Energy Sources
Development Company
(Tavan)

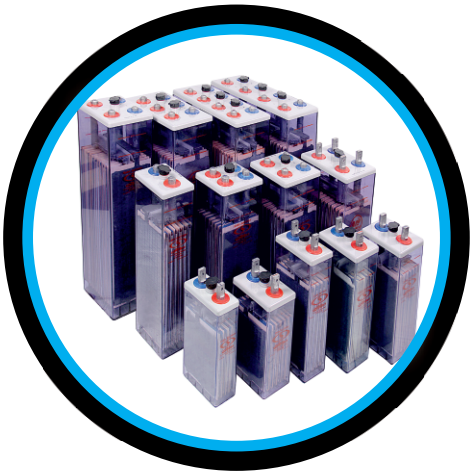
SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

Industrial Batteries & Products' Catalogue

Valve Regulated Lead Acid Batteries

4.5 - 3000 Ah Sealed Batteries



Stationary Flooded-Tubular Batteries

200 - 3000 Ah OPzS Series

Traction Battery

Industrial Batteries 110 - 1500 Ah
(PzS - PzB & Saba Smart Series)

Other Products

Minium - Distilled water - Acid water - BMS
Making Smart Of Installations

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SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

Company Profile

With more than half-a-century experience, Hajamini Industrial Group is the first battery manufacturing factory in iran, with a skillful and experienced team of experts and staff. It makes use of the most modern machinery and state of the art technology in battery industry within its well-equipped laboratories. At present, different lead acid batteries such as VRLA sealed batteries, stationary and traction batteries are being manufactured in this group in respectively accordance with the IEC 60896-21,22 and IEC 60254-1 standards, accordingly. This wide range of products has various utilization, such as, portable audio-visual equipment, medical equipment, photo and film equipment, lightening equipment, Pcs, emergency electricity power systems in hospitals, telecommunication equipment, security and alarm system, power plants, banks, telecommunication centers, portable power source, UPS and some vehicles like electrical fork lift trucks. These production are also accordance with the 4868-21,22 - 4868-11(stationary) and 4282(traction) iran national standard

HAJAMINI INDUSTRIAL GROUP

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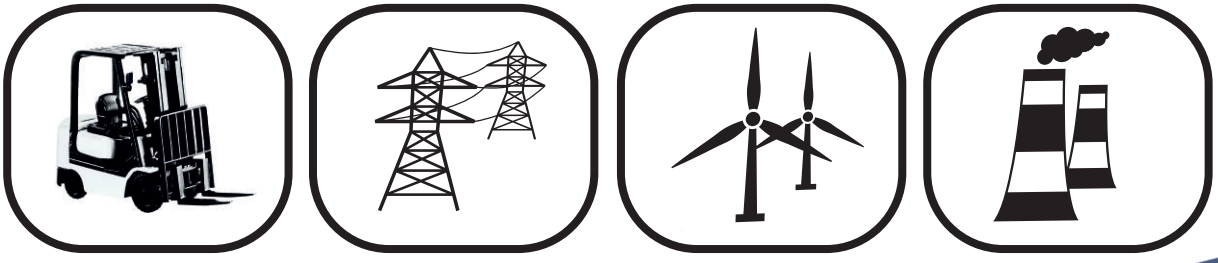

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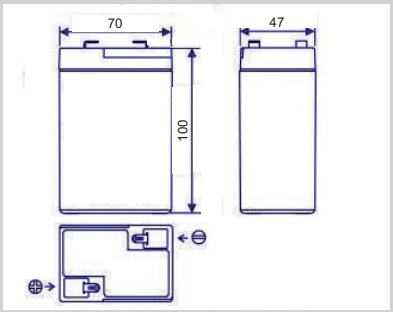
SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

Contents

6 SB 4.5 (6V 4.5Ah)

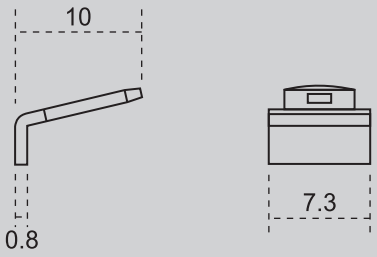
Outer Dimensions (mm)



Specifications

Nominal Voltage		6 V
Rated Capacity (10 Hour Rate)		4.5 Ah
Dimensions	Total Height	105 mm
	Height	100 mm
	Length	70 mm
	Width	47 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		0.9 Kg

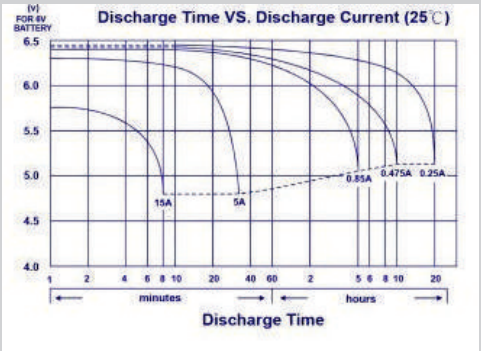
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	4.5 Ah 3.18 Ah 2.34 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	4.56 Ah 4.5 Ah 3.84 Ah 3.18 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

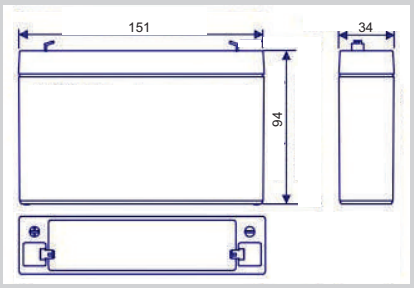
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	2.34	1.43	1.06	0.7	0.49	0.45	0.23

6 SB 7 (6V 7Ah)

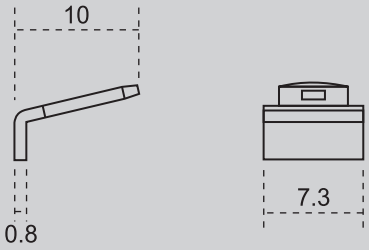
Outer Dimensions (mm)



Specifications

Nominal Voltage		6 V
Rated Capacity (10 Hour Rate)		7 Ah
Dimensions	Total Height	106.2 mm
	Height	94 mm
	Length	151 mm
	Width	34 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		1.3 Kg

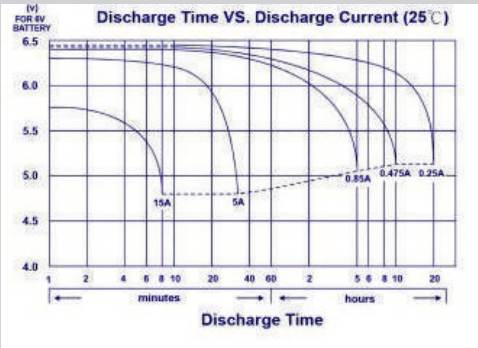
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	7 Ah 4.94 Ah 3.64 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	7.09 Ah 7 Ah 5.97 Ah 4.95 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

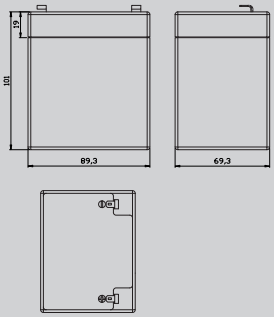
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	3.64	2.22	1.65	1.08	0.76	0.70	0.36

12 SB 4.5 (12V 4.5Ah)

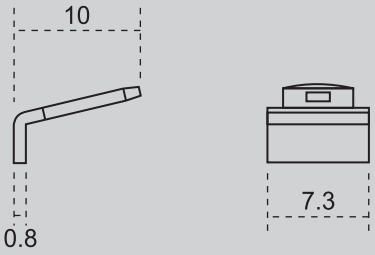
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		4.5 Ah
Dimensions	Total Height	106.2 mm
	Height	101 mm
	Length	89.3 mm
	Width	69.3 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		1.8 Kg

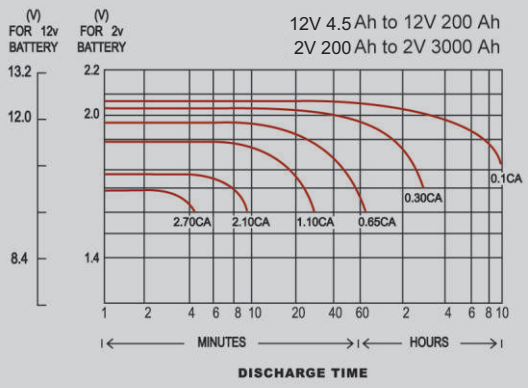
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	4.5 Ah 3.18 Ah 2.34 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	4.56 Ah 4.5 Ah 3.84 Ah 3.18 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

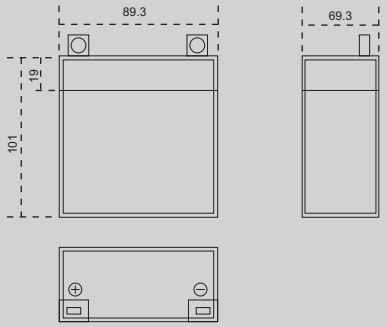
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	2.34	1.43	1.06	0.7	0.49	0.45	0.23

12 MC 4.5 (12V 4.5Ah)
motorcycle use

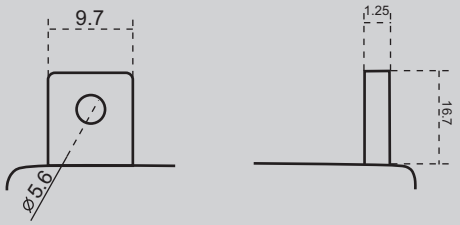
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		4.5 Ah
Dimensions	Total Height	106.2 mm
	Height	101 mm
	Length	89.3 mm
	Width	69.3 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		1.8 Kg

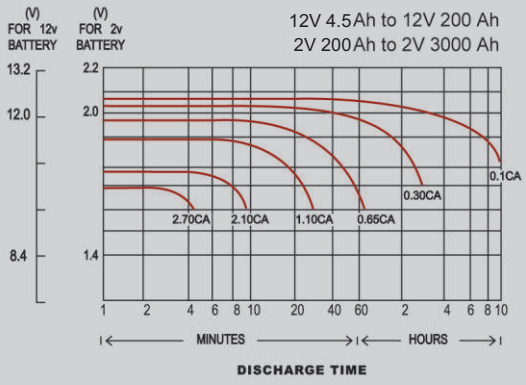
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	4.5 Ah 3.18 Ah 2.34 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 mΩ
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %

Discharge Curves 25°c (77°F)

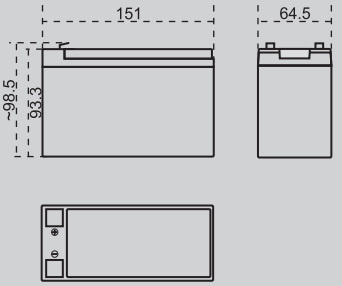


International Standard Number : JIS D 5302(1997)

ISIRI Number : 6197 (1st Edition)

12 SB 7.5 (12V 7.5Ah)

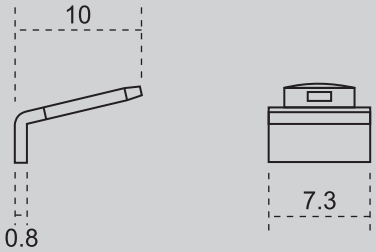
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		7.5 Ah
Dimensions	Total Height	98 mm
	Height	94 mm
	Length	151 mm
	Width	65 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		2.5 Kg

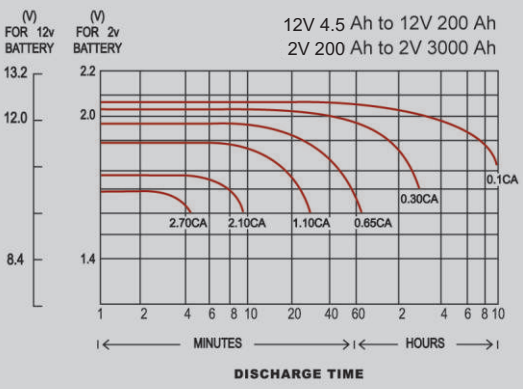
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	7.5 Ah 5.3 Ah 3.9 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	20 mΩ
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	7.6 Ah 7.5 Ah 6.4 Ah 5.3 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

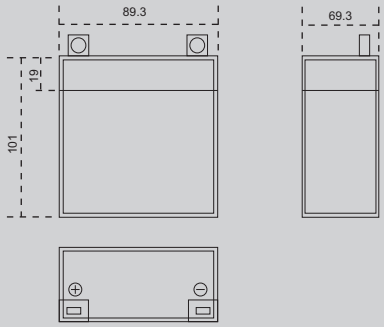
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	3.9	2.53	1.75	0.83	0.79	0.75	0.38

12 MC 7 (12V 7Ah)
motorcycle use

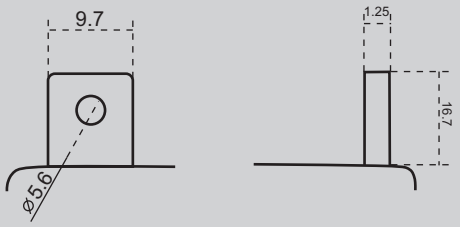
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		7 Ah
Dimensions	Total Height	101 mm
	Height	101 mm
	Length	138 mm
	Width	66 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		2.3 Kg

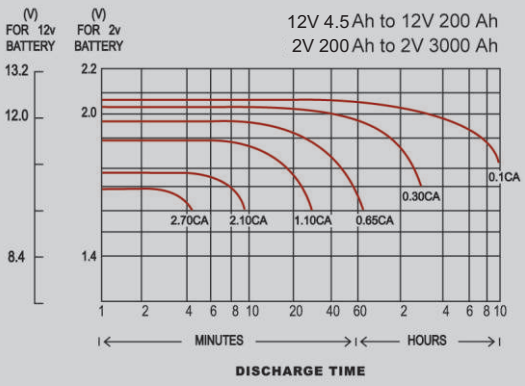
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	7 Ah 5.15 Ah 3.64 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 mΩ
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %

Discharge Curves 25°c (77°F)

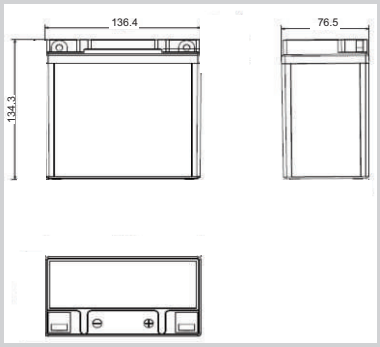


International Standard Number : JIS D 5302(1997)

ISIRI Number : 6197 (1st Edition)

12 MC 9 (12V 9Ah)
motorcycle use

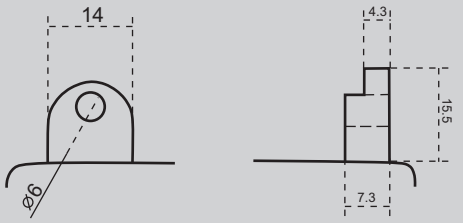
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		9 Ah
Dimensions	Total Height	134.3 mm
	Height	134.3 mm
	Length	136.4 mm
	Width	76.5 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		2.9 Kg

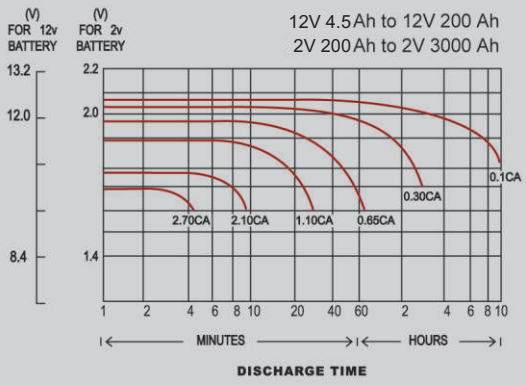
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	9 Ah 6.36 Ah 4.68 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 mΩ
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %

Discharge Curves 25°c (77°F)

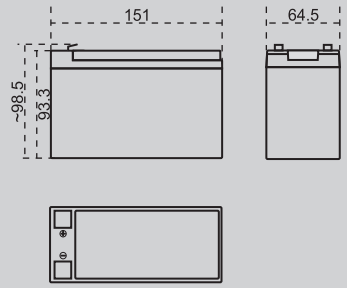


International Standard Number : JIS D 5302(1997)

ISIRI Number : 6197 (1st Edition)

12 SB 9 (12V 9Ah)

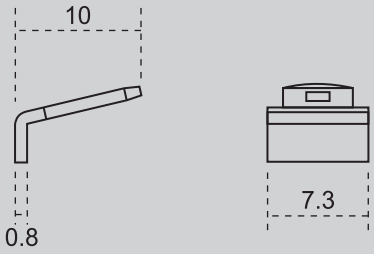
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		9 Ah
Dimensions	Total Height	98 mm
	Height	94 mm
	Length	151 mm
	Width	65 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		2.7 Kg

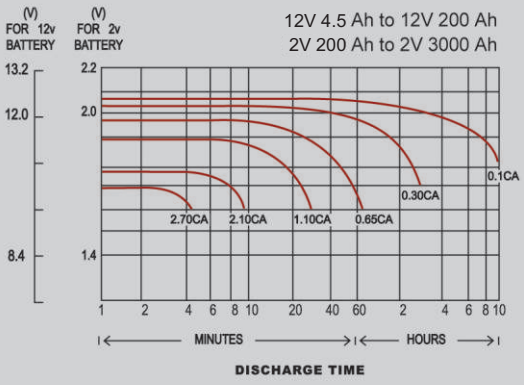
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	9 Ah 6.75 Ah 4.68 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 m
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	9.1 Ah 9 Ah 7.68 Ah 6.36 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

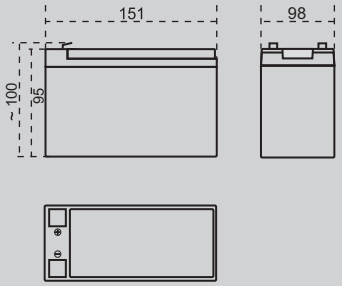
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	4.68	3.04	2.25	0.99	0.95	0.9	0.45

12 SB 12 (12V 12Ah)

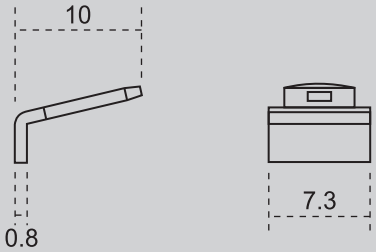
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		12 Ah
Dimensions	Total Height	100 mm
	Height	95 mm
	Length	151 mm
	Width	98 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		3.8 Kg

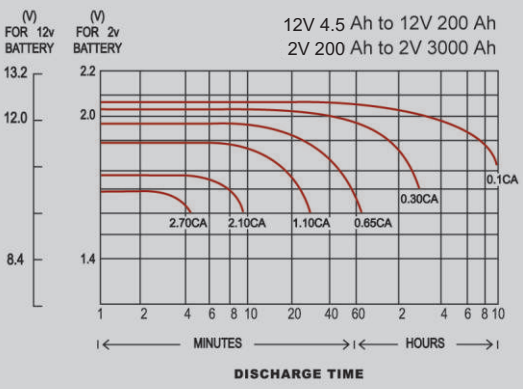
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	12 Ah 8.5 Ah 6.2 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	20 m
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	12.16 Ah 12 Ah 10.25 Ah 8.5 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

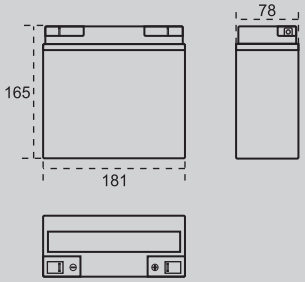
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	6.25	4	2.8	1.35	1.26	1.2	0.6

12 SB 18 (12V 18Ah)

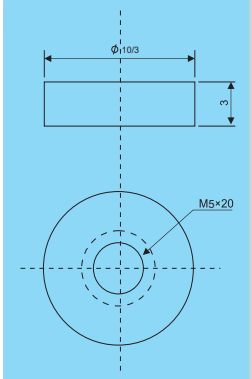
Outer Dimensions (mm)



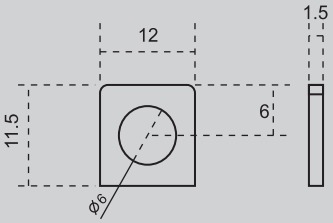
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		18 Ah
Dimensions	Total Height	165 mm
	Height	165 mm
	Length	181 mm
	Width	78 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		5.8 Kg

Terminal Type brass core (mm) (F1)



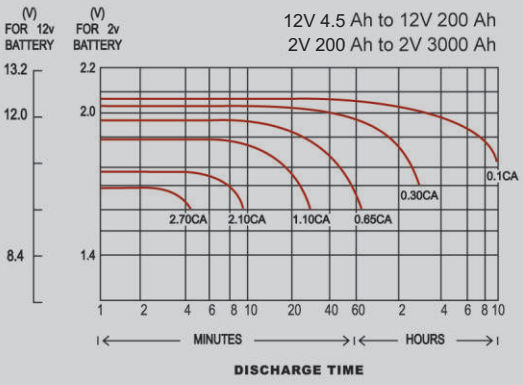
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	18 Ah 12.9 Ah 9.4 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	15 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	18.3 Ah 18 Ah 15.4 Ah 12.8 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

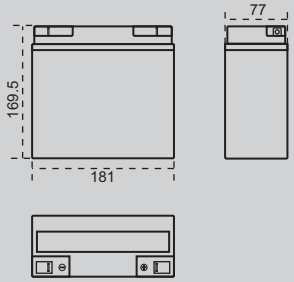
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	9.4	6	4.3	2	1.9	1.8	0.95

12 EV 20 (12V 20Ah)

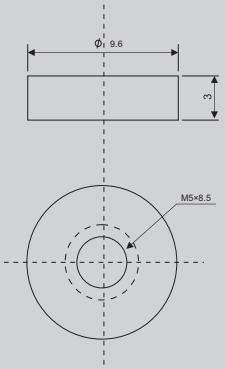
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (5 Hour Rate)		20 Ah
Dimensions	Total Height	169.5 mm
	Height	169.5 mm
	Length	181 mm
	Width	77 mm
Terminal		F1
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		7.3 Kg

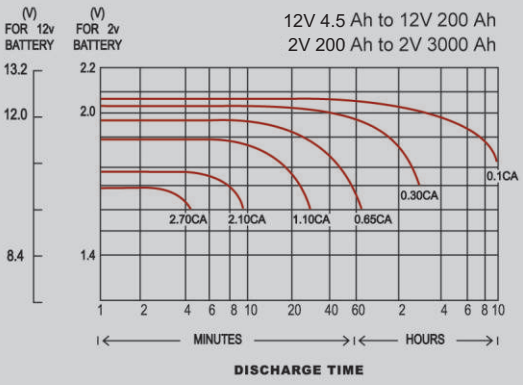
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		5 hour rate 3 hour-rate 1 hour-rate	20 Ah 17.7 Ah 13.1 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	10.5 m
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	20.3 Ah 20 Ah 17.1 Ah 14.2 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60254 Standard

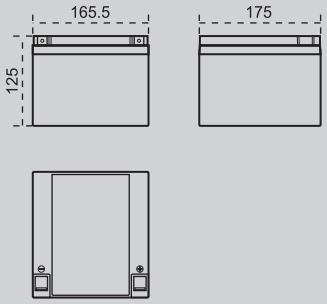
Discharg time		1 h	3 h	5 h		
Final voltage		1.61 VPC	1.68 VPC	1.70 VPC		

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h		3 h	5 h			
	13.1		5.9	4			

12 SB 28 (12V 28Ah)

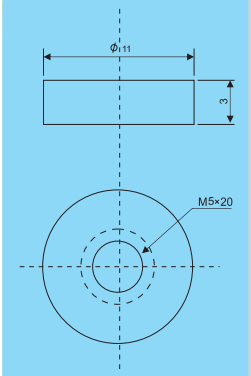
Outer Dimensions (mm)



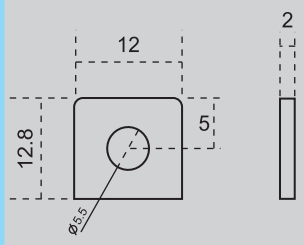
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		28 Ah
Dimensions	Total Height	125 mm
	Height	125 mm
	Length	175 mm
	Width	166 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		9 Kg

Terminal Type brass core (mm) (F1)



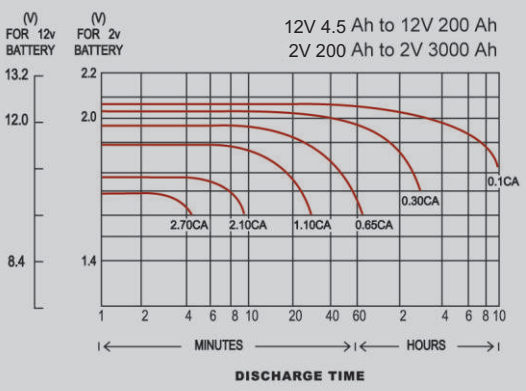
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	28 Ah 19.8 Ah 14.5 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	12 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	28.5 Ah 28 Ah 23.6 Ah 21 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

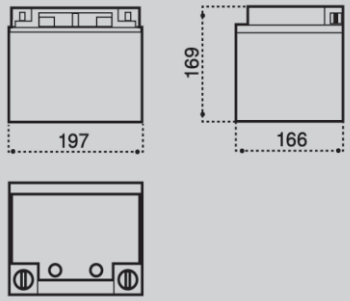
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	14.5	10	6.6	4.2	3	2.8	1.42

12 SB 42 (12V 42Ah)

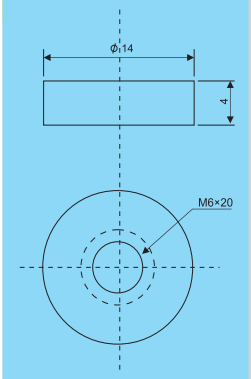
Outer Dimensions (mm)



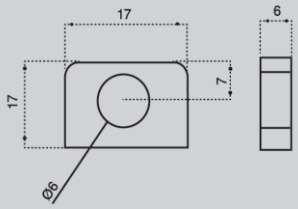
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		42 Ah
Dimensions	Total Height	169 mm
	Height	169 mm
	Length	197 mm
	Width	166 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		13 Kg

Terminal Type brass core (mm) (F1)



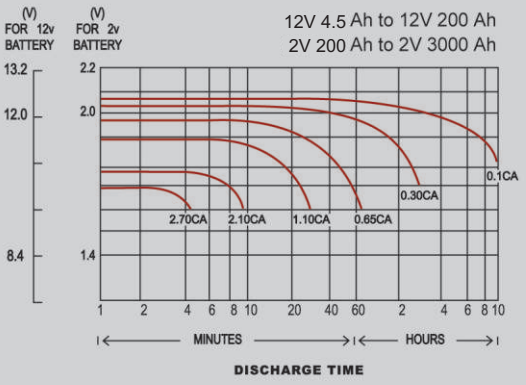
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	42 Ah 30 Ah 22 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	9 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	43 Ah 42 Ah 36 Ah 30 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

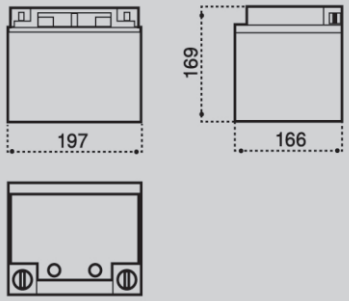
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	22	13.4	10	6.6	4.6	4.2	2.27

12 HR 40 (12V 40Ah)
High Rate Series

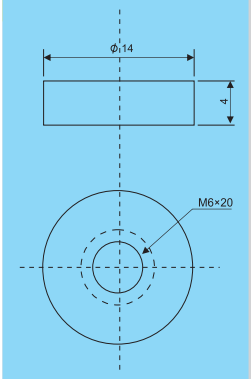
Outer Dimensions (mm)



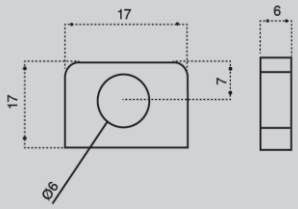
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		40 Ah
Dimensions	Total Height	169 mm
	Height	169 mm
	Length	197 mm
	Width	166 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		12.5 Kg

Terminal Type brass core (mm) (F1)



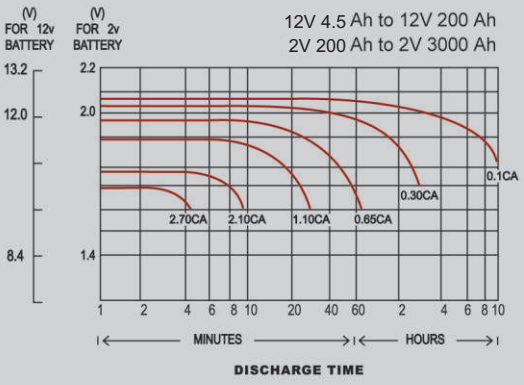
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	40 Ah 30 Ah 22 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	9 mΩ
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	43 Ah 40 Ah 36 Ah 30 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

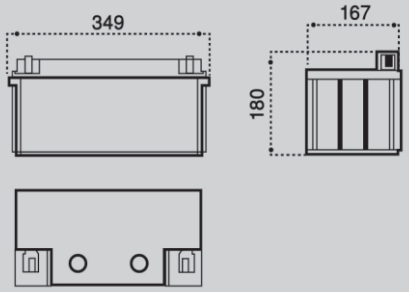
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	22	13.4	10	6.6	4.6	4.0	----

12 SB 65 (12V 65Ah)

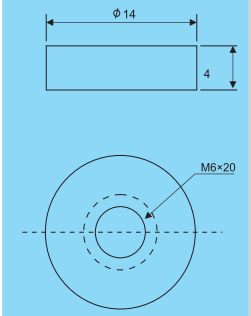
Outer Dimensions (mm)



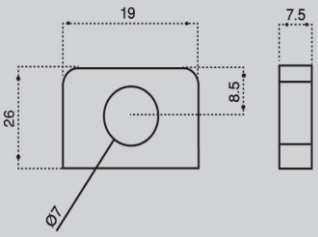
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		65 Ah
Dimensions	Total Height	185 mm
	Height	180 mm
	Length	349 mm
	Width	167 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		22 Kg

Terminal Type brass core (mm) (F1)



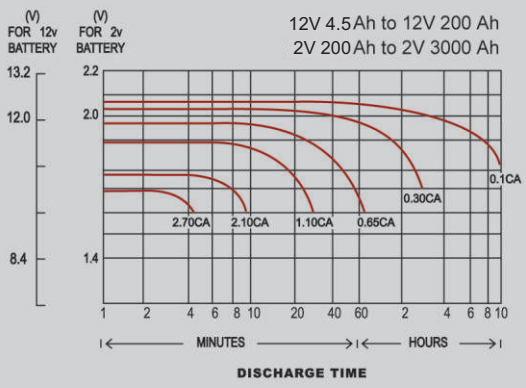
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	65 Ah 46.5 Ah 34 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	66 Ah 65 Ah 55 Ah 49 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

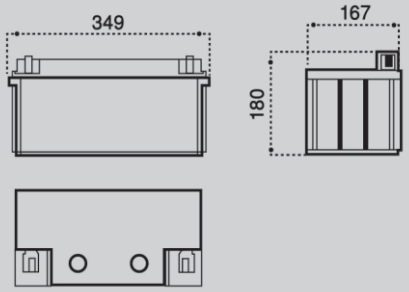
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	34	20.7	15.5	10.1	7.2	6.5	3.51

12 DC 65 (12V 65Ah)
(Deep Cycle Series)

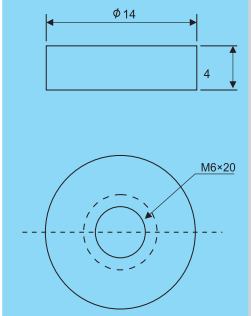
Outer Dimensions (mm)



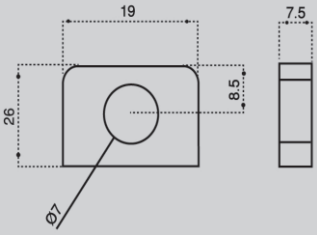
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		65 Ah
Dimensions	Total Height	185 mm
	Height	180 mm
	Length	349 mm
	Width	167 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		22 Kg

Terminal Type brass core (mm) (F1)



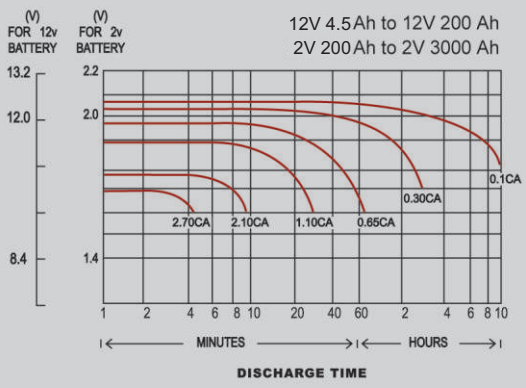
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	65 Ah 46.5 Ah 34 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	66 Ah 65 Ah 55 Ah 49 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

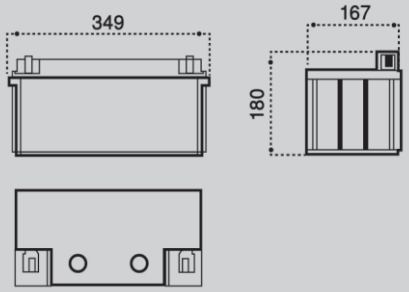
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	34	20.7	15.5	10.1	7.2	6.5	3.51

12 HR 60 (12V 60Ah)
High Rate Series

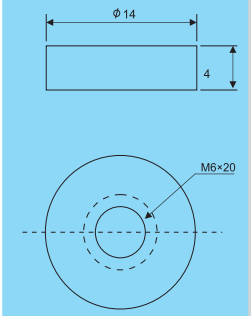
Outer Dimensions (mm)



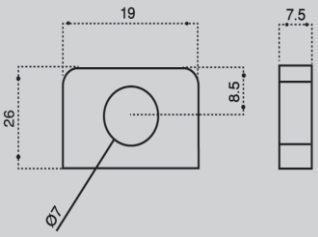
Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		60 Ah
Dimensions	Total Height	185 mm
	Height	180 mm
	Length	349 mm
	Width	167 mm
Terminal		F1 / F2
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		20.5 Kg

Terminal Type brass core (mm) (F1)



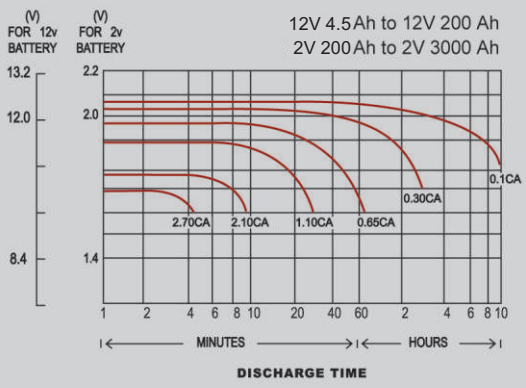
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	60 Ah 46.5 Ah 34 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	66 Ah 60 Ah 55 Ah 49 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

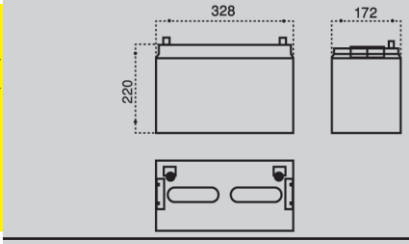
Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	34	20.7	15.5	10.1	7.2	6.0	----

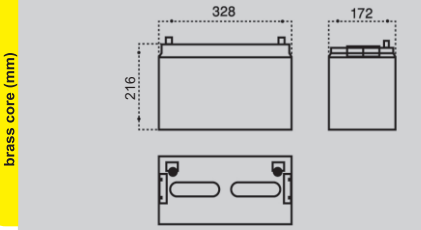
12 SB 100 (12V 100Ah)

Outer Dimensions (mm)

External dimensions bolt and nut (mm)



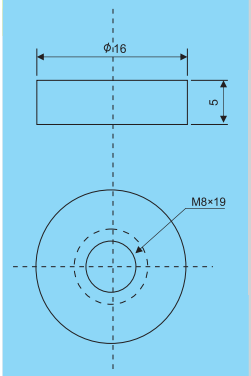
External dimensions brass core (mm)



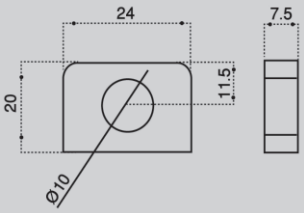
Specifications

Nominal Voltage		12 V	12 V
Rated Capacity (10 Hour Rate)		100 Ah	100 Ah
Dimensions	Total Height	242 mm	222 mm
	Height	220 mm	216 mm
	Length	328 mm	328 mm
	Width	172 mm	172 mm
Terminal		F2	F1
Container Material		ABS (UL94-HB/V0)	
Weight Approx (±2.5%)		31 Kg	31 Kg

Terminal Type brass core (mm) (F1)



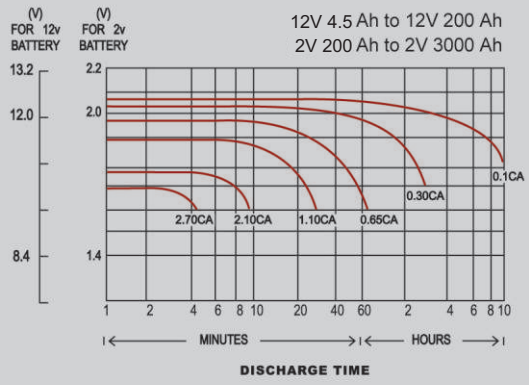
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	100 Ah 75 Ah 55 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	102 Ah 100 Ah 85 Ah 75 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

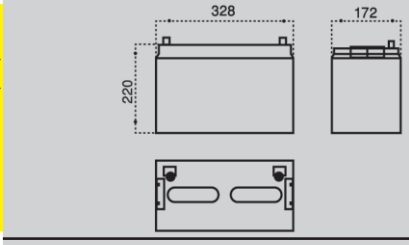
Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	55	31.8	25	16	11	10	5.4

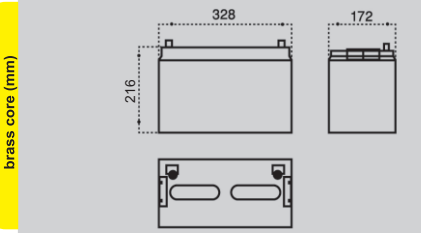
12 DC 100 (12V 100Ah)
(Deep Cycle Series)

Outer Dimensions (mm)

External dimensions bolt and nut (mm)



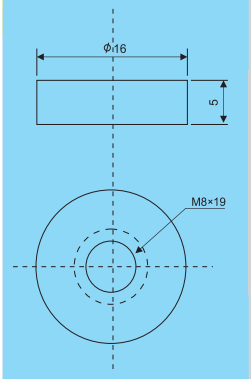
External dimensions brass core (mm)



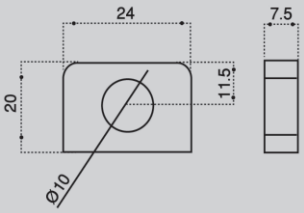
Specifications

Nominal Voltage		12 V	12 V
Rated Capacity (10 Hour Rate)		100 Ah	100 Ah
Dimensions	Total Height	242 mm	222 mm
	Height	220 mm	216 mm
	Length	328 mm	328 mm
	Width	172 mm	172 mm
Terminal		F2	F1
Container Material		ABS (UL94-HB/V0)	
Weight Approx (±2.5%)		31 Kg	31 Kg

Terminal Type brass core (mm) (F1)



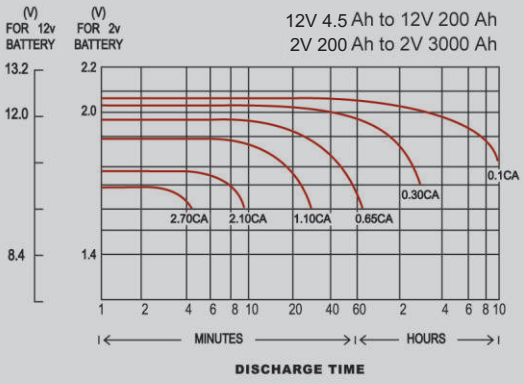
Terminal Type bolt and nut (mm) (F2)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	100 Ah 75 Ah 55 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	102 Ah 100 Ah 85 Ah 75 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

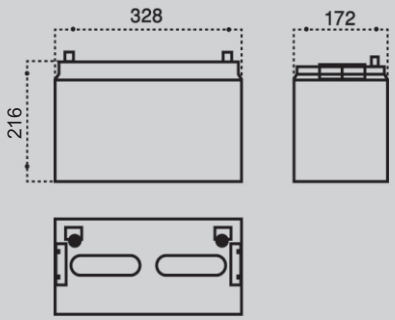
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	55	31.8	25	16	11	10	5.4

12 GB 85 (12V 85Ah)
GEL Series

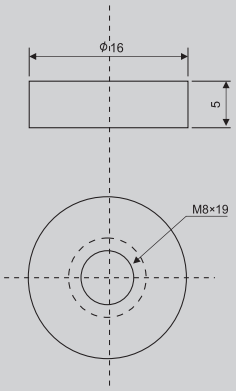
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (20 Hour Rate)		85 Ah
Dimensions	Total Height	222 mm
	Height	216 mm
	Length	328 mm
	Width	172 mm
Terminal		F1
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		31 Kg

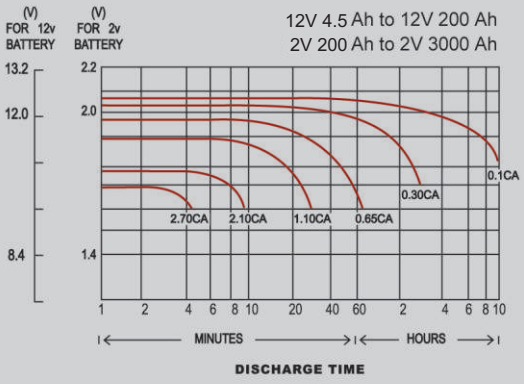
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	20 hour-rate 3 hour-rate 1 hour-rate	85 Ah 70 Ah 60 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	6 mΩ
Capacity Affected by Temperature (20 Hour Rate)	35°C 25°C 0°C -10°C	87 Ah 85 Ah 72 Ah 64 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

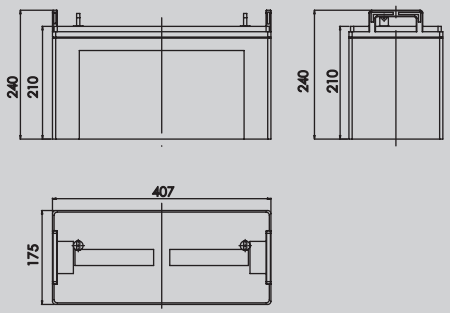
Discharg time	0.25 h	1 h	3 h	5 h	8 h	20 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	46.75	27.5	21.25	13.5	9.5	8.5	4.25

12 SB 120 (12V 120Ah)

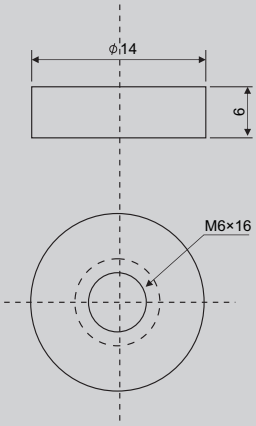
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		120 Ah
Dimensions	Total Height	233 mm
	Height	209 mm
	Length	407 mm
	Width	175 mm
Terminal		F1
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		36 Kg

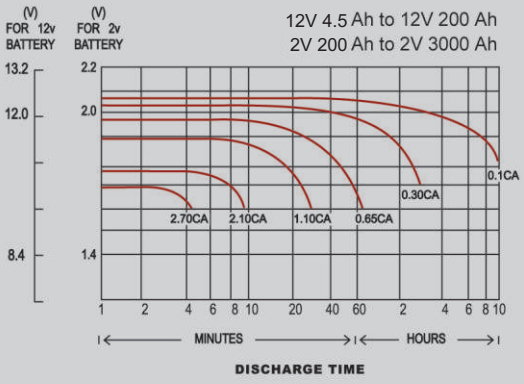
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	120 Ah 90 Ah 66 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	4 mΩ
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	122.4 Ah 120 Ah 102 Ah 90 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.28 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

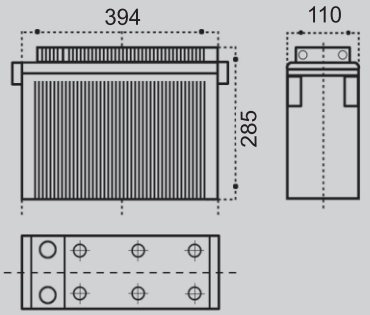
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	66	38.16	30	19.2	13.2	12	6.48

12 FT 92 (12V 92Ah)

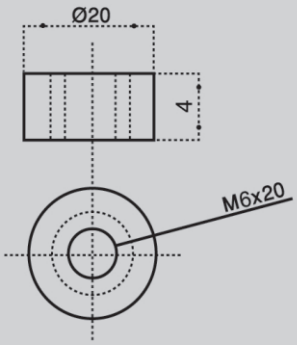
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		92 Ah
Dimensions	Total Height	285 mm
	Height	285 mm
	Length	394 mm
	Width	110 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		32 Kg

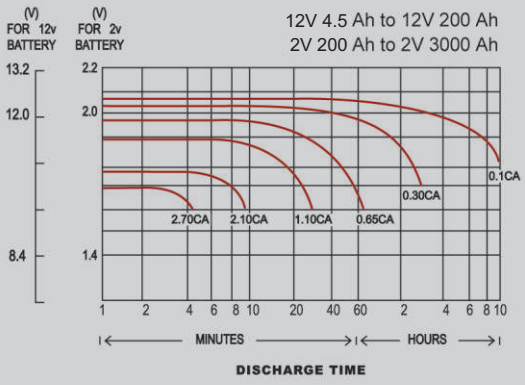
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	92 Ah 69 Ah 51 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	93 Ah 92 Ah 78 Ah 69 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

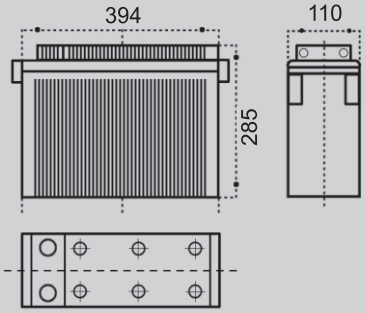
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	51	29	23	14	10	9.2	4.7

12 FT 100 (12V 100Ah)

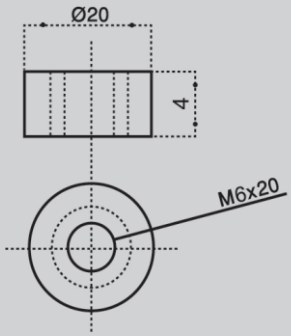
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		100 Ah
Dimensions	Total Height	285 mm
	Height	285 mm
	Length	394 mm
	Width	110 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		33 Kg

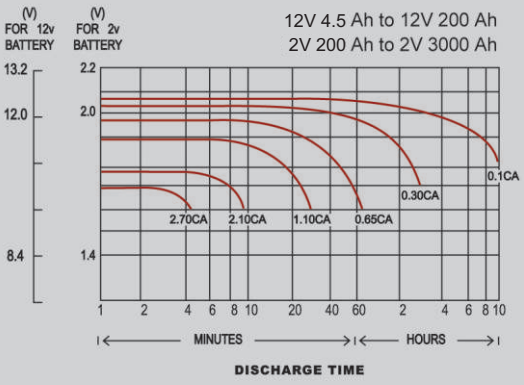
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	100 Ah 75 Ah 55 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	102 Ah 100 Ah 85 Ah 75 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

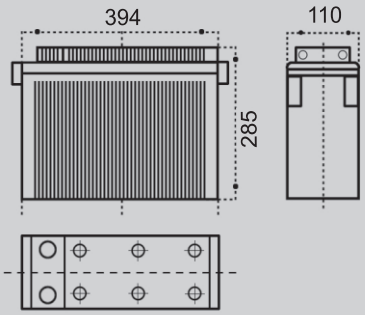
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	55	31.8	25	16	11	10	5.4

12 FT 110 (12V 110Ah)

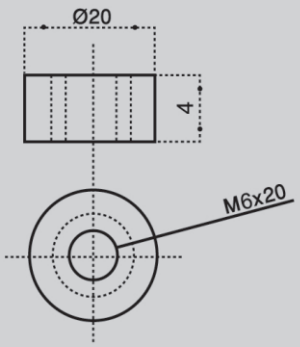
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		110 Ah
Dimensions	Total Height	285 mm
	Height	285 mm
	Length	394 mm
	Width	110 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		35 Kg

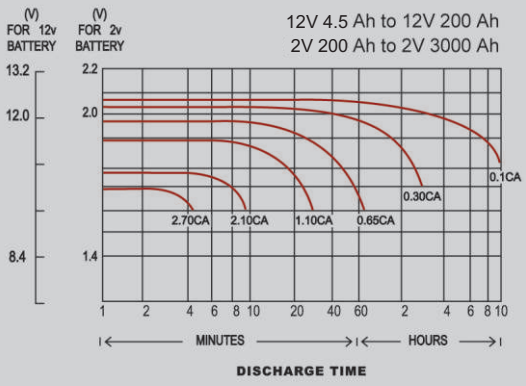
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	110 Ah 82.5 Ah 60.5 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	112.2 Ah 110 Ah 93.5 Ah 82.5 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

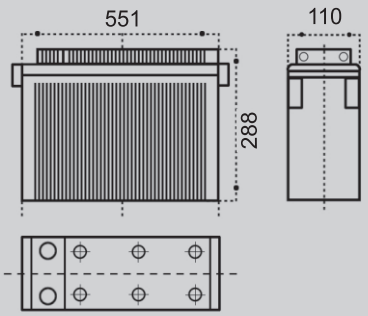
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	60.5	34	26.5	17.5	12	11	6

12 FT 150 (12V 150Ah)

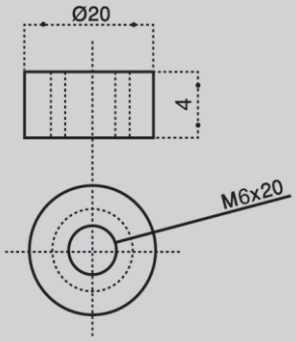
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		150 Ah
Dimensions	Total Height	288 mm
	Height	288 mm
	Length	551 mm
	Width	110 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		47 Kg

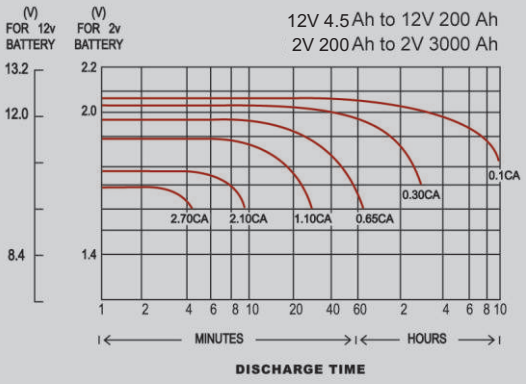
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	150 Ah 112 Ah 82 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	152 Ah 150 Ah 127 Ah 112 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

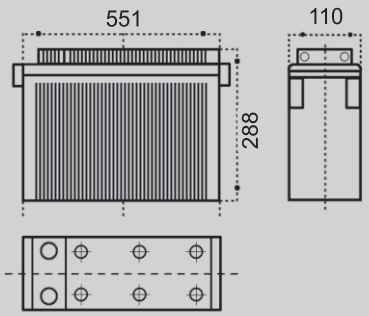
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	82	47	36	23	16	15	7.6

12 FT 155 (W:110)

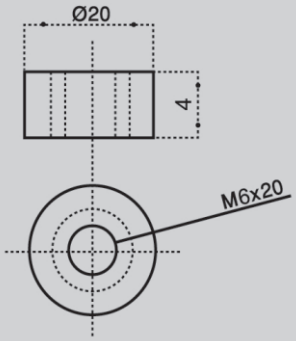
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		155 Ah
Dimensions	Total Height	288 mm
	Height	288 mm
	Length	551 mm
	Width	110 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		49 Kg

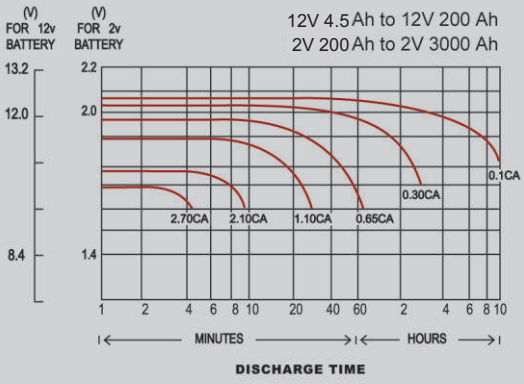
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	155 Ah 114 Ah 84 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	4.5 m
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	158 Ah 155 Ah 131 Ah 116 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

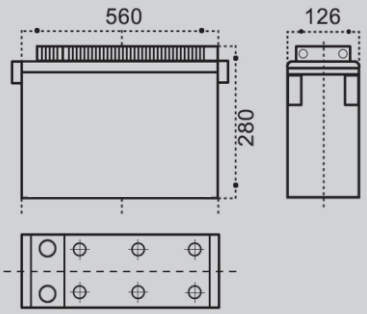
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	84	59	38	25	18.7	15.5	8.1

12 FT 155 (12V 155Ah)

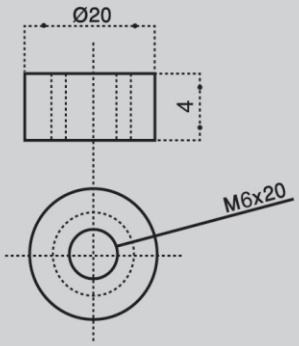
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		155 Ah
Dimensions	Total Height	280 mm
	Height	280 mm
	Length	560 mm
	Width	126 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		54 Kg

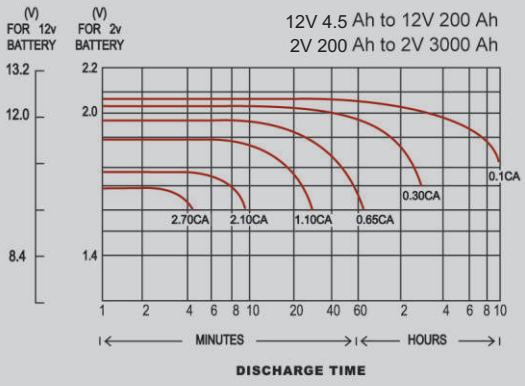
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	155 Ah 114 Ah 84 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	158 Ah 155 Ah 131 Ah 116 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

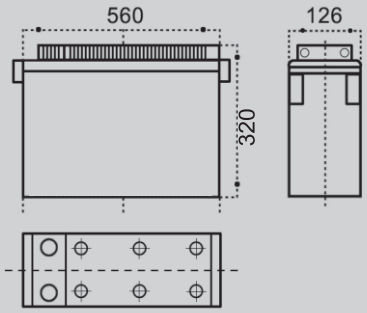
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	84	59	38	25	18.7	15.5	8.1

12 FT 200 (12V 200Ah)

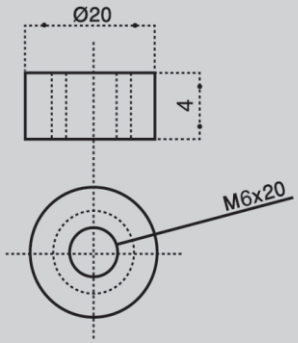
Outer Dimensions (mm)



Specifications

Nominal Voltage		12 V
Rated Capacity (10 Hour Rate)		200 Ah
Dimensions	Total Height	320 mm
	Height	320 mm
	Length	560 mm
	Width	126 mm
Container Material		ABS (UL94-HB/V0)
Weight Approx (±2.5%)		64 Kg

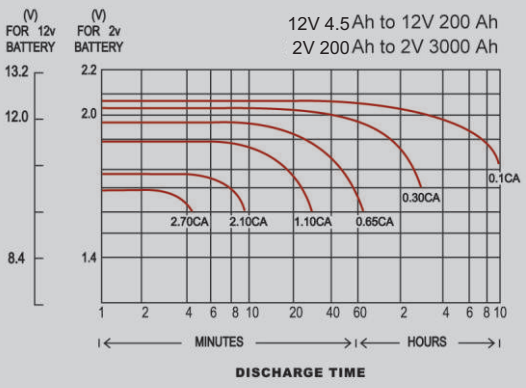
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)		10 hour-rate 3 hour-rate 1 hour-rate	200 Ah 142.5 Ah 106.1 Ah
Internal Resistance		Full Charge Battery at 25°C (77°F)	4.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)		35°C 25°C 0°C -10°C	202 Ah 200 Ah 168 Ah 148 Ah
Self-Discharge at 25°C (77°F)		Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage	Cycle	Voltage 2.40-2.45 / Cell	
	Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

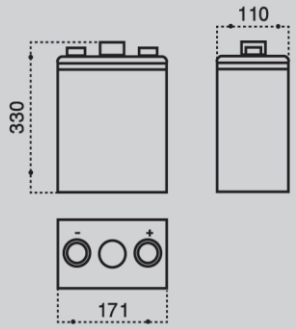
Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current (A) Discharge Table at 25°C (77°F)

Amount of Current (A)	Discharge Time						
	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	106.1	63.8	47.5	32.3	23	20	10.1

2 SB 200 (2V 200Ah)

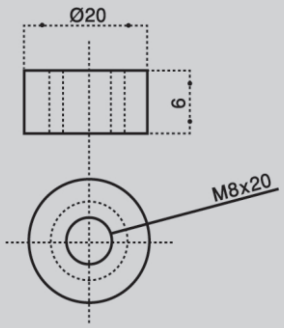
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		200 Ah
Dimensions	Total Height	365 mm
	Height	330 mm
	Length	171 mm
	Width	110 mm
Weight Approx (±2.5%)		13.35 Kg

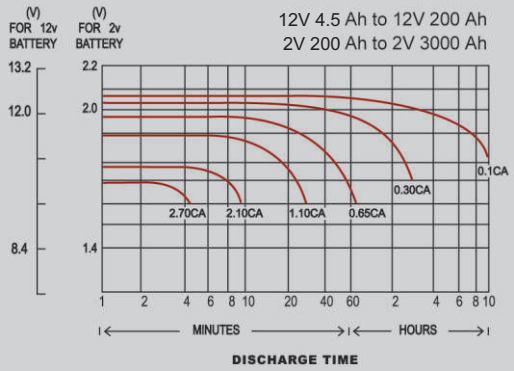
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	200 Ah 150 Ah 110 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	1 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	212 Ah 200 Ah 170 Ah 150 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

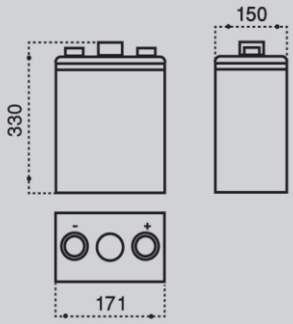
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	184	119	73	52	36	25	20	10

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	170	110	68	50	35	24	20	10.5

2 SB 250 (2V 250Ah)

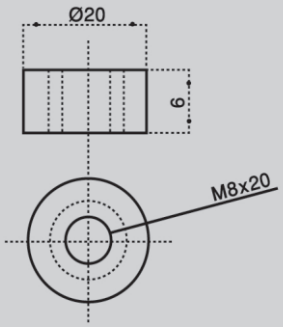
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		250 Ah
Dimensions	Total Height	365 mm
	Height	330 mm
	Length	171 mm
	Width	150 mm
Weight Approx (±2.5%)		16 Kg

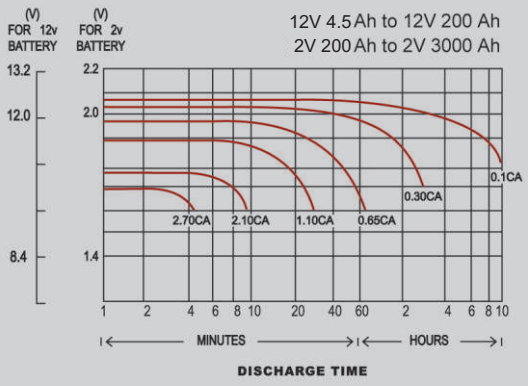
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	250 Ah 186 Ah 137 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.8 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	265 Ah 250 Ah 212 Ah 188 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

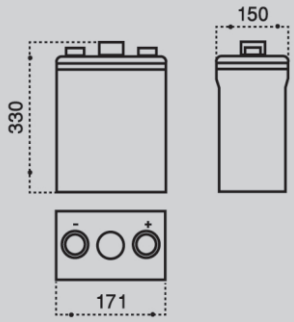
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	230	148	92	64	43	31	25	12

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	212	137	85	62	42	30	25	13

2 SB 300 (2V 300Ah)

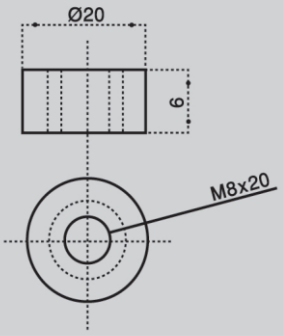
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		300 Ah
Dimensions	Total Height	365 mm
	Height	330 mm
	Length	171 mm
	Width	150 mm
Weight Approx (±2.5%)		20 Kg

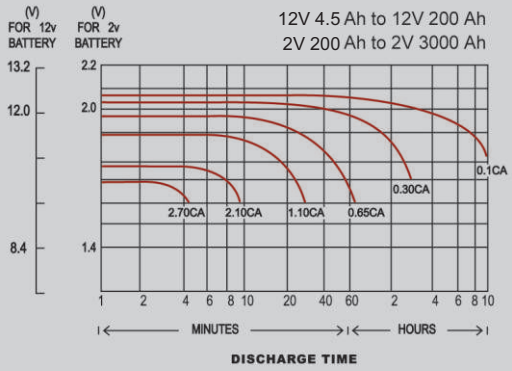
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	300 Ah 225 Ah 165 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.7 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	315 Ah 300 Ah 257 Ah 226 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

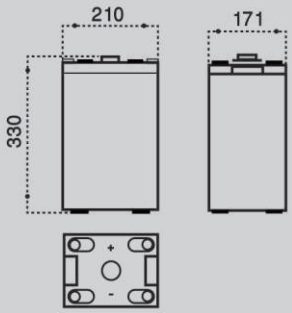
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	276	177	109	80	51	37	30	15

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	255	165	102	75	50	36	30	15.5

2 SB 350 (2V 350Ah)

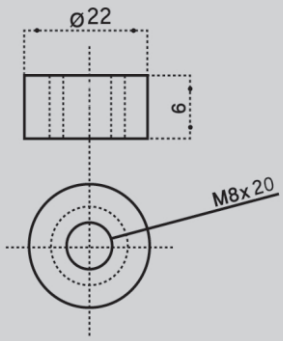
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		350 Ah
Dimensions	Total Height	365 mm
	Height	330 mm
	Length	210 mm
	Width	171 mm
Weight Approx (±2.5%)		26 Kg

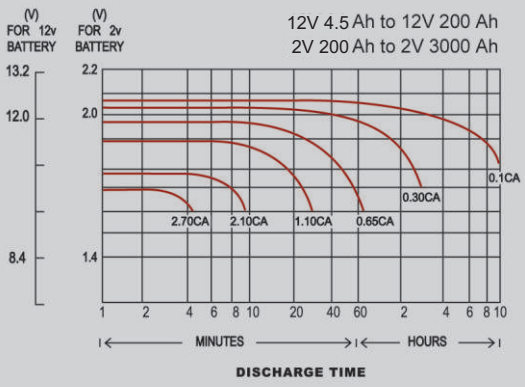
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	350 Ah 261 Ah 192 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.7 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	371 Ah 350 Ah 302 Ah 267 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

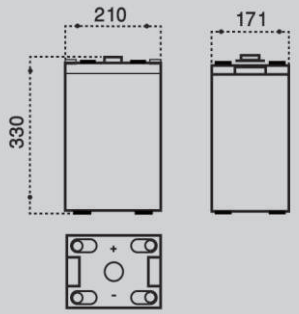
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	320	207	131	90	63	45	35	17

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	297	192	119	87	61	42	35	18

2 SB 420 (2V 420Ah)

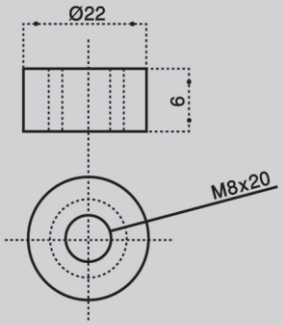
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		420 Ah
Dimensions	Total Height	365 mm
	Height	330 mm
	Length	210 mm
	Width	171 mm
Weight Approx (±2.5%)		28 Kg

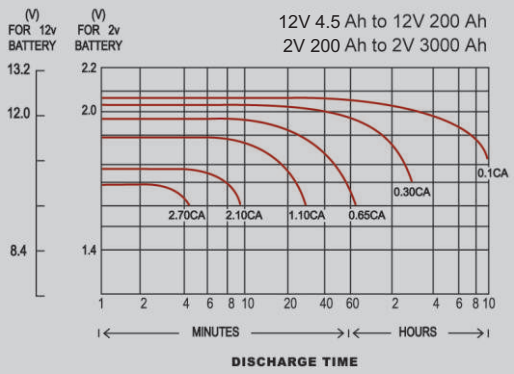
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	420 Ah 315 Ah 231 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.5 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	445 Ah 420 Ah 357 Ah 315 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

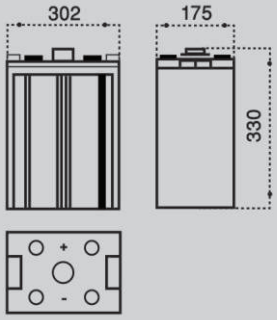
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	385	251	153	109	74	53	42	21

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	357	231	142	105	73	50	42	22

2 SB 600 (2V 600Ah)

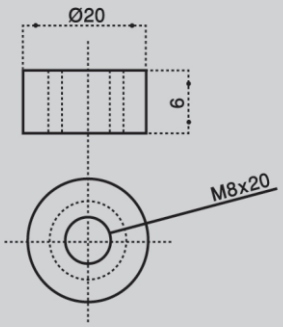
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		600 Ah
Dimensions	Total Height	367 mm
	Height	330 mm
	Length	302 mm
	Width	175 mm
Weight Approx (±2.5%)		40 Kg

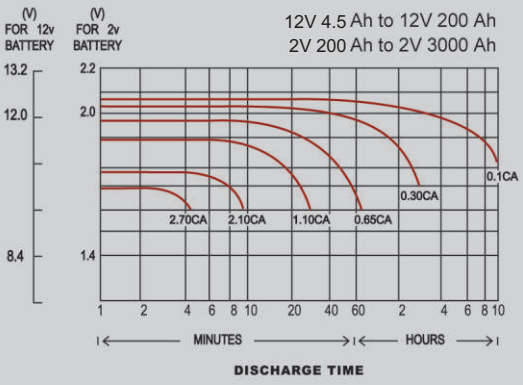
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	600 Ah 450 Ah 330 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.45 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	636 Ah 600 Ah 510 Ah 450 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

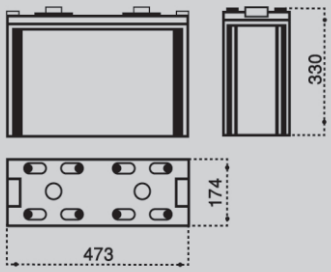
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	552	355	219	157	106	75	60	31

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	510	330	204	150	105	72	60	33

2 SB 1000 (2V 1000Ah)

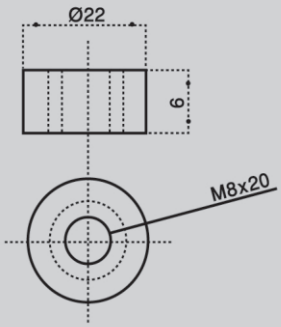
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		1000 Ah
Dimensions	Total Height	365 mm
	Height	330 mm
	Length	473 mm
	Width	174 mm
Weight Approx (±2.5%)		63 Kg

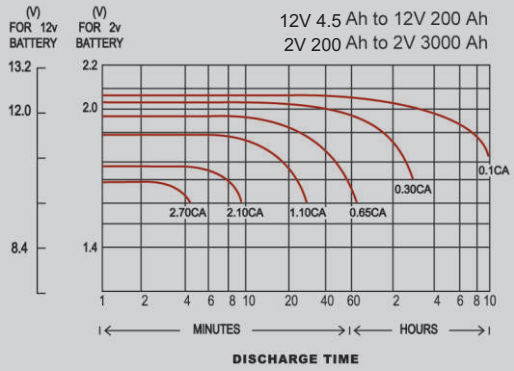
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	1000 Ah 738 Ah 550 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.3 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	1060 Ah 1000 Ah 850 Ah 750 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

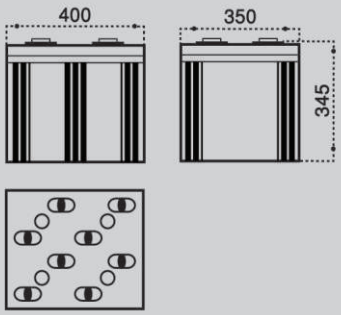
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	869	595	368	266	178	125	100	52

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	812	550	340	246	175	120	100	55

2 SB 1500 (2V 1500Ah)

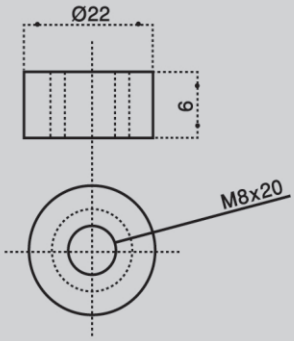
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		1500 Ah
Dimensions	Total Height	382 mm
	Height	345 mm
	Length	400 mm
	Width	350 mm
Weight Approx (±2.5%)		115 Kg

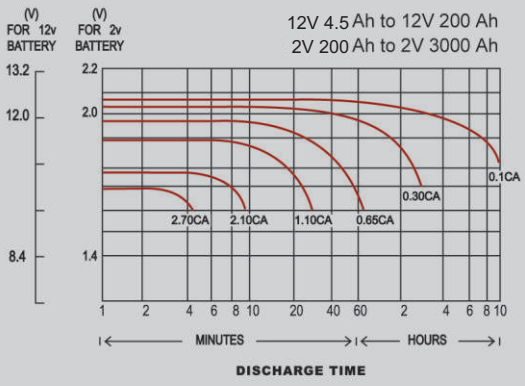
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	1500 Ah 1125 Ah 825 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.2 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	1590 Ah 1500 Ah 1275 Ah 1125 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

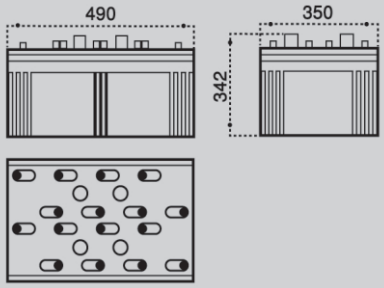
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	1379	891	550	401	268	189	150	78

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	1275	825	510	375	262	180	150	82

2 SB 2000 (2V 2000Ah)

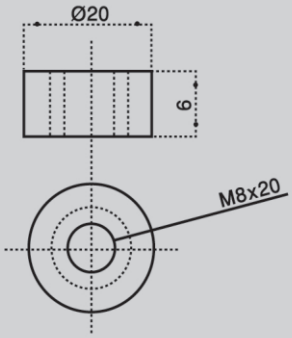
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		2000 Ah
Dimensions	Total Height	382 mm
	Height	342 mm
	Length	490 mm
	Width	350 mm
Weight Approx (±2.5%)		135 Kg

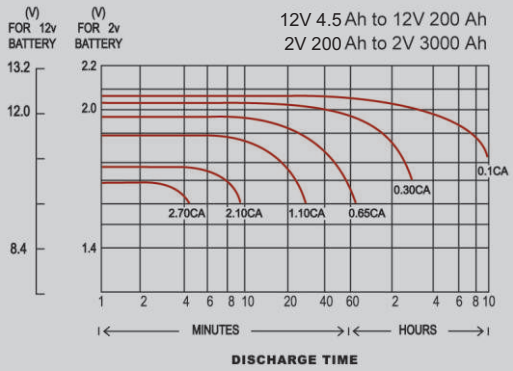
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	2000 Ah 1533 Ah 1100 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.15 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	2120 Ah 2000 Ah 1700 Ah 1500 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

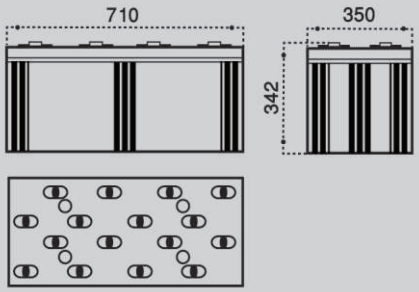
Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	1839	1186	734	532	361	249	200	105

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	1700	1100	680	511	350	240	200	109

2 SB 3000 (2V 3000Ah)

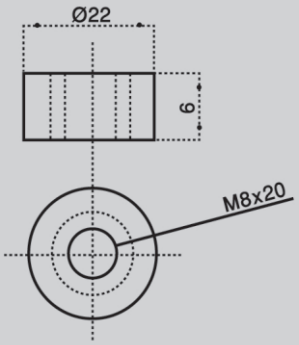
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		3000 Ah
Dimensions	Total Height	382 mm
	Height	342 mm
	Length	710 mm
	Width	350 mm
Weight Approx (±2.5%)		195 Kg

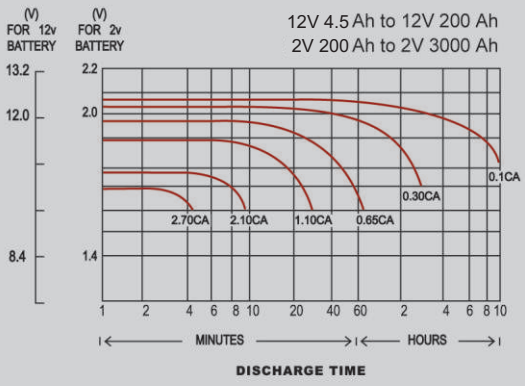
Terminal Type (mm)



Characteristics

Capacity 25°C (77°F)	10 hour-rate 3 hour-rate 1 hour-rate	3000 Ah 2307 Ah 1650 Ah
Internal Resistance	Full Charge Battery at 25°C (77°F)	0.1 mΩ
Capacity Affected by Temperature (10 Hour Rate)	35°C 25°C 0°C -10°C	3180 Ah 3000 Ah 2550 Ah 2250 Ah
Self-Discharge at 25°C (77°F)	Capacity After The 3 Month of Storage Capacity After The 6 Month of Storage Capacity After The 12 Month of Storage	91 % 82 % 64 %
Charge Constant Voltage — Cycle	Voltage 2.40-2.45 / Cell	
Charge Constant Voltage — Float	Voltage 2.23-2.25 / Cell	

Discharge Curves 25°c (77°F)



Discharge and Final Voltage Table According to IEC60896-21 Standard

Discharg time	0.25 h	1 h	3 h	5 h	8 h	10 h
Final voltage	1.60 VPC	1.60 VPC	1.70 VPC	1.73 VPC	1.75 VPC	1.80 VPC

Constant Current Discharge Table at 25°C (77°F) Based on IEC60896-21 Standard

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	2757	1780	1116	800	552	379	300	158

Constant Current Discharge Table at 25°C (77°F) Based on Final Voltage 1.80 V/Cell

Amount of Current (A)	Discharge Time							
	30 m	1 h	2 h	3 h	5 h	8 h	10 h	20 h
	2550	1650	1034	769	535	358	300	165

1. Saba Stationary Sealed Lead Acid Battery:

One of the outstanding characteristics of Saba stationary sealed lead acid batteries is their electrolyte impermeability in them and so there is no need of keeping and particular attention. This advantage is a result of high technology in recombination of oxygen. Because of AGM particular performance the oxygen which is emitted from positive plates spreads through the negative plates and due to the process of producing water in battery , there is no need of adding water and this process make the battery free from keeping or special attentions (maintenance free).

No	Kind of Battery	Voltage	Volume Ah			Dimensions (mm)				Weight	Container
			C1	C3	C10	Length	Width	Height	Total Height		
1	6 SB 4.5	6	2.34	3.18	4.5	70	47	100	105	0.9	ABS
2	6 SB 7	6	3.64	4.94	7	151	34	94	106.2	1.3	ABS
3	12 SB 4.5	12	2.34	3.18	4.5	89.3	69.3	101	106.2	1.8	ABS
4	12 MC 4.5	12	2.34	3.18	4.5	89.3	69.3	101	106.2	1.8	ABS
5	12 SB 7.5	12	3.9	5.3	7.5	151	65	94	98	2.5	ABS
6	12 MC 7	12	3.64	4.94	7	138	66	101	101	2.3	ABS
7	12 MC 9	12	4.68	6.36	9	136.4	76.5	134.3	134.3	2.9	ABS
8	12 SB 9	12	4.68	6.75	9	151	65	94	98	2.7	ABS
9	12 SB 12	12	6.2	8.5	12	151	98	95	100	3.8	ABS
10	12 SB 18	12	9.4	12.9	18	181	78	165	165	5.8	ABS
11	12 EV 20	12	13.1	17.7	20	181	77	169.5	169.5	7.3	ABS
12	12 SB 28	12	14.5	19.8	28	175	166	125	125	9	ABS
13	12 SB 42	12	22	30	42	197	166	169	169	13	ABS
14	12 HR 40	12	22	30	40	197	166	169	169	12.5	ABS
15	12 SB 65	12	34	46.5	65	349	167	180	185	22	ABS
16	12 HR 60	12	34	46.5	60	349	167	180	185	20.5	ABS
17	12 SB 100	12	55	75	100	328	172	220	242	31	ABS
18	12 DC 100	12	55	75	100	328	172	220	242	31	ABS
19	12 GB 85	12	60	70	85	328	197	216	222	31	ABS
20	12 SB 120	12	66	90	120	407	175	209	233	36	ABS
21	12 FT 92	12	51	69	92	394	110	285	285	32	ABS
22	12 FT 100	12	55	75	100	394	110	285	285	33	ABS
23	12 FT 110	12	60.5	82.5	110	394	110	285	285	35	ABS
24	12 FT 150	12	82	112	150	551	110	288	288	47	ABS
25	12 FT 155 (W:110)	12	82	114	155	551	110	288	288	49	ABS
26	12 FT 155	12	84	114	155	560	126	280	280	54	ABS
27	12 FT 200	12	106.1	142.5	200	560	126	320	320	64	ABS
28	2 SB 200	2	110	150	200	171	110	330	365	13.35	ABS
29	2 SB 250	2	137	186	250	171	150	330	365	16	ABS
30	2 SB 300	2	165	225	300	171	150	330	365	20	ABS
31	2 SB 350	2	192	261	350	210	171	330	365	26	ABS
32	2 SB 420	2	231	315	420	210	171	330	365	28	ABS
33	2 SB 600	2	330	450	600	302	175	330	367	40	ABS
34	2 SB 1000	2	550	738	1000	473	174	330	365	63	ABS
35	2 SB 1500	2	825	1125	1500	400	350	345	382	115	ABS
36	2 SB 2000	2	1100	1533	2000	490	350	342	382	135	ABS
37	2 SB 3000	2	1650	2307	3000	710	350	342	382	195	ABS

- The above mentioned weights are with ± 2.5% tolerance
- In this case the capacity of C5 mentioned

2. Components of Sealed Batteries

- Positive plates: Positive plates are made of lead calcium alloy with special formula.
- Negative Plates: Negative plates are made with lead calcium alloy with special formula.
- Separator: AGM separator is made in a way that its porosity drain at its top makes enough electrolytes for reaction of active elements of plates.
- Safety relief valve: The valve is designed in a way that can emit extra gas from the battery and keeps the internal pressure at a safe level.

3. The Unique Specification of Sealed Batteries:

- No servicing and keeping required (maintenance free).
- No electrolyte leaking
- Long life
- Working in any condition
- Low self discharge
- Minimum weight and volume
- Can be installed on equipments

4. Application:

Long life and high capacity are main features of sealed batteries. Batteries are categorized according to their applications :

a) Cyclic application

b) Standby systems application

Cyclic application

- Audio/Video Equipments
- Medical Equipments
- Photography Equipments
- Portable Power Supplying Equipments
- Lighting Equipments
- Personal Computers
- Computers Systems
- Toys

Using in Standby Systems

- Security and Alarming Systems
- Emergency Lighting
- Communication Equipments
- Path Lighting
- Power Plant
- Portable Power Resources
- UPS

5. Capacity:

The capacity of a battery is the amount of electric power usable from a charged cell. The unit of capacity is ampere per hour and it is equal to the amount of ampere multiply by the amount of discharge time. The amount of its capacity depends on discharge process, temperature during charging and the final discharge voltage.

Note: sealed batteries are made according to IEC60896-2 international standard and are generally tested

6. Maintenance and storage :

The storeroom of batteries should be clean, cool and dry. Batteries should be kept out of direct sunlight, radiators and steam pipes.

6.1. General canditions of battery storage :

- Low humidity
- The storage place must be free from the dust and direct sunlight
- Temperature of the storage must be in the range of (-15 to 55˚C)
- The storage place must be free from dust and direct sunlight

6.2. Capacity After a Long Storage Time

After a long time storage, all batteries reach to their lowest capacity than their initial level. in the case of cycling usage after many charge and discharge cycles it is possible that the batteries reach their full capacity . They usually reach the whole capacity after 2 or 3 cycles. For long storage the battery should be fully charged in advance. The amount of self discharge is approximately 3% at 25˚C per month and this process can be changed due to the environmental elements.

Temperature	Shelf life
0~20˚C (32~68˚F)	6 Month
21~30˚C (70~86˚F)	3 Month

7. Controlling Notes:

7.1. Before installation, please read the installation and maintenance instructions carefully (batteries come with instructions). If you have any question don't hesitate to contact us

Tell: +9821-56575846 (after sales service management of Shahid Gohari),

our experts are at your service to help you

7.2. Over heating reduces the battery service life, so to prolong batteries life, keeping them in 20-25˚C is advised.

7.3. As producing explosive gas in the storage area is possible, keep the batteries away from devices which produce sparks. Good air conditioning is recommended.

7.4. If the batteries are kept in a closed area, a suitable air conditioning is recommended.

7.5. In accordance to the material which is used in the battery container don't make it contact with solvent or any sticky stuffs.

7.6. The advisable temperature for usage of the battery is between -15 to 35˚C . If this range reduces to -5 to 35˚C it prolongs the service life of the battery.

7.7. If any vibrations occurred in the storeroom, use shock-absorber and fasten the batteries tightly.

7.8. While connecting the batteries put them in an open-air area. Approximate needed room between the batteries should be 5 to 10 millimeter.

7.9. While the batteries are connected in serial mode and the voltage is more than 100 V , for prevention of electric fall pay close attention to battery connections and installation.

7.10. When more than one group of batteries are connected in a parallel mode, use suitable cable with proper cross-section for connection.

7.11. Always clean the batteries with a piece of wet cloth and don't use any greasy or solvated stuff such as petrol for cleaning.

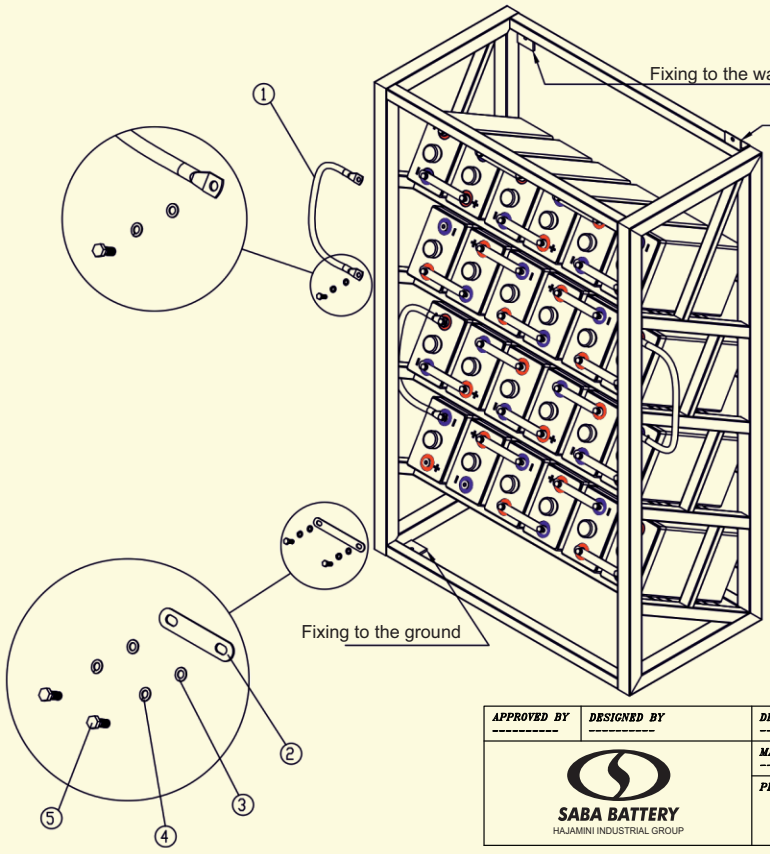
7.12. Don't dismantle the main parts of the battery, in the case of contacting the battery electrolyte (sulphuric acid) with clothes or skin wash the contact area immediately and use first aid equipment.

7.13. It is vital not to overheat the batteries and keep them away from direct flame.

7.14. While servicing or installing the battery use the rubber glove to avoid electric shock.

7.15. Using different batteries with different capacities together, it causes damage to the system.

V



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	3
2	copper belt 160*30*2 mm	20
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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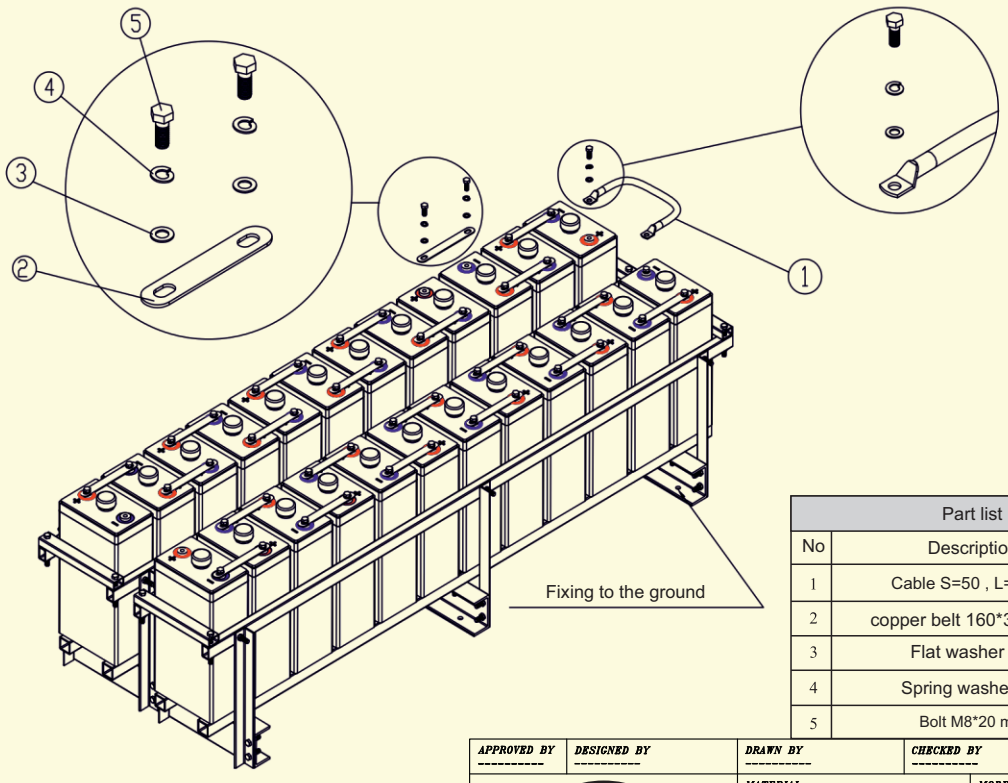
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL ----------	MODEL NO. ----------	
		PROJECT, DRAWING TITLE: Battery Installation Type: 2 SB 200Ah	DRAWING NO. F-M-42-618	
			VER. A / DATE 90.05.19	SCALE -----

H



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	1
2	copper belt 160*30*2 mm	22
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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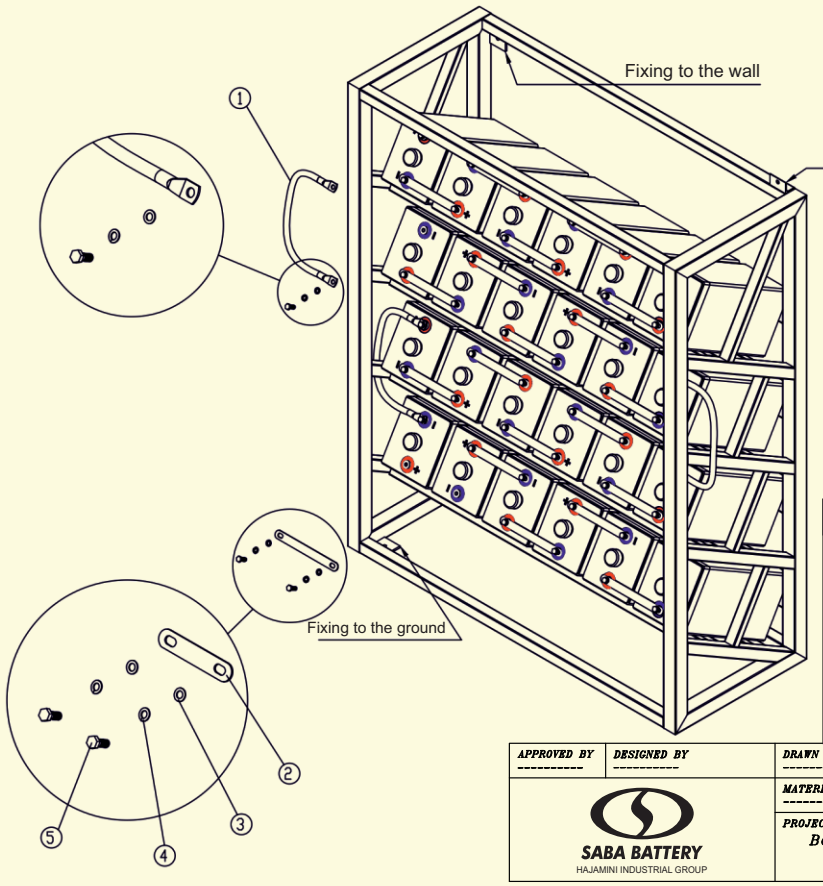
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL ----------	MODEL NO. ----------	
		PROJECT, DRAWING TITLE: Battery Installation Type: 2 SB 200Ah	DRAWING NO. F-M-42-614	
			VER. A / DATE 90.05.09	SCALE -----

V



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	3
2	copper belt 200*30*2 mm	20
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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SABA BATTERY
HAJAMINI INDUSTRIAL GROUP

MATERIAL	MODEL NO.
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PROJECT, DRAWING TITLE: Battery Installation Type: 2 SB 250Ah 2 SB 300Ah	DRAWING NO.: F-M-42-619
VER.: A	DATE: 90.05.19
SCALE: ------	

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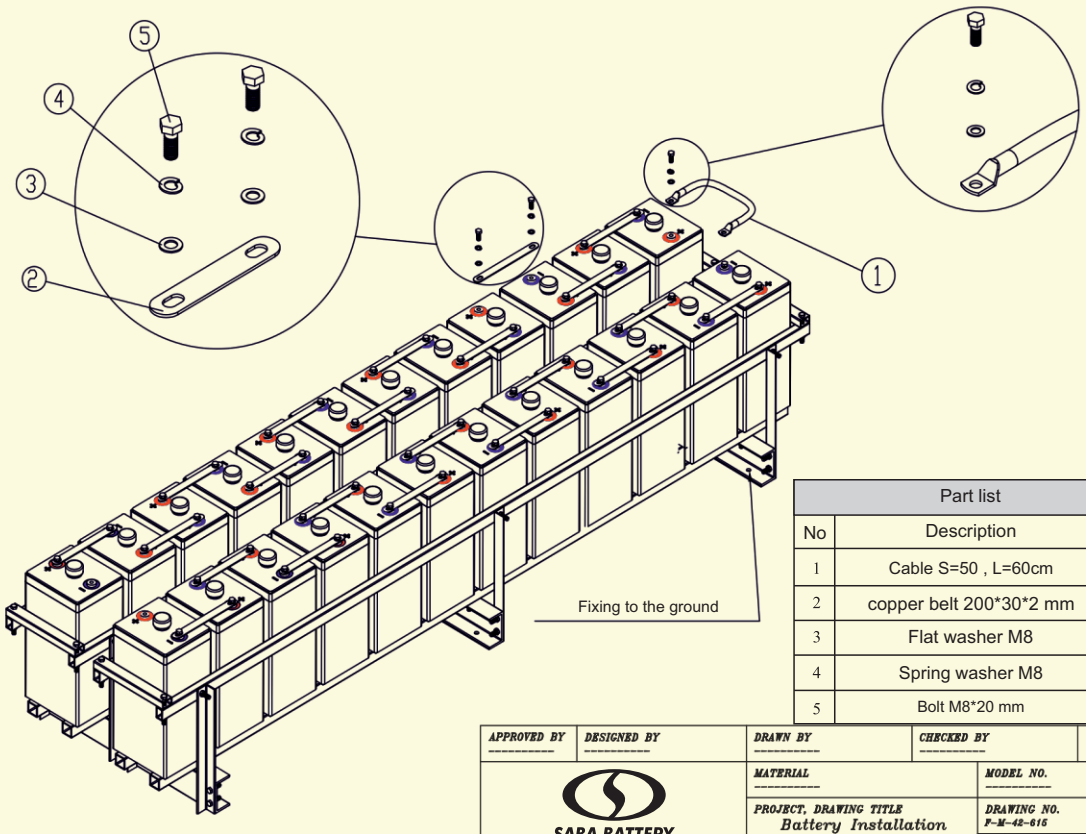

Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	3
2	copper belt 200*30*2 mm	22
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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SABA BATTERY
HAJAMINI INDUSTRIAL GROUP

MATERIAL	MODEL NO.
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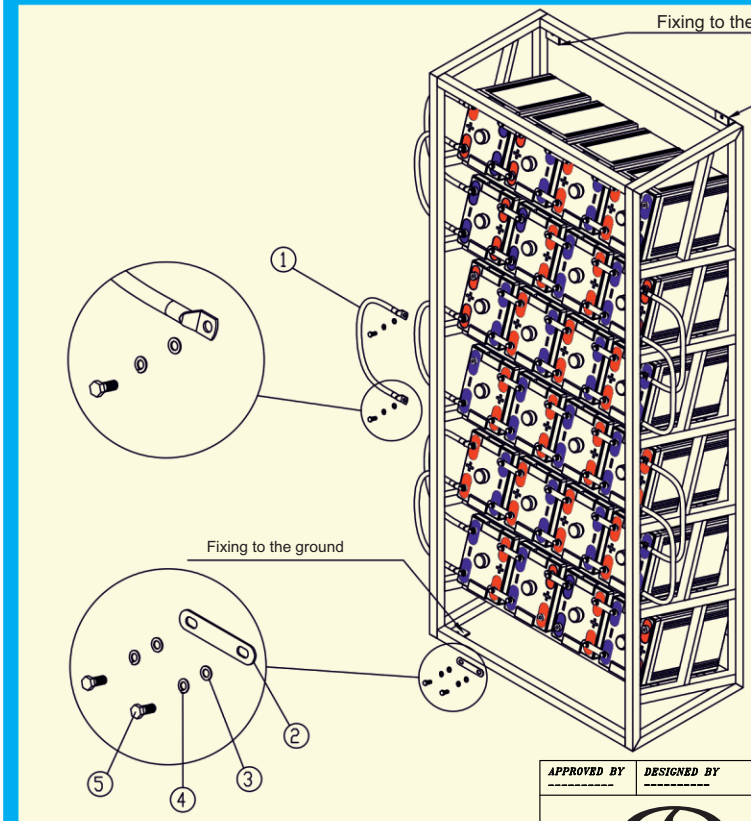
PROJECT, DRAWING TITLE: Battery Installation Type: 2 SB 250Ah 2 SB 300Ah	DRAWING NO.: F-M-42-615
VER.: A	DATE: 90.05.15
SCALE: ------	

V



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	10
2	copper belt 100*20*3 mm	36
3	Flat washer M8	96
4	Spring washer M8	96
5	Bolt M8*20 mm	96

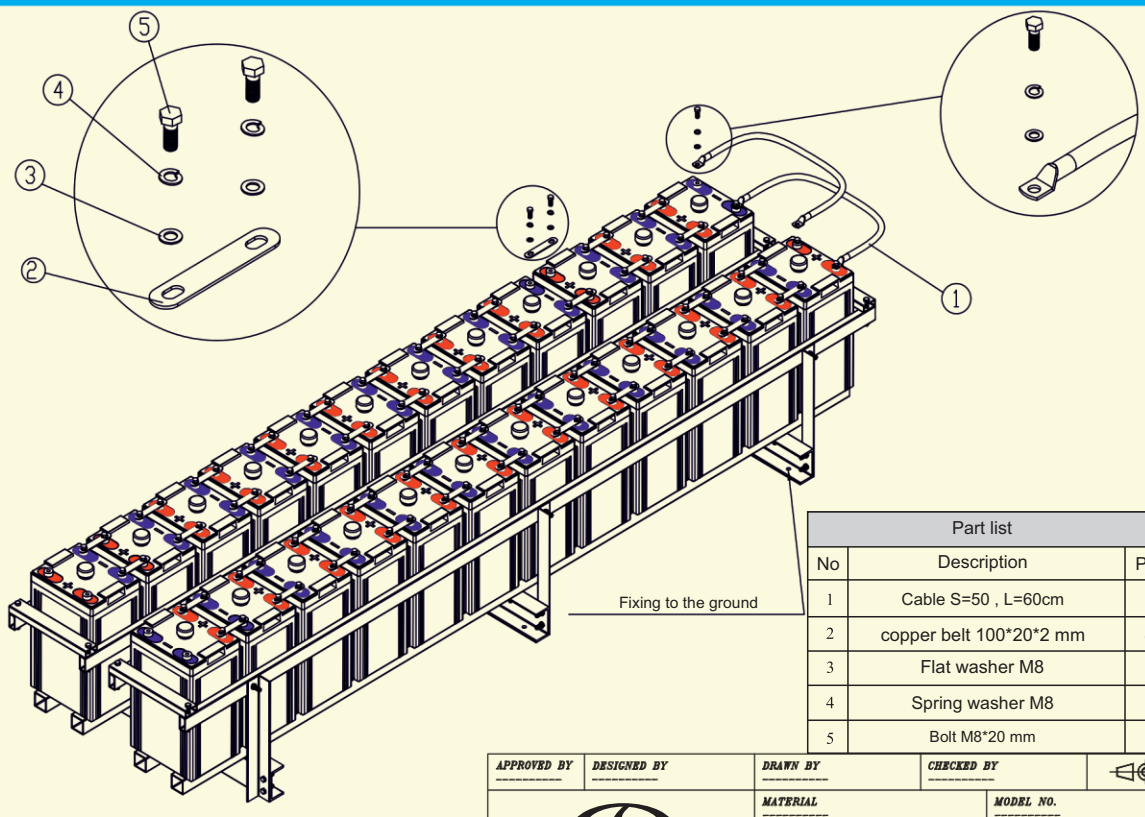
APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	

SABA BATTERY
HAJAMINI INDUSTRIAL GROUP

MATERIAL	MODEL NO.

PROJECT, DRAWING TITLE	DRAWING NO.		
Battery Installation Type: 2 SB 420Ah 2 SB 350Ah	P-M-42-812	VER. A DATE 90.04.15	SCALE -----

H



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	2
2	copper belt 100*20*2 mm	44
3	Flat washer M8	96
4	Spring washer M8	96
5	Bolt M8*20 mm	96

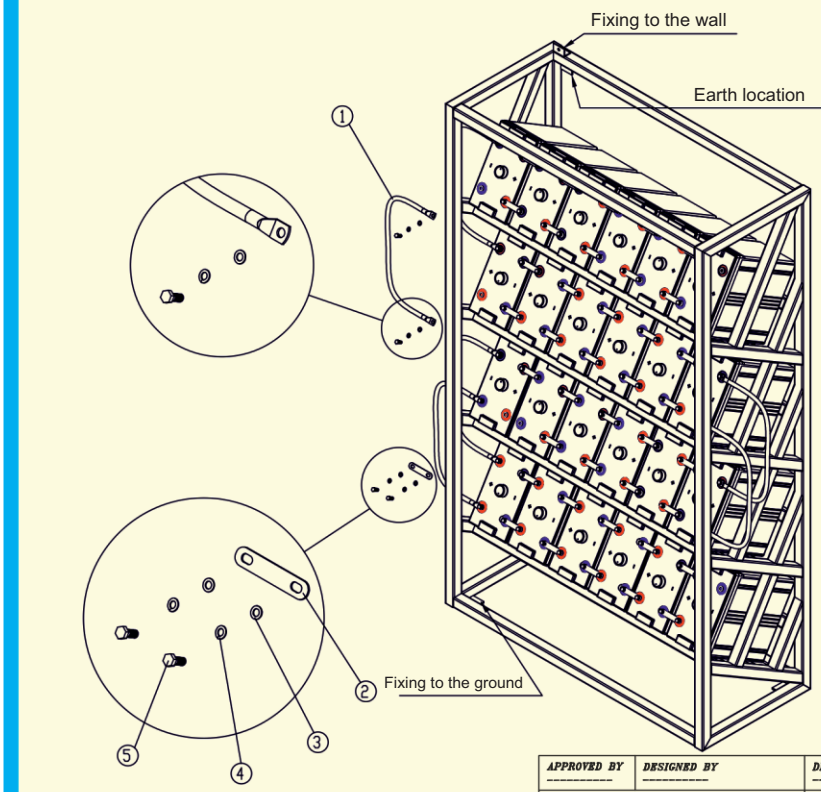
APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	

SABA BATTERY
HAJAMINI INDUSTRIAL GROUP

MATERIAL	MODEL NO.

PROJECT, DRAWING TITLE	DRAWING NO.		
Battery Installation Type: 2 SB 420Ah 2 SB 350Ah	P-M-42-811	VER. A DATE 90.04.15	SCALE -----

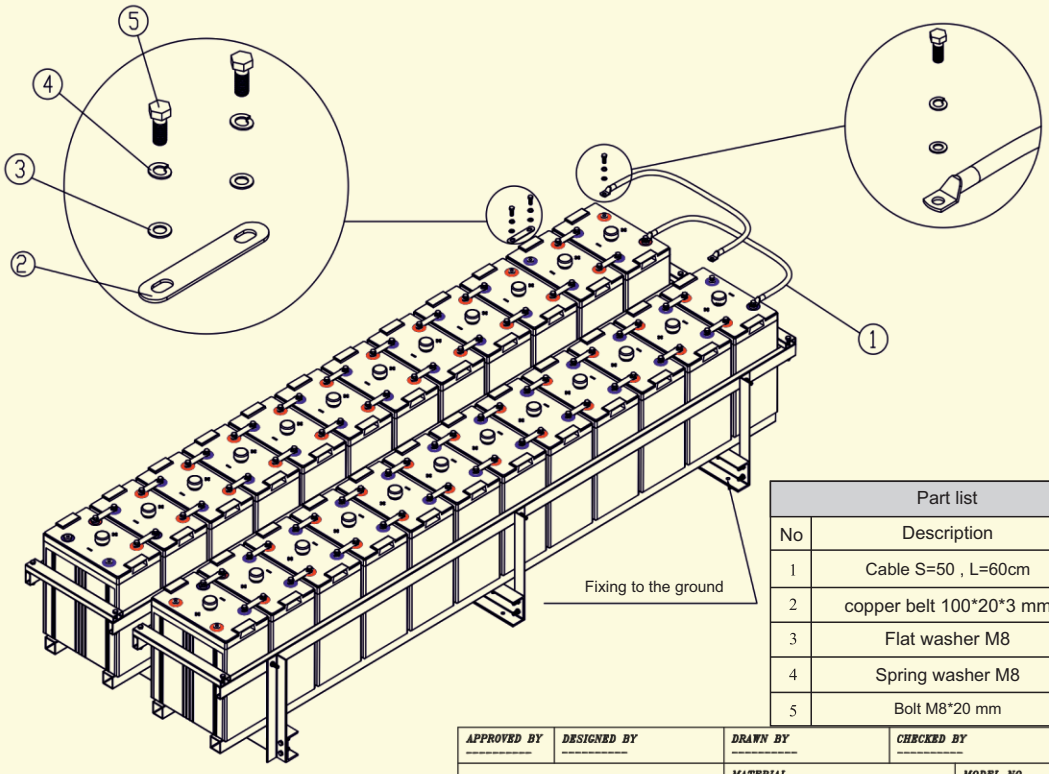
V



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	6
2	copper belt 100*20*3 mm	40
3	Flat washer M8	96
4	Spring washer M8	96
5	Bolt M8*20 mm	96

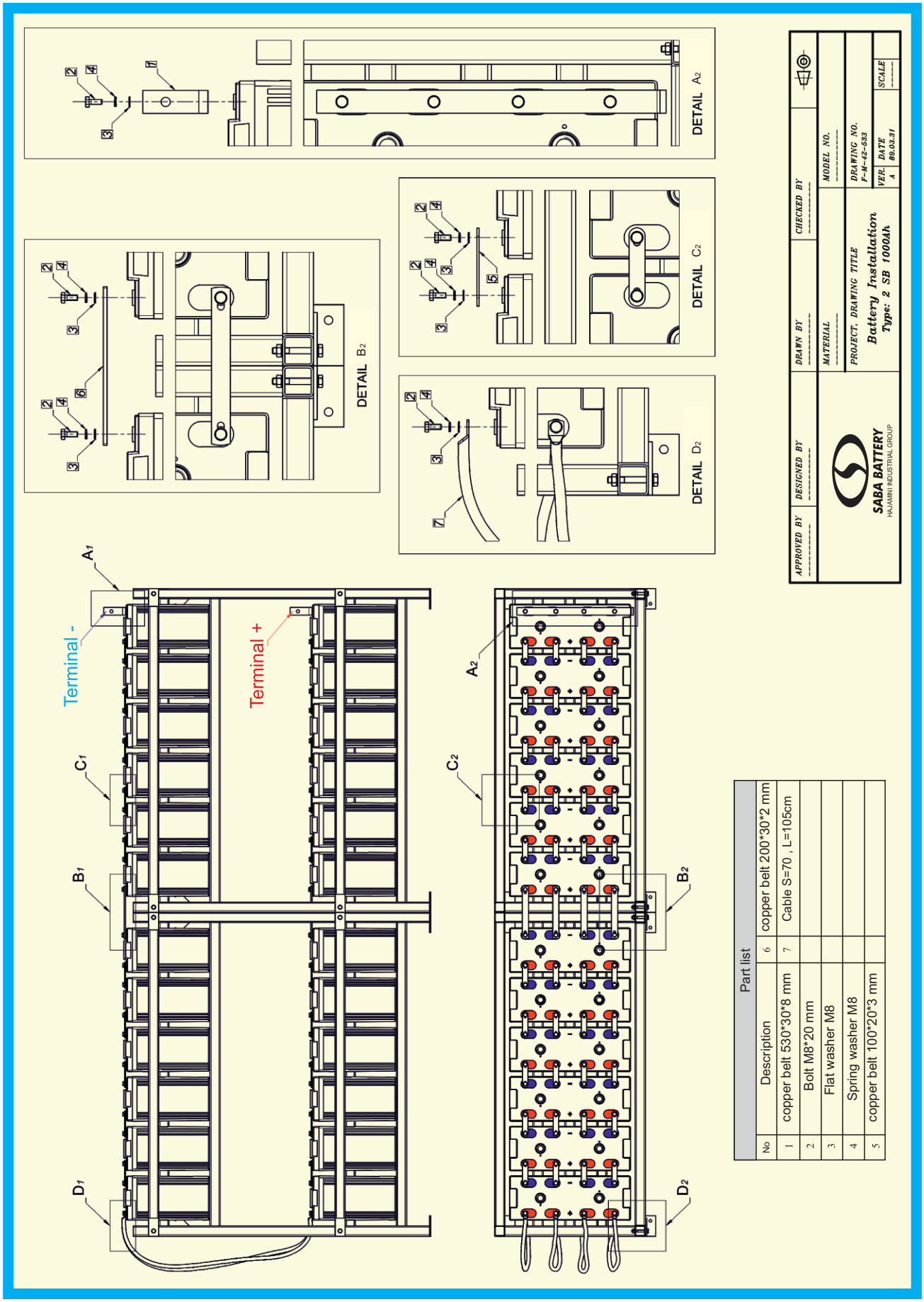
APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE Battery Installation Type: 2 SB 600Ah	DRAWING NO. P-M-42-613	
			VER. A / DATE 90.04.19	SCALE

H



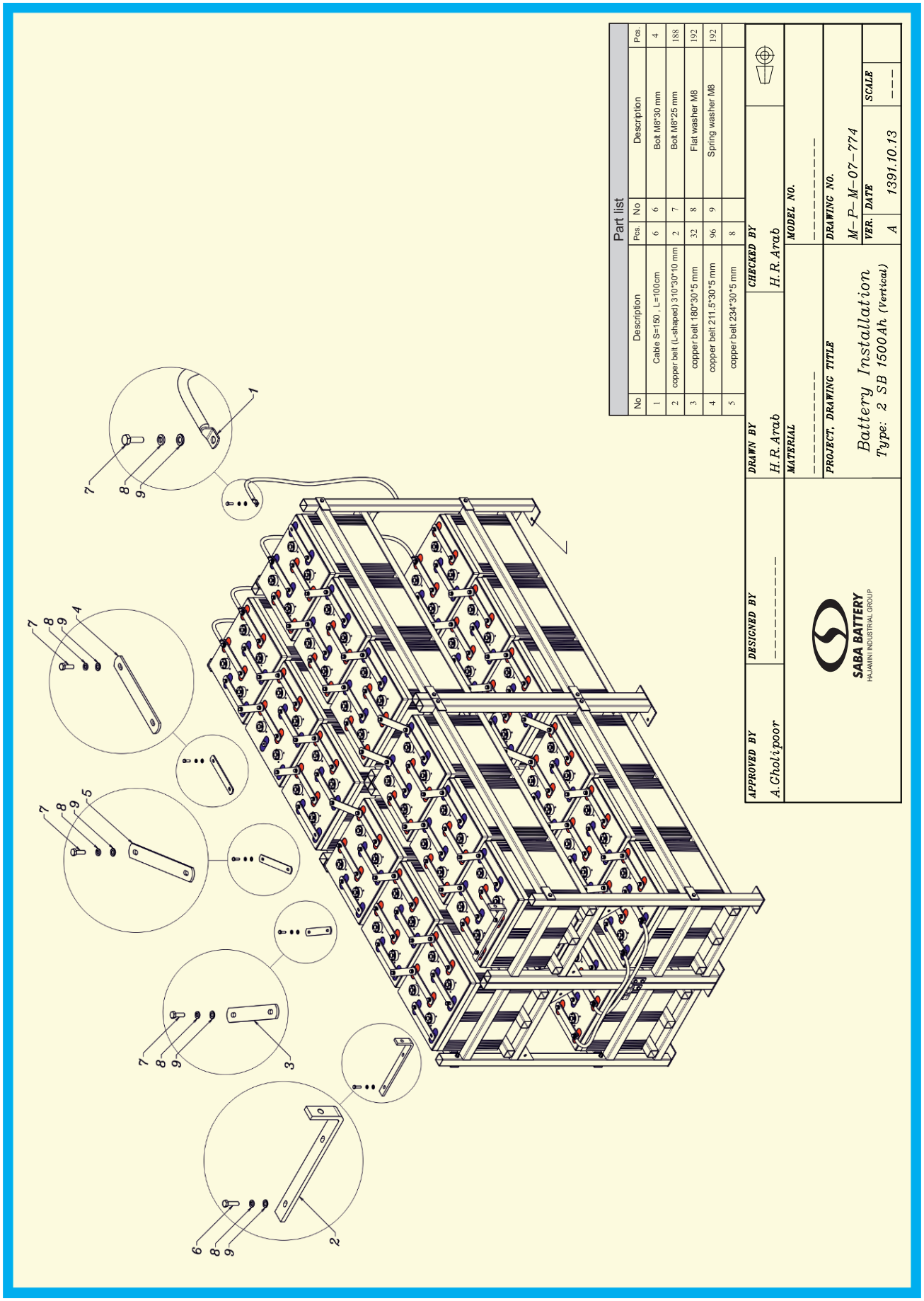
Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	2
2	copper belt 100*20*3 mm	44
3	Flat washer M8	96
4	Spring washer M8	96
5	Bolt M8*20 mm	96

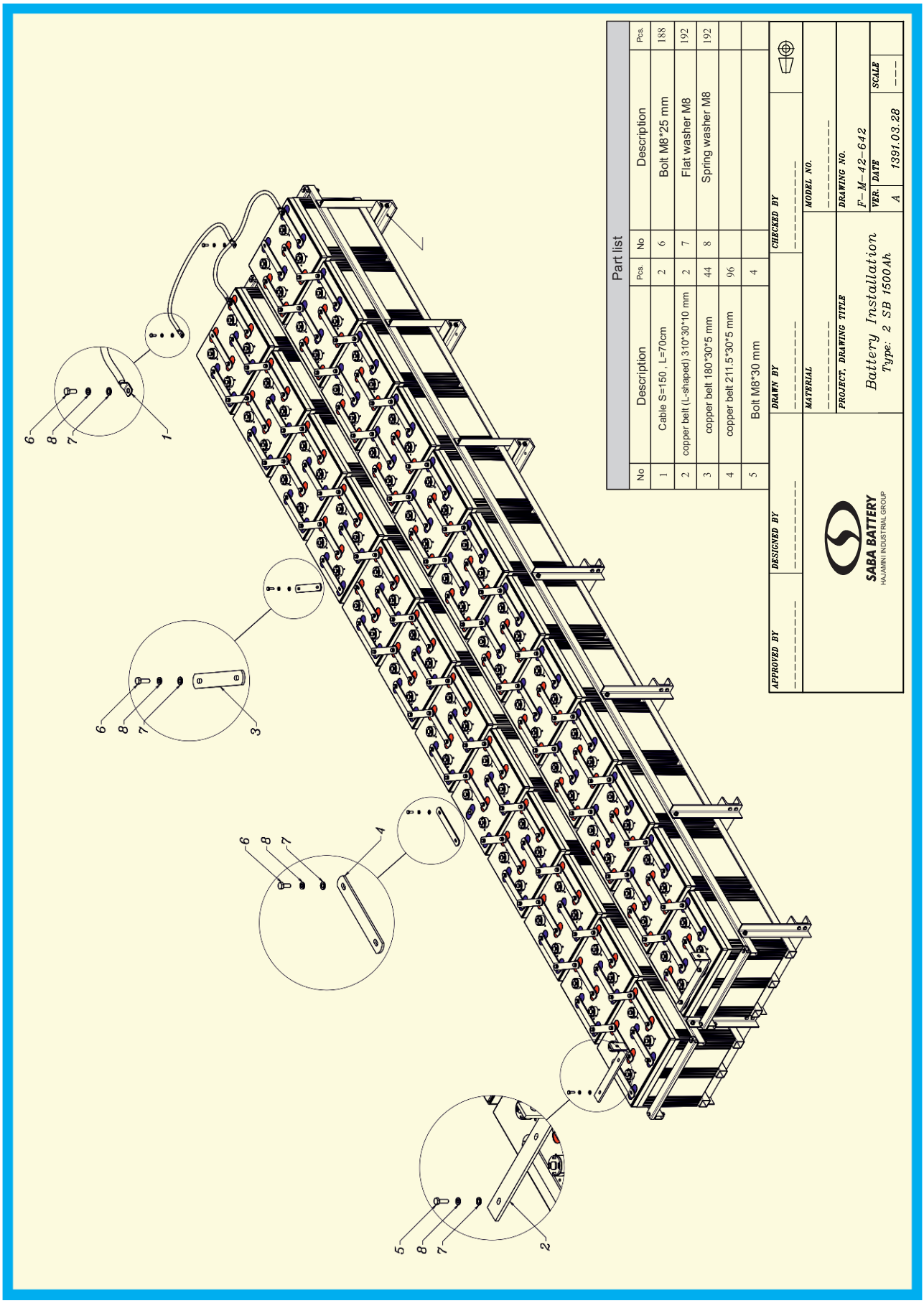
APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE Battery Installation Type: 2 SB 600Ah	DRAWING NO. P-M-42-616	
			VER. A / DATE 90.05.16	SCALE

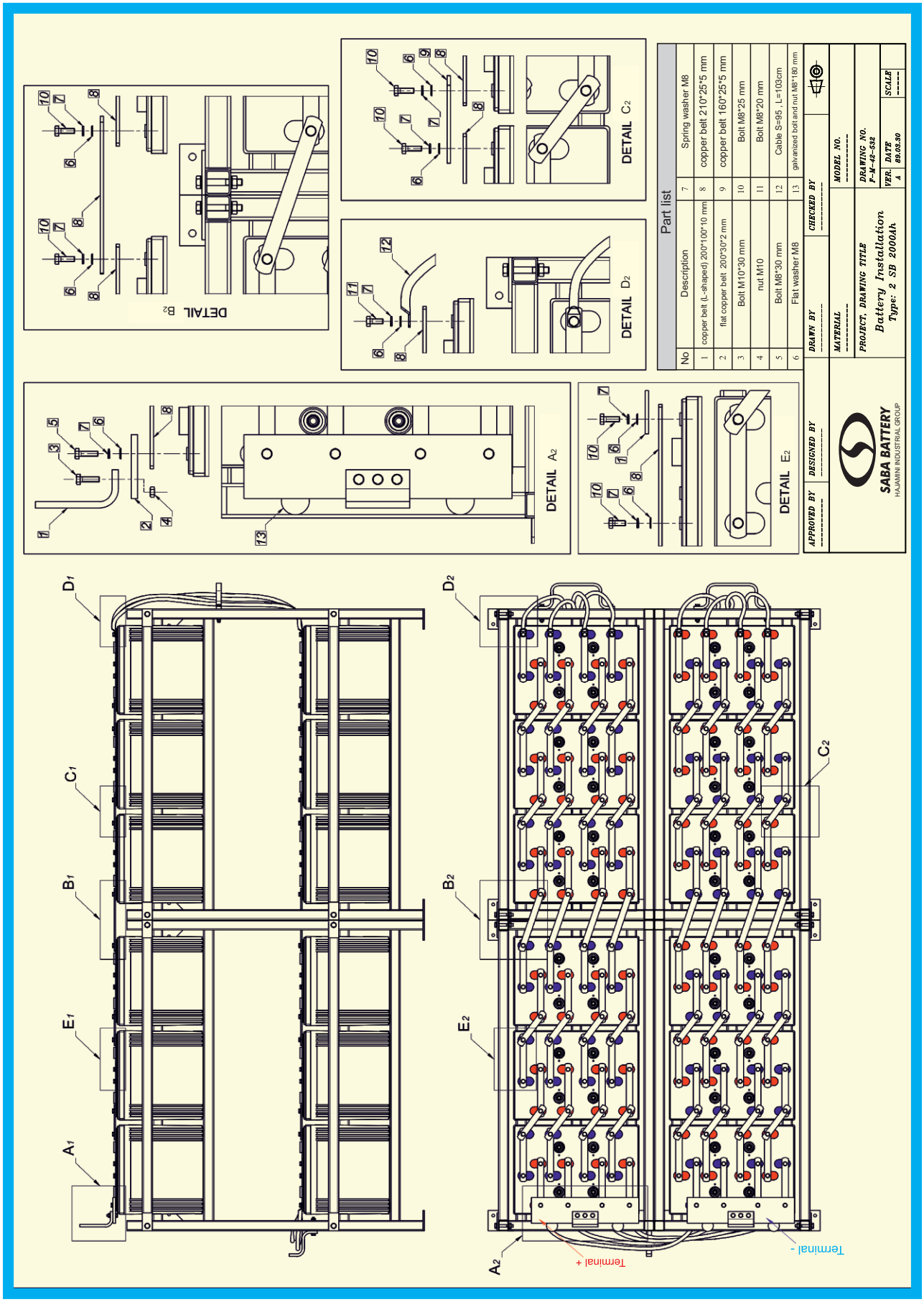


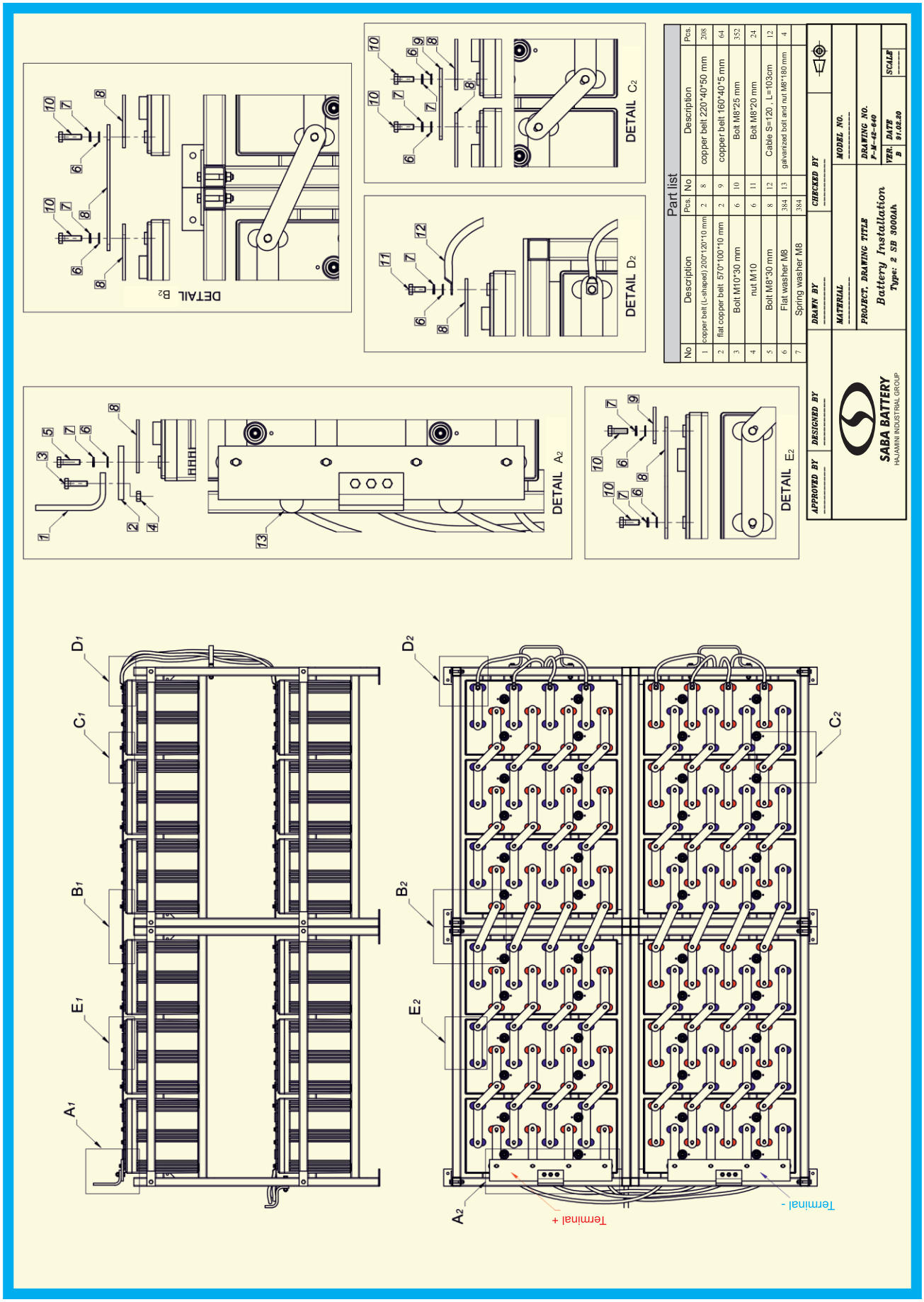
Part list

No	Description	6	copper belt 200*30*2 mm
1	copper belt 530*30*8 mm	7	Cable S=70 , L=105cm
2	Bolt M8*20 mm		
3	Flat washer M8		
4	Spring washer M8		
5	copper belt 100*20*3 mm		


Part list
No | Description | Pcs. | No | Description | Pcs.
1 | Cable S=150 , L=100cm | 6 | 6 | Bolt M8*30 mm | 4
2 | copper belt (L-shaped) 310*30*10 mm | 2 | 7 | Bolt M8*25 mm | 188
3 | copper belt 180*30*5 mm | 32 | 8 | Flat washer M8 | 192
4 | copper belt 211.5*30*5 mm | 96 | 9 | Spring washer M8 | 192
5 | copper belt 234*30*5 mm | 8
APPROVED BY
A.Gholipoor
DESIGNED BY
DRAWN BY
H.R.Arab
CHECKED BY
H.R.Arab
MATERIAL
MODEL NO.
SABA BATTERY
HAJAMIN INDUSTRIAL GROUP
PROJECT, DRAWING TITLE
Battery Installation
Type: 2 SB 1500Ah (Vertical)
DRAWING NO.
M-P-M-07-774
VER. A
DATE 1391.10.13
SCALE


Part list
No | Description | Pcs. | No | Description | Pcs.
1 | Cable S=150 , L=70cm | 2 | 6 | Bolt M8*25 mm | 188
2 | copper belt (L-shaped) 310*30*10 mm | 2 | 7 | Flat washer M8 | 192
3 | copper belt 180*30*5 mm | 44 | 8 | Spring washer M8 | 192
4 | copper belt 211.5*30*5 mm | 96
5 | Bolt M8*30 mm | 4
APPROVED BY
DESIGNED BY
DRAWN BY
CHECKED BY
MATERIAL
MODEL NO.
PROJECT. DRAWING TITLE
DRAWING NO.
F-M-42-642
VER. DATE
A 1391.03.28
SCALE
SABA BATTERY
HAJAMNI INDUSTRIAL GROUP
Battery Installation
Type: 2 SB 1500Ah


Part list
No | Description
1 | copper belt (L-shaped) 200*100*10 mm
2 | flat copper belt 200*30*2 mm
3 | Bolt M10*30 mm
4 | nut M10
5 | Bolt M8*30 mm
6 | Flat washer M8
7 | Spring washer M8
8 | copper belt 210*25*5 mm
9 | copper belt 160*25*5 mm
10 | Bolt M8*25 mm
11 | Bolt M8*20 mm
12 | Cable S=95 , L=103cm
13 | galvanized bolt and nut M8*180 mm
DETAIL B2
DETAIL C2
DETAIL D2
DETAIL A2
DETAIL E2
APPROVED BY
DESIGNED BY
DRAWN BY
CHECKED BY
MATERIAL
MODEL NO.
PROJECT, DRAWING TITLE
Battery Installation
Type: 2 SB 2000Ah
DRAWING NO.
P-M-42-532
VER. A
DATE 89.03.30
SCALE
SABA BATTERY
HAJAMIN INDUSTRIAL GROUP
D1
C1
B1
E1
A1
D2
C2
B2
E2
A2
Terminal +
Terminal -


DETAIL B2
DETAIL C2
DETAIL D2
DETAIL A2
DETAIL E2
Part list
No | Description | Pcs. | No | Description | Pcs.
1 | copper belt (L-shaped) 200*120*10 mm | 2 | 8 | copper belt 220*40*50 mm | 208
2 | flat copper belt 570*100*10 mm | 2 | 9 | copper belt 160*40*5 mm | 64
3 | Bolt M10*30 mm | 6 | 10 | Bolt M8*25 mm | 352
4 | nut M10 | 6 | 11 | Bolt M8*20 mm | 24
5 | Bolt M8*30 mm | 8 | 12 | Cable S=120 , L=103cm | 12
6 | Flat washer M8 | 384 | 13 | galvanized bolt and nut M8*180 mm | 4
7 | Spring washer M8 | 384
APPROVED BY
DESIGNED BY
DRAWN BY
CHECKED BY
SABA BATTERY
HAJAMINI INDUSTRIAL GROUP
MATERIAL
PROJECT, DRAWING TITLE
Battery Installation
Type: 2 SB 3000Ah
MODEL NO.
DRAWING NO.
P-M-42-640
VER. B
DATE 91.02.20
SCALE
A1
B1
C1
D1
E1
A2
B2
C2
D2
E2
Terminal +
Terminal -

NOTE :

NOTE :

SABA BATTERY

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SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

R005-001010

Energy Sources
Development Company
(Tavan)

SABA BATTERY

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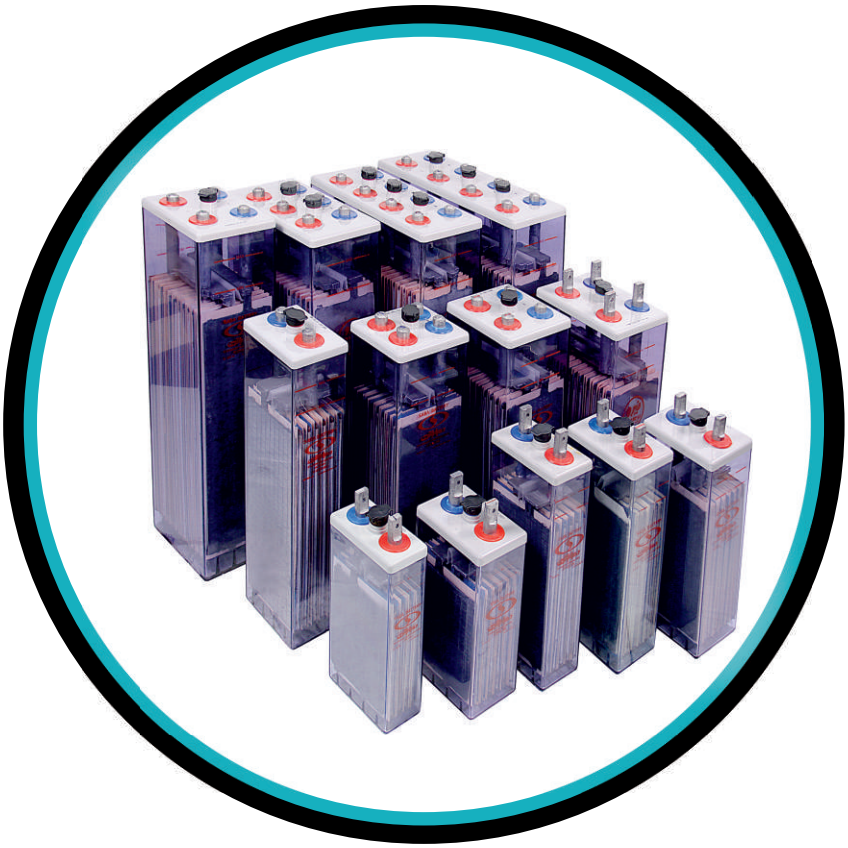
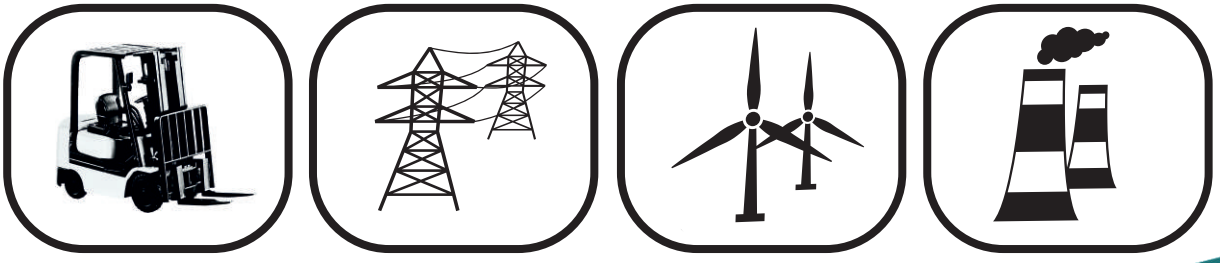


Stationary Flooded-Tubular Batteries

200 - 3000 Ah OPzS Series



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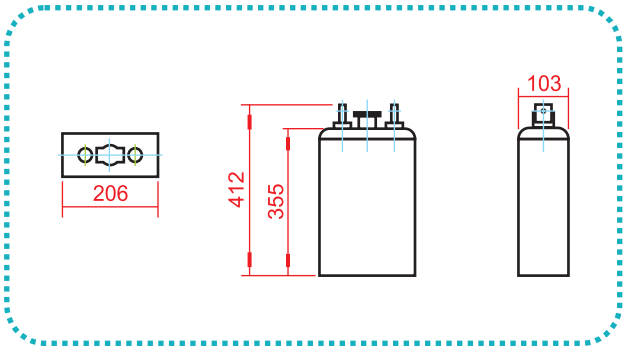
SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

Contents

4 OPzS 200 (2 V 200Ah)

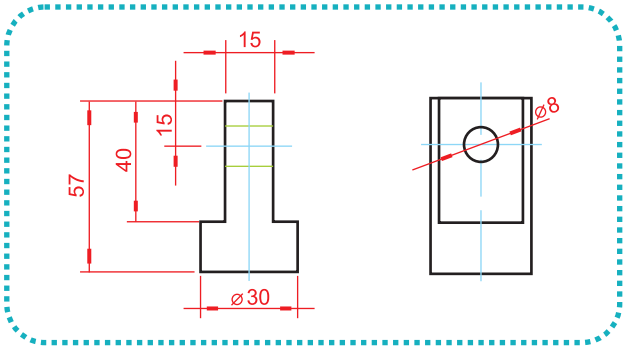
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		200 Ah
Dimensions	Total Height	412 mm
	Height	355 mm
	Length	206 mm
	Width	103 mm
Weight of Dry Battery (±2.5%)		12.6 Kg
Weight of Electrolyte		4.8 Kg

Terminal Type (mm)



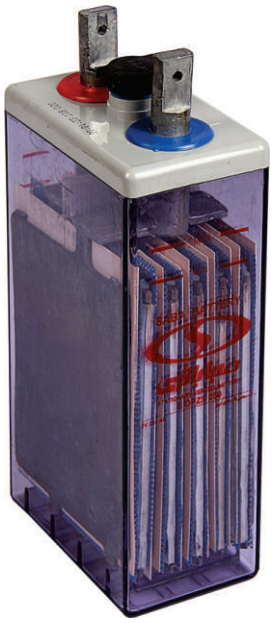
SINGLE CELL BATTERIES

TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
4 OPzS 200	200 170 150	10 5 3	20 34 50	1.82 1.79 1.77	30	14	7	50

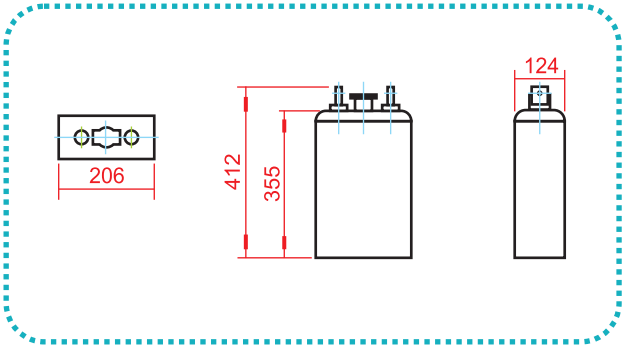
Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	81	65.2	46	36	30.4	26.6	23.4	19.2	16.2
1.87 V	95	74.8	51.6	40	33.6	29.2	25.8	21	17.6
1.83 V	111	85.6	58	44.8	36.8	31.8	28.4	22.8	19
1.80 V	122	92	61.6	47.2	38.6	33.2	29.6	24	20
1.75 V	142	100	66.4	50.4	40.8	35	31.2	25.2	–
1.70 V	156	108	69.6	52.4	42.4	36.2	32	–	–

5 OPzS 250 (2 V 250Ah)

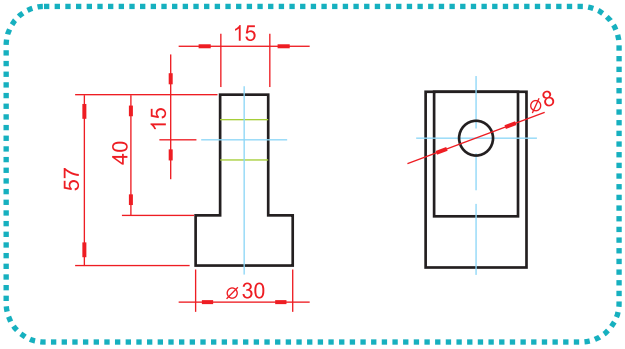


Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		250 Ah
Dimensions	Total Height	412 mm
	Height	355 mm
	Length	206 mm
	Width	124 mm
Weight of Dry Battery (±2.5%)		15.2 Kg
Weight of Electrolyte		6.1 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

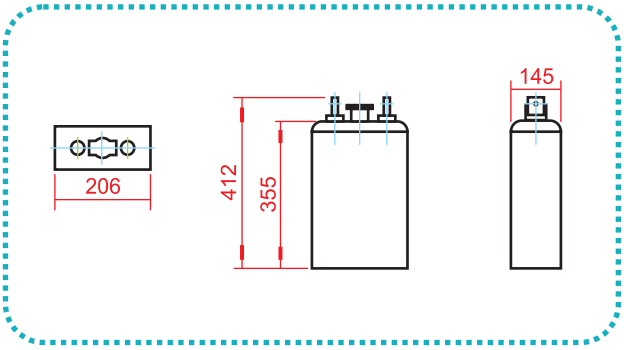
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
5 OPzS 250	250 215 189	10 5 3	25 43 63	1.82 1.79 1.77	38	17	8.5	50

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	102	81.5	57.5	45	38	33.25	29.25	24	20.25
1.87 V	119	93.5	64.5	50	42	36.5	32.25	26.25	22
1.83 V	139	107	72 5	56	46	39.75	35.5	28.5	23.75
1.80 V	153	115	77	59	48.25	41.5	37	30	25
1.75 V	178	126	83	63	51	43.75	39	31.5	—
1.70 V	195	135	87	65.5	53	45.25	40	—	—

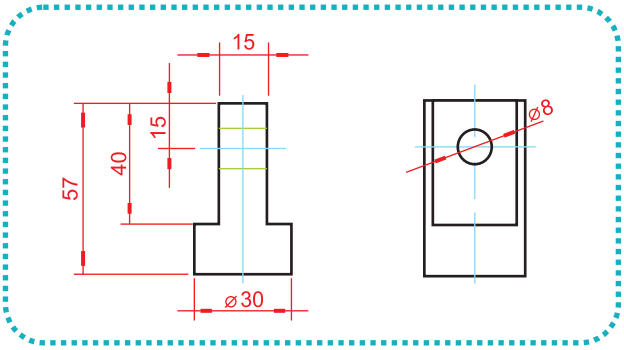
6 OPzS 300 (2 V 300Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		300 Ah
Dimensions	Total Height	412 mm
	Height	355 mm
	Length	206 mm
	Width	145 mm
Weight of Dry Battery (±2.5%)		17.6 Kg
Weight of Electrolyte		7.3 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

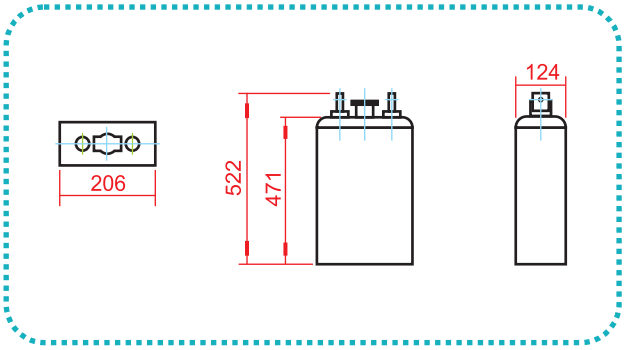
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4V/cell falling by (A)	over 2.4V/cell falling to (A)	
6 OPzS 300	300 255 225	10 5 3	30 51 75	1.82 1.79 1.77	45	20	10	50

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	123	97.8	69	54	45.6	39.9	35.1	28.8	24.3
1.87 V	143	112	77.4	60	50.4	43.8	38.7	31.5	26.4
1.83 V	166	128	87	67.2	55.2	47.7	42.6	34.2	28.5
1.80 V	184	138	92.4	70.8	57.9	49.8	44.4	36	30
1.75 V	213	151	99.6	75.6	61.2	52.5	46.8	37.8	—
1.70 V	234	162	104.4	78.6	63.6	54.3	48	—	—

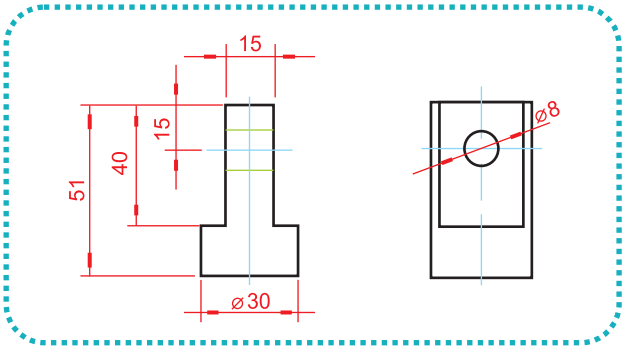
5 OPzS 350 (2 V 350Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		350 Ah
Dimensions	Total Height	522 mm
	Height	471 mm
	Length	206 mm
	Width	124 mm
Weight of Dry Battery (±2.5%)		20.7 Kg
Weight of Electrolyte		8.6 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

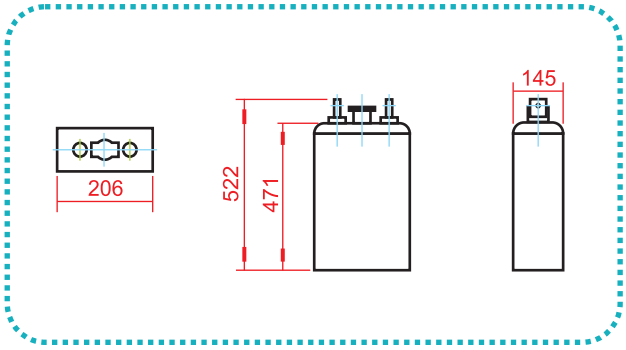
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
5 OPzS 350	350 300 264	10 5 3	35 60 88	1.82 1.79 1.77	53	24	12	70

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	121	99	70	57	48.5	43	37.5	32.5	29.5
1.87 V	148	118	84	67	56.5	49	43	36	31
1.83 V	179	140	98.5	77	64.5	55	47.5	39	33
1.80 V	199	154	106	82	68	58	50	40.5	34
1.75 V	231	171	115	88	72.5	61.5	52.5	42	—
1.70 V	254	185	122	92	75	64	54	—	—

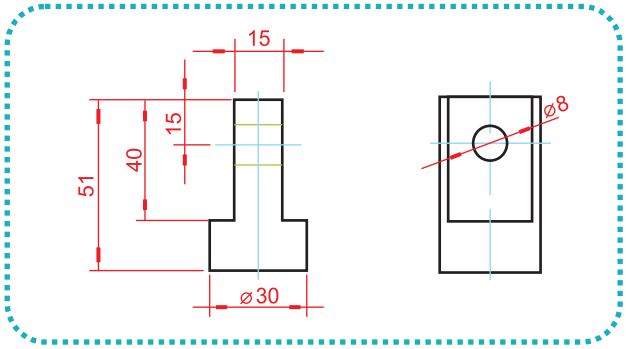
6 OPzS 420 (2 V 420Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		420 Ah
Dimensions	Total Height	522 mm
	Height	471 mm
	Length	206 mm
	Width	145 mm
Weight of Dry Battery (±2.5%)		23.7 Kg
Weight of Electrolyte		10.3 Kg

Terminal Type (mm)



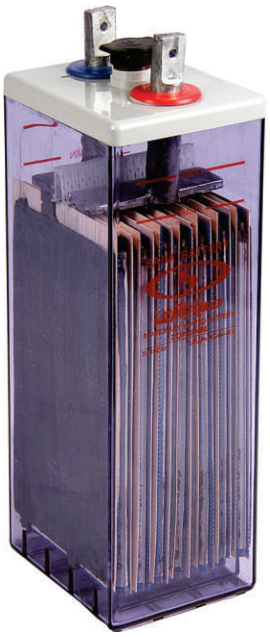
SINGLE CELL BATTERIES

TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4V/cell falling by (A)	over 2.4V/cell falling to (A)	
6 OPzS 420	420 360 315	10 5 3	42 72 105	1.82 1.79 1.77	83	28	14	70

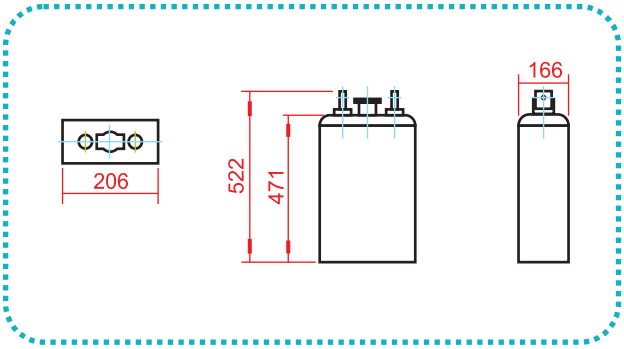
Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	145	118	84	68.4	58.2	51.6	45	39	35.4
1.87 V	177	141	100	80.4	67.8	58.8	51.6	43.6	37.2
1.83 V	214	168	118	92.4	77.4	66	57	46.8	39.6
1.80 V	238	185	127	98.4	81.6	69.6	60	48.6	40.8
1.75 V	277	205	138	105	87	73.8	63	50.4	—
1.70 V	304	222	147	110	90	76.80	65.40	—	—

7 OPzS 490 (2 V 490Ah)

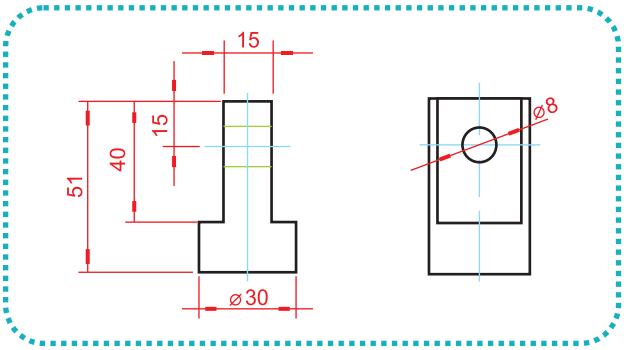


Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		490 Ah
Dimensions	Total Height	522 mm
	Height	471 mm
	Length	206 mm
	Width	166 mm
Weight of Dry Battery (±2.5%)		28 Kg
Weight of Electrolyte		12 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

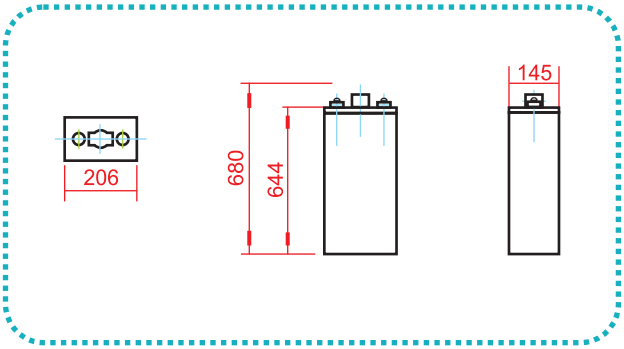
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell		
						falling by (A)	falling to (A)	
7 OPzS 490	490 425 369	10 5 3	49 85 123	1.82 1.79 1.77	74	32	16	70

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	170	138	98	79.8	67.9	60.2	52.5	45.5	41.3
1.87 V	207	165	117	93.8	79.1	68.6	60.2	50.4	43.2
1.83 V	250	196	137	107	90.3	77	66.5	54.6	46.2
1.80 V	278	216	149	114	95.2	81.2	70	56.7	47.6
1.75 V	323	239	161	123	101	86.1	73.5	58.8	—
1.70 V	355	259	171	128	105	89.6	76.3	—	—

6 OPzS 600 (2 V 600Ah)

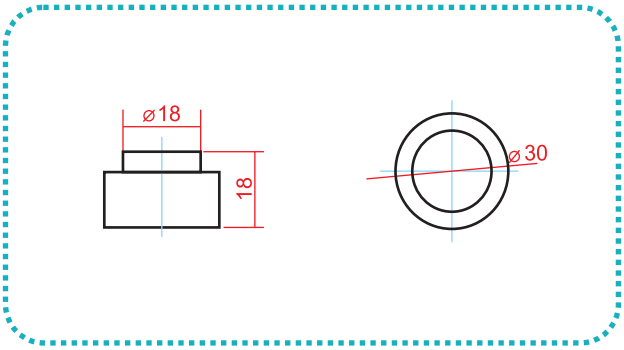
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		600 Ah
Dimensions	Total Height	680 mm
	Height	644 mm
	Length	206 mm
	Width	145 mm
Weight of Dry Battery (±2.5%)		34 Kg
Weight of Electrolyte		14.7 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

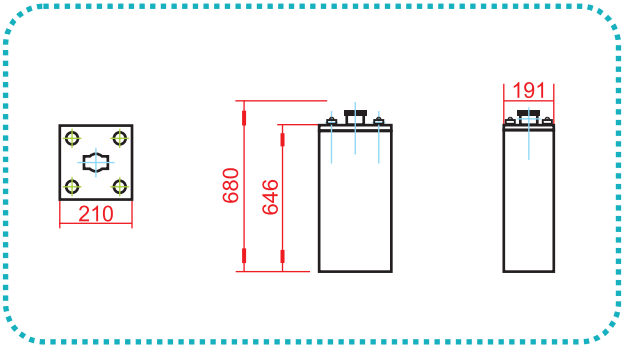
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
6 OPzS 600	600 510 450	10 5 3	60 102 150	1.80 1.77 1.75	90	40	20	100

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	192	163	121	99.6	87.6	75.6	66	53.4	43.2
1.87 V	237	193	142	115	98.4	84.6	73.8	60	49.2
1.83 V	292	228	163	130	109	94	82.2	66.6	57
1.80 V	330	252	176	139	115	99.6	87	70.2	58.8
1.75 V	385	285	192	149	121	105	91.8	74.4	—
1.70 V	427	309	204	156	127	109	95.4	—	—

8 OPzS 800 (2 V 800Ah)

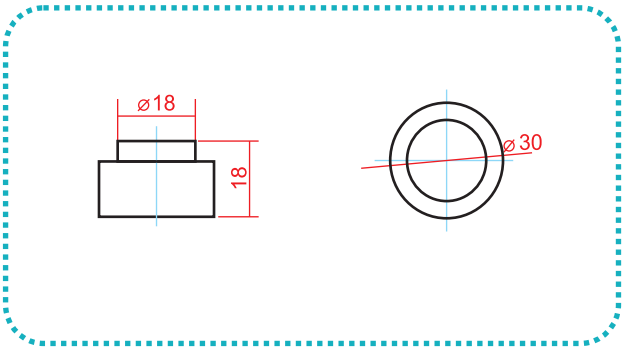
Outer Dimensions (mm)



Specifications

Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		800 Ah
Dimensions	Total Height	680 mm
	Height	646 mm
	Length	210 mm
	Width	191 mm
Weight of Dry Battery (±2.5%)		47.6 Kg
Weight of Electrolyte		19.6 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

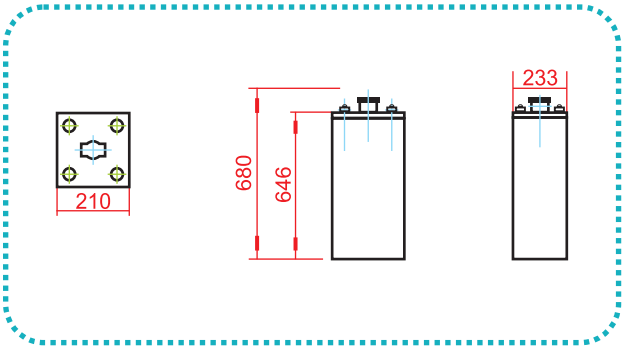
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
8 OPzS 800	800 690 600	10 5 3	80 138 200	1.80 1.77 1.75	120	54	27	100

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	256	217	162	132	116	100	88	71.2	57.6
1.87 V	316	258	189	153	131	112	98.4	80	65.6
1.83 V	390	304	216	173	145	125	109	88.8	76
1.80 V	440	336	235	185	154	132	116	93.6	78.4
1.75 V	514	380	256	199	162	140	122	99.2	–
1.70 V	569	412	279	208	169	146	127	–	–

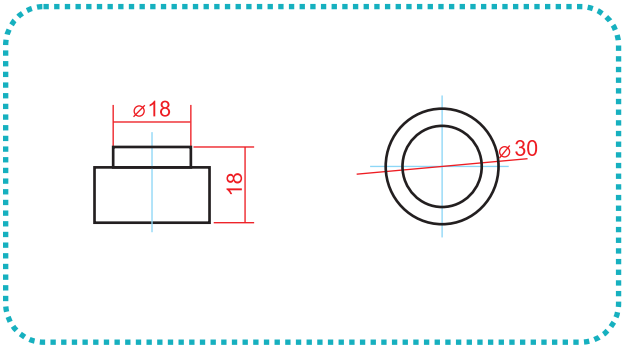
10 OPzS 1000 (2 V 1000Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		1000 Ah
Dimensions	Total Height	680 mm
	Height	646 mm
	Length	210 mm
	Width	233 mm
Weight of Dry Battery (±2.5%)		57 Kg
Weight of Electrolyte		24.4 Kg

Terminal Type (mm)



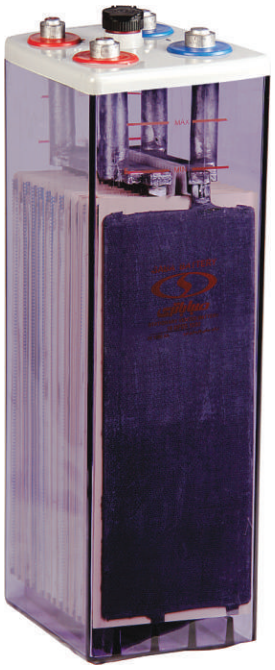
SINGLE CELL BATTERIES

TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
10 OPzS 1000	1000 865 750	10 5 3	100 173 250	1.80 1.77 1.75	150	66	33	100

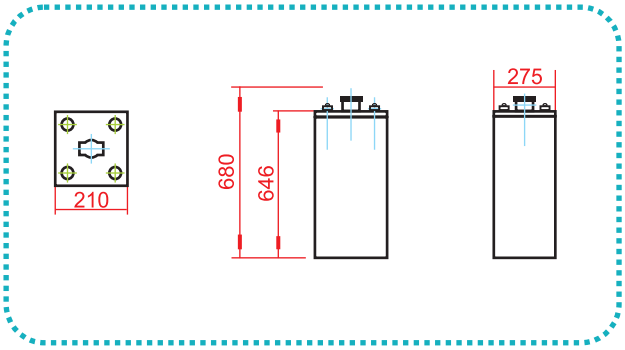
Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	321	272	202	166	146	126	110	89	72
1.87 V	396	323	237	192	164	141	123	100	82.2
1.83 V	488	380	272	261	181	156	137	111	95
1.80 V	550	420	294	232	193	166	145	117	98
1.75 V	643	475	321	249	203	176	153	124	–
1.70 V	712	516	341	261	212	183	159	–	–

12 OPzS 1200 (2 V 1200Ah)

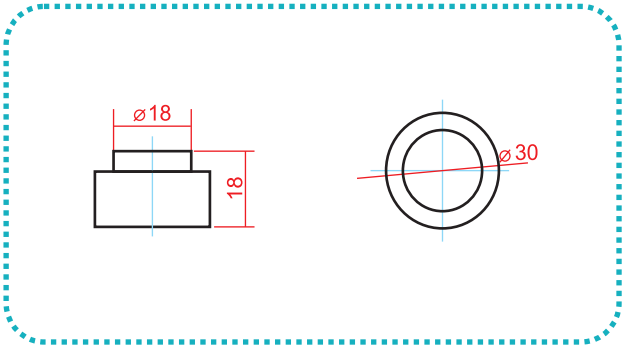


Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		1200 Ah
Dimensions	Total Height	680 mm
	Height	646 mm
	Length	210 mm
	Width	275 mm
Weight of Dry Battery (±2.5%)		68.6 Kg
Weight of Electrolyte		29.3 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

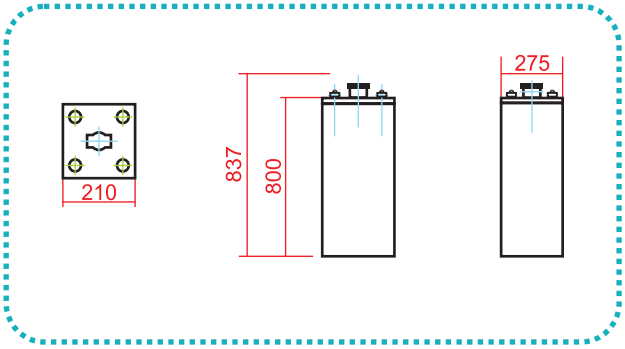
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4V/cell falling by (A)	over 2.4V/cell falling to (A)	
12 OPzS 1200	1200 1040 900	10 5 3	120 208 300	1.80 1.77 1.75	180	80	40	100

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	385	326	243	199	175	151	132	107	86.4
1.87 V	475	387	284	230	196	169	147	120	98.4
1.83 V	585	456	327	260	218	188	164	133	114
1.80 V	660	504	352	278	231	199	174	140	117
1.75 V	711	570	385	298	243	211	183	148	–
1.70 V	854	619	409	313	254	219	190	–	–

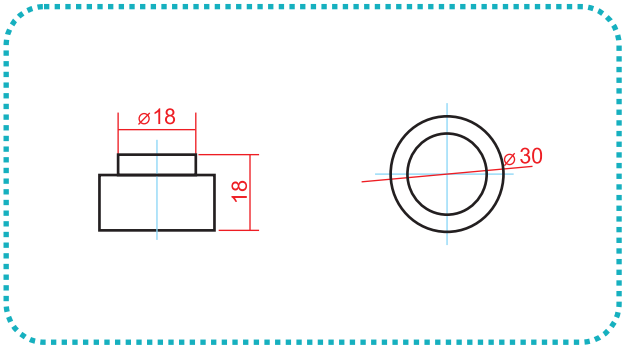
12 OPzS 1500 (2 V 1500Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		1500 Ah
Dimensions	Total Height	837 mm
	Height	800 mm
	Length	210 mm
	Width	275 mm
Weight of Dry Battery (±2.5%)		84 Kg
Weight of Electrolyte		34 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

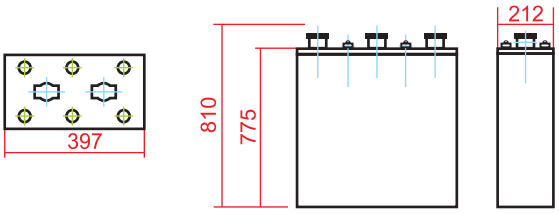
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
12 OPzS 1500	1500 1302 1152	10 5 3	150 260.4 384	1.80 1.77 1.74	225	100	50	125

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	396	396	296	252	219	194	172	138	110
1.87 V	512	464	349	296	250	218	194	153	124
1.83 V	660	541	410	326	274	240	211	169	139
1.80 V	728	591	440	345	287	249	222	178	147
1.75 V	840	667	485	374	309	264	234	189	–
1.70 V	955	757	517	398	324	274	240	–	–

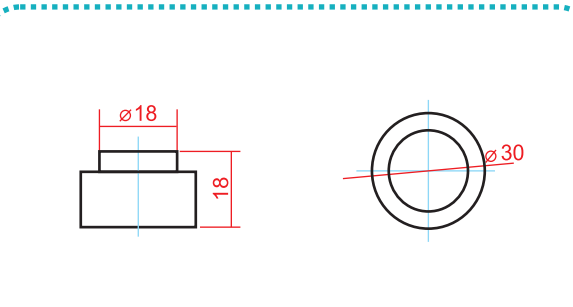
16 OPzS 2000 (2 V 2000Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		2000 Ah
Dimensions	Total Height	810 mm
	Height	775 mm
	Length	212 mm
	Width	397 mm
Weight of Dry Battery (±2.5%)		105 Kg
Weight of Electrolyte		48 Kg

Terminal Type (mm)



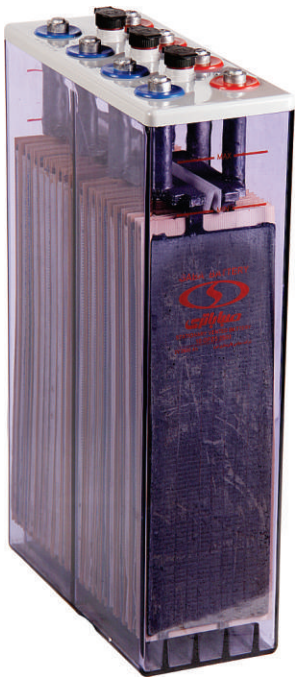
SINGLE CELL BATTERIES

TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
16 OPzS 2000	2000 1736 1536	10 5 3	200 347 512	1.80 1.77 1.74	300	132.8	67.2	125

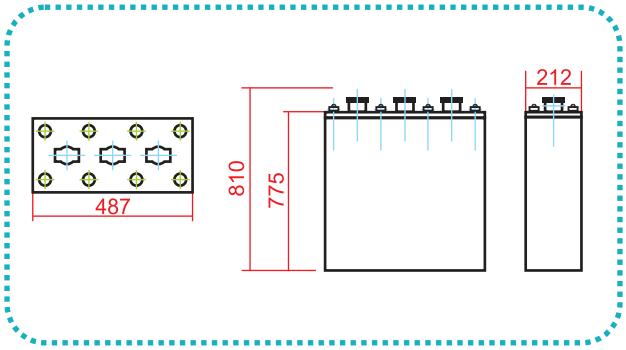
Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	528	528	394	336	292	258	229	184	146
1.87 V	682	618	465	395	333	290	258	204	165
1.83 V	880	721	546	434	365	320	281	225	185
1.80 V	970	788	586	460	382	332	296	237	196
1.75 V	1120	889	646	498	412	352	312	252	–
1.70 V	1273	1009	689	530	432	365	320	–	–

20 OPzS 2500 (2 V 2500Ah)

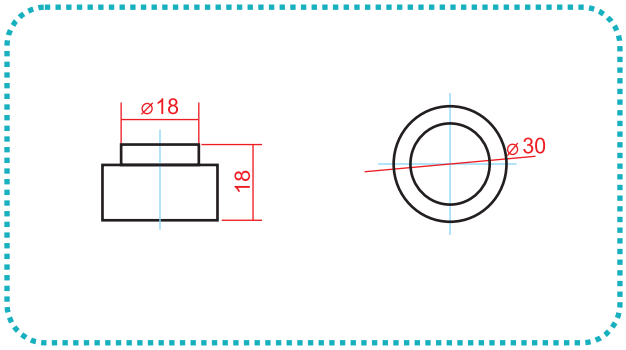


Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		2500 Ah
Dimensions	Total Height	810 mm
	Height	775 mm
	Length	212 mm
	Width	487 mm
Weight of Dry Battery (±2.5%)		130 Kg
Weight of Electrolyte		60 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

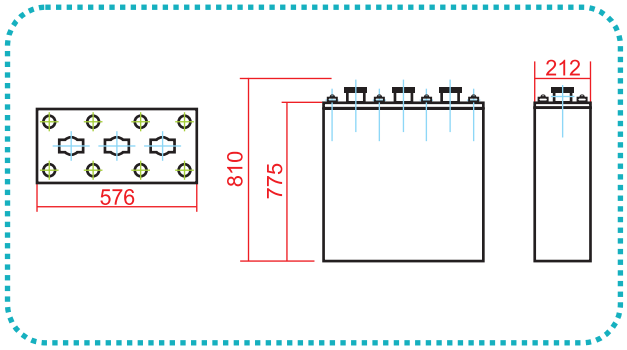
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
20 OPzS 2500	2500 2170 1920	10 5 3	250 434 640	1.80 1.77 1.74	375	166	83	125

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	660	660	493	436	365	323	288	230	184
1.87 V	853	773	581	493	416	363	323	256	208
1.83 V	1100	901	683	543	456	400	351	282	232
1.80 V	1213	985	733	575	478	415	370	298	246
1.75 V	1400	1111	808	623	515	440	390	316	–
1.70 V	1591	1261	861	663	540	456	400	–	–

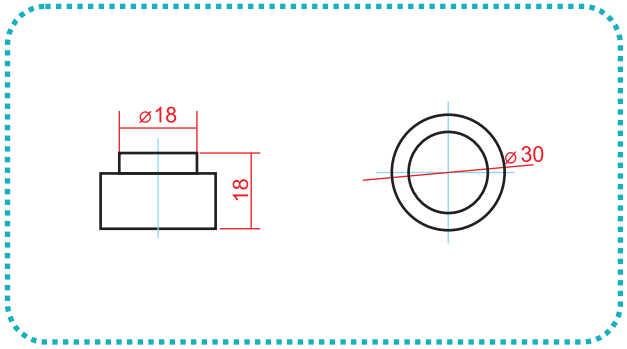
24 OPzS 3000 (2 V 3000 Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		3000 Ah
Dimensions	Total Height	810 mm
	Height	775 mm
	Length	212 mm
	Width	576 mm
Weight of Dry Battery (±2.5%)		153 Kg
Weight of Electrolyte		72 Kg

Terminal Type (mm)



SINGLE CELL BATTERIES

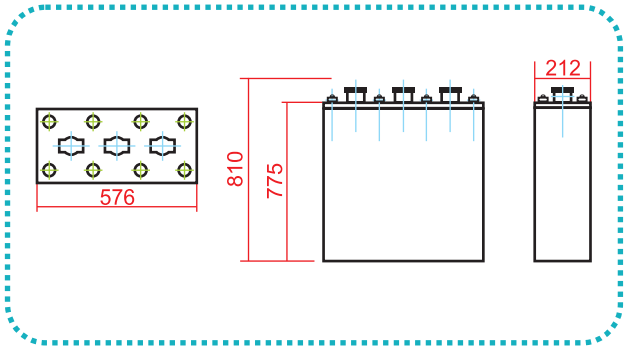
TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
24 OPzS 3000	3000 2605 2304	10 5 3	300 521 768	1.80 1.77 1.74	450	200	100	125

Constant Current (A) Discharge Table at 25°C (77°F)

Final Voltage	DISCHARGE TIME								
	30 min	1 h	2 h	3 h	4 h	5 h	6 h	8 h	10 h
1.90 V	792	792	592	523	438	388	345	276	220
1.87 V	1023	927	698	592	500	436	388	307	249
1.83 V	1320	1082	820	652	548	480	422	338	278
1.80 V	1456	1182	880	690	574	498	444	357	295
1.75 V	1680	1334	970	745	618	528	468	379	–
1.70 V	1910	1514	1034	796	648	548	480	–	–

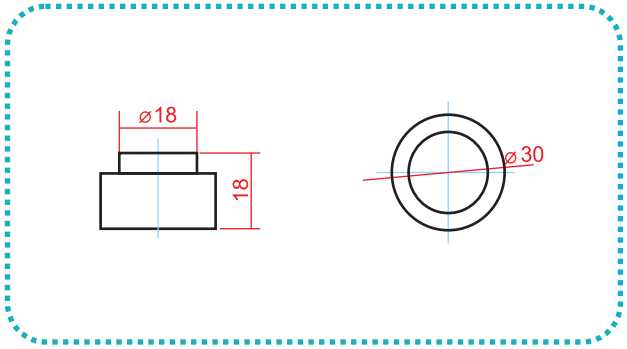
28 OPzS 3400 (2 V 3400Ah)

Outer Dimensions (mm)



Specifications		
Nominal Voltage		2 V
Rated Capacity (10 Hour Rate)		3400 Ah
Dimensions	Total Height	810 mm
	Height	775 mm
	Length	212 mm
	Width	576 mm
Weight of Dry Battery (±2.5%)		158 Kg
Weight of Electrolyte		72 Kg

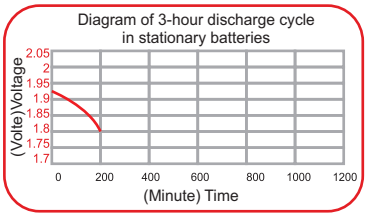
Terminal Type (mm)



SINGLE CELL BATTERIES

TYPE ACCORDING TO DIN 40736	Capacity		Discharge		Charging			Size of Plates in Ah at 10 hours rate of discharge OPzS
	in Ah	rate of discharge (hours)	(A)	until final voltage V/cell	to 2.4 V/cell (A)	over 2.4 V/cell falling by (A)	over 2.4 V/cell falling to (A)	
28 OPzS 3400	3400 2950 2600	10 5 3	340 590 866	1.80 1.77 1.74	510	227	113.5	125

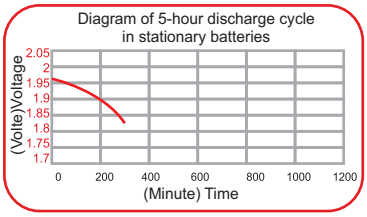
STARTUP CHARGE :
Fill the battery with sulfuric acid. (Acid density is 1.22 gr/ml 25˚C).
Wait for six hours.
Then charge the battery for 54 hours with 0.5 I_{10} current.



Note :
Battery capacity : I=Ah
Wait for two hours.
Then charge the battery again for 20 hours with 0.4 ×I_{10} current

Note :
At the end of this phase , the voltage should not be less than 2.55 V/cell and the acid density should be 1.240±0.005 gr/ml.Set the level and density of electrolyte.
Discharge the battery for 20 hours with 0.55× I_{10} current.

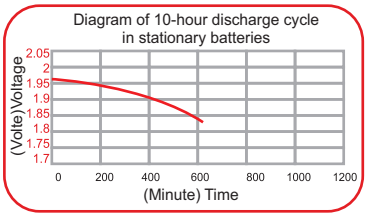
Note :
The final voltage in this phase should not be less than 1.85V for each cell.
charge the battery for 30 hours with 0.5 ×10 current



Note :
The final voltage at the end of this phase should not be less than 2.55V for each cell and the cell density should be 1.24 + 0.005 gr/ml.

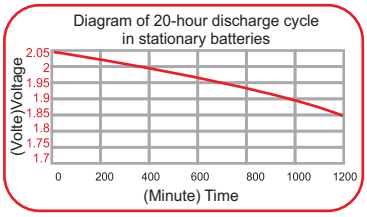
Maintaining charge :
Saba battery OPzS batteries should be kept under voltage of 2.15-2.25 V/cell, This voltage not only minimizes the electrolyte loss resulted from the electrolysis, but also it causes the battery to stay fully charged and not to require an extra charge.

Balance charge :
After each 2 or 3 months of keeping the batteries in maintaining charge mode or after high-current discharge, it is recommended to charge the batteries with balance charge method. In this way , batteries are initially fully charged and after a 1-hour interval, each cell is charged with a current of 0.5 I_{10} to voltage of 2.35-2.40V. After another 1-hour rest, charge cycle should be continued for each cell to the voltage of 2.35-2.40 V



Note :
For optimal use of the batteries, in case of no electricity power failure, the batteries undergo the maintaining charge cycle for long period of time . It is recommended to fully charge and discharge batteries for 2 hours with the I_{10} current (equal to 20% of the batteries capacity). This should be done once in each 4-5 months

Extra charge :
When a battery is dead, it should be recharged. A suitable way of extra charging is the IU method. In this method, the battery is initially charged with a constant current to the voltage of 2.40 V/cell and then the voltage is kept constant at this point and is recharged. Finally, the batteries should be kept under the voltage of 2.15-2.25 V/cell.
Capacity changes in accordance with temperature :
Capacity at a given temperature = CT
Nominal capacity at 25˚C =$C_{25^\circ c}$
Temperature=T
λ = 0.006 $CT = C_{25^\circ c} \times [\ 1 + \lambda (T-25)\ ]$



Vmc=1/70 V/CELL DISCHARGE CURRENT IN A:

NO	Type	Rated Capacity (Ah) 10 h	30	1h	2h	3h	4h	5h	6h	8h	10h
1	4 OPzS 200	200	156	108	69.60	52.40	42.40	36.20	32.00		
2	5 OPzS 250	250	195	135	87.00	65.50	53.00	45.25	40.00		
3	6 OPzS 300	300	234	162	104.40	78.60	63.60	54.30	48.00		
4	5 OPzS 350	350	254	185	122	92	75	64.00	54.00		
5	6 OPzS 420	420	304	222	147	110	90	76.80	65.40		
6	7 OPzS 490	490	355	259	171	128	105	89.60	76.30		
7	6 OPzS 600	600	427	309	204	156	127	109	95.40		
8	8 OPzS 800	800	569	412	279	208	169	146	127		
9	10 OPzS 1000	1000	712	516	341	261	212	183	159		
10	12 OPzS 1200	1200	854	619	409	313	254	219	190		
11	12 OPzS 1500	1500	955	757	517	398	324	274	240		
12	16 OPzS 2000	2000	1273	1009	689	530	432	365	320		
13	20 OPzS 2500	2500	1591	1261	861	663	540	456	400		
14	24 OPzS 3000	3000	1910	1514	1034	796	648	548	480		

Single Cells in Plastic Containers

Vmc=1/75 V/CELL DISCHARGE CURRENT IN A:

NO	Type	Rated Capacity (Ah) 10 h	30	1h	2h	3h	4h	5h	6h	8h	10h
1	4 OPzS 200	200	142	100	66.40	50.40	40.80	35.00	31.20	25.20	
2	5 OPzS 250	250	178	126	83.00	63.00	51.00	43.75	39.00	31.50	
3	6 OPzS 300	300	213	151	99.60	75.60	61.20	52.50	46.80	37.80	
4	5 OPzS 350	350	231	171	115	88	72.50	61.50	52.50	42.00	
5	6 OPzS 420	420	277	205	138	105	87	73.80	63.00	50.40	
6	7 OPzS 490	490	323	239	161	123	101	86.10	73.50	58.80	
7	6 OPzS 600	600	385	285	192	149	121	105	91.80	74.40	
8	8 OPzS 800	800	514	380	256	199	162	140	122	99.20	
9	10 OPzS 1000	1000	643	475	321	249	203	176	153	124	
10	12 OPzS 1200	1200	711	570	385	298	243	211	183	148	
11	12 OPzS 1500	1500	840	667	485	374	309	264	234	189	
12	16 OPzS 2000	2000	1120	889	646	498	412	352	312	252	
13	20 OPzS 2500	2500	1400	1111	808	623	515	440	390	316	
14	24 OPzS 3000	3000	1680	1334	970	745	618	528	468	379	

Single Cells in Plastic Containers

Vmc=1/80 V/CELL DISCHARGE CURRENT IN A:

NO	Type	Rated Capacity (Ah) 10 h	30	1h	2h	3h	4h	5h	6h	8h	10h
1	4 OPzS 200	200	122	92.00	61.60	47.20	38.60	33.20	29.60	24.00	20.00
2	5 OPzS 250	250	153	115	77.00	59.00	48.25	41.50	37.00	30.00	25.00
3	6 OPzS 300	300	184	138	92.40	70.80	57.90	49.80	44.40	36.00	30.00
4	5 OPzS 350	350	199	154	106	82.00	68.00	58.00	50.00	40.50	34.00
5	6 OPzS 420	420	238	185	127	98.40	81.60	69.60	60.00	48.60	40.80
6	7 OPzS 490	490	278	216	149	114	95.20	81.20	70.00	56.70	47.60
7	6 OPzS 600	600	330	252	176	139	115	99.60	87.00	70.20	58.80
8	8 OPzS 800	800	440	336	235	185	154	132	116	93.60	78.40
9	10 OPzS 1000	1000	550	420	294	232	193	166	145	117	98.00
10	12 OPzS 1200	1200	660	504	352	278	231	199	174	140	117
11	12 OPzS 1500	1500	728	591	440	345	287	249	222	178	147
12	16 OPzS 2000	2000	970	788	586	460	382	332	296	237	196
13	20 OPzS 2500	2500	1213	985	733	575	478	415	370	298	246
14	24 OPzS 3000	3000	1456	1182	880	690	574	498	444	357	295

Single Cells in Plastic Containers

Vmc=1/83 V/CELL DISCHARGE CURRENT IN A:

NO	Type	Rated Capacity (Ah) 10 h	30	1h	2h	3h	4h	5h	6h	8h	10h
1	4 OPzS 200	200	111	85.6	58.00	44.80	36.80	31.80	28.40	22.80	19.00
2	5 OPzS 250	250	139	107	72.50	56.00	46.00	39.75	35.50	28.50	23.75
3	6 OPzS 300	300	166	128	87.00	67.20	55.20	47.70	42.60	34.20	28.50
4	5 OPzS 350	350	179	140	98.50	77.00	64.50	55	47.50	39.00	33.00
5	6 OPzS 420	420	214	168	118	92.40	77.40	66	57.00	46.80	39.60
6	7 OPzS 490	490	250	196	137	107	90.30	77	66.50	54.60	46.20
7	6 OPzS 600	600	292	228	163	130	109	94	82.20	66.60	57.00
8	8 OPzS 800	800	390	304	216	173	145	125	109	88.80	76.00
9	10 OPzS 1000	1000	488	380	272	261	181	156	137	111	95.00
10	12 OPzS 1200	1200	585	456	327	260	218	188	164	133	114
11	12 OPzS 1500	1500	660	541	410	326	274	240	211	169	139
12	16 OPzS 2000	2000	880	721	545	434	365	320	281	225	185
13	20 OPzS 2500	2500	1100	901	683	543	456	400	351	282	232
14	24 OPzS 3000	3000	1320	1082	820	652	548	480	422	338	278

Single Cells in Plastic Containers

Vmc=1/87 V/CELL DISCHARGE CURRENT IN A:

NO	Type	Rated Capacity (Ah) 10 h	30	1h	2h	3h	4h	5h	6h	8h	10h
1	4 OPzS 200	200	95	74.80	51.60	40.00	33.60	29.20	25.80	21.00	17.60
2	5 OPzS 250	250	119	93.50	64.50	50.00	42.00	36.50	32.25	26.25	22.00
3	6 OPzS 300	300	143	112	77.40	60.00	50.40	43.80	38.70	31.50	26.40
4	5 OPzS 350	350	148	118	84.00	67.00	56.50	49.00	43.00	36.00	31.00
5	6 OPzS 420	420	177	141	100	80.40	67.80	58.80	51.60	43.60	37.20
6	7 OPzS 490	490	207	165	117	93.80	79.10	68.60	60.20	50.40	43.20
7	6 OPzS 600	600	237	193	142	115	98.40	84.60	73.80	60.00	49.20
8	8 OPzS 800	800	316	258	189	153	131	112	98.40	80.00	65.60
9	10 OPzS 1000	1000	396	323	237	192	164	141	123	100	82.20
10	12 OPzS 1200	1200	475	387	284	230	196	169	147	120	98.40
11	12 OPzS 1500	1500	512	464	349	296	250	218	194	153	124
12	16 OPzS 2000	2000	682	618	465	395	333	290	258	204	165
13	20 OPzS 2500	2500	853	773	581	493	416	363	323	256	208
14	24 OPzS 3000	3000	1023	927	698	592	500	436	388	307	249

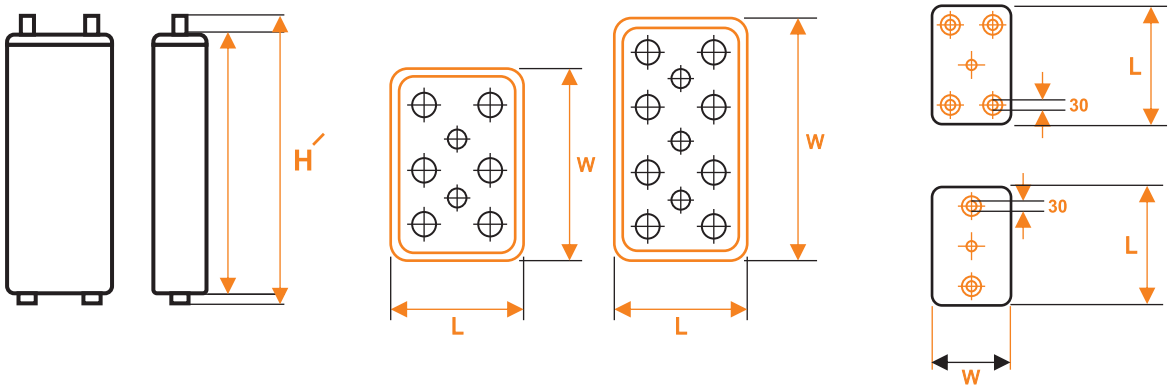
Single Cells in Plastic Containers

Vmc=1/90 V/CELL DISCHARGE CURRENT IN A:

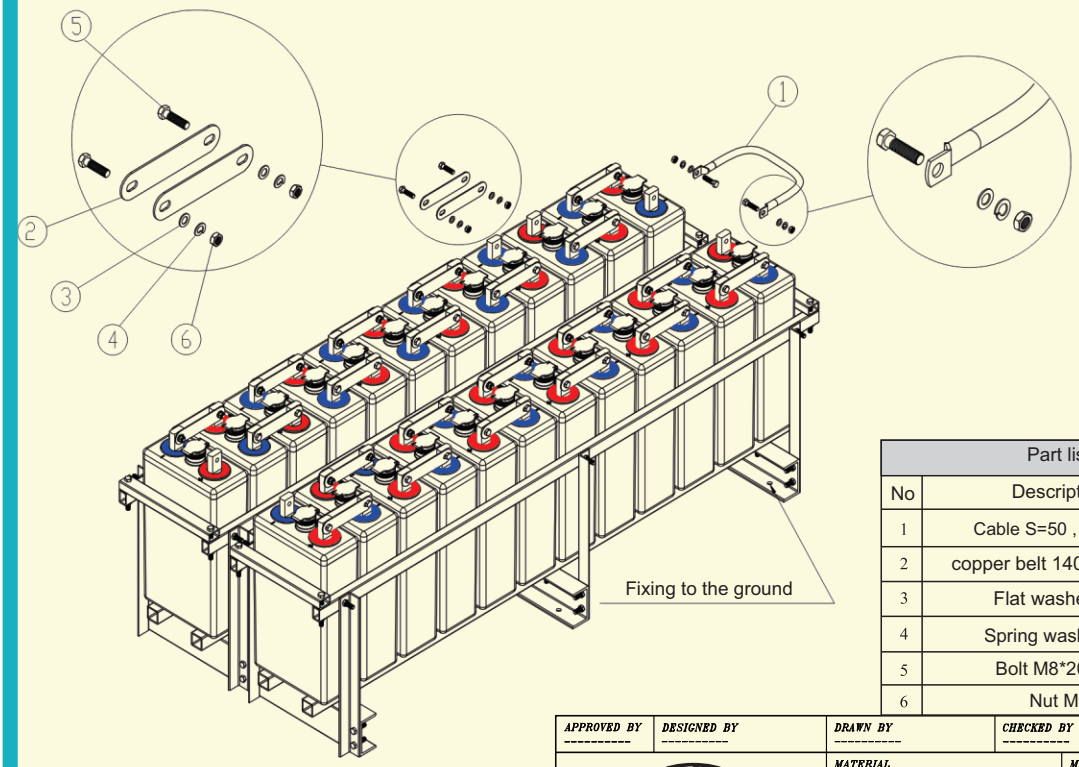
NO	Type	Rated Capacity (Ah) 10 h	30	1h	2h	3h	4h	5h	6h	8h	10h
1	4 OPzS 200	200	81	65.20	46	36	30.40	26.60	23.40	19.20	16.20
2	5 OPzS 250	250	102	81.50	57.50	45.00	38.00	33.25	29.25	24.00	20.25
3	6 OPzS 300	300	123	97.80	69	54.00	45.60	39.900	35.10	28.80	24.30
4	5 OPzS 350	350	121	99	70	57.00	48.50	43.00	37.50	32.50	29.50
5	6 OPzS 420	420	145	118	84	68.40	58.20	51.60	45.00	39.00	35.40
6	7 OPzS 490	490	170	138	98	79.80	67.90	60.20	62.50	45.50	41.30
7	6 OPzS 600	600	192	163	121	99.60	87.60	75.60	66	53.40	43.20
8	8 OPzS 800	800	256	217	162	132	116	100	88	71.20	57.60
9	10 OPzS 1000	1000	321	272	202	166	146	126	110	89.00	72.00
10	12 OPzS 1200	1200	385	326	243	199	175	151	132	107	86.40
11	12 OPzS 1500	1500	396	396	296	252	219	194	172	138	110
12	16 OPzS 2000	2000	528	528	394	336	292	258	229	184	146
13	20 OPzS 2500	2500	660	660	493	436	365	323	288	230	184
14	24 OPzS 3000	3000	792	792	592	523	438	388	345	276	220

Single Cells in Plastic Containers

NO	Type	Capacity	Charging Time	Discharge	Final Voltage	Dimensions				Weight Of Charged Battery	Weight Of Electrolyte
						Length L	Width W	Height H	Total Height H´		
1	4 OPzS 200	150 170 200	3 5 10	50 34 20	1.77 1.79 1.82	206	103	355	412	17.4	4.80
2	5 OPzS 250	189 215 250	3 5 10	63 43 25	1.77 1.79 1.82	206	124	355	412	21.3	6.10
3	6 OPzS 300	225 255 300	3 5 10	75 51 30	1.77 1.79 1.82	206	145	355	412	24.9	7.30
4	5 OPzS 350	264 300 350	3 5 10	88 60 35	1.77 1.79 1.82	206	124	471	522	29.3	8.60
5	6 OPzS 420	315 360 420	3 5 10	105 72 42	1.77 1.79 1.82	206	145	471	522	34.0	10.30
6	7 OPzS 490	369 425 490	3 5 10	123 85 49	1.77 1.79 1.82	206	166	471	522	40.0	12.00
7	6 OPzS 600	450 510 600	3 5 10	150 102 60	1.75 1.77 1.80	206	145	644	680	48.7	14.70
8	8 OPzS 800	600 690 800	3 5 10	200 138 80	1.75 1.77 1.80	210	191	646	680	67.2	19.60
9	10 OPzS 1000	750 865 1000	3 5 10	250 173 100	1.75 1.77 1.80	210	233	646	680	81.4	24.40
10	12 OPzS 1200	900 1040 1200	3 5 10	300 208 120	1.75 1.77 1.80	210	275	646	680	97.9	29.30
11	12 OPzS 1500	1152 1302 1500	3 5 10	384 260.4 150	1.74 1.77 1.80	210	275	800	837	119.0	34.00
12	16 OPzS 2000	1536 1736 2000	3 5 10	512 347 200	1.74 1.77 1.80	212	397	775	810	153.0	48.00
13	20 OPzS 2500	1920 2170 2500	3 5 10	640 434 250	1.74 1.77 1.80	212	487	775	810	190.0	60.00
14	24 OPzS 3000	2304 2605 3000	3 5 10	768 521 300	1.74 1.77 1.80	212	576	775	810	225.0	72.00



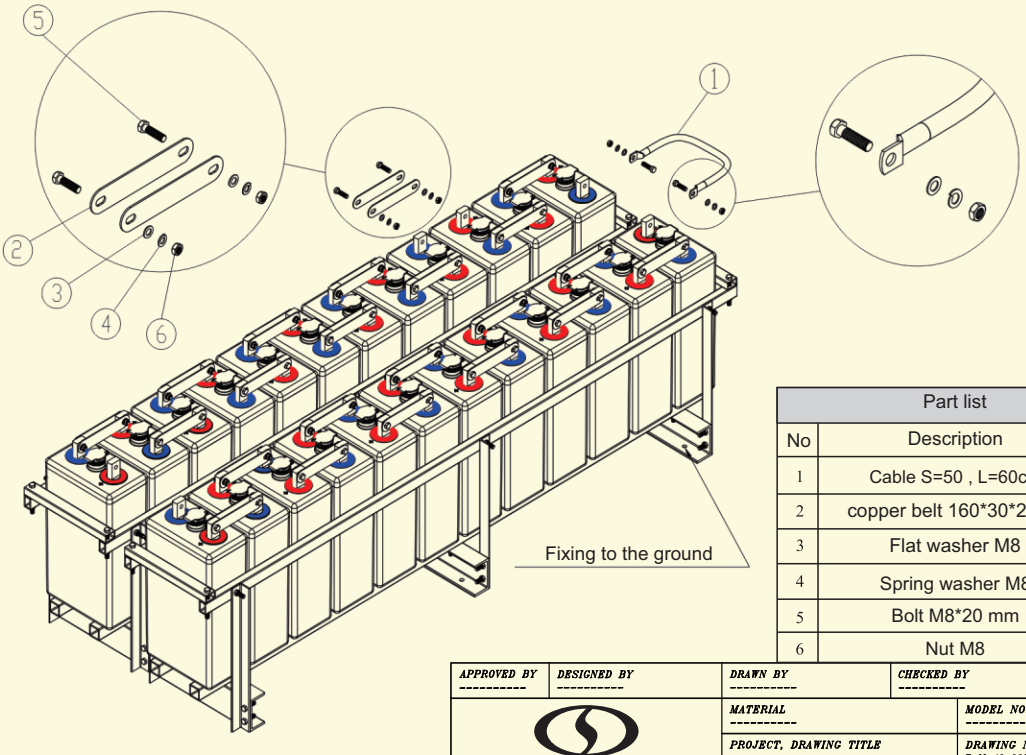
4 OPzS 200



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	1
2	copper belt 140*30*2 mm	44
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48
6	Nut M8	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE: Battery Installation Type: 4 OPZS 200Ah	DRAWING NO. P-M-42-628	
			VER. A / DATE 90.08.17	SCALE -----

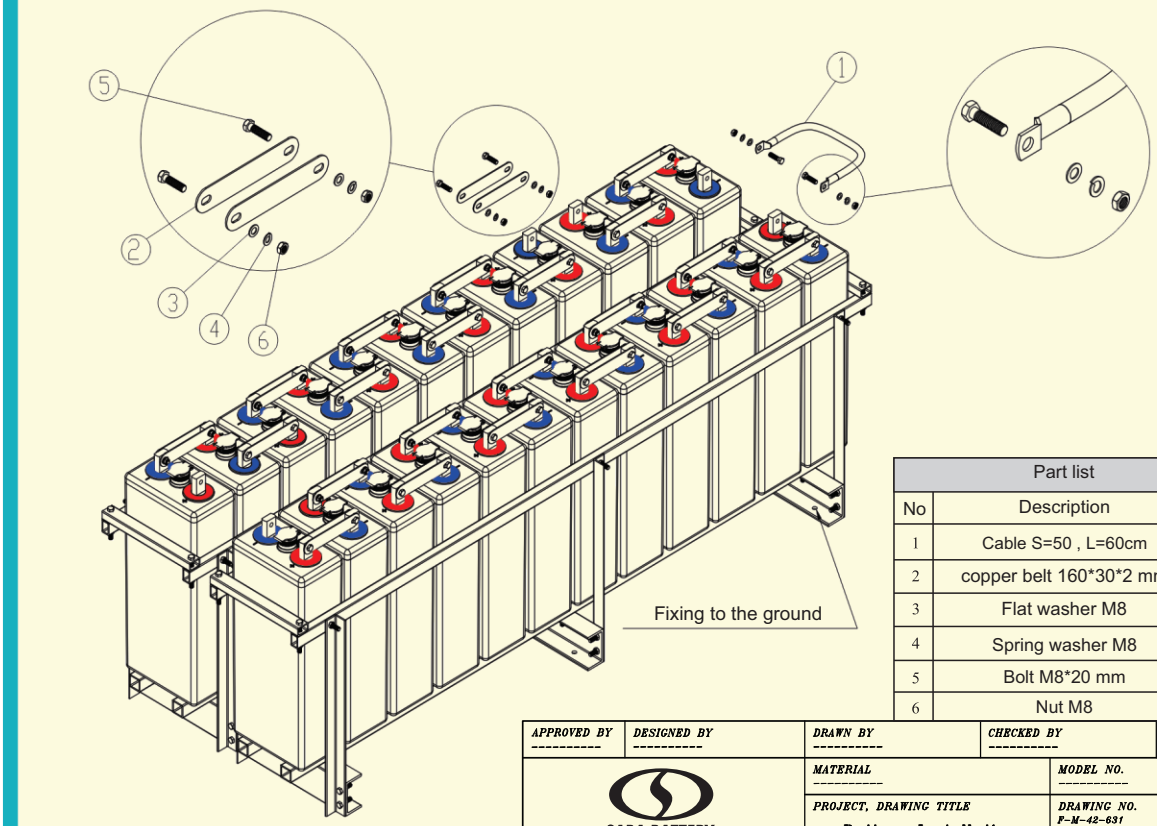
5 OPzS 250



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	1
2	copper belt 160*30*2 mm	44
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48
6	Nut M8	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE: Battery Installation Type: 5 OPZS 250Ah	DRAWING NO. P-M-42-629	
			VER. A / DATE 90.08.17	SCALE -----

5 OPzS 350



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	1
2	copper belt 160*30*2 mm	44
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*20 mm	48
6	Nut M8	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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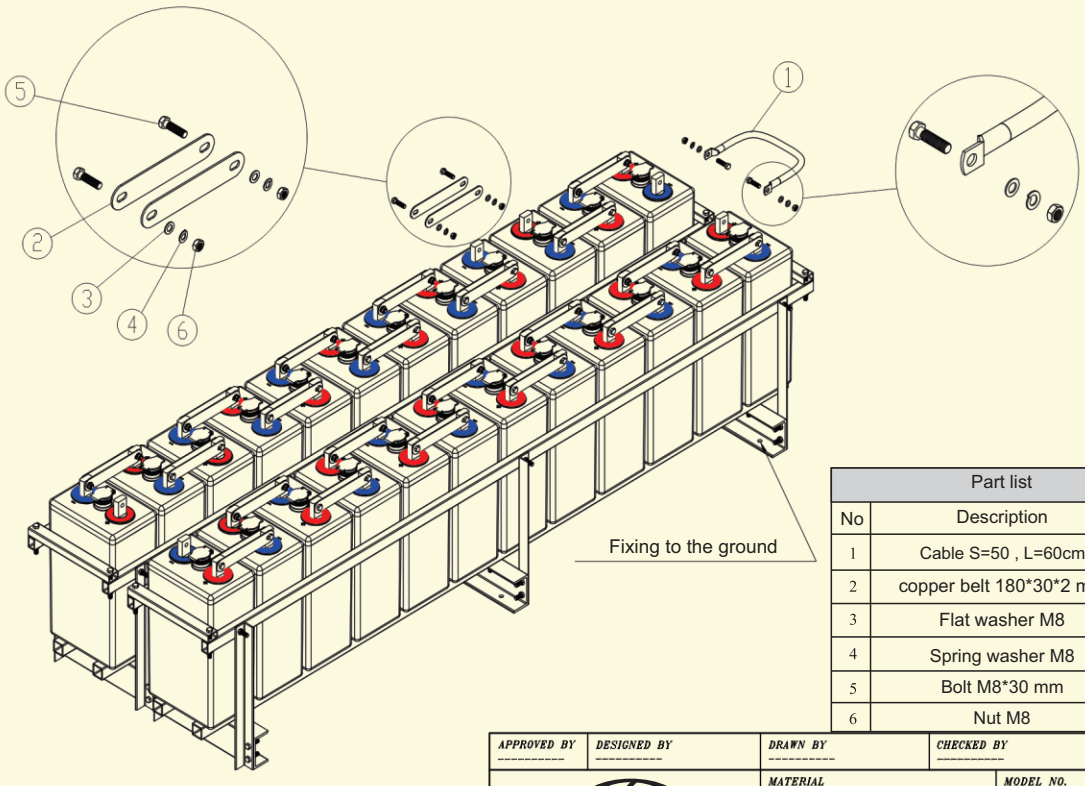
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL ----------	MODEL NO. ----------	
		PROJECT, DRAWING TITLE: Battery Installation Type: 5 OPZS 350Ah	DRAWING NO. F-M-42-631	
			VER. A / DATE 90.08.22	SCALE -----

6 OPzS 300



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	1
2	copper belt 180*30*2 mm	44
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*30 mm	48
6	Nut M8	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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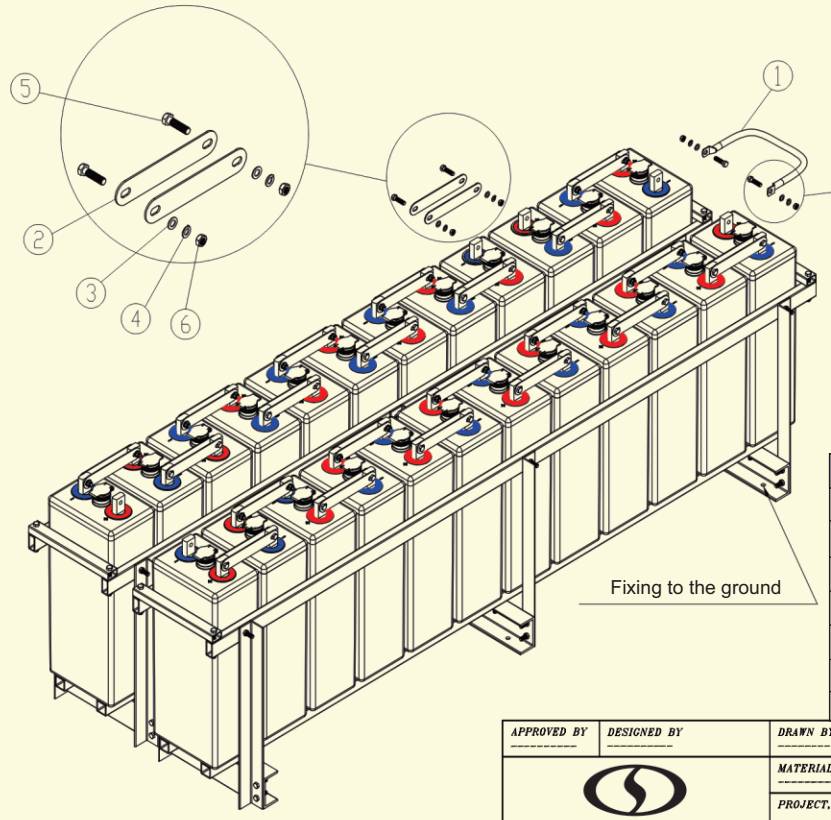
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL ----------	MODEL NO. ----------	
		PROJECT, DRAWING TITLE: Battery Installation Type: 6 OPZS 300Ah	DRAWING NO. F-M-42-630	
			VER. A / DATE 90.08.21	SCALE -----

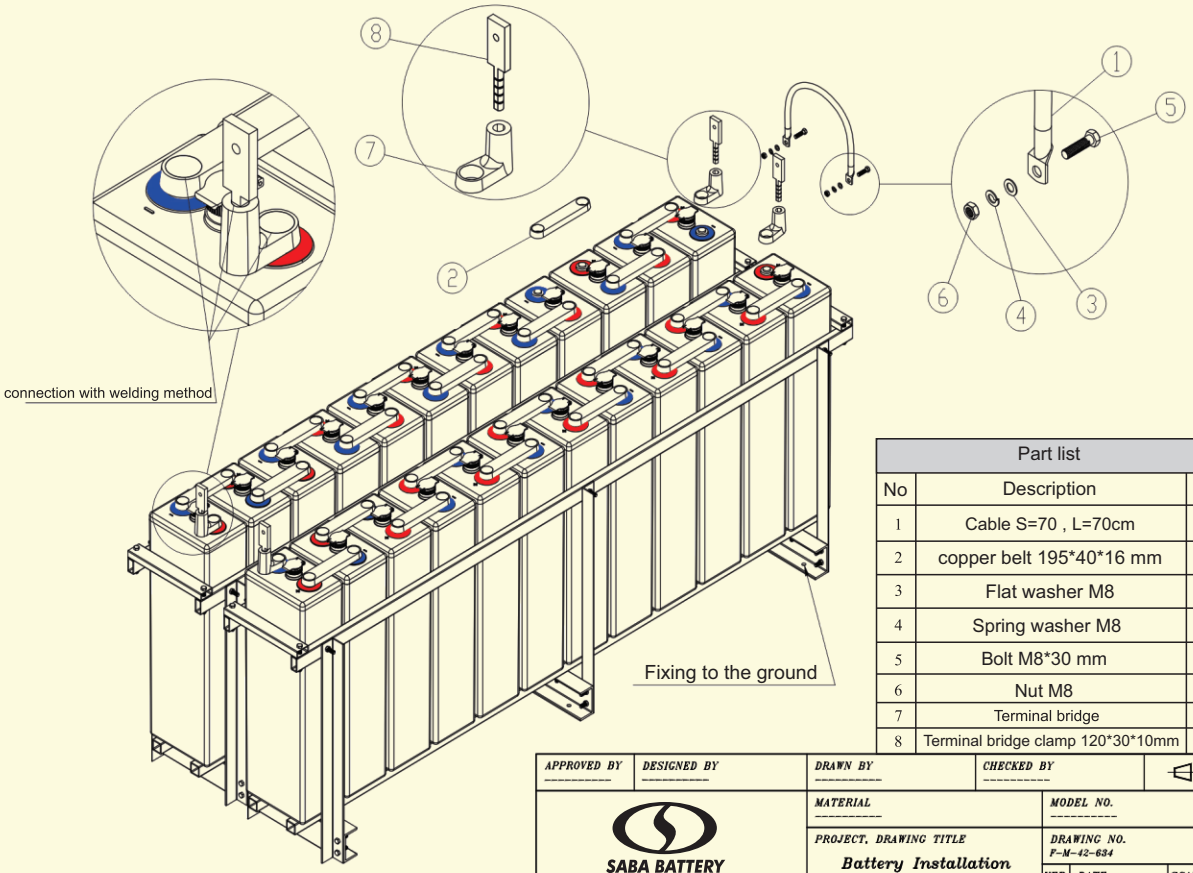
6 OPzS 420



Part list		
No	Description	Pcs.
1	Cable S=50 , L=60cm	1
2	copper belt 180*30*2 mm	44
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*30 mm	48
6	Nut M8	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE: Battery Installation Type: 6 OPZS 420Ah	DRAWING NO. F-M-42-632	
			VER. A / DATE 90.08.28	SCALE -----

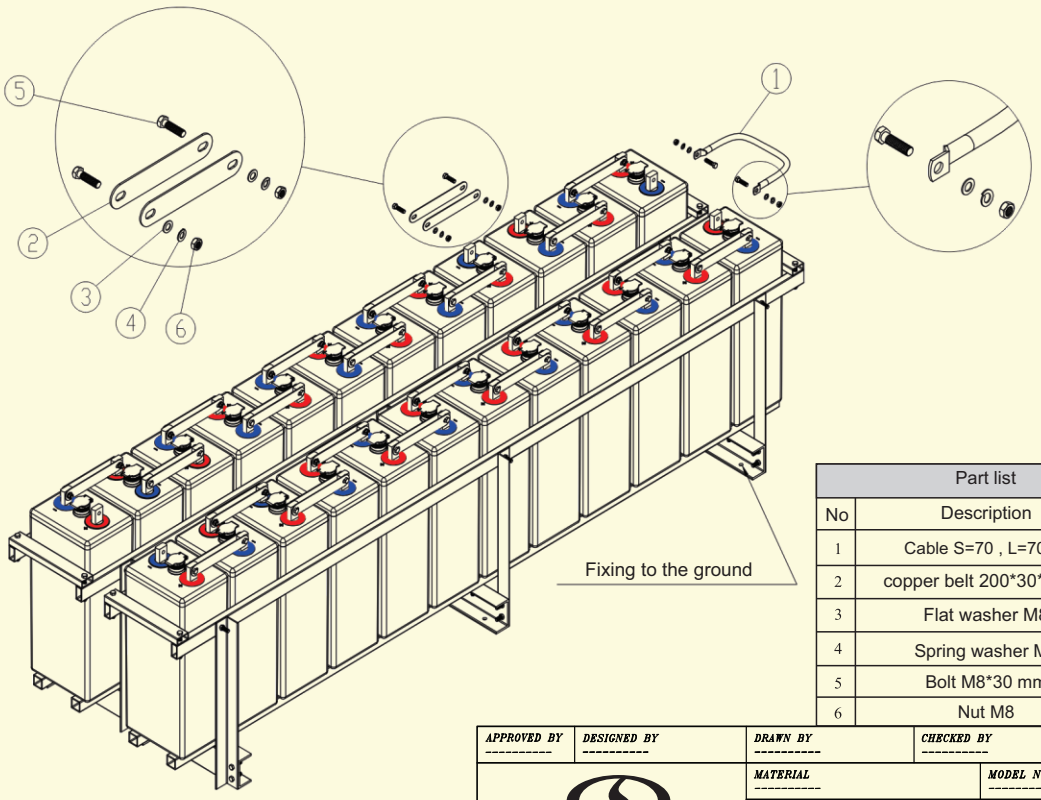
6 OPzS 600



Part list		
No	Description	Pcs.
1	Cable S=70 , L=70cm	1
2	copper belt 195*40*16 mm	22
3	Flat washer M8	4
4	Spring washer M8	4
5	Bolt M8*30 mm	4
6	Nut M8	4
7	Terminal bridge	4
8	Terminal bridge clamp 120*30*10mm	4

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE: Battery Installation Type: 6 OPZS 600Ah	DRAWING NO. F-M-42-634	
			VER. A / DATE 90.09.01	SCALE -----

7 OPzS 490



Part list		
No	Description	Pcs.
1	Cable S=70 , L=70cm	1
2	copper belt 200*30*2 mm	44
3	Flat washer M8	48
4	Spring washer M8	48
5	Bolt M8*30 mm	48
6	Nut M8	48

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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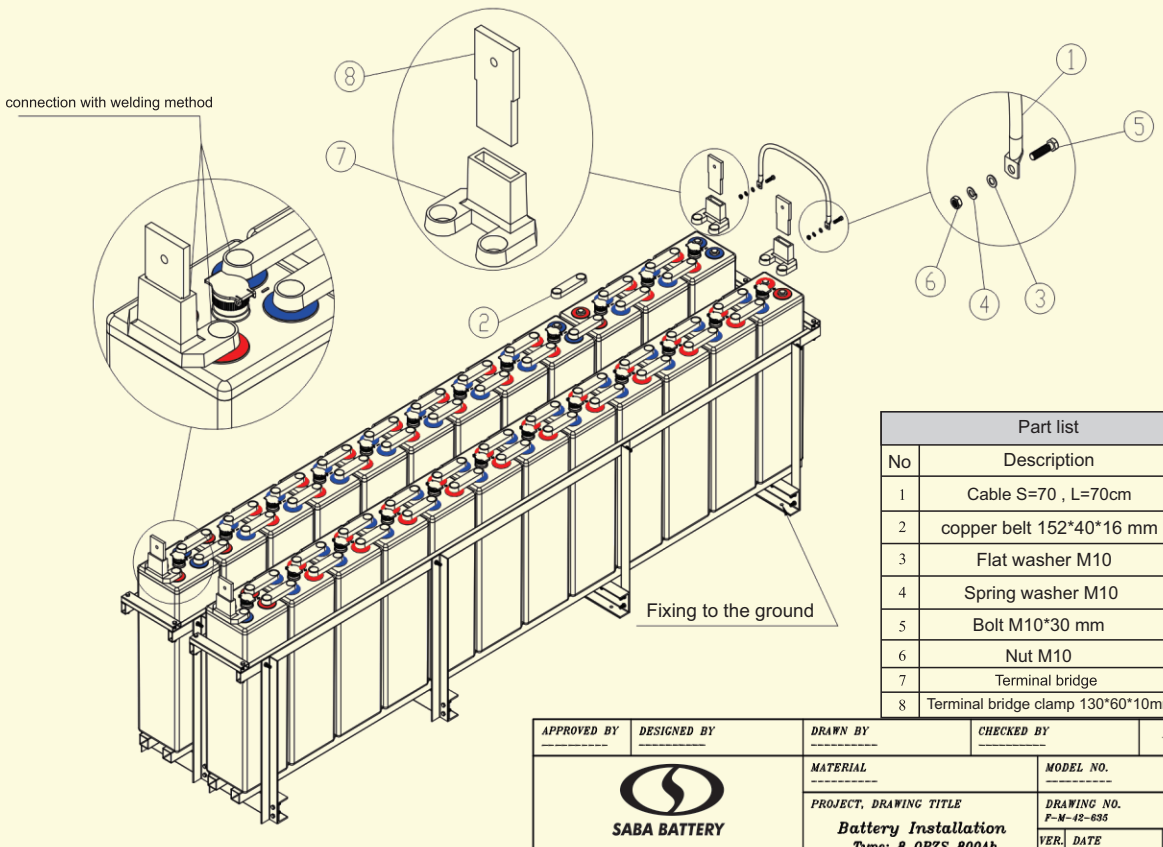
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL ----------	MODEL NO. ----------	
		PROJECT, DRAWING TITLE: Battery Installation Type: 7 OPZS 490Ah	DRAWING NO. F-M-42-633	
			VER. A / DATE 90.09.01	SCALE -----

8 OPzS 800



Part list		
No	Description	Pcs.
1	Cable S=70 , L=70cm	1
2	copper belt 152*40*16 mm	44
3	Flat washer M10	4
4	Spring washer M10	4
5	Bolt M10*30 mm	4
6	Nut M10	4
7	Terminal bridge	4
8	Terminal bridge clamp 130*60*10mm	4

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
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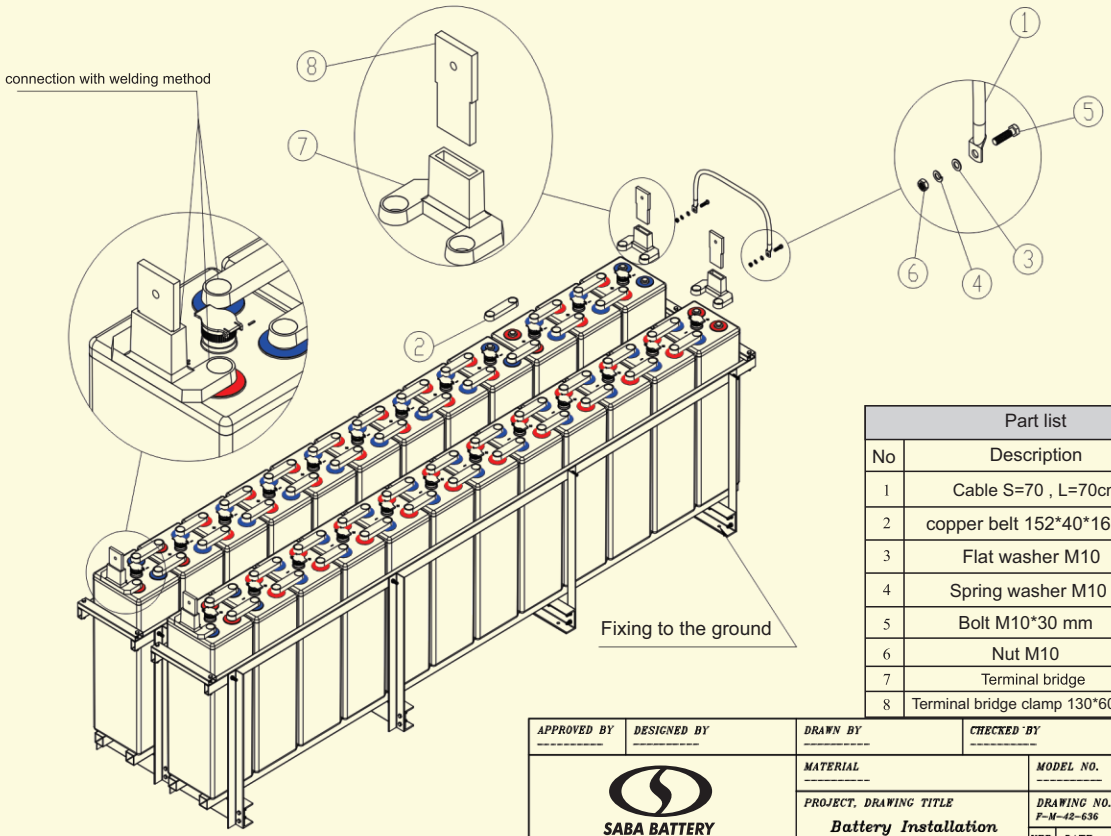
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL ----------	MODEL NO. ----------	
		PROJECT, DRAWING TITLE: Battery Installation Type: 8 OPZS 800Ah	DRAWING NO. F-M-42-635	
			VER. A / DATE 90.09.02	SCALE -----

10 OPzS 1000



Part list		
No	Description	Pcs.
1	Cable S=70 , L=70cm	1
2	copper belt 152*40*16 mm	44
3	Flat washer M10	4
4	Spring washer M10	4
5	Bolt M10*30 mm	4
6	Nut M10	4
7	Terminal bridge	4
8	Terminal bridge clamp 130*60*10mm	4

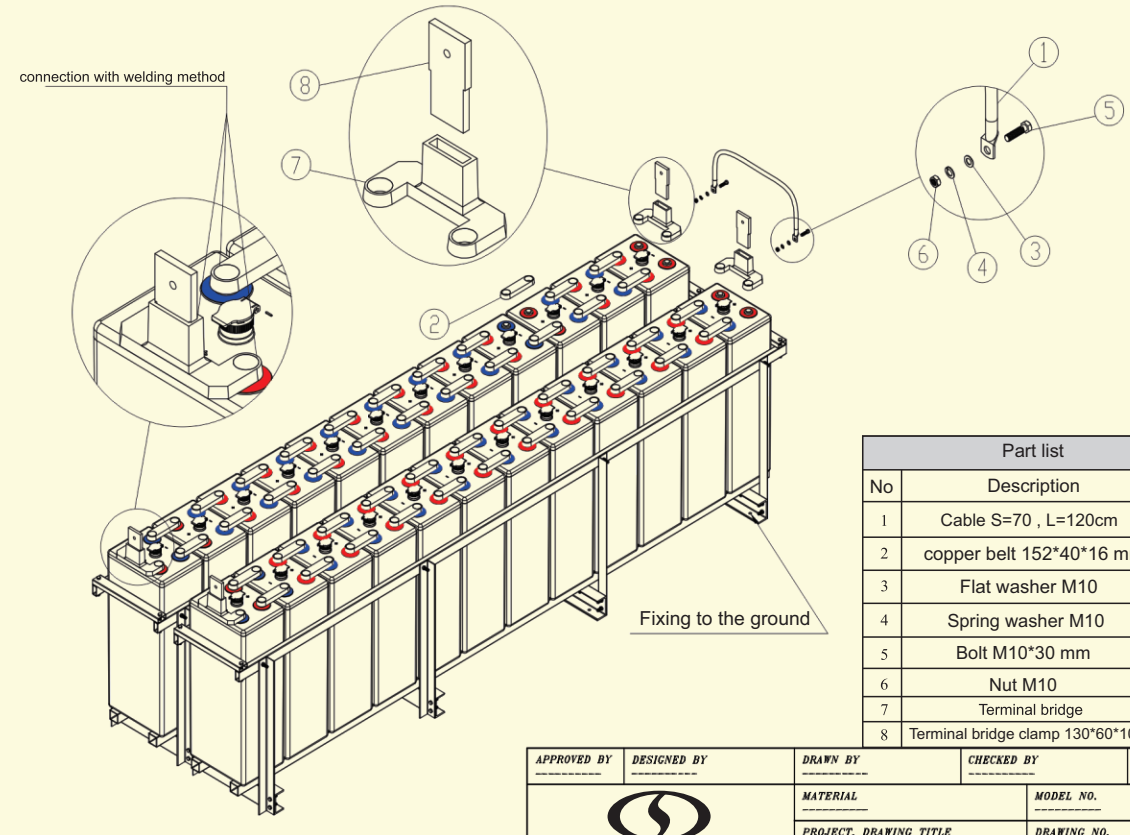
APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	

SABA BATTERY
HAJAMINI INDUSTRIAL GROUP

MATERIAL	MODEL NO.

PROJECT, DRAWING TITLE	DRAWING NO.		
Battery Installation Type: 10 OPZS 1000Ah	P-M-42-636		
	VER.	DATE	SCALE
	A	90.09.06	

12 OPzS 1200



Part list		
No	Description	Pcs.
1	Cable S=70 , L=120cm	1
2	copper belt 152*40*16 mm	44
3	Flat washer M10	4
4	Spring washer M10	4
5	Bolt M10*30 mm	4
6	Nut M10	4
7	Terminal bridge	4
8	Terminal bridge clamp 130*60*10mm	4

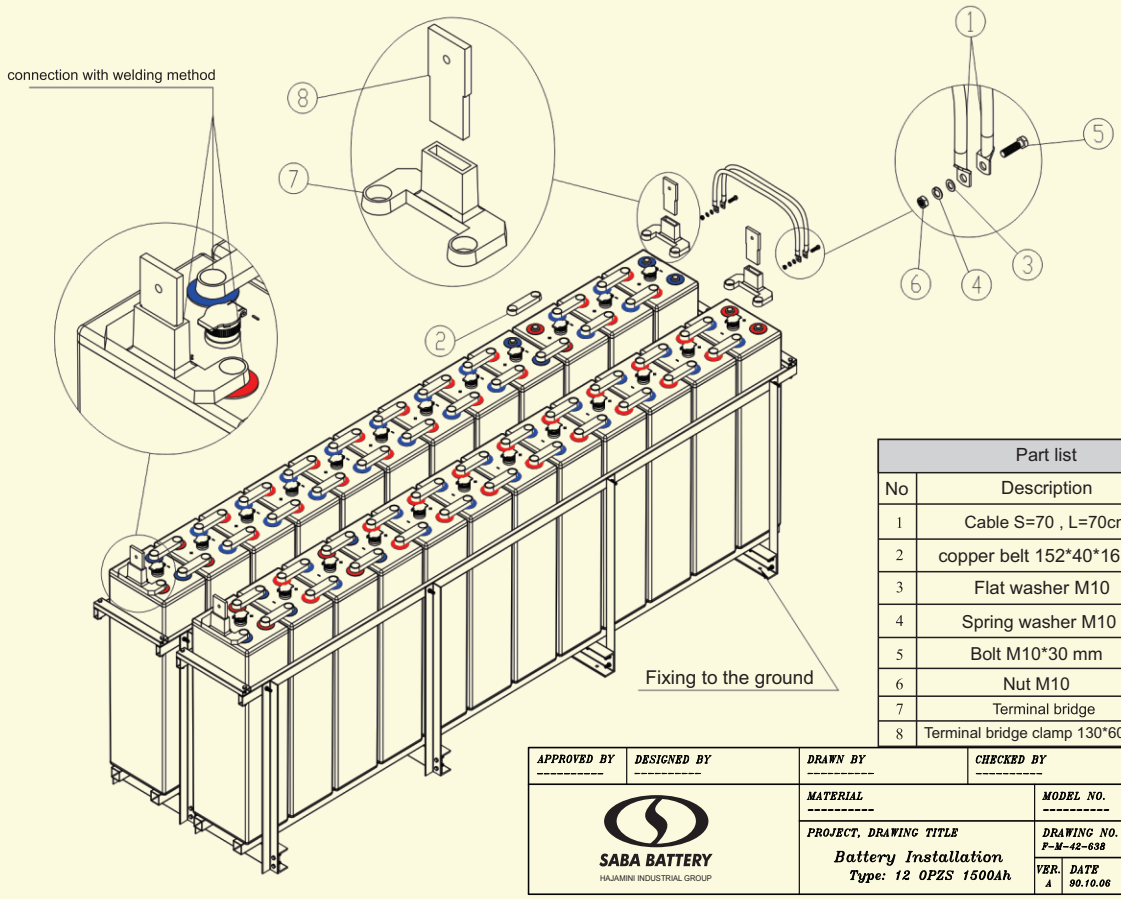
APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	

SABA BATTERY
HAJAMINI INDUSTRIAL GROUP

MATERIAL	MODEL NO.

PROJECT, DRAWING TITLE	DRAWING NO.		
Battery Installation Type: 12 OPZS 1200Ah	P-M-42-637		
	VER.	DATE	SCALE
	A	90.09.08	

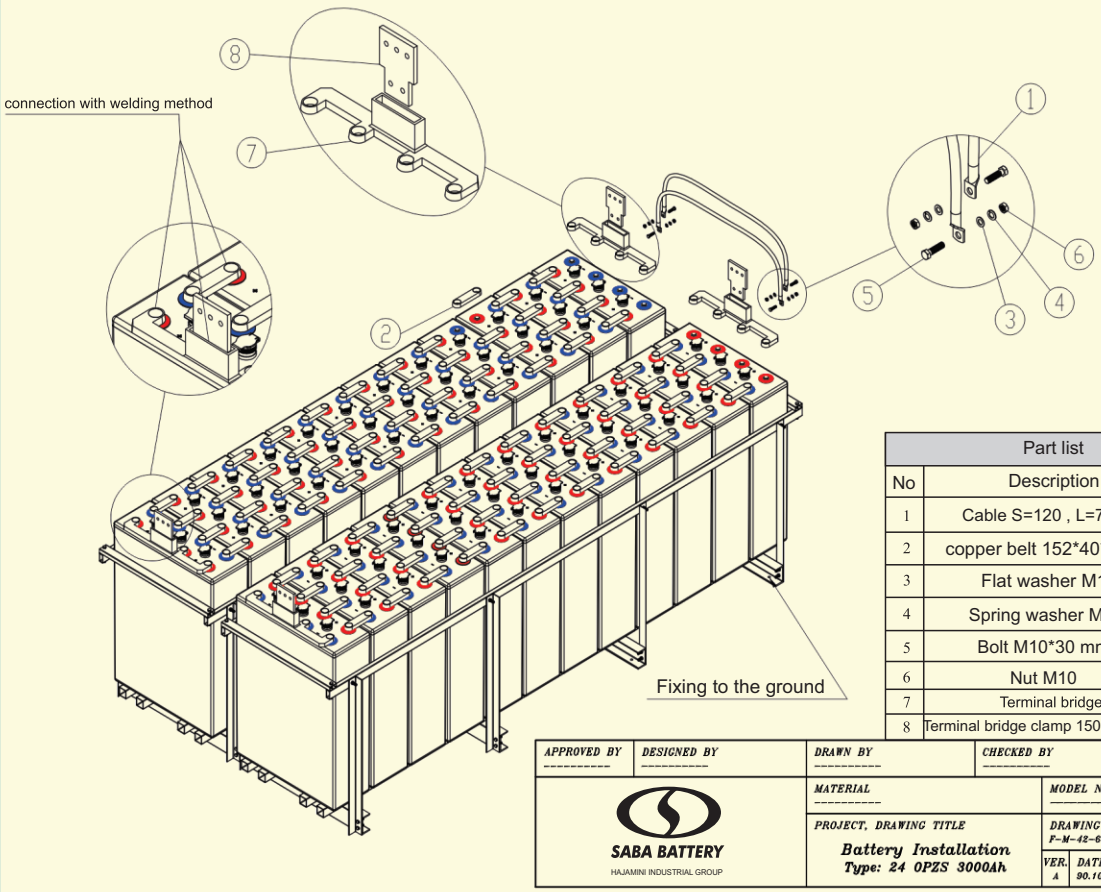
12 OPzS 1500



Part list		
No	Description	Pcs.
1	Cable S=70 , L=70cm	2
2	copper belt 152*40*16 mm	44
3	Flat washer M10	4
4	Spring washer M10	4
5	Bolt M10*30 mm	4
6	Nut M10	4
7	Terminal bridge	4
8	Terminal bridge clamp 130*60*10mm	4

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE: Battery Installation Type: 12 OPZS 1500Ah	DRAWING NO. F-M-42-638	
			VER. A / DATE 90.10.06	SCALE -----

24 OPzS 3000



Part list		
No	Description	Pcs.
1	Cable S=120 , L=70cm	2
2	copper belt 152*40*16 mm	88
3	Flat washer M10	8
4	Spring washer M10	8
5	Bolt M10*30 mm	8
6	Nut M10	8
7	Terminal bridge	4
8	Terminal bridge clamp 150*100*10mm	4

APPROVED BY	DESIGNED BY	DRAWN BY	CHECKED BY	
SABA BATTERY HAJAMINI INDUSTRIAL GROUP		MATERIAL	MODEL NO.	
		PROJECT, DRAWING TITLE: Battery Installation Type: 24 OPZS 3000Ah	DRAWING NO. F-M-42-639	
			VER. A / DATE 90.10.21	SCALE -----

NOTE :

NOTE :

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R004-000318

Energy Sources
Development Company
(Tavan)

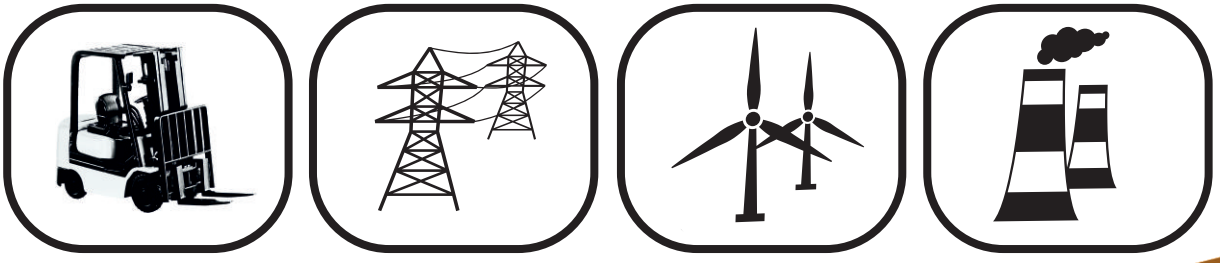
SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

Traction Battery

Industrial Batteries 110 - 1500 Ah

(PzS - PzB & Saba Smart Series)



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SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

Contents

TRACTION BATTERIES - 2 Volt

No	Battery type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte Weight (Kg)
1	2 PzS 120	66 90 120	1 3 5	66 30 24	1.62 1.68 1.70	47 198 340	8.6	2.0
2	3 PzS 180	99 135 180	1 3 5	99 45 36	1.62 1.68 1.70	65 198 340	12.0	2.6
3	4 PzS 240	132 180 240	1 3 5	132 60 48	1.62 1.68 1.70	83 198 340	15.3	3.4
4	5 PzS 300	165 225 300	1 3 5	195 75 60	1.62 1.68 1.70	101 198 340	18.8	4.2
5	6 PzS 360	198 270 360	1 3 5	198 90 72	1.62 1.68 1.70	119 198 340	22.3	5.0
6	7 PzS 420	231 315 420	1 3 5	231 105 84	1.62 1.68 1.70	137 198 340	26.9	7.8
7	8 PzS 480	264 360 480	1 3 5	264 120 96	1.62 1.68 1.70	155 198 340	30.7	9.1
8	9 PzS 540	297 405 540	1 3 5	297 135 108	1.62 1.68 1.70	174 198 340	34.3	10.2
9	10 PzS 600	330 450 600	1 3 5	330 150 120	1.62 1.68 1.70	192 198 340	38.1	11.3
10	2 PzS 160	106 141 160	1 3 5	106 47 32	1.61 1.68 1.70	47 198 400	10.9	1.7
11	3 PzS 240	158 213 240	1 3 5	158 71 48	1.61 1.68 1.70	65 198 400	15.9	2.7
12	4 PzS 320	211 282 320	1 3 5	211 94 64	1.61 1.68 1.70	83 198 400	20.6	3.6
13	5 PzS 400	264 354 400	1 3 5	264 118 80	1.61 1.68 1.70	101 198 400	25.4	4.4
14	6 PzS 480	317 423 480	1 3 5	317 141 96	1.61 1.68 1.70	119 198 400	30.3	5.4
15	7 PzS 560	370 492 560	1 3 5	370 164 112	1.61 1.68 1.70	137 198 400	35	6.2

The above mentioned weights are with ± 2.5% tolerance

TRACTION BATTERIES - 2 Volt

No	Battery type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
16	8 PzS 640	422 564 640	1 3 5	422 188 128	1.61 1.68 1.70	155 198 400	39.8	7.1
17	9 PzS 720	475 636 720	1 3 5	475 212 144	1.61 1.68 1.70	173 198 400	44.7	8
18	10 PzS 800	528 708 800	1 3 5	528 236 160	1.61 1.68 1.70	192 198 400	49.4	8.8
19	2 PzS 180	99 135 180	1 3 5	99 45 36	1.61 1.68 1.70	47 198 505	11.9	2.5
20	3 PzS 270	149 204 270	1 3 5	149 68 54	1.61 1.68 1.70	65 198 505	17.4	4
21	4 PzS 360	198 270 360	1 3 5	198 90 72	1.61 1.68 1.70	83 198 505	22.8	5.3
22	5 PzS 450	248 336 450	1 3 5	248 112 90	1.61 1.68 1.70	101 198 505	28.2	6.6
23	6 PzS 540	297 405 540	1 3 5	297 135 108	1.61 1.68 1.70	119 198 505	33.7	8
24	7 PzS 630	346 471 630	1 3 5	346 157 126	1.61 1.68 1.70	137 198 505	39.1	9.3
25	8 PzS 720	396 540 720	1 3 5	396 180 144	1.61 1.68 1.70	155 198 505	44.5	10.6
26	9 PzS 810	445 606 810	1 3 5	445 202 162	1.61 1.68 1.70	174 198 505	50	12
27	10 PzS 900	495 675 900	1 3 5	495 225 180	1.61 1.68 1.70	192 198 505	55.4	13.2
28	2 PzS 210	116 162 210	1 3 5	116 54 42	1.61 1.68 1.70	47 198 540	13.3	2.9
29	3 PzS 315	174 237 315	1 3 5	174 79 63	1.61 1.68 1.70	65 198 540	19.6	4.5
30	4 PzS 420	231 315 420	1 3 5	231 105 84	1.61 1.68 1.70	83 198 540	25.7	6

The above mentioned weights are with ± 2.5% tolerance

TRACTION BATTERIES - 2 Volt

No	Battery type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
31	5 PzS 525	290 396 525	1 3 5	290 132 105	1.55 1.68 1.70	101 198 540	31.7	7.3
32	6 PzS 630	347 474 630	1 3 5	347 158 126	1.55 1.68 1.70	119 198 540	38	9
33	7 PzS 735	404 555 735	1 3 5	404 185 147	1.55 1.68 1.70	137 198 540	44	10.3
34	8 PzS 840	462 630 840	1 3 5	462 210 168	1.55 1.68 1.70	155 198 540	50.1	11.8
35	9 PzS 945	520 708 945	1 3 5	520 236 189	1.55 1.68 1.70	173 198 540	56.3	13.3
36	10 PzS 1050	578 789 1050	1 3 5	578 263 210	1.55 1.68 1.70	191 198 540	62.4	14.7
37	2 PzS 230	127 174 230	1 3 5	127 58 46	1.61 1.68 1.70	47 198 565	14	3
38	3 PzS 345	190 258 345	1 3 5	190 86 69	1.61 1.68 1.70	65 198 565	20.7	4.7
39	4 PzS 460	253 345 460	1 3 5	253 115 92	1.61 1.68 1.70	83 198 565	27.2	6.3
40	5 PzS 575	317 432 575	1 3 5	317 144 115	1.61 1.68 1.70	101 198 565	33.5	7.7
41	6 PzS 690	380 518 690	1 3 5	380 173 138	1.61 1.68 1.70	119 198 565	40.1	9.4
42	7 PzS 805	443 603 805	1 3 5	443 201 161	1.61 1.68 1.70	137 198 565	46.5	10.8
43	8 PzS 920	506 690 920	1 3 5	506 230 184	1.61 1.68 1.70	155 198 565	53	12.4
44	9 PzS 1035	570 777 1035	1 3 5	570 259 207	1.61 1.68 1.70	173 198 565	59.5	14
45	10 PzS 1150	633 864 1150	1 3 5	633 288 230	1.61 1.68 1.70	191 198 565	65.9	15.4

The above mentioned weights are with ± 2.5% tolerance

TRACTION BATTERIES - 2 Volt

No	Battery type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
46	2 PzS 250	137.5 187.5 250	1 3 5	137.5 62.5 50	1.62 1.68 1.70	47 198 601	14	2.8
47	3 PzS 375	206 281 375	1 3 5	206 93.5 75	1.62 1.68 1.70	65 198 601	21.2	4.2
48	4 PzS 500	275 375 500	1 3 5	275 125 100	1.62 1.68 1.70	83 198 601	27.7	6.7
49	5 PzS 625	344 467 625	1 3 5	344 155.5 125	1.62 1.68 1.70	101 198 601	34.3	8.1
50	6 PzS 750	412.5 562.5 750	1 3 5	412.5 187.5 150	1.62 1.68 1.70	119 198 601	42.5	9
51	7 PzS 875	481 656 875	1 3 5	481 218.5 175	1.62 1.68 1.70	137 198 601	48.4	10.2
52	8 PzS 1000	550 750 1000	1 3 5	550 250 200	1.62 1.68 1.70	155 198 601	56.5	11
53	9 PzS 1125	619 844 1125	1 3 5	619 281 225	1.62 1.68 1.70	173 198 601	63.2	12.1
54	10 PzS 1250	687.5 937.5 1250	1 3 5	687.5 312.5 250	1.62 1.68 1.70	191 198 601	69.7	13
55	2 PzS 280	154 210 280	1 3 5	154 70 56	1.62 1.68 1.70	47 198 715	16.7	3
56	3 PzS 420	231 315 420	1 3 5	231 105 84	1.62 1.68 1.70	65 198 715	24.7	4.7
57	4 PzS 560	308 420 560	1 3 5	308 140 112	1.62 1.68 1.70	83 198 715	32.5	6.3
58	5 PzS 700	385 525 700	1 3 5	385 175 140	1.62 1.68 1.70	101 198 715	40	7.7
59	6 PzS 840	462 630 840	1 3 5	462 210 168	1.62 1.68 1.70	119 198 715	47.8	9.3
60	7 PzS 980	539 735 980	1 3 5	539 245 196	1.62 1.68 1.70	137 198 715	55.6	10.8

The above mentioned weights are with ± 2.5% tolerance

TRACTION BATTERIES - 2 Volt

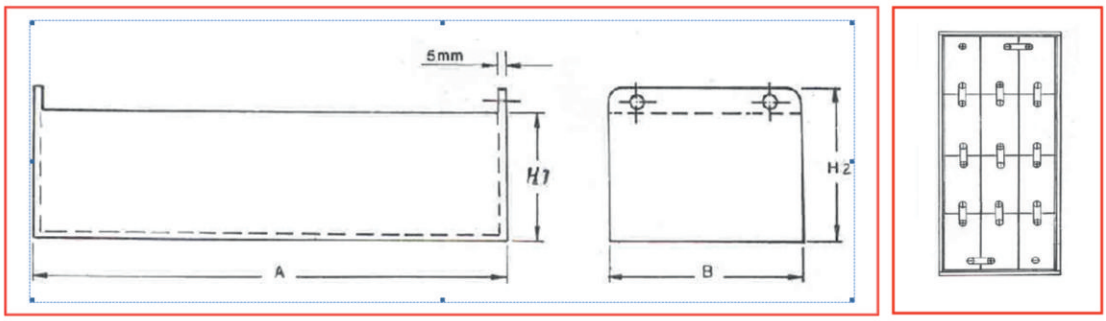
No	Battery type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
61	8 PzS 1120	616 840 1120	1 3 5	616 280 224	1.62 1.68 1.70	155 198 715	63.5	12.3
62	9 PzS 1260	693 945 1260	1 3 5	693 315 252	1.62 1.68 1.70	173 198 715	71.2	14
63	10 PzS 1400	770 1050 1400	1 3 5	770 350 280	1.62 1.68 1.70	191 198 715	78.8	15.4
64	2 PzS 300	165 225 300	1 3 5	165 75 60	1.62 1.68 1.70	47 198 745	19	7.1
65	3 PzS 450	247.5 337.5 450	1 3 5	247.5 112.5 90	1.62 1.68 1.70	65 198 745	27.2	8.8
66	4 PzS 600	330 450 600	1 3 5	330 150 120	1.62 1.68 1.70	83 198 745	35.3	10.4
67	5 PzS 750	412.5 562.5 750	1 3 5	412.5 187.5 150	1.62 1.68 1.70	101 198 745	43.4	12
68	6 PzS 900	495 675 900	1 3 5	495 225 180	1.62 1.68 1.70	119 198 745	51.6	13.7
69	7 PzS 1050	577.5 787.5 1050	1 3 5	577.5 262.5 210	1.62 1.68 1.70	137 198 745	59.7	15.2
70	8 PzS 1200	660 900 1200	1 3 5	660 300 240	1.62 1.68 1.70	155 198 745	67.5	16.8
71	9 PzS 1350	742.5 1012.5 1350	1 3 5	742.5 337.5 270	1.62 1.68 1.70	173 198 745	75.9	18.5
72	10 PzS 1500	797 1275 1500	1 5 10	797 255 150	1.58 1.70 1.72	192 198 745	84	20

The above mentioned weights are with ± 2.5% tolerance

TRACTION BATTERIES - 24 Volt

No	Battery type	Capacity (Ah)	Width (mm)			
			A	B	H1	H2
1	2 PzS 160	160	822	171	450	475
2	3 PzS 240	240	822	225	450	475
3	4 PzS 320	320	822	279	450	475
4	5 PzS 400	400	822	327	450	475
5	6 PzS 480	480	822	387	450	475
6	7 PzS 560	560	822	441	450	475
7	8 PzS 640	640	822	495	450	475
8	10 PzS 800	800	822	603	450	475
9	2 PzS 210	210	822	171	560	585
10	3 PzS 315	315	822	225	560	585
11	4 PzS 420	420	822	279	560	585
12	5 PzS 525	525	822	333	560	585
13	6 PzS 630	630	822	387	560	585
14	7 PzS 735	735	822	441	560	585
15	8 PzS 840	840	822	495	560	585
16	9 PzS 945	945	822	449	560	585
17	10 PzS 1050	1050	822	603	560	585
18	3 PzS 375	375	822	225	620	645
19	4 PzS 500	500	822	279	620	645
20	5 PzS 625	625	822	333	620	645
21	6 PzS 750	750	822	387	620	645
22	7 PzS 875	875	822	441	620	645
23	8 PzS 1000	1000	822	495	620	645
24	10 PzS 1250	1250	822	603	620	645

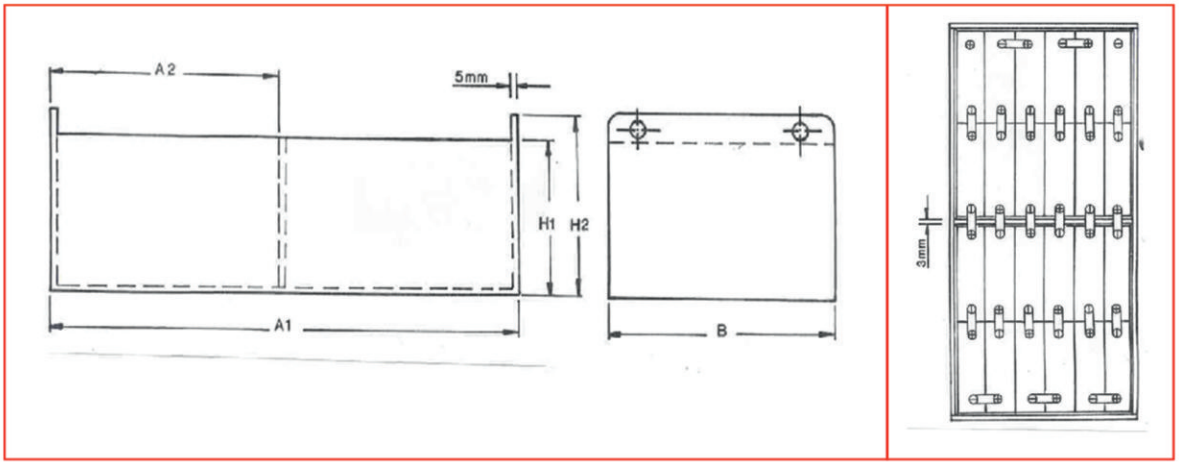
Container (box) sizes are presedented according to customer order and will be changed with considering single cell sizes



TRACTION BATTERIES - 48 Volt

No	Battery type	Capacity (Ah)	Width (mm)				
			A1	A2	B	H1	H2
1	4 PzS 320	320	832	416	528	450	475
2	5 PzS 400	400	832	416	624	450	475
3	6 PzS 480	480	832	416	784	450	475
4	7 PzS 560	560	832	416	852	450	475
5	8 PzS 640	640	832	416	960	450	475
6	3 PzS 315	315	832	416	420	560	585
7	4 PzS 420	420	832	416	528	560	585
8	5 PzS 525	525	832	416	636	560	585
9	6 PzS 630	630	832	416	744	560	585
10	7 PzS 735	735	832	416	852	560	585
11	8 PzS 840	840	832	416	960	560	585
12	3 PzS 375	375	832	416	420	620	645
13	4 PzS 500	500	832	416	528	620	645

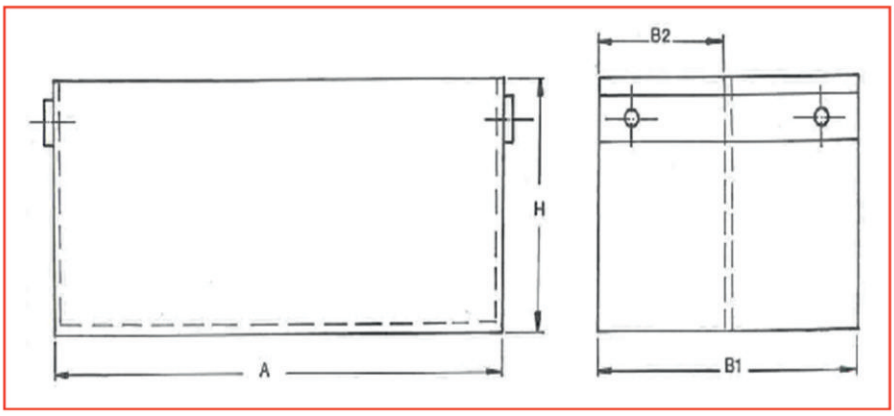
Container (box) sizes are presedented according to customer order and will be changed with considering single cell sizes

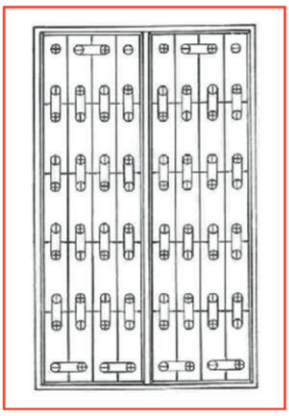


TRACTION BATTERIES - 80 Volt

No	Battery type	Capacity (Ah)	Width (mm)			
			A	B	B2	H
1	4 PzS 320	320	1020	704	352	490
2	5 PzS 400	400	1020	832	416	490
3	6 PzS 480	480	1020	992	496	490
4	7 PzS 560	560	1020	1136	568	490
5	8 PzS 640	640	1020	1280	640	490
6	3 PzS 315	315	1020	560	280	600
7	4 PzS 420	420	1020	704	352	600
8	5 PzS 525	525	1020	848	424	600
9	6 PzS 630	630	1020	992	496	600
10	7 PzS 735	735	1020	1136	568	600
11	8 PzS 840	840	1020	1280	640	600
12	3 PzS 375	375	1020	560	280	660
13	4 PzS 500	500	1020	704	352	660
14	5 PzS 625	625	1020	848	424	660
15	6 PzS 750	750	1020	992	496	660
16	7 PzS 875	875	1020	1136	568	660

Container (box) sizes are presedented according to customer order and will be changed with considering single cell sizes





No	Battery type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	9 PzS 420 (8 Volt) PP Container	420	5	84	1.70	715 195 469	122	28 .0
2	5 PzS 350 (2 Volt) PE Container	350	5	70	1.70	198 101 425	22.9	4.9

No	Battery Type	Capacity (Ah)	Discharge time H	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	2 PzB 110	60 82 110	1 3 5	60 27 22	1.62 1.68 1.70	45 158 423	7.6	1.5
2	3 PzB 165	90 123 165	1 3 5	90 41 33	1.62 1.68 1.70	61 158 423	10.5	2.0
3	4 PzB 220	121 165 220	1 3 5	121 55 44	1.62 1.68 1.70	77 158 423	13.5	2.5
4	5 PzB 275	151 206 275	1 3 5	151 41 55	1.62 1.68 1.70	93 158 423	16.5	3.0
5	6 PzB 330	181 247 330	1 3 5	181 82 66	1.62 1.68 1.70	109 158 423	19.6	3.7
6	7 PzB 385	211 288 385	1 3 5	211 96 77	1.62 1.68 1.70	125 158 423	22.6	4.2
7	8 PzB 440	242 330 440	1 3 5	242 110 88	1.62 1.68 1.70	141 158 423	25.6	4.8
8	9 PzB 495	272 371 495	1 3 5	272 123 99	1.62 1.68 1.70	157 158 423	29.1	5.3
9	10 PzB 550	302 412 550	1 3 5	302 137 110	1.62 1.68 1.70	173 158 423	32.1	5.8
10	11 PzB 605	332 453 605	1 3 5	332 151 121	1.62 1.68 1.70	189 158 423	35.2	6.5

- Electrolyte density by 30°C : 1.29 ± 0.01 kg/l.
  Weight tolerance is ± 5%.
  Cells from 9-11 PzB types are available with 4 poles only.

No	Battery Type	Capacity (Ah)	Discharge time(H)	Discharge current(A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	2 PzB 130	71 97 130	1 3 5	71 32 26	1.62 1.68 1.70	45 158 477	8.2	1.4
2	3 PzB 195	107 146 195	1 3 5	107 48 39	1.62 1.68 1.70	61 158 477	12.0	1.9
3	4 PzB 260	143 195 260	1 3 5	143 65 52	1.62 1.68 1.70	77 158 477	15.5	2.5
4	5 PzB 325	178 243 325	1 3 5	178 81 65	1.62 1.68 1.70	93 158 477	19.0	3.0
5	6 PzB 390	214 292 390	1 3 5	214 97 78	1.62 1.68 1.70	109 158 477	22.6	3.7
6	7 PzB 455	250 341 455	1 3 5	250 113 91	1.62 1.68 1.70	125 158 477	26.1	4.3
7	8 PzB 520	286 390 520	1 3 5	286 130 104	1.62 1.68 1.70	141 158 477	29.6	5.1
8	9 PzB 585	321 438 585	1 3 5	321 146 117	1.62 1.68 1.70	157 158 477	33.6	5.7
9	10 PzB 650	357 487 650	1 3 5	357 162 130	1.62 1.68 1.70	173 158 477	37.2	6.6
10	11 PzB 715	393 536 715	1 3 5	393 178 143	1.62 1.68 1.70	189 158 477	40.7	7.4

- Electrolyte density by 30°C : 1.29 ± 0.01 kg/l.
  Weight tolerance is ± 5%.
  Cells from 9-11 PzB types are available with 4 poles only.

No	Battery Type	Capacity (Ah)	Discharge time(H)	Discharge current(A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	2 PzB 150	82 112 150	1 3 5	82 37 30	1.62 1.68 1.70	45 158 537	10.0	2.4
2	3 PzB 225	123 168 225	1 3 5	123 56 45	1.62 1.68 1.70	61 158 537	13.9	3.1
3	4 PzB 300	165 225 300	1 3 5	165 75 60	1.62 1.68 1.70	77 158 537	17.8	3.7
4	5 PzB 375	206 281 375	1 3 5	206 93 75	1.62 1.68 1.70	93 158 537	21.6	4.1
5	6 PzB 450	247 337 450	1 3 5	247 112 90	1.62 1.68 1.70	109 158 537	25.6	4.7
6	7 PzB 525	288 393 525	1 3 5	288 131 105	1.62 1.68 1.70	125 158 537	29.6	5.5
7	8 PzB 600	330 450 600	1 3 5	330 450 120	1.62 1.68 1.70	141 158 537	33.5	6.1
8	9 PzB 675	371 506 675	1 3 5	371 168 135	1.62 1.68 1.70	157 158 537	38.2	7.1
9	10 PzB 750	412 562 750	1 3 5	412 187 150	1.62 1.68 1.70	173 158 537	42.3	8.1
10	11 PzB 825	453 618 825	1 3 5	453 506 165	1.62 1.68 1.70	189 158 537	46.4	9.1

- Electrolyte density by 30°C : 1.29 ± 0.01 kg/l.
  Weight tolerance is ± 5%.
  Cells from 9-11 PzB types are available with 4 poles only.

No	Battery Type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	2 PzB 172	94 129 172	1 3 5	94 43 34	1.62 1.68 1.70	45 158 591	10.7	2.4
2	3 PzB 258	141 193 258	1 3 5	141 64 51	1.62 1.68 1.70	61 158 591	15.0	3.2
3	4 PzB 344	189 258 344	1 3 5	189 86 68	1.62 1.68 1.70	77 158 591	19.3	4.1
4	5 PzB 430	236 322 430	1 3 5	236 107 86	1.62 1.68 1.70	93 158 591	23.7	5.1
5	6 PzB 516	283 387 516	1 3 5	283 129 103	1.62 1.68 1.70	109 158 591	28.1	6.1
6	7 PzB 602	331 451 602	1 3 5	331 150 120	1.62 1.68 1.70	125 158 591	32.6	7.2
7	8 PzB 688	378 516 688	1 3 5	378 172 137	1.62 1.68 1.70	141 158 591	37.1	8.3
8	9 PzB 774	425 580 774	1 3 5	425 193 154	1.62 1.68 1.70	157 158 591	42.3	9.4
9	10 PzB 860	473 645 860	1 3 5	473 215 172	1.62 1.68 1.70	173 158 591	46.9	10.6
10	11 PzB 946	520 709 946	1 3 5	520 236 189	1.62 1.68 1.70	189 158 591	51.4	11.7

- Electrolyte density by 30°C : 1.29 ± 0.01 kg/l.
  Weight tolerance is ± 5%.
  Cells from 9-11 PzB types are available with 4 poles only.

No	Battery Type	Capacity (Ah)	Discharge time (H)	Discharge current (A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	2 PzB 200	110 150 200	1 3 5	110 50 40	1.62 1.68 1.70	45 158 628	11.8	2.4
2	3 PzB 300	165 225 300	1 3 5	165 75 60	1.62 1.68 1.70	61 158 628	16.6	3.1
3	4 PzB 400	220 300 400	1 3 5	220 100 80	1.62 1.68 1.70	77 158 628	21.5	4.0
4	5 PzB 500	275 375 500	1 3 5	275 125 100	1.62 1.68 1.70	93 158 628	26.4	4.8
5	6 PzB 600	320 450 600	1 3 5	320 150 120	1.62 1.68 1.70	109 158 628	31.5	5.9
6	7 PzB 700	385 525 700	1 3 5	385 175 140	1.62 1.68 1.70	125 158 628	36.4	6.7
7	8 PzB 800	440 600 800	1 3 5	440 200 160	1.62 1.68 1.70	141 158 628	41.4	7.7
8	9 PzB 900	495 675 900	1 3 5	495 225 180	1.62 1.68 1.70	157 158 628	47.1	8.5
9	10 PzB 1000	550 750 1000	1 3 5	550 250 200	1.62 1.68 1.70	173 158 628	52.0	9.3
10	11 PzB 1100	605 825 1100	1 3 5	605 275 220	1.62 1.68 1.70	189 158 628	56.9	10.2

- Electrolyte density by 30°C : 1.29 ± 0.01 kg/l.
  Weight tolerance is ± 5%.
  Cells from 9-11 PzB types are available with 4 poles only.

No	Battery Type	Capacity (Ah)	Discharge time(H)	Discharge current(A)	Final Voltage (V)	Length Width Height (mm)	Charged Battery Weight (Kg)	Electrolyte weight (Kg)
1	2 PzB 216	118 162 216	1 3 5	118 54 43	1.62 1.68 1.70	45 158 712	13.5	3.6
2	3 PzB 324	178 243 324	1 3 5	178 81 64	1.62 1.68 1.70	61 158 712	18.9	4.6
3	4 PzB 432	237 324 432	1 3 5	237 108 86	1.62 1.68 1.70	77 158 712	24.3	5.6
4	5 PzB 540	297 405 540	1 3 5	297 135 108	1.62 1.68 1.70	93 158 712	29.7	6.5
5	6 PzB 648	356 486 648	1 3 5	356 162 129	1.62 1.68 1.70	109 158 712	35.1	7.5
6	7 PzB 756	415 567 756	1 3 5	415 189 151	1.62 1.68 1.70	125 158 712	40.5	8.4
7	8 PzB 864	475 648 864	1 3 5	475 216 172	1.62 1.68 1.70	141 158 712	45.9	9.4
8	9 PzB 972	534 729 972	1 3 5	534 243 194	1.62 1.68 1.70	157 158 712	52.0	10.4
9	10 PzB 1080	594 810 1080	1 3 5	594 270 216	1.62 1.68 1.70	173 158 712	57.4	11.4
10	11 PzB 1188	653 891 1188	1 3 5	653 297 237	1.62 1.68 1.70	189 158 712	62.8	12.4

- Electrolyte density by 30°C : 1.29 ± 0.01 kg/l.
  Weight tolerance is ± 5%.
  Cells from 9-11 PzB types are available with 4 poles only.

Installation

Industrial batteries are kept in metallic container that coated with polyethylene in both sides and the batteries are welded together in series/parallel with copper belts. Said batteries manufacture in different capacities with polypropylene (pp) lid and case that are heat sealed to avoid leaking.

Note:

1-Installing place surfaces should be balanced and any void of it should be acid resistant. Storeroom environment must be dust free and without any metallic particles and harmful gas and evolution gases (hydrogen and oxygen) must be go out freely.

2- Positive and negative terminals must be jointed to utilization with coated cable.

3- Aware of existence of hydrogen before welding. To exit hydrogen gas open the lid screw for 1-2 hours and blow air on it.

Charging and Commissioning

1- Acid filling: Fill the batteries with sulfuric acid (acid density 1.22 g/cm^3 at 25°C).

$D_{25°C} = D_T + 0.0007 (T-25)$

2- Resting time: 2 hours to penetrate acid

3- Charging with I_5 for 4 hours

4- Charging with $0.3I_5$ for 20 hours

5- Regulating of electrolyte level: after regulating electrolyte level charging will continue with $0.3I_5$ for 1 hour.

Note: following condition must be reached after charging:

Electrolyte density: 1.26+ 0.005 g/mc^3

Temperature: max 55°C

Note: Voltage deviation from average must not be higher than 0.05 V/cell.

Note: Current tolerance ±%5

Note: Mentioned current may be decreased so time must be increased to have constant ampere hour.

Note: Remove container and batteries lids before starting charge step.

Note: If the temperature increased over 55°C the charging current must be decreased. After finishing charge step each cell must be controlled from electrolyte density, temperature and gas evolution point of view.

Note: A battery is fully charged when electrolyte density and voltage is constant for 2 hours.

Maintenance and service

Maintenance charge

After finishing of activation steps, the batteries are ready to use and so before use must be kept at maintenance charging or charge once a week periodically. Voltage in maintenance charge must be 2.23-2.25 V/cell and charging current must be $0.02I_5 – 0.03I_5$

Boost charge

If the batteries are dead then must be recharged through one of the following methods:

a) Constant current charging: In this method the batteries will be charged with $0.5I_5 – 0.7I_5$ to reach 2.4 V/cell (gas generation voltage) and cell voltage and electrolyte density must be constant for 2 hours.

b) Descending current charging: First charge the batteries with $0.8I_5$ to reach gas generation voltage (2.4V/cell) then decrease the current to $0.2I_5$ and continue charging. The batteries are fully charged when the cell voltages reach to gas generation voltage and all of the cells generated gas simply and the electrolyte density reach to 1.260 g/cm^3 + 0.005 at 25°C and cell voltage and electrolyte density must be constant for 2 hours.

Discharge

When the electrolyte density reach to 1.13 g/cm^3 means that the batteries are fully discharged and for maximum life cycle the electrolyte density must not be lower than 1.13 g/cm^3.

Equalize charge

Equalize charging prevents plates sulfation. To achieve this aim, charging with $0.2I_5$ must be continued after normal charging to keep electrolyte density and voltage constant for 2 hours or charge with $0.1I_5$ for 2 days. Before finishing the charge , electrolyte density, temperature, gas evolution and voltage of the cells must be controlled (2.4 V/cell and electrolyte density 1.260 g/cm^3 + 0.005 at 25°C).

Note: Equalize charging occurs in the following conditions:

a) After a deep discharge

b) Once a week for first three months and then once a month

c) Once a week when the batteries are under low loading

d) After incomplete recharging or when there is not enough time to charge completely, it must be charged once a week.

Battery electrolyte notes:

1- The level of electrolyte must be 10 mm upper than battery plates and compensate it by adding deionized water if the level is lower than normal and recharging to 2.4 V/cell

2- Clean the battery after regulating of electrolyte level

3- Note that the level of electrolyte increases during charging, so it is essential to regulate it with deionized water one hour before finishing of charging program.

4- Avoid adding acid to the batteries. Only authorized people must do it in special conditions.

Service and maintenance notes:

a) Battery cycle life is completely related to maintenance and service conditions.

b) The batteries must be protected from dust, metallic particles and harmful gasses.

c) The batteries must have special place for charging.

d) The batteries storeroom temperature are within 5-20°C

e) Safety precautions:

1- Drinking and smoking in the storeroom is prohibited and avoid entering of melted materials.

2- Storeroom should be ventilated from start to one hour after finishing the charge.

3- Closed cells should be ventilated before using (for example by compressed air)

4- Open the battery lids during charging.

5- Don't connect or disconnect electrical current during production of gas.

6- You should grease the terminals well and inspect them carefully once a week .

f) The batteries must not be kept at discharged condition.

g) Don't charge the batteries more than authorized level.

h) Don't leave the charged batteries without utilization.

I) Keep the batteries clean and dry and control regularly for electrical connectors, electrolyte level and storeroom .

Important note: note that the battery voltage must not be lower than 1.75 V/cell during utilization.

Saba Smart

Specifications

Nominal Voltage		6 V	6 V
Rated Capacity (C5)		165 Ah	185 Ah
Final Voltage (5 Hour Rate)		1.70 $V/_{Cell}$	1.70 $V/_{Cell}$
Dimensions	Height	283 mm	283 mm
	Length	262 mm	262 mm
	Width	181 mm	181 mm
Charged Battery Weight (±2.5%)		29 Kg	31 Kg

Long Life Deep Cycle Tubular Monoblock Battery
Flooded Electrolyte Maintenance Free

12V-100Ah

Specifications

Nominal Voltage		12 V
Rated Capacity (C20)		100 Ah
Dimensions	Height	257 mm
	Length	404 mm
	Width	172 mm
Charged Battery Weight (±2.5%)		32 Kg

Long Life Deep Cycle Tubular Monoblock Battery
Flooded Electrolyte Maintenance Free

12V-200Ah

Specifications

Nominal Voltage		12 V
Rated Capacity (C20)		200 Ah
Dimensions	Height	268 mm
	Length	505 mm
	Width	262 mm
Charged Battery Weight (±2.5%)		65 Kg

New Generation Advance Tubular Batteries

Application :

- Emergency power in repetitive and long life power disrupting
- UPS/Inverter system
- Requisite battery in storing renewable energies like sun and wind power
- Electrical machines, industrial cleanliness machines

Technical specification of battery :

- Tubular positive plates with low antimony alloy for decreasing corrosion and elimination of active material effusion
- Flat negative plates with low antimony alloy
- Utilizing porous poly(ethylen) separator for decreasing internal resistance of battery
- Assembling of plate's handle by use of automatic machine C.O.S (casting on strap)
- Low preservation
- Use flooded acid

NOTE :

NOTE :

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R005-001010

Energy Sources
Development Company
(Tavan)

SABA BATTERY

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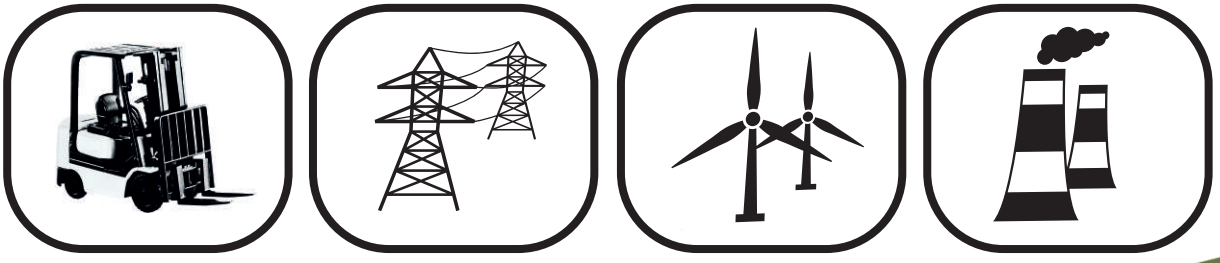
Other Products

- Minium
- Distilled water
- Acid water
- BMS
- Making Smart Of Installations



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Contents

BMS system abilities:

1. User friendly touch screen
2. Protecting from short circuit
3. Measuring and displaying of current up to 50 ampere
4. Measuring of charging and discharging up to 50 ampere
5. Measuring and displaying of each batteries voltage
6. System protection with two administrative and user levels
7. Selection of battery's type
8. Data logger with saving alarms capability
9. Alarm limit setting possibility
10. Allocation of alarms to 8 contact supervisors according to customer's needs
11. Indicating of supervisor relay
12. Ability to activation / deactivation of audio alarms
13. Measuring and indicating of temperature and creating of concerned alarms
14. Detecting and displaying type of battery charge (maintenance , discharge)
15. Detecting and displaying of fuses conditions in each battery row and creating of concerned alarms
16. Detecting and displaying of battery safety conditions containing all of concerned alarms.
17. Detecting of failed batteries in each step
18. Displaying of alarms for each battery separately
19. Ability of calibration in voltage, current and temperature measurement sensors.
20. Ability to time setting
21. Possessing Islamic calendar

22. Ability to deactivation of all batteries sensors, and also separately in need
23. Having central system for observation of all data by modem and static IP
24. Indicating of momentarily alarms:
    - Battery voltage
    - Battery current
    - Battery temperature
    - Alarm time occurrence
25. Connection via GSM for exchanging of information and sending alarms through SMS
26. Containing RS232/RS485 port
27. Monitoring system and easy to replace
28. Network card with below features:
    - Ability to receive Excel output
    - Possessing LAN port
    - Monitoring by MODBUS protocol
29. Recording of data in memory as Excel file
30. Drawing the voltage, current and temperature diagrams
31. Elimination of alarms in need
32. Measuring temperature by LM35 sensor precisely
33. Creation of password for elimination of alarms
34. Monitoring in cell phone by VNC Viewer software

Making smart of installations is used to focus on controlling , monitoring , and optimization of energy consumption (water, gas and electricity) of installation and utilization of different sensors (level meter, pressure, temperature...) and operators (power pots …) under PLC controller model 200 and monitoring with Panel Express software.

Ability of making smart of installations

- Increasing of control- ability level and decreasing of loses from network transferring of cooling and heating supply
- Optimization the amount of heating branches supply with momentary tracking of ambient temperature (controlling of boiler and collectors temperature)
- Ability to remote controlling systems through internet network (expandable in wider organizational and outside organizational networks)
- Decreasing of human resources in keeping of heating installations
- Possibility of reporting on different periods of time. Submit report of alarms and possibility of submit and declaration of system alarms including: leaking in system, changing in temperature and pressure
- Automatic controlling of pumps according to regulative pressure of pipeline
- Automatic adding water to the tanks, smart control of pump houses
- Control of over 100 installation points of group and possibility in connecting through networks like LAN , Cables and optical fiber
- Intelligent controlling of boiler, upon ambient temperature
- Prevention of thermal energy wasting in headquarters with utilization in administrative final hours and official weekends with utilizing power taps

Minium

No.	Wrap kind	Analysis
1	20 kg Packet	Lead Dioxide : minimum 27%

Distilled Water (For Industerial Use)

Wrap kind	Charcteristics	Unit	Standard
5 Gallon or 20 Litre	Electric Conduction	µs/cm	Max 10(at 25˚C)
	PH	----	5-8 (at 25˚C)
	Manganese	mg/lit	Max 0.1

Acid Water (Battery Electrolyte)

Acid density	Acid Stationary Batteries	1.220 ± 0.005(at 25˚C) gr/cm^3

Wrap kind	Characteristics	Unit	Standard Stationary Batteries
5 Gallon or 20 Litre	Residual Materials After Burning	mg/kg	Max 153.2
	Chloride	mg/kg	Max 7.15
	Sulfur dioxide	mg/kg	Max 5.1
	Ammonia nitrogen	mg/kg	Max 51.1
	Nitrogen oxides	mg/kg	Max 5.1
	Iron	mg/kg	Max 20.4
	Copper	mg/kg	Max 7.15
	Manganese	mg/kg	Max 0.102
	Arsenic	mg/kg	Max 2.04
	Nickel	mg/kg	Max 0.613
	Chrom	mg/kg	Max 0.204
	Cadmium	mg/kg	Max 0.204

NOTE :

SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

SABA BATTERY

HAJAMINI INDUSTRIAL GROUP

ADD

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