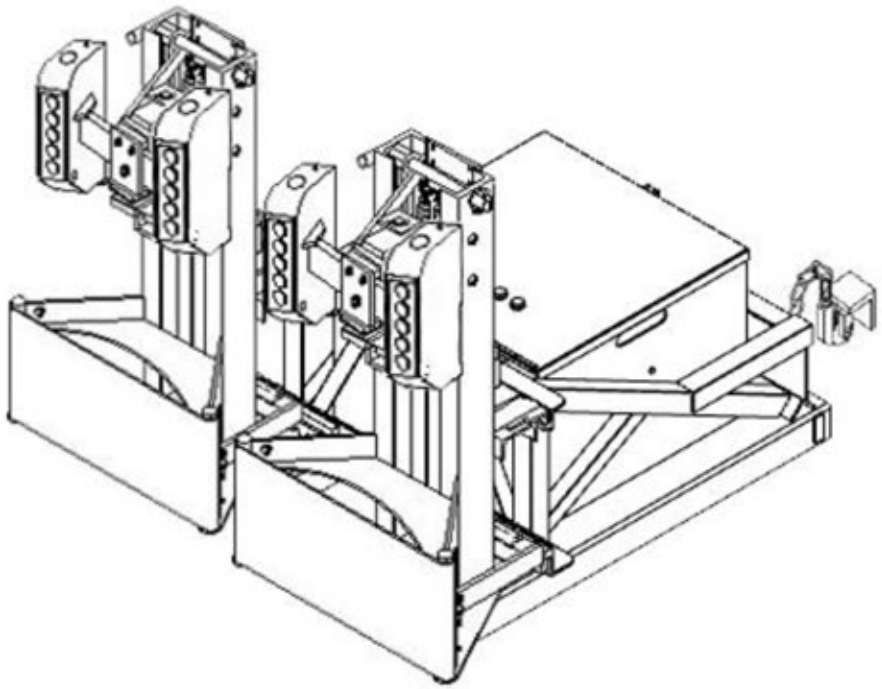
Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

OPERATING/MAINTENANCE MANUAL

FOR

MODEL EG4MDC2-F EMPTY DRUM HANDLING ATTACHMENT



Model #:
S/N:

EASY LIFT EQUIPMENT
EMPTY DRUM HANDLING ATTACHMENTS
EAGLE GRIP® MODEL EG4MDC2-F

INTRODUCTION

The Model EG4MDC2-F empty drum handling attachments utilize a heavy duty double magnetic clamping mechanism for handling 55-gallon size steel drums. The fork pockets and safety chain provide a quick and easy connection to any lift truck. The specification plate affixed to each attachment provides the following information: model number, serial number, attachment weight, and lifting capacity. **Please verify with your local forklift dealer that your lift truck, counter-balanced walkie stacker, or walkie straddle stacker is certified and tagged properly for this attachment**.

This manual contains information to instruct you on the proper use and maintenance of your empty drum handling attachment. This manual should be available to all personnel working with the machine. Follow the maintenance procedures carefully to ensure a safe and reliable service life. Do not operate your equipment until you have read and understood these instructions.

COMMISSIONING YOUR EAGLE-GRIP EG4MDC2-F ATTACHMENT

1. Remove all packing materials, protective strapping, and wood shipping blocks, then remove the machine from the shipping pallet or crate.

2. Perform a visual inspection of the entire unit for damage.

3. Drive the lift truck to position the forks inside the attachment fork pockets and remove the attachment from the pallet.

4. Secure the attachment to the lift truck by connecting the safety chain to the forklift carriage. The end of the chain is equipped with a snap hook, so generally the chain is looped around the carriage and the snap hook is connected to the chain to form a loop. (Unless the Attachment has Quick-Claw).

5. **Open the DC cabinet. Look at all the components inside the cabinet to ensure nothing came loose when the equipment was in transit.**

6. **Locate the Remote Controls which are stored in a plastic storage bag within the cabinet. Remove one of the four Remote Controls and close the cabinet. The Remote Controls have been programmed prior to shipping.**

7. **Locate the battery master disconnect switch on the outside of the cabinet and turn it to the "ON" position.**

   Note: Each magnet has one green LED light on the bottom of each magnet, on top of the battery cabinet lid, and on the underside of the attachment frame. There is also a small led blue light on the bottom of each magnet. The blue light only illuminates when the master disconnect switch is in the "ON" position.

8. **Press the "ON" button on the Remote Control to energize the magnets. All four green lights on the magnet, cabinet lid and underside of the attachment should illuminate. Should they all not illuminate, press the same Remote-Control button "ON" again until all are illuminated. Then press the button on the key fob "OFF" to de-energize the magnets. All lights should then be off. If a light remains lit, press the Remote-Control button "OFF" once again. Continue this on and off procedure until all light consistently turn on and off at the same time. Should there be a consistent issue with all of the lights going on or off, see the REMOTE CONTROL REPROGRAMMING INSTRUCTIONS within this manual or try a different Remote-Control.**

DAILY SAFETY INSPECTION

Do not operate your Eagle-Grip empty drum handling attachment if you notice any unsafe condition(s) that may have been caused by an accident or malfunction. Immediately report this condition to your supervisor.

1. Perform a visual inspection, checking for loose or damaged parts from previous use.

2. Ensure that safety chain is properly attached to carriage.

3. Check the battery discharge indicator to be sure the attachment has sufficient charge for required usage.

Do not operate your empty drum handling attachment if you notice any unsafe condition(s) that may have been caused by an accident or malfunction from previous use. Immediately report any unsafe conditions or issues with the equipment to your supervisor. Tag the machine properly to keep others from using it until the issue has been corrected.

SAFETY PRACTICES

1. Do not lift drums that have any contents in them.

2. During transportation, the drum(s) should **only** be lifted to a minimum height required for proper floor clearance.

3. Keep hands and feet clear of empty drums once they are lifted. Steel-toe safety shoes should be worn when manually handling empty steel drums.

4. Be certain the magnetic head(s) have made a secure connection with the side of the drum below the chime of the drum before attempting to move or transport the empty drums.

WARNINGS

WARNING: **Do not lift the attachment or suspend loads over people. Stay clear of suspended loads.**

WARNING: **Do not attempt to handle a drum or drums that have any contents in them.**

WARNING: **Never transport the attachment with drums being elevated more than a few inches above floor level.**

WARNING: **Do not leave attachment outside in rain, snow, etc., for extended periods.**

WARNING: **Never leave the attachment unattended with a suspended load.**

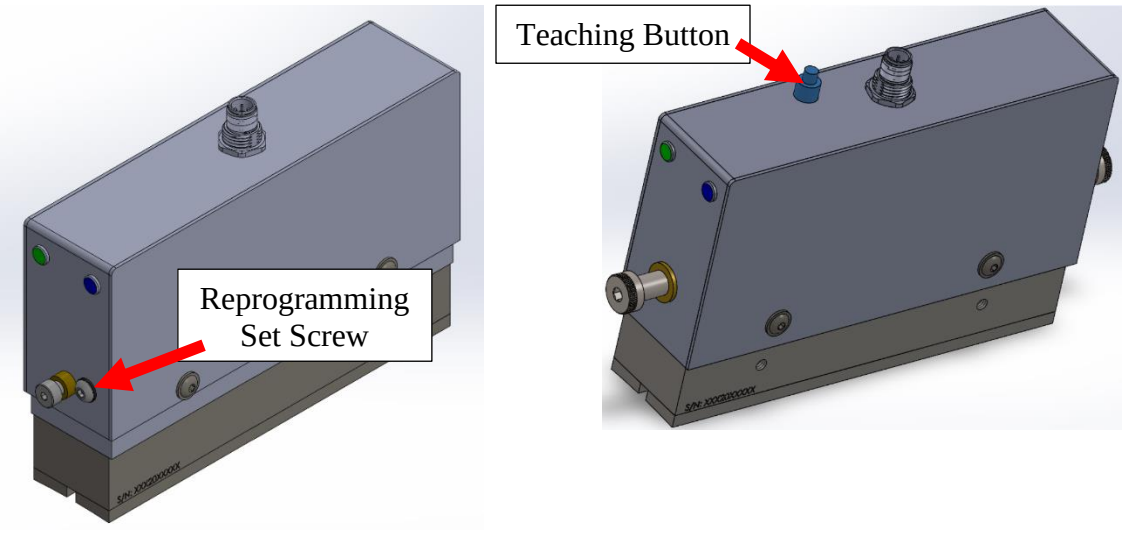
WARNING: **Never wash down the attachment. The attachment is designed to be wiped down by hand.**

WARNING: **Do not make alterations or modifications to the attachment without Easy Lift Equipment authorization.**

WARNING: **Prior to handling drums stacked three high in a trailer it is necessary to check the free lift of the lift truck mast. Be sure the lift truck mast and load backrest will not contact the ceiling of the trailer.**

WARNING: **Exercise care when lifting drums stacked three high in trailers. The upright portions on the attachment are about the same height as the empty drums when lifted. Be sure not to lift the attachment too high and cause any damage to the roof of the trailer or the attachment.**

MAGNET (GEN 1) **MAGNET (GEN 2)**



EG4MDC2-F Attachments sold before December 2023 included "GEN 1" magnets.
"GEN 1" magnets are reprogrammed via the "Reprogramming Set Screw"
"GEN 2" magnets are reprogrammed via a "Teaching Button" on the back side of the magnet.

EAGLE GRIP® 4 EMPTY DRUM HANDLING ATTACHEMENT
OPERATING INSTRUCTIONS

NOTE: The holding strength of the magnetics is dependent upon many factors. The heavier the gauge of the drum sidewall, the better magnetic attraction to the metal. Operator care in eliminating shock from traveling over dock plates and sharp turns should be exercised. Operators should strive to clamp empty drums once when unloading to reduce cosmetic abrasions where the magnets contact the drums. Magnets are equipped with replaceable wear shoes to protect the magnets themselves from wear. Wear shoes contact the drums and are powder coated to reduce cosmetic abrasions. Proper tension of the belts is another important factor in ensuring drums are held securely – essentially the belt must be positioned to ensure the drum is held vertical – tightening the belts too tight however may allow the belts to push the drums away from the magnets when attempting to grip the drums. The entire face of the magnet should be in full contact against the flat surface of the drum sidewall so that magnet is flush against the drum without any gaps at the top or bottom of the magnet. If gap is noticed between these two surfaces at the top of the magnet, the belt that rests against the lower side of the drum should be tightened. Belts will naturally stretch with use and may require periodic adjusting to correct drum position and ensure proper alignment of the magnets. Should a gap be noticed at the bottom of the magnet, the belt is too tight and should be loosened to remove the gap.

TO ENGAGE AND TRANSPORT CLOSED HEAD EMPTY STEEL DRUMS

REMOTE CONTROL

1. With the attachment properly secured to the lift truck and the disconnect switch in the "ON" position, press the Remote Control button "ON" to illuminate all four green lights which are located on top of the battery cabinet lid, on the underside of the attachment and on the magnets themselves. In the event that all four lights do not illuminate, continue to press the Remote Control button "ON" until all four lights are illuminated. Do not attempt to grip empty drums unless all four green lights are illuminated.

2. When all four green lights are illuminated, the magnets are now energized to grip the drums. Level the forks on the lift truck. Center the attachment clamping mechanisms with center of drum(s). Drive the lift truck forward with the clamping mechanisms in a position to contact the empty drum(s). The clamping mechanism should make contact against the upper third of the drum, above the second rolled hoop or "W" hoop of the empty drum. The magnets will now engage the metal on the side on the empty drum. In situations where the trailer is not on the same plane as the warehouse floor it would be necessary for the lift truck operator to tilt the mast of lift truck forward or back to keep the empty drums in a vertical (not tilted) position.

3. Raise the lift truck forks slightly to elevate the drums and back away. When removing drums from trailers it is necessary to cross dock boards and ramps softly as shock from bouncing from trailer to warehouse areas can cause the empty drums to release from the magnets.

4. **To release the drums onto the floor, pallet, or conveyor the operator must <u>not</u> have the lift truck carriage tilted forward or back. Doing so will only increase the chance of abrasions to the drums' painted surface.** Lower the drums just enough to contact the floor, pallet or conveyor, then press the Remote-Control button "OFF" to disengage the drums.

   Do not back away until all four lights are no longer illuminated. Once released, the operator can back away from the released drums, then press the Remote-Control button "ON" again to energized the magnets before entering the trailer to grip additional empty drum(s).

TO ENGAGE AND TRANSPORT OPEN HEAD EMPTY STEEL DRUMS

Open head steel drums with removable lids are wider than closed head drums. This requires one of the two mast assemblies on the carriage frame to be repositioned outward to widen the distance between the two masts assemblies by 1.6". To widen the mast assemblies, lift the roll pin in the carriage lock pin on either of the two mast assemblies and slide the mast assembly outward until the carriage lock pin drops into the next slot in the carriage. This will increase the distance between the two masts by the necessary 1.6" required to handle open head steel drums. Only move one of the two mast assemblies, not both. Once this is done, follow the same instructions above for handling closed head steel drums. When necessary to handle closed head drums again, this procedure would be reversed to close the 1.6" gap.

Note: Drums with a third rolling hoop near the drums' chime, such as a 17H drum, will not work with this attachment. The is not enough space between the second rolled hoop and the drums lid for the magnets to engage the drum.

Note: All Remote Controls are provided with a Velcro tape attached to the back of the Remote-Control Holder. This enables the Remote Control to be attached in a convenient location in the lift truck for the operator without the need to be handheld.

CHARGING THE BATTERIES:

All EG4MDC2-F empty drum attachments are equipped with DC cabinet housing two large 12-volt AGM batteries wired in series (24-volt system) to provide the power supply for activating the magnets. Also inside of the DC cabinet is an automatic 24-volt charger. To charge the unit a polarized heavy gauge extension cord rated 12-3 15amp / 125 volt is required but not provided. To remove the attachment for charging:

1. Disconnect the safety chain securing the attachment to the lift truck, the remove the attachment from the lift truck. Turn off the disconnect switch on the side of the cabinet to the "OFF" position.

2. Open the cabinet lid, use a grounded medium heavy gauge extension cord and plug the power cord from the charger into the extension cord.

3. The charger will shut off when the batteries are fully charged. A battery discharge indicator located by the disconnect switch displays the state of charger for the batteries.

CHECKING MAGNET BOLT TIGHTNESS (WEEKLY):

All EG4MDC2-F magnets have a bolt on the top and bottom, as seen here:

It is recommended to check for proper tightness of these two bolts WEEKLY to ensure they don't become too loose or fall out. For the magnets to work properly, it's imperative that these two bolts stay properly tightened.

Using a 5mm Allen Key ensure WEEKLY that these bolts are properly tightened.

It's important NOT to overtighten the bolts. Ensure that the magnets still float freely within the outer housings after the bolts have been tightened. If they do not float freely, the bolts have been overtightened.

FAILURE TO TIGHTEN THESE BOLTS PROPERLY COULD ALLOW THE MAGNETS NOT TO FUNCTION CORRECTLY OR COMPLETELY FALL OUT OF THE OUTER HOUSINGS ALTOGETHER.

MODEL EG4MDC2-F EMPTY DRUM HANDLING ATTACHMENT SPECIFICATIONS:

Model	Capacity (lbs./kg.)	Weight (lbs./kg.)	Height x Length x Width (inches)	(mm)	Drums Handled	Description
EG4MDC2-F	200/90.7	880/399.3	79x47x33	940x1194x838	1 or 2	Empty Drum Attachment

LOST LOAD CENTER: The distance from the tip of the forks to the center of the drum. 13" to center of drum measurement

VERTICAL CENTER OF GRAVITY: The distance measured from the bottom of the attachment to the center point on the mast at which it balances. 9.75" with a fork mount frame have 43" fork pockets.

HORIZONTAL CENTER OF GRAVITY: The distance or point that is measured between the beginning of the fork pockets to the end of the attachment which the attachment balances. 25.25"

FOR PARTS, SERVICE OR TECHNICAL QUESTIONS CALL:

Easy Lift Equipment
2 Mill Park Ct.
Newark, DE. 19713
800-233-1800 ; 302-737-7000
FAX: 302-737-7333
www.easylifteqpt.com
email: sales@easylifteqpt.com

Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

Operator's Daily Checklist

Eagle-Grip® Magnetic Empty Drum Handling Attachment (EG4MDC2-F)

Inspections Performed by: _____

Note: This inspection must be made by the equipment operator **daily** at the start of the shift. Check (✓) the appropriate "OK" or "Needs Repair" field.
This Daily Checklist is intended to help verify that the equipment is in proper working order each day.
More thorough Weekly, Monthly and Yearly Maintenance schedules should still be followed.

	DATE:	/		/		/		/		/		/		/	
	VISUAL CHECK	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**
VISUAL CHECK: FRAME, MASTS & BATTERY BOX	**DATA PLATES & WARNING DECALS**- Data Plates & Warning Decals are affixed to the unit and in good condition														
	DAMAGE - Look for bent, dented or broken parts. This includes frame welds, bolted connections, battery box components, (8) LED indicator lights, and fork pockets														
	LEAKS - Check for any leaking battery acid from the battery Box														
	SAFETY CHAIN - Verify that all the components of the Safety Chain are free of damage or missing components														
	CARRIAGE MOUNTS - Verify that the Carriage Mounts are free of damage and properly secured on to the Attachment Frame														
	BATTERY COMPARTMENT - Verify that the gas struts on the battery compartment lid are intact and in proper working order														
	BELTS - Verify proper belt tension (contact Easy Lift Equipment for details)														
VISUAL CHECK: MAGNETS	**MAGNET DAMAGE** - Ensure the magnet outer and inner housings, retaining pins, cotter pins, springs, LED lights and hardware are free of damage or missing components. Ensure the magnet assemblies "float freely" and articulate. This will help ensure solid contact when engaging empty drums														
	MAGNETIC SHOES - Check the magnet shoes for excessive wear														
	MAGNETIC HARDWARE - Verify the bolts located on the top and bottom of each magnet are fully tightened														
	MAGNETIC WIRING - Confirm that all magnetic wires are properly connected and show no signs of damage														

Checklist Continued on Next Page

Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

Operator's Daily Checklist (cont.)

Eagle-Grip® Magnetic Empty Drum Handling Attachment (EG4MDC2-F)

	DATE:	/		/		/		/		/		/		/	
	OPERATIONAL CHECK	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**	**OK**	**Needs Repair**
OPERATIONAL CHECK: FRAME, MASTS & BATTERY BOX	**FORK POCKETS** - Verify that the forks of your lift truck fit accordingly into the fork pockets of your Eagle-Grip Attachment														
	SAFETY CHAIN - Confirm that the Safety Chain is properly connected to the carriage of your lift truck using either the Cam Lock or Snap Hook systems														
	POWER UP - Turn the Master Disconnect Switch to the 'ON' position and ensure that the Battery Discharge Indicator properly displays														
	REMOTE CONTROL - Verify that the Magnet Remote Control is in proper working order by pressing the 'ON' button of the remote control; this should cause all (8) LED indicator lights to turn ON. Then press the 'OFF' button of the remote control, this should cause all (8) LED indicator lights to turn OFF. (In the instance where the remote control doesn't work, see the Manual for 'Reprogramming Instructions')														
MAGNETIC CLAMPS	**MAGNETIC CLAMPING HEADS** - Verify that the Eagle-Grip Magnetic Clamping Heads engage and distengage empty steel drums properly. Only lift the empty drums to the minimum height required to ensure all the magnets are in proper working order.														

List the details of all required repairs in the comments section below. Then, **tag and decommission the equipment for safety.**

Comments (items needing repair or adjustment): _____

_____

_____

_____

_____

_____

Caution – If the equipment is found to be in need of repair or in any way unsafe, or contributes to an unsafe condition, the matter shall be reported immediately to the designated supervisor, and the attachment shall not be operated until it has been restored to a safe operating condition. If during operation, the attachment becomes unsafe in any way, the matter shall be reported immediately to the designated supervisor, and the attachment shall not be operated until it has been restored to safe operating condition. Do not make repairs or adjustments unless specifically authorized to do so.

Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

EAGLE-GRIP® MAGNETIC EMPTY DRUM HANDLING ATTACHMENT (EG4MDC2-F) MAINTENANCE SCHEDULES

Easy Lift Equipment recommends the following maintenance intervals.
Failure to do so could cause the equipment not to work as intended.

WEEKLY INTERVALS

EG4MDC2-F Magnet Hardware	Verify the bolts located on the top and bottom of each magnet are fully tightened.

MONTHY INTERVALS

EG4MDC2-F Safety Chain	Thoroughly verify that all the components of the Safety Chain are free of damage or missing components.
EG4MDC2-F Battery Compartment	Thoroughly inspect the Battery Compartment and ensure that the gas struts on the battery compartment lid are intact and in proper working order.
EG4MDC2-F Magnet Components	Ensure the magnet outer and inner housings, retaining pins, cotter pins, springs, LED lights and hardware are free of damage or missing components. Ensure the magnet assemblies "float freely" and articulate. This will help ensure solid contact when engaging empty drums. **Again, verify the bolts located on the top and bottom of each magnet are fully tightened.**
EG4MDC2-F Magnet Shoes and excessive wear	Check the magnet shoes for excessive wear.
EG4MDC2-F Belts	Check belts for wear or damge and verify proper belt tension (contact Easy Lift Equipment for details).

SIX-MONTH INTERVALS

EG4MDC2-F Battery Components	Check battery discharge indicator to ensure it is functioning properly. Verify that the batteries are holding a proper charge.
EG4MDC2-F Charger Components	Check that battery cables and battery hold-downs are tight. Verify that the wiring on all LED lights are intact and properly connected.

YEARLY INTERVALS

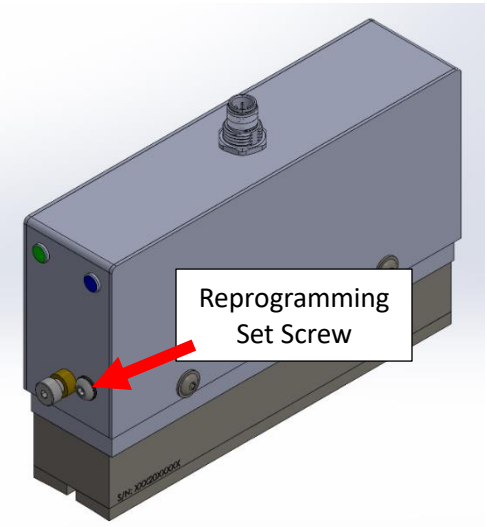
EG4MDC2-F Frame & DC Box Cracked Inspection	Elevate the attachment and thoroughly inspect the equipment, including underneath the frame, fork pockets and DC Box, for cracked welds or structural damage.

Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

REMOTE CONTROL REPROGRAMMING INSTRUCTIONS ("GEN 1" STYLE)

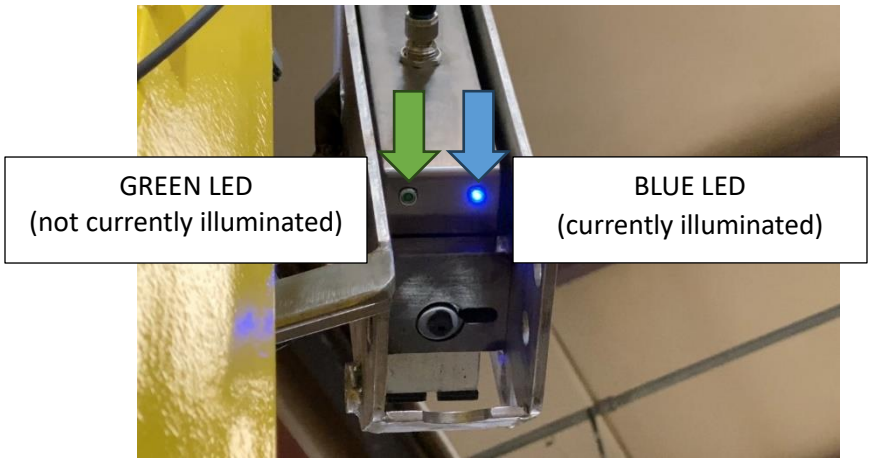
EG4MDC2-F Attachments sold before December 2023 included "GEN 1" magnets (below, left). "GEN 1" magnets are reprogrammed via the "Reprogramming Set Screw".

All EG4MDC2-F Attachments are provided with four Remote Controls (below, right).

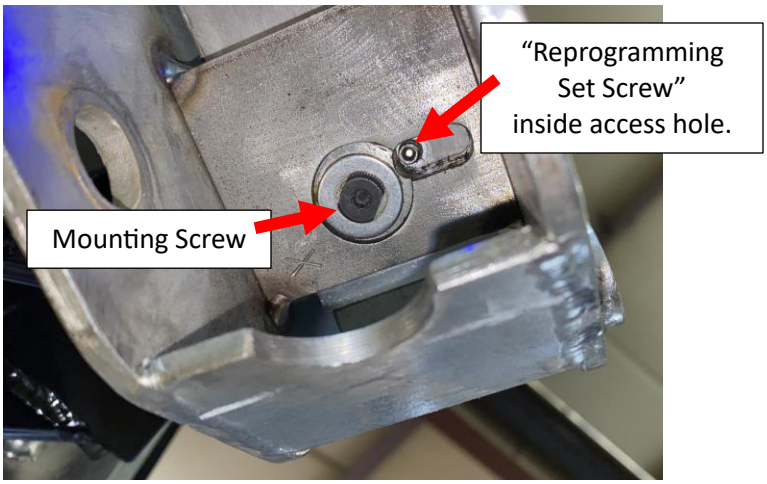


To Begin: With the attachment attached to the lift truck, elevate the attachment so the bottom of the magnets are at or above eye level. This makes the programming process more ergonomic for the operator, rather than attempting to access the bottom of the magnets from floor level.

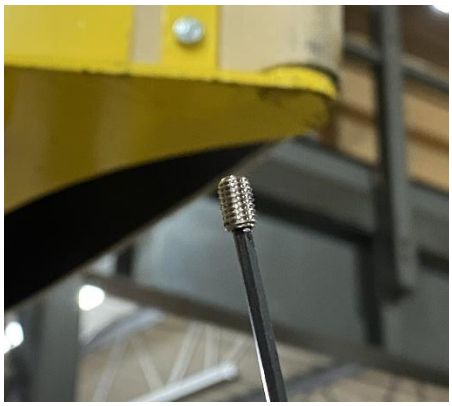
To Access the wireless teaching button: On the bottom side of every magnet there are two small LED lights, one green and one blue. These small lights are helpful when reprogramming the remote controls.



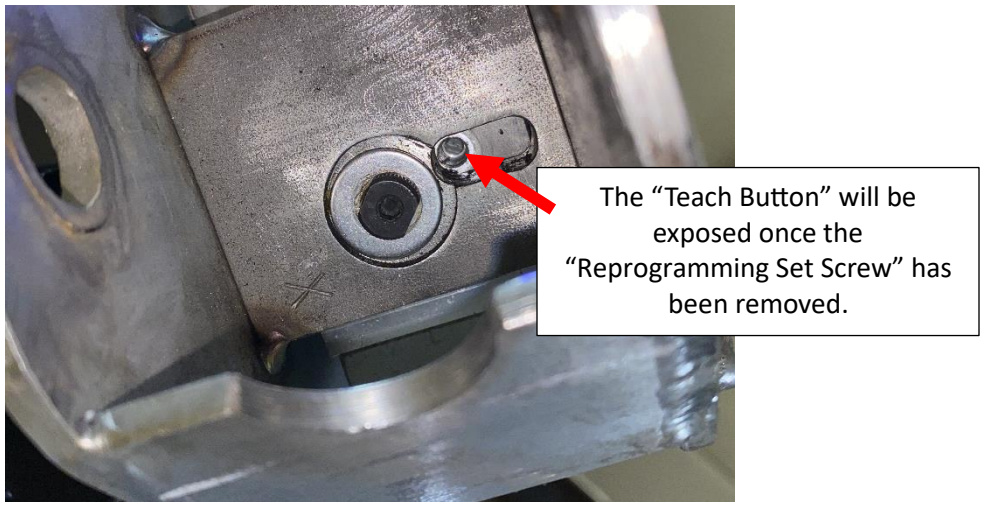
On the bottom of each magnet is a mounting screw (left) as well a 3mm “Reprogramming Set Screw” (right) within an access hole.



Use a 3mm Allen key to unthread and remove the “Reprogramming Set Screw” on the bottom of each magnet.



To Pair a Remote with a Magnet: With the “Reprogramming Set Screw” removed, inset the 3mm Allen key into the hole where the set screw was removed until it touches the **teach button** inside the hole. Hold the button in for 2 seconds to put the receiver in **pairing mode**.



Within a few seconds of releasing the teach button, press the “ON” button of the Remote Control**. You must be within close proximity of the magnet while pairing.** Then wait a few seconds for the Remote Control and magnet receiver to pair.

Once the magnet has properly paired, the green LED will illuminate.

Next, test the pairing by pushing the Remote Control “ON” and “OFF” buttons again. The green light on the magnet, the battery cabinet lid and underside of the attachment will illuminate green when the magnets are charged. And, the green LEDs will turn off, when the magnets are not charged.

Repeat this procedure until all four magnets have been paired with the same Remote Control.

Test the system by turning on and off all four magnets/green lights consistently.

If all four lights (on the magnet, the battery cabinet lid and underside of the attachment) do not illuminate, continue to press the key fob button “ON” until all four lights are illuminated. If one or more magnets do not pair, repeat the pairing process with the magnet having the problem until all four magnets/green lights consistently turn on and off.

You will have to repeat this process for every individual remote control.

Re-closing the Magnet: When all programming is complete, insert “Reprogramming Set Screw” back into the bottom screw hole of each of the magnets that have been reprogrammed, and tighten the set screws until they’re snug.

NOTE: All Eagle-Grip® Attachments conform to OSHA standards. A metal plate, affixed to each attachment, provides model number, serial number, rated capacity and attachment weight. OSHA requires contacting the lift truck manufacturer for written approval of any attachment to be used on a lift truck.

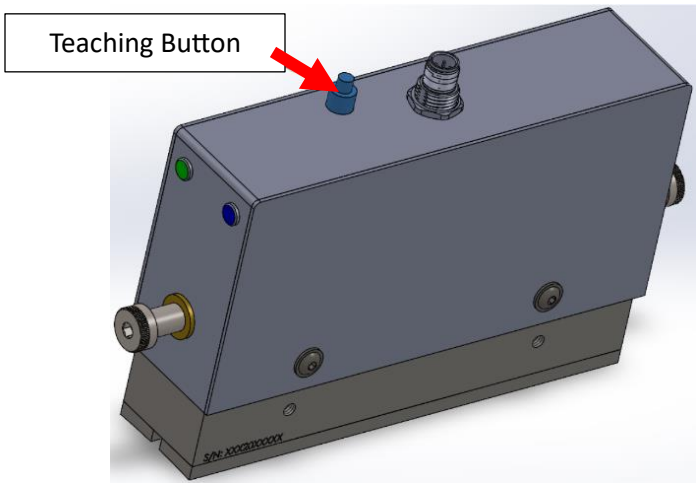
Contact Easy Lift Equipment if your Easy Lift Attachment is missing the metal specification plate.

Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

REMOTE CONTROL REPROGRAMMING INSTRUCTIONS ("GEN 2" STYLE)

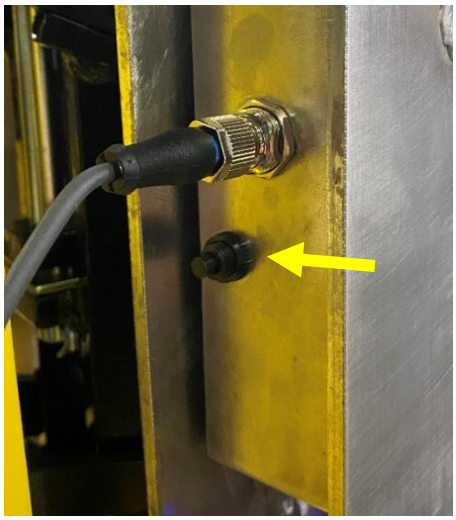
Beginning in December 2023 EG4MDC2-F Attachments include "GEN 2" magnets (below, left). "GEN 2" magnets are reprogrammed via the "Teaching Button" on the back side of the magnet.

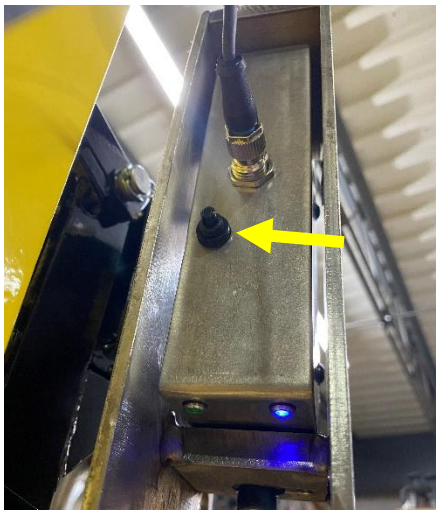
All EG4MDC2-F Attachments are provided with four Remote Controls (below, right).



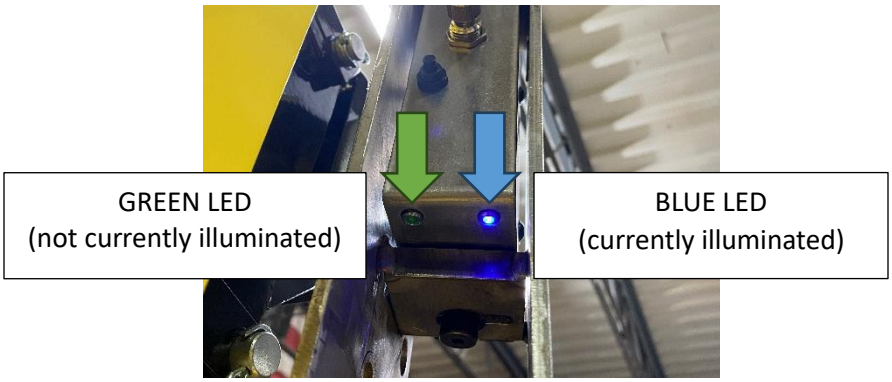
To Begin: With the attachment attached to the lift truck, elevate the attachment so the back side of the of magnets are at eye level. This makes the programming process more ergonomic for the operator.

To Pair a Remote with a Magnet: The "Teaching Button" is located on the back side of each magnet, as seen below:





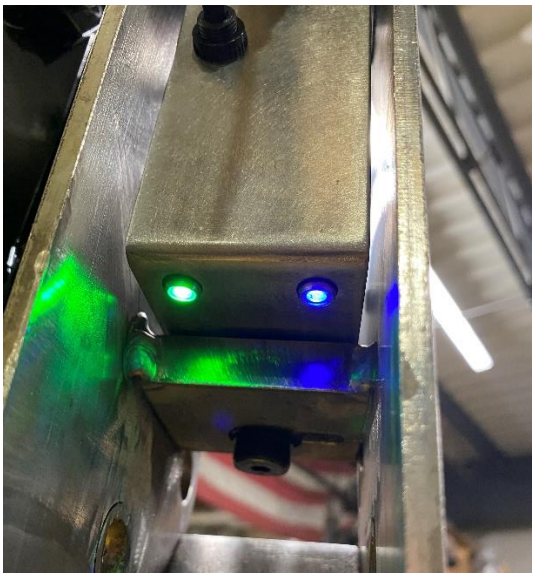
On the bottom side of every magnet there are two small LED lights, one green and one blue. These small lights are helpful when reprogramming the remote controls



Hold the Teach Button in for 2 seconds to put the receiver in **pairing mode**.

Within a few seconds of releasing the Teach Button, press the "ON" button of the Remote Control**. You must be within close proximity of the magnet while pairing.** Then wait a few seconds for the Remote Control and magnet receiver to pair.

Once the magnet has properly paired, the green LED will illuminate.



Next, test the pairing by pushing the Remote Control “ON” and “OFF” buttons again. The green light on the magnet, the battery cabinet lid and underside of the attachment will illuminate green when the magnets are charged. And, the green LEDs will turn off, when the magnets are not charged. You should also be able to audibly hear the magnets engaging and disengaging as you press the “ON” and “OFF” buttons of the remote control.

Repeat this procedure until all four magnets have been paired with the same Remote Control.

Test the system by turning on and off all four magnets/green lights consistently.

If all four lights (on the magnet, the battery cabinet lid and underside of the attachment) do not illuminate, continue to press the key fob button “ON” until all four lights are illuminated. If one or more magnets do not pair, repeat the pairing process with the magnet having the problem until all four magnets/green lights consistently turn on and off.

You will have to repeat this process for every individual remote control.

To Reset a Magnet and Remote: Press and hold the Teach Button on the back side of each magnet for at least 5 seconds. When the Teach Button is released, the magnet will then forget all paired remotes. Repeat the steps above to re-pair the magnets and remotes.

NOTE: All Eagle-Grip® Attachments conform to OSHA standards. A metal plate, affixed to each attachment, provides model number, serial number, rated capacity and attachment weight. OSHA requires contacting the lift truck manufacturer for written approval of any attachment to be used on a lift truck.

Contact Easy Lift Equipment if your Easy Lift Attachment is missing the metal specification plate.

Easy Lift Equipment Co., Inc.
2 Mill Park Court, Newark, Delaware 19713 - Phone: 800-233-1800 / 302-737-7000

EASY LIFT EQUIPMENT WARRANTY POLICY
FOR MODELS WITH PREFIXES: ED/ER/EL/ELDR/EG & RCR

Easy Lift Equipment ("ELE") warrants each new product to be free from factory material and workmanship defects, under normal use with proper maintenance, for a period of 12 months. Warranty coverage for this warranty period is provided by authorized dealers and includes parts. Labor is covered for the same periods of 12 months as outlined above. Please call ELE for the authorized repair dealer in your area.

ELE shall be the sole judge of the validity of any claim or defect and may elect to make any replacement or repair of any part thereof that it has agreed to be defective. Wearable Items such as: hoses, bearings, belts, brushes, seals, lift motors, clamp motors, relays, fuses, springs and wheels are wear items not covered under the warranty policy. ELE assumes no responsibility whatsoever to work done, parts replaced, or expenses incurred not specifically authorized by ELE. Normal maintenance or replacement of service items is not covered by this warranty. No warranty claims will be considered for customers with any delinquent outstanding balance. When batteries, battery chargers, scale printers or scale indicators are purchased from ELE with the equipment, the original manufacturer's warranty applies.

WARRANTY LIMITATION/DISCLAIMERS:

Easy Lift Equipment reserves the right to void warranty coverage if the unit has been overloaded beyond rated capacity; damaged due to: abuse, misuse, neglect, accidents, freight damage, improper usage, improper repair, and/or improper storage; or any modification or repair conducted in a manner not approved by Easy Lift Equipment. Equipment used in freezers, abrasive, corrosive, and/or excessively moist conditions must be properly equipped for the environment to ensure the warranty is not voided. Warranty questions and claims should be directed to our customer service department. ELE customer service representatives will help you assess and resolve the claim or assist you in contacting the local authorized dealer or representative. The warranty described here shall constitute the sole remedy of the authorized dealer and/or the initial purchaser. ELE neither assumes nor authorizes any person to assume for it any other obligation or responsibility in connection with this product warranty. In no event shall ELE be responsible for direct, indirect, special or consequential damages or any other delay or any economic or commercial loss resulting from Easy Lift Equipment's performance or non-performance under this warranty. This warranty is expressly in lieu of all warranties, obligations or responsibilities of ELE dealers or other authorized source, expressed, implied or statutory.

SUBMITTING CLAIMS:

To make a claim under this policy, please contact Easy Lift Equipment for assistance. We can be reached by calling 800-233-1800 ext. 4 for customer service or by writing to sales@easyliftequipment.com. Do not return defective parts unless a return authorization (RA) has been provided requesting the return. If requested, we will provide shipping information on how the part should be returned and bear the expense for the return shipping, if the part is proven to be defective. A copy of the work order made at the time of the repair and parts claimed under warranty may be requested for ELE's inspection.

ORDERING PARTS:

Easy Lift Equipment's parts are distributed through our customer service department and ship the same day as ordered whenever possible. You will be well taken care of whenever parts, adjustments or repairs are needed. **When contacting ELE, please be sure to state the model and serial number for the equipment.** There is no cost for electronic copies of replacement manuals, parts lists and other general information containing part numbers and nomenclature. Most manuals contain parts pricing, but it is not guaranteed to be valid as parts pricing can change at any time without notice. Any customer service representative can provide timely parts quotations upon request. Adherence to above procedure will save time and provide prompt assistance when it counts. You are of course always welcome to bring to us any questions, comments or recommendations pertaining to your Easy Lift Equipment products.

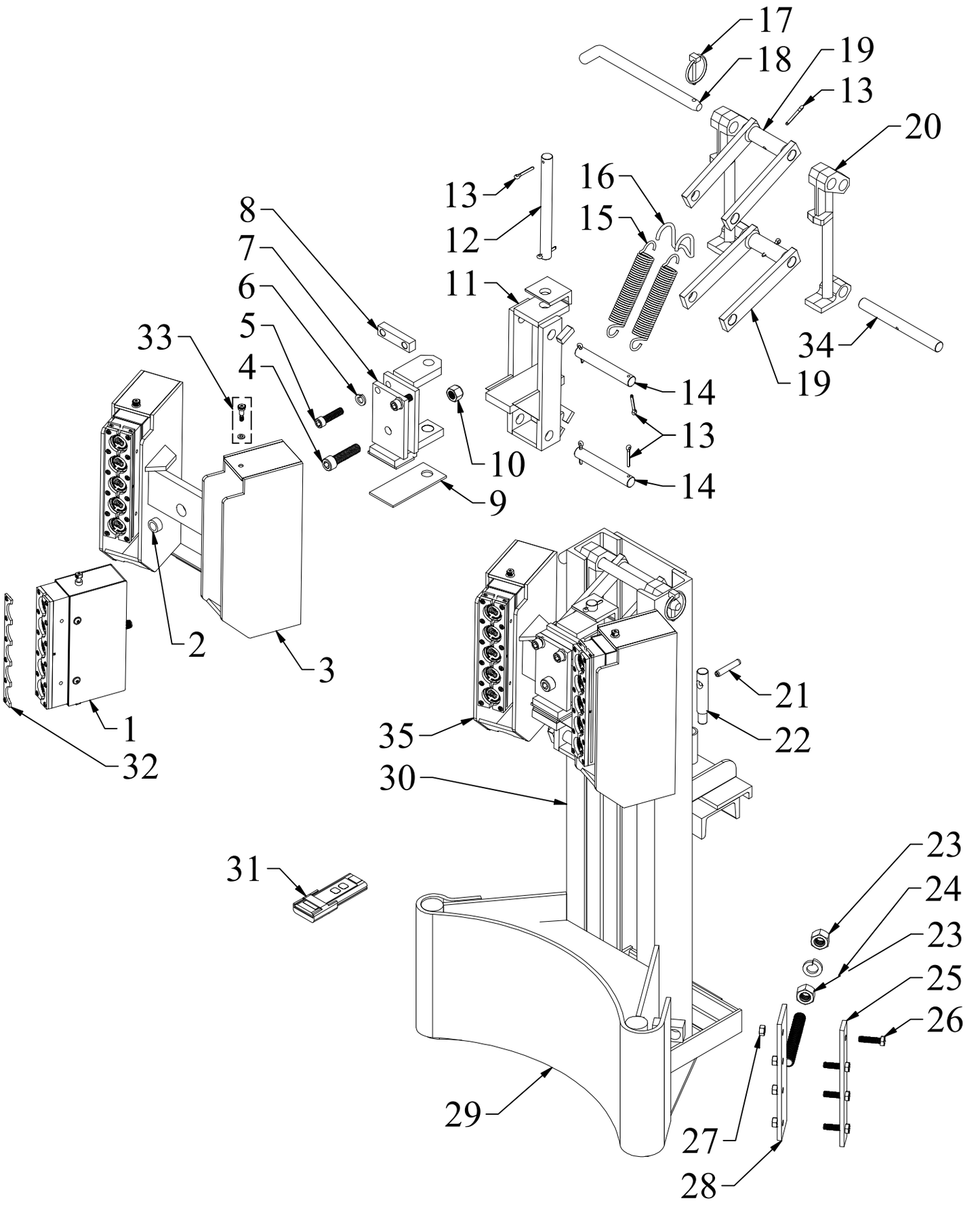
MANUFACTURER CONTACT INFORMATION:

Easy Lift Equipment Co., Inc.
2 Mill Park Ct.
Newark, DE 19713
Email: sales@easyliftequipment.com

Phone: 800-233-1800: 302-737-7000
Fax: 302-737-7333
Website: www.easyliftequipment.com

Updated: 7/26/18

EAGLE-GRIP EMPTY DRUM HANDLING CLAMPING MECHANISM ASSEMBLY



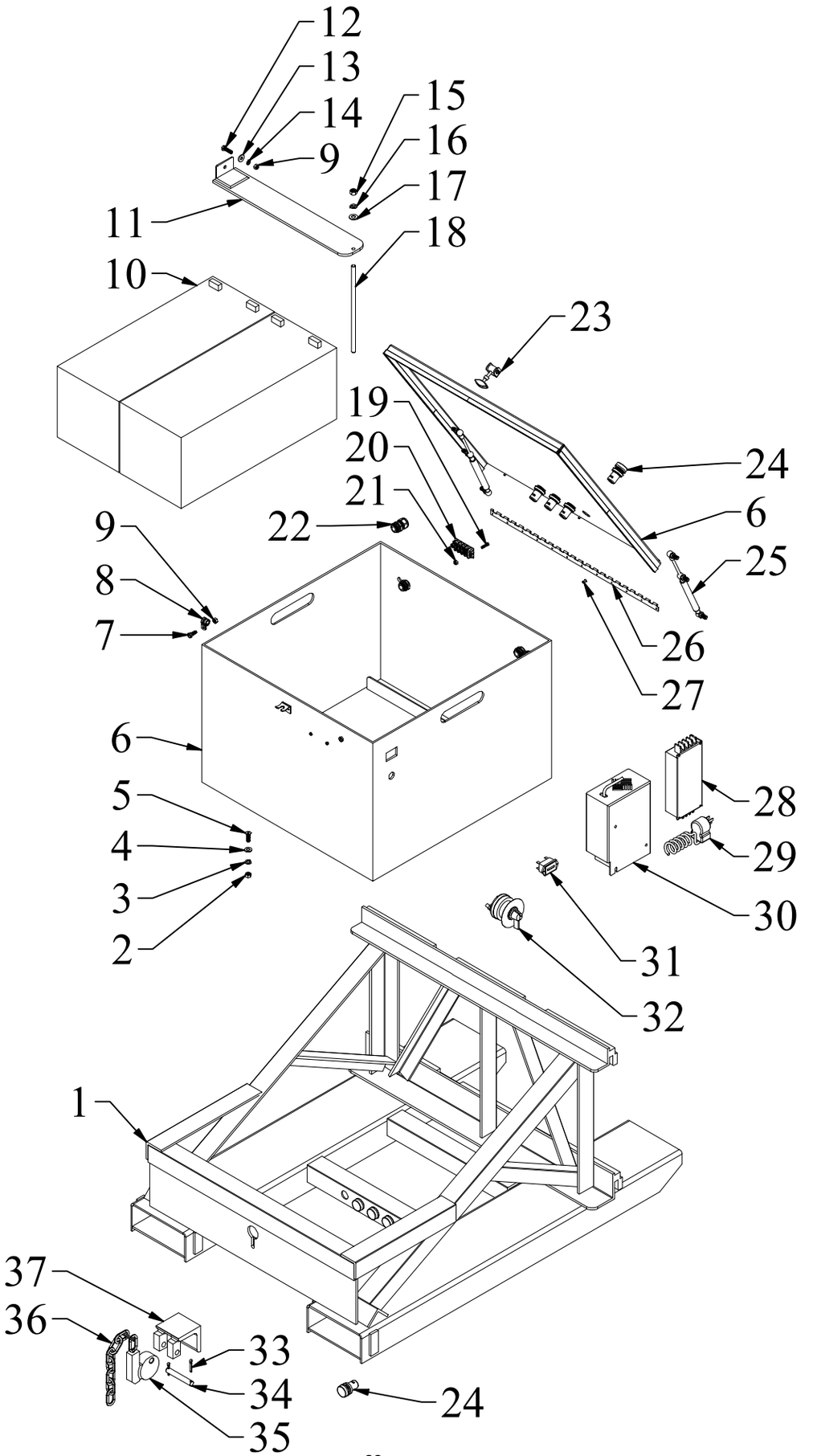
EAGLE-GRIP® EMPTY DRUM HANDLING
CLAMPING MECHANISM
PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	81401335	ELAY30x5 Magnet	2
2	10001	Bushing, Housing Yolk Trunion (zinc)	1
3	3536202	Outer Housing (Stainless Steel - EG4 Magnet)	1
4	1/2-13 x 2 SHCS	1/2-13 x 2 Socket Head Cap Screw (zinc)	1
5	3/8-16 x 1 1/2 SHCS	3/8-16 x 1 1/2 Socket Head Cap Screw Alloy Plated	2
6	3/8 LW	3/8 Lock Washer (zinc)	2
7	9202	Universal Body (Black Powder Coating)	1
8	10203-4	Spacer, Universal Body (Black Powder Coating)	1
9	16009-1	Wear Plate, Universal Carrier	1
10	1/2-13 NLN	1/2-13 Nylon Locking Nut (zinc)	1
11	7202	Universal Carrier (Black Powder Coating)	1
12	15106-1	Pin, Universal Body to Carrier (zinc)	1
13	6006-CP	Cotter Pin, 5/32" x 1" (zinc)	9
14	17006-1	Pin, Clevis to Housing (HP10-370-E)	2
15	4206	Spring, Clevis (zinc)	2
16	8996	Clevis Spring Hook (Stainless Steel)	1
17	HANG-2	3/16 x 1-3/4 Circle Cotter "Hang 2" (7016)	1
18	19106-1	Adjustment Pin (zinc)	1
19	3202	EG3 & EG4 Upper Clevis (With 3202P Pin) - 6-1/8" Length	2
20	1700-7	Adjustment Slide (Black Powder Coating)	2
21	70063	Spring Roll Pins 1/4 X 1-3/4 (zinc) (xref 70643)	1
22	36006-1	Pin, Lock to Carriage	1
23	5/8-11 HN	5/8-11 Finished Hex Nut (zinc)	2
24	5/8 LW	5/8 Lock Washer (zinc)	1
25	12200-4	Belt Clamp (Yellow Powder Coating)	2
26	5/16-18 X 1 1/4 HHCS	5/16-18 x 1 1/4 Hex Head Cap Screw Grade 5 (zinc)	8
27	5/16-18 HN	5/16-18 Finished Hex Nut (zinc)	8
28	6902	Adjusting Rod for Belt Clamp	1
29	2516	Composite Belt	1
30	4902-3	Belt Cradle Frame - 3 hole (Belt Incl.)	1
31	88001245	Magnet Remote Control Kit	1
32	88001101	Pole Shoe Kit, Easy Lift 30x5	2
33	3530489	Hardware Kit, ELAY30x5 Magnet	2
34	3202P	Clevis Replacement Pin with Cotter Pin	1
	FULL ASSEMBLY		
35	* 6004MAG	EG4 Double Clamping Mechanism (Stainless Steel - EG4 Magnet)	

* EG4 Magnetic Head Assembly Only

	HARDWARE KIT COMPONENTS		
31	88001245	Magnet Remote Control Kit	1
	270395	Remote Control, RF 433Mhz, 2 Button	1
	270398	Battery, Alkaline 23A 12V	1
	ADART054	Magnet Remote Decal	1
32	88001101	Pole Shoe Kit, Easy Lift 30x5	1
	3202533	Solid Pole Shoe, Easy Lift 30x5	2
	180752	SHCS, M4x6	12
33	3530489	Hardware Kit, ELAY30x5 Magnet	1
	M10 x 16MM with M8-1.25 SSS	M10 x 16MM with M8-1.25 Threaded Socket Shoulder Bolt (alloy)	2
	93475A280	Thick M10 18-8 SST Washer, 10.50 ID x 20MM OD	2
	98689A117	Thin M10 18-8 SST Washer, 10.50 ID x 18MM OD	2
	99186A136	M10 Rubber Sealing Washer, 10.50 ID x 20MM OD	2

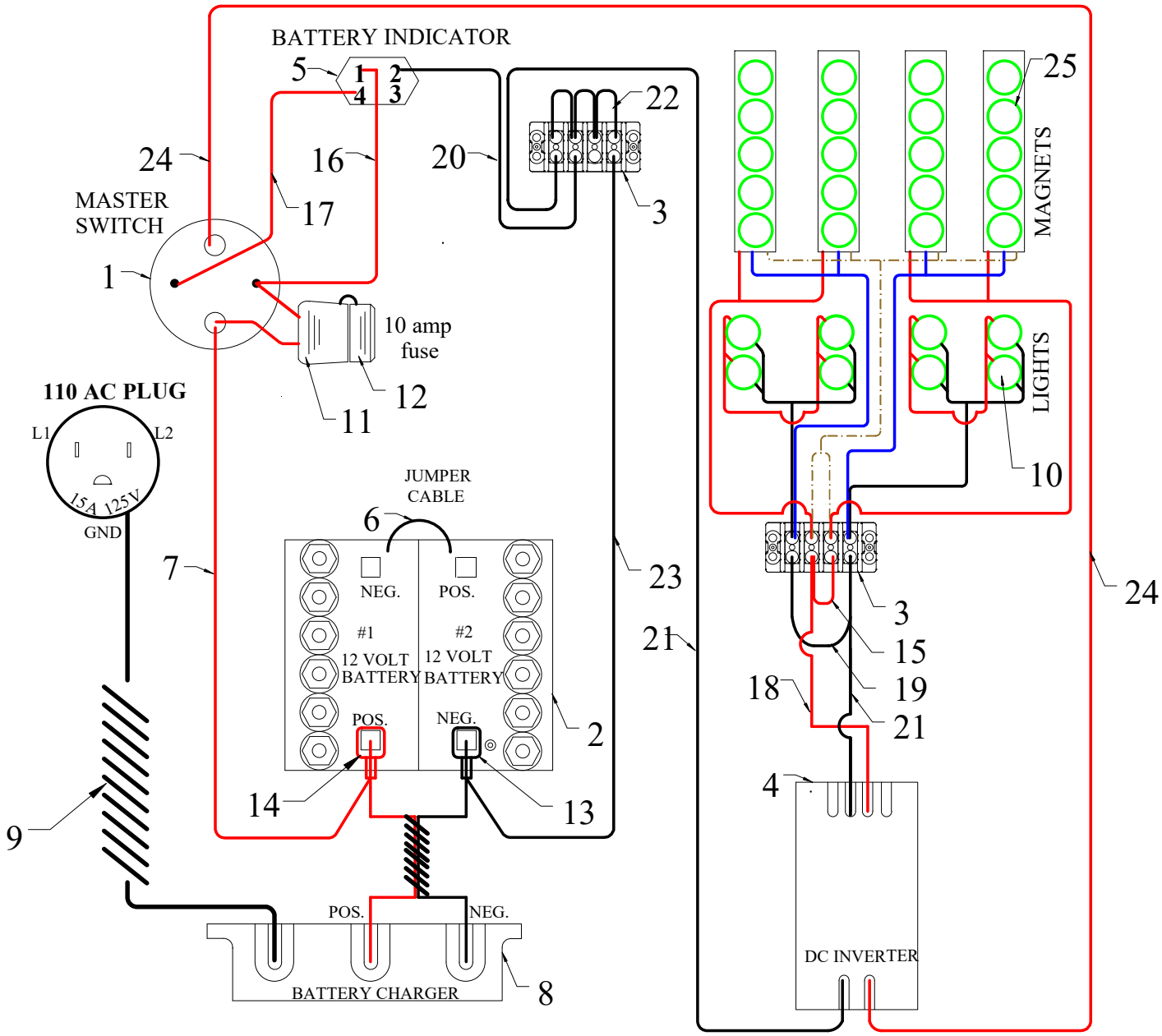
EAGLE-GRIP EMPTY DRUM HANDLING ATTACHMENT DC BOX ASSEMBLY



EAGLE-GRIP® EMPTY DRUM HANDLING
ATTACHMENT DC BOX
PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	3530511	Magnetic Drum Handling Frame	1
2	5/16-18 HN	5/16-18 Finished Hex Nut (zinc)	4
3	5/16 LW	5/16 Lock Washer (zinc)	4
4	5/16 FW	5/16 Flat Washer (zinc)	4
5	5/16-18 x 1 FSHCS-SS	5/16-18 x 1 Flat Socket Head Cap Screw (stainless steel)	4
6	3530510	DC Cabinet & Lid for Magnetic Drum Handling Attachment	1
7	1/4-20 x 1/2 HHCS-SS	1/4-20 x 1/2 Hex Head Cap Screw (stainless steel)	2
8	8863T14	Loop Clamp with Vinyl Coated 1/2" OD, 1-7/16" Long	2
9	1/4-20 NLN	1/4-20 Nylon Locking Nut (zinc)	3
10	DC210-12	12 volt, 210 AH AGM Battery	2
11	3530509	Battery Bracket for Magnetic Drum Handling Attachment	1
12	1/4-20 x 1 HHCS	1/4-20 x 1 Hex Head Cap Screw Grade 5 (zinc)	1
13	1/4 FW SAE	1/4 Flat Washer SAE (zinc)	1
14	1/4 LW	1/4 Lock Washer (zinc)	1
15	3/8-16 HN	3/8-16 Finished Hex Nut (zinc)	1
16	3/8 LW	3/8 Lock Washer (zinc)	1
17	3/8 FW	3/8 Flat Washer (zinc)	1
18	3530508	3/8-16 x 10" ALL THREAD	1
19	8-32 x 3/4 PTHS	8-32 x 3/4 Phillips Truss Head Screw (zinc)	4
20	7527K64	Terminal Block (Strip) 7/16", 4 circuits	2
21	8-32 NLN	8-32 Nylon Locking Nut (zinc)	4
22	ZZHEY3208	Cable Fitting	4
23	WJ202	Hood Latch (730-1750)	1
24	A18033000UX0419	Green Indicator Light AC/DC 24V, 22mm Panel Mount	8
25	FT0831-50N	50N Hydraulic Gas Strut Lift Support Door Cabinet Hinge	2
26	CS24010628H	Cabinet Hinge	1
27	97447A025	Aluminum Blind Rivet w/Aluminum Mandrel 1/8, .188-.25"	10
28	RSD-200B-24	DC /DC Converter 1 Output 24V 8.4 A	1
29	51045638	USA AC Cable	1
30	51064543	Battery Charger 115v/24v 30A (Magnetic Empty Drum Attachments ONLY)	1
31	T101772	24 Volt Battery Discharge Indicator (906T24JWDGN)	1
32	PA16529	Master Disconnect Switch	1
33	6006-CP	Cotter Pin, 5/32" x 1" (zinc)	2
34	4006-1	Pin, Cam Lock	1
35	0504D	Cam, Cam Lock	1
36	504	Safety Chain & Cam Lock Assembly	1
37	0504A	Clamp, Cam Lock (zinc)	1

EAGLE GRIP EMPTY DRUM HANDLING ATTACHMENT WIRING ASSEMBLY



EAGLE-GRIP® EMPTY DRUM HANDLING ATTACHMENT WIRING PARTS LIST

ITEM	PART NO.	DESCRIPTION	QTY
1	PA16529	Master Disconnect Switch	1
2	DC210-12	12 volt, 210 AH AGM Battery	2
3	7527K64	Terminal Block (Strip) 7/16", 4 circuits	2
4	RSD-200B-24	DC /DC Converter 1 Output 24V 8.4 A	1
5	T101772	24 Volt Battery Discharge Indicator (906T24JWDGN)	1
6	113765-67-67-4	BLACK Battery Cable 4" - 4ga with (2) 5/16" Ring Terminal Ends	1
7	113766-67-68-5	RED Battery Cable 5" - 4ga with (1) 5/16" & (1) 3/8 Terminal Ends	1
8	51064543	Battery Charger 115v/24v 30A (Magnetic Empty Drum Attachments ONLY)	1
9	51045638	USA AC Cable	1
10	A18033000UX0419	Green Indicator Light AC/DC 24V, 22mm Panel Mount	8
11	210954-94-06	In Line Fuse Holder with (1) #3/8 and (1) #10 ends	1
12	PA82693	Auto Fuse, ATC Type, Red, 10A	1
13	DEK06120	Left Elbow Boot 4-8 GA Black	2
14	DEK06121	Left Elbow Boot 4-8 GA Red	2
15	80094UZ-06-06-3	3" Signal Wire with (2) #10 ends	1
16	80094UZ-06-29-4	4" Signal Wire with (1) .250 & (1) #10 end	1
17	80094UZ-06-29-6	6" Signal Wire with (1) .250 & (1) #10 end	1
18	80094UZ-06-06-24	24" Signal Wire with (2) #10 ends	1
19	81055UZ-06-06-3	3" Signal Ground with (2) #10 ends	1
20	81055UZ-06-29-7	7" Signal Ground with (1) .250 and (1) #10 end	1
21	81055UZ-06-06-24	24" Signal Ground with (2) #10 ends	2
22	81055UZ-06x4	(3) 3" Signal Ground Wires with (4) #10 ends	1
23	81055UZ-06-84-16	16" Signal Ground with (1) .250 and (1) #5/16 end	1
24	80094UZ-06-84-20	20" Signal Wire with (1) #10 & (1) #5/16 ends	1
25	81401335	ELAY30x5 Magnet	4

200W Railway Single Output DC-DC Converter RSD-200 series

■ Features :

- Compliance to BS EN/EN50155 and BS EN/EN45545-2 railway standard
- 2:1 wide input range
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input reverse polarity
- 4000VDC I/O isolation
- Cooling by free air convection
- Half encapsulated
- Built-in constant current limiting circuit
- 1U low profile 40mm
- All using 105℃ long life electrolytic capacitors
- LED indicator for power on
- 100% full load burn-in test
- 3 years warranty

User's Manual

UL62368-1 AS/NZS62368-1 TPTC004 IEC62368-1

SPECIFICATION

MODEL			RSD-200B-12	RSD-200B-24	RSD-200B-48	RSD-200C-12	RSD-200C-24	RSD-200C-48	RSD-200D-12	RSD-200D-24	RSD-200D-48
OUTPUT	DC VOLTAGE		12V	24V	48V	12V	24V	48V	12V	24V	48V
	RATED CURRENT		16.7A	8.4A	4.2A	16.7A	8.4A	4.2A	16.7A	8.4A	4.2A
	CURRENT RANGE		0 ~ 16.7A	0 ~ 8.4A	0 ~ 4.2A	0 ~ 16.7A	0 ~ 8.4A	0 ~ 4.2A	0 ~ 16.7A	0 ~ 8.4A	0 ~ 4.2A
	RATED POWER		200.4W	201.6W	201.6W	200.4W	201.6W	201.6W	200.4W	201.6W	201.6W
	RIPPLE & NOISE (max.) Note.2		120mVp-p	150mVp-p	180mVp-p	120mVp-p	150mVp-p	180mVp-p	120mVp-p	150mVp-p	180mVp-p
	VOLTAGE TOLERANCE Note.3		±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%	±2.0%
	LINE REGULATION		±0.2%	±0.2%	±0.5%	±0.2%	±0.2%	±0.5%	±0.2%	±0.2%	±0.5%
	LOAD REGULATION		±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	SETUP, RISE TIME		800ms, 50ms at full load								
	HOLD UP TIME (Typ.)		Please refer to page 3 Hold up Time(Load de-rating curve)								
INPUT	VOLTAGE RANGE	CONTINUOUS	16.8 ~ 31.2VDC			33.6 ~ 62.4VDC			67.2 ~ 143VDC		
		1 SEC.	14.4 ~ 33.6VDC			28.8 ~ 67.2VDC			57.6 ~ 154VDC		
	EFFICIENCY (Typ.)		89%	89%	89%	91%	91%	91%	91%	91%	91%
	DC CURRENT (Typ.)		9.6A/24V	9.6A/24V	9.6A/24V	4.8A/48V	4.8A/48V	4.8A/48V	2.1A/110V	2.1A/110V	2.1A/110V
	INRUSH CURRENT (Typ.)		45A/24VDC			45A/48VDC			45A/110VDC		
	INTERRUPTION OF VOLTAGE SUPPLY		EN50155:2007-B/C- type comply with S1 level @ full load, comply with S2 level @ 70% load ; D-type comply with S2 level @ full load								
			EN50155:2017-Comply with S1 level								
PROTECTION	OVERLOAD		105 ~ 135% rated output power								
			Protection type : Constant current limiting, recovers automatically after fault condition is removed								
	OVER VOLTAGE		13.8 ~ 16.2V	27.6 ~ 32.4V	55.2 ~ 64.8V	13.8 ~ 16.2V	27.6 ~ 32.4V	55.2 ~ 64.8V	13.8 ~ 16.2V	27.6 ~ 32.4V	55.2 ~ 64.8V
			Protection type : Shut down o/p voltage, re-power on to recover								
	OVER TEMPERATURE		Shut down o/p voltage, recovers automatically after temperature goes down								
ENVIRONMENT	WORKING TEMP.		-40 ~ +55℃ (no derating) ; +70℃ @ 60% load by free air convection ; +70℃ no derating with external base plate, TX class compliance								
	WORKING HUMIDITY		5 ~ 95% RH non-condensing								
	STORAGE TEMP.		-40 ~ +85℃								
	TEMP. COEFFICIENT		±0.03%/℃ (0 ~ 50℃)								
	VIBRATION		10 ~ 500Hz, 5G 10min./1cycle, 60min. each along X, Y, Z axes ; Mounting : compliance to IEC61373								
	OPERATING ALTITUDE		5000 meters								
SAFETY & EMC (Note 4)	SAFETY STANDARDS		UL 62368-1, IEC 62368-1, AS/NZS 62368-1, EAC TP TC 004 approved, Design refer to BS EN/EN62368-1								
	WITHSTAND VOLTAGE		I/P-O/P:4KVDC I/P-FG:2.5KVDC O/P-FG:2.5KVDC								
	ISOLATION RESISTANCE		I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25℃/ 70% RH								
	EMC EMISSION		Compliance to BS EN/EN55032 (CISPR32) Conduction Emission: Class A, Radiation Emission: Class B, EAC TP TC 020								
	EMC IMMUNITY		Compliance to BS EN/EN61000-4-2,3,4,5,6,8, light industry level, criteria A, EAC TP TC 020								
	RAILWAY STANDARD		BS EN/EN50155 / IEC60571 including IEC61373 for shock & vibration, BS EN/EN50121-3-2 for EMC ;BS EN/EN45545-2 for fire protection								
OTHERS	MTBF		218.2K hrs min. MIL-HDBK-217F (25℃)								
	DIMENSION		191*86*40mm (L*W*H)								
	PACKING		0.94Kg; 12pcs/12.3Kg/0.73CUFT								

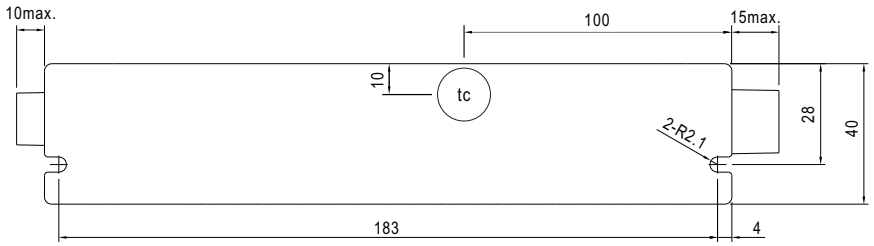
NOTE

1. All parameters NOT specially mentioned are measured at 24,48,110VDC input, rated load and 25℃ of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. The power supply is considered a component which will be installed into a final equipment. All the EMC tests are been executed by mounting the unit on a 360mm*360mm metal plate with 1mm of thickness. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com)
5. Strongly recommended that external output capacitance should not exceed 5000uF. (Only for: RSD-200-12)
6. The ambient temperature derating of 3.5℃/1000m with fanless models and of 5℃/1000m with fan models for operating altitude higher than 2000m(6500ft).

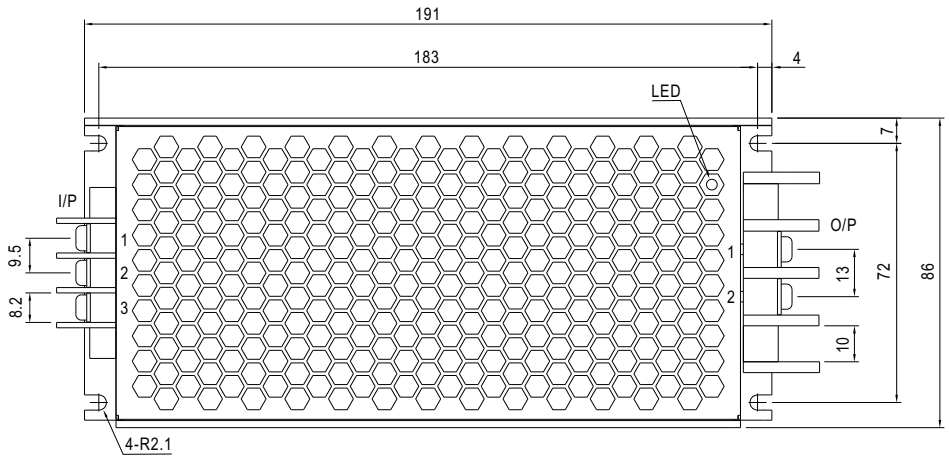
※ Product Liability Disclaimer : For detailed information, please refer to https://www.meanwell.com/serviceDisclaimer.aspx

■ Mechanical Specification

Case No.203A Unit:mm



• ⓣc : Max. Case Temperature



Input Terminal Pin No. Assignment :

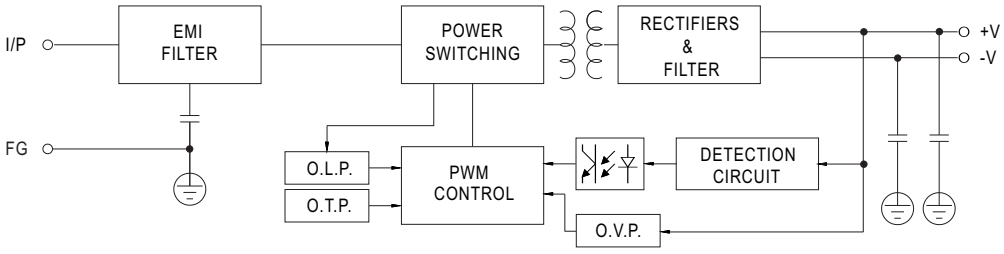
Pin No.	Assignment
1	DC INPUT V+
2	DC INPUT V-
3	FG ⏚

Output Terminal Pin No. Assignment :

Pin No.	Assignment
1	DC OUTPUT -V
2	DC OUTPUT +V

■ Block Diagram

fosc : 130KHz



■ Input Fuse

There are one or two fuses connected in series to the positive input line, which are used to protect against abnormal surge. Fuse specifications of each model are shown as below.

Type	Fuse Type	Reference and Rating
B	Time-Lag	2*Conquer UDA-A, 10A, 250V
C	Time-Lag	Conquer UDA-A, 10A, 250V
D	Time-Lag	Conquer UDA-A, 5A, 250V

Input Reverse Polarity Protection

There is a MOSFET connected in series to the negative input line. If the input polarity is connected reversely, the MOSFET opens and there will be no output to protect the unit.

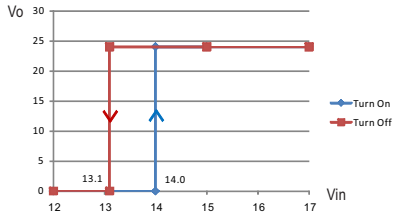
Input Range and Transient Ability

The series has a wide range input capability. Within ±30% of rated input voltage, it can be executed at full-load operation and operate properly; with ±40% of rated input voltage, it can withstand that for 1 second.

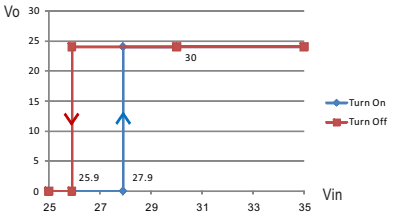
Input Under-Voltage Protection

If input voltage drops below Vimin, the internal control IC shuts down and there is no output voltage. It recovers automatically when input voltage reaches above Vimin, please refer to the cruve below.

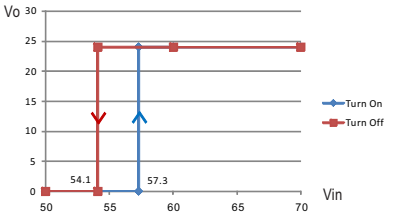
RSD-200B-24



RSD-200C-24



RSD-200D-24



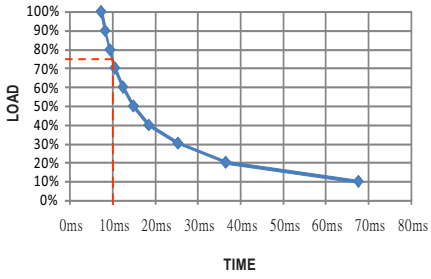
Inrush Current

Inrush current is suppressed by a resistor during the initial start-up, and then the resistor is bypassed by a MOSFET to reduce power consumption after accomplishing the start-up.

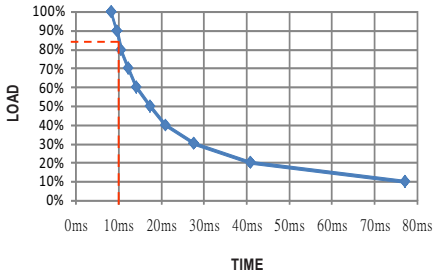
Hold-up Time

- EN50155: 2007 version - D type is in compliance with S2 level, while B and C types are in compliance with S1 level at full load output condition. To fulfil the requirements of S2 level, B and C types require de-rating their output load to 70%, please refer to the curve diagrams below.

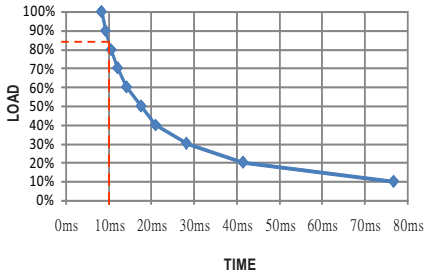
RSD-200B-12



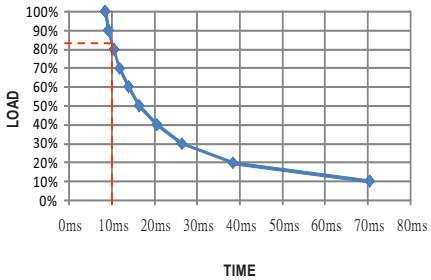
RSD-200B-24



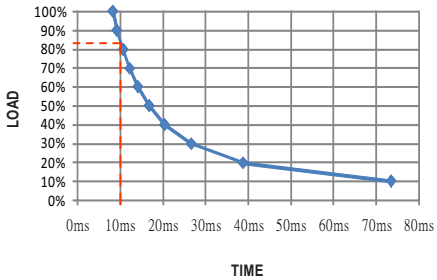
RSD-200B-48



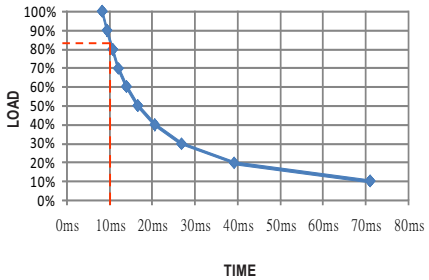
RSD-200C-12



RSD-200C-24



RSD-200C-48



- EN50155: 2017 version - Comply with S1 level

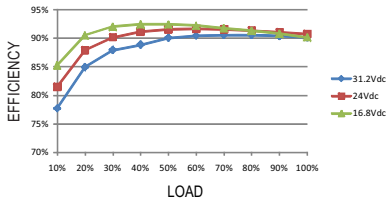
Output Voltage Adjustment

This function is optional, which the standard product does not have it. If you do need the function, please contact MW for details.

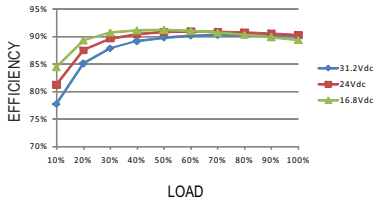
■ Efficiency vs Load & Vin Curve

The efficiency vs load & Vin curves of each model are shown as below.

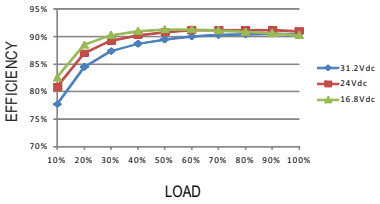
RSD-200B-12



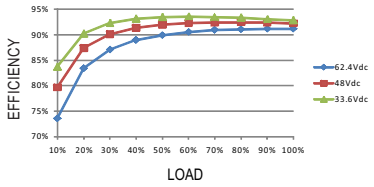
RSD-200B-24



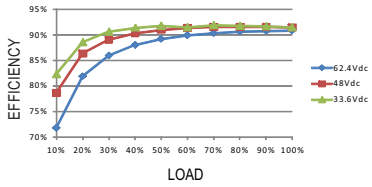
RSD-200B-48



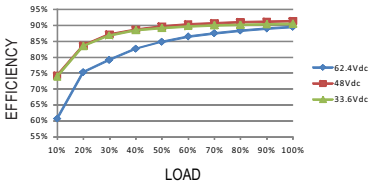
RSD-200C-12



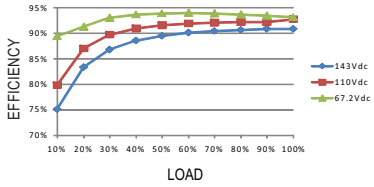
RSD-200C-24



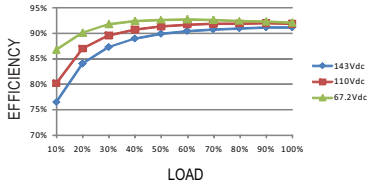
RSD-200C-48



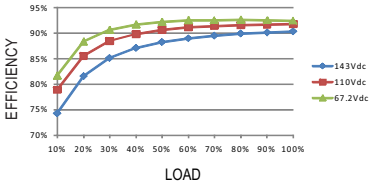
RSD-200D-12



RSD-200D-24



RSD-200D-48

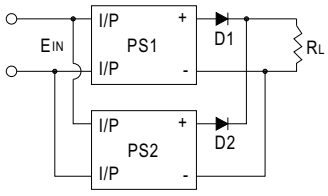


■ Parallel and Series Connection

A.Operation in Parallel

Since RSD-200 series don't have built-in parallel circuit, it can only use external circuits to achieve the redundant operation but not increase the current rating.

1.Add a diode at the positive-output of each power supply (as shown as below), the current rating of the diode should be larger than the maximum output current rating and attached to a suitable heat sink. This is only for redundant use (increase the reliability of the system) and users have to check suitability of the circuit by themselves.

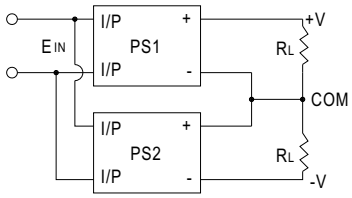


2.When using S.P.S. in parallel connection, the leakage current will increase at the same time. This could pose as a shock hazard for the user. So please contact the supplier if you have this kind of application.

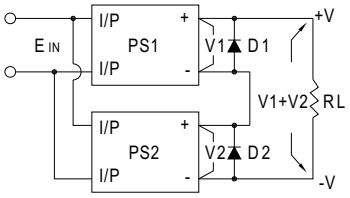
B.Operation in Series

RSD-200 can be operated in series. Here are the methods of doing it:

1.Positive and negative terminals are connected as shown as below. According to the connection, you can get the positive and negative output voltages for your loads.

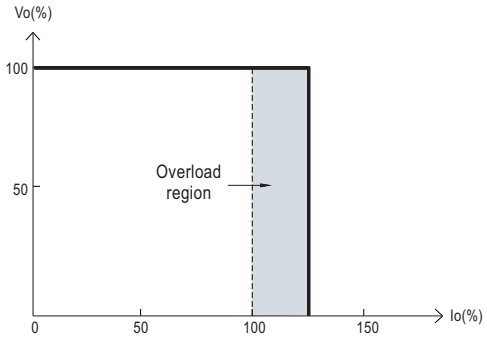


2.Increase the output voltage (current does not change). Because RSD-200 series have no reverse blocking diode in the unit, you should add an external blocking diode to prevent the damage of every unit while starting up. The voltage rating of the external diode should be larger than V1+V2 (as shown as below).



■ Overload Protection

If the output draw up to 105~135% of its output power rating, the converter will go into overload protection which is constant current mode. After the faulty condition is removed, it will recover automatically. Please refer to the diagram below for the detail operation characteristic. Please note that it's not suitable to operate within the overload region continuously, or it may cause to over temperature and reduce the life of the power supply unit or even damage it.



■ Over Voltage Protection

The converter shuts off to protect itself when the output voltage drawn exceeds 115~135% of its output rating. It must be repowered on to recover.

■ Over Temperature Protection

The converter shuts off to protect itself when the built-in temperature sensor mounted on the main power transformer senses a high temperature. The output recovers automatically if the temperature drops below the limit.

■ LED Indicator

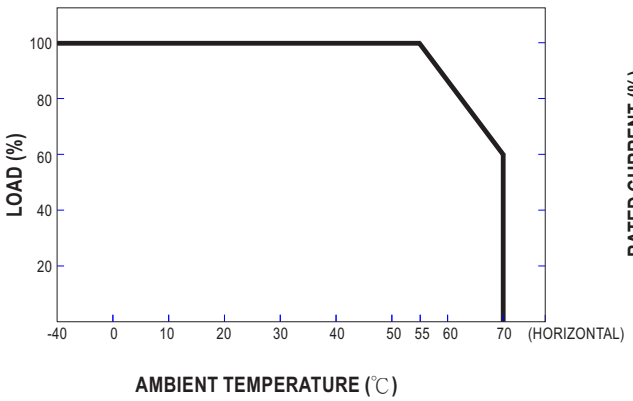
Equipped with a built-in LED indicator, the converter provides an easy way for users to check its condition through the LED indicator.

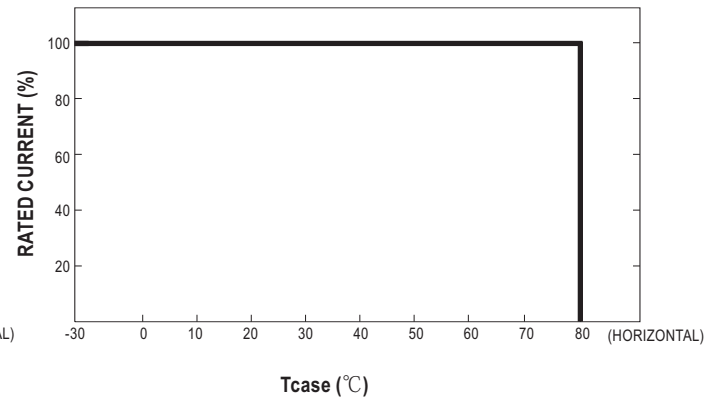
Green : normal operation; No signal: no power or failure.

■ Derating Curve

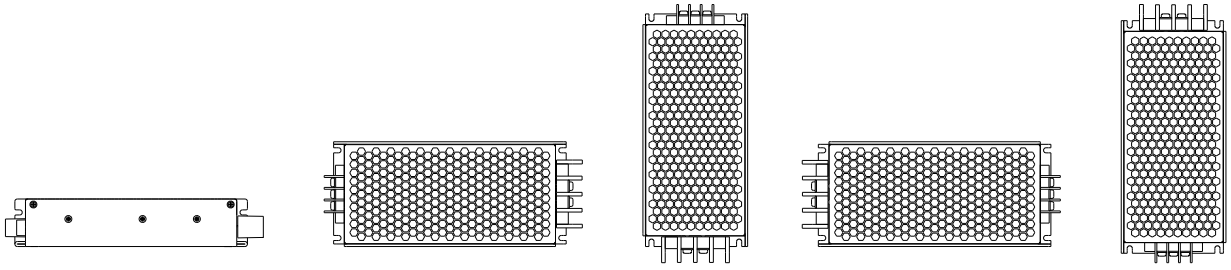
a.Single unit operation

If the unit has no iron plate mounted on its bottom, the maximum ambient temperature for the unit will be 55℃ as operating under full load condition. It requires de-rating output current when ambient temperature is between 55-70℃, please refer to the de-rating curve as below.





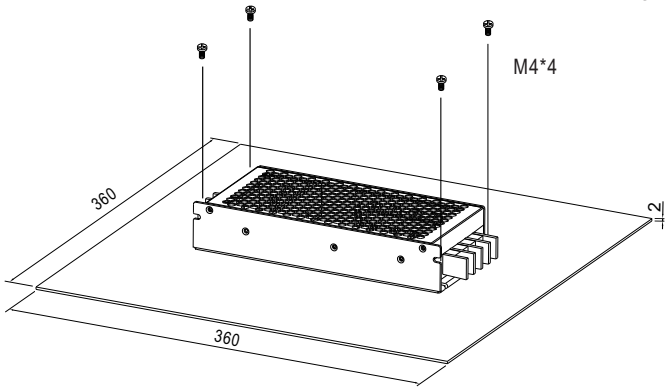
Suitable installation methods are shown as below. Since RSD-200 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.



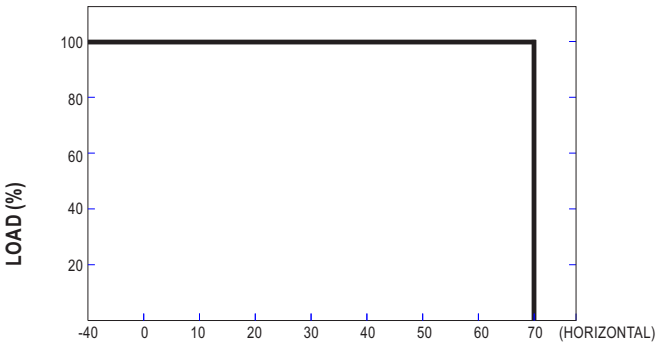
b.Operate with additional iron plate

If it is necessary to fulfil the requirements of EN50155 TX level that operate the unit fully-loaded at 70℃, RSD-200 series must be installed onto an iron plate on the bottom. The size of the suggested iron plate is shown as below. In order for optimal thermal performance, the iron plate must have an even & smooth surface and RSD-200 series must be firmly mounted at the center of the iron plate.

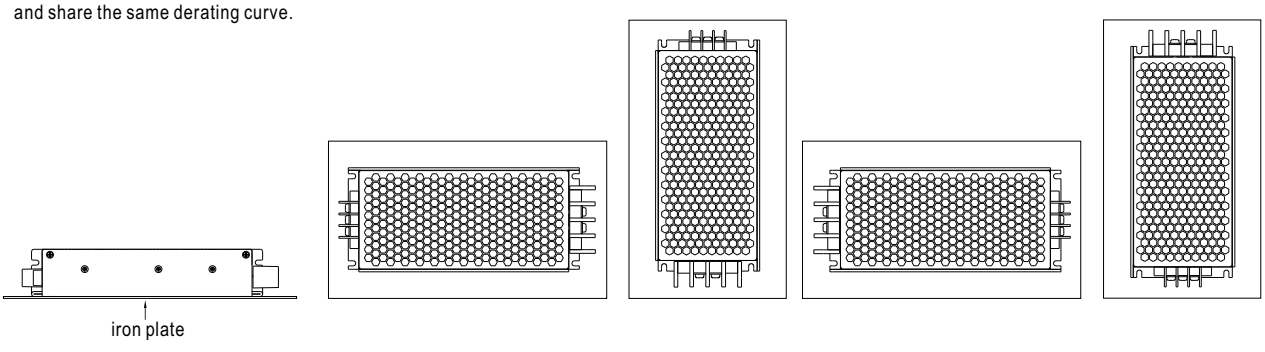
Unit:mm



The load vs ambient temperature curve is shown as below.



Suitable installation methods are shown as below. Since RSD-200 is a semi-potted model, its thermal performances for the following installation methods are similar and share the same derating curve.



■ Immunity to Environmental Conditions

Test method	Standard	Test conditions	Status
Cooling Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40℃ Dwell Time: 2 hrs/cycle	No damage
Dry Heat Test	EN 50155 section 12.2.4 (Column 2, Class TX) EN 50155 section 12.2.4 (Column 3, Class TX & Column 4, Class TX) EN 60068-2-2	Temperature: 70℃ / 85℃ Duration: 6 hrs / 10min	PASS
Damp Heat Test, Cyclic	EN 50155 section 12.2.5 EN 60068-2-30	Temperature: 25℃~55℃ Humidity: 90%~100% RH Duration: 48 hrs	PASS
Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19℃ Humidity: 65% Duration: 10 mins	PASS
Increased Vibration Test	EN 50155 section 12.2.11 EN 61373	Temperature: 19℃ Humidity: 65% Duration: 5 hrs	PASS
Shock Test	EN 50155 section 12.2.11 EN 61373	Temperature: 21± 3℃ Humidity: 65 ± 5% Duration: 30ms*18	PASS
Low Temperature Storage Test	EN 50155 section 12.2.3 (Column 2, Class TX) EN 60068-2-1	Temperature: -40℃ Dwell Time: 16 hrs	PASS
Salt Mist Test	EN 50155 section 12.2.10 (Class ST4)	Temperature: 35℃ ±2℃ Duration: 96 hrs	PASS

■ EN45545-2 Fire Test Conditions

Test Items			Hazard Level		
Items		Standard	HL1	HL2	HL3
R22	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
	Smoke density test	EN 45545-2:2013 EN ISO 5659-2:2006	PASS	PASS	PASS
	Smoke toxicity test	EN 45545-2:2013 NF X70-100:2006	PASS	PASS	PASS
R24	Oxygen index test	EN 45545-2:2013 EN ISO 4589-2:1996	PASS	PASS	PASS
R25	Glow-wire test	EN 45545-2:2013 EN 60695-2-11:2000	PASS	PASS	PASS
R26	Vertical flame test	EN 45545-2:2013 EN 60695-11:2003	PASS	PASS	PASS