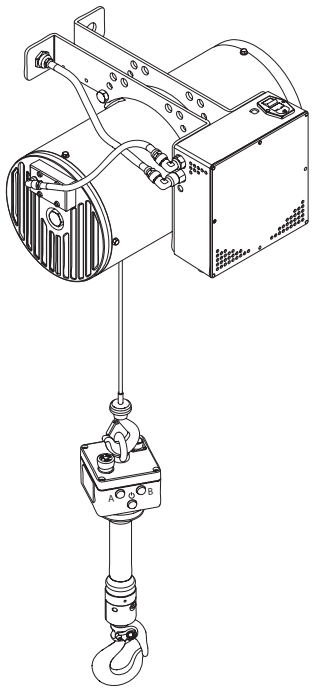
47804819
Edition 2
April 2023

Zero Gravity Air Balancer - Gen2

ZG Series



User Manual

Save these Instructions

Ingersoll Rand

EN

When tool life has expired, it is recommended to:

- disassemble the tool.
- degrease the tool.
- separate tool parts by material for correct recycling.

Tool repair and maintenance should be conducted by an Authorized Service Center.

Refer all communications to the nearest **Ingersoll Rand** office or distributor.

Manuals are available at ingersollrand.com

Table 1. Product Information Manuals

Publication	CCN
Product Safety Information Manual	16598831
Product Information Manual	54072541
Product Parts Information Manual	16598849
Product Installation Manual	47646669001
Product Maintenance Manual	16598856
Declaration of Conformity	47808318001

Product Description

This control kit is designed for use with an air balancer. It provides the ability to electronically move loads up and down using handle actuators or applying force directly to a lifted load.

⚠ WARNING

- **Controller must be used by a single operator. Simultaneous command inputs may result in hazardous movements.**
- **Do not use this product or attached equipment for;**
  - lifting, supporting or transporting people.
  - lifting or supporting loads over people.
- **Do not operate this product in wet or explosive environments.**

⚠ CAUTION

To reduce the risk of electric shock, do not expose to rain. Store indoors.

Specifications

This device needs to be connected to a standard E type plug or B type plug (for other option, contact factory). It works from 100-150 V AC at 50 to 400 Hz and the power consumption is 3.5A Max. This system is protected by 2 fuses (characteristics: T type, dimension 5x20 mm, 3.15 A 250 V AC). Working pressure of 100 PSI (6.9 bar) dry and clean air only (30 microns filter must be use).

Model Code Explanation

Example:			**ZG**	**2**	**W**	**020**	**120**	**S**	**00**	**B**
Type of Control Kit										
ZG	=	**Zero Gravity**								
2	=	**Gen 2**								
Wire										
W	=	**Wire Rope**								
Capacity										
015	=	150 lb. (68 kg)								
020	=	**200 lb. (91 kg)**								
035	=	350 lb. (158 kg)								
050	=	500 lb. (227 kg)								
Inches of Travel										
080	=	80 in. (203 cm)								
120	=	**120 in. (305 cm)**								
S	=	**Z-Stop**								
Type of Suspension Kit										
00	=	**No Suspension**								
AT	=	ZRAT Rail								
A1	=	ZRA1 Rail								
A2	=	ZRA2 Rail								
HM	=	Top Hook Mount								
S2	=	ZRS2 Rail								
Type of Hook										
B	=	**Bullard**								
C	=	Steel Snap								

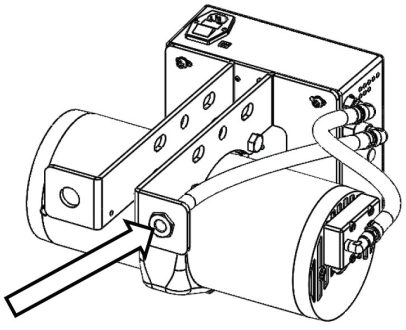
Installation

⚠ WARNING

Prior to installation, refer to Product Safety Information Manual for all sections of installation.

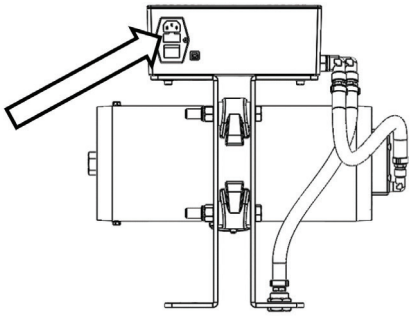
1. To mount the Balancer, use brackets provided.
2. Connect air supply line to main air inlet using a 3/8" coupling.
3. Use 10mm pipe for pneumatic connection.

Fig. A



4. Connect power cord to the controller.
   a. Power supply 100-150 V AC, 50-400 Hz.

Fig. B



Handle Installation

NOTICE

- **To make sure balancer operates as intended, it is not recommended to use balancing mode in the bottom 1/4 of the balancer's stroke. Refer Fig. E.**
- **For load hook installation and lash up instructions, refer to Balancer Installation Manual 47646669001.**
- **Control handle can be installed inline with wire rope and the load (Fig. C) or mounted in a remote location using mounting brackets (Fig. D).**

Fig. C

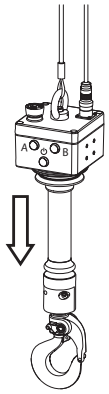


Fig. D

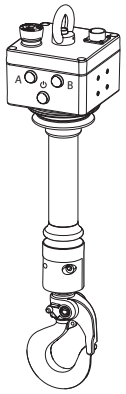
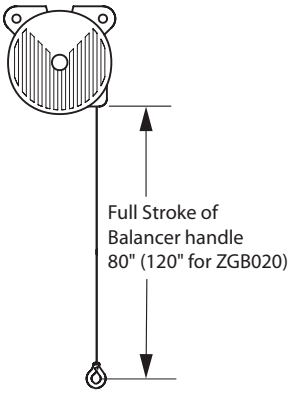


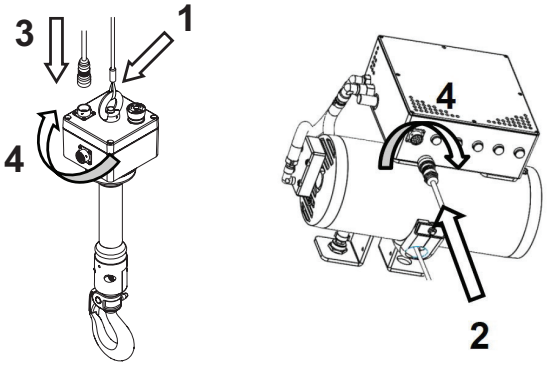
Fig. E



Handle Connection

1. Connect the handle eye bolt to the wire rope eyelet.
2. Connect the electric spiral wire to the electronic box.
3. Connect the electric spiral wire to the plug on top of handle.
4. Fasten the ring clockwise for a secure connection.

Fig. F



Turn ON Power

5. Switch ON the Zero Gravity Controls using the power switch on the main box.
   a. To disengage the operation, press the Emergency Stop Button (ESB) located on top of the handle.

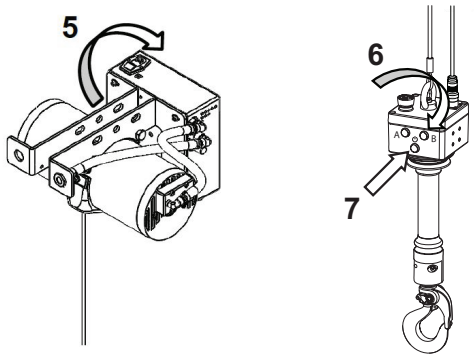
⚠ WARNING

Do not touch the control handle during initialization of the controller kit.

6. Release E-stop button by rotating clockwise until it pops.

7. Push the power button (green) on the handle to begin operation.

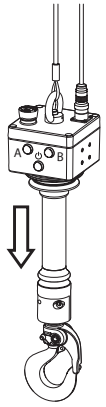
Fig. G



Deflate the Chamber

8. Three Yellow lights indicate completion of initialization of controller. When lit, pull down sleeve of handle to deflate the chamber.

Fig. H



Operation

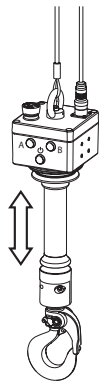
⚠ WARNING

- **Press Emergency Stop button to stop movement in case of an emergency.**
- **Make sure electrical wiring to the balancer conforms to all relevant safety codes and regulations.**
- **Make sure all electrical connections are secure before applying power.**
- **Never operate equipment with damaged, frayed or twisted electrical cables.**
- **Before each shift or initial use, inspect balancer for visible wear and damage.**
- **Immediately disconnect main power if balancer is damaged.**
- **Only licensed electrical technicians, trained on this product, should be allowed to access electrical components to perform troubleshooting and/or repair.**
- **Troubleshooting of the system by licensed electrical technicians is limited to visual inspection of components and sub assemblies once the enclosures are opened.**
- **Before accessing electrical components, follow 'lock-out, tag-out' procedures to make sure that power to the system has been disconnected.**
- **Disconnect air supply to balancer prior to maintenance.**

Standard Operation

Red light stays ON for two seconds immediately after powering up the balancer. During this time, load cell and handle sensor resting values are calculated by controller. When the Red light turns OFF, balancer is ready for operation. If the resting values of handle and load cell sensors are out of expected range, then the Red light flashes rapidly. Balancer is inoperable in this state.

Fig. J



Float Mode

Engage Float Mode

To engage float mode, release handle. Float mode will be triggered by lack of contact with handle. While float mode is engaging, Red light will appear on Zero Gravity Balancer. Do not touch handle while controller is calculating load. Float mode is engaged and calculation complete when three Yellow lights appear on controller.

⚠ WARNING

Do not apply force on the load (upward/downward) while float mode is calculating as this will cause faulty calculation of the weight and drift of the load.

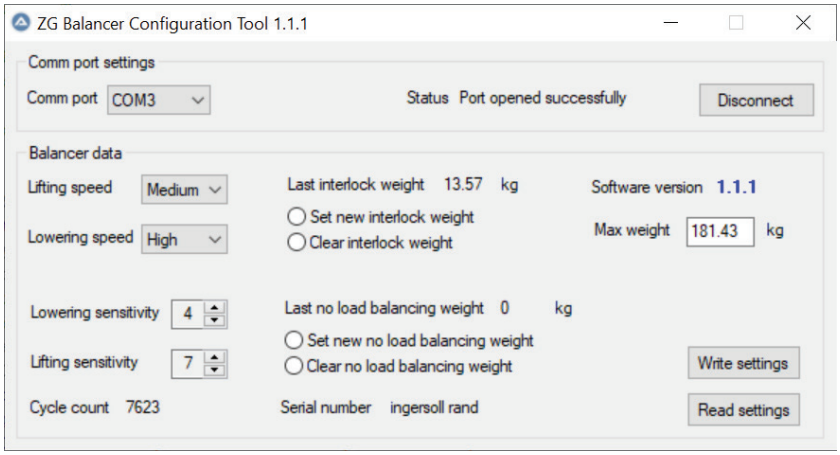
Move loads up and down by acting direclty on the load itself.

Disengage Float Mode

Float mode disengages automatically once handle is touched resulting in Yellow lights on the controller to turn OFF. When Yellow lights turn OFF, use handle sleeve to move load upward/downward.

Configuration Tool

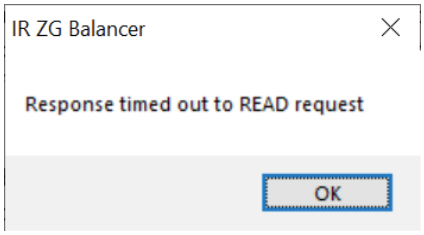
This is a windows application which communicates with the controller over USB serial port and helps the user to change settings and enable/disable the balancer features.



Steps to be followed for using this tool

- Turn ON the balancer and wait for the Red light to turn OFF.
- Connect the controller to laptop using an USB cable.
- Run the configuration tool by double clicking its executable file.
- Select the communication/serial port number from the drop down box of the configuration tool.
- Click on Connect button. Tool will read data from controller and present the last stored data in controller.

Communication loss between controller and configuration tool is notified to user using the below dialog box.



If this message is frequently reported by tool, restart communication by power cycling the controller, unplug the USB cable and restart the configuration tool.

Cycle Count

This counter indicates how many times a load weighing more than approximately 10 Kg is lifted in air and lowered to ground. Cycle count is incremented when the load on the handle becomes less than equal to handle weight after lifting approximately 10 Kg load.

No Load Balancing

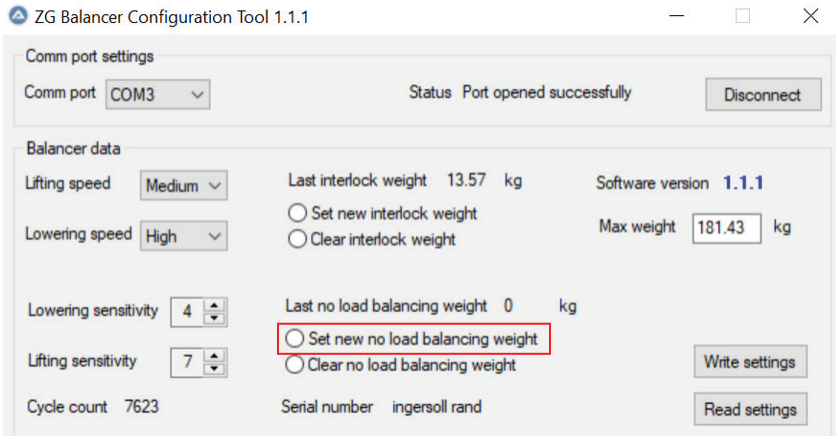
Use no load balancing if a handling device is permanently suspended to the unit. This will keep the handling device balanced, in float mode, and help to prevent damaging the part during loading/unloading.

This is the minimum weight limit balancer will handle. When the weight on the handle goes below no load balancing limit then Red light flashes rapidly and downward movement of load is disabled. Only lifting operation is possible at this stage.

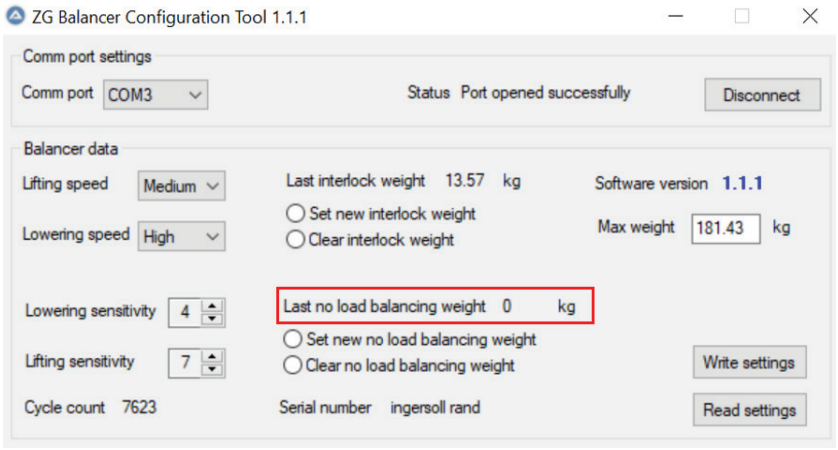
Steps to Enable/Disable No Load Balancing

- Using handle mode, lift the handling device or gripper load to a height where it is clearly suspended in air.
- Connect the controller to laptop with an USB cable.
- Run the configuration tool .

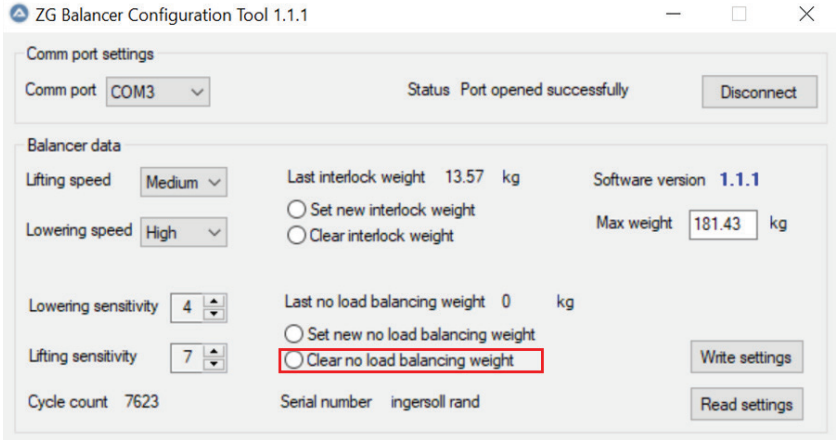
- To enable no load balancing feature, click the option "Set new no load balancing weight", and save this setting to controller by clicking on Write settings button. Configuration tool will indicate the status of write operation with a write successful message box.



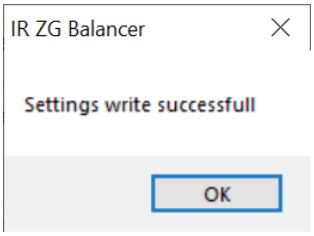
- No load balancing weight measured by controller is displayed in configuration tool.



- This completes the enable no load balancing setup.
- To disable no load balancing feature, click the option "Clear no load balancing weight", and save this setting by clicking on Write settings button. Last, no load balancing weight will be set to zero.



- When the settings are saved successfully in the controller, configuration tool notifies the user with message box shown below.



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Interlock

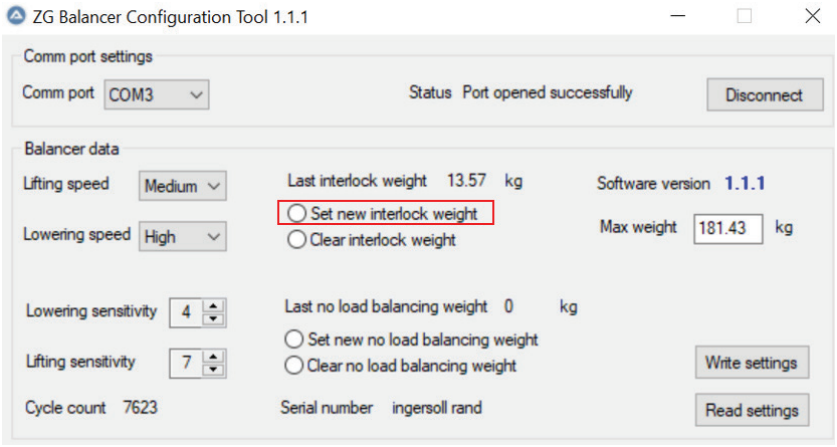
The interlock feature will not allow the handling device to open while it is suspended. This feature can be enabled using the configuration tool. Once enabled, the state of interlocking operation is indicated to user using the Yellow lights.

- Yellow light1, indicates that the part is clamped.
- Yellow light2, indicates that the part is released.
- Yellow light3, indicates that the part is ready to be removed from controller, load is no longer supported.

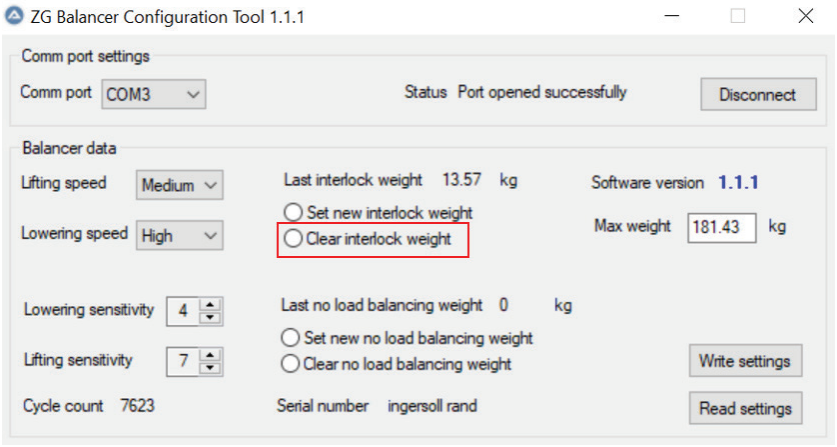
Note: Yellow lights status indication for float mode ready is not available when interlocking is enabled.

Steps to Enable/Disable Interlocking

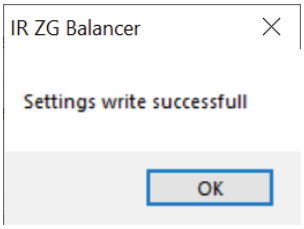
- Using handle mode, lift the handling device or gripper load to a height where it is clearly suspended in air.
- Connect the controller to laptop with an USB cable.
- Run the configuration tool.
- To enable no Interlocking feature, click the option "Set new interlock weight", and save this setting to controller by clicking on Write settings button. Configuration tool will indicate the status of write operation with a write successful message box.



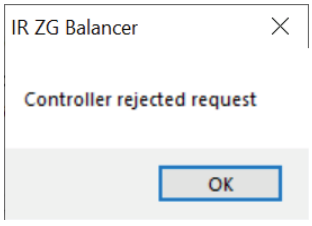
- This completes the enable interlocking feature setup.
- To disable no interlock feature, click the option "Clear interlock weight" and save this setting by clicking on Write settings button. Last, interlock weight will be set to zero.



- When the settings are saved successfully in the controller, configuration tool notifies the user with message box shown below.

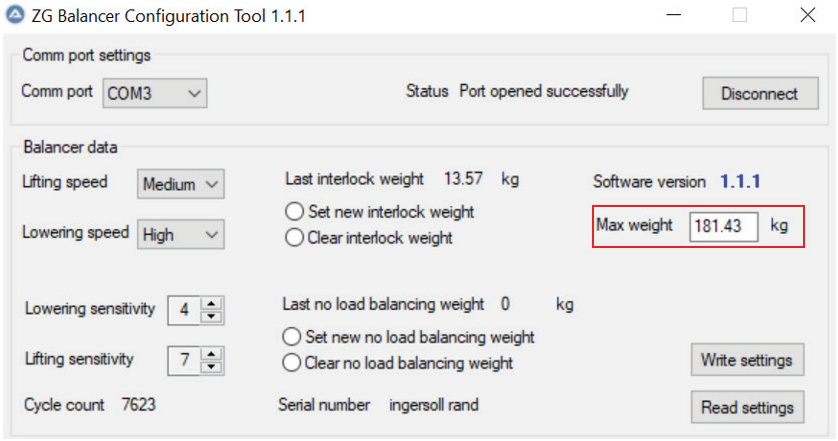


Note : The controller does not allow disable/clear previously set interlock weight when the load weight measured by controller is more than the handle weight. Make sure to clear last interlock weight, the handling device should be lowered fully to ground. Tool displays below message box when interlock disable is attempted while the load is still suspended in air.



Max Weight/Over Pressure

Controlled pressure within the chamber will prevent fast upward movement if there is a blockage of the load or gripper, or sudden release of the load. Use this feature to prevent from such occurrence or limit the balancer capacity. Use this filed in configuration tool to set the maximum weight.

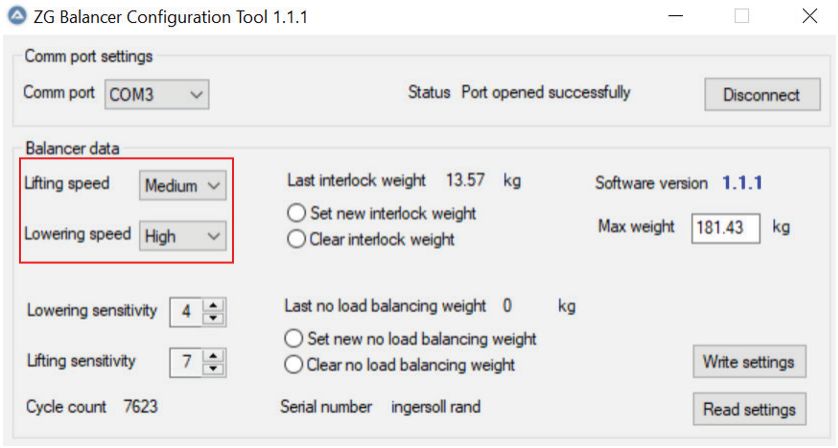


Controller allows entering a value less than 80% of the balancer capacity. Otherwise, controller will reject the request. During lifting operation, controller allows the weight of the load to exceed the set limit by approximately about 5kg.

When controller reads a weight more than the set maximum weight then upward movement is stopped and Red light flashes rapidly. Only downward movement is allowed when this event occurs.

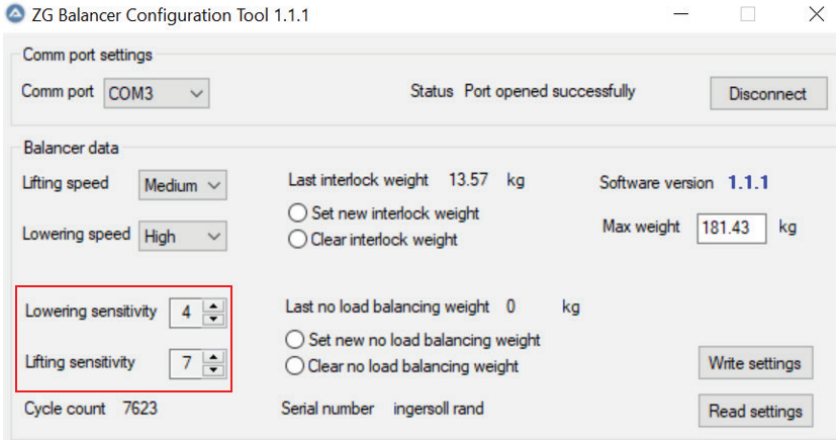
Speed Settings

Speed settings are calibrated in factory for different weight ranges and different balancer capacities. The default factory setting is set to medium speed. A different speed setting can be programmed separately for lowering and lifting by selecting Low/Medium/High from the respective drop down boxes. Save the settings by clicking on the Write settings button.



Sensitivity Control Settings

Sensitivity Control settings are related to float mode operation only. Higher the setting number, lower the sensitivity. Effort required to move the load by directly applying force on the load is more when the sensitivity number is high and vice-versa.



Interlock Wiring

NOTICE

The interlock activates an available output on the I/O plug at the back of the handle.

Connect your handling device to the controller as follow:

- Pin J and K: Clamp control actuator.
- Pin J and L: Release control actuator.
- Pin J and M: Ready to release information.

Use release button (orange) on the controller handle to activate clamping action. Pull down the sliding part of the handle (bimanual action).

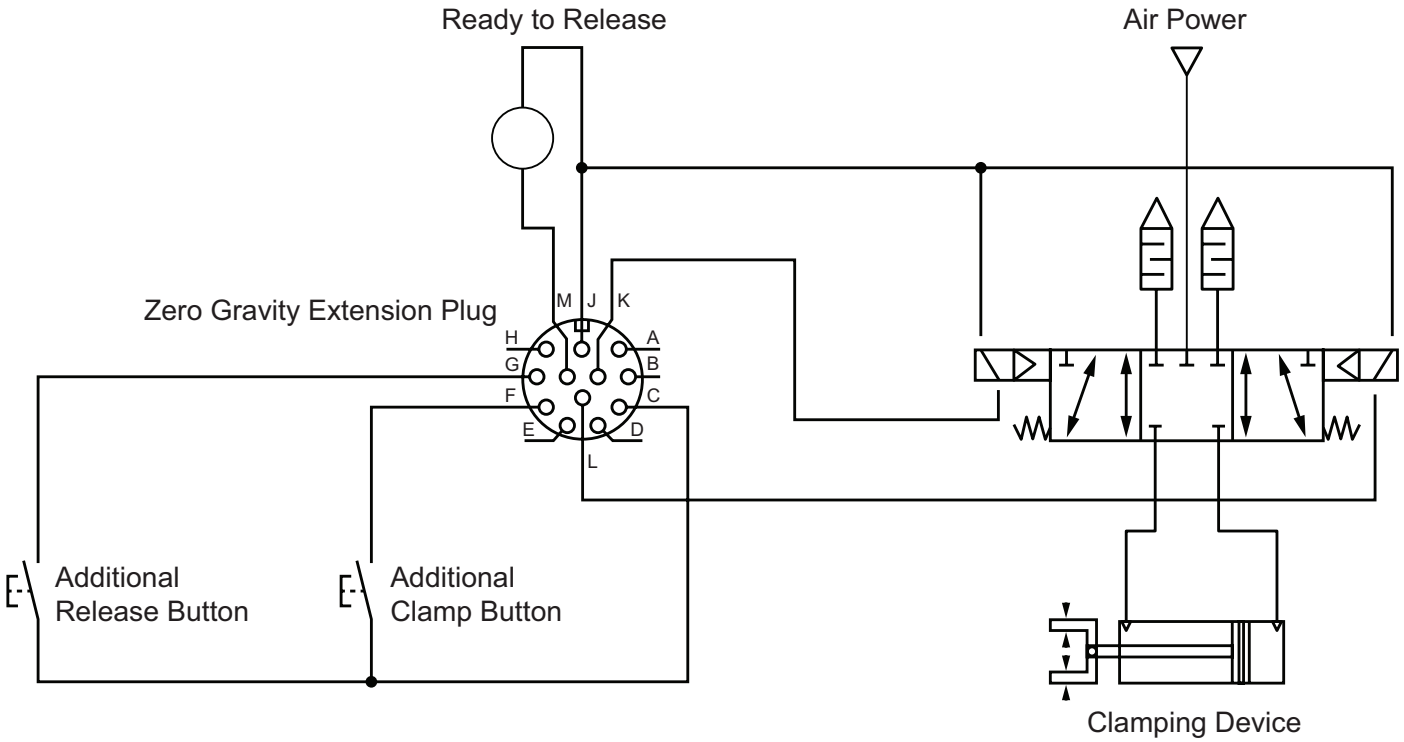
Use black button on the controller handle to activate release action. Pull down the sliding part of the handle (bimanual action).

Orange and black buttons can be wired outside of handle sleeve using connection pins.

- Pin C and F: Additional clamp push button (NO contact).
- Pin C and G: Additional release push button (NO contact).

Schematics

Fig. K



Extension Plug Pinout

Pin	Function
A	Not used
B	Not used
C	Ground
D	+5 V for input
E	Additional force sensor input
F	Additional clamp button input
G	Additional release button input
H	Input 4
J	+12 V for output
K	Clamping output
L	Release output
M	Ready to release output

Input/Output Hardware

Kit ZGB00-I/O is required to connect to extension plug. Contact your service or sales representative for availability.

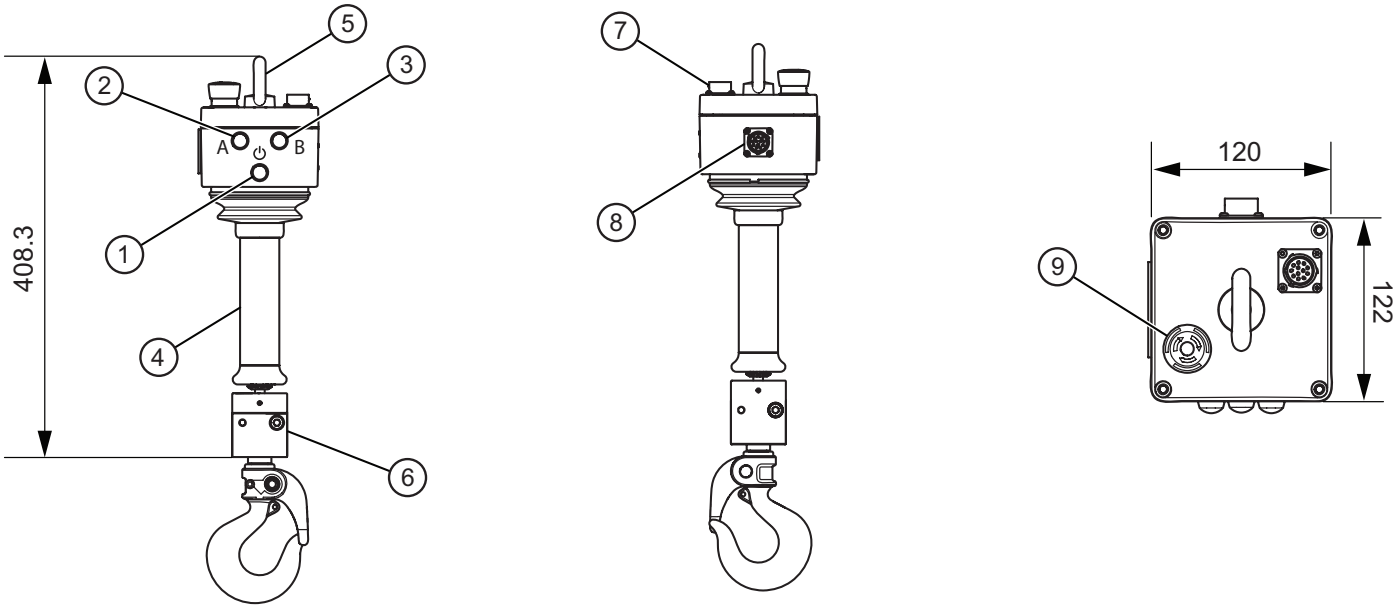
To activate, input switch unit to ground; to deactivate, input switch unit to +5 V DC or open wire.

To activate controller, output switch output pin to ground. Output power supply voltage is 12 V DC. Do not exceed total of 3 A.

Zero Gravity Handle Review

Refer to Fig. L.

Fig. L

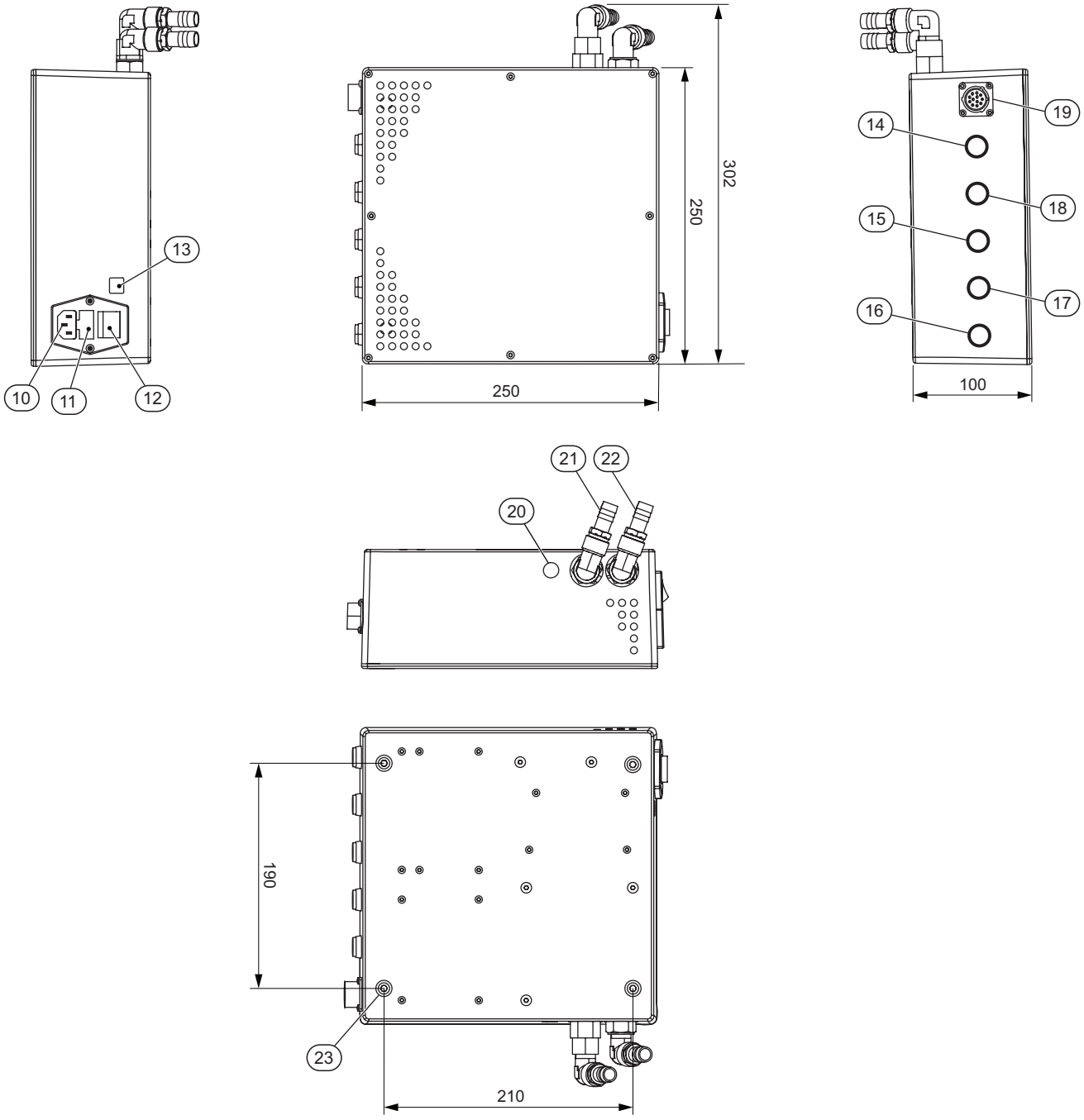


Item Number	Part Description
1	Power Button (Green)
2	De-Clamp Button (Orange)
3	Clamp Button (Blue)
4	Handle Sleeve
5	Top Eyelet
6	Bottom Hook Block
7	Main Plug: to Zero Gravity Control Box
8	Extension Plug: Connection to Input or Output
9	Emergency Stop

Zero Gravity Control Box Review

Refer to Fig. M.

Fig. M



Item Number	Part Description
10	Power Supply 85-250 V AC
11	Fuses
12	Power Switch
13	USB Connection
14	Power ON Indicator Light
15	Balancing Mode or Part Released Indicator Light
16	Error Indicator Light
17	Balancing Mode or Ready to Release Signal Indicator Light
18	Balancing Mode or Part Clamped Indicator Light
19	Main Plug: to Zero Gravity Handle
20	Muffler
21	Air Supply Port Fitting
22	Balancer Hose Port Fitting
23	Mounting Hole 4xM6

Software Communication Section

Reload Internal Software of the Zero Gravity

What is needed:

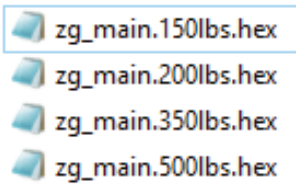
Equipment	Tool
	- Computer
	- AVRDudeSS Software

To do:

- Install Arduino software rev 1.8.x like explained below.
- Unzip the AVRDudeSS software folder to C:\Program Files\
- Create a shortcut of AVRDudeSS.exe file to your Desktop.
- Copy the file libusb0.dll from C:\Program Files\Arduino\ and paste to C:\Program Files\AVRDudeSS\

How to load the software

- Four .hex files are created based on the capacity of balancer.



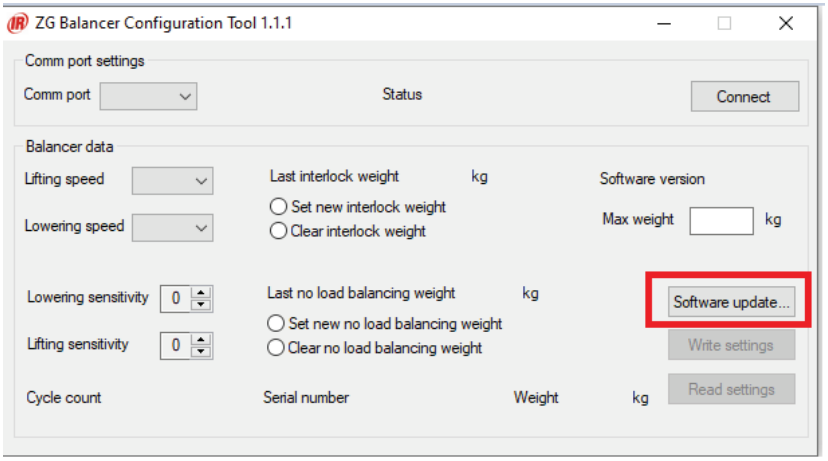
- Store the .hex file in a new folder on desktop.

Note: Do not add space or special character in naming the folder name.

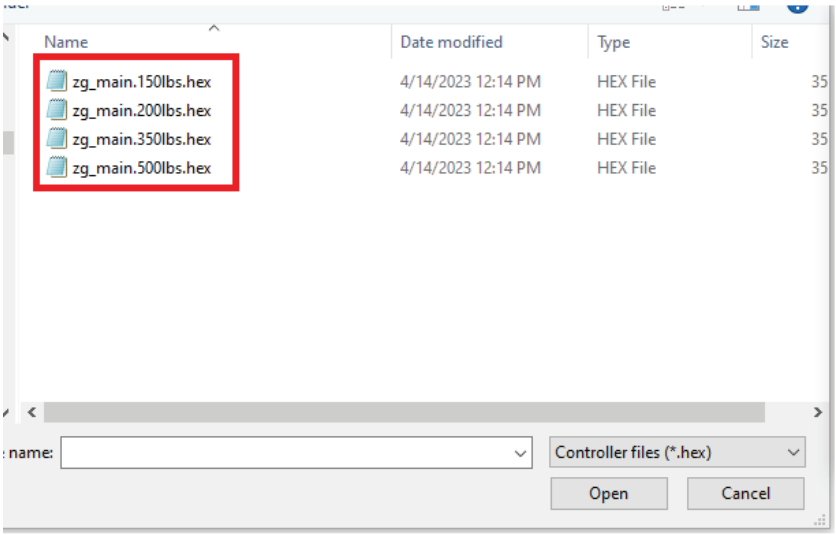
- Connect the USB cable from Control Box to the system and open the GUI tool.

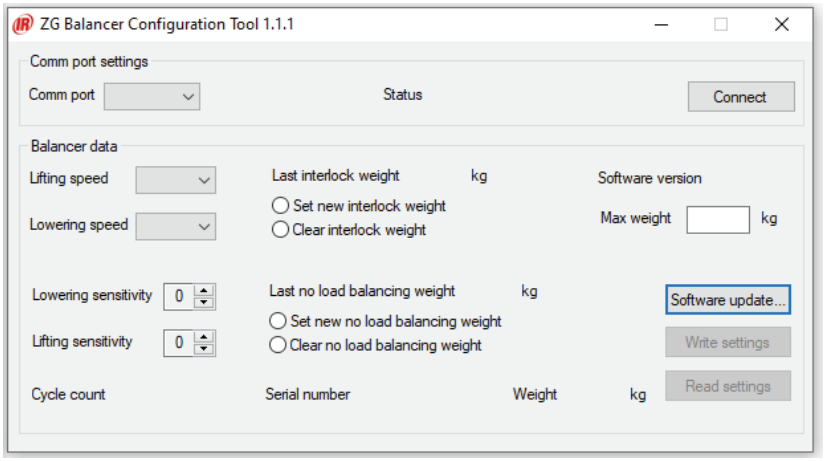
Note: Do not click on the Connect button in GUI tool.

- Select the "Comm port ".
- Click on "Software update" button.



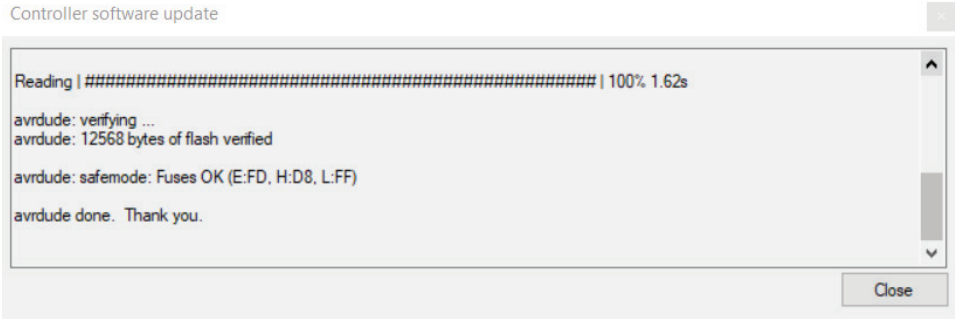
- Go to the folder where .hex file is store and double click on the .hex file based on the capacity intended to load.





● A message pops out on the screen as in image below.

Note: The software is loaded in the Control Box.



Maintenance

Electronics

Steady Red light on controller box indicates run error. Restart system to troubleshoot errors. If problem recurs, system will switch to safe mode and Red light remains constant.
Conduct yearly system check to prevent drifting of the sensor.

Spiral/Electric Wire

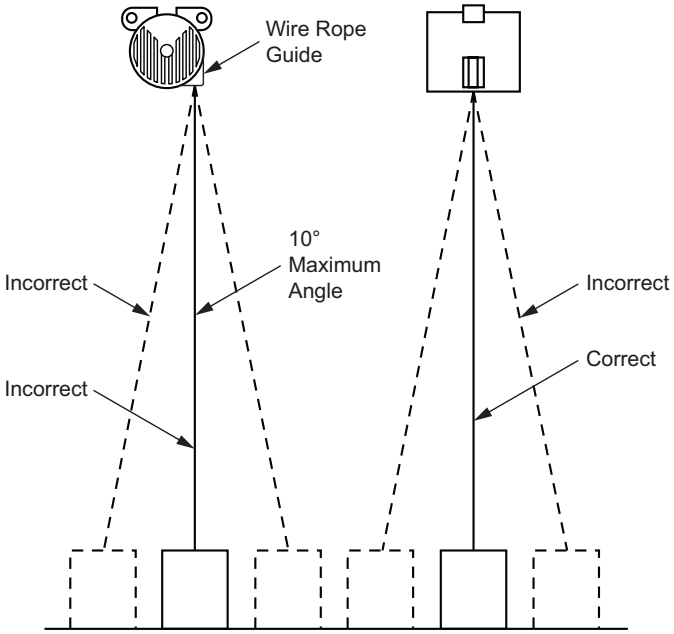
Inspect electric wires daily. Make sure all electric wires are free of rust, dirt, water, oil, and any damage to insulation or plug. Replace spiral wire yearly.

Wire Rope

Do not yard wire rope more than 10 degrees from vertical center of wire rope guide. Excessive yarding will cause increased wear on the balancer and decrease the life of the components. Replace wire rope if frayed, kinked, or bird caging is visible.

Refer to the Product Maintenance Manual.

Fig. N



Maintenance Schedule

WARNING

Disconnect the power supply before working on the equipment. The unit must be repaired by qualified personal, risk of electric shock.

Component	Inspection	Criteria for operation	Daily	Frequent (6 months)	Periodic (1 year)
Spiral Wire	Damages	No visible damage on entire length or on plugs.	X	X	X
	Kinks	No visible kinks on entire length.	X	X	X
Power Cord	Damages	No visible damage on entire length or on plugs.	X	X	X
	Kinks	No visible kinks on entire length.	X	X	X
Control Box	Valves leaks	Load doesn't move when the system is switched OFF.		X	X
	Pressure sensor damages	Balancing mode operational.		X	X
Command Handle	Force sensor damage	Load doesn't move when handle is free and power ON.	X	X	X
	Gap between sensitive area and handle	No resistance in motion, only axial motion must be possible.			X
	Emergency stop	Good operation of this part.	X	X	X
	Control buttons	No visible looseness, or sticking of buttons.	X	X	X

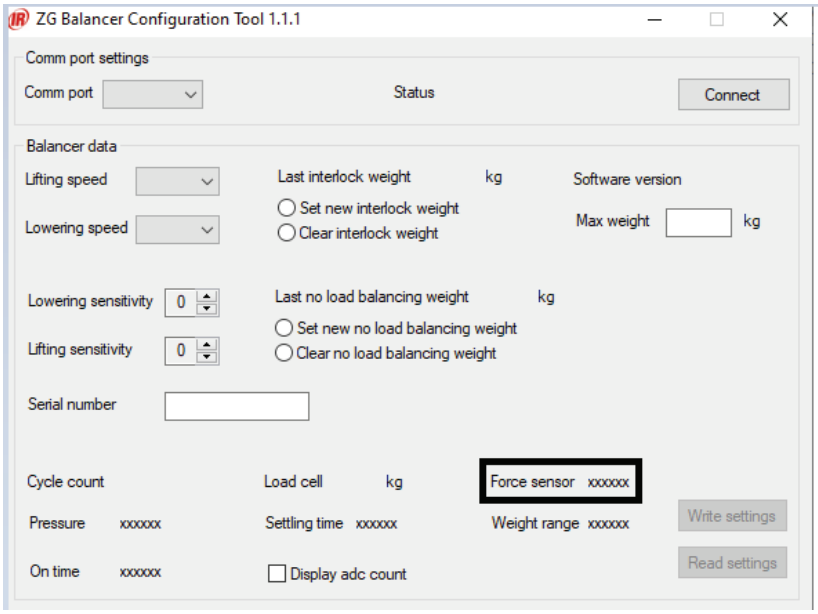
Troubleshooting

1. Load is not moving up and down.

- Check for the leakages at fitting by using soap bubble test, especially at the yellow and black pipe.
- Observe for any leakage noise.
- If the load is still not moving up and down then open the Control Box, remove the solenoid valves, exhaust valve (D1, D2 and D3) and inlet valve (M1, M2 and M3) and clean it and refit the valves in same position.

2. Red light is blinking in the Control Box for more than 10 seconds after initiation or green button is turned ON.

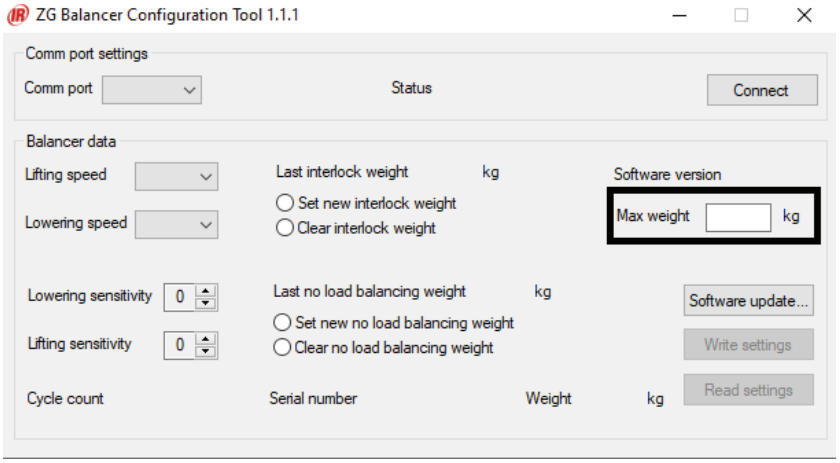
- This is an indication of Force sensor in handle ADC value is not in limit or Force sensor in handle is out of range.
- Connect the Control Box to the system, open the GUI tool and check for the Force sensor ADC value. It should be 512 +/- 40.



- Its normally factory setting if any deviation then contact IR office.

3. Load not moving in up direction but moving in down position.

- This is a clear indication of the Max weight logic.
- Red light starts blinking when load is moved up in Control Box.
- Connect the Control Box to the system and Open the GUI tool Max. Check the weight of the load and change the Max value in the Max weight box accordingly to load to be lifted.



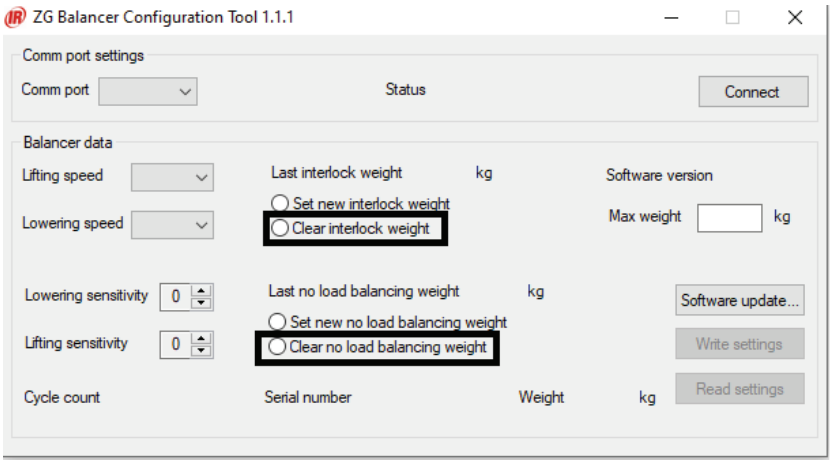
Note: Max weight cannot exceed 80% of the balancer capacity.

4. Load is moving up and down but sometimes it's a jerky motion or not working or a red light is blinking in the Control Box.

- This situation will occur when the operator is moving the load in handle mode up and down in faster rate.
- This will cause the ADC value in load cell reaching more than Max weight. Hence a red light will blink not allowing the system to go up.
- This is a logic intentionally adopted in system to avoid abusing of system.
- In such case, get the load down turn OFF the system for 10 seconds and turn ON/press the green button. The system gently move the system up and down in handle mode.

5. Load is on ground but the handle is not moving further down.

- This is an indication of interlock or load balancing.
- In such case, connect the Control Box to system and open GUI tool.
- Is any value is displayed on the last interlock weight or last no load balancing weight, clear it by ticking the box and press on write setting to update in system.



Zero Gravity Balancer Gen 2 - Parts List

Model Driver	Description	Suspension	Balancer	Kit	Prop 65 Label
ZG2W01508000B	Zero Gravity Balancer, 150 LBS, No Suspension Kit, Bullard Hook	ZGS00	BW015080	ZG2015B-KIT	47645393001
ZG2W015080A1B	Zero Gravity Balancer, 150 LBS, ZRA1 Mount, Bullard Hook	ZGSA1-150			
ZG2W015080A2B	Zero Gravity Balancer, 150 LBS, ZRA2 Mount, Bullard Hook	ZGSA2-150			
ZG2W015080ATB	Zero Gravity Balancer, 150 LBS, ZRAT Mount, Bullard Hook	ZGSAT-150			
ZG2W015080HMB	Zero Gravity Balancer, 150 LBS, Hook Mount, Bullard Hook	ZGSHM-150			
ZG2W015080S2B	Zero Gravity Balancer, 150 LBS, ZRS2 Mount, Bullard Hook	ZGSS2-150			
ZG2W02012000B	Zero Gravity Balancer, 200 LBS, No Suspension Kit, Bullard Hook	ZGS00	BW020120	ZG2020B-KIT	
ZG2W020120A1B	Zero Gravity Balancer, 200 LBS, ZRA1 Mount, Bullard Hook	ZGSA1			
ZG2W020120A2B	Zero Gravity Balancer, 200 LBS, ZRA2 Mount, Bullard Hook	ZGSA2			
ZG2W020120ATB	Zero Gravity Balancer, 200 LBS, ZRAT Mount, Bullard Hook	ZGSAT			
ZG2W020120HMB	Zero Gravity Balancer, 200 LBS, Hook Mount, Bullard Hook	ZGSHM			
ZG2W020120S2B	Zero Gravity Balancer, 200 LBS, ZRS2 Mount, Bullard Hook	ZGSS2			
ZG2W020120S00B	Zero Gravity Balancer, 200 LBS, No Suspension Kit, Z-Stop, Bullard Hook	ZGS00	BW020120S		
ZG2W020120SA1B	Zero Gravity Balancer, 200 LBS, ZRA1 Mount, Z-Stop, Bullard Hook	ZGSA1			
ZG2W020120SA2B	Zero Gravity Balancer, 200 LBS, ZRA2 Mount, Z-Stop, Bullard Hook	ZGSA2			
ZG2W020120SATB	Zero Gravity Balancer, 200 LBS, ZRAT Mount, Z-Stop, Bullard Hook	ZGSAT			
ZG2W020120SHMB	Zero Gravity Balancer, 200 LBS, Hook Mount, Z-Stop, Bullard Hook	ZGSHM			
ZG2W020120SS2B	Zero Gravity Balancer, 200 LBS, ZRS2 Mount, Z-Stop, Bullard Hook	ZGSS2			
ZG2W03508000B	Zero Gravity Balancer, 350 LBS, No Suspension Kit, Bullard Hook	ZGS00	BW035080	ZG2035B-KIT	
ZG2W035080A1B	Zero Gravity Balancer, 350 LBS, ZRA1 Mount, Bullard Hook	ZGSA1			
ZG2W035080A2B	Zero Gravity Balancer, 350 LBS, ZRA2 Mount, Bullard Hook	ZGSA2			
ZG2W035080ATB	Zero Gravity Balancer, 350 LBS, ZRAT Mount, Bullard Hook	ZGSAT			
ZG2W035080HMB	Zero Gravity Balancer, 350 LBS, Hook Mount, Bullard Hook	ZGSHM			
ZG2W035080S2B	Zero Gravity Balancer, 350 LBS, ZRS2 Mount, Bullard Hook	ZGSS2			
ZG2W035080S00B	Zero Gravity Balancer, 350 LBS, No Suspension Kit, Z-Stop, Bullard Hook	ZGS00	BW032080S		
ZG2W035080SA1B	Zero Gravity Balancer, 350 LBS, ZRA1 Mount, Z-Stop, Bullard Hook	ZGSA1			
ZG2W035080SA2B	Zero Gravity Balancer, 350 LBS, ZRA2 Mount, Z-Stop, Bullard Hook	ZGSA2			
ZG2W035080SATB	Zero Gravity Balancer, 350 LBS, ZRAT Mount, Z-Stop, Bullard Hook	ZGSAT			
ZG2W035080SHMB	Zero Gravity Balancer, 350 LBS, Hook Mount, Z-Stop, Bullard Hook	ZGSHM			
ZG2W035080SS2B	Zero Gravity Balancer, 350 LBS, ZRS2 Mount, Z-Stop, Bullard Hook	ZGSS2			

Model Driver	Description	Suspension	Balancer	Kit	Prop 65 Label
ZG2W05008000B	Zero Gravity Balancer, 500 LBS, No Suspension Kit, Bullard Hook	ZGS00	BW050080	ZG2050B-KIT	47645393001
ZG2W050080A1B	Zero Gravity Balancer, 500 LBS, ZRA1 Mount, Bullard Hook	ZGSA1			
ZG2W050080A2B	Zero Gravity Balancer, 500 LBS, ZRA2 Mount, Bullard Hook	ZGSA2			
ZG2W050080ATB	Zero Gravity Balancer, 500 LBS, ZRAT Mount, Bullard Hook	ZGSAT			
ZG2W050080HMB	Zero Gravity Balancer, 500 LBS, Hook Mount, Bullard Hook	ZGSHM			
ZG2W050080S2B	Zero Gravity Balancer, 500 LBS, ZRS2 Mount, Bullard Hook	ZGSS2			
ZG2W050080S00B	Zero Gravity Balancer, 500 LBS, No Suspension Kit, Z-Stop, Bullard Hook	ZGS00	BW050080S		
ZG2W050080SA1B	Zero Gravity Balancer, 500 LBS, ZRA1 Mount, Z-Stop, Bullard Hook	ZGSA1			
ZG2W050080SA2B	Zero Gravity Balancer, 500 LBS, ZRA2 Mount, Z-Stop, Bullard Hook	ZGSA2			
ZG2W050080SATB	Zero Gravity Balancer, 500 LBS, ZRAT Mount, Z-Stop, Bullard Hook	ZGSAT			
ZG2W050080SHMB	Zero Gravity Balancer, 500 LBS, Hook Mount, Z-Stop, Bullard Hook	ZGSHM			
ZG2W050080SS2B	Zero Gravity Balancer, 500 LBS, ZRS2 Mount, Z-Stop, Bullard Hook	ZGSS2			

Model Driver	Description	Suspension	Balancer	Kit	Prop 65 Label
ZG2W01508000C	Zero Gravity Balancer, 150 LBS, No Suspension Kit, Snap Hook	ZGS00	BW015080	ZG2015C-KIT	47645393001
ZG2W015080A1C	Zero Gravity Balancer, 150 LBS, ZRA1 Mount, Snap Hook	ZGSA1-150			
ZG2W015080A2C	Zero Gravity Balancer, 150 LBS, ZRA2 Mount, Snap Hook	ZGSA2-150			
ZG2W015080ATC	Zero Gravity Balancer, 150 LBS, ZRAT Mount, Snap Hook	ZGSAT-150			
ZG2W015080HMC	Zero Gravity Balancer, 150 LBS, Hook Mount, Snap Hook	ZGSHM-150			
ZG2W015080S2C	Zero Gravity Balancer, 150 LBS, ZRS2 Mount, Snap Hook	ZGSS2-150			
ZG2W02012000C	Zero Gravity Balancer, 200 LBS, No Suspension Kit, Snap Hook	ZGS00	BW020120	ZG2020C-KIT	
ZG2W020120A1C	Zero Gravity Balancer, 200 LBS, ZRA1 Mount, Snap Hook	ZGSA1			
ZG2W020120A2C	Zero Gravity Balancer, 200 LBS, ZRA2 Mount, Snap Hook	ZGSA2			
ZG2W020120ATC	Zero Gravity Balancer, 200 LBS, ZRAT Mount, Snap Hook	ZGSAT			
ZG2W020120HMC	Zero Gravity Balancer, 200 LBS, Hook Mount, Snap Hook	ZGSHM			
ZG2W020120S2C	Zero Gravity Balancer, 200 LBS, ZRS2 Mount, Snap Hook	ZGSS2			
ZG2W020120S00C	Zero Gravity Balancer, 200 LBS, No Suspension Kit, Z-Stop, Snap Hook	ZGS00	BW020120S		
ZG2W020120SA1C	Zero Gravity Balancer, 200 LBS, ZRA1 Mount, Z-Stop, Snap Hook	ZGSA1			
ZG2W020120SA2C	Zero Gravity Balancer, 200 LBS, ZRA2 Mount, Z-Stop, Snap Hook	ZGSA2			
ZG2W020120SATC	Zero Gravity Balancer, 200 LBS, ZRAT Mount, Z-Stop, Snap Hook	ZGSAT			
ZG2W020120SHMC	Zero Gravity Balancer, 200 LBS, Hook Mount, Z-Stop, Snap Hook	ZGSHM			
ZG2W020120SS2C	Zero Gravity Balancer, 200 LBS, ZRS2 Mount, Z-Stop, Snap Hook	ZGSS2			

Model Driver	Description	Suspension	Balancer	Kit	Prop 65 Label
ZG2W03508000C	Zero Gravity Balancer, 350 LBS, No Suspension Kit, Snap Hook	ZGS00	BW035080	ZG2035C-KIT	47645393001
ZG2W035080A1C	Zero Gravity Balancer, 350 LBS, ZRA1 Mount, Snap Hook	ZGSA1			
ZG2W035080A2C	Zero Gravity Balancer, 350 LBS, ZRA2 Mount, Snap Hook	ZGSA2			
ZG2W035080ATC	Zero Gravity Balancer, 350 LBS, ZRAT Mount, Snap Hook	ZGSAT			
ZG2W035080HMC	Zero Gravity Balancer, 350 LBS, Hook Mount, Snap Hook	ZGSHM			
ZG2W035080S2C	Zero Gravity Balancer, 350 LBS, ZRS2 Mount, Snap Hook	ZGSS2			
ZG2W035080S00C	Zero Gravity Balancer, 350 LBS, No Suspension Kit, Z-Stop, Snap Hook	ZGS00	BW032080S		
ZG2W035080SA1C	Zero Gravity Balancer, 350 LBS, ZRA1 Mount, Z-Stop, Snap Hook	ZGSA1			
ZG2W035080SA2C	Zero Gravity Balancer, 350 LBS, ZRA2 Mount, Z-Stop, Snap Hook	ZGSA2			
ZG2W035080SATC	Zero Gravity Balancer, 350 LBS, ZRAT Mount, Z-Stop, Snap Hook	ZGSAT			
ZG2W035080SHMC	Zero Gravity Balancer, 350 LBS, Hook Mount, Z-Stop, Snap Hook	ZGSHM			
ZG2W035080SS2C	Zero Gravity Balancer, 350 LBS, ZRS2 Mount, Z-Stop, Snap Hook	ZGSS2			
ZG2W05008000C	Zero Gravity Balancer, 500 LBS, No Suspension Kit, Snap Hook	ZGS00	BW050080	ZG2050C-KIT	
ZG2W050080A1C	Zero Gravity Balancer, 500 LBS, ZRA1 Mount, Snap Hook	ZGSA1			
ZG2W050080A2C	Zero Gravity Balancer, 500 LBS, ZRA2 Mount, Snap Hook	ZGSA2			
ZG2W050080ATC	Zero Gravity Balancer, 500 LBS, ZRAT Mount, Snap Hook	ZGSAT			
ZG2W050080HMC	Zero Gravity Balancer, 500 LBS, Hook Mount, Snap Hook	ZGSHM			
ZG2W050080S2C	Zero Gravity Balancer, 500 LBS, ZRS2 Mount, Snap Hook	ZGSS2			
ZG2W050080S00C	Zero Gravity Balancer, 500 LBS, No Suspension Kit, Z-Stop, Snap Hook	ZGS00	BW050080S		
ZG2W050080SA1C	Zero Gravity Balancer, 500 LBS, ZRA1 Mount, Z-Stop, Snap Hook	ZGSA1			
ZG2W050080SA2C	Zero Gravity Balancer, 500 LBS, ZRA2 Mount, Z-Stop, Snap Hook	ZGSA2			
ZG2W050080SATC	Zero Gravity Balancer, 500 LBS, ZRAT Mount, Z-Stop, Snap Hook	ZGSAT			
ZG2W050080SHMC	Zero Gravity Balancer, 500 LBS, Hook Mount, Z-Stop, Snap Hook	ZGSHM			
ZG2W050080SS2C	Zero Gravity Balancer, 500 LBS, ZRS2 Mount, Z-Stop, Snap Hook	ZGSS2			

Model Code Explanation - Kit Parts

Example: ZG 2 015 B -KIT

Type of Control Kit

ZG = Zero Gravity

2 = Gen 2

Capacity

015 = 150 lb. (68 kg)
020 = 200 lb. (91 kg)
035 = 350 lb. (158 kg)
050 = 500 lb. (227 kg)

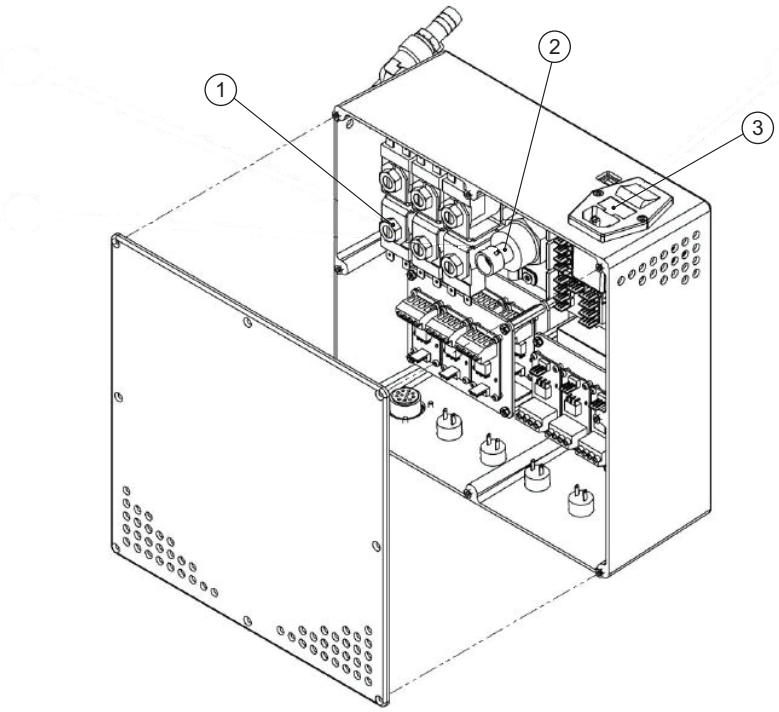
Type of Hook

B = Bullard
C = Steel Snap

Zero Gravity Balancer Gen 2 - Kit List

Model Driver	Description	Balancer Brackets	Control Box	Hook	Spiral Wire	Manuals
ZG2015B-KIT	ZG Gen 2 Kit for 150 LBS Balancer with Bullard Hook	ZGE06 (47563439001)	ZGB015 (47565285001)	47808627001	ZGC2 (47563687001)	47804819001 47804820001 47808318001
ZG2015C-KIT	ZG Gen 2 Kit for 150 LBS Balancer with Steel Snap Hook			47805074001		
ZG2020B-KIT	ZG Gen 2 Kit for 200 LBS Balancer with Bullard Hook	ZGE10 (47565321001)	ZGB020 (47565286001)	47808627001		
ZG2020C-KIT	ZG Gen 2 Kit for 200 LBS Balancer with Steel Snap Hook			47805074001		
ZG2035B-KIT	ZG Gen 2 Kit for 350 LBS Balancer with Bullard Hook		ZGB035 (47565287001)	47808627001		
ZG2035C-KIT	ZG Gen 2 Kit for 350 LBS Balancer with Steel Snap Hook			47805074001		
ZG2050B-KIT	ZG Gen 2 Kit for 500 LBS Balancer with Bullard Hook		ZGB050 (47563687001)	47808627001		
ZG2050C-KIT	ZG Gen 2 Kit for 500 LBS Balancer with Steel Snap Hook			47805074001		

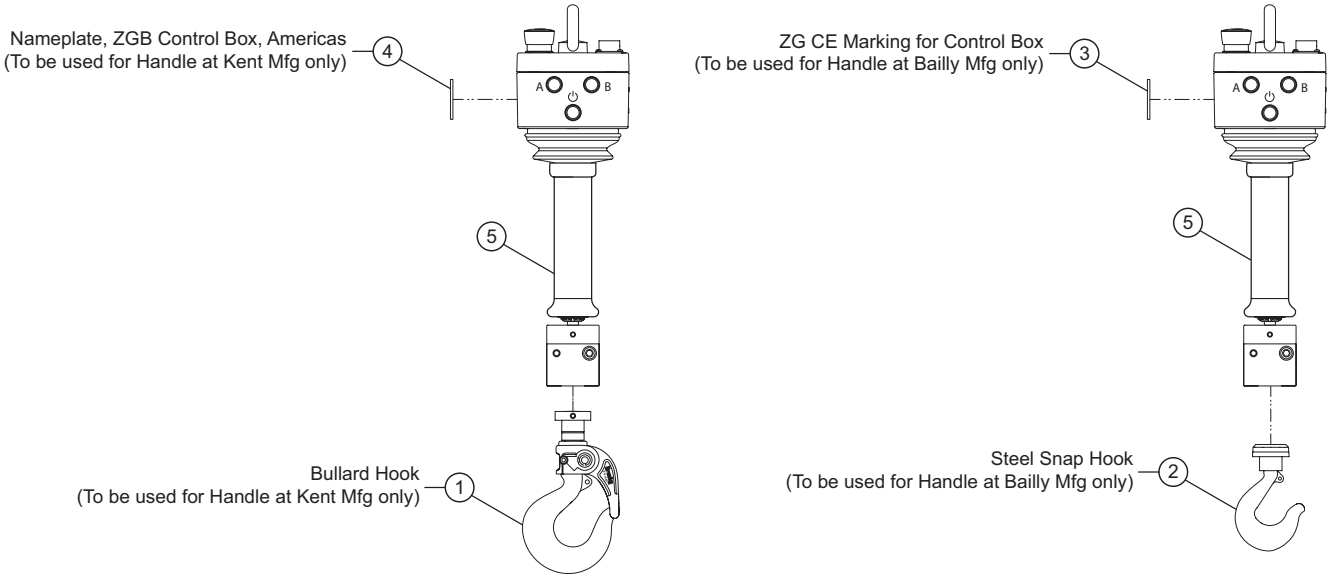
Controller Box - Exploded View



Controller Box - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	Set of Valve for FSB015	1	(47563675001)
	Set of Valve for FSB020	1	(47563676001)
	Set of Valve for FSB035	1	(47563677001)
	Set of Valve for FSB050	1	(47563678001)
2	Pressure Sensor	1	ZHSEA0080 (04709614)
3	Fuses	2	(47738840001)

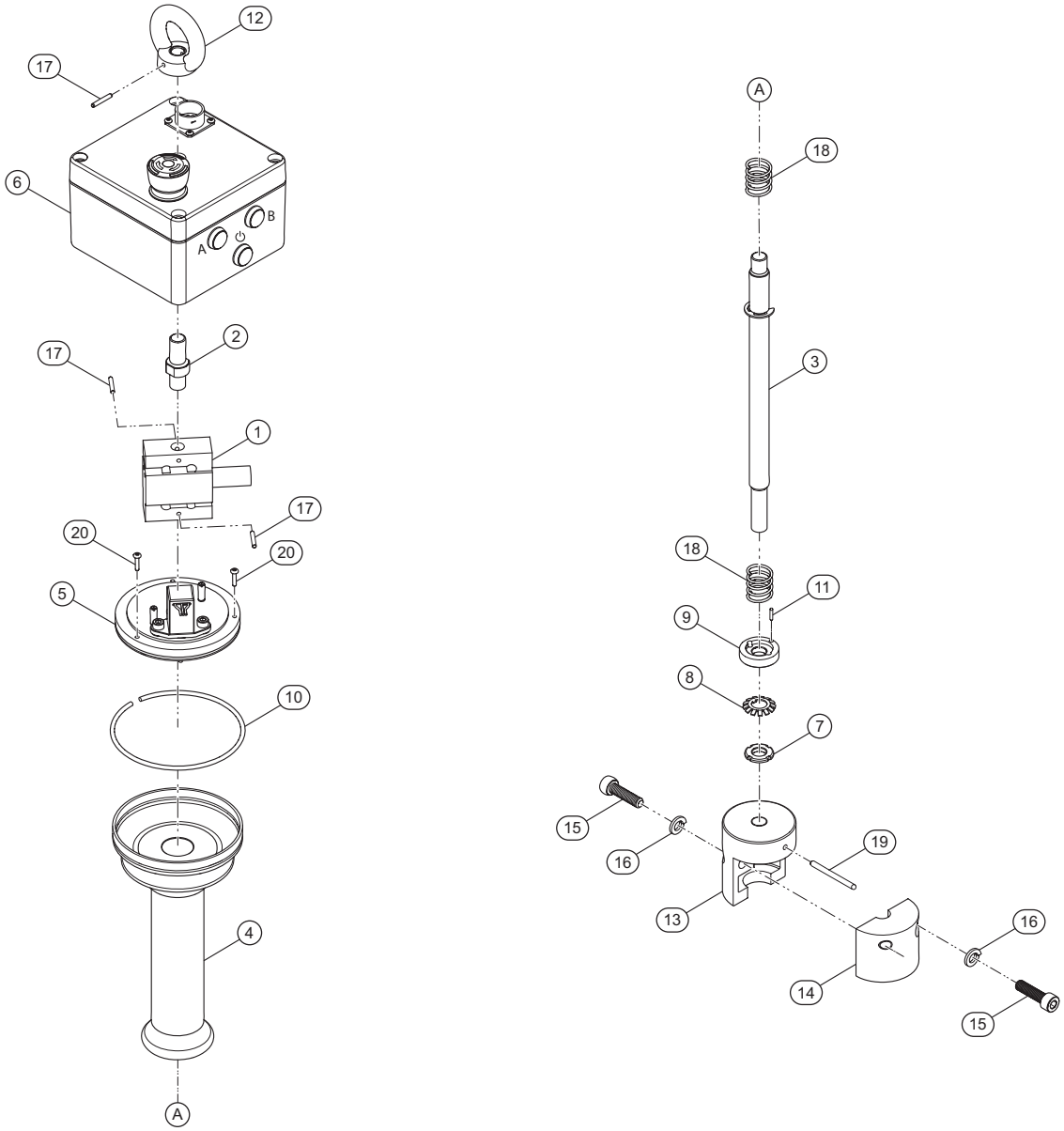
Zero Gravity Command Handle Gen 2 - Exploded View



Zero Gravity Command Handle Gen 2 - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	Bullard Hook	1	CE110-KBB377 (03504537)
2	Steel Snap HooK	1	MLK-KS304 (03945649)
3	Nameplate, Control Box, ZGB	1	(47596414001)
4	Nameplate, ZGB Control Box, Americas	1	(47739849001)
5	Zero Gravity Command Handle Gen 2 without Hook	1	(47784990001)

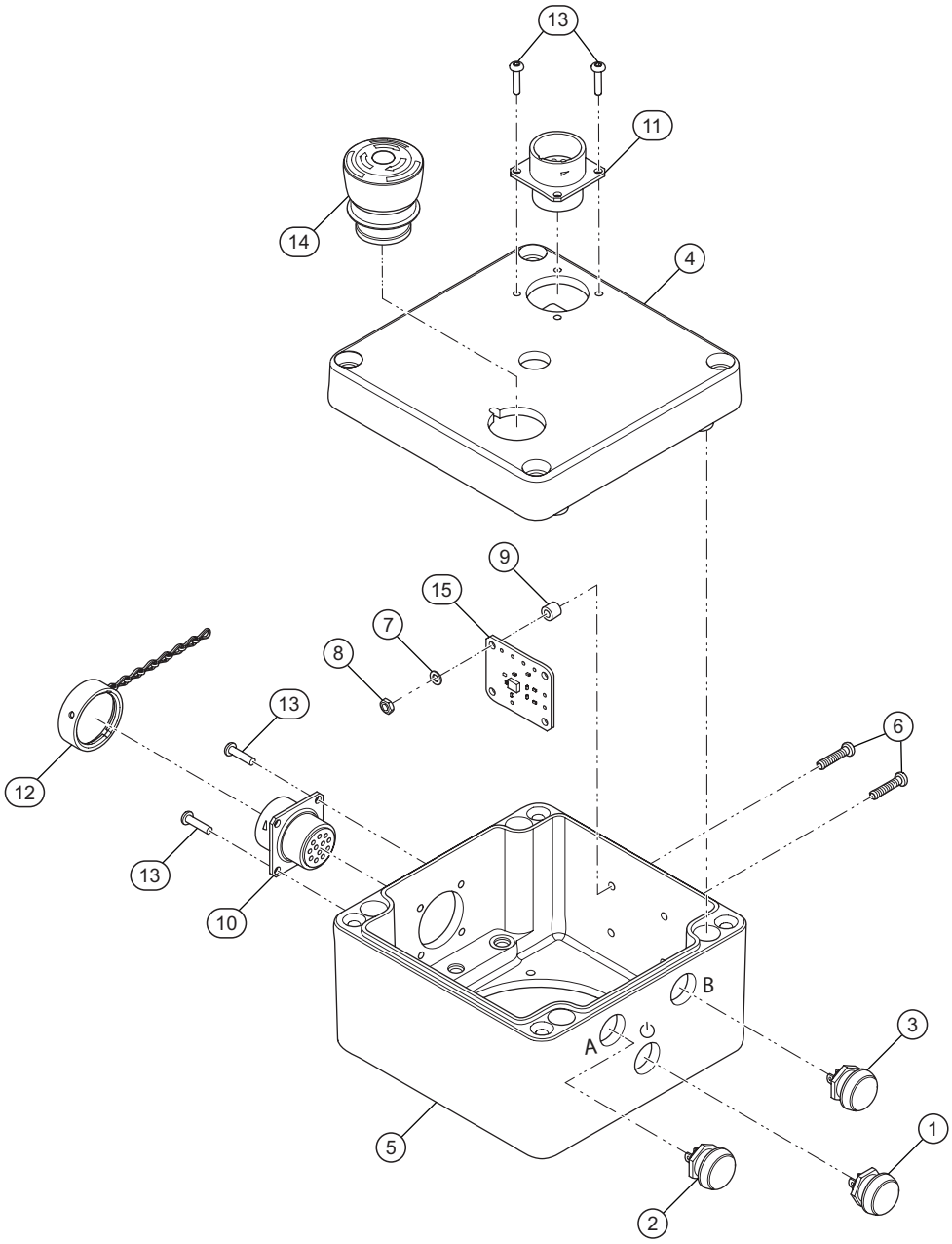
Zero Gravity Command Handle Gen 2 Without Hook - Exploded View



Zero Gravity Command Handle Gen 2 Without Hook - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	UXT 500 kg Tension Load Cell	1	(47784991001)
2	Adaptor	1	(47784994001)
3	Shaft Assembly	1	(47784996001)
4	Composite Handle Assembly	1	(47784998001)
5	Bottom Plate Assembly	1	(47784999001)
6	Handle Enclosure Assembly	1	(47787985001)
7	Lock Nut	1	(47791325001)
8	Lock Washer	1	(47791326001)
9	Coupler Nut	1	(47791329001)
10	Spring Steel, 105 mm	1	(47796368001)
11	Grub Screw, M3x10	1	(47799065001)
12	Female Eye Bolt	1	(47799228001)
13	Primary Hook Shell	1	(47799229001)
14	Secondary Hook Shell	1	(47799230001)
15	Bolt, M8x30	2	(47799268001)
16	Lock Washer, M8	2	(47799269001)
17	Spring Pin (3 mm length 20)	3	(47800801001)
18	Spring	2	(47801365001)
19	Spring Pin (4 mm length 50)	1	(47801722001)
20	Bolt, M3x12	3	(47805421001)

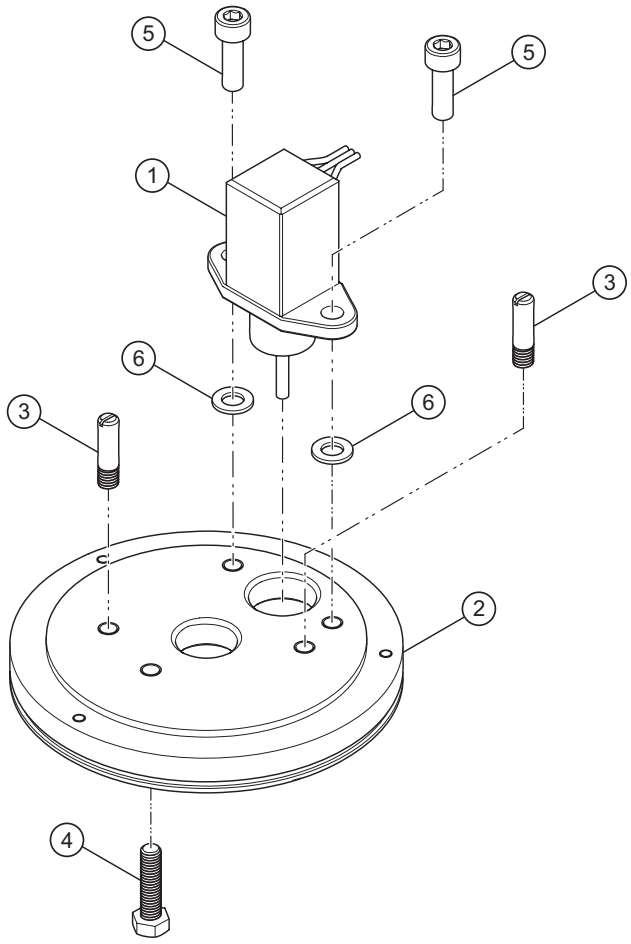
Handle Enclosure Assembly - Exploded View



Handle Enclosure Assembly - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	Power Button (green)	1	RS248-8913 (47563683001)
2	Clamp Button (blue)	1	RS322-041 (47802734001)
3	Release Button (orange)	1	RS408-038 (47563685001)
4	Enclosure Top Plate Machined	1	(47787987001)
5	Enclosure Bottom Plate Machined	1	(47787988001)
6	Plastic Bolt, M3x16	4	(47798036001)
7	Plastic Washer, M3	4	(47798037001)
8	Plastic Nut, M3	4	(47798038001)
9	Plastic Spacer, M3	4	(47798137001)
10	Female Connector	1	(47801357001)
11	Male Connector	1	(47801358001)
12	Dust Cap	1	(47801359001)
13	Bolt, M3x12	8	(47801360001)
14	RS477-4890	1	RS477-4890 (47563686001)
15	LC-AMP Board	1	TA-ZG-499

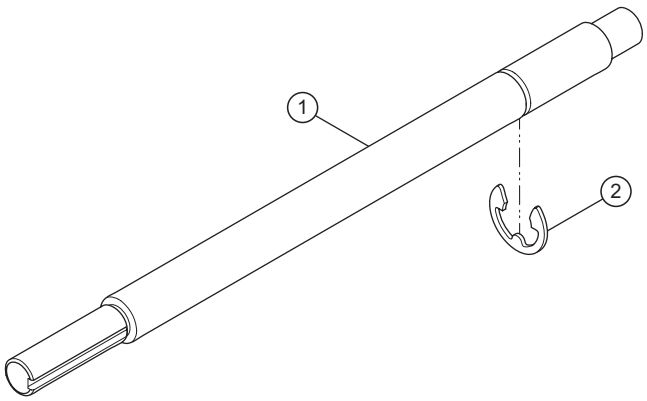
Bottom Plate Assembly - Exploded View



Bottom Plate Assembly - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	Capteur, RS	1	RS317-780 (47563682001)
2	Bottom Holder	1	(47785000001)
3	Stud, M5x20	2	(47798156001)
4	Bolt, M5x20	1	(47801361001)
5	Bolt, M5x16	2	(47801362001)
6	Washer, M5	2	(47802158001)

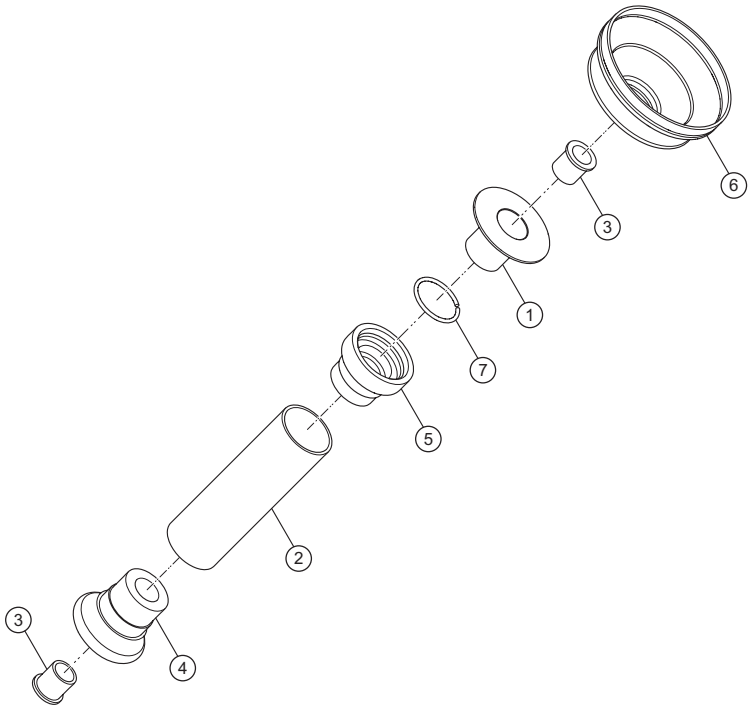
Shaft Assembly - Exploded View



Shaft Assembly - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	Shaft	1	(47784995001)
2	Retaining Ring	1	(47796762001)

Composite Handle Assembly - Exploded View



Composite Handle Assembly - Parts List

Item	Part Description	Quantity	Part Number (CCN)
1	Force Sensor Tube	1	(47784997001)
2	Composite Handle	1	(47785011001)
3	Brass Bushing	2	(47791327001)
4	Lower Cup	1	(47791331001)
5	Upper Cup	1	(47796366001)
6	Bellow	1	(47796367001)
7	Spring Steel, 35 mm	1	(47801363001)

Notes:

Notes:

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