High Temperature Battery
Lithium Battery Professional

Downhole Drilling
Exploration
Pipeline Inspection Gauge
Geophysical Surveying
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 11 - Creativity, Change, Challenge and Innovation

Vision

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ЗАКАЗЫ ПО РОССИИ
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**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

---Vision---

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---VITZROCELL’s Past, Present and Future---

---1987~1991---
1987.10 Establishment Teckraf Co., Ltd. (present Vitzrocell)
1988.05 Technical Adoption of GaL 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 KBID
2004.11 Granted USD 10 Million Exportation Prize
2005.05 Awarded “Advance Technology and R&D Center (ATC)” (MKI)
2006.03 Acquired Environment System Certification (ISO 14001)
2007.11 Acquired Defence Quality Management System Certification from D&G
2008.01 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 20 Million Export
2010.12 NEP Approval (Ministry of Knowledge & Economy)

---2010~Now---
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 30 Million export (July, 2012 - June, 2013)
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.

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

**Main Characteristics**
3.6V Li/SOD2
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**

<table>
<thead>
<tr>
<th>Model</th>
<th>PN</th>
<th>Size(mm)</th>
<th>Capacity</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD-HR-150(S)</td>
<td>32-126-H150G</td>
<td>φ 31.9 × h127</td>
<td>25Ah - 28Ah</td>
<td>-40°C ~ 150°C</td>
</tr>
<tr>
<td>DD-HR-150(A)</td>
<td>32-126-H150A</td>
<td>φ 31.9 × h127</td>
<td>25Ah - 26Ah</td>
<td>-40°C ~ 150°C</td>
</tr>
<tr>
<td>FAT-D-150</td>
<td>48-80-H150G</td>
<td>φ 48.5 × h80.5</td>
<td>37Ah - 40Ah</td>
<td>-40°C ~ 150°C</td>
</tr>
<tr>
<td>DD-MR-165</td>
<td>32-126-M165G</td>
<td>φ 31.9 × h127</td>
<td>25Ah - 26Ah</td>
<td>-40°C ~ 185°C</td>
</tr>
<tr>
<td>DD-MR-180</td>
<td>32-126-M180G</td>
<td>φ 31.9 × h127</td>
<td>22Ah - 25Ah</td>
<td>50°C ~ 180°C</td>
</tr>
<tr>
<td>CC-MR-165 (21mm)</td>
<td>21-102-M165G</td>
<td>φ 20.85 × h102.1</td>
<td>7Ah - 8Ah</td>
<td>-40°C ~ 165°C</td>
</tr>
<tr>
<td>CC-MR-165 (25mm)</td>
<td>25-102-M165G</td>
<td>φ 24.75 × h102.1</td>
<td>11Ah - 13Ah</td>
<td>-40°C ~ 165°C</td>
</tr>
<tr>
<td>CC-MR-165 (26mm)</td>
<td>26-102-M165G</td>
<td>φ 25.55 × h102.1</td>
<td>13Ah - 14Ah</td>
<td>-40°C ~ 165°C</td>
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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.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extreme Shock &amp; Vibration Resistance</td>
<td>Measurement While Drilling</td>
</tr>
<tr>
<td>Available Temperature: 150°C ~ 200°C</td>
<td>Logging While Drilling</td>
</tr>
<tr>
<td>Very High Power and Energy Density</td>
<td>Cased-Hole Logging</td>
</tr>
<tr>
<td>High and Stable Operating Voltage</td>
<td></td>
</tr>
</tbody>
</table>

**Pipeline Inspection Gauge (PIG)**
Vitzrocell's high temperature batteries, especially Li/SOCl2 (3.9V) batteries are widely used in PIG market. Vitzrocell’s Li/SOCl2 (3.9V) batteries are very competitive for its higher capacity (more than 20%) and low temperature performance comparing its competitor. We are proud of its outstanding performance overwhelmed the competitor’s.

<table>
<thead>
<tr>
<th>Feature</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Extreme Shock &amp; Vibration Resistance</td>
<td>PIG (Pipeline Inspection Gauge)</td>
</tr>
<tr>
<td>Available Over Temperature: -20°C ~ 100°C</td>
<td>Production Well Reserve Monitoring</td>
</tr>
<tr>
<td>Very High Power and Energy Density</td>
<td></td>
</tr>
<tr>
<td>High and Stable Operating Voltage</td>
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</tbody>
</table>

**Ocean Equipment**
In today’s market, batteries for ocean equipment 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/SOCl2 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 beacon, oil flow monitors and current meters.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Applications</th>
</tr>
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<tbody>
<tr>
<td>High and Stable Operating Voltage: 3.9V</td>
<td>Oceanographic Devices: Buoy, Tsunami Detector, Seismic devices</td>
</tr>
<tr>
<td>High Power and Energy Density</td>
<td></td>
</tr>
</tbody>
</table>

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**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(S)
- 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**

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<td>DD-HR-150(S)</td>
<td>32-126-H190G</td>
<td>φ31.9×h127</td>
<td>26Ah~28Ah</td>
<td>-40°C ~ 150°C</td>
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<td>DD-HR-150(A)</td>
<td>32-126-H190A</td>
<td>φ31.9×h127</td>
<td>25Ah~28Ah</td>
<td>-40°C ~ 150°C</td>
</tr>
<tr>
<td>FAT-D-150</td>
<td>48-80-H150G</td>
<td>φ48.5×h150</td>
<td>37Ah~40Ah</td>
<td>-40°C ~ 150°C</td>
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<td>DD-MR-165</td>
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<td>φ25.55×h102.1</td>
<td>13Ah ~ 14Ah</td>
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</tr>
</tbody>
</table>

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**Oil & Gas**

**Model:** DD-HR-150G  
**PN:** 32-126-H150G

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**Key Features**
- 304L stainless steel structure
- Non-bleed 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 fault 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)

**Cell Characteristics**
- Nominal Capacity
  - 26Ah ~ 28Ah
- Open Circuit Voltage
  - At 20°C: 3.65V
- Nominal Closed Circuit Voltage
  - 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.
  - 3.2V
- Constant Current Discharge 580mA
  - 1300mA (reduced capacity)
- Storage Conditions
  - 30°C (86°F) Max
- Operational Temperature Range
  - -40°C to 150°C

**Fuse**
- 5.0A
- Parallel Diode

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**Physical Characteristics**
- **Dimensions:**
  - 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 x 302mm x 210mm

**Temperature versus Capacity**

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**Temperature versus Capacity (6.13 Discharge 25% to 150°C)**

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**Storability:**
- 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.
- Information is also dependent on actual conditions and does not guarantee future performance.
- And subject to change.
Oil & Gas – MWD/LWD

MODEL: DD-HR-150G
PN: 32-126-H150G

**Physical Characteristics**
- **Barometer:** 21.45 – 29.3 kPa
- **Height:** 127.0 mm
- **Weight:** 230g
- **Lithium Metal Content:** 8.02g

**Packaging Information**
- **Packaging Type per CT:** 64
- **Net Weight per CT (Kg):** 14.72
- **Gross Weight per CT (Kg):** 15.82
- **CT Size:** 427mm × 302mm × 210mm

**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 fault 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)

**Cell Characteristics**
- **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:**
  - At 20°C: 3.65V
- **Nominal Closed Circuit Voltage:**
  - 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.
  - 3.2V
- **Constant Current Discharge:**
  - 580mA (reduced capacity)
  - 1300mA (reduced 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

**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)

**Cell Characteristics**
- **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:**
  - At 20°C: 3.65V
- **Nominal Closed Circuit Voltage:**
  - 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.
  - 3.2V
- **Constant Current Discharge:**
  - 580mA (reduced capacity)
  - 1300mA (reduced 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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Oil & Gas
-MWD/LWD

MODEL : DD-HR-150A  PN : 32-126-H150A

Characteristics
- 3.6V DD-Size Lithium Thionyl Chloride Cell (Li-SOCl2), 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 current constant and pulse applications
- Aluminum Based electrolyte providing lower cost and very low self-discharge
- 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/OS1 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)

Cell Characteristics
- Nominal Voltage: 3.6V
- Maximum Internal Voltage: 3.95V
- Nominal Current: 580mA
- Nominal Capacity: 25Ah~28Ah
- Open Circuit Voltage: 3.65V
- Nominal Closed Circuit Voltage: 3.2V
- Constant Current Discharge: 580mA (reduced capacity)
- Storage Conditions: 30°C 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.

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

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

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

Physical Characteristics
- Batteries: 31.9mm x 28.0mm
- Weight: 230g
- Lithium Metal Content: 8.02g
- External Dimensions

Packing Information
- Packaging Qty per C/T: 64
- Net Weight per C/T: 14.72 Kg
- Gross Weight per C/T: 15.82 Kg
- C/T Size: 427mm × 302mm × 210mm

Temperature versus Capacity
- Discharge Temperature vs. Nominal Capacity
- 6/1 Discharge 50 to 150°C

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)

Cell Characteristics
- Nominal Capacity: 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: At 20°C 3.65V
- Nominal Closed Circuit Voltage: 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 (reduced capacity)
- Storage Conditions: 30°C 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.

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

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(Tel code : +82-41-332-8642
Fax : +82-41-332-8646
Email : overseas@vitzrocell.com
Web : www.vitzrocell.com
External Dimensions

Oil&Gas – MWD/LWD

MODEL : DD-HR-150A
PN : 32-126-H150A

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
- 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, UN0990 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)

Cell Characteristics

- Nominal Capacity
  - Based on 580mA discharge at temperatures of 50~150°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures of other capacities limited.
  - 25Ah ~ 28Ah
- Open Circuit Voltage
  - 3.6V @ 20°C
- Nominal Closed Circuit Voltage
  - 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.
  - 3.2V
- 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.

Discharge Temperature vs. Nominal Capacity

- 6/12 Discharge 50 to 150°C

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

Abuse and Transport Certifications

- UN/DOT Certified : Class 9 Transport, UN0990 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)

Cell Characteristics

- Nominal Capacity
  - Based on 580mA discharge at temperatures of 50~150°C to a 2.0V cutoff. Discharge at higher currents or lower temperatures of other capacities limited.
  - 25Ah ~ 28Ah
- Open Circuit Voltage
  - 3.6V @ 20°C
- Nominal Closed Circuit Voltage
  - 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.
  - 3.2V
- 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.

Discharge Temperature vs. Nominal Capacity

- 6/12 Discharge 50 to 150°C

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. Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.
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Web: www.vitzrocell.com

MODEL : FAT-D-150
PN : 48-80-H150G

Oil&Gas
− MWD/LWD

Characteristics
- 3.6V FAT D Size Lithium Thionyl Chloride (Li-SOCl2) Electrolyte
- Low Magnetic
- High Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 150°C Operational Temperature

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

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

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

Packing Information
- Pack: 48 batteries per CT
- Net Weight: 10.1 kg
- Gross Weight: 10.8 kg
- No. of Batteries: 24 / 3 layers

Temperature versus Capacity
- 60% Discharge 2S to 150°C

Cell Characteristics
- 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.
- 37Ah ~ 40Ah

Open Circuit Voltage
- At 20°C: 3.65V

Nominal Closed Circuit Voltage
- 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.
- 3.2V

Magnetic Characteristics
- 40 nano Tesla @7 inch
- Constant Current Discharge 580mA
- 2000mA (reduced capacity)

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

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.

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

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

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Web: www.vitzrocell.com
**Oil & Gas – MWD/LWD**

**MODEL:** FAT-D-150  **PN:** 48-80-H150G

---

### 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

### Cell Characteristics
- **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.
  - 37Ah ~ 40Ah

- **Open Circuit Voltage** at 20°C
  - 3.65V

- **Nominal Closed Circuit Voltage** 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.
  - 3.2V

- **Magnetic Characteristics** @ 40 nano Tesla @ 7 inch
  - 6G3 Discharge 25 to 150°C
  - 2000mA (reduced capacity)

### Physical Characteristics
- **Diameter**: 48.5mm (+0.02, -0.01)
- **Height**: 80.5mm (+0.03, -0.01)
- **Weight**: 337g
- **Lithium Metal Content**: 12.3g

### Physical Dimensions
- **Packing Information**
  - Packing Weight per CT: 36g
  - Net Weight per CT (kg): 1.93
  - C/T Size: 450mm x 250mm x 230mm

### Temperature versus Capacity

#### Discharge Temperature vs. Nominal Capacity

- **6G3 Discharge 25 to 150°C**

### 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.
  Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.
Oil & Gas
— MWD/LWD

MODEL : DD-MR-165
PN : 32-126-M165G

Key Features
- 304L stainless steel structure
- Non-bulge design
- Non-bulge design 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

Cell Characteristics
Nominal Capacity
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.

26Ah ~ 29Ah

Open Circuit Voltage
At 20°C
3.65V

Nominal Closed Circuit Voltage
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.

3.2V

Constant Current Discharge 300mA
600mA (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
8.0A

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

Characteristics
- 3.6V DD-Size Lithium Thionyl Chloride (Li-SOCl2), Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 165°C Operational Temperature

External Dimensions

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Fax : +82-2-499-2756
Email : overseas@vitzrocell.com
Web : www.vitzrocell.com

Packing Information
Packing Weight per C/T
94
Net Weight per C/T (kg)
9.5

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 guarantee future performance. And subject to change.

Physical Characteristics
Max. Diame 21.6mm (0.85 in)
Height 26.8mm (1.06 in)
Weight 23g
Lithium Metal Content 8.6g

Temperature versus Capacity
Discharge Temperature vs. Nominal Capacity
125° Discharge 25°C to 165°C

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

Cell Characteristics
Nominal Capacity
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.

26Ah ~ 29Ah

Open Circuit Voltage
At 20°C
3.65V

Nominal Closed Circuit Voltage
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.

3.2V

Constant Current Discharge 300mA
600mA (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
8.0A

ISO 9001 : 2008
ISO 14001 : 2004
MSDS, RoHS, UN
**Key Features**

- SUS4L 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

**Cell Characteristics**

- Nominal Capacity
  - 26Ah to 29Ah
- Open Circuit Voltage
  - 3.65V at 20°C
- 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

**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 guarantee future performance. And subject to change.

---

**Model:** DD-MR-165  
**PN:** 32-126-M165G  
**Temperature versus Capacity**

Discharge Temperature vs. Nominal Capacity  
162°C Discharge 25°C to 165°C  

---

**External Dimensions**

- **Diameter:** 31.9mm (1.26 in)
- **Height:** 127.0mm (5.0 in)
- **Weight:** 225g
- **Lithium Metal Content:** 8.60g
Oil & Gas – MWD/LWD

MODEL : DD-MR-180  PN : 32-126-M180G

**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
- 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

**Cell Characteristics**

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<thead>
<tr>
<th>Temperature (°C)</th>
<th>Capacity (Ah)</th>
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**Physical Characteristics**
- **Diameter**
  - 31.9±0.1mm
- **Height**
  - 127.0mm
- **Weight**
  - 225g
- **Lithium Metal Content**
  - 8.30g

**Packaging Information**
- Packing Quantity 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

**Packing Dimensions**
- External Dimensions
  - 1264.2x915.6

**Characteristics**
- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl2), Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 180°C Operational Temperature

**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**
- Any information given here is for reference only.
- Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.

**External Dimensions**
- 1264.2x915.6
- Maximum Height 31.9±0.1mm

**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

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**Physical Characteristics**
- **Diameter**
  - 31.9±0.1mm
- **Height**
  - 127.0mm
- **Weight**
  - 225g
- **Lithium Metal Content**
  - 8.30g

**Packaging Information**
- Packing Quantity 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

**Packing Dimensions**
- External Dimensions
  - 1264.2x915.6

**Characteristics**
- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl2), Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 180°C Operational Temperature

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- 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**
- Any information given here is for reference only.
- Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.

**External Dimensions**
- 1264.2x915.6
- Maximum Height 31.9±0.1mm

**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
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**Physical Characteristics**
- **Diameter**
  - 31.9±0.1mm
- **Height**
  - 127.0mm
- **Weight**
  - 225g
- **Lithium Metal Content**
  - 8.30g

**Packaging Information**
- Packing Quantity 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

**Packing Dimensions**
- External Dimensions
  - 1264.2x915.6

**Characteristics**
- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl2), Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
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**Note**
- Any information given here is for reference only.
- Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.

**External Dimensions**
- 1264.2x915.6
- Maximum Height 31.9±0.1mm

**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

**Cell Characteristics**

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**Physical Characteristics**
- **Diameter**
  - 31.9±0.1mm
- **Height**
  - 127.0mm
- **Weight**
  - 225g
- **Lithium Metal Content**
  - 8.30g

**Packaging Information**
- Packing Quantity 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

**Packing Dimensions**
- External Dimensions
  - 1264.2x915.6

**Characteristics**
- 3.6V DD-Size Lithium Thionyl Chloride Cell(Li-SOCl2), Gallium Electrolyte
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**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**
- Any information given here is for reference only.
- Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.
Oil & Gas
– MWD/LWD

MODEL : DD-MR-180  PN : 32-126-M180G

**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, higher 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

**Cell Characteristics**
- Nominal Capacity : 22Ah ~ 25Ah
- Open Circuit Voltage : 3.65V
- Nominal Closed Circuit Voltage : 3.2V
- Constant Current Discharge : 225mA, 320mA (reduced capacity)
- Storage Conditions : 30°C
- Temperature versus Capacity

**Physical Characteristics**
- 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**

**Discharge Temperature vs. Nominal 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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**ISO 9001 : 2008**
**ISO 14001 : 2004**
**MSDS, RoHS, UN**

**Characteristics**
- 3.6V DD-Szsz Lithium Thionyl Chloride (Li-SOCl2) Galium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 180°C Operational Temperature

**External Dimensions**

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Fax : +82-2-2024-3252
Email : overseas@vitzrocell.com
Web : www.vitzrocell.com
**Oil & Gas – MWD/LWD**

**Model:** CC-MR 165(21mm)  **PN:** 21-102-M165(21mm)

---

**Key Features**
- 304L stainless steel shell structure
- Non-bulge design
- Hermetic glass to metal seal engineered for leak free operation
- Internal 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

---

**Cell Characteristics**

<table>
<thead>
<tr>
<th>Measured Capacity @ 75°C</th>
<th>Nominal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0 Ah to 8.0 Ah</td>
<td></td>
</tr>
</tbody>
</table>

| Nominal Open Circuit Voltage @ 20°C | 3.65V |
| Nominal Closed Circuit Voltage @ 25°C | 3.2V (at 64mA) |

| Constant Current Discharge | 120mA | 200mA (reduced capacity) |

---

**Physical Characteristics**
- Diameter: 20.85±0.1mm
- Height: 102.1±0.5mm
- Weight: 80g
- Lithium Metal Content: 2.8g

---

**Packaging Information**
- Packaging 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

---

**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 guarantee future performance. And subject to change.

---

**Capacity vs. Temperature**

**Discharge Graph (@165°C)**

---

**Technical Specifications**

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>0</th>
<th>5</th>
<th>10</th>
<th>15</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>35</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (V)</td>
<td>3.65</td>
<td>3.55</td>
<td>3.35</td>
<td>3.25</td>
<td>3.20</td>
<td>3.15</td>
<td>3.10</td>
<td>3.05</td>
<td>3.00</td>
</tr>
</tbody>
</table>

---

**External Dimensions**

---

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Email: overseas@vitzrocell.com
Web: www.vitzrocell.com

---

**Characteristics**
- 3.6V CC-Size Lithium Thionyl Chloride Cell (Li-SOCl2)
- Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 165°C Maximum Operational Temperature

---

**Cell Characteristics**

<table>
<thead>
<tr>
<th>Measured Capacity @ 20°C</th>
<th>Nominal Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0 Ah to 8.0 Ah</td>
<td></td>
</tr>
</tbody>
</table>

| Nominal Open Circuit Voltage @ 20°C | 3.65V |
| Nominal Closed Circuit Voltage @ 25°C | 3.2V (at 64mA) |

| Constant Current Discharge | 120mA | 200mA (reduced capacity) |

---

**Physical Characteristics**
- Diameter: 20.85±0.1mm
- Height: 102.1±0.5mm
- Weight: 80g
- Lithium Metal Content: 2.8g

---

**Packaging Information**
- Packaging 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

---

**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 guarantee future performance. And subject to change.
Oil & Gas
– MWD/LWD

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

Key Features
- 304L stainless steel structure
- Non-bulge design
- Hermetic glass to metal seal engineered for leak-free operation
- Internal 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
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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

Capacity vs. Temperature

Discharge Temperature vs. Nominal Capacity

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Capacity (Ah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7.0</td>
</tr>
<tr>
<td>25</td>
<td>6.2</td>
</tr>
<tr>
<td>50</td>
<td>5.4</td>
</tr>
<tr>
<td>75</td>
<td>4.8</td>
</tr>
<tr>
<td>100</td>
<td>4.3</td>
</tr>
<tr>
<td>125</td>
<td>3.8</td>
</tr>
<tr>
<td>150</td>
<td>3.4</td>
</tr>
<tr>
<td>165</td>
<td>3.1</td>
</tr>
</tbody>
</table>

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

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

Technical Specifications

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Capacity</td>
<td>7.0 Ah</td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>3.65V</td>
</tr>
<tr>
<td>Nominal Open Circuit Voltage</td>
<td>3.2V (at 64mA)</td>
</tr>
<tr>
<td>Current Drain Voltage</td>
<td>1.0A</td>
</tr>
<tr>
<td>Internal Voltage</td>
<td>165°C</td>
</tr>
<tr>
<td>Storage Temperature Range</td>
<td>30°C to 86°F</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-40°C to 165°C</td>
</tr>
<tr>
<td>Lithium Metal Content</td>
<td>2.8g</td>
</tr>
<tr>
<td>Packing Qty per C/T</td>
<td>100</td>
</tr>
<tr>
<td>Net Weight per C/T</td>
<td>8.0 Kg</td>
</tr>
<tr>
<td>Gross Weight per C/T</td>
<td>9.1 Kg</td>
</tr>
<tr>
<td>C/T Size</td>
<td>427mm x 302mm x 210mm</td>
</tr>
</tbody>
</table>

Note
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- Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.
Oil & Gas - MWD/LWD

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

**Key Features**
- 304L stainless steel structure
- Non-bulge design
- Negative glass-to-metal seal engineered for leak-free operation
- Internal parallel diode
- Reduced Electrode Surface Area, high-rate capability & lower self-discharge

**Benefits**
- Industry loading 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
- Vibration Testing

**Cell Characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Capacity</td>
<td>11Ah - 13Ah</td>
</tr>
<tr>
<td>Open Circuit Voltage</td>
<td>3.65V</td>
</tr>
<tr>
<td>Nominal Closed Circuit Voltage</td>
<td>3.2V(at 80mA)</td>
</tr>
<tr>
<td>Maximum Discharge Current</td>
<td>1.0A</td>
</tr>
</tbody>
</table>

**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.

**Physical Characteristics**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diameter</td>
<td>Ø24.75mm(0.97 in)</td>
</tr>
<tr>
<td>Height</td>
<td>102.1mm(4.02 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>115g</td>
</tr>
<tr>
<td>Lithium Metal Content</td>
<td>4.0g</td>
</tr>
</tbody>
</table>

**Packing Information**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Packing Qty per C/T</td>
<td>80</td>
</tr>
<tr>
<td>Net Weight per C/T</td>
<td>9.2Kg</td>
</tr>
<tr>
<td>Gross Weight per C/T</td>
<td>10.3Kg</td>
</tr>
</tbody>
</table>

**Capacity vs. Temperature**

**Discharge Temperature vs. Nominal Capacity**

<table>
<thead>
<tr>
<th>Temperature(˚C)</th>
<th>Capacity Amp-hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 165°C</td>
<td>4.0 to 2.0</td>
</tr>
</tbody>
</table>

**External Dimensions**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>102.1mm</td>
</tr>
<tr>
<td>Diameter</td>
<td>24.75mm</td>
</tr>
</tbody>
</table>

**Characteristics**

- 3.6V C-Szue Lithium Thiyl Chloride Cell(Li-SOCl2)
- Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 165°C Maximum Operational Temperature

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Email: overseas@vitzrocell.com
Web: www.vitzrocell.com
Characteristics

-3.6V CC-Size Lithium Thionyl Chloride Cell (Li-SOCl\textsubscript{2})

-304L Stainless Steel Structure
-Non-Bulge Design
-High Capacity
-Extreme Shock and Vibration Resistance
-165°C Maximum Operational Temperature

Technical Support
-Various customer service support
-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

-Non-Bulge Design
-Moderate Rate Capability for constant current and pulse applications
-Gallium based electrolytes 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

Fuel Cell Characteristics

- Nominal Capacity: 225mA (reduced capacity)
- Storage Conditions: 30°C (86°F) Max
- Operational Temperature Range: -40°C to 165°C
- Parallel Diode: 1.0A

Physical Characteristics

- 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

Capacity vs. Temperature

- Nominal Capacity: 11Ah ~ 13Ah
- Open Circuit Voltage: 3.65V
- Nominal Closed Circuit Voltage: 3.2V (at 80mA)

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 guarantee future performance. And subject to change.
Oil & Gas – MWD/LWD

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

Key Features
- 304L stainless steel structure
- Non-bulge design
- Hermetic glass-to-metal seal engineered for leak free operation
- Internal 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

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- 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

<table>
<thead>
<tr>
<th>Nominal Capacity (Ah)</th>
<th>13Ah – 14Ah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Discharge Voltage (V)</td>
<td>3.65V</td>
</tr>
<tr>
<td>Nominal End of Discharge Voltage (V)</td>
<td>2.50V – 2.65V</td>
</tr>
<tr>
<td>Continuous Current Discharge (A)</td>
<td>1.0A (10hr)</td>
</tr>
<tr>
<td>Storage Voltage (V)</td>
<td>3.0V – 3.15V</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>-20°C to 165°C</td>
</tr>
</tbody>
</table>

Discharge Characteristics

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>0</th>
<th>25</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>165</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Capacity (Ah)</td>
<td>12.6</td>
<td>13.0</td>
<td>13.3</td>
<td>13.6</td>
<td>13.9</td>
<td>14.2</td>
<td>14.5</td>
</tr>
</tbody>
</table>

Physical Characteristics

<table>
<thead>
<tr>
<th>Dimensions (mm)</th>
<th>83 x 38 x 38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (g)</td>
<td>120g</td>
</tr>
<tr>
<td>Lithium Metal Content</td>
<td>4.3g</td>
</tr>
</tbody>
</table>

Packing Information

<table>
<thead>
<tr>
<th>Packing Weight per CT</th>
<th>4.7kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Weight per CT</td>
<td>4.8kg</td>
</tr>
</tbody>
</table>

Capacity vs. Temperature

Discharge Temperature vs. Nominal Capacity

Capacity vs. Temperature

Capacity vs. Voltage

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 guarantee future performance. And subject to change.

Characteristics
- 3.6V Cc-Sized Lithium Thionyl Chloride Cell(Li-SOCl2)
- Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 165°C Maximum Operational Temperature

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

ISO 9001 : 2001
ISO 14001 : 2004
MSDS, RoHS, UN

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

Capacity vs. Temperature

Discharge Temperature vs. Nominal Capacity

Capacity vs. Temperature

Capacity vs. Voltage

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

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Web: www.vitzrocell.com
Oil & Gas
-MWD/LWD

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

Key Features
- 304L stainless steel structure
- Non-bulge design
- Hermetic glass to metal seal engineered for leak free operation
- Internal 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/1811 Certified: Class 9 Transport, UN3090 Lithium Metal Batteries
- Shock Testing: To be determined
- Vibration Testing: To be determined

Cell Characteristics
- Nominal Voltage: 3.6V
- Nominal Capacity: 13Ah to 14Ah
- Open Circuit Voltage: 3.65V at 20°C
- Nominal Closed Circuit Voltage: 3.2V (at 80mA)
- Constant Current Discharge: 150mA (reduced capacity)
- Storage Conditions: 30°C Max
- Operational Temperature Range: -40°C to 165°C
- Parallel Diode: 1.0A

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

Characteristics
- 3.6V CC-Size Lithium Thionyl Chloride Cell (Li-SOCl2)
- Gallium Electrolyte
- Moderate Rate Capability
- High Capacity
- Extreme Shock and Vibration Resistance
- 165°C Maximum Operational Temperature

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

Packing Information
- Packing Quantity per C/T: 80
- Net Weight per C/T (Kg): 9.6
- Gross Weight per C/T (Kg): 10.7
- C/T Size: 427mm x 302mm x 210mm

Capacity vs. Temperature
- Discharge Temperature vs. Nominal Capacity
- 142(26) Discharge 0°C to 165°C

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 guarantee future performance. And subject to change.
Oil & Gas – Pigging / Ocean Equipments

Application
PIG (Pipe Line Inspection Gauge) for Oil & Gas transport
Oceanographic Equipment (Tsunami detector, Seismic search, etc)

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

Main Characteristics
3.9V Li/SiCl₂
High Capacity
100°C Operational Temperature
High Rate Capability

Summary of Product Line-up

<table>
<thead>
<tr>
<th>Model</th>
<th>PN</th>
<th>Size (mm)</th>
<th>Capacity (Ah)</th>
<th>Temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC-DD01 (PIG-DD)</td>
<td>34–111–H100G</td>
<td>83.6 x h112.3</td>
<td>27–32</td>
<td>20–100</td>
</tr>
<tr>
<td>SC-D01 (PIG-D)</td>
<td>34–59–H100G</td>
<td>83.6 x h160.3</td>
<td>12–15</td>
<td>20–100</td>
</tr>
<tr>
<td>SC-C01 (PIG-C)</td>
<td>20–49–H100G</td>
<td>825.5 x h49.1</td>
<td>4–7</td>
<td>20–100</td>
</tr>
</tbody>
</table>

Packing Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Weight (kg)</th>
<th>Packing qty per Case</th>
<th>Netweight per Case (kg)</th>
<th>Grossweight per Case (kg)</th>
<th>C/TS</th>
<th>Size (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD-HR-150G</td>
<td>0.23</td>
<td>64</td>
<td>14.72</td>
<td>15.92</td>
<td></td>
<td>423 x 302 x 210mm</td>
</tr>
<tr>
<td>DD-HR-150A</td>
<td>0.23</td>
<td>64</td>
<td>14.72</td>
<td>15.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DD-MR-165</td>
<td>0.225</td>
<td>64</td>
<td>14.4</td>
<td>15.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC-MR 165(21mm)</td>
<td>0.08</td>
<td>100</td>
<td>8.0</td>
<td>9.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC-MR 155(25mm)</td>
<td>0.115</td>
<td>80</td>
<td>9.2</td>
<td>10.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CC-MR 165(26mm)</td>
<td>0.12</td>
<td>80</td>
<td>9.6</td>
<td>10.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC-DD01 (PIG-DD)</td>
<td>0.213</td>
<td>64</td>
<td>13.63</td>
<td>14.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FAT-D-150</td>
<td>0.337</td>
<td>36</td>
<td>12.13</td>
<td>13.13</td>
<td></td>
<td>450 x 250 x 230mm</td>
</tr>
<tr>
<td>SC-D01 (PIG-D)</td>
<td>0.122</td>
<td>80</td>
<td>9.76</td>
<td>10.76</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SC-C01 (PIG-C)</td>
<td>0.059</td>
<td>150</td>
<td>8.85</td>
<td>9.85</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Oil & Gas – Pigging / Ocean Equipments

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

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

Main Characteristics
3.9V Li/SOCl2
High Capacity
100°C Operational Temperature
High Rate Capability

Summary of Product Line-up

<table>
<thead>
<tr>
<th>Model</th>
<th>PN</th>
<th>Size(mm)</th>
<th>Capacity(Ah)</th>
<th>Temperature(°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC-DD01 (PIG-DD)</td>
<td>34-111-H100G</td>
<td>63.6 x h112.3</td>
<td>27 – 32</td>
<td>20 – 100</td>
</tr>
<tr>
<td>SC-D01 (PIG-D)</td>
<td>34-99-H100G</td>
<td>63.6 x h100.3</td>
<td>12 – 15</td>
<td>20 – 100</td>
</tr>
<tr>
<td>SC-C01 (PIG-C)</td>
<td>20-49-H100G</td>
<td>21.5 x h49.1</td>
<td>4 – 7</td>
<td>20 – 100</td>
</tr>
</tbody>
</table>

Packing Information

<table>
<thead>
<tr>
<th>Model</th>
<th>Cell weight(kg)</th>
<th>Packing qty per Case</th>
<th>Net weight per Case(kg)</th>
<th>Gross weight per Case(kg)</th>
<th>C/TSize</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD-HR-150G</td>
<td>0.23</td>
<td>64</td>
<td>14.72</td>
<td>15.82</td>
<td></td>
</tr>
<tr>
<td>DD-HR-150A</td>
<td>0.23</td>
<td>64</td>
<td>14.72</td>
<td>15.82</td>
<td></td>
</tr>
<tr>
<td>DD-MR-165</td>
<td>0.225</td>
<td>64</td>
<td>14.4</td>
<td>15.5</td>
<td></td>
</tr>
<tr>
<td>DD-MR-180</td>
<td>0.225</td>
<td>64</td>
<td>14.4</td>
<td>15.5</td>
<td></td>
</tr>
<tr>
<td>CC-MR 165(21mm)</td>
<td>0.08</td>
<td>100</td>
<td>8.0</td>
<td>9.1</td>
<td></td>
</tr>
<tr>
<td>CC-MR 165(25mm)</td>
<td>0.115</td>
<td>80</td>
<td>9.2</td>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>CC-MR 165(26mm)</td>
<td>0.12</td>
<td>80</td>
<td>9.6</td>
<td>10.7</td>
<td></td>
</tr>
<tr>
<td>SC-DD01 (PIG-DD)</td>
<td>0.213</td>
<td>64</td>
<td>13.63</td>
<td>14.73</td>
<td></td>
</tr>
<tr>
<td>FAT-D-150</td>
<td>0.337</td>
<td>36</td>
<td>12.13</td>
<td>13.13</td>
<td></td>
</tr>
<tr>
<td>SC-D01 (PIG-D)</td>
<td>0.122</td>
<td>80</td>
<td>9.76</td>
<td>10.76</td>
<td></td>
</tr>
<tr>
<td>SC-C01 (PIG-C)</td>
<td>0.059</td>
<td>150</td>
<td>8.85</td>
<td>9.85</td>
<td></td>
</tr>
</tbody>
</table>
External Dimensions

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

Cell Characteristics
- Nominal Capacity: 27Ah ~ 32Ah
- Nominal Open Circuit Voltage: 3.91V
- Nominal Closed Circuit Voltage: 3.4V
- Maximum Constant Current Rate: 580mA
- Storage Conditions: 20°C
- Nominal Voltage: 3V
- Temperature range: -20°C to 100°C
- Typical life: 100°C Operational Temperature

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

Note
- Any information given here is for reference only. Information is also dependent on actual conditions and does not guarantee future performance. And subject to change.

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.

Characteristics
- 3.9V DD-Size Lithium Sulfuryl Chloride Cell(Li-SO2Cl2)
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

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

Physical Characteristics
- Nominal Capacity: 27Ah ~ 32Ah
- Nominal Open Circuit Voltage: 3.91V
- Nominal Closed Circuit Voltage: 3.4V
- Maximum Constant Current Rate: 580mA
- Packaging Weight per Cell: 106g
- Shipping Weight per Cell: 119g
- 7.0A Fuse
- 8.0A Parallel Diode

Discharge Temperature vs. Nominal Capacity
6.3 Discharge -20 to 100°C

Packing Information
- Packing Weight per Cell: 106g
- Shipping Weight per Cell: 119g
- 7.0A Fuse
- 8.0A Parallel Diode

VITZROCELL USA, Inc.
USA Sales & Warehouse
10804 Fallstone, Suite 200,
Houston, TX 77099, USA
Office : 1 832 850 7095
Email : arose@vitzrocellusa.com
Web : www.vitzrocellusa.com

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

VITZROCELL Co., Ltd.
Head Office & Factory
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Chungcheongnam-do, South Korea
(Tel code : 32417)
Tel : +82-41-332-8642
Fax : +82-41-332-8646
Seoul Office
VITZROCELL B/D 25Gil-10 Neungdong-ro,
Gwangjin-Gu, Seoul (Zip code : 04998)
Tel : +82-2-2024-3252
Fax : +82-2-499-2756
Email : overseas@vitzrocell.com
Web : www.vitzrocell.com

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

Oil&Gas – Pigging/Ocean Equipment

Iso 9001 : 2008
Iso 14001 : 2004
MsdS, RoHs, Un, AteX
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 current and pulse applications
- Automated assembly for uniform performance
- Certified shock and vibration testing to ensure trouble free operation under severe 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 : Completed
- Vibration Testing : Completed

Cell Characteristics
- Nominal Capacity: 27Ah ~ 32Ah
- Open Circuit Voltage: 3.91V at 20°C
- Nominal Closed Circuit Voltage: 3.4V at 25°C
- Maximum Constant Current Rate: 580mA
- 2000mA (reduced capacity)
- Storage Conditions: 30°C 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
- Parallel Diode
- 7.0A
- 8.0A

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

Characteristics
- 3.6V Cell (Li-Sulfuryl Chloride Cell (Li-SO2Cl2))
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

Packing Information
- Packing Quantity: 6it
- Net Weight per C/T (Kg): 13.63
- Gross Weight per C/T (Kg): 14.73

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 guarantee future performance. And subject to change.

Temperature versus Capacity
- Discharge Temperature vs. Nominal Capacity
  - 63.3 Discharge -20 to 100°C

Discharge Graph (@1500 mA, 6 ohm load)
Oil&Gas – Pigging/Ocean Equipment

MODEL : SC-D01(PGD) PN : 34-59-H100G

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 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
- 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

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

- 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 guarantee future performance. And subject to change.
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 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 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 : 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
  - Maximum Constant Current Rate 280mA
  - 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
- 8.0A

Parallel Diode

- 4.0A
- 8.0A

Physical Characteristics

- Diameter
  - 33.6mm (1.32 in)
- Height
  - 60.3mm (+0.5/-0.2)
- Weight
  - 122g
- Lithium Metal Content
  - 4.7g

Packing Information

- Packing Factor 48
- Net Weight per Piece (Kg)
  - 0.75
- Water Weight per Piece (Kg)
  - 0.75
- C/T Size
  - 450mm×250mm×230mm

Temperature versus Capacity

- Graph displaying discharge temperature vs. nominal capacity for temperatures ranging from -20°C to 100°C.

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 guarantee future performance. And subject to change.
# Characteristics
- 3.9V C-Size Lithium Sulfuryl Chloride Cell (Li-SO2Cl2)
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

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

## 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

## 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

## Cell Characteristics

<table>
<thead>
<tr>
<th>Nominal Capacity</th>
<th>4.0Ah ~ 7.0Ah</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open Circuit Voltage</td>
<td>3.91V at 20°C</td>
</tr>
<tr>
<td>Nominal Closed Circuit Voltage</td>
<td>3.4V at 25°C</td>
</tr>
<tr>
<td>Constant Current Discharge</td>
<td>175mA (maximum), 600mA (reduced capacity)</td>
</tr>
</tbody>
</table>

## Temperature versus Capacity

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>Capacity (Ah)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20</td>
<td>4.0</td>
</tr>
<tr>
<td>25</td>
<td>4.5</td>
</tr>
<tr>
<td>100</td>
<td>2.8</td>
</tr>
</tbody>
</table>

## Physical Characteristics

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage</td>
<td>3.9V</td>
</tr>
<tr>
<td>Nominal Current</td>
<td>15mA</td>
</tr>
<tr>
<td>Maximum Continuous Current</td>
<td>100mA</td>
</tr>
<tr>
<td>Maximum Continuous Power</td>
<td>0.3W</td>
</tr>
<tr>
<td>Maximum Continuous Capacity</td>
<td>4.0Ah</td>
</tr>
<tr>
<td>Storage Conditions</td>
<td>0°C to 40°C</td>
</tr>
<tr>
<td>Operational Temperature Range</td>
<td>-20°C to 100°C</td>
</tr>
</tbody>
</table>

## 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 guarantee future performance. And subject to change.

---

## Physical Dimensions

- External Dimensions
  - Height: 49.1mm (1.93 inch)
  - Diameter: 25.5mm (1.00 inch)
  - Weight: 59g
- Lithium Metal Content: 2.4g

---

## Packing Information

<table>
<thead>
<tr>
<th>Packing Quantity</th>
<th>150</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Weight per C/T (Kg)</td>
<td>8.85</td>
</tr>
<tr>
<td>Gross Weight per C/T (Kg)</td>
<td>9.85</td>
</tr>
<tr>
<td>Carton Size</td>
<td>450mm x 250mm x 230mm</td>
</tr>
</tbody>
</table>

---

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

---

## Temperature Discount Graph

![Temperature vs. Capacity Graph](image)
Oil & Gas – Pigging/Ocean Equipment

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

Key Features
- 3.9V C-Size Lithium Sulfuryl Chloride Cell (Li-SO2Cl2)
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

Benefits
- Competitive capacity
- High rate capability for high 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: To be determined
- Vibration Testing: To be determined

Cell Characteristics
- Nominal Capacity: 4.0Ah ~ 7.0Ah
- Nominal Closed Circuit Voltage: 3.4V
- Constant Current Discharge: Maximum Constant Current Rate: 175mA, 600mA (reduced capacity)
- Storage Conditions: 30°C Max

Physical Characteristics
- Nominal Voltage: 3.9V
- Weight: 9g
- Lithium Metal Content: 5.4g

Packing Information
- Packing Weight per C/T: 8.4kg
- Gross Weight per C/T: 8.5kg

Temperature versus Capacity
- Discharge Temperature vs. Nominal Capacity
- 20°C Discharge -20 to 100°C

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 gasses 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 guarantee future performance. And subject to change.

Characteristics
- 3.9V C-Size Lithium Sulfuryl Chloride (Li-SO2Cl2)
- High Rate Capability
- High Capacity
- 100°C Operational Temperature

Electrical Specifications
- 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

External Dimensions

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

Abuse
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