# **High Temperature Battery**

Lithium Battery Professional



VITZRO CELL VITZRO CELL U S A

# **Mission & Core Value**

#### ...Mission

To enhance smart, safe and green world as a dedicated power solution provider.

#### ...Core Value

Desire a happy and great workplace for the Vitzrocell family and its stakeholders.

#### ...Golden Rule

3C 1I - Creativity, Change, Challenge and Innovation



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# VITZROCELL's Past, Present and Future

1987~1991	1987.10	Establishment Teckraf Co.,Ltd.(at present Vitzrocell)
	1988.05	Technical Adoption of Cell with Wilson Greatbatch USA
	1990.04	Registration as a Supplier of Ministry of National Defence
	1990.05	Establishment Factory Line in hap-duk
	1991.05	Establishment of R&D Center
1992~2000	1993.10	Nominated as a Sole Manufacturer for Korean Military
	1996.01	UL Approval
	1998.01	Establishment Factory Line in Ye-san
	1998.08	Acquired ISO 9001 Quality Certification
	2000.05	Unification of CI and declaration of Vitzro Group
2001~2010	2002.06	Changed Company Name to Vitzrocell from Teckraf
	2004.06	Designated as Technology Company from KIBO
	2004.11	Granted USD 10Million Exportation Prize
	2005.05	Awarded "Advance Technology and R&D Center(ATC)"(MKE)
	2006.03	Acquired Environment System Certification(ISO 14001)
	2007.11	Acquired Defence Quality Management System Certification from DTaQ
	2009.05	Grand Prix Prize of Excellent Corporate Management in Chungnam Province
	2009.10	VITZROCELL Listed on KOSDAQ(Go Public)
	2009.11	"The Technology Fast 500" by Deloitte
	2010.07	Awarded "Excellent labor-management company" by Ministry of Labor
	2010.11	Awarded a Prize of 20Million Export
	2010.12	NEP Approval(Ministry of Knowledge & Economy)
<b>2010~N</b> ow	2011.11	Awarded "Excellent Create Employment Company" by Chungnam Province
	2012.05	Awarded "World Class 300 Company" (Ministry of Knowledge & Economy)
	2012.08	Acquisition of Exium Technologies.,Inc
	2012.10	Establishment of 2nd factory and the expansion of 1st factory
	2013.07	Awarded"Excellent Labor-Management Company" by Ministry of Labor
	2013.10	Awarded"Global Specialized Company" by Ministry of Trade Industry and Energy
	2013.11	Awarded a prize of USD 30Million export (July, 2012 ~ June, 2013)
	2014.11	Awarded a prize of USD 50Million export (July, 2013 ~ June, 2014)
	2015.08	Changed Company Name to Vitzrocell USA from Exium Technologies Inc.
	2015.12	Awarded "Presidential citation"



Vitzrocell has been recognized as one of the best power solution providers of Lithium Primary Batteries in the world. We are proud of our competitive products, especially High Temperature Battery, suitable for various applications such as Measurement While Drilling (MWD), Pipeline Inspection Gauge (PIG), Production Well Reserve Monitoring & Oceanographic Devices particularly relevant with Oil & Gas industry.

Based on nearly 30 years accumulated expertise equipped with ISO9001, ISO14001, UL and others, we have achieved a leading position in the global markets through creative R&D resources, vertically integrated production facilities, reliable products, on-time delivery, and superb technical service. we maintain close relationships with many valuable partners and customers in over 100 countries.

#### **Our Business**

#### **Downhole Drilling(MWD, LWD)**

Vitzrocell's high temperature batteries are used in devices that require high power demands under harsh usage condition (high shock and vibration). These cells are typically used in extreme oil and gas extraction conditions where power cannot be interrupted. The continuous addition of new high temperature battery to the company Product Lineup will help propel Vitzrocell into the industry leader within the next few years.



#### Feature

- Extreme Shock & Vibration Resistance
- Available Temperature 150°C ~ 200°C
- Very High Power and Energy Density
- High and Stable Operating Voltage

#### Applications

- MWD(Measurement While Drilling)
- LWD(Logging While Drilling)
- Cased-Hole Logging

#### **Pipeline Inspection Gauge (PIG)**

Vitzrocell's high temperature batteries, especially Li/SO<sub>2</sub>Cl<sub>2</sub> (3.9V) batteries are widely used in PIG market. Vitzrocell's Li/SO<sub>2</sub>Cl<sub>2</sub> (3.9V) batteries are very competitive for its higher capacity (more than 20%) and low temperature performance comparing it's competitor. We are proud of its outstanding performance overwhelmed the competitor's.



#### Feature

- Extreme Shock & Vibration Resistance
- Available Over Temperature -20°C~ 100°C
- Very High Power and Energy Density
- High and Stable Operating Voltage

#### Applications

- PIG(Pipeline Inspection Gauge)
- Production Well Reserve Monitoring

#### **Ocean Equipment**

In today's market, batteries for ocean equipments operate in a variety of high current-pulse applications that require low background currents and brief periods of high-current pulses over an extended period of time. Vitzrocell's Li/SOCI<sup>2</sup> battery pack, Hybrid type, and High temperature battery (3.9V) are currently used in subsea monitoring, subsea navigation, underwater surveillance systems, hydrographical survey equipment, acoustic release, mini beacons, ice flow monitors and current meters.



- Feature
- High and Stable Operating Voltage(3.9V)
- Extensive Shelf Life(Over 10 Years)
- High Energy Density

#### Applications

 Oceanographic Devices : Buoy, Tsunami Detector, Seismic devices

# Oil & Gas - MWD/LWD

#### ... Application

Power Source of MWD(Measurement While Drilling) & LWD(Logging While Drilling) for Oil & Gas Exploration

#### ... Main Products

DD-HR-150(G) DD-HR-150(A) FAT-D-150 DD-MR-165 DD-MR-180 CC-MR-165(21/25/26mm)

#### ... Main Characteristics

3.6V Li/SOCl2 High Capacity Extreme Shock & Vibration Resistance 150°C/165°C/180°C Operational Temperature High Rate Capability Non-bulge design

#### ...Summary of Product Line-up

Model	PN	Size(mm)	Capacity	Temperature
DD-HR-150(G)	32-126-H150G	Ф 31.9 × h127	26Ah ~ 28Ah	-40°C ~ 150°C
DD-HR-150(A)	32-126-H150A	Ф 31.9 × h127	25Ah ~ 28Ah	-40°C ~ 150°C
FAT-D-150	48-80-H150G	Ф 48.5 X h80.5	37Ah ~ 40Ah	-40°C ~ 150°C
DD-MR-165	32-126-M165G	Ф 31.9 × h127	26Ah ~ 29Ah	-40°C ~ 165°C
DD-MR-180	32-126-M180G	Ф 31.9 × h127	22Ah ~ 25Ah	50°C ~ 180°C
CC-MR-165 (21mm)	21-102-M165G	Ф 20.85× h102.1	7Ah ~ 8Ah	-40°C ~ 165°C
CC-MR-165 (25mm)	25-102-M165G	Ф24.75×h102.1	11Ah ~ 13Ah	-40°C ~ 165°C
CC-MR-165 (26mm)	26-102-M165G	Ф 25.55 × h102.1	13Ah ~ 14Ah	-40°C ~ 165°C

#### MODEL : DD-HR-150G

PN: 32-126-H150G



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

# **Characteristics**

- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>), Gallium Electrolyte
- High Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 150°C Operational Temperature

#### Key Features

- 304L stainless steel structure
- Non-bulge design
- · Hermetic glass-to-metal seal engineered for leak free operation
- Integral safety fuse and parallel diode
- Reduced Electrode Surface Area, high rate capability & lower self-discharge

#### **Benefits**

- Industry leading capacity
- · High rate capability for high constant current and pulse applications
- · Gallium based electrolyte providing excellent start up and minimal passivation
- Automated assembly for uniform performance
- · Extreme shock and vibration testing to ensure trouble free operation under severe drilling conditions

#### **Technical Support**

- · We pledge our full support to provide you with the service you deserve
- Application Analysis
- Testing and Test Reports
- Analysis of field problems and reports
- Engineering support for custom applications

# Abuse and Transport Certifications

- UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : 1000G 0.5 ms 10 shocks each axis at 150°C
- Vibration Testing : 30G Sine & 20G random vibration at 150°C(Full report available)

Nominal Capacity Based on 580mA discharge at temperatures of 25–150°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures will affect capacity obtained.	26Ah ~ 28Ah	
Open Circuit Voltage Ar 20°C	3.65V	
Nominal Closed Circuit Voltage	3.2V	
Based on stable CCV produced at 25°C under a 320mA load. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.		
Constant Current Discharge	580mA 1300mA(reduced capacity)	
Storage Conditions	30°C (86°F) Max	
Operational Temperature Range	-40°C to 150°C	
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.		
Fuse	5.0A	
Fuse Parallel Diode	3.0A	

Diameter	31.9mm(1.26 in)
Height	127.0mm(5.0 in)
Weight	230g
Lithium Metal Content	8.02g

# Packing Information

Packing Qty per C/T	64
Net Weight per C/T(Kg)	14.72
Gross Weight per C/T(Kg)	15.82
C/T Size	427mm×302mm×210mm

### Temperature versus Capacity



#### Storage

- Store cells in a cool(<30°C) and dry location

#### Warning

- · Fire, explosion, and burn hazard
- Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic
  gases if exposed to water
- · Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- Do not expose cell to temperatures in excess of the maximum operating temperature, 150°C

#### Note

Any information given here is for reference only.

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#### **External Dimensions**



#### VITZROCELL USA, Inc.

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# VITZROCELL Co., Ltd.

#### MODEL : DD-HR-150A

PN: 32-126-H150A



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V DD-Size Lithium Thionyl ChlorideCell(Li-SOCl<sub>2</sub>), Aluminum Electrolyte
- High Rate Capability
- High Capacity
- Extreme Shock and Vibration
  Resistance
- 150°C Operational Temperature

#### Key Features

- ·304L stainless steel structure
- Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- ·Integral safety fuse and parallel diode
- •Reduced Electrode Surface Area, high rate capability & lower self-discharge

#### **Benefits**

- Industry leading capacity
- ·High rate capability for high constant current and pulse applications
- ·Aluminum based electrolyte providing lower cost and very low self-discharge
- $\boldsymbol{\cdot}$  Automated assembly for uniform performance
- •Extreme shock and vibration testing to ensure trouble free operation under severe drilling conditions

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- Testing and Test Reports
- ·Analysis of field problems and reports
- · Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- ·Shock Testing : 1000G 0.5 ms 10 shocks each axis at 150°C
- ·Vibration Testing : 30G Sine & 20G random vibration at 150°C(Full report available)

Nominal Capacity 2	25Ah ~ 28Ah	
Based on 580mA discharge at temperatures of 50~150°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures will affect capacity obtained.		
Open Circuit Voltage 3 At 20°C	8.65V	
Nominal Closed Circuit Voltage 3	3.2V	
Based on stable CCV produced at 25°C under a 320mA load. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.		
Constant Current Discharge 5	i80mA	
1	300mA(reduced capacity)	
Storage Conditions 3	80°C (86°F) Max	
Operational Temperature Range	40°C to 150°C	
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.		
Fuse 5	5.0A	
Parallel Diode 3	8.0A	

Diameter	31.9mm(1.26 in)
Height	127.0mm(5.0 in)
Weight	230g
Lithium Metal Content	8.02g

# Packing Information

Packing Qty per C/T	64
Net Weight per C/T(Kg)	14.72
Gross Weight per C/T(Kg)	15.82
C/T Size	427mm×302mm×210mm

### Temperature versus Capacity



#### **Storage**

•Store cells in a cool(<30°C) and dry location

#### Warning

- ·Fire, explosion, and burn hazard
- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- ·Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- -Do not expose cell to temperatures in excess of the maximum operating temperature, 150°C

#### Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

MODEL : FAT-D-150

PN: 48-80-H150G



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V FAT-D Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>), Gallium Electrolyte
- Low Magnetic
- High Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 150°C Operational Temperature

#### Key Features

- ·304L stainless steel structure
- ·Hermetic glass-to-metal seal engineered for leak free operation
- ·Integral safety fuse and parallel diode
- •Reduced Electrode Surface Area, high rate capability & lower self-discharge
- ·Low magnetic signature

#### **Benefits**

- Industry leading capacity
- ·High rate capability for high constant current and pulse applications
- Gallium based electrolyte providing excellent start up and minimal passivation
- •Automated assembly for uniform performance
- •Extreme shock and vibration testing to ensure trouble free operation under severe drilling conditions

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- Testing and Test Reports
- ·Analysis of field problems and reports
- ·Engineering support for custom applications

#### Abuse and Transport Certifications

- -UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : To be determined
- Vibration Testing : To be determined

Nominal Capacity	37Ah ~ 40Ah	
Based on 580mA discharge at temperatures of 25 ~ 150°C to a 2.0V cutoff.		
Discharge at higher currents or lower temperatures will affect capacity obtained.		
Open Circuit Voltage	2 651/	
At 20°C	3.03 V	
Nominal Closed Circuit Voltage	3.2V	
Based on stable CCV produced at 25°C under a 400mA load.		
The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.		
Magnetic Characteristics	40 nano Tesla@7inch	
Constant Current Discharge	580mA	
	2000mA(reduced capacity)	
Storage Conditions	30°C (86°F) Max	
Operational Temperature Range	-40°C to 150°C	
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.		
Fuse	10A	
Parallel Diode	8.0A	

Diameter	48.5mm(1.91 in)
Height	80.5mm(3.17 in)
Weight	337g
Lithium Metal Content	12.3g

## Packing Information

Packing Qty per C/T	36
Net Weight per C/T(Kg)	12.13
Gross Weight per C/T(Kg)	13.13
C/T Size	450mm×250mm×230mm

### Temperature versus Capacity



#### Storage

·Store cells in a cool(<30°C) and dry location

#### Warning

- -Fire, explosion, and burn hazard
- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- •Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- -Do not expose cell to temperatures in excess of the maximum operating temperature, 150°C

#### Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

#### MODEL : DD-MR-165

PN: 32-126-M165G



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>), Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 165°C Operational Temperature

#### Key Features

- ·304L stainless steel structure
- •Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- Integral parallel diode
- Reduced Electrode Surface Area

#### **Benefits**

- ·Industry leading capacity in Non-Bulge Design
- ·Moderate Rate Capability for constant current and pulse applications
- ·Gallium based electrolyte providing excellent start up and minimal passivation
- Automated assembly for uniform performance
- •Extreme shock and vibration resistant design, trouble free operations under severe drilling conditions

#### Technical Support

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- •Testing and Test Reports
- ·Analysis of field problems and reports
- ·Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : To be determined
- Vibration Testing : To be determined

Nominal Capacity 26Ah ~	~ 29Ah
Based on 300mA discharge at temperatures of 25–165°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures will affect capacity obtained.	
Open Circuit Voltage 3.65V	
Nominal Closed Circuit Voltage 3.2V	
Based on stable CCV produced at 25°C under a 140mA load. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.	
Sanatant Surrant Disabaran 300mA	4
600mA	A(reduced capacity)
Storage Conditions 30°C (8	86°F) Max
Operational Temperature Range -40°C t	to 165°C
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.	
Parallel Diode 8.0A	

Diameter	31.9mm(1.26 in)
Height	127.0mm(5.0 in)
Weight	225g
Lithium Metal Content	8.60g

# Packing Information

Packing Qty per C/T	64
Net Weight per C/T(Kg)	14.4
Gross Weight per C/T(Kg)	15.5
C/T Size	427mm×302mm×210mm

# Temperature versus Capacity



#### Storage

·Store cells in a cool(<30°C) and dry location

#### Warning

- ·Fire, explosion, and burn hazard
- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- ·Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- ·Do not expose cell to temperatures in excess of the maximum operating temperature, 165°C

#### Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

#### MODEL : DD-MR-180

PN: 32-126-M180G



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>), Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 180°C Operational Temperature

#### Key Features

- ·304L stainless steel structure
- •Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- Integral parallel diode
- -Reduced Electrode Surface Area, high rate capability & lower self-discharge

#### Benefits

- ·Industry leading capacity in Non-Bulge Design
- ·Moderate Rate Capability for constant current and pulse applications
- $\boldsymbol{\cdot} \textsc{Gallium}$  based electrolyte providing excellent start up and minimal passivation
- Automated assembly for uniform performance
- •Extreme shock and vibration resistant design, trouble free operations under severe drilling conditions

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- Testing and Test Reports
- ·Analysis of field problems and reports
- ·Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : To be determined
- Vibration Testing : To be determined

Nominal Capacity	22Ah ~ 25Ah
Based on 225mA discharge at temperatures of 100–180°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures will affect capacity obtained.	
Open Circuit Voltage At 20°C	3.65V
Nominal Closed Circuit Voltage	3.2V
Based on stable CCV produced at 100°C under a 140mA load. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.	
Constant Current Discharge	225mA
	320mA(reduced capacity)
Storage Conditions	30°C (86°F) Max
Operational Temperature Range	50°C to 180°C
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.	
Parallel Diode	A0.8

Diameter	31.9mm(1.26 in)
Height	127.0mm(5.0 in)
Weight	225g
Lithium Metal Content	8.30g

# Packing Information

Packing Qty per C/T	64
Net Weight per C/T(Kg)	14.4
Gross Weight per C/T(Kg)	15.5
C/T Size	427mm×302mm×210mm

# Temperature versus Capacity



#### Storage

·Store cells in a cool(<30°C) and dry location

# Warning

- ·Fire, explosion, and burn hazard
- -Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- ·Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- •Do not expose cell to temperatures in excess of the maximum operating temperature, 180°C

#### Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

#### MODEL : CC-MR 165(21mm) PN : 21-102-M165(21mm)



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V CC-Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>) Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration
  Resistance
- 165°C Maximum Operational Temperature

#### Key Features

- ·304L stainless steel structure
- •Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- Interal parallel diode
- •Reduced Electrode Surface Area, high rate capability & lower self-discharge

#### Benefits

- ·Industry leading capacity in Non-Bulge Design
- ·Moderate Rate Capability for constant current and pulse applications
- ·Gallium based electrolyte providing excellent start up and minimal passivation
- Automated assembly for uniform performance
- •Extreme shock and vibration resistant design, trouble free operations under severe drilling conditions

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- •Testing and Test Reports
- ·Analysis of field problems and reports
- •Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : To be determined
- Vibration Testing : To be determined

Nominal Capacity	7Ah ~ 8Ah
20°C ~ 165°C	
Open Circuit Voltage	2 GEV/
At 20°C	3.034
Nominal Closed Circuit Voltage	3.2V(at 64mA)
Based on stable CCV produced at 25°C. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.	
Constant Current Discharge	120mA
	200mA(reduced capacity)
Storage Conditions	30°C (86°F) Max
Operational Temperature Range	-40°C to 165°C
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.	
Parallel Diode	1.0A

Diameter	20.85mm(0.82 in)
Height	102.1mm(4.02 in)
Weight	80g
Lithium Metal Content	2.8g

#### Packing Information

Packing Qty per C/T	100
Net Weight per C/T(Kg)	8.0
Gross Weight per C/T(Kg)	9.1
C/T Size	427mm×302mm×210mm

#### Capacity vs. Temperature



#### Storage

•Store cells in a cool(<30°C) and dry location

#### Warning

- ·Fire, explosion, and burn hazard
- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- ·Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- -Do not expose cell to temperatures in excess of the maximum operating temperature, 165°C

#### Note

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Information is also dependent on actual conditions and does not guaranty future performance. And subject to change.

#### **External Dimensions**



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Email : jlundquist@vitzrocellusa.com Web : www.vitzrocellusa.com

# VITZROCELL Co., Ltd.

#### MODEL : CC-MR 165(25mm) PN : 25-102-M165(25mm)



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V CC-Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>) Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration
  Resistance
- 165°C Maximum Operational Temperature

#### Key Features

- ·304L stainless steel structure
- •Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- Interal parallel diode
- •Reduced Electrode Surface Area, high rate capability & lower self-discharge

#### Benefits

- ·Industry leading capacity in Non-Bulge Design
- ·Moderate Rate Capability for constant current and pulse applications
- ·Gallium based electrolyte providing excellent start up and minimal passivation
- Automated assembly for uniform performance
- •Extreme shock and vibration resistant design, trouble free operations under severe drilling conditions

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- Testing and Test Reports
- ·Analysis of field problems and reports
- •Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : To be determined
- Vibration Testing : To be determined

Nominal Capacity	11Ah ~ 13Ah
20°C ~ 165°C	
Open Circuit Voltage	2 GEV/
At 20°C	3.03 V
Nominal Closed Circuit Voltage	3.2V(at 80mA)
Based on stable CCV produced at 25°C. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.	
Constant Current Discharge	150mA
	225mA(reduced capacity)
Storage Conditions	30°C (86°F) Max
Operational Temperature Range	-40°C to 165°C
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.	
Parallel Diode	1.0A

Diameter	24.75mm(0.97 in)
Height	102.1mm(4.02 in)
Weight	115g
Lithium Metal Content	4.0g

#### Packing Information

Packing Qty per C/T	80
Net Weight per C/T(Kg)	9.2
Gross Weight per C/T(Kg)	10.3
C/T Size	427mm×302mm×210mm

#### Capacity vs. Temperature



#### Storage

·Store cells in a cool(<30°C) and dry location

#### Warning

- ·Fire, explosion, and burn hazard
- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- ·Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- -Do not expose cell to temperatures in excess of the maximum operating temperature, 165°C

#### Note

·Any information given here is for reference only.

Information is also dependent on actual conditions and does not guaranty future performance. And subject to change.

#### **External Dimensions**



#### VITZROCELL USA, Inc.

#### USA Sales & Warehouse

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# VITZROCELL Co., Ltd.

#### MODEL : CC-MR 165(26mm) PN : 26-102-M165(26mm)



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.6V CC-Size Lithium Thionyl Chloride Cell(Li-SOCl<sub>2</sub>) Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration
  Resistance
- 165°C Maximum Operational Temperature

#### Key Features

- ·304L stainless steel structure
- •Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- Interal parallel diode
- •Reduced Electrode Surface Area, high rate capability & lower self-discharge

#### Benefits

- ·Industry leading capacity in Non-Bulge Design
- ·Moderate Rate Capability for constant current and pulse applications
- $\boldsymbol{\cdot} \textsc{Gallium}$  based electrolyte providing excellent start up and minimal passivation
- Automated assembly for uniform performance
- •Extreme shock and vibration resistant design, trouble free operations under severe drilling conditions

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- •Testing and Test Reports
- ·Analysis of field problems and reports
- •Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing : To be determined
- Vibration Testing : To be determined

Nominal Capacity	13Ah ~ 14Ah		
20°C ~ 165°C			
Open Circuit Voltage	3.65\/		
At 20°C	3.03 V		
Nominal Closed Circuit Voltage	3.2V(at 80mA)		
Based on stable CCV produced at 25°C. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.			
Constant Current Discharge	150mA		
	225mA(reduced capacity)		
Storage Conditions	30°C (86°F) Max		
Operational Temperature Range	-40°C to 165°C		
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.			
Parallel Diode	1.0A		

Diameter	25.55mm(1.00 in)
Height	102.1mm(4.02 in)
Weight	120g
Lithium Metal Content	4.3g

#### Packing Information

Packing Qty per C/T	80
Net Weight per C/T(Kg)	9.6
Gross Weight per C/T(Kg)	10.7
C/T Size	427mm×302mm×210mm

#### Capacity vs. Temperature



#### Storage

·Store cells in a cool(<30°C) and dry location

#### Warning

- ·Fire, explosion, and burn hazard
- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water
- ·Do not recharge, expose to flame, short circuit, crush, disassemble, or incinerate
- -Do not expose cell to temperatures in excess of the maximum operating temperature, 165°C

#### Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

Declaimer	Information
Packing	Intormation

Model	Cell weight(kg)	Packingqty per Case	Netweight per Case(kg)	Grossweight per Case(kg)	C/TSize
DD-HR-150G	0.23	64	14.72	15.82	
DD-HR-150A	0.23	64	14.72	15.82	
DD-MR-165	0.225	64	14.4	15.5	
DD-MR-180	0.225	64	14.4	15.5	407-mm
CC-MR 165(21mm)	0.08	100	8.0	9.1	427mm x 302mm x 210mm
CC-MR 165(25mm)	0.115	80	9.2	10.3	
CC-MR 165(26mm)	0.12	80	9.6	10.7	
SC-DD01 (PIG-DD)	0.213	64	13.63	14.73	
FAT-D-150	0.337	36	12.13	13.13	
SC-D01 (PIG-D)	0.122	80	9.76	10.76	450mm x 250mm x 230mm
SC-C01 (PIG-C)	0.059	150	8.85	9.85	

# Oil & Gas – Pigging / Ocean Equipments

#### **Application**

PIG(Pipe Line Inspection Gauge) for Oil & Gas transport Oceanographic Equipments(Tsunami detector, Seismic search, ets)

#### **Main Products**

SC-DD01(PIG-DD) SC-D01(PIG-D) SC-C01(PIG-C)

#### **Main Characteristics**

3.9V Li/SO<sub>2</sub>Cl<sub>2</sub> High Capacity 100°C Operational Temperature High Rate Capability

#### **Summary of Product Line-up**

Model	PN	Size(mm)	Capacity(Ah)	Temperature(°C)
SC-DD01(PIG-DD)	34-111-H100G	Ф 33.6 × h112.3	27~ 32	-20 ~ 100
SC-D01(PIG-D)	34-59-H100G	Ф 33.6 × h60.3	12 ~ 15	-20 ~ 100
SC-C01(PIG-C)	26-49-H100G	Ф 25.5 × h49.1	4 ~ 7	-20 ~ 100

# Oil&Gas – Pigging/Ocean Equipment

#### MODEL : SC-DD01(PIG-DD) PN : 34-111-H100G



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN, ATEX

#### **Characteristics**

- 3.9V DD-Size Lithium Sulfuryl Chloride Cell(Li-SO<sub>2</sub>Cl<sub>2</sub>)
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

#### Key Features

- ·304L stainless steel structure
- Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- ·Integral safety fuse and parallel diode
- ·Electrode Surface Area, high rate capability & lower self-discharge

#### **Benefits**

- Competitive capacity
- ·High rate capability for high constant current and pulse applications
- ·Automated assembly for uniform performance
- •Certified shock and vibration testing to ensure trouble free operation under severe conditions in process

#### **Technical Support**

- ·We pledge our full support to provide you with the service you deserve
- Application Analysis
- •Testing and Test Reports
- ·Analysis of field problems and reports
- ·Engineering support for custom applications

#### Abuse and Transport Certifications

- ·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries
- ·Shock Testing : Completed
- ·Vibration Testing : Completed

Nominal Capacity	27Ah ~ 32Ah	
Based on 580mA discharge at temperatures of 25-100°C to a 2.0V cutoff.		
Discharge at higher currents or lower temperatures will affect capacity obtained.		
Open Circuit Voltage	2.011/	
At 20°C	3.91V	
Nominal Closed Circuit Voltage	3.4V	
Based on stable CCV produced at 25°C under a 425mA load.		
The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.		
Constant Current Discharge	580mA	
Maximum Constant Current Rate	2000mA(reduced capacity)	
Storage Conditions	30°C (86°F) Max	
Operational Temperature Range	-20°C to 100°C	
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.		
Fuse	7.0A	
Parallel Diode	8.0A	

Diameter	33.6mm(1.32 in)
Height	112.3mm(4.42 in)
Weight	213g
Lithium Metal Content	9.6g

#### Packing Information

Packing Qty per C/T	64
Net Weight per C/T(Kg)	13.63
Gross Weight per C/T(Kg)	14.73
C/T Size	427mm×302mm×210mm

#### Temperature versus Capacity



#### Storage

•Store cells in a cool(<30°C) and dry location

#### Warning

- -Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water.
- Fire, explosion and severe burn hazard. Do not recharge, crush, disassemble, heat above 100°C(212°F), incinerate, short circuit or expose contents to water. Keep battery out of reach of children and in original package until ready to use.
- ·Dispose of used batteries promptly.

#### Note

·Any information given here is for reference only.

Information is also dependent on actual conditions and does not guaranty future performance. And subject to change.

#### **External Dimensions**



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# VITZROCELL Co., Ltd.

# Oil&Gas – Pigging/Ocean Equipment

MODEL : SC-D01(PIG-D) PN : 34-59-H100G



- ·304L stainless steel structure
- Non-bulge design
- $\boldsymbol{\cdot} \text{Hermetic glass-to-metal seal engineered for leak free operation}$
- Integral safety fuse and parallel diode to protect from short circuits and guarantee continued pack operation
   Electrode Surface Area, high rate capability & lower self-discharge

#### **Benefits**

- Competitive capacity
- ·High rate capability for high constant current and pulse applications
- ·Automated assembly for uniform performance
- ·Certified shock and vibration testing to ensure trouble free operation under severe conditions in process

#### Technical Support

- ·We pledge our full support to provide you with the service you deserve
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- •Testing and Test Reports
- ·Analysis of field problems and reports
- ·Engineering support for custom applications

#### Abuse and Transport Certifications

·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries

- Shock Testing : To be determined
- ·Vibration Testing : To be determined

#### **Cell Characteristics**

Nominal Capacity	12Ah ~ 15Ah	
Based on 280mA discharge at temperatures of 25-100°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures will affect capacity obtained.		
Open Circuit Voltage At 20°C	3.91V	
Nominal Closed Circuit Voltage	3.4V	
Based on stable CCV produced at 25°C under a 200mA load. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance		
Constant Current Discharge	280mA	
Maximum Constant Current Rate	1000mA(reduced capacity)	
Storage Conditions	30°C (86°F) Max	
Operational Temperature Range	-20°C to 100°C	
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.		
Fuse	4.0A	
Parallel Diode	8.0A	



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN, ATEX

#### **Characteristics**

- 3.9V D-Size Lithium Sulfuryl Chloride Cell(Li-SO<sub>2</sub>Cl<sub>2</sub>) High Rate Capability
- High Capacity
- 100°C Operational Temperature

Diameter	33.6mm(1.32 in)
Height	60.3mm(2.37 in)
Weight	122g
Lithium Metal Content	4.7g

# Packing Information

Packing Qty per C/T	80
Net Weight per C/T(Kg)	9.76
Gross Weight per C/T(Kg)	10.76
C/T Size	450mm×250mm×230mm

### Temperature versus Capacity



#### Storage

• Store cells in a cool(<30°C) and dry location

# Warning

- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water.
- •Fire, explosion and severe burn hazard. Do not recharge, crush, disassemble, heat above 100°C(212°F), incinerate, short circuit or expose contents to water. Keep battery out of reach of children and in original package until ready to use.
- ·Dispose of used batteries promptly.

# Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

# Oil&Gas – Pigging/Ocean Equipment

#### MODEL : SC-C01(PIG-C) PN : 26-49-H100G



- •304L stainless steel structure
- Non-bulge design
- ·Hermetic glass-to-metal seal engineered for leak free operation
- ·Integral safety fuse and parallel diode
- ·Electrode Surface Area, high rate capability & lower self-discharge

#### **Benefits**

- Competitive capacity
- ·High rate capability for high constant current and pulse applications
- ·Automated assembly for uniform performance
- ·Certified shock and vibration testing to ensure trouble free operation under severe conditions in process

#### Technical Support

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#### Abuse and Transport Certifications

·UN/DOT Certified : Class 9 Transport, UN3090 Lithium Metal Batteries

- Shock Testing : To be determined
- ·Vibration Testing : To be determined

#### **Cell Characteristics**

Nominal Capacity	4.0Ah ~ 7.0Ah
Based on 157mA discharge at temperatures of 25 ~ 100°C to a 2.0V cutoff.	
Discharge at higher currents or lower temperatures will affect capacity obtained.	
Open Circuit Voltage	3.91V
At 20°C	
Nominal Closed Circuit Voltage	3.4V
Based on stable CCV produced at $25^{\circ}$ C under a 90mA load. The CCV of a cell will decay slightly over discharge due to the normal increase in internal impedance.	
Constant Current Discharge	175mA
Maximum Constant Current Rate	600mA(reduced capacity)
Storage Conditions	30°C (86°F) Max
Operational Temperature Range	-20°C to 100°C
Note full capacity is obtained at temperatures of 25°C and above. Below 25°C both the rate capability and the capacity of the cell are reduced.	
Fuse	2.0A
Parallel Diode	3.0A



ISO 9001 : 2008 ISO 14001 : 2004 MSDS, RoHS, UN

#### **Characteristics**

- 3.9V C-Size Lithium Sulfuryl Chloride Cell(Li-SO<sub>2</sub>Cl<sub>2</sub>)
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

Diameter	25.5mm(1.00 in)
Height	49.1mm(1.93 in)
Weight	59g
Lithium Metal Content	2.4g

#### Packing Information

Packing Qty per C/T	150
Net Weight per C/T(Kg)	8.85
Gross Weight per C/T(Kg)	9.85
C/T Size	450mm×250mm×230mm

#### Temperature versus Capacity



#### Storage

• Store cells in a cool(<30°C) and dry location

#### Warning

- •Contents of this hermetically sealed cell are water reactive and will produce flammable and toxic gases if exposed to water.
- Fire, explosion and severe burn hazard. Do not recharge, crush, disassemble, heat above 100°C(212°F), incinerate, short circuit or expose contents to water. Keep battery out of reach of children and in original package until ready to use.
- ·Dispose of used batteries promptly.

#### Note

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#### **External Dimensions**



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# VITZROCELL Co., Ltd.

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