RAHIMAFROOZ

Maintenance Free VRLA AGM Battery

General RA Types

Industry Battery – RA Series

(General Purpose Type)

The RA Series is general purpose Valve regulated lead acid (VRLA) AGM battery which combine RA power's industry scale and advanced equipment together to provide high reliability product and the most competitive price. This range offers 5~8 years design life with very good cycling capacity, it is highly suited to cyclic or standby application.

- Cycle or standby (or float) application.
- Long life, low self-discharge rate and high reliability.
- It has safety, low resistance so recharge is easy and energy output is more remarkable.
- Strictly manufacture process control high consistency
- ISO9001, ISO14001 Certified
- UL, IEC60896-21&22, TLC, CE and European council Directive 2006/66/EC and its amendment (2008/12/EC) certification.

Application

Standby Use

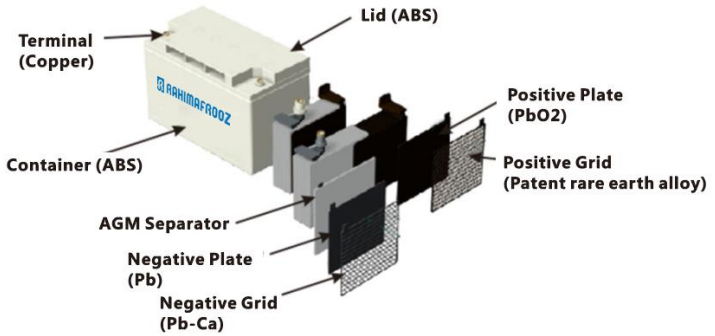
- Uninterrupted Power Supply (UPS)
- Communications and electric equipment
- Emergency fighting equipment
- Fire alarm and security systems
- Robots, control equipment, and other factory automation equipment
- Emergency power supply (EPS) in power generation plants and substations

Cycle Use

- Portable VTR/TV, radio and so on
- Power tools, lawn mowers, vacuum cleaners
- Camera s and photog rap hic equipment
- Portable measuring equipment
- Portable telephone sets
- Various power toys and hob by equipment
- Lighting equipment

Construction

- Positive Place - Patent rare earth alloy grid with special paste for corrosion resistance
- Negative Plate – Balanced Pb-Ca grid for improved recombination efficiency
- Separator – Advanced AGM separator for high pressure cell design, the electrolyte is completely absorbed.
- Electrolyte - Dilute high purity sulphuric acid
- Battery container and cover - ABS UL94-HB (Flame-retant ABS UL94-V0 is optional)



Product Specification

Model	Nominal Voltage (V)	Nominal Capacity C_{10} (Ah) 1.80Vpc/25^0 C	Nominal Capacity $C2_0$ (Ah) 1.80Vpc/25^0 C	Dimension (mm)				Weight (Kg)	Dimension (Inch)				Weight (lbs)	Terminal
				L	W	H	TH		L	W	H	TH		
RA6-3.0	6	2.84	3	70	47	100	106	0.64	2.76	1.85	3.94	4.17	1.41	T1/T2
RA6-3.2	6	3.03	3.2	70	47	100	106	0.68	2.76	1.85	3.94	4.17	1.5	T1/T2
RA6-4.0	6	3.79	4	70	47	100	106	0.72	2.76	1.85	3.94	4.17	1.59	T1/T2
RA6-4.5	6	4.27	4.5	70	47	100	106	0.75	2.76	1.85	3.94	4.17	1.65	T1/T2
RA6-5.4	6	5.12	5.4	70	47	100	106	0.8	2.76	1.85	3.94	4.17	1.76	T1/T2
RA6-7.0	6	6.64	7	151	35	93	99	1.1	5.94	1.38	3.66	3.9	2.43	T1/T2
RA6-7.2	6	6.83	7.2	151	35	93	99	1.2	5.94	1.38	3.66	3.9	2.65	T1/T2
RA6-7.5	6	7.11	7.5	151	35	93	99	1.26	5.94	1.38	3.66	3.9	2.78	T1/T2
RA6-7.8	6	7.39	7.8	151	35	93	99	1.28	5.94	1.38	3.66	3.9	2.82	T1/T2
RA6-8.5	6	8.06	8.5	151	35	93	99	1.2	5.94	1.38	3.66	3.9	2.65	T1/T2
RA6-10	6	9.48	10	151	51	94	100	1.62	5.94	2.01	3.7	3.94	3.57	T1/T2
RA6-12	6	11.4	12	151	51	94	100	1.8	5.94	2.01	3.7	3.94	3.97	T1/T2
RA6-14	6	13.3	14	151	51	94	100	2.05	5.94	2.01	3.7	3.94	4.52	T1/T2
RA12-4.0	12	3.79	4	90	70	101	107	1.45	3.54	2.76	3.98	4.21	3.2	T1/T2
RA12-4.5	12	4.27	4.5	90	70	101	107	1.48	3.54	2.76	3.98	4.21	3.26	T1/T2
RA12-5.0L	12	4.74	5	151	65.5	93.5	99.5	1.75	5.94	2.58	3.68	3.92	3.86	T1/T2
RA12-5.0	12	4.74	5	90	70	101	107	1.6	3.54	2.76	3.98	4.21	3.53	T1/T2
RA12-5.4	12	5.12	5.4	90	70	101	107	1.65	3.54	2.76	3.98	4.21	3.64	T1/T2
RA12-5.5	12	5.21	5.5	90	70	101	107	1.85	3.54	2.76	3.98	4.21	4.08	T1/T2
RA12-6.0	12	4.74	5	151	65.5	93.5	99.5	1.9	5.94	2.58	3.68	3.92	4.19	T1/T2
RA12-6.5	12	6.16	6.5	151	65.5	93.5	99.5	2.06	5.94	2.58	3.68	3.92	4.54	T1/T2
RA12-7.0	12	6.64	7	151	65.5	93.5	99.5	2.18	5.94	2.58	3.68	3.92	4.81	T1/T2
RA12-8.0	12	7.58	8	151	65.5	93.5	99.5	2.35	5.94	2.58	3.68	3.92	5.18	T1/T2
RA12-8.5	12	8.06	8.5	151	65.5	93.5	99.5	2.45	5.94	2.58	3.68	3.92	5.4	T1/T2
RA12-9.0	12	8.34	8.8	151	65.5	93.5	99.5	2.66	5.94	2.58	3.68	3.92	5.86	T2
RA12-10	12	9.48	10	151	99.5	95.5	101.5	3.25	5.94	3.92	3.76	4	7.16	T1/T2
RA12-12	12	11.4	12	151	99.5	95.5	101.5	3.6	5.94	3.92	3.76	4	7.94	T1/T2
RA12-14	12	13.3	14	151	99.5	95.5	101.5	4.05	5.94	3.92	3.76	4	8.93	T1/T2
RA12-15	12	14.2	15	182	77	170	170	4.7	7.17	3.03	6.69	6.69	10.4	110
RA12-17	12	16.1	17	182	77	170	170	5	7.17	3.03	6.69	6.69	11	110
RA12-18	12	17.1	18	182	77	170	170	5.4	7.17	3.03	6.69	6.69	11.9	110
RA12-20	12	19	20	182	77	170	170	5.78	7.17	3.03	6.69	6.69	12.7	110
RA12-24	12	22.8	24	166	175	125	125	7.8	6.54	6.89	4.92	4.92	17.2	L1
RA12-24H	12	22.8	24	166	126.5	172.5	172.5	7.3	6.54	4.98	6.79	6.79	16.1	11

Product Specification

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				L	W	H	TH		L	W	H	TH		
RA12-26	12	24.6	26	166	175	125	125	8.5	6.54	6.89	4.92	4.92	18.7	I1/L1
RA12-28	12	26.5	28	166	175	125	125	8.6	6.54	6.89	4.92	4.92	19	L1
RA12-28H	12	26.5	28	166	126.5	172.5	172.5	8.7	6.54	4.98	6.79	6.79	19.2	L1
RA12-30	12	28.4	30	195	130	157.5	162	9.3	7.68	5.12	6.2	6.38	20.5	I1/I2
RA12-33	12	31.3	33	195	130	157.5	162	10	7.68	5.12	6.2	6.38	22	I1/I2
RA12-35	12	33.2	35	195	130	157.5	162	11.1	7.68	5.12	6.2	6.38	24.5	B1
RA6-150	6	150	158.7	260	180	247	253	21	10.24	7.09	9.72	9.96	46.3	I5
RA6-180	6	180	190.4	306	168	222	228	27	12.05	6.61	8.74	8.98	59.5	I7
RA6-200	6	200	211.6	306	168	222	228	28	12.05	6.61	8.74	8.98	61.7	I7
RA6-200L	6	200	211.6	322	178	228	234	29.5	12.68	7.01	8.98	9.21	65	I5
RA12-38	12	38	40.2	198.5	166	169.5	169.5	12.1	7.81	6.54	6.67	6.67	26.7	I3
RA12-45	12	45	47.6	198.5	166	169.5	169.5	13.5	7.81	6.54	6.67	6.67	29.8	I3
RA12-50	12	50	52.9	257	133	200	200	16.2	10.12	5.24	7.87	7.87	35.7	I3
RA12-55	12	55	58.2	229	138.5	211	216	16.4	9.02	5.45	8.31	8.5	36.2	I3
RA12-60	12	60	63.5	260	168	211	213.5	18.4	10.24	6.61	8.31	8.41	40.6	I3
RA12-65	12	65	68.8	350	167	180	180	21	13.78	6.57	7.09	7.09	46.3	I3
RA12-65E	12	61.6	65	350	167	180	180	19.8	13.78	6.57	7.09	7.09	43.7	I3
RA12-70	12	70	74.1	350	167	180	180	21.6	13.78	6.57	7.09	7.09	47.6	I3
RA12-75	12	75	79.4	260	168	211	213.5	22.3	10.24	6.61	8.31	8.41	49.2	I3
RA12-80	12	80	84.6	260	168	211	213.5	24	10.24	6.61	8.31	8.41	52.9	I3
RA12-90	12	90	95.2	306.5	168	208.5	211	26.8	12.07	6.61	8.21	8.31	59.1	I7
RA12-90L	12	90	95.2	330	172	214	221.5	27.8	12.99	6.77	8.43	8.72	61.3	I7
RA12-100	12	100	105.8	330	172	214	221.5	29.8	12.99	6.77	8.43	8.72	65.7	I7
RA12-120E	12	109	115	408	177	224	224	31.7	16.06	6.97	8.82	8.82	69.9	I7
RA12-120	12	120	127	408	177	224	224	34	16.06	6.97	8.82	8.82	75	I7
RA12-135	12	135	142.8	345	172	274	279	41.2	13.58	6.77	10.79	10.98	90.8	I7
RA12-150	12	150	158.7	480	170	240	240	42.2	18.9	6.69	9.45	9.45	93	I7
RA12-150E	12	142.2	150	480	170	240	240	40.2	18.9	6.69	9.45	9.45	88.6	I7
RA12-180	12	180	190.4	532	207	215	220	53.5	20.94	8.15	8.46	8.66	117.9	I7
RA12-200	12	200	211.6	520	239	220	225	60	20.47	9.41	8.66	8.86	132.3	I7
RA12-200E	12	189.6	200	520	239	220	225	57.8	20.47	9.41	8.66	8.86	127.4	I7
RA12-230	12	230	243.3	520	239	220	225	63.5	20.47	9.41	8.66	8.86	140	I7
RA12-250	12	250	264.5	522	268	220	225	72.5	20.55	10.55	8.66	8.86	159.8	I7

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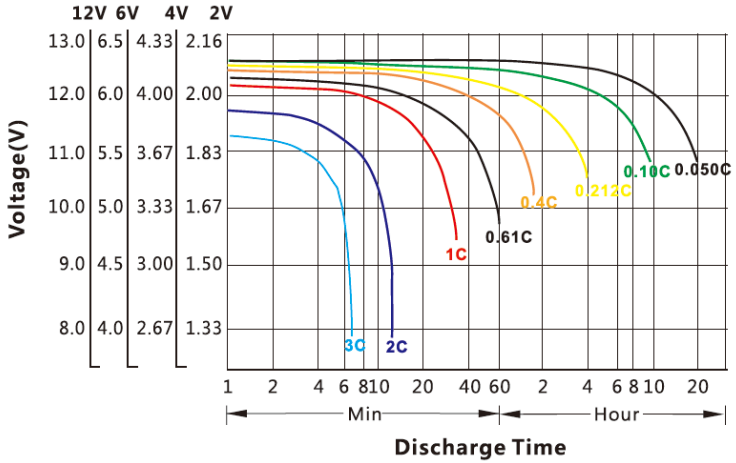
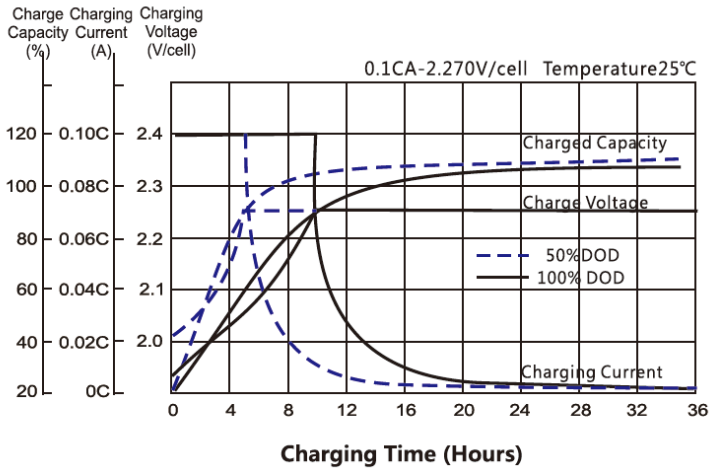
				L	W	H	TH		L	W	H	TH		
RA2-65	2	65	69.4	171	76	213	220	4.6	6.73	2.99	8.39	8.66	10	I7
RA2-100	2	100	106.8	171	76	213	220	6.2	6.73	2.99	8.39	8.66	13.7	I7
RA2-150	2	150	159.8	171	102	206	222	8.3	6.73	4.02	8.11	8.74	18.3	I7
RA2-200	2	200	213	170	106	330	350	13	6.69	4.17	12.99	13.78	28.7	I7
RA2-250	2	250	266.3	170	106	330	341.5	13.5	6.69	4.17	12.99	13.44	29.8	I7
RA2-300	2	300	319.5	170	150	330	350	18	6.69	5.91	12.99	13.78	39.7	I7
RA2-350	2	350	372.8	170	150	330	341.5	22	6.69	5.91	12.99	13.44	48.5	I7
RA2-400	2	400	426	175	210	328	350	25.5	6.89	8.27	12.91	13.78	56.2	I7
RA2-500	2	500	532.5	240	172	330	350	31.2	9.45	6.77	12.99	13.78	68.78	I7
RA2-600	2	600	639	285	170	330	350	34.9	11.22	6.69	12.99	13.78	76.9	I7
RA2-800	2	800	852	410	175	330	350	50.5	16.14	6.89	12.99	13.78	111.3	I7
RA2-1000	2	1000	1065	470	170	330	341.5	56.8	18.5	6.69	12.99	13.44	125.2	I7
RA2-1200	2	1200	1278	470	170	330	341.5	66.2	18.5	6.69	12.99	13.44	145.9	I7
RA2-1500	2	1500	1597.5	355	338	330	342	87	13.98	13.31	12.99	13.46	191.8	I7
RA2-2000	2	2000	2130	490	350	339	349	121	19.29	13.78	13.35	13.74	266.8	I7
RA2-2500	2	2500	2662.5	490	350	339	349	133.5	19.29	13.78	13.35	13.74	294.3	I7
RA2-3000	2	3000	3195	709	350	337	347	181	27.91	13.78	13.27	13.66	399	I7

Performance Curve

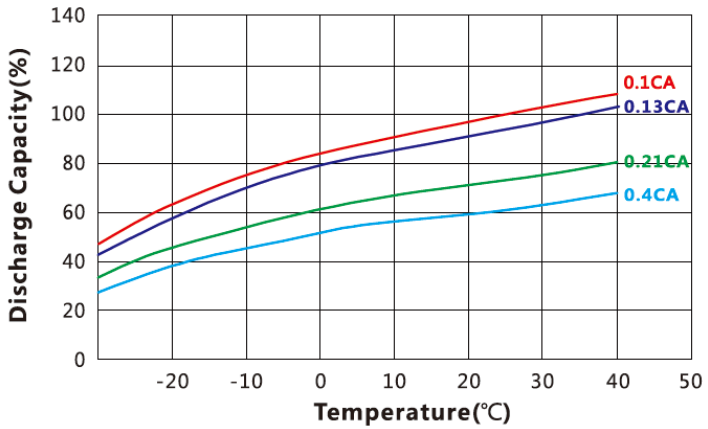
Discharge Characteristics (25°C)



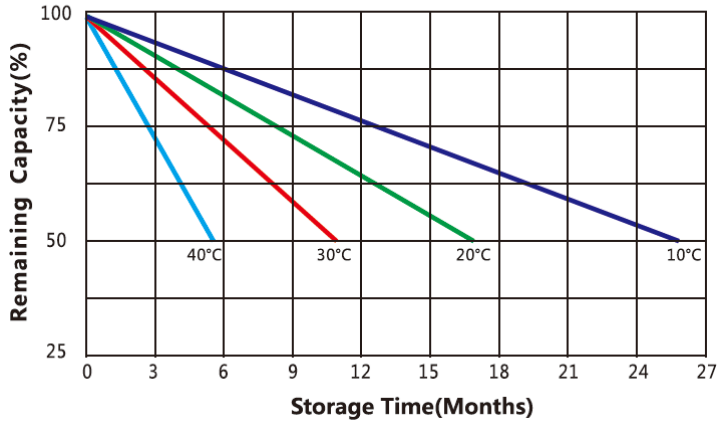
Charging Characteristics (25°C)



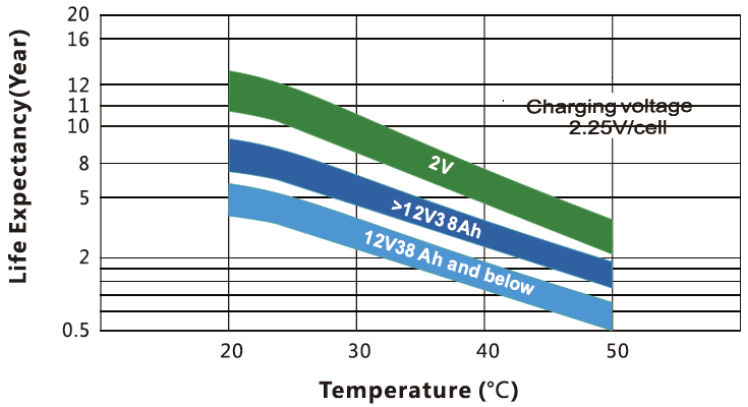
Capacity With Different Temperature



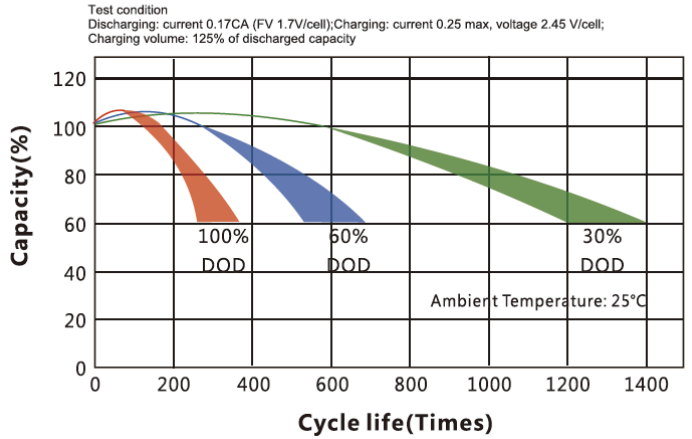
Self-Discharge Characteristics



Float Life at Different Temperature

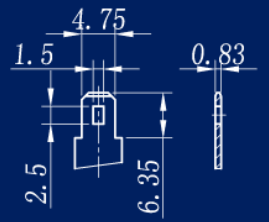


Cycle Life with Different DOD

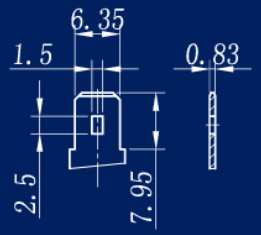


Terminal Type (unit : mm)

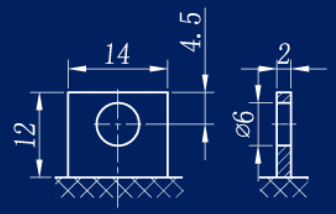
T1



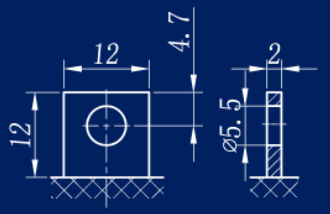
T2



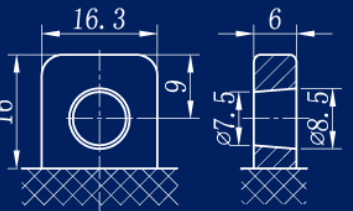
L1



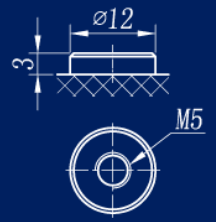
L2



B1



I1



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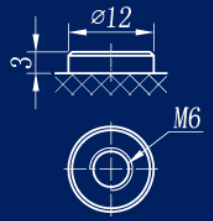
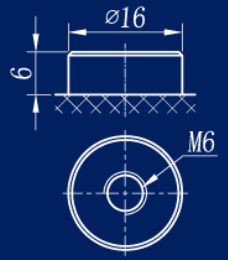


I3



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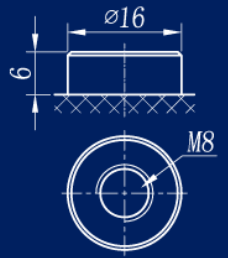

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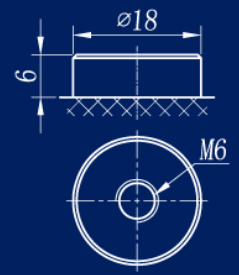
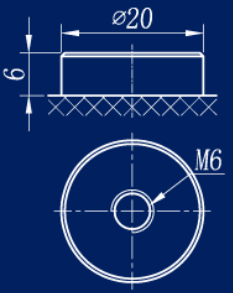
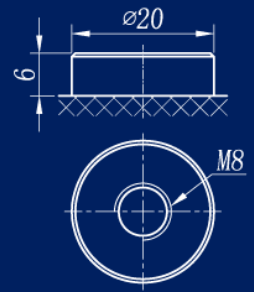


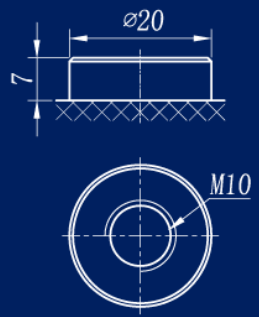
I6



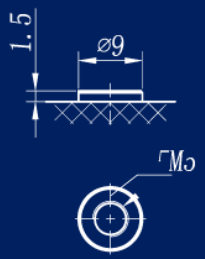
I7



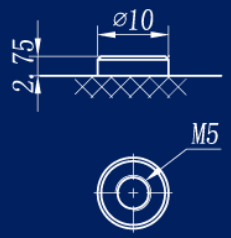
I8



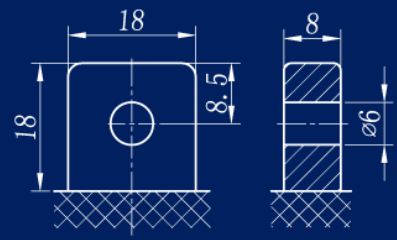
I9



I10



B2



Torque:

M5: 2.0~3.0 N*m; M6: 3.9~5.4 N*m; M8: 10~12 N*m

VRLA (AGM) battery vs Gel Battery

- A **VRLA battery** (valve-regulated lead-acid battery), also known as a sealed battery (SLA), is a type of lead-acid rechargeable battery. Due to the design and structure, both our **AGM** and **Gel** batteries are VRLA (valve-regulated lead-acid battery) which do not require constant maintenance.

- **AGM** (absorbed glass mat) is a special design glass mat designed to wick the battery electrolyte between the battery plates. **AGM** batteries contain only enough liquid to keep the mat wet with the electrolyte and if the battery is broken no free liquid is available to leak out.

- Our **Gel type** batteries also use AGM design but contain a silica type gel that the battery electrolyte is suspended in, this thick paste like material allows electrons to flow between plates but will not leak from the battery if the case is broken.

VRLA (AGM) battery vs Gel Battery (Cont.)

- Both **AGM** and **Gel** batteries have similar traits; such as being maintenance free, non-spillable, may be mounted in most places, low self-discharge, safe for use in limited ventilation areas.
- **AGM** is better performing when a high burst of amps may be required. The life expectancy remains excellent in most AGM batteries if the batteries are not discharged more than 60% between recharge.
- **Gel** type Batteries are typically a bit more costly than **AGM** batteries. The Gel battery excels in slow discharge rates and slightly higher ambient operating temperatures. The gel type electrolyte is filled into the battery cells to avoid dry out and prevent thermal runaway of batteries. Radioactive structure of grids can enhance the utilization ratio of active material, improve the corrosion-proof performance of positive plates and reduce come out of hydrogen form negative plates. Same as AGM batteries, Gel batteries have good recharge efficiency and good performance for cycle operation. However, Gel batteries have a better cycle life performance than normal lead-acid batteries and less leakage of acid gas within cycle use. But, one issue with Gel Batteries that must be addressing is the charge profile. Gel type Batteries need to be recharged correctly or the battery will suffer premature failure.

VRLA (AGM) battery vs Gel Battery (Cont.)

AGM	Gel
VRLA, SLA, AGM design	VRLA, SLA, AGM, Gel type electrolyte
Conventional charging system	Requires stabilized, regulated charging system
Less expensive	Better cycle life
Maintenance free, non-spillable, may be mounted in most places, low self-discharge, safe for use in limited ventilation areas.	Maintenance free, non-spillable, may be mounted in most places, low self-discharge, safe for use in limited ventilation areas, less leakage of acid gas.
Can be designed to deliver a high burst of amps (if require).	Does not deliver high CCA; better suited for long duration discharges
Ability to dissipate heat	Excels in slow discharge rates and slightly higher ambient operating temperatures

VRLA (AGM) battery Overview

Specifications	AGM				GEL			
	VS	VT	HT		VSJ	VTJ	OPzV	
	2	12	2	12	2	12	2	12
								
Technology	Sealed, Maintainance Free, Valve Regulated	Sealed, Maintainance Free, Valve Regulated	Sealed, Maintainance Free, Valve Regulated (Specially Designed For High Temperature Environment)		Sealed, Maintainance Free, Valve Regulated	Sealed, Maintainance Free, Valve Regulated	Sealed, Maintainance Free, Valve Regulated (Specially Designed For Harsh Condition)	
Types of Plate	Flat	Flat	Flat		Flat	Flat	Tubular	
Monoblocks		√				√		
Single Cell	√		√		√		√	
Capacity Range (AH)	200AH - 3000AH	55AH - 190AH	80 - 1000AH		200AH - 3000AH	100AH - 200AH	200 - 800AH	
Designed Life	15 Years	15 Years	15 Years		15 Years	15 Years	15 Years	
Self Life	≤ 6% up to Six Months@25°C	≤ 9% up to Six Months@25°C	≤ 8% up to Six Months@25°C		≤ 6% up to Six Months@25°C	≤ 8% up to Six Months@25°C	≤ 9% up to Six Months@25°C	
Operating Temperature	Up to 35°C	Up to 35°C	Up to 45°C		Up to 45°C	Up to 45°C	Up to 50°C	
Terminal Type	M8 × Ø 20	FT 55 & FT57	M8 × Ø 20		M8 × Ø 20	FT 55 & FT57	M10 × Ø 20	
Warranty	2 Years	2 Years	3 Years		2 Years	2 Years	3 Years	

VS Series

VS Series batteries are latest AGM valve regulated technology, high purity raw and auxiliary material and several patent technology are adopted, the battery has long floating and cycle life, has high specific energy, low self-discharge rate and good low-high temperature endurance performance. National and international standards are complied, is the best reliable choice in wireless and fixed communication application field, meanwhile, could be widely used in data and TV signal transmission and EPS/UPS field etc.

Design Features

- Grid: Patent primary and secondary grid structure design.
- Positive Plate: Pasted type, high temperature and humidity 4BS solidity technology.
- Separator: High adsorptive and stable performance multi-hole super thin glass mat separator.
- Battery Container: High intension ABS (FV0 class is optional) container with good impact and shock endurance.
- Terminal Sealing: Patent multi-layer polarity post sealing technic.
- Valve: Patent labyrinth type, two-layer and explosion-proof acid filter valve.
- Terminal: Copper insert terminal structure design.

Product Feature

- Capacity Range (C10): 200Ah~3000Ah (25^0C)
- Nominal Voltage: 2V
- Design Floating Charge Service Life: 15 years for 2V battery (25^0C)
- Low Self Discharge Rate: ≤ 1 (per month) (25^0C)
- High Sealed Reaction Efficiency: ≥99%
- Tight Structure and High Specific Energy
- Wide operation temperature: 15^0C~40^0C

VS Series

Battery Model	Rated Voltage (V)	Rated Capacity (Ah, 25°C)	Dimension (mm)				Weight (kg)	Short Circuit Current (A)	Internal Resistance (mΩ,25°C)	Terminal Type
		C^{10} 1.80V/cell	L	W	H	TH				
VS200	2	200	98.5	174	348.5	357.5	13.5	3100	0.50	M8×φ20
VS300	2	300	171	151	334	344	20.7	3900	0.43	M8×φ20
VS400	2	400	211	175	334	344	27.6	4900	0.36	M8×φ20
VS500	2	500	243	174	335	345	33.5	5200	0.34	M8×φ20
VS600	2	600	302	177	334	334	41.0	5600	0.36	M8×φ20
VS800	2	800	410	175	334	334	55.0	7200	0.19	M8×φ20
VS1000	2	1000	478	175	334	334	67.0	8600	0.17	M8×φ20
VS1200	2	1200	346	310	335	357	82.0	9000	0.18	M8×φ18
VS1500	2	1500	401	351	340	350	102.0	11500	0.18	M8×φ18
VS2000	2	2000	490	350	340	350	131.0	13400	0.10	M8×φ18
VS3000	2	3000	710	353	340	350	200.0	20000	0.09	M8×φ18

Installation & Application

- Recommended Operating Temperature: 25°C
- Recommended Floating Voltage (at 25°C
- ambient temperature): VS series: 2.25V/Cell
- Battery could be installed in battery cabinet
- or rack for saving installation space.

Compliant Standards

- GB/T19638.2—2005
- YD/T799—2010
- DL/T637-1997
- JIS C8704-1:2006
- JIS C8704-2:2006
- Eurobat Guide
- Passed ISO9001, ISO14001 OHSAS18001, UL, CE and TLC certificate

Note: Internal resistance is tested in battery fully charged state at 25±5 deg.C ambient temperature. The test equipment is HIOKI-3551 made by Hioki in Japan.

VT Series

VT Series batteries are special designed front terminal battery for 19’ and 23’power supply cabinet, high Sn low Ca alloy, AGM valve regulated technology, high efficiency recombination theory are adopted, succeeded in battery sealing and free maintenance, the battery has long service life, including two types VTA and VTB.
Usually, 4 pcs batteries compose 48V system; positive and negative terminal and vent hole are on front. It is convenient for installation, maintenance and measurement, saving space.

Design Features

- Narrow Structure Design: Cells are arranged in 2*3 type, be good for heat dissipation.
- Positive/Negative Plate: Grid design, Good performance in large current discharge, thicker design, longer service life.
- Front terminal is convenient for installation connection and maintenance.
- Front Centralized Exhaust System: Battery internal gas could be vented to outdoor
- Terminal Protective Cover: Avoiding short circuit, inspection hole is available for voltage measurement.
- Separator: Particular thin and thick fiber matching AGM separator, enhance electrolyte adsorbed volume.

Product Feature

- Recommended Floating Voltage: 2.27V/cell (at 25^0C ambient temperature)
- Recommended Equalizing Voltage: 2.40V/cell (at 25^0Cambient temperature)
- The best installation method is vertical installation, terminal end and horizontal installation is not allowed.
- Batteries could be installed in battery cabinet or rack, and could be installed inside of the power supply equipment.
- Batteries could be floating and cycle used.

VT Series

Battery Model	Rated Voltage (V)	Rated Capacity (Ah, 25°C)	Dimension (mm)			Weight (kg)	Short Circuit Current (A)	Internal Resistance (mΩ,25°C)	Terminal Type
		C^{10} 1.80V/cell	L	W	H				
VTB 55	12	55	277	106	222.5	17	1412	8.5	FT-51
VTB 80	12	80	395	110	288	27.5	2300	5.2	FT-52
VTB 95	12	95	395	105	270	28.5	2500	4.8	FT-54
VTB100	12	100	395	110	288	32.0	2720	4.5	FT-57
VTB 105	12	105	508	110	238	35.4	2920	4.1	FT-54
VTB125	12	125	551	110	288	38.5	3000	4	FT-53
VTB150	12	150	551	110	288	44.5	3200	3.6	FT-57
VTA100	12	100	558	125	230	36.3	2650	4.8	FT-55
VTA125	12	125	558	125	270	45.2	3000	4	FT-55
VTA150	12	150	558	125	311	52.7	3200	3.6	FT-55
VTA175	12	175	558	125	311	54.0	3650	3.3	FT-55
VTA200	12	200	546	125	323.5	58.0	3750	4.1	FT-56

Installation & Application

- Capacity Range (C10): 55Ah~175Ah (25^{0}C)
- Nominal Voltage: 12V
- Low Self Discharge Rate: ≤ 1.5% month (25^{0}C)
- Good discharge performance at high discharge rate
- Long Design Life (25^{0}C): 12 years
- High sealed reaction efficiency: ≥98%
- Wide operation temperature range:15^{0}C~40^{0}C

Compliant Standards

- IEC60896-21/22:2004
- BS 6290-4:1997
- YD/T799-2010
- Eurobat Guide
- Passed ISO9001, ISO14001 OHSAS18001, UL, CE and TLC certificate

Note: Internal resistance is tested in battery fully charged state at 25±5 deg.C ambient temperature. The test equipment is HIOKI-3551 made by Hioki in Japan.

HT Series

HT Series VRLA battery uses advanced AGM technology which is designed for high temperature resistant performance with good cycle life and fast charging acceptance capability. can be used in the range of 35~50^{0}C environment. Suitable for high temperature environments for floating or cyclic applications, it can effectively reduce the energy consumption of air-conditioning.

Design Features

- Grid: Special grid structure design, muscle section area increased.
- Positive Plate: Adding imported 4BS crystal (average grain-size<1.5μm) positive active material of American Addenda Company to positive plate, making formation process evenly and ensuring battery's accordance and good cyclic performance.
- Negative Plate: Adopts anti-high temperature additive instead of traditional VRLA battery additive, meanwhile using different type carbon material, ensure battery has good charging acceptance, effectively avoid sulfation in the later period of battery cycling use.
- Separator: High adsorptive and stable performance multi-hole super thin glass mat separator
- Battery Container: Adopt high strengthen and anti-high temperature ABS material, the temperature endurance increased 10^{0}C more than normal ABS material.
- Valve: Patent labyrinth type, two-layer and explosion-proof acid filter valve.
- Terminal: Copper insert terminal structure design.

Product Feature

- Capacity Range (C20): 80Ah~1000Ah (25^{0}C) Self Discharge Rate: ≤2% (monthly 250C) for both 2V & 12V
- Design Life: 2V: 15 years (25^{0}C) & 12V: 12 years (25^{0}C)
- Operating Temperature Range: -20^{0}C~75^{0}C For both 2V & 12V

HT Series

Battery Model	Rated Voltage (V)	Rated Capacity (Ah, 25°C)	Dimension (mm)				Weight (kg)	Short Circuit Current (A)	Internal Resistance (mΩ,25°C)	Terminal Type
		C^{10} 1.80V/cell	L	W	H	TH				
HT-300	2	300	154	176	337	347	21.5	3900	0.34	M8×φ20
HT-400	2	400	201	177	337	347	29.0	5000	0.30	M8×φ20
HT-500	2	500	248	177	337	347	35.5	5500	0.28	M8×φ20
HT-600	2	620	296	178	337	347	43.0	6600	0.35	M8×φ20
HT-800	2	890	390	177	337	347	57.0	10000	0.15	M8×φ20
HT-1000	2	1000	484	177	337	347	71.0	11000	0.14	M8×φ20
HT-80	12	80	395	105	270	270	28.5	2500	0.48	FT-54
HT-100	12	100	558	125	230	230	37.5	2500	0.48	FT-55
HT-150	12	150	558	125	311	311	52.7	3200	0.36	FT-55

Installation & Application

- Recommended operation temperature: 15°C~40°C
- Recommended Floating Voltage (25°C): 2.25V/cell; equalizing charge voltage (25°C): 2.35V/cell
- Batteries could be installed on ground and platform in single tier and multitier.
- Batteries could be installed in battery cabinet or rack for saving installation space.

Compliant Standards

- GB/T 22473-2008
- JIS C8704-1:2006
- JIS C8704-2:2006
- IEC 60896-21/22: 2004
- IEC 61427-2005
- Eurobat Guide

Passed ISO9001, ISO14001 OHSAS18001 certificate

Note: Internal resistance is tested in battery fully charged state at 25±5 deg.C ambient temperature. The test equipment is HIOKI-3551 made by Hioki in Japan.

VSJ Series

VSJ Series advanced flat plate gel battery production technology originated from Germany, key raw material imported from Europe, key production equipment imported from Europe are adopted. Flat positive plate and pasted negative plate design, particular gel electrolyte confecting and filling technology ensure the battery service life. And battery has super long service life and high reliability, could be used in rigorous low-high temperature.

Design Features

- Long Service Life: Patented long life Alloy having the lowest calcium levels in the industry minimizing grid growth, Low density of gel electrolyte decelerates corrosion of plate grids.
- Gel Electrolyte: Extra electrolyte design ensures gel electrolyte is full of the plates, separators, and containers, perfect heat dispersion, prevents thermal runaway caused by water loss, and the plate-coating gelatin protects active materials from shedding off.
- Special Separator: AMERSIL PVC-SiO2 micro porous separator ensures low internal resistance, high porosity, intense absorption of gel electrolyte and long cyclic life.
- Patented Relief Valve: Multi-fold vent system, comprised of proprietary and flash arrester, minimizes bulging and prevents flashback explosion from external ignition source.

Product Feature

- Capacity Range (C10): 200Ah~2000Ah (25^0C)
- Self Discharge Rate: ≤1% (Monthly 25^0C)
- Design Life: 2V: 12 years (25^0C)
- Operating Temperature Range: -20^0C~50^0C, can be used in 35~40^0C environment for a long time.

Application

- Communication base station standby power
- Data center standby power
- Private network standby power
- Data transmission and TV signal transmission
- EPS/UPS
- Wind, solar energy and wind/hybrid power system
- Cycle use

VSJ Series

Battery Model	Rated Voltage (V)	Rated Capacity	Dimension (mm)				Weight (kg)	Short Circuit Current (A)	Internal Resistance (mΩ,25°C)	Terminal Type
		C_{10} (AH)	L	W	H	TH				
VSJ-200	2	200	171	107	334	344	14.8	2800	0.68	M8×φ20
VSJ-300	2	300	171	151	334	344	21.3	3600	0.54	M8×φ20
VSJ-400	2	400	211	175	334	344	30	4350	0.45	M8×φ20
VSJ-500	2	500	243	174	334	344	35.5	5020	0.39	M8×φ20
VSJ-600	2	600	302	177	334	344	44	5860	0.33	M8×φ20
VSJ-800	2	800	410	175	334	344	60	6900	0.28	M8×φ20
VSJ-1000	2	1000	478	175	334	344	71	8000	0.24	M8×φ20
VSJ-1200	2	1200	346	310	335	357	85.5	9600	0.165	M8×φ18
VSJ-1500	2	1500	401	351	340	350	107	12000	0.184	M8×φ18
VSJ-2000	2	2000	490	350	340	350	140	16000	0.12	M8×φ18

Compliance Standard

- EC60896-21/22:004
- IEC61427-2005
- DIN43539-T5
- DIN40742:1999
- BSEN61427-2002
- YD/T1360-2005
- GB/T 22473-2008
- Eurobat Guide

  Passed ISO9001, ISO14001
  OHSAS18001, UL and Certificate

Note: Internal resistance is tested in battery fully charged state at 25±5 deg.C ambient temperature. The test equipment is HIOKI-3551 made by Hioki in Japan.

VTJ Series

VTJ Series advanced flat gel battery production technology originated from Germany, key raw material imported from Europe, key production equipment imported from Europe are adopted. Sufficient liquid design, thick plate technology and particular gel electrolyte confecting and filling technology assure of batteries' service life, the battery has super long service life and high reliability, could be used in rigorous low-high temperature, bad electric power condition. Narrow structure, positive and negative terminal and vent hole on the front of battery, it is convenient for installation, maintenance and measurement, saving space, central exhaust system could make battery internal gas vented to outdoor, enhance system's safety and reliability.

Design Features

- Narrow Structure Design: Cells are arranged in 2*3 type, be good for heat dissipation.
- Front terminal is convenient for installation connection and maintenance.
- Electrolyte: In gel state, no delamination, good cycle performance low density good for floating charge life.
- Gel Additive: Gas phase SiO2 imported from Germany, good dispersity performance, good stability.
- Plate: Radial grid design, pasted active substance, good large current discharge performance.
- Separator: PVC-SiO2 separator imported from Europe, low internal resistance, high hole rate, long life.
- Battery Case: Container and lid are thicker design, made of impact and shock proof ABS material, no leakage, bulge and etc danger, safe and reliable.

Product Feature

- Capacity Range (C20): 100Ah~200Ah (25^0C)
- Nominal Voltage: 12V
- Design Floating Charge Service Life:10 years at 25^0C±5^0C ambient temperature
- Self-Discharge Rate: ≤2%/month (25^0C)
- High recharge efficiency, save time and energy
- Operation Temperature: 20^0C~45^0C

VTJ Series

Battery Model	Rated Voltage (V)	Rated Capacity (Ah, 25°C)		Dimension (mm)			Weight (kg)	Short Circuit Current (A)	Internal Resistance (mΩ,25°C)	Terminal Type
		C_{10} 1.80V/cell	C_{20} 1.75V/cell	L	W	H				
VTJ-100-A	12	90	100	558	125	230	36.3	2100	4.80	FT-55
VTJ-100-B	12	90	100	395	110	288	33.8	2100	5.50	FT-57
VTJ-125-A	12	113	125	558	125	270	45.7	2500	4.37	FT-55
VTJ-150-B	12	135	142	551	110	288	45.0	2700	4.33	FT-57
VTJ-150-A	12	135	150	546	125	311	53.7	3000	4.33	FT-54

Installation & Application

- Recommended Floating Charge Voltage: 2.23V/cell (250C)
- Recommended Equality Charge Voltage: 2.23V/cell (250C)
- The best installation method is vertical installation, terminal end and horizontal installation is not allowed.
- Batteries cabinet or rack could be used, or could be installed inside the power supply equipment.

Compliant Standards

- IEC60896-21/22:2004
- DIN43539-T5
- YD/T1360-2005
- Eurobat Guide
  Passed ISO9001, ISO14001
  OHSAS18001, UL, CE certificate

Note: Internal resistance is tested in battery fully charged state at 25±5 deg.C ambient temperature. The test equipment is HIOKI-3551 made by Hioki in Japan.

OPzV Series

OPzV Series advanced tubular plate gel battery production technology originated from Germany, key raw material imported from Europe, key production equipment imported from Europe are adopted. Tubular positive plate and pasted negative plate design, particular gel electrolyte confecting and filling technology ensure the battery service life. And battery has super long service life and high reliability, could be used in rigorous low-high temperature, bad electric power condition.

Design Features

- Plate: Tubular type for positive plate, active substance break off is avoided. Framework is die-casted with multi-element alloy.
- Gel Electrolyte: Main material is made of gas phase SiO2 imported from Germany, Sufficient electrolyte design could insure battery could not be dry up in condition of high temperature and over charged, thermal capacity is large, heat dissipation is good, and thermo runaway will not be happen.
- Separator: Particular micro pore PVC-SiO2 separator imported from Europe.
- Gel Tight Surrounding Plate Sets: Active substance break off is avoided.
- Battery Case: Battery container and lid are thick with good impact resistance and shock proof ABS material, in transportation and operation, no leakage and bulge will occur.

Product Feature

- Capacity Range (C10): 150Ah~3000Ah(25^{0}C) for 2V & 50Ah~150AH for 12V
- Nominal Voltage: 2V, 12V
- Design Floating Charge Service Life: 18 years for 2V battery, 18 years for 2V battery
- Cycle Life: 5500 times at 25% DOD at standard application condition
- Self-Discharge Rate: ≤3% /month (25^{0}C)
- Operation Temperature:-25^{0}C~60^{0}C
- Storage Life: After fully charged, the battery can be storage after about 2 years at 25^{0}C temperature, the left capacity still more than 50%, and the battery capacity could reach to 100% rated capacity after recharged.

OPzV Series

Battery Model	Rated Voltage (V)	Rated Capacity (Ah, 25°C)	Dimension (mm)				Weight (kg)	Short Circuit Current (A)	Internal Resistance (mΩ,25°C)	Terminal Type
		C^{10} 1.80V/cell	L	W	H	TH				
OPzV300	2	300	145	206	352.5	385	25.5	2999	0.60	M8×φ20
OPzV420	2	420	145	206	471	503.5	33.5	3658	0.55	M8×φ20
OPzV490	2	490	166	206	471	503.5	38.0	4268	0.50	M8×φ20
OPzV500	2	500	166	206	471	503.5	38.0	4268	0.50	M8×φ20
OPzV600	2	600	145	206	646	678.5	46.5	4606	0.45	M8×φ20
OPzV50	12	50	272	205	335	365	33.5	500	0.13	M6×φ18
OPzV100	12	100	272	205	335	365	52.5	1000	0.72	M6×φ18
OPzV150	12	150	380	205	335	365	73.5	1500	6.2	M6×φ18

Installation & Application

- Recommended Floating Charge Voltage: 2.23~2.27V/Cell (25°C)
- Recommended Equality Charge Voltage: (2.23~2.37V/Cell (25°C)
- The best installation method is vertical installation, terminal end and horizontal installation is not allowed. Batteries could be installed in battery cabinet or rack for saving installation space.

Compliant Standards

- GB/T19638.2—2005
- YD/T799—2010
- DL/T637-1997
- JIS C8704-1:2006
- JIS C8704-2:2006
- Eurobat Guide
- Passed ISO9001, ISO14001 OHSAS18001, UL, CE and TLC certificate

Note: Internal resistance is tested in battery fully charged state at 25±5 deg.C ambient temperature. The test equipment is HIOKI-3551 made by Hioki in Japan.

Recommendation

BTS Site Power Solution with Rahimafrooz VRLA Battery

Power Supply Type	Quantity of The Power Line	Charging Sources	Frequency of Power Failure (per day)	Power Failure (each time)	Recommended Rahimafrooz VRLA Batteries
Type-1	Two Power Line	Grid Power	≤ 1 time	≤ 0.5h	Any Type Rahimafrooz VRLA (AGM, GEL or HT)
Type-2	One or Two Power Line	Grid Power	≤ 3.5 time	≤ 6h	AGM-VS Series (2V), HT Series (2V & 12V), Tubular GEL-OPzV Series (2V & 12V), Flat GEL-VTJ Series (12V),
Type-3	One Power Line	Grid Power is Main & Gen-Set is Back up	≤ 4.5 time	≤ 8h	Tubular GEL- OPzV Series (2V & 12V), Flat GEL-VSJ Series (2V) & VTJ Series (12V), HT Series (2V & 12V)
Type-4	One Power Line	PV, Genset, Unstable Grid Power /No Grid Power	≥ 5 time	> 8h	Tubular GEL-OPzV Series(2V & 12V), Flat GEL-VSJ Series(2V), HT Series(2V & 12V)

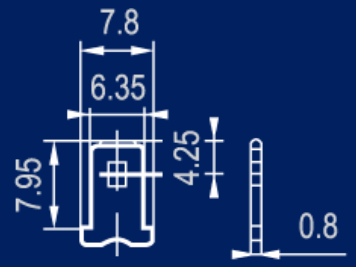
Recommendation

Relative Advantages of Different Technology

Battery Type	Cycle Life	PSOC	Space Saving	Safety	Efficiency
Tubular Gel	***	***	**	***	***
Flat Gel	**	*	*	**	**
HT Series	***	***	**	***	***
Conventional AGM	*	*	*	**	***

***High **Medium *Low

Terminal Type (unit : mm)



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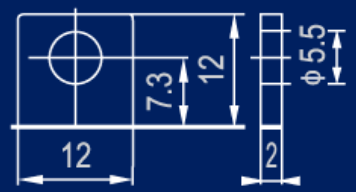
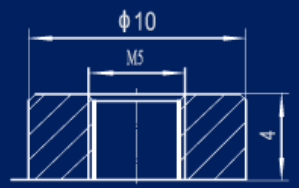
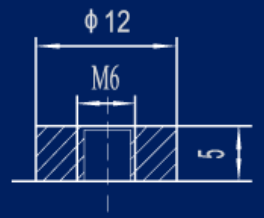


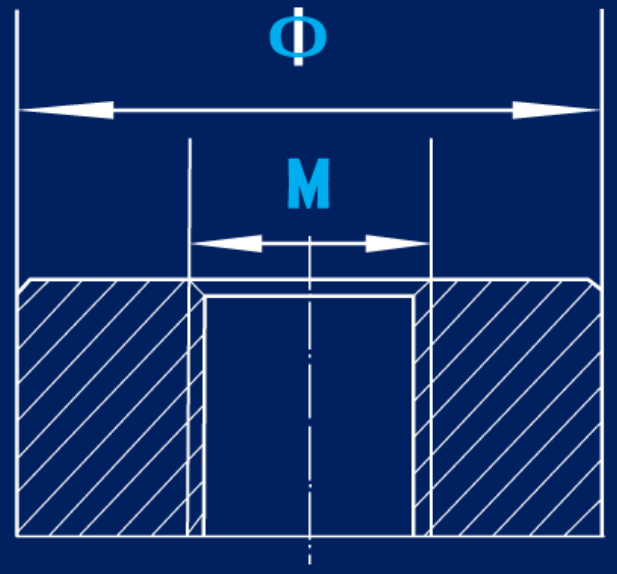
SP-11

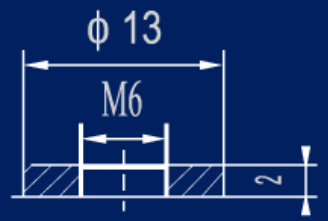


SP-20

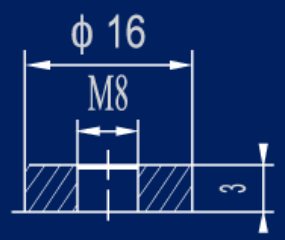


SP-21

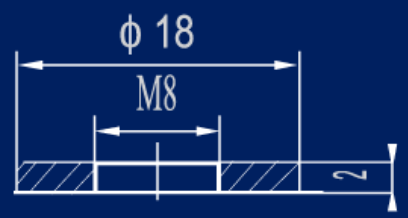




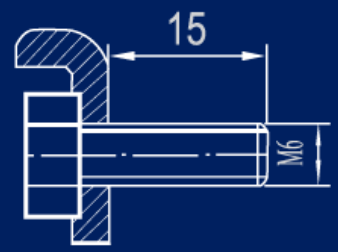
FT-51



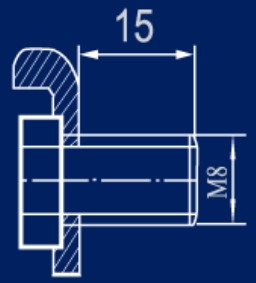
FT-52



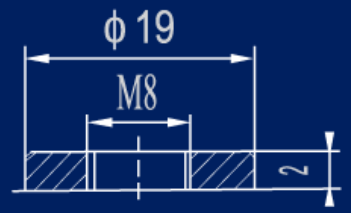
FT-53



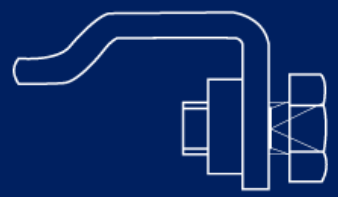
FT-54



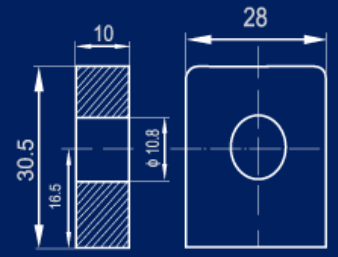
FT-55



FT-56



FT-57



GFM-12

M 5 x φ 8	M 5 = 5 m m	φ 8 = 8 m m
M5xφ10	M 5 = 5 m m	φ10=10mm
M6xφ12	M 6 = 6 m m	φ12=12mm
M6xφ13	M 6 = 6 m m	φ13=13mm
M6xφ14	M 6 = 6 m m	φ14=14mm
M6xφ16	M 6 = 6 m m	φ16=16mm
M6xφ16	M 6 = 6 m m	φ16=16mm
M8xφ17	M 8 = 8 m m	φ17=17mm
M8xφ18	M 8 = 8 m m	φ18=18mm
M8xφ19	M 8 = 8 m m	φ19=19mm
M8xφ20	M 8 = 8 m m	φ20=20mm
M10xφ20	M10=10mm	φ20=20mm
M10φ24	M10=10mm	φ24=24mm