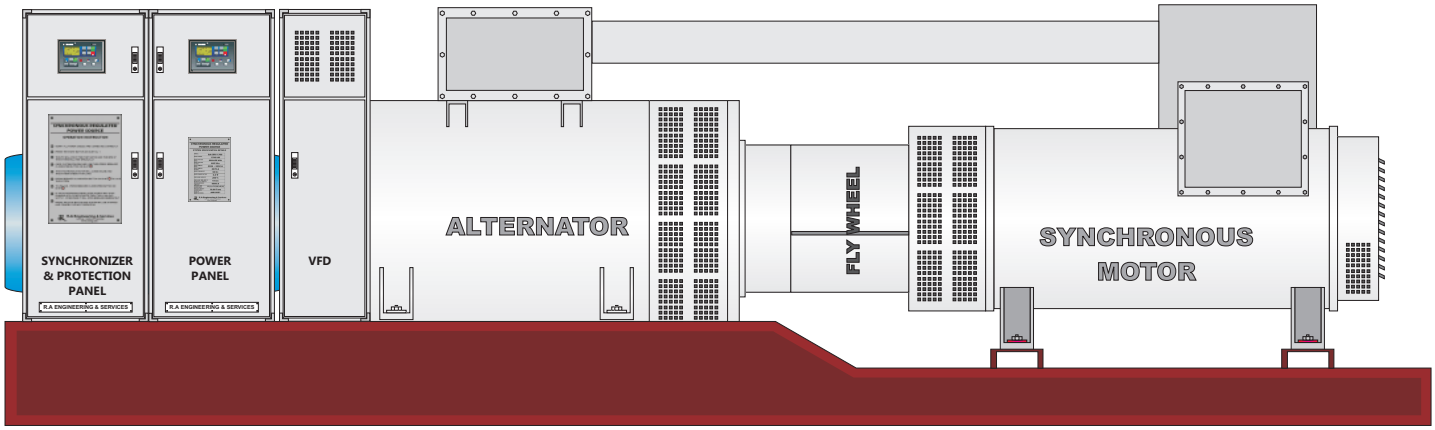
R.A ENGINEERING (Pvt. Ltd.)

SYNCHRONOUS REGULATED POWER SOURCE

250kW to 10,000kW Models



Non-Regulated 3-phase input
Regulated 400VAC 3-phase output
Distortion free Power Source
Isolation from grid
Clean Harmonics free electricity
Grid voltage fluctuation filtered
Reactive Power Compensator
Torque Loads Compensator

www.raeng.com

WHAT IS SYNCHRONOUS REGULATED POWER SOURCE

A synchronous regulated power is a device that supports network voltage by providing reactive power compensation and additional short circuit power capacity. Practically, a synchronous regulated power is a synchronous generator operating without a prime mover. Generation or consumption of reactive power is achieved by regulating the excitation current. The benefit of a synchronous regulated power is that it contributes to the overall short circuit capacity in the power gen system. This resulting, improves the chances that equipment connected to the network will be able to "ride through" network fault conditions.

A synchronous regulated power is also beneficial to operating during overload duty for shorter or longer periods of time. Synchronous regulated power can support the power system voltage during prolonged voltage sags by increasing the network inertia.

SYSTEM PHILOSOPHY

The Electrical Energy is converted to Mechanical Energy and then again the Mechanical Energy is converted to Electrical Energy.This conversion resulting in many benefits as defined . ▶

Non-Regulated 3-phase input
Regulated 400VAC 3-phase output
Distortion free Power Source
Isolation from grid
Eliminates the use of PFI system
Clean Harmonics free electricity
Grid voltage fluctuation filtered
Reactive Power Compensator
Torque Loads Compensator

PONY MOTOR

PONY MOTOR is used to start-up the system with VFD.
Once the system is started and reached to 1500 rpm then the pony motor becomes idle.

SYNCHRONOUS MOTOR

SYNCHRONOUS MOTOR is used to drive the alternator. All the connected load on Alternator comes to Synchronous motor.
This motor has same electrical power rating as compare to alternator of the system.

ALTERNATOR

The Alternator of this system is Simple alternator of designated capacity.
Since this alternator has its own AVR , so the system voltage are constant all the time regardless of any voltage fluctuation on Grid side.

FLYWHEEL (Optional)

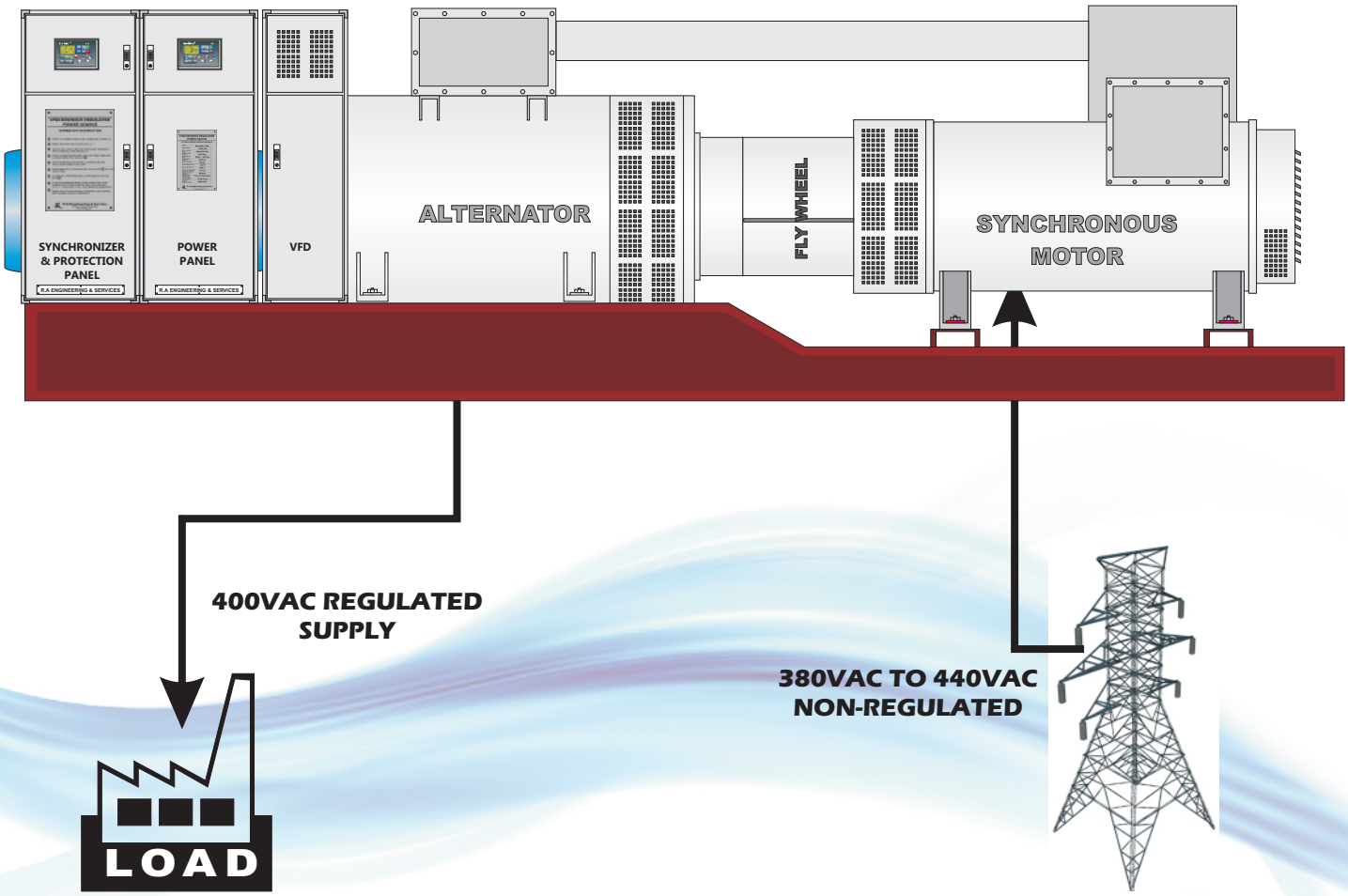
The Plants where there are big torque loads and large kinetic energy is required , then optional FLYWHEEL is added as per required and calculated weight and mass. This improves the system frequency stability against the torque loads.

SYNCHRONOUS REGULATED POWER SOURCE

The purpose of designing this product is to eliminate the voltage fluctuation and to save the sensitive controls with narrow supply input range.

The Electrical energy is converted into mechanical energy by using synchronous motor and the mechanical energy is then converted back to electrical energy by with precisely controlled the output voltages.

Fly weight is also introduced in the system. which provides the strength against the torque loads.



BENEFITS

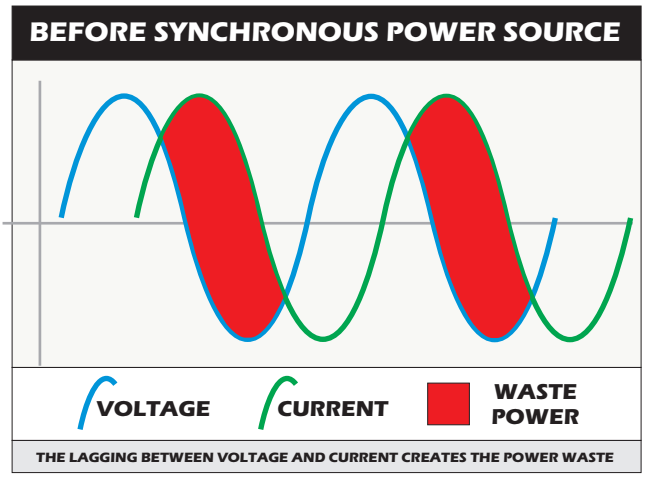
Low harmonics contents on input and output from no load to full linear load.
Voltage stabilize from 380V to 440V
High overload capability and a sustaining short circuit capability of 300% of nominal amps for 10 seconds.
0.9 power factor at input without power factor correction.

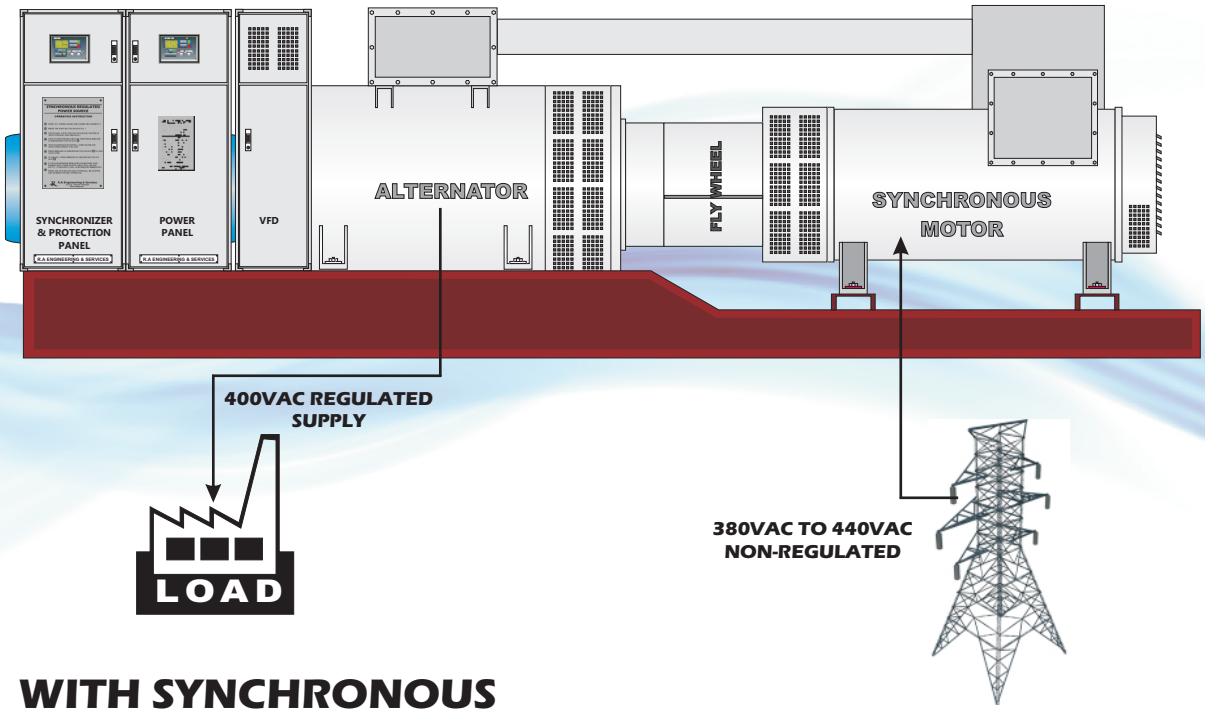
R.A. ENGINEERING Pvt. Ltd.

SYNCHRONOUS REGULATED POWER SOURCE

WITHOUT SYNCHRONOUS POWER SOURCE

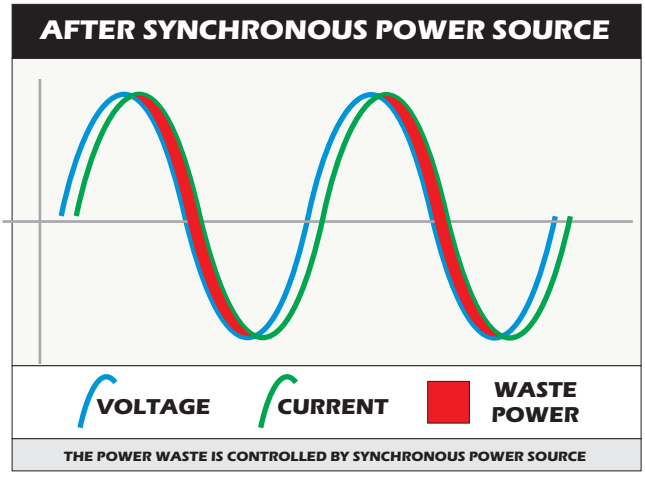
Without Synchronous Power Source , the utility power has distortion and waste power due to inductive load of the plant. Hence Power factor improvement (PFIP) system with capacitors is utilized but capacitors generates electrical harmonics in line , resulting disturbs & damages the systems with sensitive electronics controls.





WITH SYNCHRONOUS POWER SOURCE

With Synchronous Power Source , the utility power with distortion is rectified .
Since Synchronous power source has its own power factor controller (AVR) so Power factor improvement (PFIP) system with capacitors is not required resulting clean and distortion free electricity.
Since waste part of power is minimized and active power capacity of the system is maximized Hence efficiency of the system is improved.

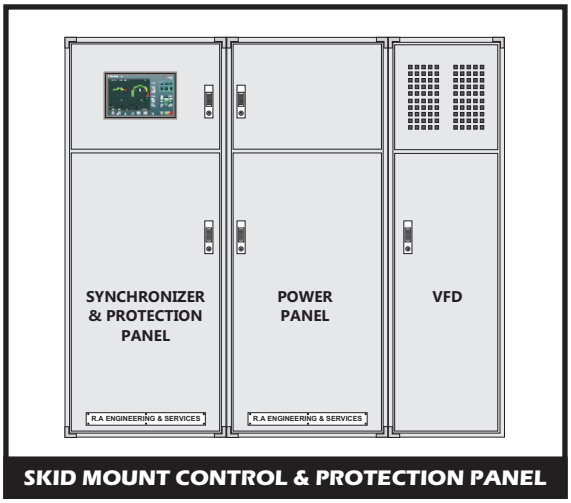


SYNCHRONOUS REGULATED POWER SOURCE

CONTROL & PROTECTIONS SYSTEM

SYNCHRONIZER & PFI CONTROLLER

ComAp



SKID MOUNT CONTROL & PROTECTION PANEL

In Synchronous Power Source , we utilized ComAp's Power Management System Name InteliSys-Base Box , The Short name is IS-NT-BB.
The main responsibilities of ComAp system are the Synchronizing & Voltage (PFI) Controlling.
Additional , 8 Inch SCADA HMI named Intelivision 8 is utilized which provides interactive and operator friendly system operation.
Additionally , All The electrical protections are responsibility of ComAp system.

POWER PANEL

The Power Panel contains the Main Power Breakers i-e ACB or VCB (depending on the system rated voltage and capacity)

VFD PANEL

The VFD Panel contains the Designated capacity of Variable Frequency Drive , which is used during the startup of the system and once system RPM / Frequency reaches rated level the system synchronized with utility power.

SYSTEM BY PASS

The System bypass is the standard feature of the Synchronous Regulated Power and it is provided for the system maintenance or if the system become NON-Operational due to some fault then Bypass system ensures the availability of the power with no electrical modifications on site. Hence saves the time.

OTHER SPECIFICATIONS OF SYSTEM

OPTIONAL FEATURES

Based on the requirement of the customer and the nature of the plant load , some features are optional and can be discussed and customized.

Followings are some considerable Value Added Features.

- FLYWHEEL
- 50Hz to 60Hz
- 60Hz to 50Hz
- MV Ratings

R.A. ENGINEERING Pvt. Ltd.

SYSTEM SPECIFICATION PLATE

SYNCHRONOUS REGULATED POWER SOURCE

SYSTEM SPECIFICATION DETAILS

MODEL:	RA-SRPS-1700
RATED POWER	1700 kW
RATED VOLTAGE INPUT	380-420 VAc
RATED VOLTAGE OUTPUT	400 VAc
RATED AMPERE INPUT	2924 ~ 3232 A
RATED AMPERE OUTPUT	3070 A
RATED FREQUENCY	50 Hz
RATED POWER FACTOR	0.8 φ
OVERLOAD CAPACITY	200 %
OVERLOAD TIME LIMIT TO DEFINED O/L CAPACITY	10 Sec
BYPASS BREAKER CAPACITY	4000 A
PACKAGE SIZE AGGREGATED	22′(L) x 7.5′(W) x 8′(H)
PACKAGE WEIGHT AGGREGATED	10.00 Tons
YEAR OF MANUFACTURING	JAN 2021

R.A Engineering & Services
Pvt. (Ltd) - KARACHI - PAKISTAN
www.raeng.com

OUR PRINCIPALS

mtu A Rolls-Royce solution

ABB

ComAp

SIEMENS

LU-VE exchangers

BROAD

GOVERNORS AMERICA CORP.

For more details please click the link below

www.raeng.com

Thanks for your time

(R.A. Engineering)

Copyrights © 2021 , R.A. Engineering Pvt. Ltd. All rights reserved.

R.A ENGINEERING (Pvt. Ltd.)