

Workshop Exercises:

Advantage and disadvantage of different types of batteries and inverters

1. Please fill in the table provided outlining the pros and cons of each battery technology

	Flooded Lead-acid Batteries	Valve-regulated Lead-acid Batteries	Lithium Ion Batteries
Positive features	• • •	• • •	• • •
Negative features	• • •	• • •	• • •

2. Describe the difference between AGM and Gel VRLA batteries. Include in description physical difference between the two technology and performance differences:

3. Study the datasheet extracts provided for the following battery models, then fill out the table below.

Table 1: Battery nominal voltage and C_{10} and C_{20} capacity rating

Model	Nominal voltage	C_{10} rating	C_{20} rating
Example: 12SG133FTG	12 V	103 Ah	Not provided
2SG1200			
12SG200FTG			
S12/6.6 S			
S12/27 G5			
S12/230 A			

Model	Nom Volts	10hr rate to 1.80 VPC	120hr rate to 1.80 VPC	Length mm	Width mm	Height mm	Weight kg
2SG1000	2	666	1048	145	206	680	54
2SG1200	2	777	1223	210	191	680	64
2SG1400	2	888	1398	210	191	680	71
2SG2000	2	1332	2097	210	275	680	103
12SG133FTG	12	103	133	394	125	287	42
12SG200FTG	12	160	200	544	125	317	63

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Technical data

Technical characteristics and data

Type	Part number	Nom. voltage V	Nominal capacity C_{100} 1.80 Vpc 20 °C Ah	Discharge current I_{100} A	Length (l) max. mm	Width (b/w) max. mm	Height up to top of cover (h1) max. mm	Height including connectors (h2) max. mm	Weight approx. kg	Terminal	Terminal position
S12/6.6 S	NGS01206D6HS0SA	12	6.60	0.06	152	65.5	94.5	98.4	2.60	S-4.8	3
S12/17 G5	NGS0120017HS0BA	12	17.0	0.17	181	76.0	-	167	6.10	G-M5	1
S12/27 G5	NGS0120027HS0BA	12	27.0	0.27	167	176	-	126	9.60	G-M5	1
S12/32 G6	NGS0120032HS0BA	12	32.0	0.32	197	132	160	184	11.1	G-M6	2
S12/41 A	NGS0120041HS0CA	12	41.0	0.41	210	175	-	175	14.2	A-Terminal	1
S12/60 A	NGS0120060HS0CA	12	60.0	0.60	261	136	208	230	18.1	A-Terminal	1
S12/85 A	NGS0120085HS0CA	12	85.0	0.85	353	175	-	190	26.8	A-Terminal	1
S12/90 A	NGS0120090HS0CA	12	90.0	0.90	330	171	213	236	29.2	A-Terminal	2
S12/130 A	NGS0120130HS0CA	12	130	1.30	286	269	208	230	37.5	A-Terminal	4
S12/230 A	NGS0120230HS0CA	12	230	2.30	518	274	216	238	67.0	A-Terminal	3

Capacities C_1 - C_{100} (20 °C) in Ah

Type	C_1 1.70 Vpc	C_2 1.70 Vpc	C_{10} 1.70 Vpc	C_{20} 1.75 Vpc	C_{100} 1.80 Vpc
S12/6.6 S	2.90	4.60	5.10	5.70	6.60
S12/17 G5	9.30	12.6	14.3	15.0	17.0
S12/27 G5	15.0	22.1	23.5	24.0	27.0
S12/32 G6	16.9	24.4	27.0	28.0	32.0
S12/41 A	21.0	30.6	34.0	38.0	41.0
S12/60 A	30.0	42.5	47.5	50.0	60.0
S12/85 A	55.0	68.5	74.0	76.0	85.0
S12/90 A	50.5	72.0	78.0	84.0	90.0
S12/130 A	66.0	93.5	104	110	130
S12/230 A	120	170	190	200	230

4. Briefly describe the defining features of the following types of inverter

Battery inverter:

Inverter/charger:

PV inverter:

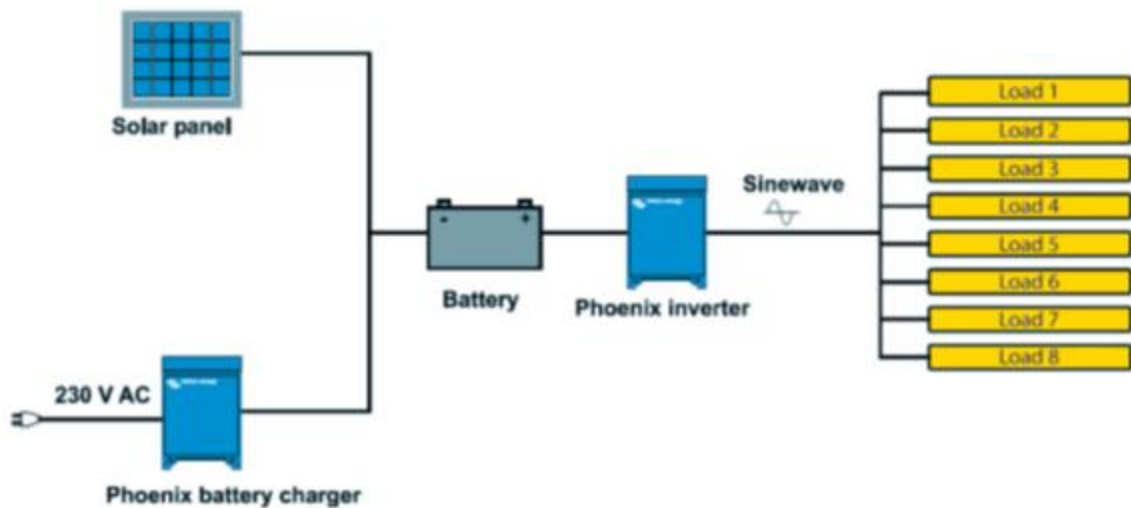
dc bus interactive inverter:

ac bus interactive inverter:

5. Study the datasheet/installation manual extracts provided for the following inverters, then identify the type/functionality each of the inverter.

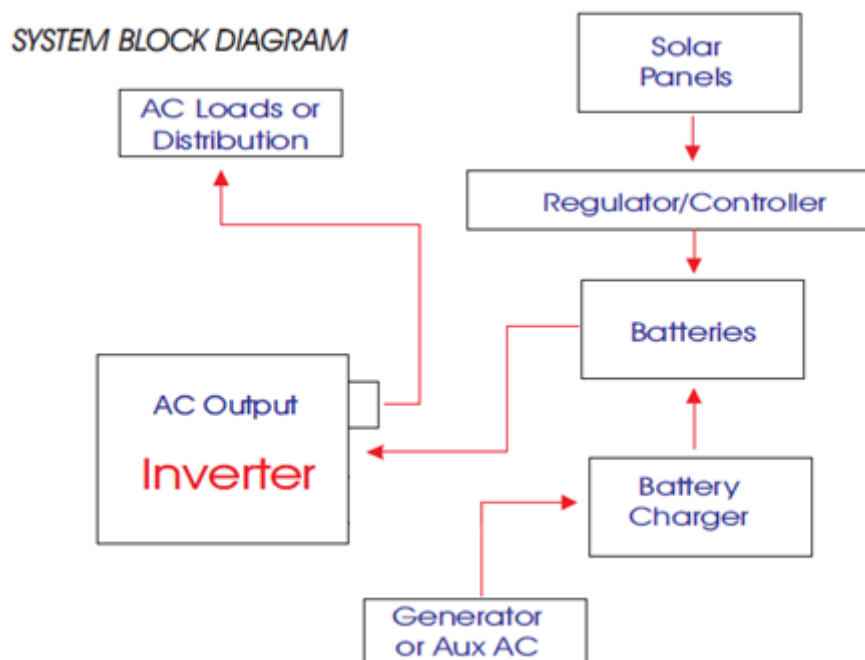
5.1:

Please describe the type of the inverter which is labelled 'Phoenix Inverter' and justify your answer:



5.2:

Please describe the type(s) of the inverter which is labelled 'inverter' and justify your answer:



5.3:

What feature is required for the ‘Mobile FX or VFX Inverter/Charger’ shown below to be known as a dc bus interactive inverter?

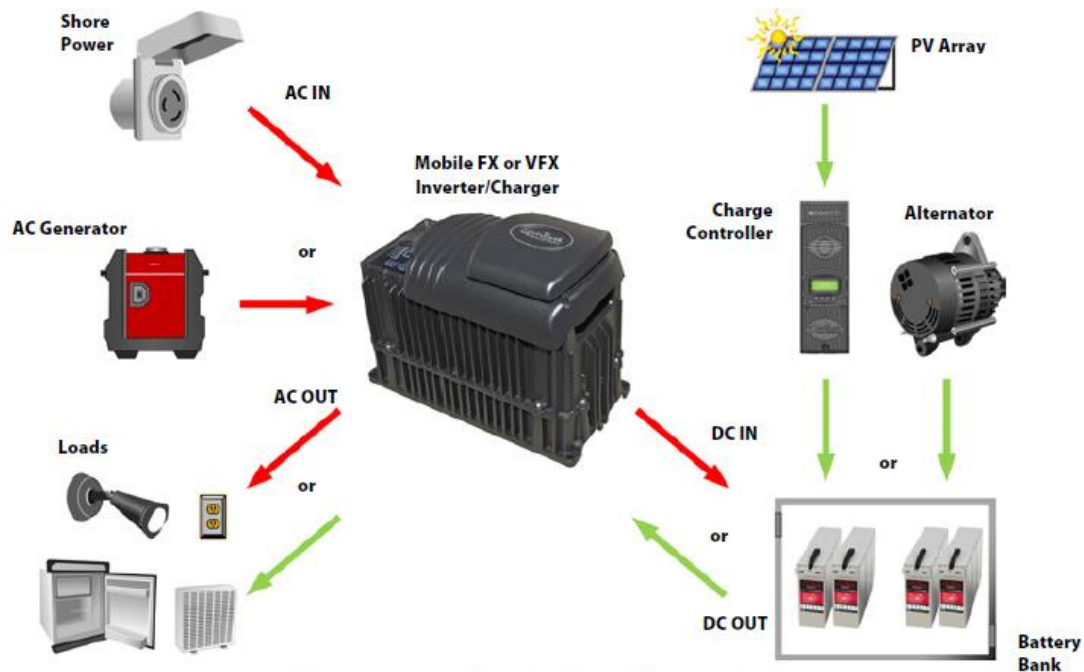
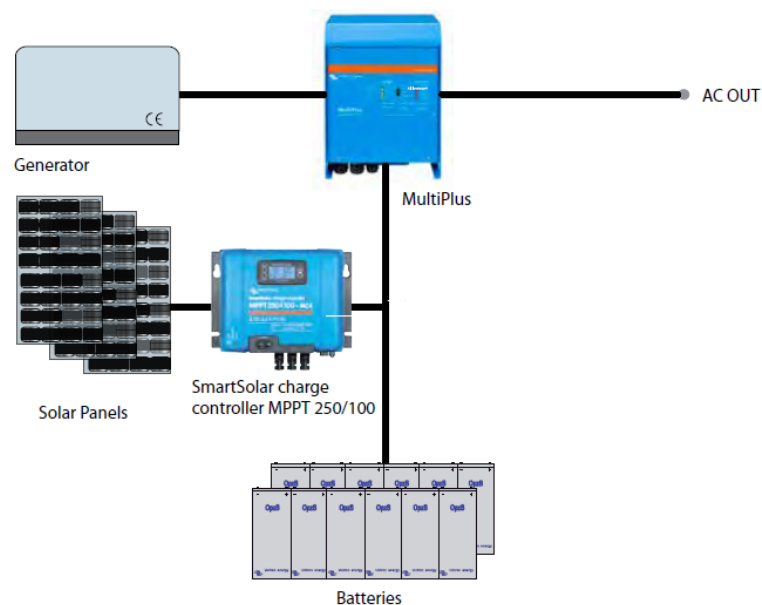


Figure 3 Applications (Example)

5.4:

Please describe the type of the inverter which is labelled ‘MultiPlus’ and justify your answer:



5.5:

Please describe the type of the inverter which is labelled 'Quatro' and justify your answer:

Please describe the type of the inverter which is labelled 'Solar Inverter' and justify your answer:

