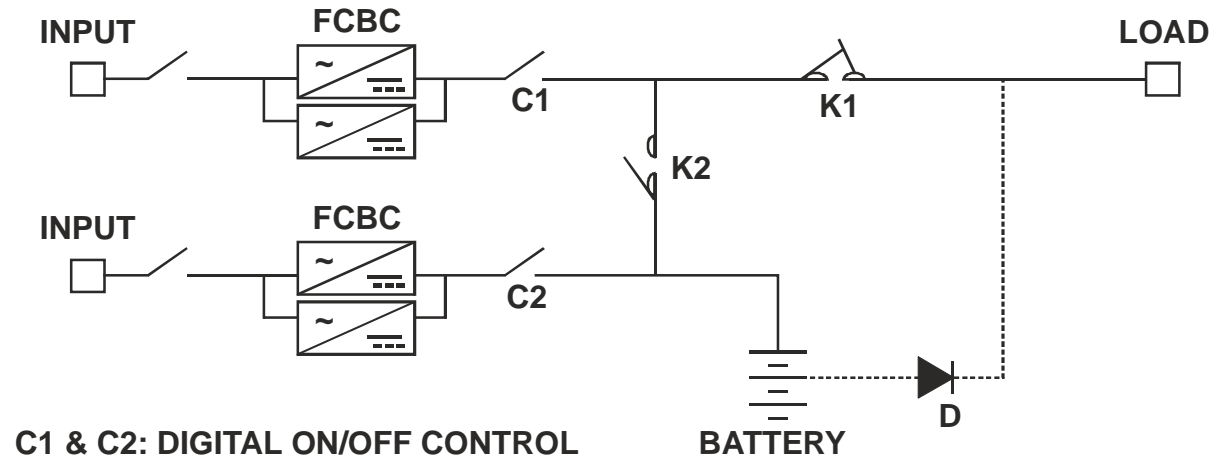
5. DUAL FCBC WITH 2X100% BATTERY, COMMON LOAD



In this configuration, both the charges are float cum boost charges (FCBC) and the battery's configuration is 2x 100%. Each battery has 1 battery connected directly to it; however only one charger can go to boost mode at a time. If battery one needs boost charging, then FCBC-1 will go to boost mode to turbo charge the battery one and K1 will be OFF. At this time FCBC-2 will be float mode trickle charging the battery-2 and supplying the load. If battery-2 needs boost charging, then FCBC-2 will go boost mode to boost charge the battery-2 and K2 will be OFF. At this time, FCBC-1 will be in float mode trickle charging the battery-1 and supplying the load.

APPLICATIONS

6. FCBC WITH BATTERY CELL TAP CHANGER WITH N+N REDUNDANCY



CONFIGURATION	C1	C2	K1	K2
50+50 FLOAT 50+50 BOOST ON STAND BY	CLOSE	OPEN	CLOSE	OPEN
50+50 FLOAT ON REPAIR 50+50 BOOST MODULE WORKING AS FLOAT	OPEN	CLOSE	CLOSE	CLOSE
50+50 FLOAT ON REPAIR 50+50 BOOST ACTIVE	OPEN	CLOSE	OPEN	OPEN
50+50 BOOST ON REPAIR 50+50 FLOAT MODULE WORKING AS BOOST	CLOSE	OPEN	OPEN	CLOSE

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