General Technical Particulars

	Units	
Type of Cell		**YHP 11**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P535P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	535
Rated	AH	535
End of Life	AH	535
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	77.04
15 minutes	1.65	175.48
30 minutes	1.69	243.96
45 minutes	1.71	299.60
1 hour	1.75	321.00
2 hour	1.78	394.83
3 hour	1.80	433.89
4 hour	1.81	461.17
5 hour	1.82	481.50
6 hour	1.83	497.55
7 hour	1.83	508.79
8 hour	1.84	519.49
9 hour	1.84	528.58
10 Hour	1.85	535.00
Maximum momentary current for 1 min till 1.60 e.c.v		1198.4
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.332
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	107
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	74.9
ii) Finishing current	A	37.45
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	300
ii) Maximum	mA	600
Equalising charge		
a) Voltage	V	2.3
b) Current	A	26.75
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	230*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	238
Quantity of Electrolyte per Cell	litres	27.7
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	60.1
with acid	kg	92.8
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		5
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		6
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel /Teak Wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	17.12
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 13**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P645P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	645
Rated	AH	645
End of Life	AH	645
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
1 hour	1.75	387.00
2 hour	1.78	476.01
3 hour	1.80	523.10
4 hour	1.81	555.99
5 hour	1.82	580.50
6 hour	1.83	599.85
7 hour	1.83	613.40
8 hour	1.84	626.30
9 hour	1.84	637.26
10 Hour	1.85	645.00
Maximum momentary current for 1 min till 1.60 e.c.v		1444.8
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.242
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	129
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	90.3
ii) Finishing current	A	45.15
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	360
ii) Maximum	mA	720
Equalising charge		
a) Voltage	V	2.3
b) Current	A	32.25
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	230 x 368 x 682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	238
Quantity of Electrolyte per Cell	litres	26.4
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	70.5
with acid	kg	101.5
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		6
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		7
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
CIearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		Steel/Teak wood
e) Dimensions of the racks	mm	Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	20.64
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 15**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P750P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	750
Rated	AH	750
End of Life	AH	750
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	108.00
15 minutes	1.65	246.00
30 minutes	1.69	342.00
45 minutes	1.71	420.00
1 hour	1.75	450.00
2 hour	1.78	553.50
3 hour	1.80	608.25
4 hour	1.81	646.50
5 hour	1.82	675.00
6 hour	1.83	697.50
7 hour	1.83	713.25
8 hour	1.84	728.25
9 hour	1.84	741.00
10 Hour	1.85	750.00
Maximum momentary current for 1 min till 1.60 e.c.v		1680
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.237
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	150
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	105
ii) Finishing current	A	52.5
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	420
ii) Maximum	mA	840
Equalising charge		
a) Voltage	V	2.3
b) Current	A	37.5
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	230*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	238
Quantity of Electrolyte per Cell	litres	24.5
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	78.5
with acid	kg	108
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		7
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		8
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3X2
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel/Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	24
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 17**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P860P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	860
Rated	AH	860
End of Life	AH	860
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	123.84
15 minutes	1.65	282.08
30 minutes	1.69	392.16
45 minutes	1.71	481.60
1 hour	1.75	516.00
2 hour	1.78	634.68
3 hour	1.80	697.46
4 hour	1.81	741.32
5 hour	1.82	774.00
6 hour	1.83	799.80
7 hour	1.83	817.86
8 hour	1.84	835.06
9 hour	1.84	849.68
10 Hour	1.85	860.00
Maximum momentary current for 1 min till 1.60 e.c.v		1926.4
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.145
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	172
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	120.4
ii) Finishing current	A	60.2
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	480
ii) Maximum	mA	960
Equalising charge		
a) Voltage	V	2.3
b) Current	A	43
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	433*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	64.2
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	96.3
with acid	kg	172.6
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		8
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		9
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
CIearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Connection hardware with 5% extra furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel/Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	27.52
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 19**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P965P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	965
Rated	AH	965
End of Life	AH	965
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	138.96
15 minutes	1.65	316.52
30 minutes	1.69	440.04
45 minutes	1.71	540.40
1 hour	1.75	579.00
2 hour	1.78	712.17
3 hour	1.80	782.62
4 hour	1.81	831.83
5 hour	1.82	868.50
6 hour	1.83	897.45
7 hour	1.83	917.72
8 hour	1.84	937.02
9 hour	1.84	953.42
10 Hour	1.85	965.00
Maximum momentary current for 1 min till 1.60 e.c.v		2161.6
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.184
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	193
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	135.1
ii) Finishing current	A	67.55
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	550
ii) Maximum	mA	1100
Equalising charge		
a) Voltage	V	2.3
b) Current	A	48.25
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	433*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	63.0
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	104.5
with acid	kg	179.2
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		9
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		10
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Cell insulators provided If yes, material of insulator	Yes/No	No
Racks		
Racks a) Number of racks per battery b) Number of cells per rack c) Type of racks d) Material of rack e) Dimensions of the racks		 Depends on the battery layout Depends on the battery layout Depends on the battery layout steel/Teak wood Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	30.88
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 21**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1070P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1070
Rated	AH	1070
End of Life	AH	1070
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	154.08
15 minutes	1.65	350.96
30 minutes	1.69	487.92
45 minutes	1.71	599.20
1 hour	1.75	642.00
2 hour	1.78	789.66
3 hour	1.80	867.77
4 hour	1.81	922.34
5 hour	1.82	963.00
6 hour	1.83	995.10
7 hour	1.83	1017.57
8 hour	1.84	1038.97
9 hour	1.84	1057.16
10 Hour	1.85	1070.00
Maximum momentary current for 1 min till 1.60 e.c.v		2396.8
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.166
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	214
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	149.8
ii) Finishing current	A	74.9
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	600
ii) Maximum	mA	1200
Equalising charge		
a) Voltage	V	2.3
b) Current	A	53.5
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	433*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	61.8
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	116.6
with acid	kg	189.7
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		10
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		11
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	34.24
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 23**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1180P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1180
Rated	AH	1180
End of Life	AH	1180
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	169.92
15 minutes	1.65	387.04
30 minutes	1.69	538.08
45 minutes	1.71	660.80
1 hour	1.75	708.00
2 hour	1.78	870.84
3 hour	1.80	956.98
4 hour	1.81	1017.16
5 hour	1.82	1062.00
6 hour	1.83	1097.40
7 hour	1.83	1122.18
8 hour	1.84	1145.78
9 hour	1.84	1165.84
10 Hour	1.85	1180.00
Maximum momentary current for 1 min till 1.60 e.c.v		2643.2
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.153
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	236
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	165.2
ii) Finishing current	A	82.6
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	660
ii) Maximum	mA	1320
Equalising charge		
a) Voltage	V	2.3
b) Current	A	59
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	433*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	60.6
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	126.1
with acid	kg	197.7
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		11
Area of Positive plate	Sqcm	12000
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		12
Area of Negative plate	Sqcm	1930
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	37.76
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 25**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1285P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1285
Rated	AH	1285
End of Life	AH	1285
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	185.04
15 minutes	1.65	421.48
30 minutes	1.69	585.96
45 minutes	1.71	719.60
1 hour	1.75	771.00
2 hour	1.78	948.33
3 hour	1.80	1042.14
4 hour	1.81	1107.67
5 hour	1.82	1156.50
6 hour	1.83	1195.05
7 hour	1.83	1222.04
8 hour	1.84	1247.74
9 hour	1.84	1269.58
10 Hour	1.85	1285.00
Maximum momentary current for 1 min till 1.60 e.c.v		2878.4
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.138
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	257
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	179.9
ii) Finishing current	A	89.95
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	720
ii) Maximum	mA	1440
Equalising charge		
a) Voltage	V	2.3
b) Current	A	64.25
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.190 +/- 0.005
b) at full charge		1.200 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H	mm	433*368*682
(Tolerance : L X W X H : +/-3 X +/-3 X +/-5 mm)		
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	59.4
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	134
with acid	kg	204
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		12
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		13
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	41.12
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 27**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1395P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1395
Rated	AH	1395
End of Life	AH	1395
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	200.88
15 minutes	1.65	457.56
30 minutes	1.69	636.12
45 minutes	1.71	781.20
1 hour	1.75	837.00
2 hour	1.78	1029.51
3 hour	1.80	1131.35
4 hour	1.81	1202.49
5 hour	1.82	1255.50
6 hour	1.83	1297.35
7 hour	1.83	1326.65
8 hour	1.84	1354.55
9 hour	1.84	1378.26
10 Hour	1.85	1395.00
Maximum momentary current for 1 min till 1.60 e.c.v		3124.8
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.128
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	279
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	195.3
ii) Finishing current	A	97.65
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	780
ii) Maximum	mA	1560
Equalising charge		
a) Voltage	V	2.3
b) Current	A	69.75
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	433*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	56.3
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	145.5
with acid	kg	211.5
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		13
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		14
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	6.35
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	44.64
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 29**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1500P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1500
Rated	AH	1500
End of Life	AH	1500
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	216.00
15 minutes	1.65	492.00
30 minutes	1.69	684.00
45 minutes	1.71	840.00
1 hour	1.75	900.00
2 hour	1.78	1107.00
3 hour	1.80	1216.50
4 hour	1.81	1293.00
5 hour	1.82	1350.00
6 hour	1.83	1395.00
7 hour	1.83	1426.50
8 hour	1.84	1456.50
9 hour	1.84	1482.00
10 Hour	1.85	1500.00
Maximum momentary current for 1 min till 1.60 e.c.v		3360
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.091
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	300
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	210
ii) Finishing current	A	105
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	850
ii) Maximum	mA	1700
Equalising charge		
a) Voltage	V	2.3
b) Current	A	75
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell $L^{+/-3}$ x $W^{+/-3}$ x $H^{+/-5}$	mm	433*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	55.1
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	155
with acid	kg	219.5
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		14
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	4.2
No. of negative plates per cell		15
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	57
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	6.35
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	48
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 31**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1605P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1605
Rated	AH	1605
End of Life	AH	1605
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	231.12
15 minutes	1.65	526.44
30 minutes	1.69	731.88
45 minutes	1.71	898.80
1 hour	1.75	963.00
2 hour	1.78	1184.49
3 hour	1.80	1301.66
4 hour	1.81	1383.51
5 hour	1.82	1444.50
6 hour	1.83	1492.65
7 hour	1.83	1526.36
8 hour	1.84	1558.46
9 hour	1.84	1585.74
10 Hour	1.85	1605.00
Maximum momentary current for 1 min till 1.60 e.c.v		3595.2
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.111
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	321
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	224.7
ii) Finishing current	A	112.35
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	900
ii) Maximum	mA	1800
Equalising charge		
a) Voltage	V	2.3
b) Current	A	80.25
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	509*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	66.6
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	174
with acid	kg	254.3
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		15
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		16
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	51.36
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 33**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1715P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1715
Rated	AH	1715
End of Life	AH	1715
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	246.96
15 minutes	1.65	562.52
30 minutes	1.69	782.04
45 minutes	1.71	960.40
1 hour	1.75	1029.00
2 hour	1.78	1265.67
3 hour	1.80	1390.87
4 hour	1.81	1478.33
5 hour	1.82	1543.50
6 hour	1.83	1594.95
7 hour	1.83	1630.97
8 hour	1.84	1665.27
9 hour	1.84	1694.42
10 Hour	1.85	1715.00
Maximum momentary current for 1 min till 1.60 e.c.v		3841.6
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.104
Total Resistance of Battery	Ohms	Depends on the battery layout
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	343
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	240.1
ii) Finishing current	A	120.05
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	960
ii) Maximum	mA	1920
Equalising charge		
a) Voltage	V	2.3
b) Current	A	85.75
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6

Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130
Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H	mm	509*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	65.2
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	184
with acid	kg	262.6
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		16
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		17
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel/Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	54.88
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)
Does the battery meet the required duty cycle curve	Yes/No	Yes (refer sizing calaulation)

General Technical Particulars

	Units	
Type of Cell		**YHP 35**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1820P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1820
Rated	AH	1820
End of Life	AH	1820
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	262.08
15 minutes	1.65	596.96
30 minutes	1.69	829.92
45 minutes	1.71	1019.20
1 hour	1.75	1092.00
2 hour	1.78	1343.16
3 hour	1.80	1476.02
4 hour	1.81	1568.84
5 hour	1.82	1638.00
6 hour	1.83	1692.60
7 hour	1.83	1730.82
8 hour	1.84	1767.22
9 hour	1.84	1798.16
10 Hour	1.85	1820.00
Maximum momentary current for 1 min till 1.60 e.c.v		4076.8
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.098
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	364
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	254.8
ii) Finishing current	A	127.4
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	1025
ii) Maximum	mA	2050
Equalising charge		
a) Voltage	V	2.3
b) Current	A	91
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	509*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	63.9
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	194
with acid	kg	271
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		17
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		18
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	3
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		Steel/Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	58.24
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 37**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P1930P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	1930
Rated	AH	1930
End of Life	AH	1930
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	277.92
15 minutes	1.65	633.04
30 minutes	1.69	880.08
45 minutes	1.71	1080.80
1 hour	1.75	1158.00
2 hour	1.78	1424.34
3 hour	1.80	1565.23
4 hour	1.81	1663.66
5 hour	1.82	1737.00
6 hour	1.83	1794.90
7 hour	1.83	1835.43
8 hour	1.84	1874.03
9 hour	1.84	1906.84
10 Hour	1.85	1930.00
Maximum momentary current for 1 min till 1.60 e.c.v		4323.2
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.092
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	386
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	270.2
ii) Finishing current	A	135.1
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	1100
ii) Maximum	mA	2200
Equalising charge		
a) Voltage	V	2.3
b) Current	A	96.5
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	585*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	76.8
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	208
with acid	kg	300.5
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		18
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		19
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	6.35
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel /Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	61.76
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 39**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P2035P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	2035
Rated	AH	2035
End of Life	AH	2035
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	293.04
15 minutes	1.65	667.48
30 minutes	1.69	927.96
45 minutes	1.71	1139.60
1 hour	1.75	1221.00
2 hour	1.78	1501.83
3 hour	1.80	1650.39
4 hour	1.81	1754.17
5 hour	1.82	1831.50
6 hour	1.83	1892.55
7 hour	1.83	1935.29
8 hour	1.84	1975.99
9 hour	1.84	2010.58
10 Hour	1.85	2035.00
Maximum momentary current for 1 min till 1.60 e.c.v		4558.4
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.087
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	407
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	284.9
ii) Finishing current	A	142.45
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	1150
ii) Maximum	mA	2300
Equalising charge		
a) Voltage	V	2.3
b) Current	A	101.75
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	585*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	75.6
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	218
with acid	kg	309.1
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		19
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		20
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	6.35
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel / Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	65.12
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 41**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P2140P - HDP
Number of cells in the battery bank		n
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	2140
Rated	AH	2140
End of Life	AH	2140
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	308.16
15 minutes	1.65	701.92
30 minutes	1.69	975.84
45 minutes	1.71	1198.40
1 hour	1.75	1284.00
2 hour	1.78	1579.32
3 hour	1.80	1735.54
4 hour	1.81	1844.68
5 hour	1.82	1926.00
6 hour	1.83	1990.20
7 hour	1.83	2035.14
8 hour	1.84	2077.94
9 hour	1.84	2114.32
10 Hour	1.85	2140.00
Maximum momentary current for 1 min till 1.60 e.c.v		4793.6
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.083
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	428
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	299.6
ii) Finishing current	A	149.8
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	1200
ii) Maximum	mA	2400
Equalising charge		
a) Voltage	V	2.3
b) Current	A	107
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L $^{+/-3}$x W$^{+/-3}$ x H$^{+/-5}$	mm	585*368*682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	74.1
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	230
with acid	kg	319.3
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		20
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		21
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	6.35
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		steel/Teak wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	68.48
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 yrs.(with the plugs closed tightly)

General Technical Particulars

	Units	
Type of Cell		**YHP 43**
Nominal Voltage per cell	Volts	2
Manufacturer's Name		Exide Industries Ltd.
Standards to which battery is manufactured		IS 1652 / BS6290
IS Nomenclature		P2250P - HDP
Number of cells in the battery bank		108
Nominal Voltage of Battery	Volts	2 X n
Declared Capacity at 27 degree C upto 1.85 ecv		
Initial	AH	2250
Rated	AH	2250
End of Life	AH	2250
Rated Capacity at mimimum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Rated Capacity at maximum ambient temperature	Ah	As per formula: Ct=C27{1+0.009(t-27)}
Capacity in AH at various end cell voltages and duration of discharge		
	E.C.V.	**Ah output**
5 minutes	1.62	324.00
15 minutes	1.65	738.00
30 minutes	1.69	1026.00
45 minutes	1.71	1260.00
1 hour	1.75	1350.00
2 hour	1.78	1660.50
3 hour	1.80	1824.75
4 hour	1.81	1939.50
5 hour	1.82	2025.00
6 hour	1.83	2092.50
7 hour	1.83	2139.75
8 hour	1.84	2184.75
9 hour	1.84	2223.00
10 Hour	1.85	2250.00
Maximum momentary current for 1 min till 1.60 e.c.v		5040
Expected life of battery under normal operation & maintainence conditions	Years	15 - 20 years
Internal Resistance of cell (IR)	milli ohms	0.079
Loss in capacity in 28 days due to self discharge	%	<8%
Recommended Charging rate for		
a) Float Charging		
i) Limit current	A	450
ii) Voltage	V	2.25 vpc
b) Boost charging		
i) Starting Current	A	315
ii) Finishing current	A	157.5
iii) Voltage	V	2.75
Trickle Charging Rate		
i) Minimum	mA	1250
ii) Maximum	mA	2500
Equalising charge		
a) Voltage	V	2.3
b) Current	A	112.5
c) Duration	Hrs.	6
d) Interval between succesive equalising charge	Months	6
Recommended Specific gravity at 27 deg C		
a) for first filling		1.205 +/- 0.005
b) at full charge		1.215 +/- 0.005
c) when Battery is discharged at 10 hours rate		1.120 - 1.130

Permissible max. temperature of Electrolyte		
i) During Initial Charging	deg C	50
ii) During Normal Operation	deg C	45
Overall dimensions		
Each Cell L x W x H (tolerance of +/- 2 mm in each case)	mm	585 x 368 x 682
Complete Battery	mm	Depends on the battery layout
Distance between cell centres	mm	376
Quantity of Electrolyte per Cell	litres	72.7
Quantity of Electrolyte for battery (Including 10% extra)	litres	n X electrolyte per cell X 1.1
Weight(+/-5%)		
Each cell		
without acid	kg	246.6
with acid	kg	333.1
Complete Battery without acid	kg	n X each cell weight without acid
with acid	kg	n X each cell weight with acid
Material and type of Plates		
i) Positive Plates		
Material		99.99% Pure Lead
Height of Positive Plate	mm	368
Thickness of Positive Plate	mm	9.8
No. of positive plates per cell		21
Whether positive plates of individual cells are interchangeable		Yes, but not recommended
ii) Negative Plates		
Material		Lead - Antimony alloy grid
Height of Negative Plate	mm	378.5
Thickness of Negative Plate	mm	5.08
No. of negative plates per cell		22
Whether negative plates of individual cells are interchangeable		Yes, but not recommended
Material and type of Separators		
Material		PVC
Thickness of separator	mm	4.5
Clearance between bottom of the plate and the bottom of the container	mm	51
Clearance between top of the plates and top of container	mm	140.5
Whether explosion vents are offerred		YES
Type of Vent and Filling Plugs		Explosion proof microporous ceramic made

Container		
Thickness of Container	mm	7
Material of Container		Transperant Styrene Acrylonitrile (SAN)
Cover		
Type of cover		Adhesive Sealed
Material of Cover		Opaque Styrene Acrylonitrile (SAN)
Connections		
Material of Inter-Cell Connectors		Lead Plated Copper
Thickness of Inter-Cell Connectors	mm	6.35
Method of connection		Bolted
Inter-row, Inter-tier connectors and end take-offs furnished?		Yes
Material of Bolt, Nut and Washer for Inter-Cell and Cable Connections		Lead plated MS
Racks		
Racks		
a) Number of racks per battery		Depends on the battery layout
b) Number of cells per rack		Depends on the battery layout
c) Type of racks		Depends on the battery layout
d) Material of rack		Steel / Teak Wood
e) Dimensions of the racks		Depends on the battery layout
Ventilation requirements		
Cubic content of battery rooms	m^3	To be provided by customer
Gas generation per single cell per hour	Lit	72.0
No. of air exchanges required per hour		Depends on the size of battery room
Gasification Voltage per Cell	Volt	2.36
Efficiency		
Ah efficiency	%	> 92 %
Watt Hr efficiency	%	> 80 %
Recommended Max. period of cell storage before the first Charge (After Installation and filling of Electrolyte)		12 - 18 hours
Recommended Storage life of Battery (Dry shelf life)		2 years (with plugs closed tightly)