DATA CENTER

Server Rack Lifter

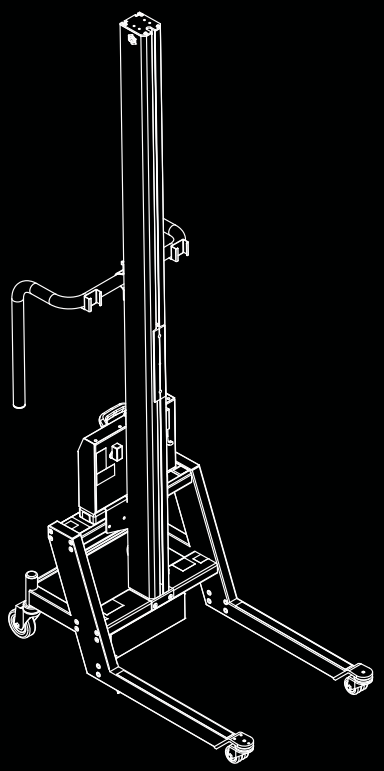
User Manual: Information and Operation

SERIAL NUMBER

WEBSITE
www.phswest.com

24/7 PHONE NUMBER
+1.763.498.7576

ADDRESS
6704 Bleck Drive
Rockford, MN 55373



63517-401_Rev_B

Liability Statement

This product, the Server Rack Lifter, has been built to the highest standards of PHS West. Please do not attempt to operate or repair this equipment without adequate training. Any use, operation, or repair in contravention of this document is at your own risk. By acceptance of this system, you hereby assume all liability consequent to your use or misuse of this equipment. PHS West assumes no liability for incidental, special, or consequential damage of any kind. PHS West reserves the right to make equipment or product specification changes at any time. This manual, and all information contained within it, are subject to revision at a future date.

End of Life Statement

Your PHS West Server Rack Lifter has been designed to provide years of reliable and trouble free service, but at some point in time, it may be necessary to retire the system from service. To protect the environment, the following requirements should be considered and followed:

- This PHS West Server Rack Lifter is primarily constructed from steel and contains no hazardous materials (with the exception of the batteries). This equipment has an electrical control panel that must be removed from the system and disposed of according to country, regional and local requirements.
- The PHS West Server Rack Lifter is considered mobile industrial equipment as stated in Category 6 in Annex 1A of the European Waste of Electrical and Electronic Equipment (EU WEEE) Directive 2012/19/EU. As of 2014, this directive could change in the future and the directive should be reviewed for any future changes.
- Included in the PHS West Server Rack Lifter are components manufactured by others. Their retirement and disposal are covered in the individual equipment technical manuals listed in the PHS West manual if applicable.

Proprietary Notice

Trademark Acknowledgments

Revision Log

Revision Level	Date	Affected Pages	Description of Change
A	8/28/2023	All	Consolidation of Lifter Manuals
B	1/5/2026	All	Branding

Introduction

The Server Rack Lifter is ergonomically designed to simplify handling, lifting and transporting goods. Each lifting unit can be equipped with different types of load carriers or attachments. The goods to be handled are placed on the load carrier and adjusted to the desired height by using the toggle switch on the handheld remote pendant. The lifter is powered by rechargeable, sealed lead acid batteries. The lift mast is totally enclosed and features a ball screw for smooth, vertical, DC-powered movement.

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Related Documents

These documents are included in the manual package that shipped with your equipment. All information contained in these documents pertains to devices not manufactured by PHS West. Each manufacturer assumes responsibility for the contents of the accompanying literature.

Equipment Type	Functional Data	Document Numbers and Manufacturer
Battery Charger	24 VDC 2A Fully Automatic Battery Charger	Document Number 2043 SP Soneil

Conditions Suitable to Operate

- Charger: 100-240VAC, 2A, 50/60Hz, 1~
- Lifter: 24VDC powered by (quantity two) 12VDC 17Ah lead acid batteries
- Maximum static load capacity of 350lbs (159kg)
  - Includes weight of tooling/platform
- Size: 29.1" (73.9cm) W x 48" (121.9cm) L x 69.5" (176.5cm) H
- Operating Range: 4" (10.2cm) to 89" (226.1cm) H
- Indoor, dry environment
- Operating temperature range: 5°C - 40°C
- Typical operating humidity range from 50% to 70% non-condensing, may be operated at lower facility humidity levels
- Operating altitude up to 1,650m above mean sea level
- Transportation and storage temperature range -25°C-+55°C

Safety

Document Symbol Conventions

It is important that you read and understand this manual. The information contained within relates to protecting your safety and preventing problems. The symbols below are used to help you recognize this information.

Symbol	Description
	DANGER! Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury
	WARNING! Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury
	CAUTION! Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury
	NOTICE: Indicates a potential situation which, if not avoided, can result in property damage or damage to the equipment
	Note: Indicates information, notes, or tips for improving your success using the equipment

Built-in Features

The ergonomic design of the Server Rack Lifter is, in itself, an active factor of operational safety. The casters are equipped with pedal activated brakes. The lift mast contains a slip clutch; if anything gets in the way of downward movement of the attachment, the slip clutch engages to help prevent injuries as well as mechanical damage to the lifter. Current limiting is also incorporated to prevent overloading beyond the rated capacity for the unit.

Storage and Transport

During storage and transport, the remote pendant and motor cable should be disconnected. The lifter should be secured during transport to avoid the risk of tipping over.

Movement

Use caution when passing thresholds, cords, and other objects on the floor. The handle bar should be gripped in a way so that hands are not hurt when passing edges, walls or protruding objects. The movement of heavy loads can be easier when using the directional lock.

Loading and Unloading

The user is responsible for ensuring the lifter is loaded correctly. Always apply the brakes when loading and unloading. The center of gravity of the goods should always be centered on the lifter platform and positioned as close to the lift mast as possible for maximum stability.
The lifter platform should be positioned at the correct height before loading and unloading to allow for good working position. The load should be pushed or pulled on or off the lifter platform.

⚠ CAUTION!

The following instructions are vital to preventing hazardous situations that could result in injury.

- Before servicing, disconnect the power at the batteries and unplug the charger.
- All batteries are sealed and maintenance free. Do not open the batteries.
- Never operate the lifter if your visibility is obstructed.
- Always use safety straps when transporting equipment or parts on the lifter platform.
- Use caution when operating the lifter on steep inclines.
- Never carry riders on the lifter.
- Never leave the lifter unattended while the parking brake is disengaged.

General Safety Instructions

Read all safety warnings and instructions. Failure to follow the warnings and instructions may result in serious injury or property damage. The following general precautions are recommended for all personnel who perform system operation for maintenance:

- Personnel responsible for system operation and/or maintenance should attend all available safety and operational training courses.
- Do not defeat or disconnect safety interlocks on covers, doors, or any other hazard barrier.
- Know the location and operation of all stop devices.

General Safety Instructions (Continued)

- Know the location of fire extinguishers and how to use them. Use only ABC-type extinguishers on electrical fires.
- Observe all safety and warning signs when working with the system.
- Make sure that the floors in the work area are dry and non-slip. Keep the work area clean to help identify working hazards and conditions.

Hazardous Energy Safety

Sources of hazardous energy can be in many forms such as electrical power, hydraulic power, pneumatic power, and stored energy such as springs, capacitors, and even falling weight. Before servicing any equipment, it is important to disable, or at least account for, all forms of hazardous energy.

- Know the location of equipment branch circuit interrupters or circuit breakers and how to turn them off in case of emergency.
- Avoid contact with electrical components while the system is powered. Contact with electrical components may result in electric shock.
- Immediately disconnect electrical power if there are signs of overheating such as a burnt odor, smoke, or excessive heat. Failure to disconnect power immediately may result in fire or equipment damage.

*See **Addendum A** for regulatory cautions.*

Daily Inspection

Perform the following on a daily basis:

- Visually check the casters wheels for damage.
- Check the battery charge indicator. Operating the lifter with a low charge can damage the batteries.
- If equipped with safety straps, check that they are functioning, secure, and not damaged.
- Visually check the lifter for any external damage.
- Visually check the charging cord and plug to monitor normal wear and tear. If the cord or plug is found to have damage, remove from service and replace immediately per normal protocol.

Operation

In order to prevent risk of an injury, it is important the lifter is operated in a proper manner.

Power Pack

Modifying the power pack is dangerous. The power pack should remain sealed. The power pack should not be exposed to splashed or running water.

Figure 1: Power Pack

Figure 2: Remote Control Pendant

Height Control

The load carrier is raised and lowered by a slider on the handheld remote control pendant. To raise the load carrier, push the pendant slider up. The speed the load carrier is raised is proportionate to the level the slider is pushed up. To lower the load carrier, push the pendant slider down.

Brake System

The brake is applied by moving the brake bar to it's lowest position. The directional lock is activated by moving the brake bar to it's highest position. This locks the rear wheels in a position limiting the lifter to move forward and backward only

Figure 3: Brake Lever Position (Top to Bottom: Directional Lock, Free Wheeling, Set Brake)

Battery Charging

24V Charging Precautions

- Charge batteries in a dry, well ventilated, fire retardant location away from patient care areas with open sources of oxygen.
- Inspect batteries for bulging, swelling and cracking during preventative maintenance routines.
- Ensure that batteries are replaced every 12 months.
- Examine the power cord periodically for cracking or damage.
- Use only a charger designed for sealed lead acid batteries. The charger is not intended to supply power to an extra-low voltage electrical system or to charge dry cell batteries.
- Never charge a frozen battery.

Figure 4: Charging Cord Access Port

Maintenance Schedule

Guidelines

In order for the Server Rack Lifter to function properly, it is important that maintenance is carried out in accordance with this document. The stated service intervals are applicable during normal use and charging once per day.

Daily Maintenance

The batteries should be recharged nightly. Completely discharging the batteries risks damage; charging when the lifter is not in use for an extended period of time mitigates potential damage.

- Charge batteries using only chargers supplied by PHS West.
- The charger must not be exposed to water.
- The lifter must be in a well-ventilated area when charging.
- Always connect charger to the lifter before plugging into an electrical outlet.
- Do not operate the device while charging.
- When the battery charger is connected to the lifter and has power, there is a yellow or orange light on the charger indicating charging. When the batteries are fully charged, the light will illuminate green. The lifter can remain connected to the charger indefinitely without risk of overcharging.

Daily Maintenance (Continued)

- For power packs equipped with a voltage indicator, a flashing bar on the voltage indicator means the batteries need charging. If the lifter is left unused for ten minutes, sleep mode is activated and the voltage indicator turns black. The lifter can be restarted by pressing any button on the remote control pendant. When the lifter is restarted from sleep mode after charging, it will take two minutes before the voltage indicator shows the batteries are fully charged.

Yearly or As Needed Maintenance

- **Cleaning:** Clean the lifter by wiping it down with only a damp cloth. A mild detergent may be used. Wipe the lifter dry after cleaning. Do not use a hose or high pressure jet as this may damage the electronics and the paint.
- **Electrical Connections:** Check all connections and repair any damage or wear. If needed, replace with new parts.
- **Machine Parts:** Check all parts of the lifter in order to identify any cracking or wear.
- **Nuts and Bolts:** Be sure all nuts and bolts are tightened properly.
- **Lift Mast:**
  1. Lift the column from the cross-member.
  2. Clean the brush strips and wipe the column clean.
  3. Remove the four corner screws at the top of the column (NOT the three in the middle)
  4. Pull out, wipe and lubricate the lift screw with new ball bearing grease
  5. Put the lift screw back and tighten the screws
  6. Check the coupling by making sure the sleeve and hub located inside the column and inside the cross-member are intact and in working order.
  7. Put the lift mast back and perform a load test.
- **Wheels:** Make sure all wheels are running smoothly and that the tire rubber is intact. Lubricate the bearings.
- **Brakes:** Check the brakes work.
- **Replacing the Fuse:** The fuse is located inside of the power pack. Before removing the lid, the user should apply the brakes and wear protective footwear. Remove the lid by loosening the screws. A wiring diagram for the lifter is attached to the inside of the lid of the power pack. Be extra cautious when opening the power pack. If the device is tilted after the lid has been removed, the batteries may slide out of the power pack potentially causing the user harm.
- **Replacing the Batteries:** The batteries may be replaced by authorized personnel. When changing the batteries, apply the brakes and wear protective footwear. To open the power pack, see the section above (**Replacing the Fuse**). Used batteries should be handed in to a recycling center.
- **Plates and Decals:** Reference the Labeling section to verify that the plates and decals are attached and fully readable.

Troubleshooting

The lifter is designed for safe and efficient operation provided that routine maintenance is carried out in accordance with the instructions given. If problems arise, some guidance is provided below. If the problem persists after action has been taken, please contact a service technician or PHS West by calling +1 888-639-5438.

Lifter Platform Does Not Move or Moves Very Slowly

- Verify the maximum load is not exceeded.
- Charge the batteries.
- Check that the battery charger is working.
  - Verify there is a visible light on the charger when plugged into the main power.
- Check if the fuse inside the power pack needs to be replaced.
- Check the battery voltage and replace the batteries if the voltage is less than 24 volts after eight hours of charging.

Lifter Sounds Strange

See the **Maintenance Schedule** section.

Warranty

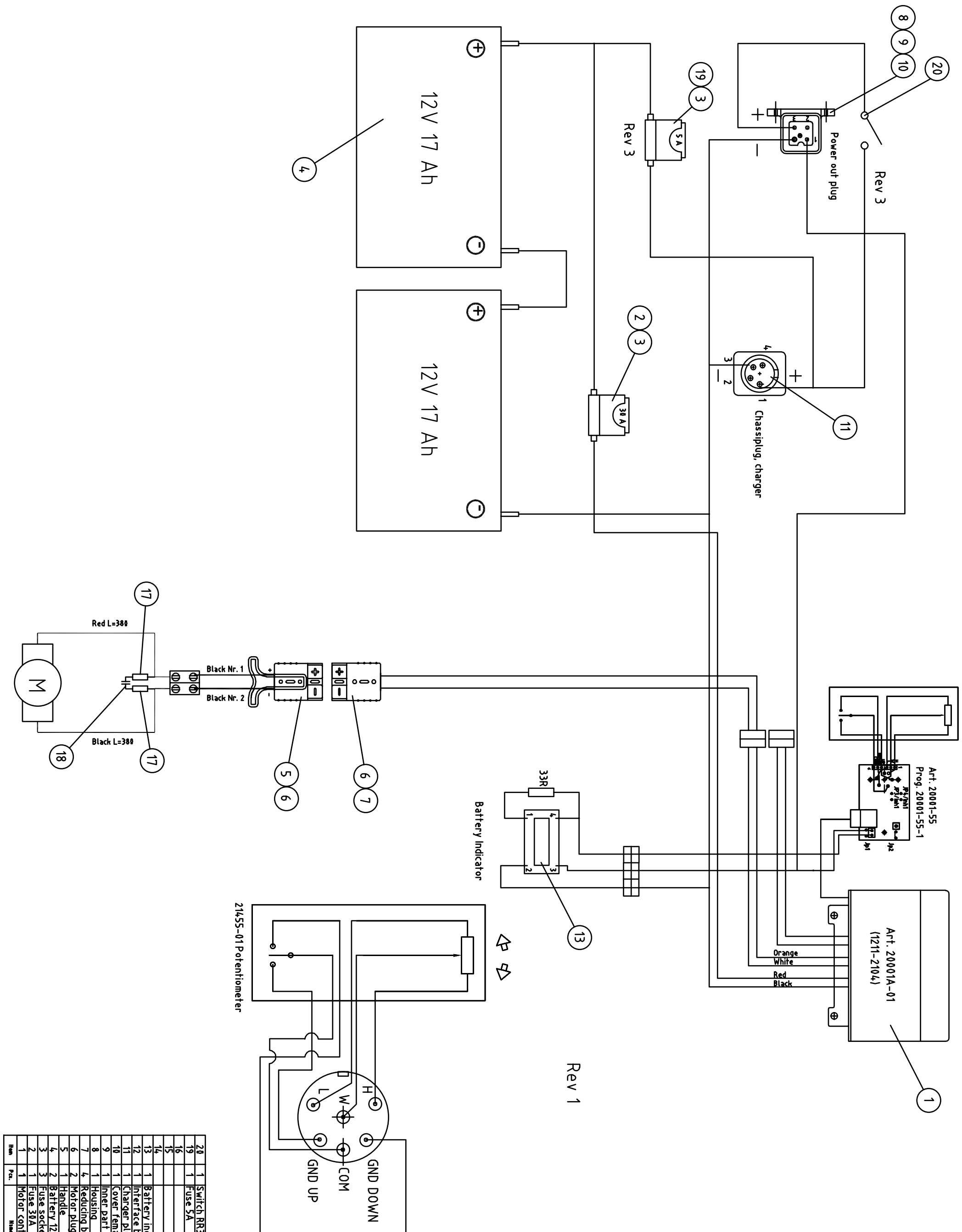
Limited Warranty

PHS West warrants this product to be free of defects in material and workmanship during the warranty period. Our warranty obligation is to provide a replacement for a defective original part, if the part is covered by the warranty, after we receive a proper request from the warrantee for warranty service.

- **Who may request service?** Only a warrantee may request service. The purchaser is the warrantee.
- **What is an "original part?"** The part used to make the product as shipped to the warrantee.
- **What is a "proper request?"** A request for warranty service is proper if PHS West receives both:
  - A photocopy of the customer invoice displaying shipping date
  - A written request for warranty service that includes the warrantee's name and phone number.
- **Requests may be sent using the following methods:**
  - **Email:** info@phswest.com
  - **Mail:** PHS West, 6704 Bleck Drive, Rockford, MN 55373
  - **Fax:** +1 763-498-8128
- **What is covered under the warranty?** After PHS West receives a request for warranty service, an authorized representative will contact the warrantee to determine whether the claim is covered by the warranty. Before providing warranty service, PHS West may require the warrantee to send the entire product or the defective part(s) to PHS West.
- **How long is the warranty period?** The warranty period for original, dynamic components is one year. For batteries, the warranty period is 30 days. The warranty period begins the date the product is shipped to the warrantee from PHS West.

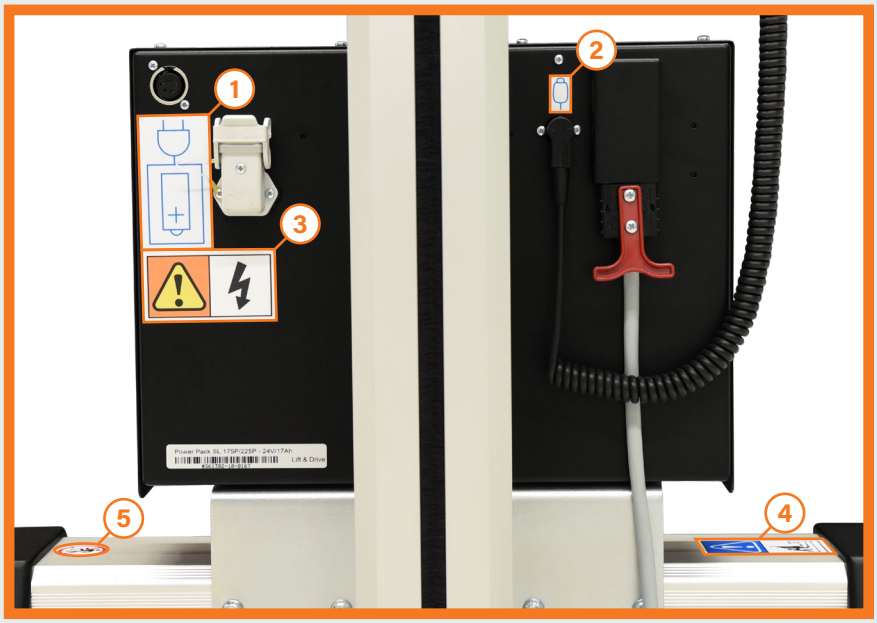
- **Warranty Evaluation**: All parts sent back (freight paid by warrantee) to PHS West for warranty replacement or repair will be evaluated. PHS West will determine if the part is a warranty issue or if it has been damaged due to misuse or negligence. A written report will be issued detailing the investigation of the part and whether or not the part is classified as warranty.
- **What is not covered by warranty?**
  - Labor
  - Freight
  - Occurrence of any of the following (automatically voiding the warranty):
    - Product misuse
    - Negligent operation or repair
    - Corrosion or use in corrosive environments
    - Inadequate or improper maintenance
    - Damage sustained during shipping
    - Collisions or other incidental contact causing damage to the product
    - Unauthorized modifications
    - Do not modify the product in any way without first receiving written authorization from PHS West as modifications may make the product unsafe to use or could cause excessive or abnormal wear.
- **If a defective part is warranteed, how will PHS West correct the issue?** PHS West will provide an appropriate replacement for any covered part. An authorized representative of PHS West will contact the warrantee to discuss the claim.
- **Warranty Procedure:** In the event that a part is damaged or broken, please contact PHS West via telephone or email to establish dialogue to identify and diagnose the issue. Please have your lifter's serial number available when you call or email (located on the intermediate).

Wiring Schematic



PARAMETER SETTINGS	
MAIN C/L	30A
MOTOR R	220
MEASURE R	OFF
IR COMP COEFF	30
TREMOR COMP	1
FWD ACCEL MAX SPD	1.4
FWD ACCEL MIN SPD	1.4
FWD DECEL MAX SPD	0.2
FWD DECEL MIN SPD	0.2
SOFT STOP SPD	0
REV ACCEL MAX	1.4
REV ACCEL MIN	1.4
REV DECEL MAX	0.2
REV DECEL MIN	0.2
KEY OFF DECEL	0.2
E STOP	0.2
MAX SPD	100
MIN SPD	15
RAMP SHAPE	50
REV MAX SPD	100
REV MIN SPD	15
SLEEP DLY	0
BRAKE DELAY	0.8
CREEP SPD	0
THRTL TYPE	0
THRTL DEADBAND	9,0%
THRTL GAIN	1.2
THRTL AUTOCAL	OFF
HIGH PEDAL DIS	OFF
FAULT BEEP	OFF
BRAKE FLTS	OFF

Item	Pcs.	Name/Designation	Material	Mod.no./Blank Dimension	Pattern No./Note
20	1	Switch RR3405A			Art.no: F030006
19	1	Fuse 5A			Art.no: 7460K43
16					
15					
14					
13	1	Battery indicator 24V			Art.no: 20001-08
12	1	Interface board			Art.no: 20001-55
11	1	Charger plug, chassis			Art.no: 19139B-12
10	1	Cover female			Art.no: 17270-14
9	1	Inner part			Art.no: 17270-09
8	1	Housing			Art.no: 17270-11
7	4	Reducing bush			Art.no: 19155
6	2	Motor plug			Art.no: 19154
5	1	Handle			Art.no: 19160
4	2	Battery 12V, 17Ah			Art.no: 19138
3	3	Fuse socket			Art.no. 13063
2	1	Fuse 30A			Art.no: 13064
1	1	Motor controller 24V,45A			Art.no: 20001A-01



Labeling

1 **Charger**
Indicates the power pack source.

2 **Pendant Plug In**
Indicates the plug in port for the handheld remote control pendant.

3 **Hazardous Voltage**
Indicates possible hazardous voltage areas.

4 **Platform Height for Transport**
Indicates the lifter platform height (30cm or 12in approximately) when transporting

5 **Do Not Step**
Indicates “No Step” or “Do Not Step”.

6+7 **Foot Crush, Lifter Leg**
Lifter frame and leg label. Indicates “No Step” or “Do Not Step” zone and possible toe or foot crush area.

8 **PHS West Logo (Blue-Orange)**
PHS West brand label

9 **PHS West Logo (White-Orange)**
PHS West brand label

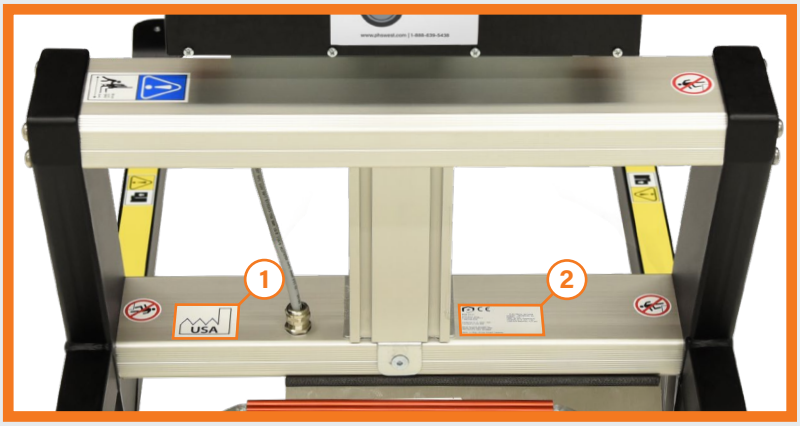
10 **Read Manual**
Indicates user or user manual to be read prior to operation or service of the lifter.

11 **Battery Charge Level**
Indicates the charge level of the battery.

12 **Brake Rod Position**
Indicates the brake rod position and functionality. See **Brake System** for details.

Machine Identification Labels

1. Manufacturer Country of Origin
2. Machine Serial Plate



Addendum A

Regulatory Reference - 60335-1 © IEC:2010+A1:2013 (Clause 7.12 and 7.12 of Annex B)

⚠ CAUTION! Possible Harm to persons and equipment

This equipment (lifter) is not intended for use by:

- Persons with reduced physical, sensory, or mental capabilities, including children, or that lack experience and knowledge of said equipment, unless they have been trained and supervised in the instruction of use of this equipment by a person responsible for their safety.
- Children (if applicable) should be supervised to ensure they do not play with the equipment.

⚠ CAUTION! Follow all instructions regarding battery handling

- Batteries are intended to be replaced by the user. See sections for **Replacing the Batteries.**
- Disable the equipment before performing any maintenance.
- Disconnect the equipment from the charging system before servicing the batteries.
- This equipment utilizes two sealed 12VDC, 17AH rechargeable batteries.
- Remove batteries as per the replacement and installation instructions in this manual.
- Replace batteries as per the replacement and installation instructions in this manual.
- For installation, be sure to understand the correct battery polarity.
- The batteries must be removed from the equipment before scrapping the device.
- Follow country and local environmental laws and regulations for proper and safe disposal of used batteries.
- Do not use non-rechargeable batteries.

⚠ CAUTION! In the event of a leaking battery, follow the instructions below

- Immediately stop use of the equipment.
- Follow the **Replacing the Batteries** instructions to remove the leaking battery. Wear gloves and eye protection during removal.
- Properly dispose of the leaking battery according to local environmental laws and regulations.
- Replace the battery with an identical rechargeable 12VDC, 17AH battery.

⚠ WARNING! Crushing Risk! Heavy Weight!

Addendum B

MATERIAL SAFETY DATA SHEET

VALVE REGULATED LEAD ACID BATTERY, NON-SPILLABLE

(US, CN, EU Version for International Trade)

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Valve Regulated Lead Acid Battery Part No: SG12180FP

OTHER PRODUCT NAMES: Sealed Lead Acid, Gel: Absorbed Electrolyte Sealed; Valve-Regulated Non-Spillable Battery; Battery Non-Spillable 49 CFR 173.159a

MANUFACTURER: Sigma Power Systems **ADDRESS:** 4010 Christopher Way, Plano, TX 75024, USA

EMERGENCY TELEPHONE NUMBERS: US: CHEMTREC 1-800-424-9300
CN: CHEMTREC 1-800-424-9300
Outside US: 1-703-527-3887

NON-EMERGENCY HEALTH/SAFETY INFORMATION: 1-832-364-6478

CHEMICAL FAMILY: This product is a absorbed electrolyte type lead acid storage battery.

PRODUCT USE: Industrial/Commercial electrical storage batteries.

This product is considered a Hazardous Substance, Preparation or Article that is regulated under US-OSHA; CAN-WHMIS; IOSH; ISO; UK-CHIP; or EU Directives (67/548/EEC-Dangerous Substance Labeling, 98/24/EC-Chemical Agents at Work, 99/45/EC-Preparation Labeling, 2001/58/EC-MSDS Content, and 1907/2006/EC-REACH), and an MSDS/SDS is required for this product considering that when used as recommended or intended, or under ordinary conditions, it may present a health and safety exposure or other hazard.

Additional Information

This product may not be compatible with all environments, such as those containing liquid solvents or extreme temperature or pressure. Please request information if considering use under extreme conditions or use beyond current product labeling.

SECTION 2: HAZARDS IDENTIFICATION

GHS Classification:

Health	Environmental	Physical
Acute Toxicity – Not listed (NL) Eye Corrosion – Corrosive* Skin Corrosion – Corrosive* Skin Sensitization – NL Mutagenicity/Carcinogenicity – NL Reproductive/Developmental – NL Target Organ Toxicity (Repeated) – NL	Aquatic Toxicity – NL	NFPA – Flammable gas, hydrogen (during charging) CN - NL EU - NL

*as sulfuric acid

GHS Label: Valve Regulated Lead Acid Gel Battery, Non-Spillable

MATERIAL SAFETY DATA SHEET

VALVE REGULATED LEAD ACID BATTERY, NON-SPILLABLE

(US, CN, EU Version for International Trade)

Symbols: C (Corrosive)

Hazard Statements	**Precautionary Statements**
Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin.	Keep out of reach of children. Keep containers tightly closed. Avoid heat, sparks, and open flame while charging batteries. Avoid contact with internal acid/ gel.

EMERGENCY OVERVIEW: May form explosive air/gas mixture during charging. Contact with internal components may cause irritation or severe burns. Irritating to eyes, respiratory system, and skin. Prolonged inhalation or ingestion may result in serious damage to health. Pregnant women exposed to internal components may experience reproductive/developmental effects.

POTENTIAL HEALTH EFFECTS:
EYES: Direct contact of internal electrolyte gel with eyes may cause severe burns or blindness.
SKIN: Direct contact of internal electrolyte gel with the skin may cause skin irritation or damaging burns.
INGESTION: Swallowing this product may cause severe burns to the esophagus and digestive tract and harmful or fatal lead poisoning. Lead ingestion may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, and pain in the arms, legs and joints.
INHALATION: Respiratory tract irritation and possible long-term effects.
ACUTE HEALTH HAZARDS:
Repeated or prolonged contact may cause mild skin irritation.

CHRONIC HEALTH HAZARDS:
Lead poisoning if persons are exposed to internal components of the batteries. Lead absorption may cause nausea, vomiting, weight loss, abdominal spasms, fatigue, pain in the arms, legs and joints. Other effects may include central nervous system damage, kidney dysfunction, and potential reproductive effects. Chronic inhalation of sulfuric acid mist may increase the risk of lung cancer.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:
Respiratory and skin diseases may predispose the user to acute and chronic effects of sulfuric acid and/or lead. Children and pregnant women must be protected from lead exposure. Persons with kidney disease may be at increased risk of kidney failure.

Additional Information
No health effects are expected related to normal use of this product as sold.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENTS (Chemical/Common Names):	**CAS No.:**	**% by Wt:**	**EC No.:**
Lead, inorganic	7439-92-1	60–75 (average: 67)	231-100-4

MATERIAL SAFETY DATA SHEET

VALVE REGULATED LEAD ACID BATTERY, NON-SPILLABLE

(US, CN, EU Version for International Trade)

Sulfuric acid	7664-93-9	5–15 (average: 10)	231-639-5
Antimony	7440-36-0	0–0.1 (average: <0.1)	231-146-5
Arsenic	7440-38-2	<0.1	231-148-6
Tin	7440-31-5	0–0.1 (average: <0.1)	231-141-8
Polypropylene	9003-07-0	2–10 (average: 4) NA: Not applicable;	NA ND: Not determined

Additional Information
These ingredients reflect components of the finished product related to performance of the product as distributed into commerce.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush eyes with large amounts of water for at least 15 minutes. Seek immediate medical attention if eyes have been exposed directly to acid gel.

SKIN CONTACT: Flush affected area(s) with large amounts of water using deluge emergency shower, if available, shower for at least 15 minutes. Remove contaminated clothing. If symptoms persist, seek medical attention.

INGESTION: If swallowed, give large amounts of water. Do NOT induce vomiting or aspiration into the lungs may occur and can cause permanent injury or death.

INHALATION: If breathing difficulties develop, remove person to fresh air. If symptoms persist, seek medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE/UNSUITABLE EXTINGUISHING MEDIA: Dry chemical, carbon dioxide, water, foam. Do not use water on live electrical circuits.

SPECIAL FIREFIGHTING PROCEDURES & PROTECTIVE EQUIPMENT: Use appropriate media for surrounding fire. Do not use carbon dioxide directly on cells. Avoid breathing vapours. Use full protective equipment (bunker gear) and self-contained breathing apparatus.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Batteries evolve flammable hydrogen gas during charging and may increase fire risk in poorly ventilated areas near sparks, excessive heat or open flames.

SPECIFIC HAZARDS IN CASE OF FIRE: Thermal shock may cause battery case to crack open. Containers may explode when heated.

Additional Information Firefighting water runoff and dilution water may be toxic and corrosive and may cause adverse environmental impacts.

SECTION 6: ACCIDENTAL RELEASE MEASURES

MATERIAL SAFETY DATA SHEET

VALVE REGULATED LEAD ACID BATTERY, NON-SPILLABLE

(US, CN, EU Version for International Trade)

PERSONAL PRECAUTIONS: Avoid Contact with Skin. Neutralize any spilled electrolyte with neutralizing agents, such as soda ash, sodium bicarbonate, or very dilute sodium hydroxide solutions.
ENVIRONMENTAL PRECAUTIONS: Prevent spilled material from entering sewers and waterways.
SPILL CONTAINMENT & CLEANUP METHODS/MATERIALS: Add neutralizer/absorbent to spill area. Sweep or shovel spilled material and absorbent and place in approved container.
Dispose of any non-recyclable materials in accordance with local, state, provincial or federal regulations.
Additional Information
Lead acid batteries and their plastic cases are recyclable. Contact your Sigma Power Systems representative for recycling information.

SECTION 7: HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING AND STORAGE:
• Keep containers tightly closed when not in use.
• If battery case is broken, avoid contact with internal components.
• Do not handle near heat, sparks, or open flames.
• Protect containers from physical damage to avoid leaks and spills.
• Place cardboard between layers of stacked batteries to avoid damage and short circuits.
• Do not allow conductive material to touch the battery terminals. A dangerous short-circuit may occur and cause battery failure and fire.

OTHER PRECAUTIONS (e.g.; Incompatibilities):
Keep away from combustible materials, organic chemicals, reducing substances, metals, strong oxidizers and water.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS/SYSTEM DESIGN INFORMATION: Charge in areas with adequate ventilation.
VENTILATION: General dilution ventilation is acceptable.
RESPIRATORY PROTECTION: Not required for normal conditions of use. See also special firefighting procedures (Section 5).
EYE PROTECTION: Wear protective glasses with side shields or goggles.
SKIN PROTECTION: Wear chemical resistant gloves as a standard procedure to prevent skin contact.
OTHER PROTECTIVE CLOTHING OR EQUIPMENT: None required under normal-use conditions for gel/absorbed electrolyte-type batteries.
Wash hands after handling.
EXPOSURE GUIDELINES & LIMITS:

OSHA	Permissible Exposure Limit (PEL/TWA)	Lead, inorganic (as Pb Sulfuric acid) Antimony Arsenic Tin	0.05 mg/m^3 1.00 mg/m 0.50 mg/m 0.01 mg/m 2.00 mg/m
ACGIH	2007 Threshold Limit Value (TLV)	Lead, inorganic (as Pb) Sulfuric acid Antimony Arsenic	0.05 mg/m 0.20 mg/m 0.50 mg/m 0.01 mg/m

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		Tin	2.00 mg/m
Quebec	Permissible Exposure Value (PEV)	Lead, inorganic (as Pb) Sulfuric acid Antimony Arsenic Tin	0.15 mg/m 1.00 mg/m TWA 3.00 mg/m STEV 0.50 mg/m 0.10 mg/m 2.00 mg/m
Ontario	Occupational Exposure Level (OEL)	Lead (designated substance) Sulfuric acid Antimony Arsenic (designated substance) Tin	0.10 mg/m 1.00 mg/m TWAEV 3.00 mg/m STEV 0.50 mg/m 0.01 mg/m 2.00 mg/m
Netherlands	Maximaal Aanvaarde Concentratie (MAC)	Lead, inorganic (as Pb) Sulfuric acid	0.15 mg/m 1.00 mg/m
Germany	Maximale Arbeitsplatzkonzentrationen (MAK)	Lead, inorganic (as Pb) Sulfuric acid Antimony	0.10 mg/m 1.00 mg/m TWA 2.00 mg/m STEL 0.50 mg/m
United Kingdom	Occupational Exposure Standard (OES)	Lead Antimony Arsenic Tin	0.15 mg/m 0.50 mg/m 0.10 mg/m 2.00mg/m

TWA: 8-Hour Time-Weighted Average; STE: Short-Term Exposure; mg/m: milligrams per cubic metre of air; NE: Not Established; STEV: Shortterm exposure value; TWAEV: Time-weighted average exposure value; STEL: Short-term exposure limit

Additional Information

• Batteries are housed in polypropylene cases which are regulated as total dust or respirable dust only when they are ground up during recycling. The OSHA PEL for dust is 15 mg/m as total dust or 5 mg/m as respirable dust.
• May be required to meet Domestic Requirements for a Specific Destination(s).

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Industrial/commercial lead acid gel battery
ODOR:	Odorless
ODOR THRESHOLD:	NA
PHYSICAL STATE:	Sulfuric Acid, Gelatinous/ Lead, solid
pH:	<1
BOILING POINT:	235-240° F (113–116° C) (as sulfuric acid)
MELTING POINT:	NA
FREEZING POINT:	NA
VAPOUR PRESSURE:	10 mmHg
VAPOUR DENSITY (AIR = 1):	> 1
SPECIFIC GRAVITY (H2O = 1):	1.27–1.33
EVAPORATION RATE (n-BuAc=1):	<1
SOLUBILITY IN WATER:	100% (as sulfuric acid)

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FLASH POINT:	Below room temperature (as hydrogen gas)
AUTO-IGNITION TEMPERATURE:	NA
LOWER EXPLOSIVE LIMIT (LEL):	4% (as hydrogen gas)
UPPER EXPLOSIVE LIMIT (UEL):	74% (as hydrogen gas)
PARTITION COEFFICIENT:	NA
VISCOSITY (poise @ 25° C):	Not Available
DECOMPOSITION TEMPERATURE:	Not Available

FLAMMABILITY/HMIS HAZARD CLASSIFICATIONS (US/CN/EU): As sulfuric acid

HEALTH: 3 FLAMMABILITY: 0 REACTIVITY: 2

SECTION 10: STABILITY AND REACTIVITY

STABILITY: This product is stable under normal conditions at ambient temperature.
INCOMPATIBILITY (MATERIAL TO AVOID): Strong bases, combustible organic materials, reducing agents, finely divided metals, strong oxidizers, and water.
HAZARDOUS DECOMPOSITION OR BYPRODUCTS: Thermal decomposition will produce sulfur dioxide, sulfur trioxide, carbon monoxide, sulfuric acid mist, and hydrogen.
HAZARDOUS POLYMERIZATION: Will not occur
CONDITIONS TO AVOID: Overcharging, sources of ignition

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE TOXICITY (Test Results Basis and Comments):
Sulfuric acid: LD50, Rat: 2140 mg/kg
LC50, Guinea pig: 510 mg/m
Lead: No data available for elemental lead
SUBCHRONIC/CHRONIC TOXICITY (Test Results and Comments):
Repeated exposure to lead and lead compounds in the workplace may result in nervous system toxicity. Some toxicologists report abnormal conduction velocities in persons with blood-lead levels of 50 µg/100 ml or higher. Heavy lead exposure may result in central nervous system damage, encephalopathy and damage to the blood-forming (hematopoietic) tissues.

Additional Information

- Very little chronic toxicity data available for elemental lead.
- Lead is listed by IARC as a 2B carcinogen: possible carcinogen in humans. Arsenic is listed by IARC, ACGIH, and NTP as a carcinogen, based on studies with high doses over long periods of time. The other ingredients in this product, present at equal to or greater than 0.1% of the product, are not listed by OSHA, NTP, or IARC as suspect carcinogens.
- The 19th Amendment to EC Directive 67/548/EEC classified lead compounds, but not lead in metal form, as possibly toxic to reproduction. Risk phrase 61: May cause harm to the unborn child, applies to lead compounds, especially soluble forms.

SECTION 12: ECOLOGICAL INFORMATION

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PERSISTENCE & DEGRADABILITY: Lead is very persistent in soils and sediments. No data available on biodegradation.

BIOACCUMULATIVE POTENTIAL (Including Mobility): Mobility of metallic lead between ecological compartments is low. Bioaccumulation of lead occurs in aquatic and terrestrial animals and plants, but very little bioaccumulation occurs through the food chain. Most studies have included lead compounds, not solid inorganic lead.

AQUATIC TOXICITY (Test Results & Comments):

Sulfuric acid: 24-hour LC50, fresh water fish (Brachydanio rerio): 82 mg/l
96-hour LOEC, fresh water fish (Cyprinus carpio): 22 mg/l (lowest observable effect concentration)

Lead (metal): No data available

Additional Information

- No known effects on stratospheric ozone depletion. PAGE 6 OF 8
- Volatile organic compounds: 0% (by Volume)
- Water Endangering Class (WGK): NA

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Lead acid batteries are recyclable when sent to a secondary lead smelter. Following local, State/Provincial, and Federal/National regulations applicable to end-of-life characteristics will be the responsibility of the end-user.

HAZARDOUS WASTE CLASS/CODE: US - Not applicable to finished product as manufactured for distribution into commerce.
CN – Not applicable to finished product as manufactured for distribution into commerce.
EWC – Not applicable to finished product as manufactured for distribution into commerce.

Additional Information
Not included – Recycle or dispose as allowed by local jurisdiction for the end-of-life characteristics as-disposed.

SECTION 14: TRANSPORT INFORMATION

GROUND – US-DOT/CAN-TDG/EU-ADR/APEC-ADR:

Proper Shipping Name Not regulated as a Hazardous Material

AIRCRAFT – ICAO-IATA:

Proper Shipping Name Not regulated as a Hazardous Material

VESSEL – IMO-IMDG:

Proper Shipping Name Not regulated as a Hazardous Material

Additional Information

- Each battery and the outer packaging must be plainly and durably marked “Non-spillable” or “Non-spillable Battery”
- Non-Spillable Battery complies with the provisions listed in 49 CFR 173.159a; therefore, must not be marked with an identification number or hazardous label and is not subject to hazardous shipping paper requirements.

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- Transport requires proper packaging and paperwork, including the Nature and Quantity of goods, per applicable origin/destination/customs points as-shipped.

SECTION 15: REGULATORY INFORMATION

INVENTORY STATUS: All components are listed on the TSCA; EINECS/ELINCS; and DSL, unless noted otherwise below.

U.S. FEDERAL REGULATIONS:

TSCA Section 8b – Inventory Status: All chemicals comprising this product are either exempt or listed on the TSCA Inventory.

TSCA Section 12b – Export Notification: If the finished product contains chemicals subject to TSCA Section 12b export notification, they are listed below:

Chemical	CAS #
None	NA

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT)

Chemicals present in the product which could require reporting under the statute:

Chemical	CAS #
Lead	7439-92-1
Sulfuric acid	7664-93-9

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT) The finished product contains chemicals subject to the reporting requirements of Section 313 of SARA Title III.

Chemical	CAS #	% wt
Lead	7439-92-1	67
Sulfuric acid	7664-93-9	10

CERCLA SECTION 311/312 HAZARD CATEGORIES: Note that the finished product is exempt from these regulations, but lead and sulfuric acid above the thresholds are reportable on Tier II reports.

Fire Hazard	No
Pressure Hazard	No
Reactivity Hazard	No
Immediate Hazard	Yes (Internal acid gel is Corrosive)
Delayed Hazard	No

Sulfuric Acid is regulated as an Extremley Hazardous Substance.

STATE REGULATIONS (US):

California Proposition 65

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The following chemicals identified to exist in the finished product as distributed into commerce are known to the State of California to cause cancer, birth defects, or other reproductive harm:

Chemical	CAS #	% Wt
Arsenic (as arsenic oxides)	7440-38-2	<0.1
Strong inorganic acid mists including sulfuric acid	NA	10
Lead	7439-92-1	67

California Consumer Product Volatile Organic Compound Emissions
This Product is not regulated as a Consumer Product for purposes of CARB/OTC VOC Regulations, as-sold for the intended purpose and into the industrial/Commercial supply chain.

INTERNATIONAL REGULATIONS (Non-US):
Canadian Domestic Substance List (DSL)
All ingredients remaining in the finished product as distributed into commerce are included on the Domestic Substances List.
WHMIS Classifications
Class E: Corrosive materials present at greater than 1%
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the Controlled Products Regulations.
NPRI and Ontario Regulation 127/01
This product contains the following chemicals subject to the reporting requirements of Canada NPRI +/or Ont. Reg. 127/01:

Chemical	CAS #	% Wt
Lead	7439-92-1	67
Sulfuric acid	7664-93-9	10

European Inventory of Existing Commercial Chemical Substances (EINECS)
All ingredients remaining in the finished product as distributed into commerce are exempt from, or included on, the European Inventory of Existing Commercial Chemical Substances.
European Communities (EC) Hazard Classification according to directives 67/548/EEC and 1999/45/EC.

R-Phrases	S-Phrases
35, 36, 38	1/2, 26, 30, 45

Additional Information
This product may be subject to Restriction of Hazardous Substances (RoHS) regulations in Europe and China, or may be regulated under additional regulations and laws not identified above, such as for uses other than described or as-designed/as intended by the manufacturer, or for distribution into specific domestic destinations.

SECTION 16: OTHER INFORMATION

OTHER INFORMATION:
Distribution into Quebec to follow Canadian Controlled Product Regulations (CPR) 24(1) and 24(2).
Distribution into the EU to follow applicable Directives to the Use, Import/Export of the product as-sold.

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SOURCES OF INFORMATION:

International Agency for Research on Cancer (1987), IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Overall Evaluations of Carcinogenicity: An updating of IARC Monographs Volumes 1-42, Supplement 7, Lyon, France. Ontario Ministry of Labour Regulation 654/86. Regulations Respecting Exposure to Chemical or Biological Agents. RTECS – Registry of Toxic Effects of Chemical Substances, National institute for Occupational Safety and Health.

MSDS/SDS PREPARATION INFORMATION:

DATE OF ISSUE: 7, February 2011 SUPERCEDES: None Issue No: 1. Rev0.1

DISCLAIMER:

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Notes

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