



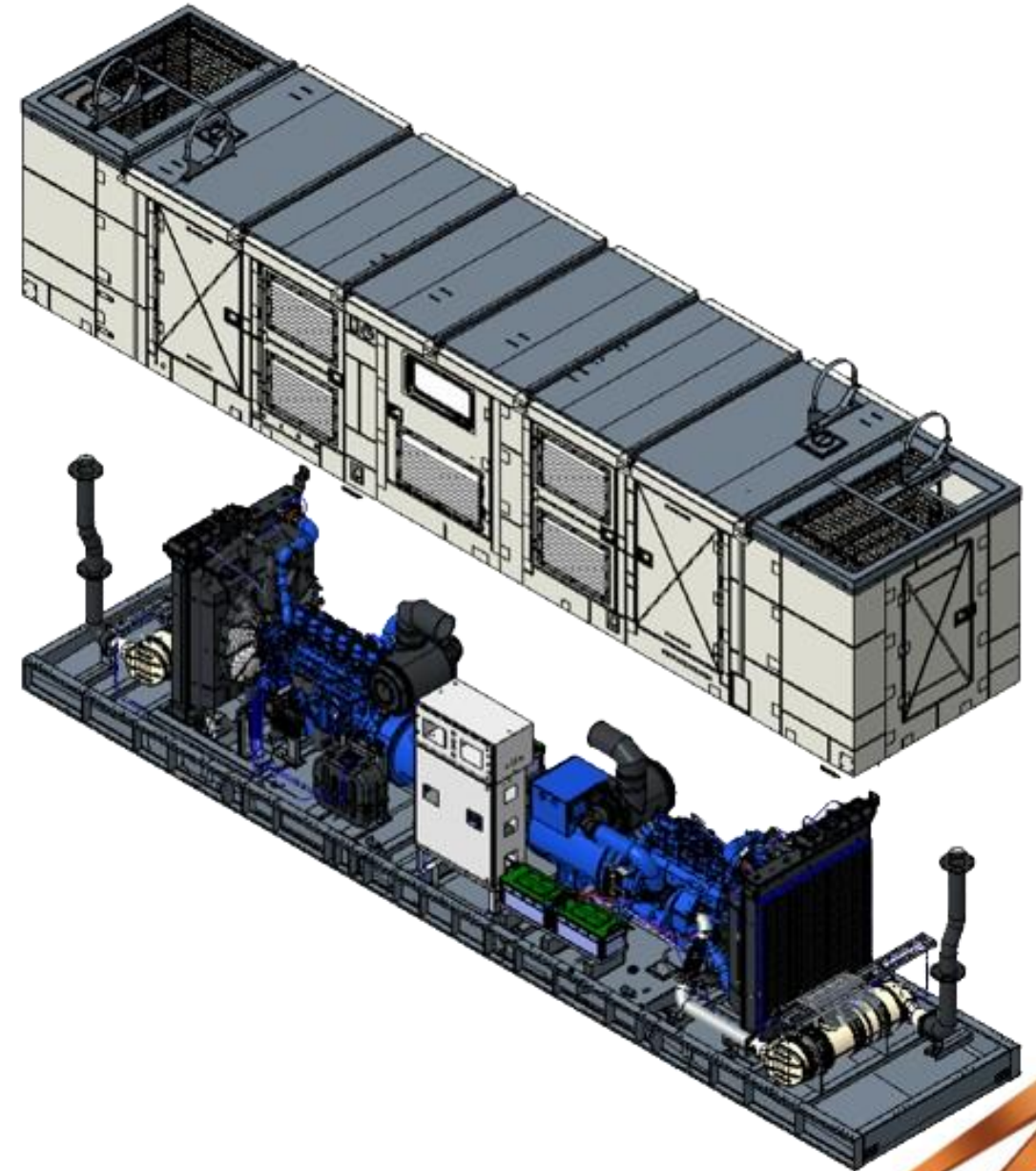
Application & Installation of KOEL

OPTIPRIME

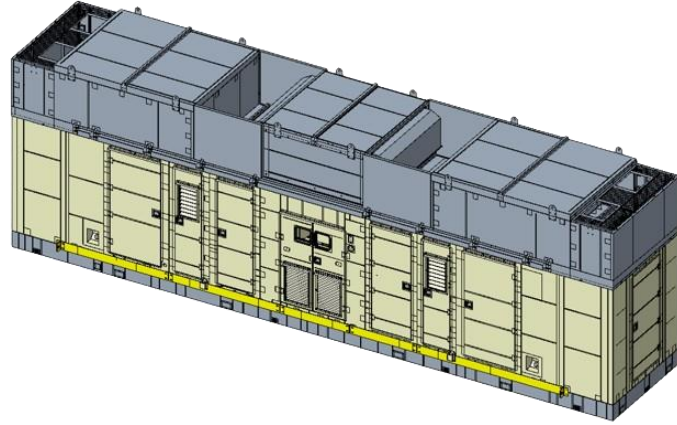
27-03-2024

OPTRIPRIME GENSETS

- 2 X Power: Innovation combined with Optimal Efficiency
- Optimum Power, Optimum Footprint, Optimum Savings.
- Multiple configuration options available based on customer and site requirements
- Common Power output to load
- Single package solution
- Optimized footprint
- Power redundancy
- Enhance Reliability
- Ease of handling and transportation

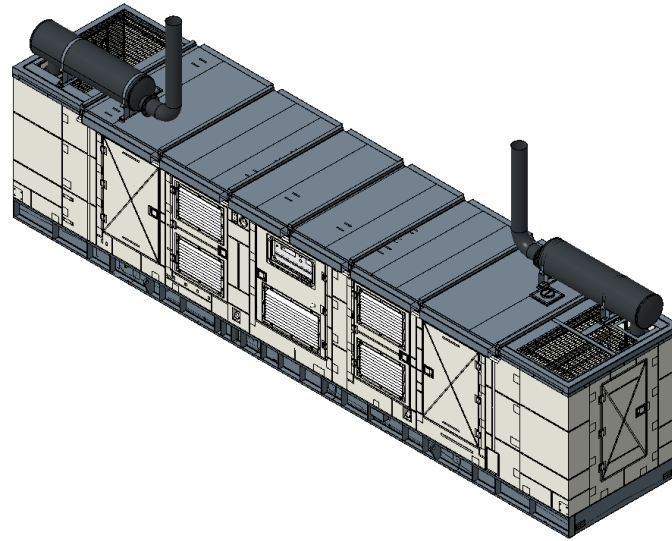


Cap on canopy



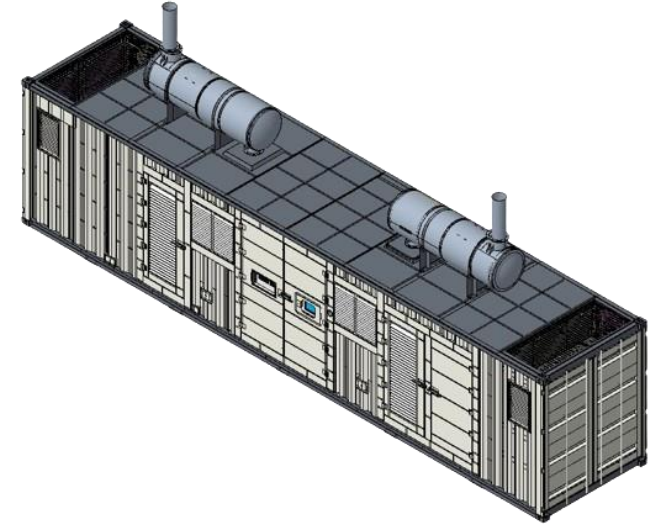
Same canopy but different base frames

Common base frame



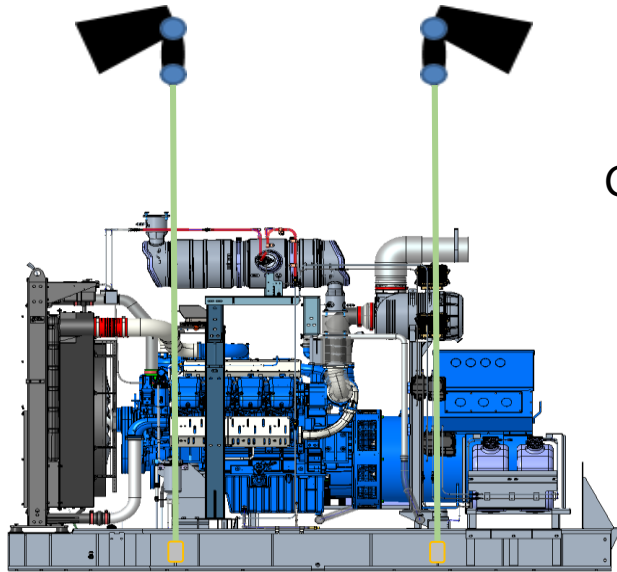
Two gensets on common base frame

Containerized genset



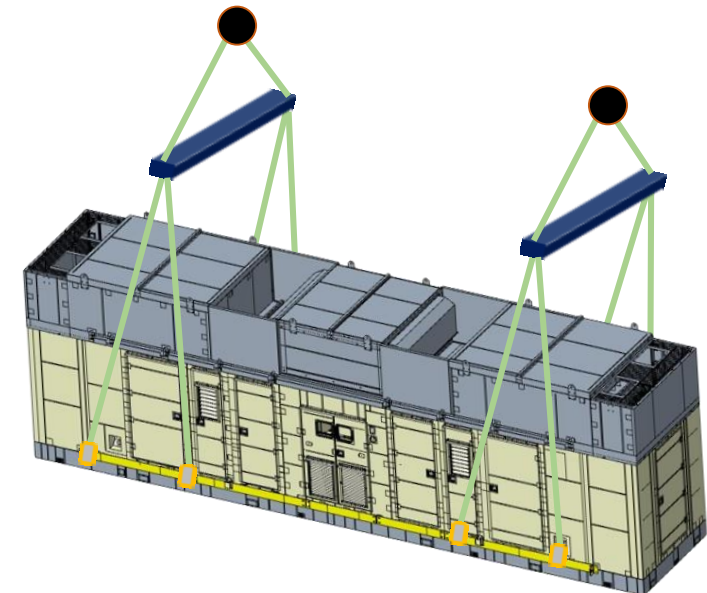
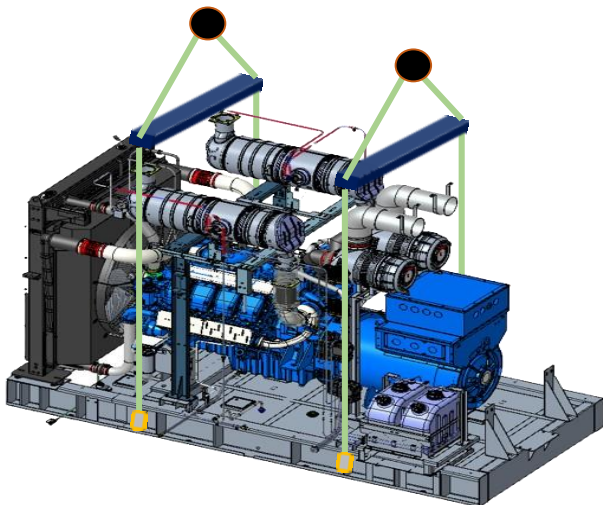
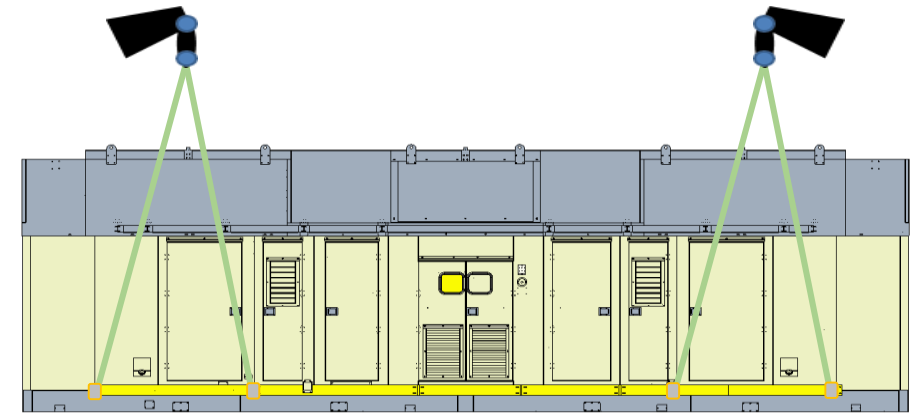
Two gensets in a shipping container

GENSET WITH DIFFERENT BASEFRAME (Cap on canopy)

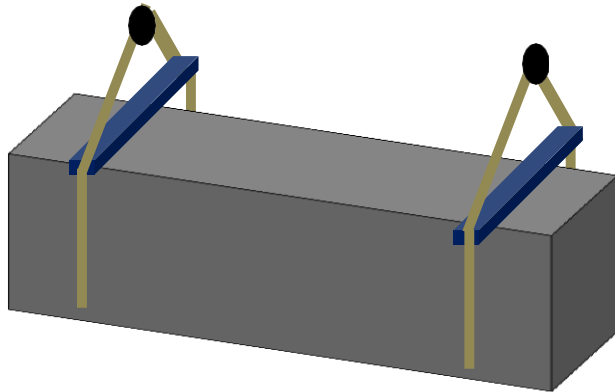
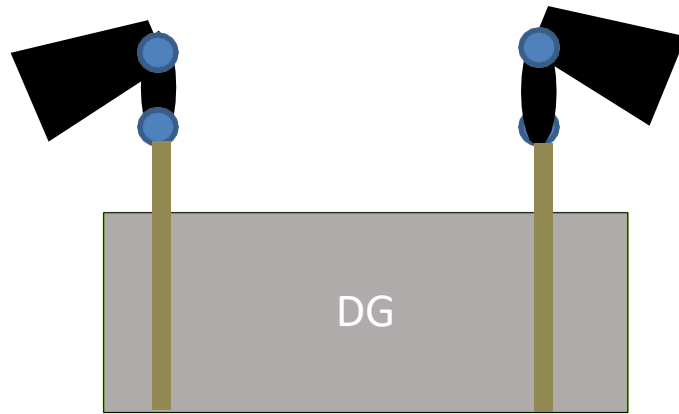


GOOD METHOD FOR UNLOADING

- Genset with different base frame, engines should be lift individually with the help of provided four hooks at the baseframe.
- The canopy has hooks at the bottom are provided to lift with ease.
- This reduces the risk of damage to the canopy.
- This method makes it easier for unloading and loading the genset.



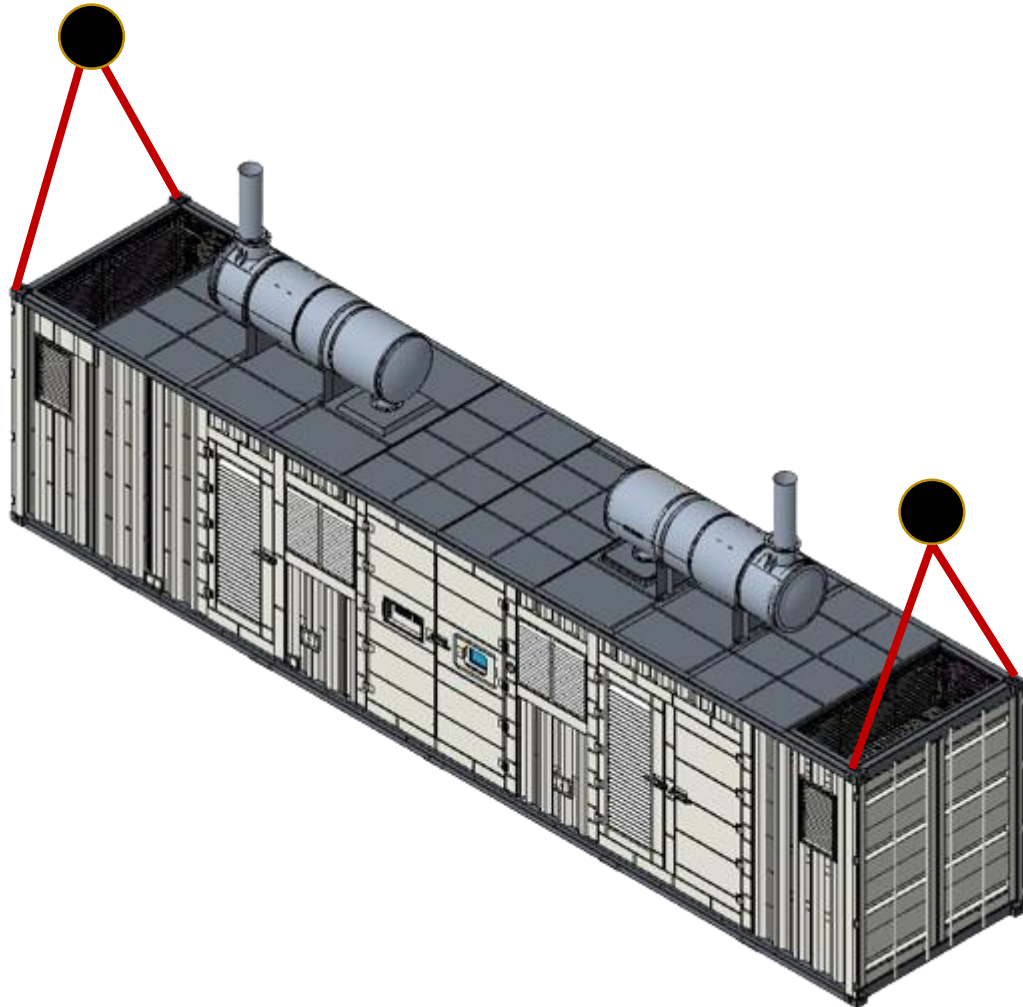
GENSET WITH COMMON BASEFRAME



GOOD METHOD FOR UNLOADING

- Genset with common base frame should be lift with the help of provided four hooks at the baseframe.
- This reduces the risk of damage to the canopy.
- This method makes it easier for unloading and loading the genset.

FOR CONTAINERIZED GENSETS



GOOD METHOD FOR UNLOADING

- Containerized genset should be lift with the help of provided hooks at the all four corners on the top.
- This reduces the risk of damage to the container.
- This method makes it easier for unloading and loading the genset.



GOOD FOUNDATION



Low Vibration



Good comp. Alignment



Better Life



Equip./human safety



Easy Maintenance



Floatation avoided



BAD FOUNDATION



Vibration transfer



Heat Spots in equipment



Poor Product Life



Poor performance



Difficult serviceability



Unsafe environment to work

This pressure must be less than the load-carrying capability of the soil foundation pad.

Foundations must be able to withstand the installation's weight and prevent floatation & deflections.



PRESSURE EXERTED

$$P = W/A$$

SAFE LOAD BEARING CAPACITY

Where:
P = pressure in PSI (kPa)
W = generator set wet weight in lbs (kg)
A = Area in sq. in. (m2) of the rails, pad vibration mounts.



WHY IS POSITIONING IMPORTANT?



Easy
Serviceability



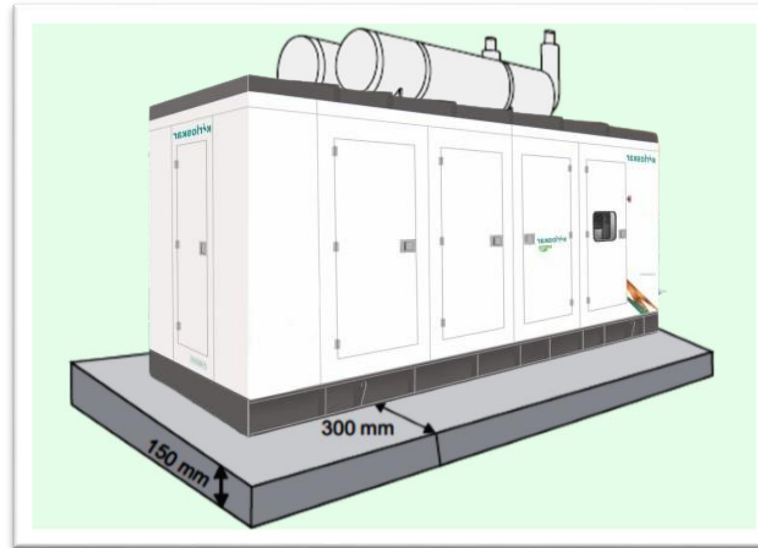
Easy
Maintenance



Safety



Better
Performance



Foundation > Genset Size

Genset to Foundation > 200mm

Foundation Height < 200mm

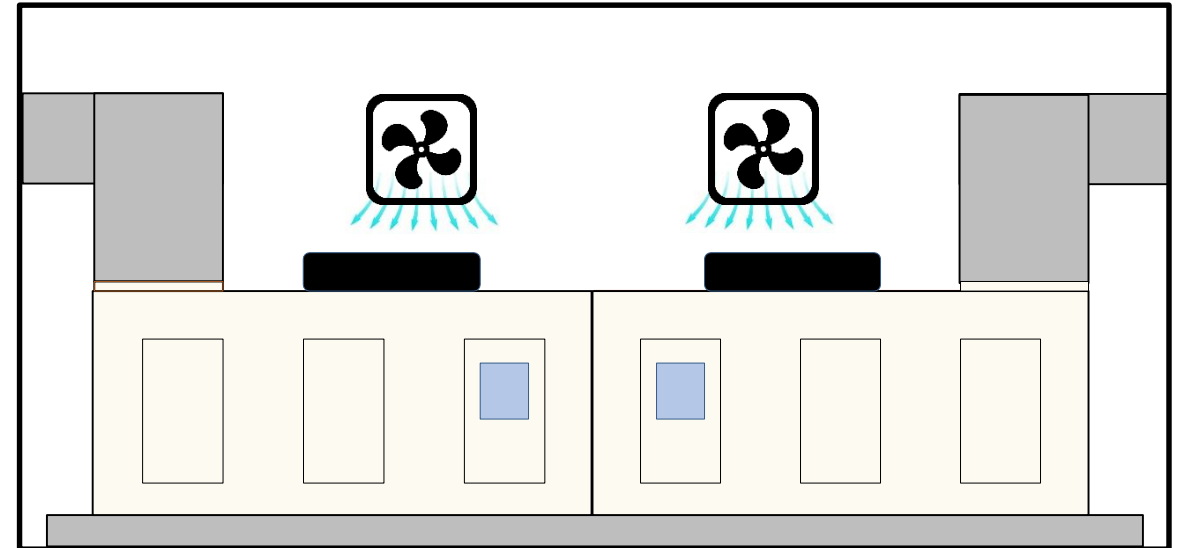
Distance B/w Foundation > 1500mm

Foundation Clearance > 1500mm

PROPER ROOM DESIGN ENSURES...

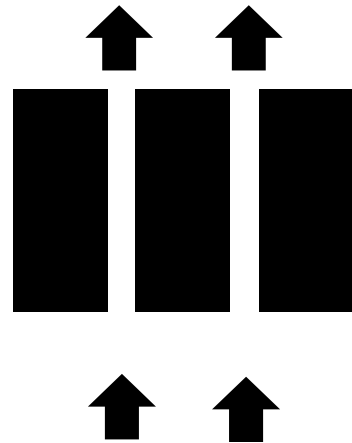


FOR SERIES TYPE OPTIPRIME





CORRECT AIR FLOW DIRECTION



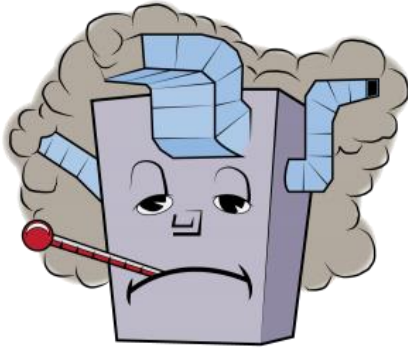
- Best Genset performance
- No heat transfer from other Genset
- No cross cooling



INCORRECT AIR FLOW DIRECTION

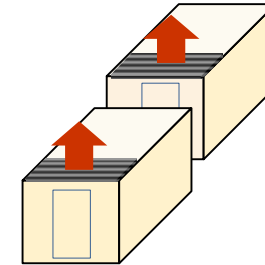


- Poor Genset performance
- Heat transfer from other Genset
- Cross cooling, poor cooling efficiency



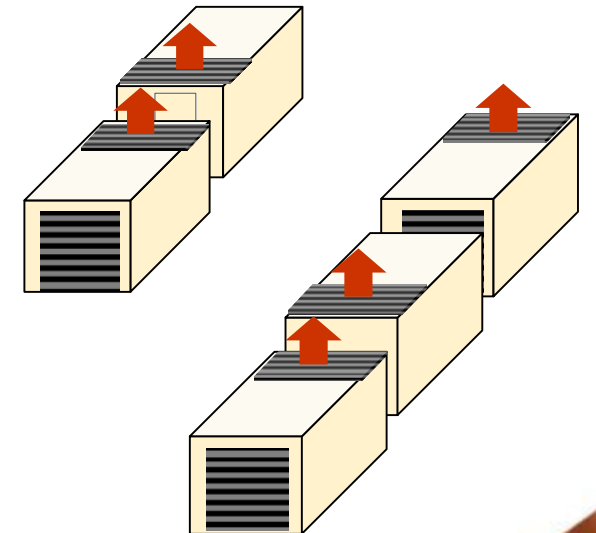
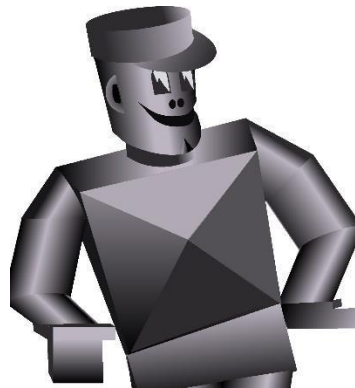
BAD VENTILATION

- Hot air Circulation to fresh air side.
- Genset Deration
- Poor Genset Life



GOOD VENTILATION

- No hot air Circulation
- Good performance of Genset
- Three Or More Genset Scheme



PROPER ROOM DESIGN ENSURES...



Easy
Serviceability



Easy
Maintenance



Easy
Walk Around



Safety &
Isolation

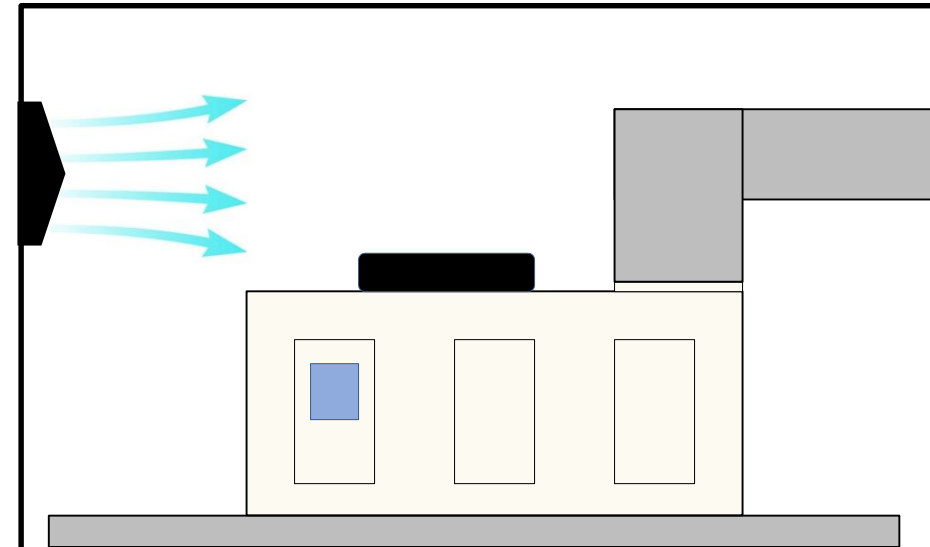


Better
Performance

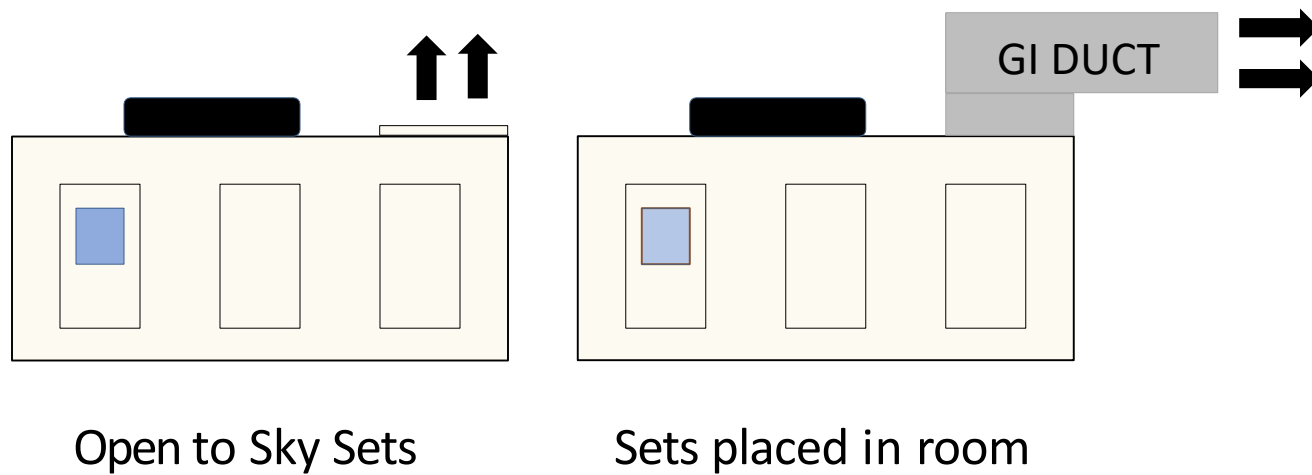


Good
Ventilation

FOR PARALLEL TYPE OPTIPRIME








Hot Air Out Schemes

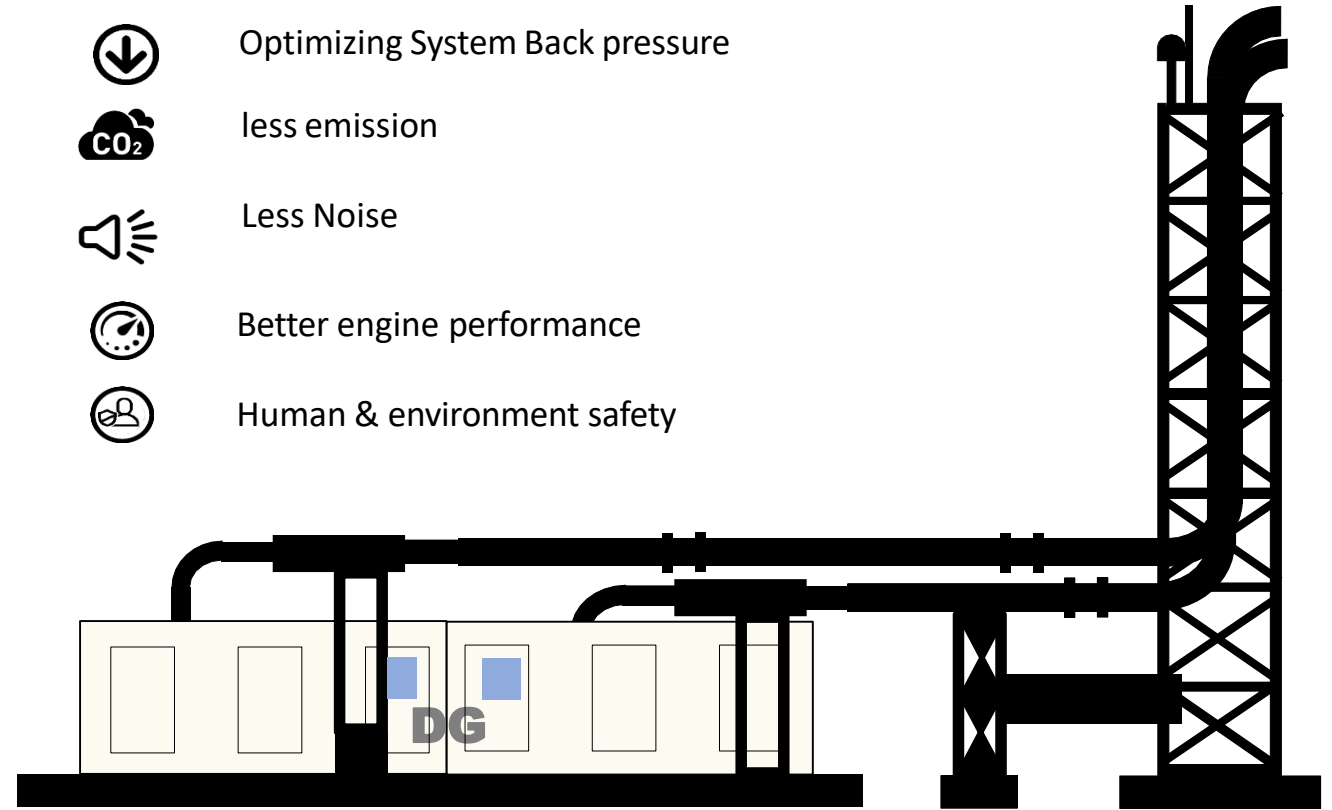


GI Ducting ensures...

- No Hot air Circulation
- Avoids back pressure
- Ensures efficient cooling
- Avoids wall cracking
- Reduces room temperature

- The exhaust stacks should be individual for both the engines.
- The back pressure should be less than the recommended max. permissible back pressure of individual engine.
- Do not combine the exhausts of two separate engines, it is highly recommended. (damages the engine performance)

-  Optimizing System Back pressure
-  less emission
-  Less Noise
-  Better engine performance
-  Human & environment safety



CPCB STANDARD NORMS FOR EXHAUST STACK HEIGHT



Genset Rating
<= 800kW

➔ $H = h + 0.2 \sqrt{\text{kVA}}$

H = Total height of stack in meter,
h = Height of the building in meters where
the generator set is installed nearest
Building height (DG is kept at ground level)
KVA = Total generator capacity in KVA



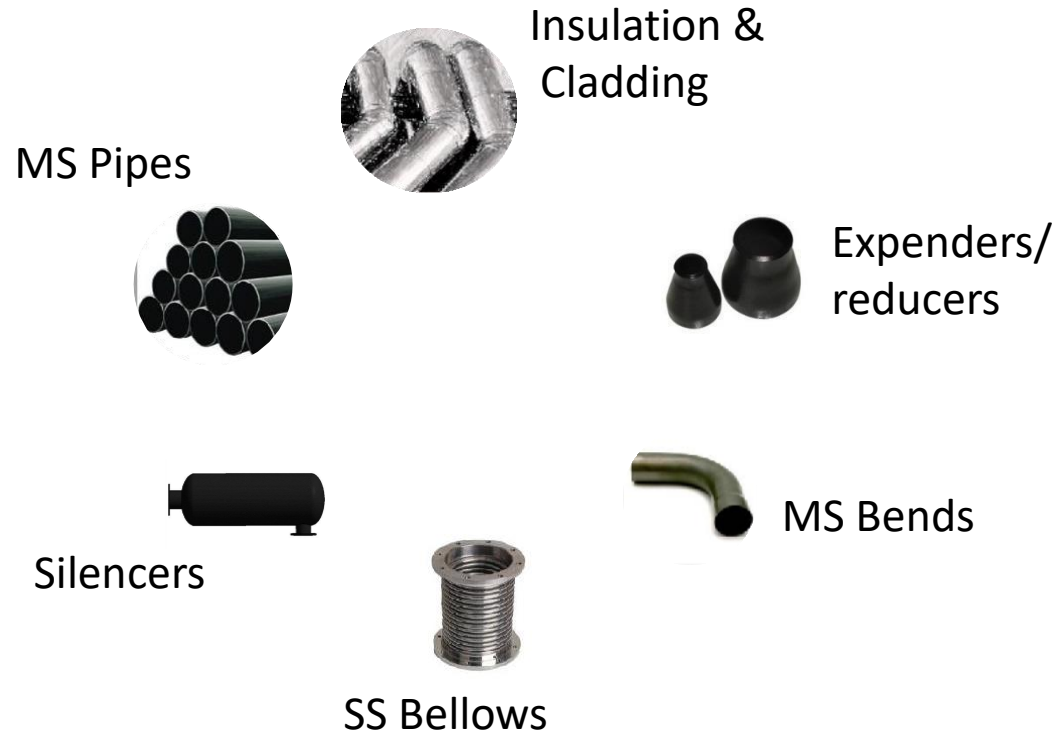
Genset Rating
> 800kW

- ➔ 30 m
- ➔ 6 m above the building
- ➔ $14 Q^{0.3}$

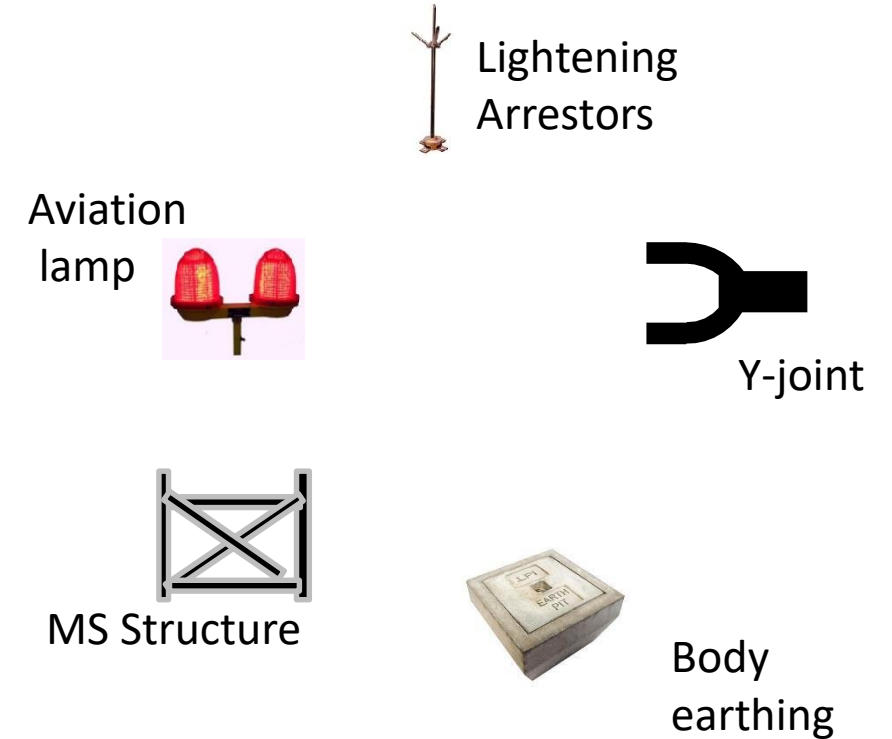
H= Height of Stack
Q=Total SO₂ Emission from the Plant
Q= (Total Fuel Consumption) kg / Hr x
(Sulphur Percentage) / 100
Fuel Consumption in KG / Hr = Fuel
consumption in Lts/ Hr x 0.845 x 1.05



GENERAL PROJECT COMPONENTS



SPECIAL PROJECT COMPONENT -EXTRA



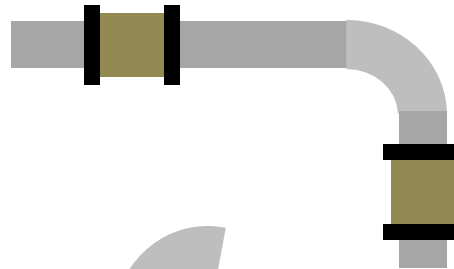
WHERE?

IN STRAIGHT
HORIZONTAL
PIPE



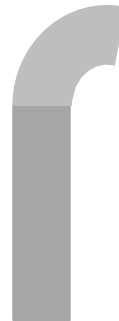
NEEDED

CONSIDERING
HORIZONTAL
BENDS



NEEDED

CONSIDERING
VERTICAL
BENDS

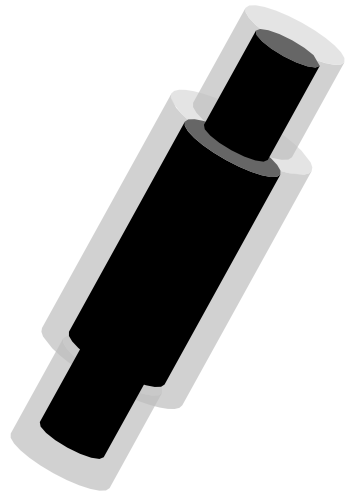


NOT
NEEDED

WHY?

- To absorb expansion in pipe
- To avoid movements
- To avoid counter force in the supports
- To avoid cracks in the adjacent walls
- To avoid support structure bending

SPECIFICATIONS RECOMMENDED



Rock/Glass/
Mineral wool



Density:
48-150kg/m³



Chicken
Mesh



Thickness:
50-100mm



Sheet: 24-26
SWG Al Sheet

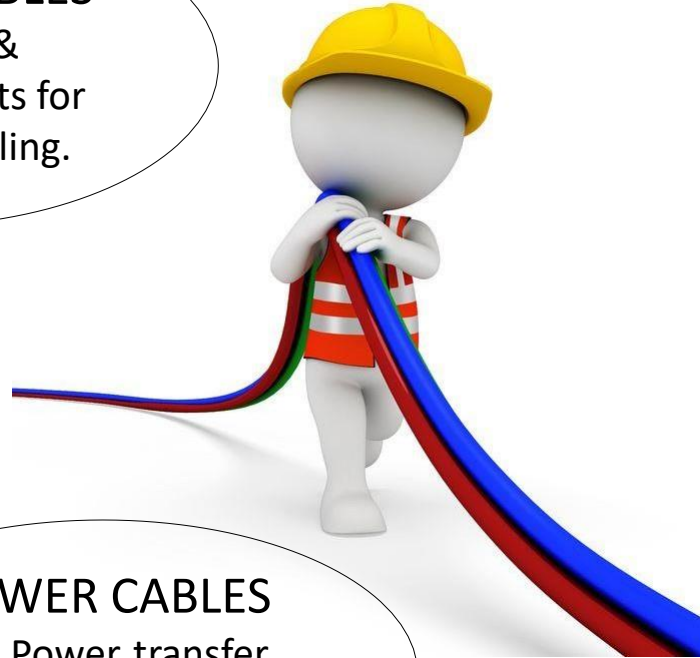
WHY?

- To reduce Thermal dissipation from pipes
- Restrict Sound
- Human Safety

** The values given are indicative and can change based on tender requirement and application.

CONTROL CABLES

For Control & command circuits for metering/signaling.



POWER CABLES

For Power transfer from Genset to the distribution/loads

WHY PROPER SIZING/SELECTION OF CABLE IS IMPORTANT.....

- For Continuous operations
- Withstanding short circuits currents
- Better life of Cables
- Better life of Instruments
- Better life of Instruments
- For Power system & human safety

CABLE SELECTION PARAMETERS...

- Deration Factors ●
- Number of Runs ●
- Cable Type ●
- Size of cable ●



- Breaker Max Current
- Protection Type
- Number of cores
- Fault level

CABLE TRAYS



- Cable entry to panel should be from top
- Perforated for control & ladder for power Cables
- Easy Servicing/ maintenance

TRENCHS



- Cable entry to panel should be from Bottom
- Uneasy servicing and maintenance
- Safety from human interaction



WHERE ?

- For large Current Power systems
- Where Cable installation is problem
- Isolation is important
- Cable Termination is difficult
- Space is a concern

WHY?

- Site Assembly
- Can be designed as per site
- Bars can be directly bolted to Terminals
- Easy to Maintain & service
- Can be used for outdoor installations

TYPES

WHY ?



NEUTRAL EARTHING

Star Point grounding to absorb the leakage current

BODY EARTHING

All electrical equipment to be grounded to route the leakage current through other connections



- Equipment safety
- Power system safety
- Human safety
- Arrest leakages
- Handling unbalanced phases

Importance of Earthing

Good Earthing not only ensures safety, but also improves the reliability of equipment and reduces the damages due to fault current.

Poor/ Lack of Grounding is dangerous and increases the risk of Equipment failure. Due to poor grounding there can be a

- Risk of Electric Shock
- Instrumentation Errors
- Harmonic distortions
- Failure of components
- And a list of un intended problems

The generating set and all associated equipment, control and switch gear panels must be earthed before the set is put into operation. 4 numbers earth pits are required as per Indian Electricity rules or local electricity board.

- 2 earthing pits for genset / control panel body

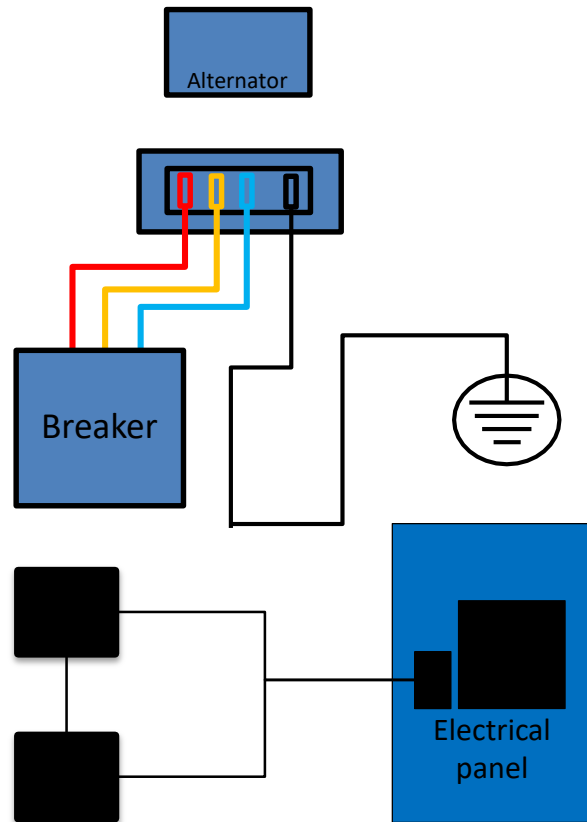
- 2 earthing pits for neutral

Copper or GI strips of suitable size may be used for earthing. Please note that for normal soil, earth resistance should not exceed one ohm.

Advantages of Neutral Grounding

- Greater safety for personnel and equipment.
- Increased service reliability.
- Lower operating and maintenance expense.
- Reduced magnitude voltage transients.
- Simplified ground-fault location.

Note: For Earthing Purpose, Optiprime sets should be considered as two independent generator



WHY ?



High voltages due to arcing grounds are eliminated.



Over-voltages due to lightning are discharged to earth.



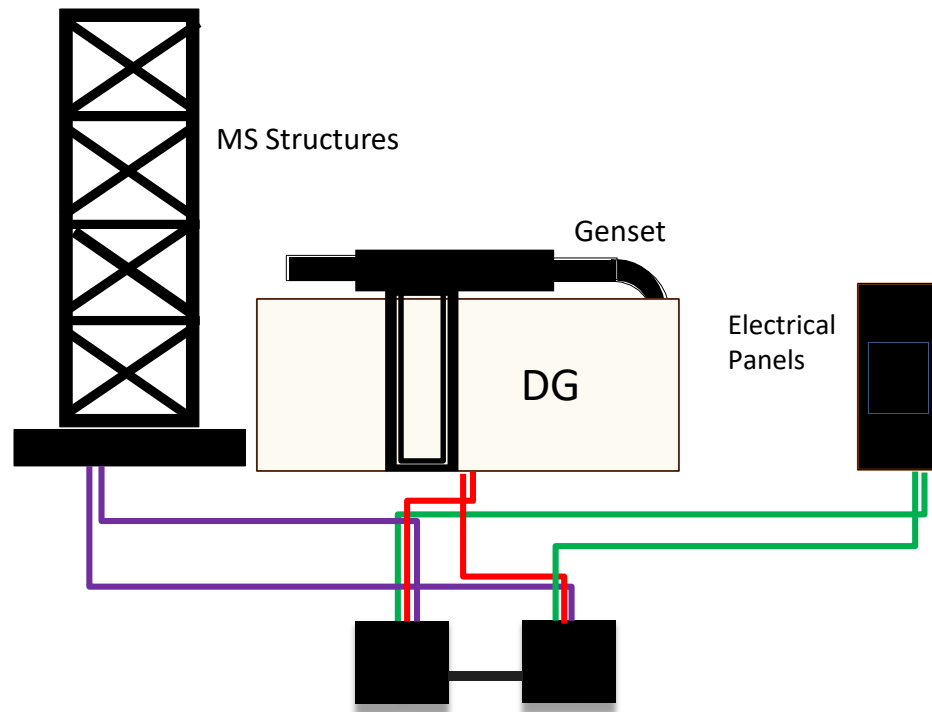
Greater safety to personnel and equipment.



Improved service reliability.



O&M expenditures are reduced.



WHY ?



Safety of Equipment.



Safety to personnel's.



Adds to overall life to Equipment.

Thank You..!