

World NO.1 to The Only One

VITZRO CELL

Since 1987

The Core of Smart Weaponry System

AMPOULE RESERVE BATTERY



THERMAL RESERVE BATTERY



WHO ARE WE ?

“ Vitzrocell , a world class portable power solution provider ”

Vitzrocell Co.,Ltd. established in **1987**, has been manufacturing and providing **Lithium Primary Battery** all over the world for more than 30 years.

Especially, our lithium based **Ampoule and Thermal reserve batteries** have been recognized as the most optimized solutions for various defense applications such as electronic fuzes, guided missiles, smart bombs, ammunitions, rockets, decoys and torpedoes, etc.

As proven in the field tests and real missions over 20 years, we guarantee **the highest level of reliability** and quality of our products in the defense applications based on long-term accumulated expertise equipped with ISO9001, ISO14001, DQMS(Defense Quality Management System) certified, automatic and vertically integrated production / qualification facilities, superb technical supports and on-time delivery.

OUR PAST, PRESENT AND FUTURE

1987 – 1999	1987.	Founded the company
	1988.	Technical Alliance with Wilson Great batch for Lithium Battery
	1993.	Nominated as a Sole Manufacturer for Korean Military
	1996.	Acquired UN certification
	1998.	Acquired ISO 9001 Quality Certification
2000 – 2009	2002.	Changed Company Name to Vitzrocell from Teckraf
	2004.	Granted a prize of USD 10 million export
	2005.	Awarded “Advance Technology and R&D Center(ATC)”
	2006.	Acquired Environment System Certification (ISO 14001)
	2007.	Acquired Defense Quality Management System Certification
	2009.	Vitzrocell listed on KOSDAQ (Go public)
2010 – 2019	2010.	Granted a prize of USD 20 million export
	2012.	Acquisition of Exium Technologies.,Inc for high temperature battery business
	2013.	Granted a prize of USD 30 million export
	2014.	Granted a prize of USD 50 million export
	2015.	Changed Company Name to Vitzrocell USA from Exium Technologies.,Inc
	2018.	The Grand opening of Dangjin Smart Campus
	2018.	ISO9001, ISO14001, ATEX Certificated
	2019.	DQMS(Defense Quality Management System) Certificated
	2019.	Granted a prize of USD 70 million export
2020 – 2021		(Expected) a prize of USD 100 million export

WHY VITZROCELL?



- \\ Fully automatic and vertically integrated production line
- \\ **Over 30 years knowhow and technology**
- \\ World's best and the largest Reliability Test Center
- \\ Optimized and customized full ranges of product line-up

01 SAFETY

- \\ **The world safest factory (Smart Campus)**
- \\ Hermetic glass-to-metal seal engineered for leak free operation
- \\ Proven in the harsh environment tests and qualified by a number of global defense companies and related institutions.

02 (TECHNICAL) SERVICES

- \\ Test capability(180 Chambers/10,000 Discharge channels /Torsional shock & Vibration/3D X Ray Analysis)
- \\ **Customized Technical seminar**
- \\ On-site engineering support for customer application

03 QUALITY

- \\ **World's best and the largest Reliability Test Center**
- \\ Fully automated and vertically integrated production line
- \\ ISO9001/14001/MSDS/RoHS/DQMS Certificated
- \\ ATEX (Atmosphere Explosibles) Certificated

LITHIUM BASED

AMPOULE RESERVE BATTERY



APPLICATIONS

ELECTRONIC FUZE SYSTEMS

- \ Calibers
- \ Naval/Artillery Gun
- \ MLRS(Multiple Launch Rocket System)
- \ RAAMS(Remote Anti-Armor Mine System)

ADVANTAGES

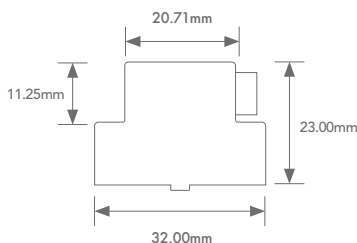
- \ Lithium based technology
- \ High level of reliability
- \ **More than 15 years of shelf life**
- \ **Wide operating temperature range(-43°C ~ +63°C)**
- \ Customized design
- \ Short activation time
- \ No self-discharge

AMPOULE BATTERY LINE-UP

Model	Model No.	Size [mm]	Open Voltage [V]	Functional Time	Operating Temperature [°C]	Shelf Time [Year]	Activation Mechanism
Medium size Ampoule Battery	R32G15-10 [VCG152S10-00]	Ø32×H23	7V(2S) ~ 36V(10S)	≥200s, @200mA	-43°C ~ 63°C	Over 15years	Gun launch
	R32H50-10 [VCG502S10-00]	Ø32×H23	7V(2S) ~ 36V(10S)	≥200s, @200mA	-43°C ~ 63°C	Over 15years	Gun launch
	R32G15-42/32/22	Ø32×H23	14V (4S×2P)~ 7V (2S×2P)	≥200s @400mA	-43°C ~ 63°C	Over 15years	Gun launch
	R32H50-42/32/22	Ø32×H23	14V (4S×2P)~ 7V (2S×2P)	≥200s @400mA	-43°C ~ 63°C	Over 15years	Gun launch
	R27H50-06	Ø27×H18	7V(2S) ~ 36V(10S)	≥200s, @50mA	-43°C ~ 63°C	Over 15years	Gun launch
Small size Ampoule Battery	R12X21-01 [VCP-AP1221-00]	Ø12.8×H21.3	3.6	≥240hr, @6.6kΩ, 2.5V	-43°C ~ 63°C	Over 15years	Stab / Primer initiated
Subminiature size Ampoule Battery	R05X05-01 [VCS-GW0505-00]	Ø5.6×H5.5	3.6	≥180s, @6.8kΩ, 2.7V	-43°C ~ 63°C	Over 15years	Stab initiated
	R05X07-01	Ø5.6×H7.15	3.6	≥120hrs, @150kΩ, 2.7V	-43°C ~ 63°C	Over 15years	Stab initiated

MEDIUM SIZE

AMPOULE RESERVE BATTERY

R32G15-10**[VCG152S10-00]***** R32G15-00**: Number of the stacks
(ex. 2S > R32G15-02)*** R32H50-00**: Number of the stacks
(ex. 4S > R32H50-04)

Stacking Structure Serial type (2 ~ 10Serials)

Dimension (mm) $\varnothing 32 \times H23$ (Medium Size)

Open Voltage (V) 7V (2S) ~ 36V (10S)

Discharge Condition $\leq 200\text{mA}$ Activation Time(s) $\leq 400\text{ms}$, @100mA

Stacks	2S	3S	4S	5S	6S	7S	8S	9S	10S
Voltage	4V	6V	8V	10V	12V	14V	16V	20V	20V

Functional Time, Capacity $\geq 200\text{s}$, @100mA

Stacks	2S	3S	4S	5S	6S	7S	8S	9S	10S
Voltage (cut-off)	4.5V	7.5V	10V	12V	15V	17V	20V	25V	25V

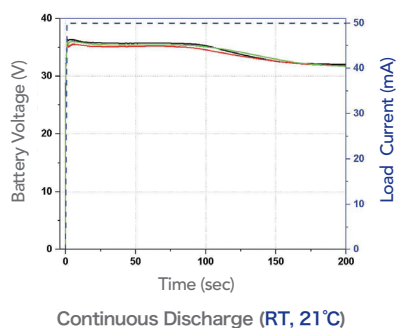
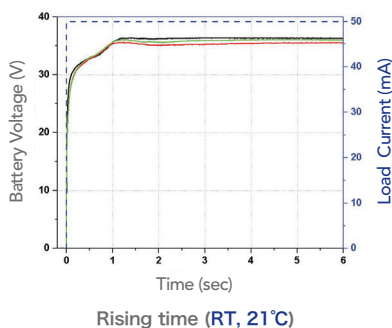
Weight (gram) ≤ 43 Activation Acceleration (G) $\geq 1,500\text{G}$

Rotation Speed (Max) 30,000rpm

Typical Shelf Life Over 15years

Operating Temperature $-43^\circ\text{C} \sim +63^\circ\text{C}$ Storage Temperature $-54^\circ\text{C} \sim +71^\circ\text{C}$ Electrochemistry Li/SOCl_2

Activation Mechanism Gun launch

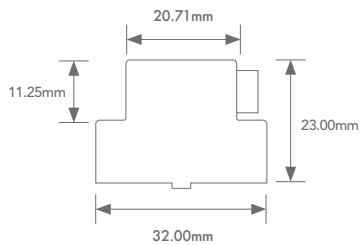
Typical Application Naval/ Artillery Gun
(76,127,105,155mm Shell)

MEDIUM SIZE

AMPOULE RESERVE BATTERY

R32H50-10

[VCG502S10-00]



* **R32G15-00**
: Number of the stacks
(ex. 2S > R32G15-02)

* **R32H50-00**
: Number of the stacks
(ex. 4S > R32H50-04)

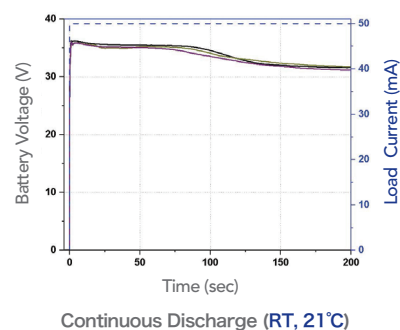
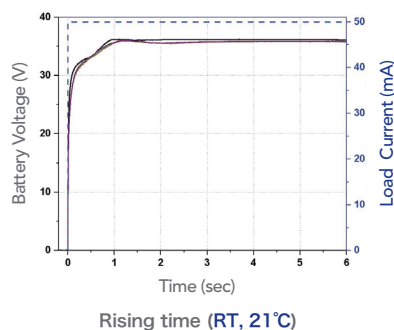
Stacking Structure Serial type (2 ~ 10Serials)
Dimension (mm) $\varnothing 32 \times H23$ (Medium Size)
Open Voltage (V) 7V (2S) ~ 36V (10S)
Discharge Condition $\leq 200\text{mA}$
Activation Time(s) $\leq 400\text{ms}$, @100mA

Stacks	2S	3S	4S	5S	6S	7S	8S	9S	10S
Voltage	4V	6V	8V	10V	12V	14V	16V	20V	20V

Functional Time, Capacity $\geq 200\text{s}$, @100mA

Stacks	2S	3S	4S	5S	6S	7S	8S	9S	10S
Voltage (cut-off)	4.5V	7.5V	10V	12V	15V	17V	20V	25V	25V

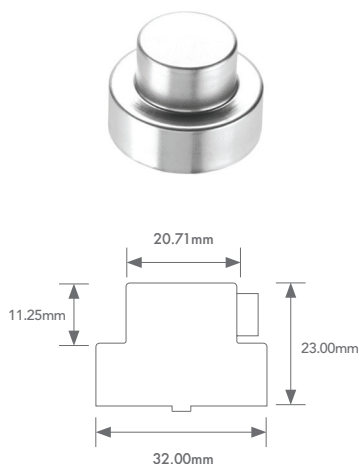
Weight (gram) ≤ 40
Activation Acceleration (G) $\geq 5,000\text{G}$
Rotation Speed (Max) 30,000rpm
Typical Shelf Life Over 15years
Operating Temperature $-43^{\circ}\text{C} \sim +63^{\circ}\text{C}$
Storage Temperature $-54^{\circ}\text{C} \sim +71^{\circ}\text{C}$
Electrochemistry Li/SOCl_2
Activation Mechanism Gun launch
Typical Application Naval/ Artillery Gun
(76,127,105,155mm Shell)



MEDIUM SIZE

AMPOULE RESERVE BATTERY

R32G15-42/32/22



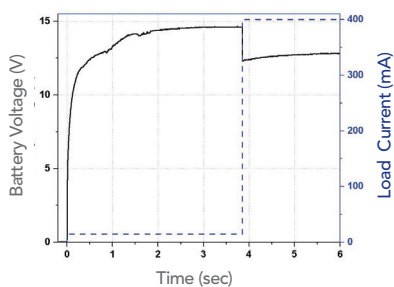
* R32G15-00

: Number of the stacks
(ex. 2S × 2P > R32G15-22)

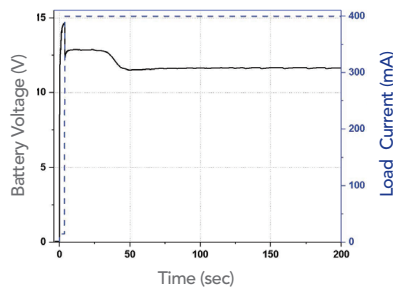
* R32H50-00

: Number of the stacks
(ex. 4S × 2P > R32H50-42)

Stacking Structure	Parallel type (4Serials × 2Parallels) (3Serials × 2Parallels) (2Serials × 2Parallels)
Dimension (mm)	Ø32 × H23 (Medium Size)
Open Voltage (V)	14.4V(4S × 2P)
Discharge Condition	≤400mA
Activation Time(s)	≤500ms, @400mA(4S × 2P)
Functional Time, Capacity	≥200s @400mA
Weight (gram)	≤43
Activation Acceleration (G)	≥1,500G
Rotation Speed (Max)	30,000rpm
Typical Shelf Life	Over 15years
Operating Temperature	-43°C ~ +63°C
Storage Temperature	-54°C ~ +71°C
Electrochemistry	Li/SOCl ₂
Activation Mechanism	Gun launch
Typical Application	Naval/ Artillery Gun (76,127,105,155mm Shell)



Rising time (RT, 21°C) [4S × 2P]

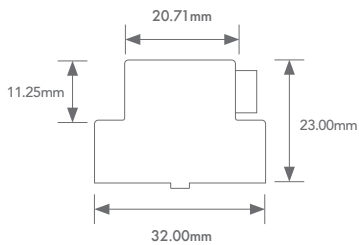


Continuous Discharge (RT, 21°C) [4S × 2P]

MEDIUM SIZE

AMPOULE RESERVE BATTERY

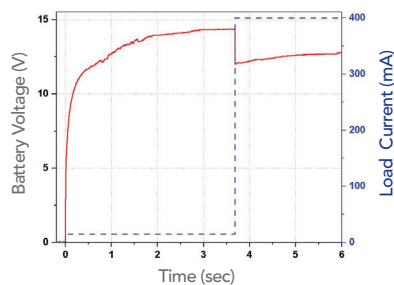
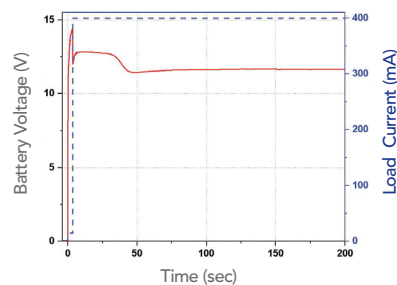
R32H50-42/32/22



* **R32G15-00**
: Number of the stacks
(ex. $2S \times 2P > R32G15-22$)

* **R32H50-00**
: Number of the stacks
(ex. $4S \times 2P > R32H50-42$)

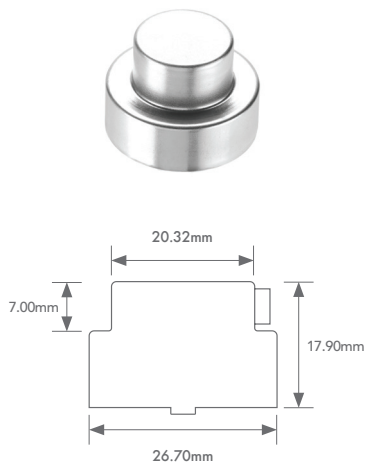
Stacking Structure	Parallel type (4Serials $\times$ 2Parallels) (3Serials $\times$ 2Parallels) (2Serials $\times$ 2Parallels)
Dimension (mm)	$\varnothing 32 \times H23$ (Medium Size)
Open Voltage (V)	14.4V(4S $\times$ 2P)
Discharge Condition	$\leq 400mA$
Activation Time(s)	$\leq 500ms$, @400mA(4S $\times$ 2P)
Functional Time, Capacity	$\geq 200s$ @400mA
Weight (gram)	≤ 40
Activation Acceleration (G)	$\geq 5,000G$
Rotation Speed (Max)	30,000rpm
Typical Shelf Life	Over 15years
Operating Temperature	$-43^{\circ}C \sim +63^{\circ}C$
Storage Temperature	$-54^{\circ}C \sim +71^{\circ}C$
Electrochemistry	Li/SOCl ₂
Activation Mechanism	Gun launch
Typical Application	Naval/ Artillery Gun (76,127,105,155mm Shell)

Rising time (RT, 21°C) [4S $\times$ 2P]Continuous Discharge (RT, 21°C) [4S $\times$ 2P]

MEDIUM SIZE

AMPOULE RESERVE BATTERY

R27H50-06



Stacking Structure Serial type (2 ~ 10Serials)

Dimension (mm) $\varnothing 27 \times H18$ (Medium Size)

Open Voltage (V) 7V (2S) ~ 36V (10S)

Discharge Condition $\leq 200\text{mA}$ Activation Time(s) $\leq 400\text{ms}$, @50mA

Stacks	2S	3S	4S	5S	6S	7S	8S	9S	10S
Voltage	4V	6V	8V	10V	12V	14V	16V	20V	20V

Functional Time, Capacity $\geq 150\text{s}$, @50mA

Stacks	2S	3S	4S	5S	6S	7S	8S	9S	10S
Voltage (cut-off)	4.5V	7.5V	10V	12V	15V	17V	20V	25V	25V

Weight (gram) ≤ 20 Activation Acceleration (G) $\geq 5,000\text{G}$

Rotation Speed (Max) 30,000rpm

Typical Shelf Life Over 15years

Operating Temperature $-43^{\circ}\text{C} \sim +63^{\circ}\text{C}$ Storage Temperature $-54^{\circ}\text{C} \sim +71^{\circ}\text{C}$ Electrochemistry Li/SOCl_2

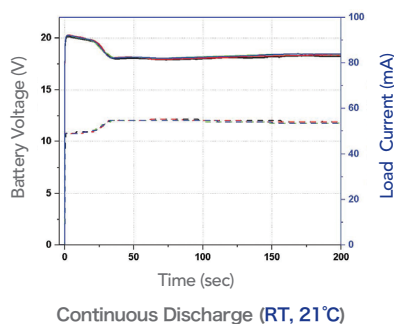
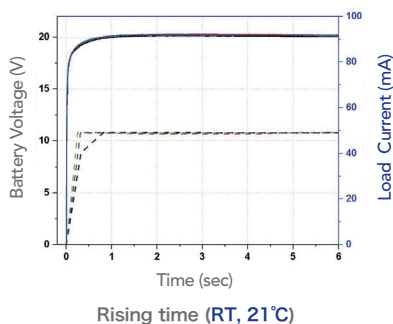
Activation Mechanism Gun launch

Typical Application Naval/ Artillery Gun
(40,76mm Shell)

* R27H50-00

: Number of the stacks

(ex.6S > R27H50-06)

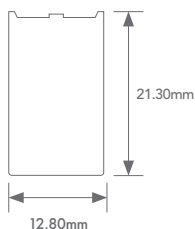


SMALL SIZE

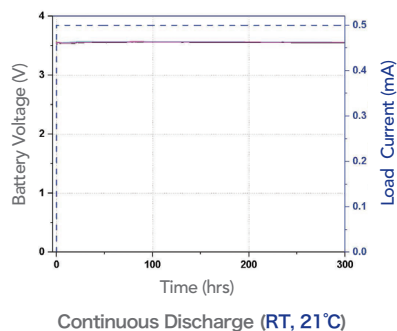
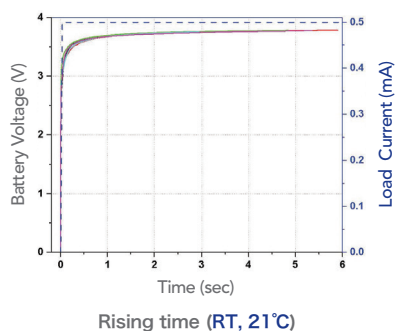
AMPOULE RESERVE BATTERY

R12X21-01

[VCP-AP1221-00]



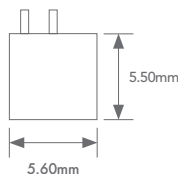
Stacking Structure	Single cell
Dimension (mm)	Ø12.8×H21.3 (Small Size)
Open Voltage (V)	3.6
Discharge Condition	6.6kΩ
Activation Time(s)	≤500ms, @6.6kΩ, 2.5V
Functional Time, Capacity	≥240hr, @6.6kΩ, 2.5V
Weight (gram)	≤6.5
Activation Acceleration (G)	>10,000G
Shock Resistance	≤10,000G
Typical Shelf Life	Over 15years
Operating Temperature	-43 °C ~ +63°C
Storage Temperature	-54°C ~ +71°C
Electrochemistry	Li/SOCl ₂
Activation Mechanism	Stab / Primer initiated
Typical Application	"155mm RAAMS (Remote Anti-Armor Mine System)"



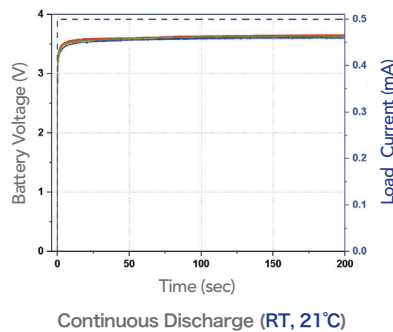
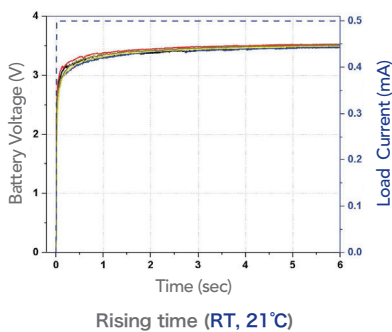
SUBMINIATURE SIZE

AMPOULE RESERVE BATTERY

R05X05-01
[VCS-GW0505-00]



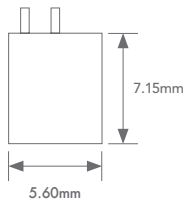
Stacking Structure	Single cell
Dimension (mm)	Ø5.6×H5.5 (Subminiature Size)
Open Voltage (V)	3.6
Discharge Condition	6.8kΩ ~ 150kΩ
Activation Time(s)	≤1s, @6.8kΩ, 2.7V (at ≥+20°C) ≤5s, @6.8kΩ, 2.7V (at -40°C)
Functional Time, Capacity	≥180s, @6.8kΩ, 2.7V
Weight (gram)	0.7
Shock Resistance	≤10,000G
Typical Shelf Life	Over 15years
Operating Temperature	-43°C ~ +63°C
Storage Temperature	-54°C ~ +71°C
Electrochemistry	Li/SOCl ₂
Activation Mechanism	Stab initiated
Typical Application	Sub-munition (MLRS, etc)



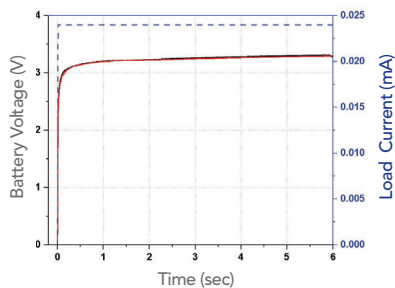
SUBMINIATURE SIZE

AMPOULE RESERVE BATTERY

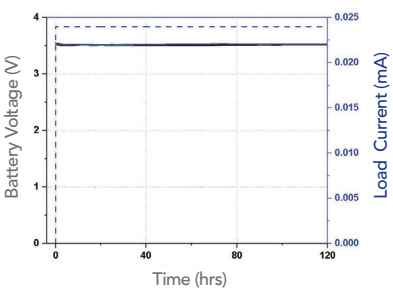
R05X07-01



Stacking Structure	Single cell
Dimension (mm)	Ø5.6×H7.15 (Subminiature Size)
Open Voltage (V)	3.6
Discharge Condition	6.8kΩ ~ 150kΩ
Activation Time(s)	≤1s, @150kΩ, 2.7V (at ≥+20°C) ≤5s, @150kΩ, 2.7V (at. -40°C)
Functional Time, Capacity	≥120hrs, @150kΩ, 2.7V
Weight (gram)	0.9
Shock Resistance	≤20,000G
Typical Shelf Life	Over 15years
Operating Temperature	-43°C ~ +63°C
Storage Temperature	-54°C ~ +71°C
Electrochemistry	Li/SOCl ₂
Activation Mechanism	Stab initiated
Typical Application	Sub-munition (MLRS, etc)



Rising time (RT, 21°C)



Continuous Discharge (RT, 21°C)

MEMO



ELECTRIC IGNITER BASED

THERMAL RESERVE BATTERY



APPLICATIONS

- \\ Guided Missiles
- \\ Projectiles
- \\ Rockets
- \\ Bombs
- \\ Mines
- \\ Decoys
- \\ Jammers
- \\ Torpedoes
- \\ Space Exploration Systems
- \\ Emergency Escape Systems

ADVANTAGES

- \\ High energy density
- \\ High level of reliability
- \\ **Wide operating temperature range(-54°C to +75°C)**
- \\ **More than 15 years of shelf life**
- \\ Customized design
- \\ No self-discharge
- \\ Wide range of voltage
- \\ Fast activation time

ELECTRIC IGNITER BASED

THERMAL RESERVE BATTERY

THERMAL BATTERY LINE-UP

Model	Size[mm]	Voltage [V]	Current [A]	Activation Time [s]	Functional Life Time [s]	Weight [g]
VT-2010	Φ63.5 X h70.0	26 ~ 34	12A (base) / 20A (peak)	≤0.7	≥100	≤700
VT-PSAO	Φ57.8 X h44.8	18.5 ~ 24	10A (base) / 11A (peak)	≤0.4	≥19	≤340
VT-PSBO	Φ57.0 X h70.0	18.5 ~ 24	6A (base) / 11A (peak)	≤0.5	≥45	≤460
VT-MSIO	Φ63.5 X h74.5	26 ~ 34	2A (base) / 20A (peak)	≤0.6	≥100	≤760
VT-MSMO	Φ63.5 X h125.0	26 ~ 34	25A (base) / 30A (peak)	≤0.7	≥100	≤1,200
VT-MSSO	Φ63.5 X h125.0	50 ~ 64	10A (base) / 20A (peak)	≤0.7	≥100	≤1,230
VT-MSAO	Φ63.5 X h180.0	110 ~ 150	10A (base)	≤0.75	≥100	≤1,560
VT-SASO	Φ38.1 X h160.0	50 ~ 64	15A 0.1s / 20A 0.1s Pulse	≤0.8	≥40	≤550
VT-SAMO	Φ50.0 X h105.0	24 ~ 34	22A 0.005s / 30A 0.005s Pulse	≤0.8	≥40	≤660
VT-SAAO	Φ38.1 X h160.0	50 ~ 64	15A 0.1s / 20A 0.1s pulse	≤0.8	≥40	≤610
VT-FZBO	Φ22.3 X h44.0	24 ~ 34	100mA (base) / 500mA (peak)	≤0.6	≥25	≤60
VT-2031	Φ63.5 X 128.0	25 ~ 34	50A (base)	≤1.0	≥40	≤1,230
VT-2050	Φ38.1 X h95.0	26 ~ 36	5.5A / 7.5A 1Hz	≤0.6	≥30	≤360
VT-LGR01	Φ44.0 X h52.0	24 ~ 32	5 ~ 9A	≤0.4	≥35	≤230
VT-FBAO	Φ48.0 X h68.0	22 ~ 34	9A 0.98s / 11A 0.02s pulse	≤1.0	≥100	≤450
VT-FBA1	Φ48.0 X h68.0	22 ~ 32	9A 0.98s / 11A 0.02s pulse	≤1.0	≥100	≤450
VT-FBBO	Φ110.0 X h130.5	22 ~ 34	12.7A (base) / 26.5A(peak)	≤2.8	≥700	≤4,000

ELECTRIC IGNITER BASED

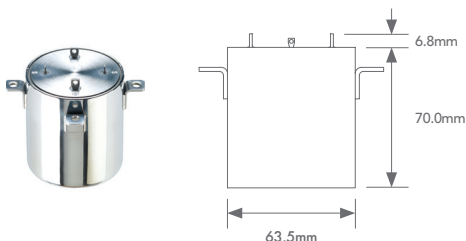
THERMAL RESERVE BATTERY

Vibration	Shock	Acceleration [G]	Operational Temperature[°C]	Activation Mechanism
20 ~ 2,000Hz : 0.05g ² /Hz	Sawtooth wave / 200g, 6ms	X axis 60g / Z axis 30g	-42 ~ +71	Electric Igniter
0.06 inch-double amplitude 10 ~ 70Hz, 15g peak 71 ~ 2,000Hz or 4hours axis	3 times sawtooth / Half-sine 350g peak, 3msec	65g	-40 ~ +60	Electric Igniter
5-2000Hz 36min, 0.2inch 5-14Hz, 2g, 14-33Hz 0.036inch, 33-55Hz, 5g, 52-2000Hz	40g, 11ms	N/A	-40 ~ +71	Shock Igniter
9.08grms, 0.05g ² /Hz @ 20~2,000Hz	200g, 5ms	Axial 30g / Lateral 60g	-32 ~ +75	Electric Igniter
9.4 grms / 20 ~ 2,000 Hz	200g, 5ms	Axial 30g / Lateral 60g	-32 ~ +75	Electric Igniter
9.4 grms / 20 ~ 2,000 Hz	200g, 5ms	Axial 30g / Lateral 60g	-32 ~ +75	Electric Igniter
9.4 grms / 20 ~ 2,000 Hz	200g, 5ms	Axial 30g / Lateral 60g	-32 ~ +75	Electric Igniter
9.08grms, 0.05g ² /Hz @ 20~2,000Hz	200g, 5ms	38.5g Lateral 33.0g Longitudinal	-32 ~ +71	Electric Igniter
9.08grms, 0.05g ² /Hz @ 20~2,000Hz	200g, 5ms	38.5g Lateral 33.0g Longitudinal	-32 ~ +71	Electric Igniter
9.08grms, 0.05g ² /Hz @ 20~2,000Hz	200g, 5ms	38.5g Lateral 33.0g Longitudinal	-32 ~ +71	Electric Igniter
8.23 grms / 20 ~ 2,000Hz	40g, 11ms	N/A	-40 ~ +60	Electric Igniter
0.01 ~ 0.025 g ² /Hz	20g, 11ms	X axis 9g / Z axis 16.5g	-32 ~ +63	Electric Igniter
10 ~ 2,000Hz : 0.05g ² /Hz	Sawtooth wave /40g, 11ms	+X axis 16.5g / -X axis 5.0g / +Z axis 13.2g	-32 ~ +63	Electric Igniter
3.85grms / 5 ~ 500Hz	50g, 10ms	80g	-35 ~ +60	Electric Igniter
15 ~ 2,000Hz : 0.01g ² /Hz	20g, 11ms	X axis 15g / Y axis 11.2g / +Z 18g / -Z 12g, 9.8g	-54 ~ +55	Electric Igniter
15 ~ 2,000Hz : 0.01g ² /Hz	20g, 11ms	X axis 15g / Y axis 11.2g / +Z 18g / -Z 12g, 9.8g	-54 ~ +55	Electric Igniter
113.3 ~ 453.3Hz : 0.311g ² /Hz	20g, 11ms	-X axis 10g	-66 ~ +51	Electric Igniter

ELECTRIC IGNITER BASED

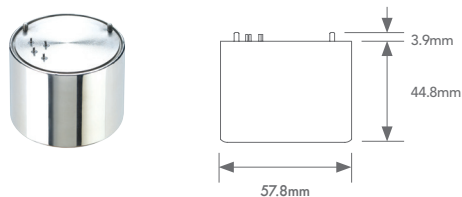
THERMAL RESERVE BATTERY

VT-2010



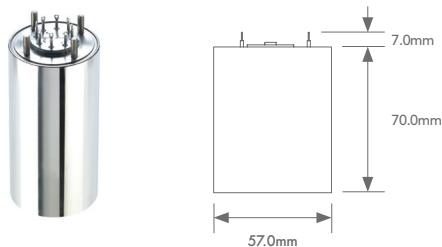
Dimension (mm)	Φ63.5 X h70.0
Open Voltage (V)	26 ~ 34
Current (A)	12A (base) / 20A (peak)
Activation Time (s)	≤0.7
Functional Time, Capacity	≥100
Weight (g)	≤700
Vibration	20 ~ 2,000Hz : 0.05g ² /Hz
Shock	Sawtooth wave / 200g, 6ms
Acceleration (G)	X axis 60g / Z axis 30g
Operating Temperature(°C)	-40 ~ +71
Activation Mechanism	Electric Igniter

VT-PSAO



Dimension (mm)	Φ57.8 X h44.8
Open Voltage (V)	18.5 ~ 24
Current (A)	10A (base) / 11A (peak)
Activation Time (s)	≤0.4
Functional Time, Capacity	≥19
Weight (g)	≤340
Vibration	0.06 inch-double amplitude 10 ~ 70Hz, 15g peak 71 ~ 2,000Hz or 4hours axis
Shock	3 times sawtooth / Half-sin 350g peak, 3msec
Acceleration (G)	65
Operating Temperature(°C)	-40 ~ +60
Activation Mechanism	Electric Igniter

VT-PSB0

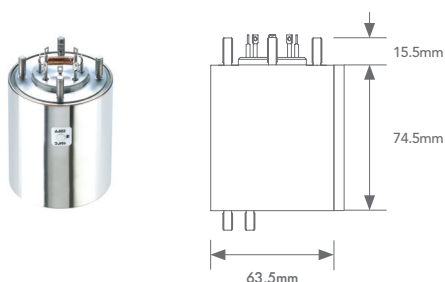


Dimension (mm)	Φ57.0 X h70.0
Open Voltage (V)	18.5 ~ 24
Current (A)	6A (base) / 11A (peak)
Activation Time (s)	≤0.5
Functional Time, Capacity	≥45
Weight (g)	≤460
Vibration	5-2000Hz 36min, 0.2inch 5-14Hz, 2g, 14-33Hz 0.036inch, 33-55Hz, 5g, 52-2000Hz
Shock	40g, 11ms
Acceleration (G)	N/A
Operating Temperature(°C)	-40 ~ +71
Activation Mechanism	Shock Igniter

ELECTRIC IGNITER BASED

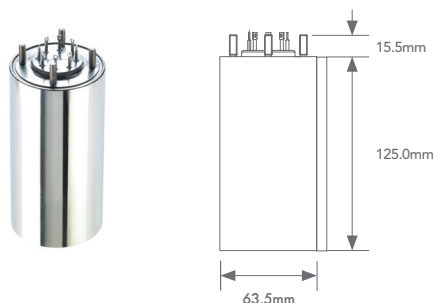
THERMAL RESERVE BATTERY

VT-MS10



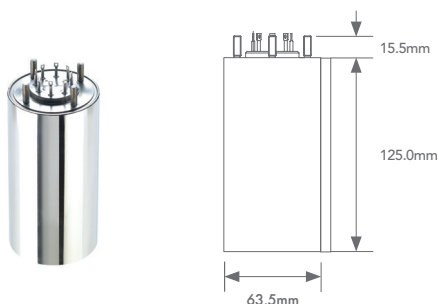
Dimension (mm)	Φ63.5 X h74.5
Open Voltage (V)	26 ~ 34
Current (A)	2A (base) / 20A (peak)
Activation Time (s)	≤0.6
Functional Time, Capacity	≥100
Weight (g)	≤760
Vibration	9.08 grms 0.05 g2/Hz @20~2,000Hz
Shock	200g, 5ms
Acceleration (G)	Axial 30g / Lateral 60g
Operating Temperature(°C)	-32 ~ +75
Activation Mechanism	Electric Igniter

VT-MSM0



Dimension (mm)	Φ63.5 X h125.0
Open Voltage (V)	26 ~ 34
Current (A)	25A (base) / 30A (peak)
Activation Time (s)	≤0.7
Functional Time, Capacity	≥100
Weight (g)	≤1,200
Vibration	9.4 grms / 20 ~ 2,000 Hz
Shock	200g, 5ms
Acceleration (G)	Axial 30g / Lateral 60g
Operating Temperature(°C)	-32 ~ +75
Activation Mechanism	Electric Igniter

VT-MSS0

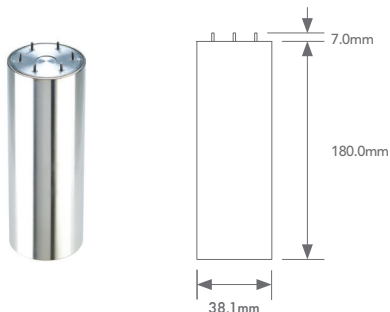


Dimension (mm)	Φ63.5 X h125.0
Open Voltage (V)	50 ~ 64
Current (A)	10A (base) / 20A (peak)
Activation Time (s)	≤0.7
Functional Time, Capacity	≥100
Weight (g)	≤1,230
Vibration	9.4 grms / 20 ~ 2,000 Hz
Shock	200g, 5ms
Acceleration (G)	Axial 30g / Lateral 60g
Operating Temperature(°C)	-32 ~ +75
Activation Mechanism	Electric Igniter

ELECTRIC IGNITER BASED

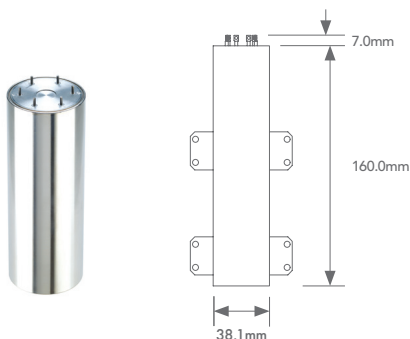
THERMAL RESERVE BATTERY

VT-MSA0



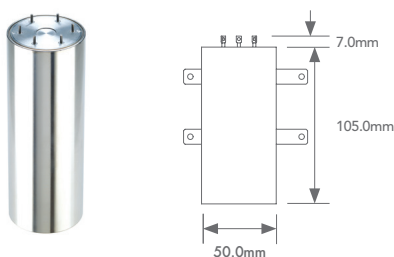
Dimension (mm)	Φ63.5 X h180.0
Open Voltage (V)	110 ~ 150
Current (A)	10A (base)
Activation Time (s)	≤0.75
Functional Time, Capacity	≥100
Weight (g)	≤1,560
Vibration	9.4 grms / 20 ~ 2,000 Hz
Shock	200g, 5ms
Acceleration (G)	Axial 30g / Lateral 60g
Operating Temperature(°C)	-32 ~ +75
Activation Mechanism	Electric Igniter

VT-SAS0



Dimension (mm)	Φ38.1 X h160.0
Open Voltage (V)	50 ~ 64
Current (A)	15A 0.1s / 20A 0.1s
Activation Time (s)	≤0.8
Functional Time, Capacity	≥40
Weight (g)	≤550
Vibration	9.08grms, 0.05g2/Hz @ 20-2,000Hz
Shock	200g, 5ms
Acceleration (G)	38.5g Lateral 33.0g Longitudinal
Operating Temperature(°C)	-32 ~ +71
Activation Mechanism	Electric Igniter

VT-SAM0

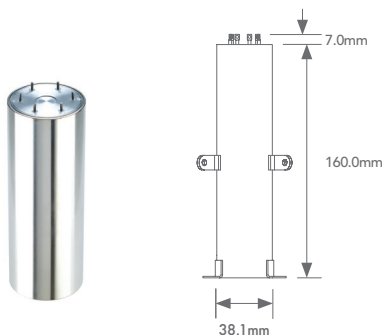


Dimension (mm)	Φ50.0 X h105.0
Open Voltage (V)	24 ~ 34
Current (A)	22A 0.005s / 30A 0.005s Pulse
Activation Time (s)	≤0.8
Functional Time, Capacity	≥40
Weight (g)	≤660
Vibration	9.08grms, 0.05g2/Hz @ 20-2,000Hz
Shock	200g, 5ms
Acceleration (G)	38.5g Lateral 33.0g Longitudinal
Operating Temperature(°C)	-32 ~ +71
Activation Mechanism	Electric Igniter

ELECTRIC IGNITER BASED

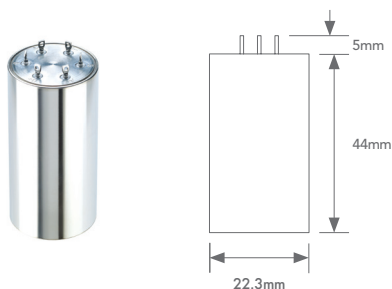
THERMAL RESERVE BATTERY

VT-SAA0



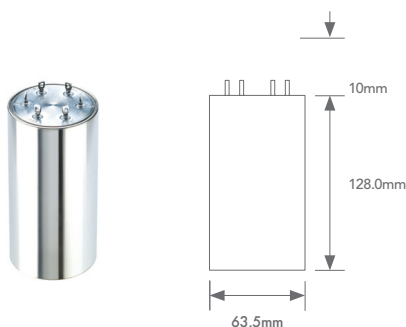
Dimension (mm)	Φ38.1 X h160.0
Open Voltage (V)	50 ~ 64
Current (A)	15A 0.1s / 20A 0.1s pulse
Activation Time (s)	≤0.8
Functional Time, Capacity	≥40
Weight (g)	≤610
Vibration	9.08 grms, 0.05g ² /Hz @ 20-2,000Hz
Shock	200g, 5ms
Acceleration (G)	38.5g Lateral 33.0g Longitudinal
Operating Temperature(°C)	-32 ~ +71
Activation Mechanism	Electric Igniter

VT-FZB0



Dimension (mm)	Φ22.3 X h44.0
Open Voltage (V)	24 ~ 34
Current (A)	100mA (base) / 500mA (peak)
Activation Time (s)	≤0.6
Functional Time, Capacity	≥25
Weight (g)	≤60
Vibration	8.23 grms / 20 ~ 2,000Hz
Shock	40g, 11ms
Acceleration (G)	N/A
Operating Temperature(°C)	-40 ~ +60
Activation Mechanism	Electric Igniter

VT-2031

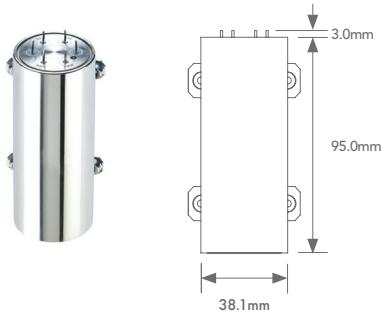


Dimension (mm)	Φ63.5 X 128.0
Open Voltage (V)	25 ~ 34
Current (A)	50A (base)
Activation Time (s)	≤1.0
Functional Time, Capacity	≥40
Weight (g)	≤1,230
Vibration	0.01 ~ 0.025 g ² /Hz
Shock	20g, 11ms
Acceleration (G)	X axis 9g / Z axis 16.5g
Operating Temperature(°C)	-32 ~ +63
Activation Mechanism	Electric Igniter

ELECTRIC IGNITER BASED

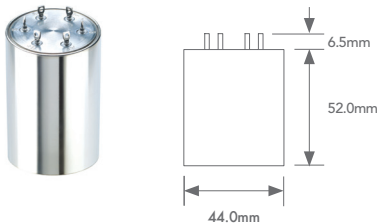
THERMAL RESERVE BATTERY

VT-2050



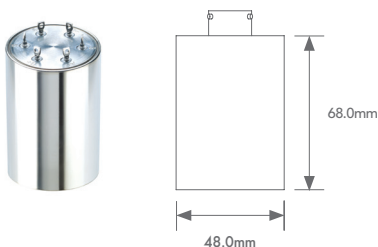
Dimension (mm)	Φ38.1 X h95.0
Open Voltage (V)	26 ~ 36
Current (A)	5.5A / 7.5A 1Hz
Activation Time (s)	≤0.6
Functional Time, Capacity	≥30
Weight (g)	≤360
Vibration	10 ~ 2,000Hz : 0.05g ² /Hz
Shock	Sawtooth wave / 40g, 11ms
Acceleration (G)	+X axis 16.5g / -X axis 5.0g / +Z axis 13.2g
Operating Temperature(°C)	-32 ~ +63
Activation Mechanism	Electric Igniter

VT-LGR01



Dimension (mm)	Φ44.0 X h52.0
Open Voltage (V)	24 ~ 32
Current (A)	5 ~ 9A
Activation Time (s)	≤0.4
Functional Time, Capacity	≥35
Weight (g)	≤230
Vibration	2.18grms / 5 ~ 500Hz
Shock	50g, 10ms
Acceleration (G)	80g
Operating Temperature(°C)	-35 ~ +60
Activation Mechanism	Electric Igniter

VT-FBA0

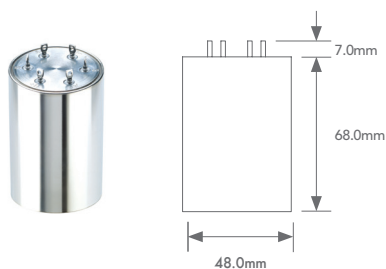


Dimension (mm)	Φ48.0 X h68.0
Open Voltage (V)	22 ~ 34
Current (A)	9A 0.98s / 11A 0.02s pulse
Activation Time (s)	≤1.0
Functional Time, Capacity	≥100
Weight (g)	≤350
Vibration	15 ~ 2,000Hz : 0.01g ² /Hz
Shock	20g, 11ms
Acceleration (G)	X axis 15g / Y axis 11.2g / +Z 18g / -Z 12g, 9.8g
Operating Temperature(°C)	-54 ~ +55
Activation Mechanism	Electric Igniter

ELECTRIC IGNITER BASED

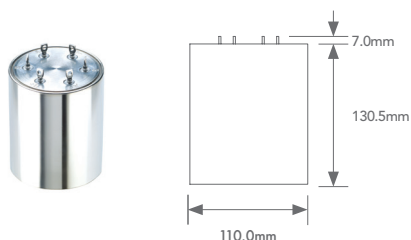
THERMAL RESERVE BATTERY

VT-FBA1



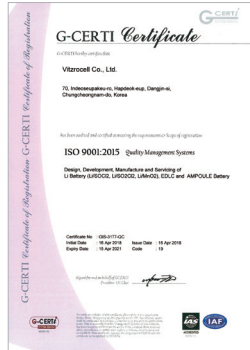
Dimension (mm)	Φ48.0 X h68.0
Open Voltage (V)	22 ~ 32
Current (A)	9A 0.98s / 11A 0.02s pulse
Activation Time (s)	≤1.0
Functional Time, Capacity	≥100
Weight (g)	≤450
Vibration	15 ~ 2,000Hz : 0.01g ² /Hz
Shock	20g, 11ms
Acceleration (G)	X axis 15g / Y axis 11.2g / +Z 18g / -Z 12g, 9.8g
Operating Temperature(°C)	-54 ~ +55
Activation Mechanism	Electric Igniter

VT-FBBO

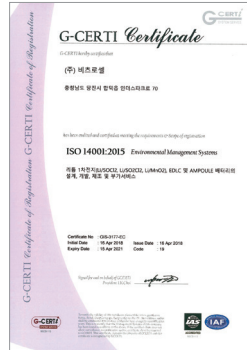


Dimension (mm)	Φ110.0 X h130.5
Open Voltage (V)	22 ~ 34
Current (A)	12.7A (base)
Activation Time (s)	≤2.8
Functional Time, Capacity	≥700
Weight (g)	≤4000
Vibration	113.3 ~ 453.3Hz : 0.311g ² /Hz
Shock	20g, 11ms
Acceleration (G)	-X axis 10g
Operating Temperature(°C)	-66 ~ +51
Activation Mechanism	Electric Igniter

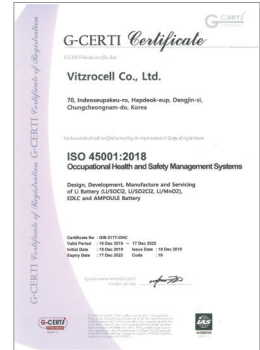
CERTIFICATES



ISO 9001



ISO 14001



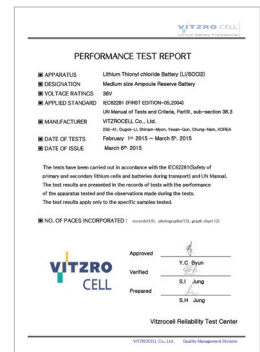
ISO 45001



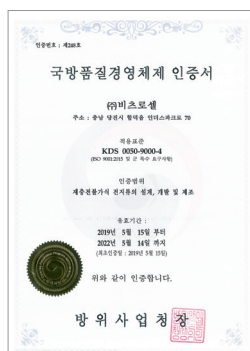
ROHS(Intertek)



UN Transportation Certificate



UN Performance Test Report



DQMS(Defense Quality Management System)

THE OPTIMUM POWER SOLUTIONS FOR DEFENSE APPLICATIONS

LITHIUM PRIMARY SOLUTIONS



Li-SOCl₂
Li-MnO₂



EDLC
(Electric Double Layer Capacitor)

LITHIUM RECHARGEABLE SOLUTIONS



VLB(Rechargeable Battery)
VHC(Hybrid Capacitor)

APPLICATIONS



MILITARY
OPTICAL DEVICE



MILITARY
COMMUNICATION
DEVICE



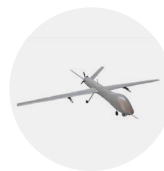
GAS MASK



HAND
GRENADE



DRONE



UAV

VITZRO CELL

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