



Ensuring a Greener Earth

Powerline Group of Industries

INSTALLATION GUIDELINES & USER MANUAL

CONTENT

SR.NO.	TOPIC	SHEET NO.
1.	INSTALLATION- location, foundation, canopy design, & exhaust system	1-4
2.	FOUNDATION DRAWING FOR DG SETS	5
3.	SINGLE LINE DIAGRAM FOR CHANGE OVER SWITCH FOR MANUAL PANEL	6
4.	SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH (IDEAL)	7
5.	SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH – (NOT RECOMMENDED)	8
7.	EARTHING FOR DG SET	9
18.	OVERALL INSTALLATION SUMMARY: Cable, Earthing, Foundation, etc.	12

LOCATION

Dust and Fumes are the greatest danger to generating set as they could lead to clogging of cooling of air system which may affect Genset performance.

1. If KGPI genset to be installed in free field condition, please ensure dust free location and clear space of 2 times of height of genset.
2. If KGPI genset to be installed in the room, please ensure proper cross ventilation, clear space of minimum 3 meters from all sides.
3. If KGPI genset to be installed on Roof Top, please ensure Structural clearance, proper cross ventilation with respect to wind direction, clear space of minimum 3 meters from all sides.
4. If KGPI genset to be installed in basement, ensure ventilation with respect to Air requirement and clear space for easy maintenance.

FOUNDATION

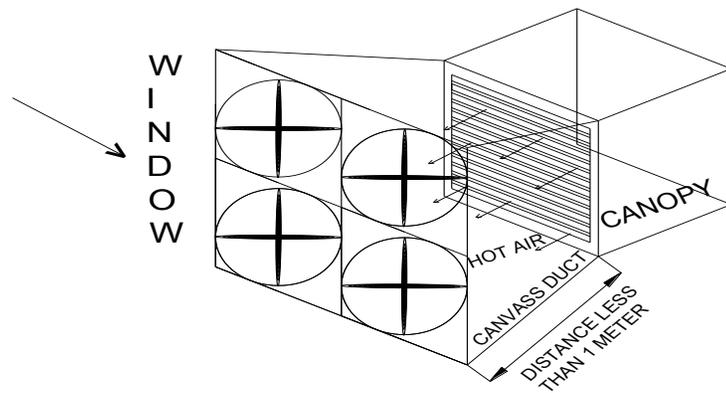
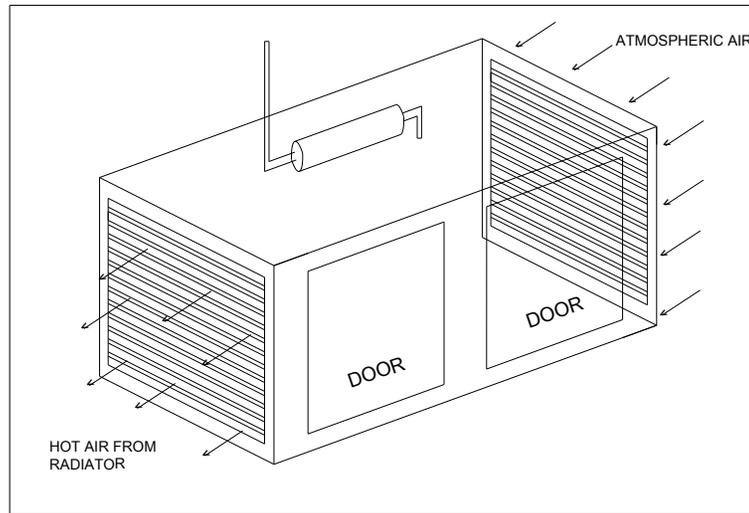
The basic functions of foundation are as below:

- To provide leveled platform to seat and seal the genset.
- To support the weight of the entire generating set.
- Support the dynamic load of genset while running.
- Absorb the vibration produced by the rotating and reciprocating masses.
- Isolate the surrounding structures by absorbing the vibration of generating set while in running.

CANOPY DESIGN / INSTALLATION OF CANOPY

The canopied genset may be lowered down from top with the help of a crane on the foundation block after curing time of PCC is over which usually is 21 days.

For installation inside a room window must be provided in line on either side walls- one for hot air to go out of room and other for letting in the atmosphere air without any restriction between window and canopy. Window size= 1.5 x Frontal area of air passage of canopy



be less then one meter.

Provide canvass ducting between canopy & window.

In case natural wind flow resists hot air.
 In case natural wind causing overheating
 of engine then install exhaust fans in the
 window for positive scavanging of hot air
 outside room.

Exhaust fans discharge capacity (total)
 $M^3/hr = 75 \times \text{bhp of Engine}$.

Distance between window and canopy should

EXHAUST SYSTEM INSTALLATION

Genset Exhaust system directs the hot flue gases into the atmosphere harmlessly.

On KGPI genset, exhaust silencer and expansion bellow are the integral part of exhaust system. At the time of genset installation, please ensure, proper alignment of exhaust silencer with respect to expansion bellow. If the canopy is required to dismantle, then utmost care is necessary at the time of re-assembling.

While taking exhaust gases away from genset above stack height, please refer table below for selecting the size of exhaust pipe.

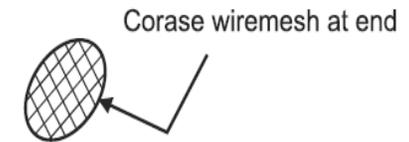
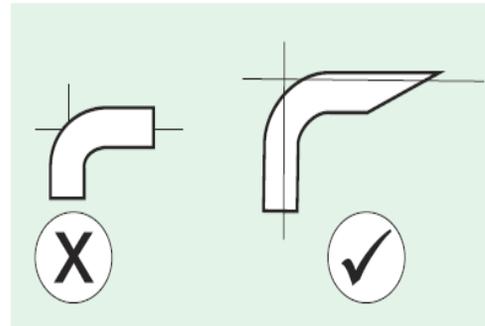
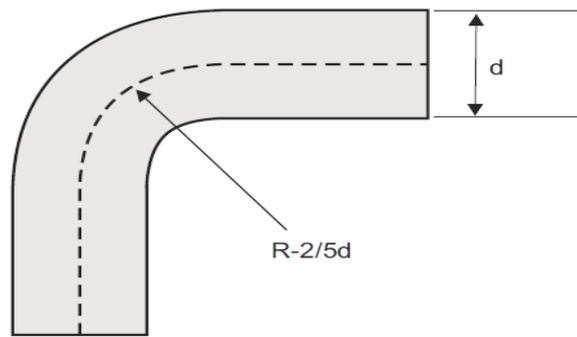
As per Statutory regulations, exhaust pipe has to be extended above the surrounding stack as below.

$H = h + 0.2 \times v \text{ KVA}$ Where H= Minimum height of exhaust stack, h= height of building.

ENGINE MODEL (WATER COOLED)	MINIMUM PIPE INSIDE DIAMETER IN INCH		ENGINE MODEL (AIR COOLED)	MINIMUM PIPE INSIDE DIAMETER IN INCH
EW- SERIES	2.5''		EA 10/16	2''
RB-SERIES	2.5''		HA294/ 394/ 494	2.5''
2R/3R/4R	2.5''		HA694	3''
4RTA	3''			
4K/6K	4''			
6SL	5''			
K	5''			
DV	5''			

Note: If the extension of exhaust pipe is more than 5 meters above Genset, increase pipe dia by 0.5'' for every 3 meters.

EXHAUST BEND: MS Bends used in exhaust piping should have a long smooth bend as shown in figure to ensure smooth flow of exhaust gases. Exhaust Outlet should have 30 cut at the tail end with Coarse wire mesh.

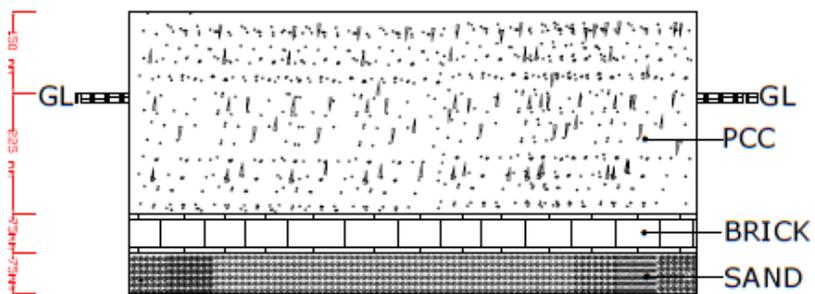
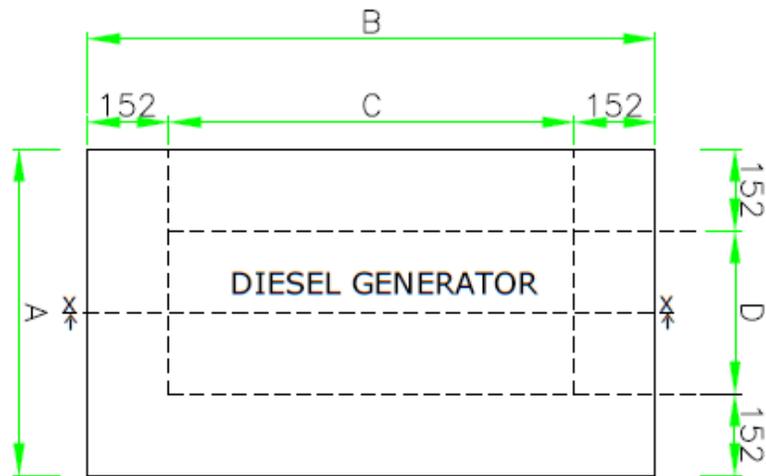


Note:

- If no. of bends are more than 4, increase the diameter of Exhaust Pipe and Bend by 0.5'' for addition of each band.
- The exhaust outlet should be in the direction of prevailing wind.
- tank.
- It is recommended to fill fuel after stopping the genset to avoid condensation.

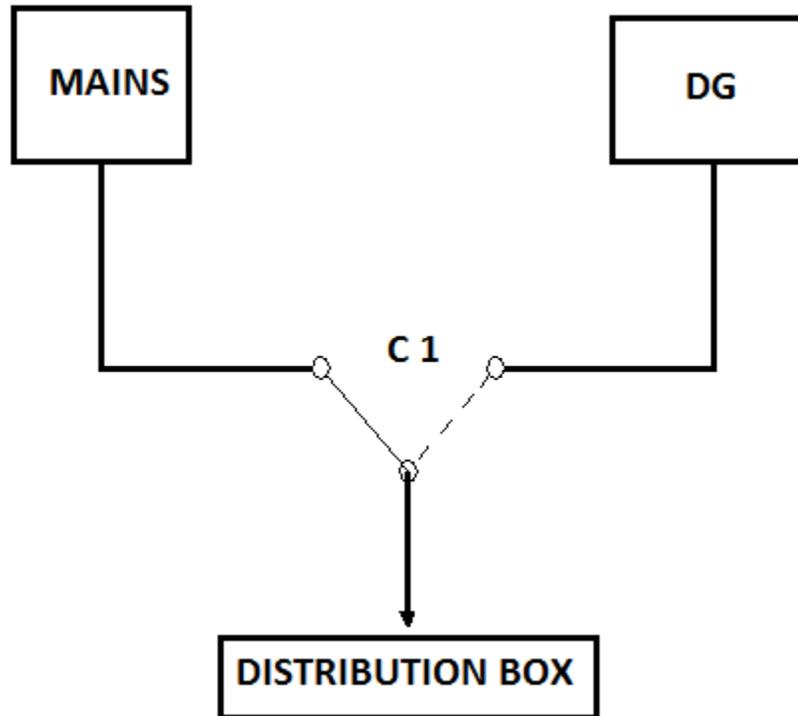
FOUNDATION DRAWING FOR DG SETS

DRAWING NAME ; INSTALLATION GUIDELINES.(FOUNDATION DIAGRAM)
POWERLINE GROUP OF INDUSTRIES.
KOEL GREEN GENSETS.



The dimensions mentioned in the foundation diagram are in mm (millimeter).

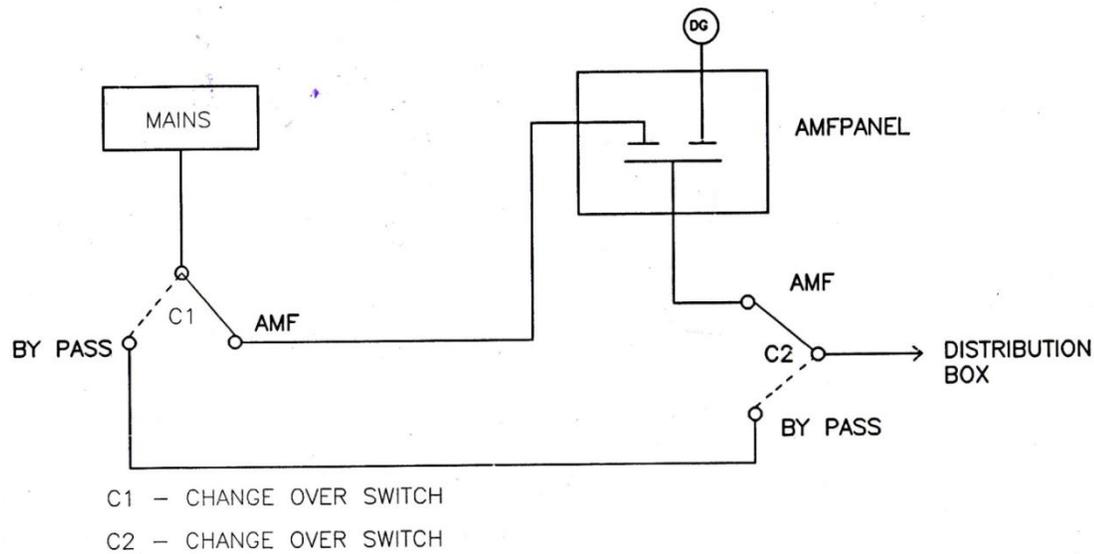
SINGLE LINE DIAGRAM FOR CHANGE OVER SWITCH FOR MANUAL PANELS



C1- CHANGE OVER SWITCH

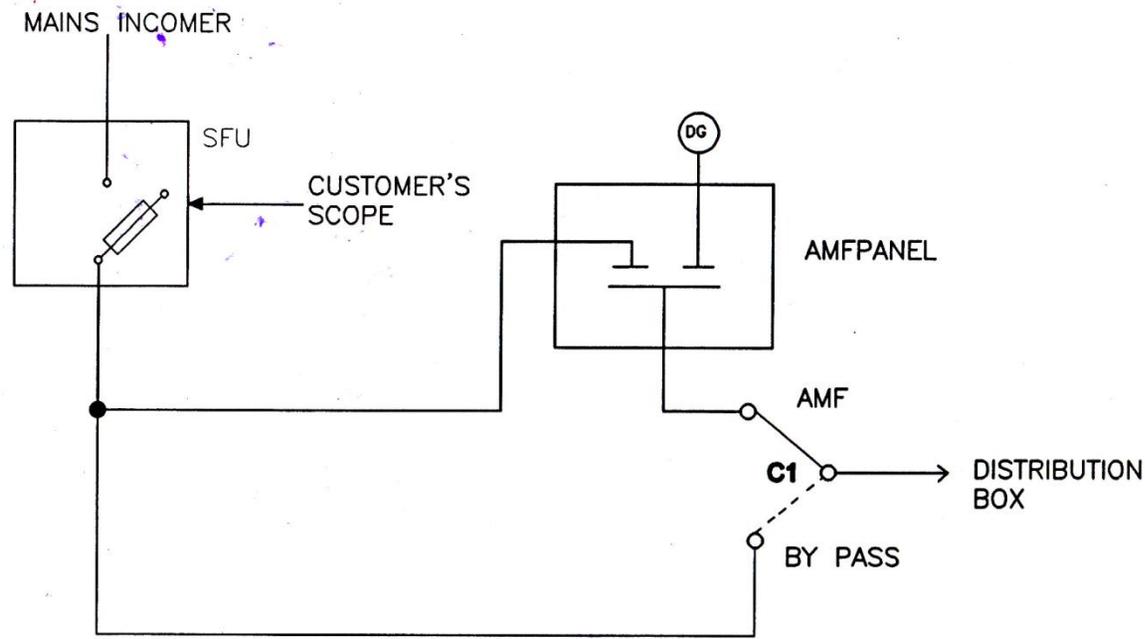
KVA		PHASE SUPPLY	CHANGE OVER RATING (AMP)	
FROM	TO		NO.OF POLE	RATING (AMP)
5	7.5	Single	2	32
10	15	Single	4	32
20	25	Single	4	63
30	40	Single	4	100
50	62.5	Single	4	160
5	10	Three	4	16
15	20	Three	4	32
25	40	Three	4	63
50	62.5	Three	4	100
70	82.5	Three	4	120
100	-----	Three	4	160
125	160	Three	4	250
180	200	Three	4	320
250	-----	Three	4	400
320	-----	Three	4	500
380	400	Three	4	600
500	-----	Three	4	800
600	625	Three	4	1000
750	-----	Three	4	1250/ 1600
1010	-----	Three	4	1600

SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH - (IDEAL)



KVA		PHASE SUPPLY	CHANGE OVER RATING (AMP)	
FROM	TO		NO.OF POLE	RATING (AMP)
5	7.5	Single	2	32
10	15	Single	4	32
20	25	Single	4	63
30	40	Single	4	100
50	62.5	Single	4	160
5	10	Three	4	16
15	20	Three	4	32
25	40	Three	4	63
50	62.5	Three	4	100
70	82.5	Three	4	120
100	-----	Three	4	160
125	160	Three	4	250
180	200	Three	4	320
250	-----	Three	4	400
320	-----	Three	4	500
380	400	Three	4	600
500	-----	Three	4	800
600	625	Three	4	1000
750	-----	Three	4	1250 /1600
1010	-----	Three	4	1600

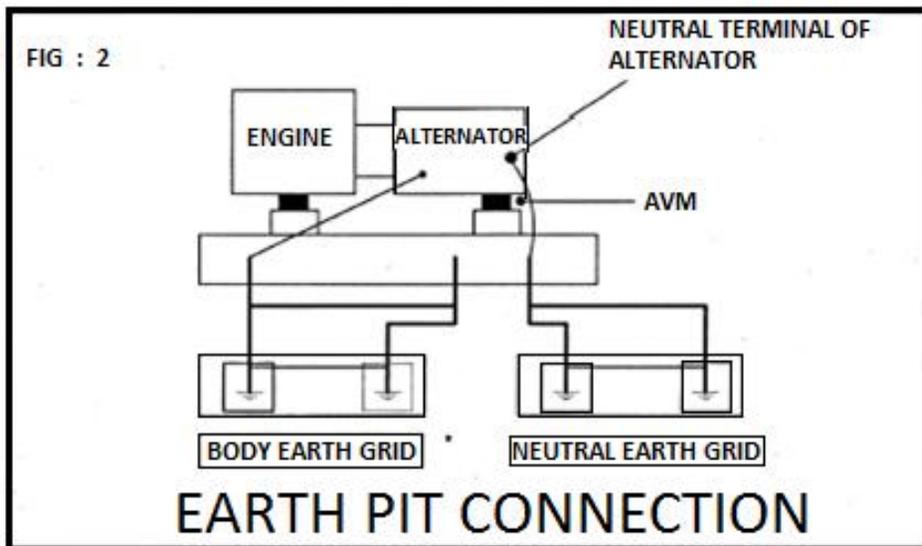
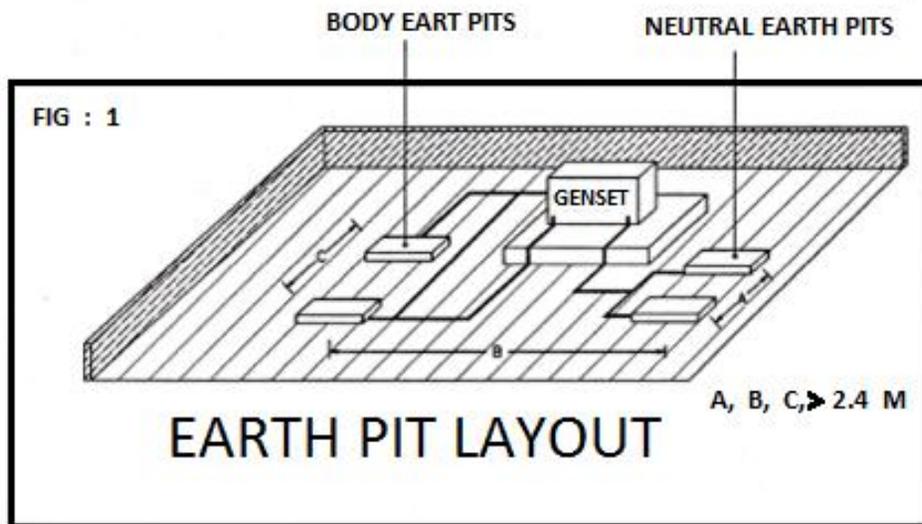
SINGLE LINE DIAGRAM FOR AMF BY-PASS WITH TWO CHANGE OVER SWITCH – (NOT RECOMMENDED)



C1 – CHANGE OVER SWITCH

KVA		PHASE SUPPLY	CHANGE OVER RATING (AMP)	
FROM	TO		NO.OF POLE	RATING (AMP)
5	7.5	Single	2	32
10	15	Single	4	32
20	25	Single	4	63
30	40	Single	4	100
50	62.5	Single	4	160
5	10	Three	4	16
15	20	Three	4	32
25	40	Three	4	63
50	62.5	Three	4	100
70	82.5	Three	4	120
100	-----	Three	4	160
125	160	Three	4	250
180	200	Three	4	320
250	-----	Three	4	400
320	-----	Three	4	500
380	400	Three	4	600
500	-----	Three	4	800
600	625	Three	4	1000
750	-----	Three	4	1250 / 1600
1010	-----	Three	4	1600

EARTHING FOR DG SET



REQUIRED EARTH PIT

KVA		NO. OF EARTH PIT	CONNECTION
FROM	TO		
2.1	30	2	Neutral- 1, Body- 1
40	140	3	Neutral- 2, Body- 1
160	1010	4	Neutral- 2, Body- 2

EARTHING WIRE & STRIP SIZE

KVA		RECOMMENDED EARTH STRIP/ CABLE
FROM	TO	
5	70	8 SWG- COPPER/ 25X3 mm GI
82.5	250	25x3mm COPPER/ 25X6mm GI
320	620	50X6 COPPER/25X6mm GI 2 RUNS
625	1010	50X6 mm CU 1 RUN/ 50x6 mm GI 2 RUNS

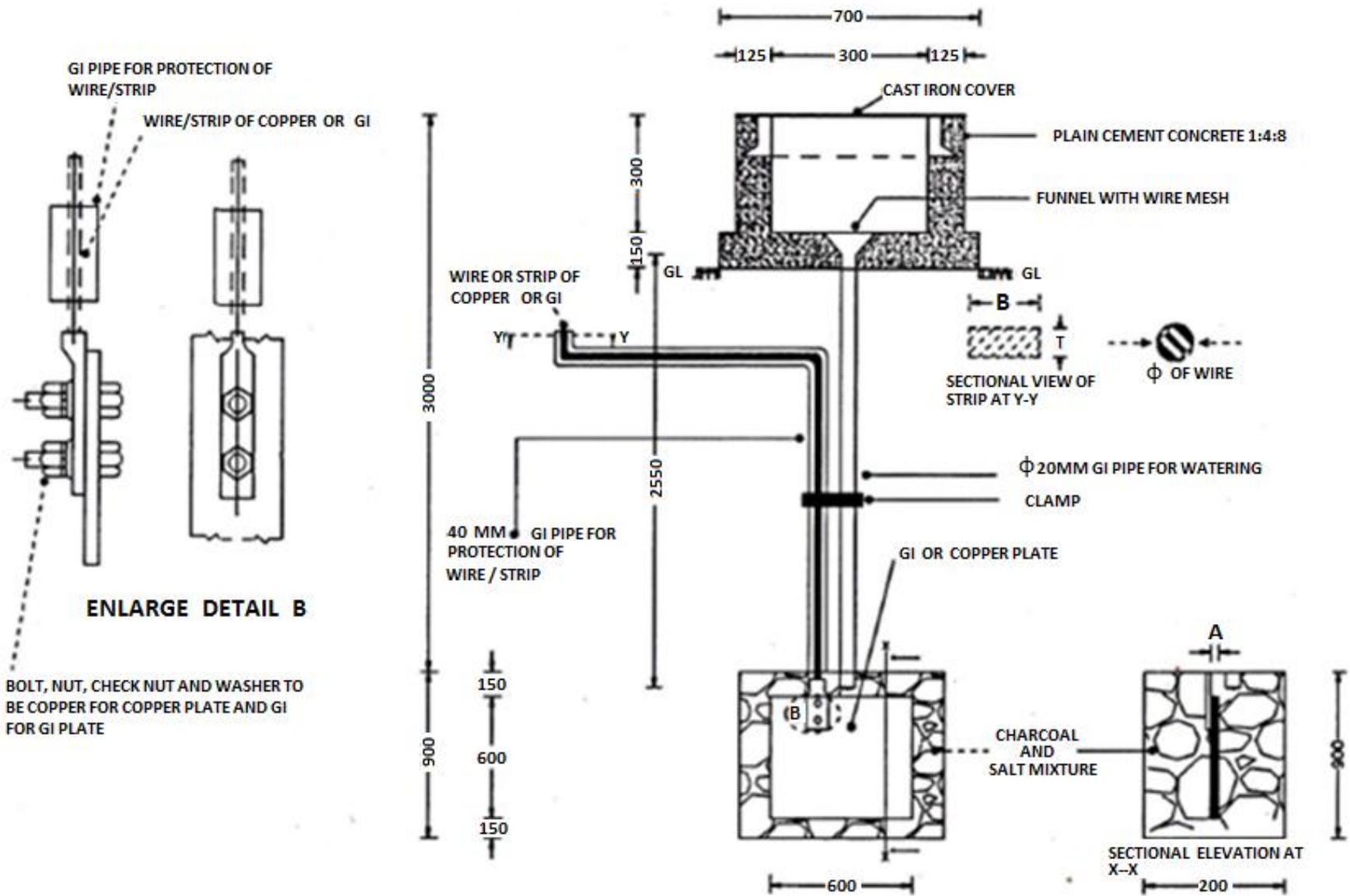
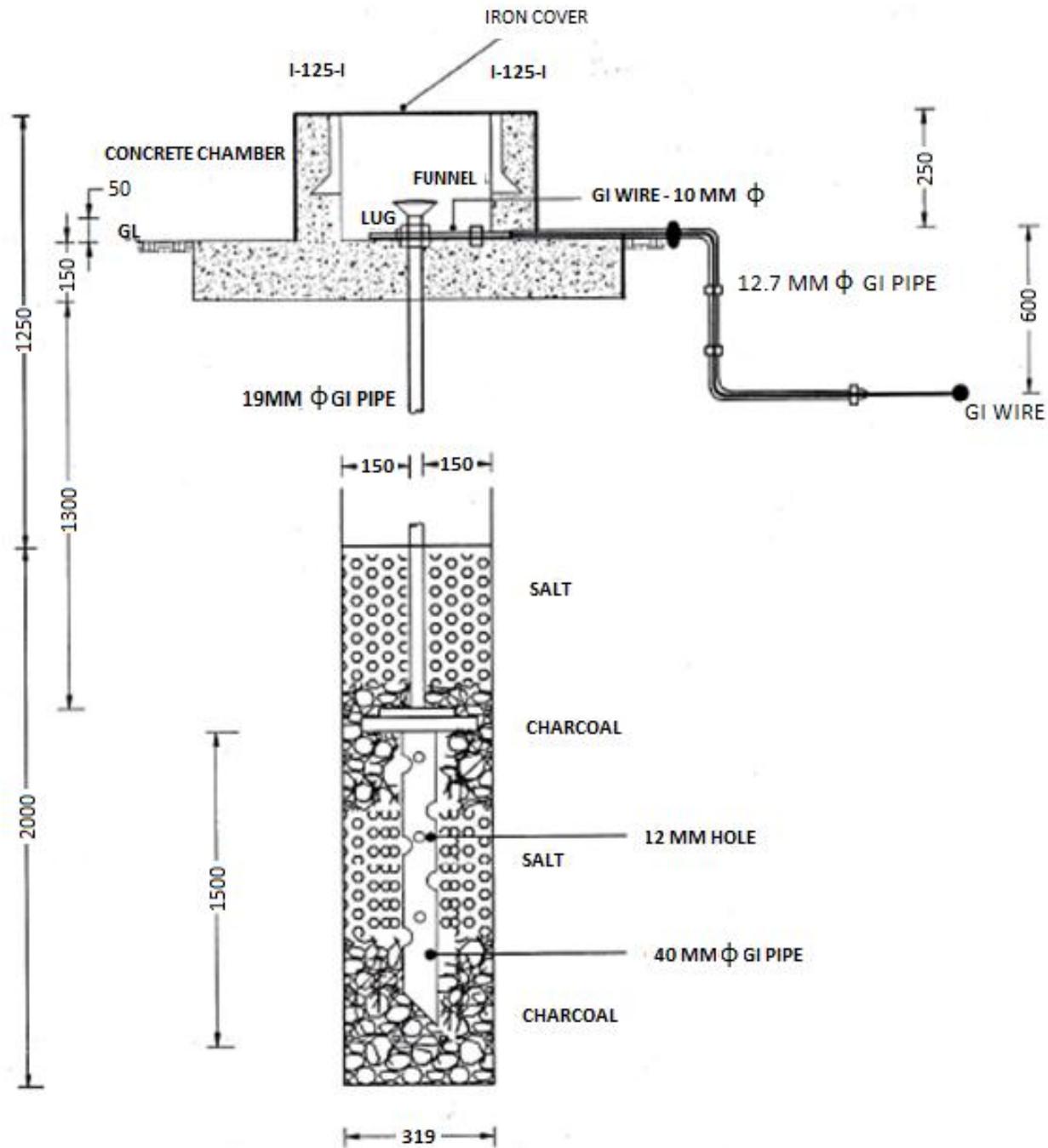


PLATE EARTHING



PIPE EARTHING

KVA	Phase	Cable Arrangement (in sqmm)				Earthing Arrangement (Plate earthing)			Charcoal + Salt (amount in kg)	Foundation		Reqd Genset surrounding Free space	Load (min)	Changeover		
		Aluminium			OR	Copper	No. of Earthing required	Copper Wire/Strip size		OR	GI Wire/Strip size				Length x Width (In feet)	Height (In Inch)
		Option I	Option II	Option III		Option I										
2.1	I	4	.....	.....		2.5	1	10 swg	8 swg	30+10	.....	.....	1.5 m	50%	16 Amp, 2 Pole
3.3	I	6	.....	.....		4	1	10 swg	8 swg	30+10	.....	.....	1.5 m	50%	16 Amp, 2 Pole
3	I	6	.....	.....		4	1	10 swg	8 swg	30+10	.....	.....	1.5 m	50%	16 Amp, 2 Pole
4	I	6	.....	.....		4	1	10 swg	8 swg	30+10	.....	.....	1.5 m	50%	32 Amp, 2 Pole
5	I	10	.....	.....		6	1	8 swg	6 swg	30+10	.....	.....	1.5 m	50%	32 Amp, 2 Pole
5	I	16	.....	.....		10	2	8 swg	6 swg	30+10	7 X 4	6	1.5 m	50%	32 Amp, 2 Pole
7.5	I	16	.....	.....		10	2	8 swg	6 swg	30+10	7 X 4	6	1.5 m	50%	32 Amp, 2 Pole
10	I	16	.....	.....		10	2	8 swg	6 swg	30+10	7 x 4	6	1.5 m	50%	32 Amp, 4 Pole
12.5	I	25	.....	.....		16	2	8 swg	6 swg	30+10	7 x 5	6	1.5 m	50%	63 Amp, 2 Pole
15	I	25	.....	.....		16	2	8 swg	6 swg	30+10	8 x 5	6	1.5 m	50%	63 Amp, 2 Pole
20	I	50	.....	.....		35	2	8 swg	6 swg	30+10	8 x 5	6	1.5 m	50%	100 Amp, 4 Pole
25	I	50	.....	.....		35	2	8 swg	6 swg	30+10	9 x 5	6	1.5 m	50%	100 Amp, 4 Pole
30	I	70	.....	.....		50	2	6 swg	25*3 mm	30+10	10 x 5	6	1.5 m	50%	100 Amp, 4 Pole
35	I	70	.....	.....		50	2	6 swg	25*3 mm	30+10	10 x 5	6	1.5 m	50%	100 Amp, 4 Pole
40	I	95	.....	.....		70	2	6 swg	25*3 mm	30+15	11 x 5	6	1.5 m	50%	100 Amp, 4 Pole
45	I	120	.....	.....		95	2	6 swg	25*3 mm	30+15	11 x 5	6	1.5 m	50%	100 Amp, 4 Pole
50	I	150	.....	.....		95	2	6 swg	25*3 mm	30+15	11 X 5	6	1.5 m	50%	160 Amp, 4 Pole
62.5	I	150	.....	.....		95	2	6 swg	25*3 mm	30+15	11 X 6	6	1.5 m	50%	160 Amp, 4 Pole
5	III	6	.....	.....		4	2	8 swg	6 swg	30+15	7 x 4	6	1.5 m	50%	16 Amp, 4 Pole
7.5	III	6	.....	.....		4	2	8 swg	6 swg	30+15	7 x 4	6	1.5 m	50%	16 Amp, 4 Pole
10	III	6	.....	.....		4	2	8 swg	6 swg	30+15	7 x 4	6	1.5 m	50%	16 Amp, 4 Pole
12.5	III	6	.....	.....		4	2	8 swg	6 swg	30+15	7 x 4	6	1.5 m	50%	32 Amp, 4 Pole
15	III	10	.....	.....		6	2	8 swg	6 swg	30+15	8 X 5	6	1.5 m	50%	32 Amp, 4 Pole
20	III	10	.....	.....		6	2	8 swg	6 swg	30+15	8 x 5	6	1.5 m	50%	32 Amp, 4 Pole
25	III	16	.....	.....		10	2	8 swg	6 swg	30+15	9 x 5	6	1.5 m	50%	63 Amp, 4 Pole
30	III	16	.....	.....		10	2	8 swg	6 swg	30+15	10 x 5	6	1.5 m	50%	63 Amp, 4 Pole
35	III	25	.....	.....		16	2	8 swg	6 swg	30+15	10 x 5	6	1.5 m	50%	63 Amp, 4 Pole
40	III	25	.....	.....		16	3	8 swg	6 swg	30+15	11 x 5	6	1.5 m	50%	63 Amp, 4 Pole
45	III	25	.....	.....		16	3	8 swg	6 swg	30+15	11 x 5	6	1.5 m	50%	100 Amp, 4 Pole
50	III	35	.....	.....		25	3	6 swg	25*3 mm	30+15	11 X 5	6	1.5 m	50%	100 Amp, 4 Pole
62.5	III	50	.....	.....		35	3	6 swg	25*3 mm	30+15	11 X 6	6	1.5 m	50%	100 Amp, 4 Pole
82.5	III	70	.....	.....		50	3	25*3 mm	25*6mm	40+20	13 X 6	6	1.5 m	50%	125 Amps, 4 Pole
100	III	95	.....	.....		70	3	25*3 mm	25*6 mm	40+20	13 X 6	6	1.5 m	50%	160 Amps, 4 Pole
125	III	150	.....	.....		70	3	25*3 mm	25*6 mm	40+20	13 X 6	6	1.5 m	50%	200 Amps, 4 Pole
140	III	185	.....	.....		95	3	25*3 mm	25*6 mm	40+20	15 X 7	6	1.5 m	50%	250 Amps, 4 Pole
160	III	240	.....	.....		120	4	25*3 mm	25*6 mm	40+20	15 X 7	6	1.5 m	50%	250 Amps, 4 Pole
180	III	240	.....	.....		120	4	25*3 mm	25*6 mm	40+20	16 X 8	6	1.5 m	50%	320 Amps, 4 Pole
200	III	300	.....	.....		150	4	25*3 mm	25*6 mm	40+20	16 X 8	6	1.5 m	50%	320 Amps, 4 Pole
250	III	300	.....	.....		150	4	25*3 mm	25*6 mm	40+20	16 X 8	6	1.5 m	50%	400 Amps, 4 Pole
320	III	240 x 2	.....	.....		120 x 2	4	50*6mm	50*6 mm x	40+20	19 X 9	6	1.5 m	50%	500 Amps, 4 Pole
380	III	300 x 2	.....	.....		150 x 2	4	50*6mm	50*6 mm x	40+20	20 X 9	6	1.5 m	50%	600 Amps, 4 Pole
400	III	300 x 2	.....	.....		150 x 2	4	50*6mm	50*6 mm x	40+20	20 X 9	6	1.5 m	50%	600 Amps, 4 Pole
500	III	240 X 3	.....	.....		185 X 2	4	50*6mm	50*6 mm x	40+20	21 X 9	6	1.5 m	50%	800 Amps, 4 Pole
600	III	300 X 3	.....	.....		400	4	50*6mm	50*6 mm x	40+20	24 X 9	6	1.5 m	50%	1000 Amps, 4 Pole
625	III	300 X 3	.....	.....		400	4	50*6mm	50*6 mm x 2	40+20	24 X 9	6	1.5 m	50%	1000 Amps, 4 Pole
750	III	300 X 4	240 X 5	185 X 6		300 + 185	4	50*6mm	50*6 mm x 2	50+30	25 X 10	6	1.5 m	50%	1250 / 1600, 4 Pole	
900	III	300 X 6	400 X 5	.....		.....	4	50*6mm	50*6 mm x 2	50+30	30 X 10	6	1.5 m	50%	1600 Amps, 4 Pole
1010	III	300 X 6	400 X 5	.....		.....	4	50*6mm	50*6 mm x 2	50+30	30 X 10	6	1.5 m	50%	1600 Amps, 4 Pole

A gentle note: Improper Installation may adversely impact the performance of the Genset and will have a bearing on warranty support from the manufacturers. As such, we request you to ensure that given guidelines are strictly followed while installing the Genset. Before commissioning of the Genset please go through the warranty booklet for more details.