Fire & Safety Systems Ltd

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TECHNICAL BULLETIN

Technical Bulletin 082

Zero 175 EVO

Installation Guide

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Revision 02

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Technical Bulletin 082 – Zero 175 EVO Installation Guide

REV2 04/02/2025

Other References	
TB001	System Care, Maintenance and Service
TB006	Monnex MSDS
TB0083	Zero 175 EVO – Kit Content and Spares

Overview

The Lifeline Zero 175 EVO fire suppression system (UK Patent No. 2578666) Is homologated to FIA 8876-2022 and uses Monnex™ fire suppression powder. Monnex™ has been tested rigorously on fuels from numerous industries including aviation, as well as testing against industrial chemical, showing its versatility and effectiveness. Monnex™ is the most trusted high performance firefighting powder.

The information below provides a guide to installing your chosen system. Due to the complexity of the vehicles this system is used in, it is difficult to define the exact positions of the bottle and the accompanying ancillaries required for the installation. This document provides “best practice” advice suitable for most vehicles. If you feel that your installation cannot follow these guidelines, please contact Lifeline Technical for further guidance.

Fully read and understand the instructions below before starting installation. Plan your installation carefully referring to the tables below and the system drawings. Do not cut the supplied tubing or the plug and lead sets until you are certain of the location of the cylinder, connectors, nozzles, switches, and power pack.

Cylinder Installation

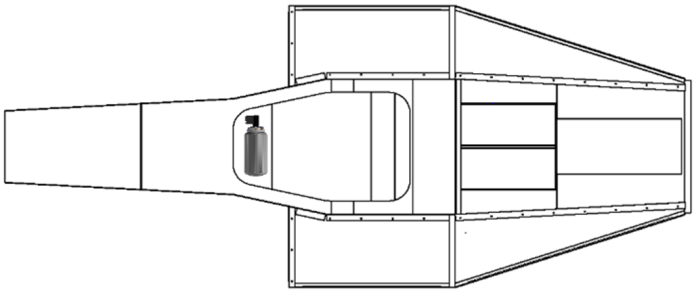


Figure 1 Cylinder position is free within the safety cell/roll cage

Mount the cylinder transversally or longitudinally in the car, and within the safety cell/roll cage. We recommend it being placed behind the seat on the floor to provide protection to the tubing and cylinder when entering and exiting the vehicle.

Avoid positions where the cylinder is likely to be damaged, abraded or exposed to extreme heat.

The homologation and maintenance labels must be visible for scrutineering.

Figure 2 Example of Anti vibration mount

Secure the cylinder bracket to the car using the M6 nuts and bolts. Use vibration washers or nyloc nuts. Do not use self-tapping screws. The use of anti-vibration mounts appropriate to the vehicle is highly recommended.

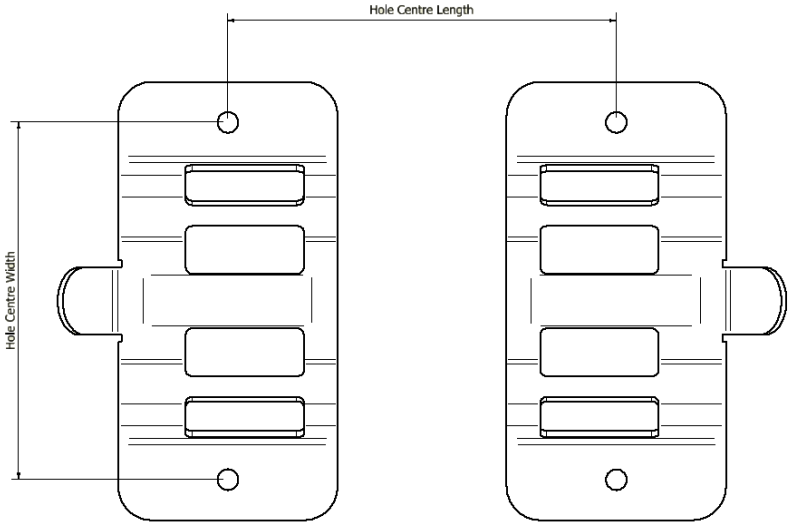


Figure 3 Hole centre positions for bracket mounting

Hole Centres	
Length	115mm
Width	105 ± 2mm

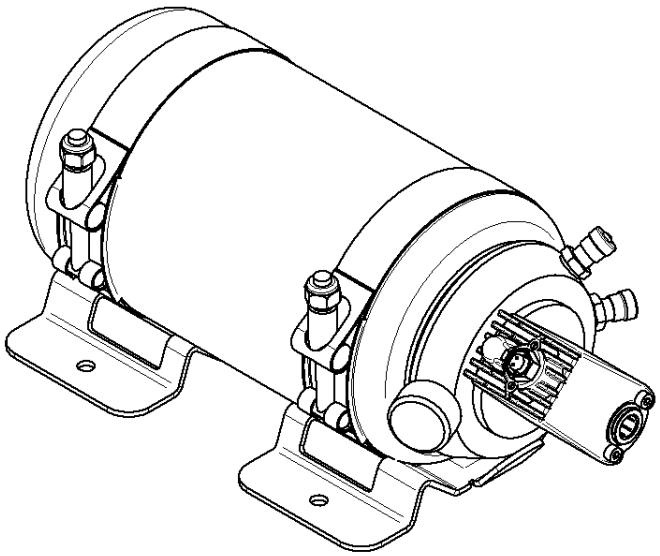


Figure 4 Image of bottle strapped into the brackets

It is permitted to use bracket and straps of your own design provided it conforms to Appendix J, Art. 253 of the FIA International Sporting Code.

Thread the T-Bolt steel straps through the slots on the bracket. Place the cylinder inside the straps using an 11mm Socket. Ensure the cylinder is secure, but do not over tighten.

Ensure that you have access to plug in the actuator wire once it has been strapped in position.

Compression T Piece

Figure 5 T-Piece compression fittings

Slide the compression nut onto the tube followed by the compression olive. Insert the pipes into the T-piece, ensuring they are fully seated against the step inside the T-piece. Then, slide the compression nuts over the olives and tighten them onto the T-piece (See figure 5).

Tighten the compression nuts to a torque of 25Nm. Once properly tightened, check the alignment of the pipes and ensure the connections are firm and correctly positioned.

For the 10mm T connector, the two horizontal connection points feature a reduction insert to allow the step down to the 8mm tubing (See figure 6).

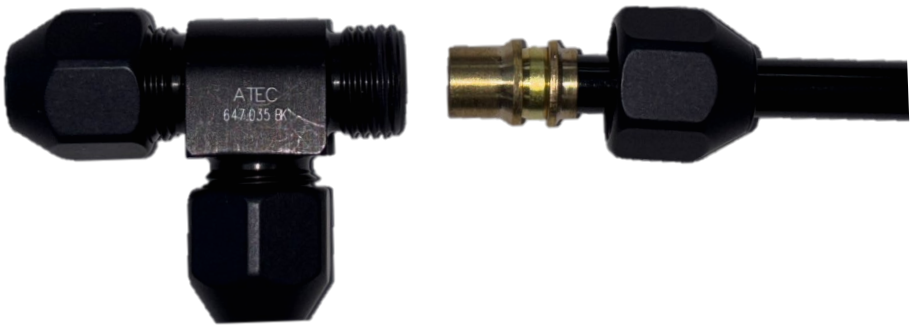


Figure 6 10mm to 8mm adapter

Tubing

Use a dedicated tube cutter to cut the tube, ensuring there are no sharp edges, and that the tube remains circular. Do not use a hack saw or similar tool which could leave a jagged edge which could damage the seals in the connectors. After cutting the tubing, deburr the inside and outside edges to minimise restrictions. Form the tube using high quality pipe bending equipment, taking care not to create a kink which could restrict flow. Minimum bend radius of the tube is shown below. Minimise bend quantity to allow for smooth suppressant flow and best performance.

Tube Ø	Minimum Bend Radius
8mm	16mm when using pipe bending tool
10mm	20mm when using pipe bending tool

Secure the tube using cable ties and saddles or P-clips. Tubes passing through a bulkhead must be protected using a rubber grommet.

Cockpit Nozzle

The blue Zero 360 (955-300-003) cockpit nozzle should be mounted ensuring there are no obstructions restricting the flow of suppressant. Ensure that the nozzle protrudes rearwards of surrounding items, for example, at least 5mm clear of any item within 20mm laterally or vertically. However, position nozzle as far from the driver as possible within these restrictions.

The nozzle must **NOT** be pointed at the head of the driver. **There must be one nozzle in the cockpit.**

The nozzle should be mounted on the left side pointing inwards for optimum coverage (see figure 7)

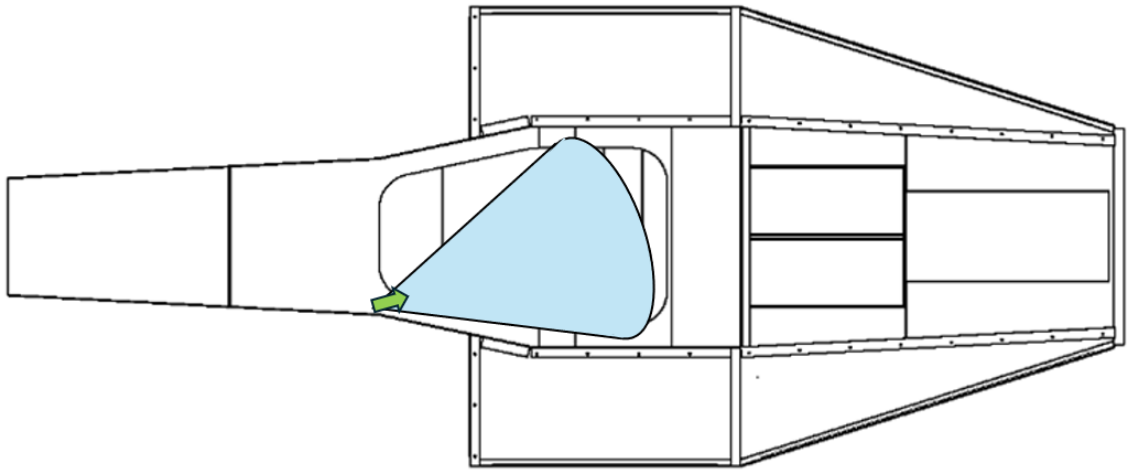


Figure 7 Cockpit nozzle position and coverage

N.B Obstruction around the nozzle could reduce the effectiveness of the extinguisher.

Figure 8 Groove cut in tube for push fitting

Nozzle fitment to tubing

The nozzles provided in the kit are push fit and designed to fit on the 8mm tubing. To ensure correct fitment, cut a groove using a pipe cutter 7mm from the end of the tube that is 0.5mm deep. If done correctly it should not be possible to pull the nozzle from the tube and it should not be loose on the tube.

Tubing fitment to bottle

The bottle also uses a push fit design. The 10mm tubing connection into the bottle requires a groove being cut 9mm from the end of the tube that is 0.5mm deep.

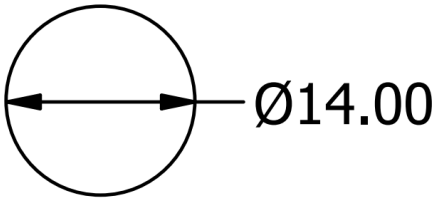


Figure 9 Hole diameter for nozzle bracket

Securing of nozzles

When securing the nozzles, a bracket with a ø14mm hole will be required. 2 x 16mm spanners will be needed to tighten the lock nuts. If the nozzles require further securing, this must be done in such a way that the nozzle is not obstructed.

Engine and Sidepod Nozzles

For the engine and sidepods the gold Zero 360 Double 'Z' (955-300-004) should be used. The engine nozzle and sidepod nozzles positions are recommended to be positioned upstream of air flow through the sidepod and air box, unobstructed and allowing coverage of any high-risk components within the sidepods.

Engine Nozzle

The engine nozzle should be directed at the top of the engine in the position shown in figure 10, so that maximum coverage can be provided by the nozzle.

As stated previously, it is imperative that the nozzles are not obstructed and have a clear path to the high ignition risk areas to maximise the effectiveness of the extinguisher.

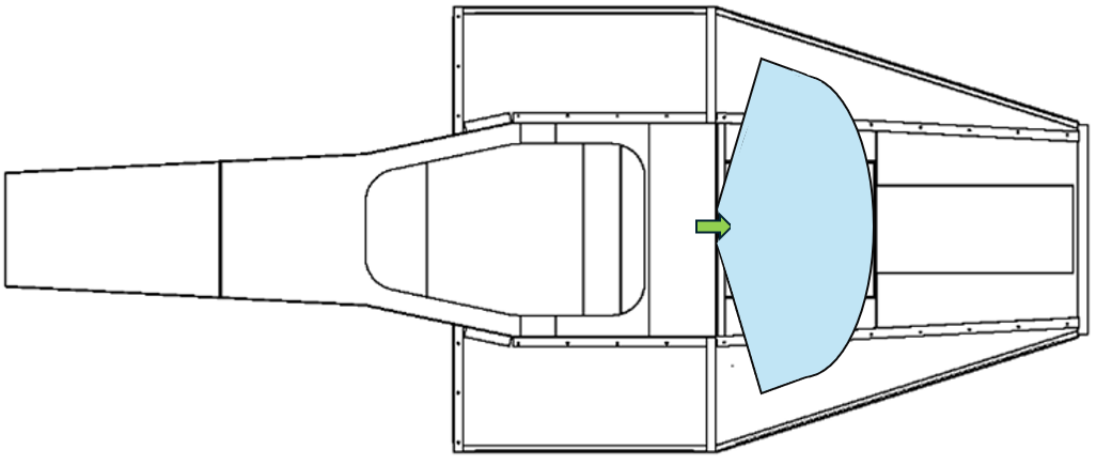


Figure 10 Engine nozzle position and coverage

Sidepod Nozzles

The recommended position for the sidepod nozzles is shown in figure 11. The position of the sidepod nozzles should provide coverage to the side of the engine block and the sidepod area that is not covered by the engine nozzle. When positioning these nozzles, direct them in such a way that you achieve maximum coverage of all ignition sources, or position them towards specific high-risk sources.

As stated previously, it is important to keep the nozzles unobstructed to allow maximum coverage of the suppressant when discharged.

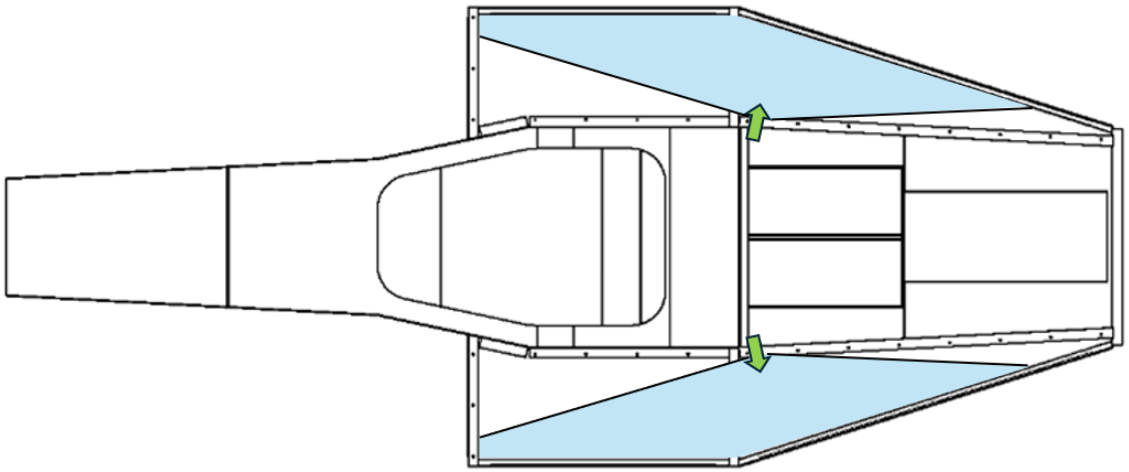


Figure 11 Sidepod nozzle positions and coverage

Delivery Network

Tubing

Connect the Zero 175 EVO cylinder to the nozzles following the schematic below and using the fittings provided in the kit. Ensure that the correct size tubing is used as per the diagram. Try to use similar lengths of tube from the cross piece to the engine and sidepod nozzles to distribute the suppressant as equally as possible. We recommend fixing the tubing to the safety cell, if possible. This helps ensure that the tubing remains in optimum condition.

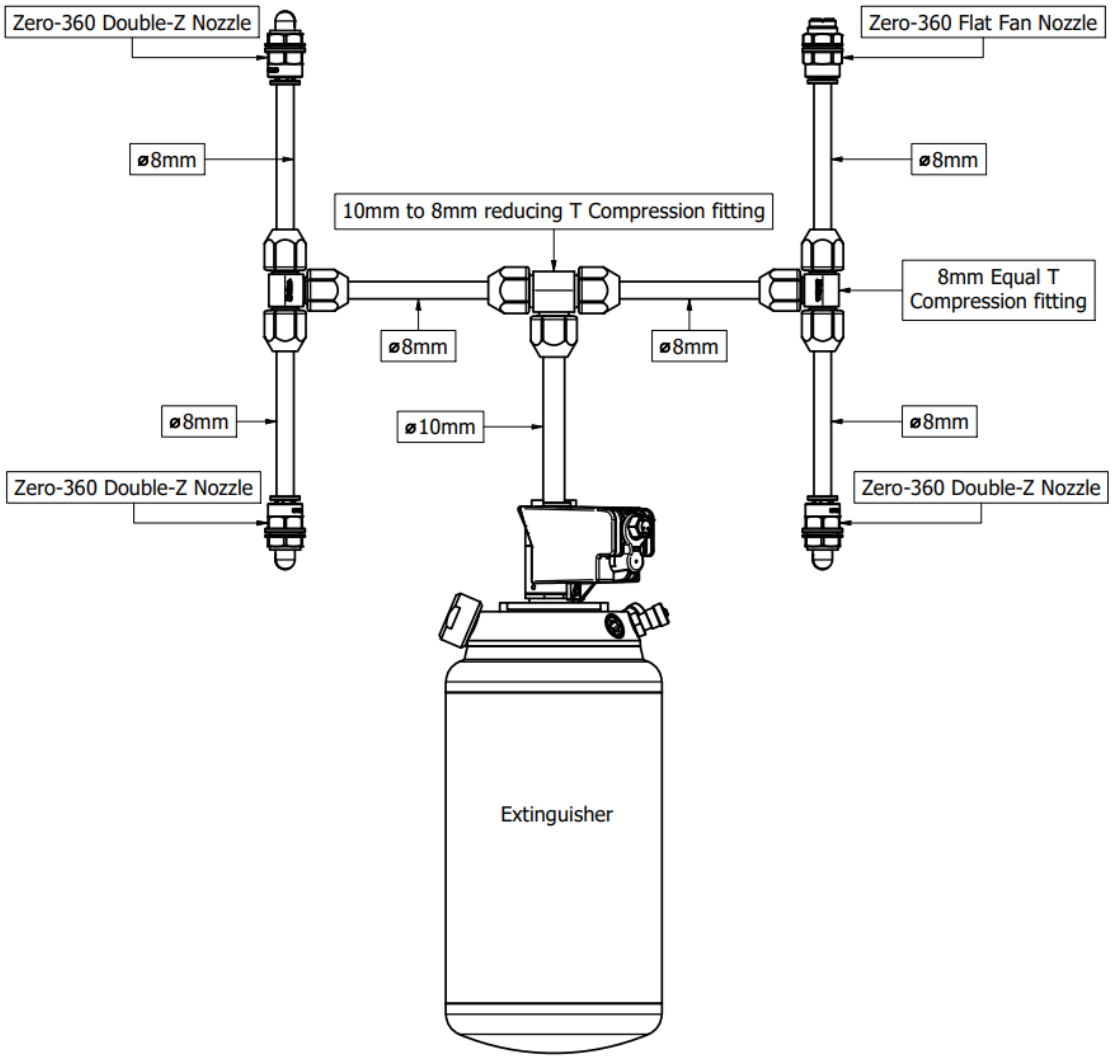


Figure 12 System Delivery network

Other fittings are available and can be purchased separately upon request.

Electrical Activation

The electrical system for Zero 175 EVO **MUST** be independent of other vehicle systems. This is so the extinguisher can still fire in the event of an electrical failure. The system may be integrated into a vehicle wiring loom if it remains an independent circuit.

Do not connect the extinguisher to a common ground or power source. Integrating the electrical system into other electrical circuits will cause the extinguisher to malfunction and it will likely fire.

Do not disassemble or modify the control box. This assembly is homologated by the FIA and must be used as supplied. Modifying the control box may cause the system to malfunction.

Control Box & Activation Switches

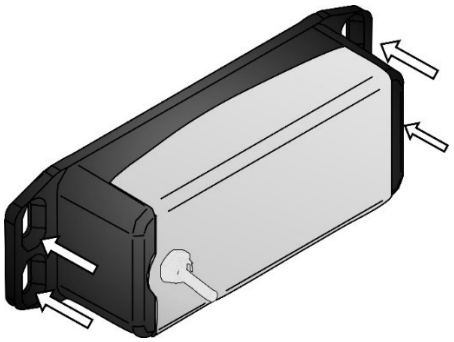


Figure 13 Control box mounting slots

The Control box must be located where It can be reached by the driver/co-driver. E.g. centre of dashboard of centre console area.

Ensure that the LED indicator lights are visible to the driver. Use M4 countersunk bolts to secure the control box.

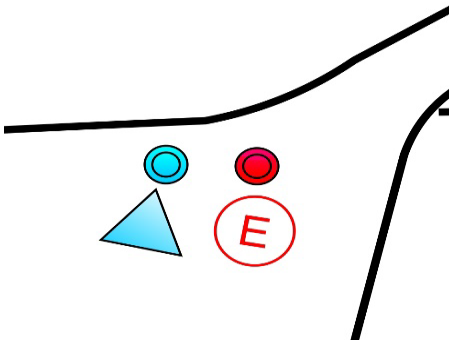


Figure 14 Locate external switch next to electrical cut off

One activation switch must be located inside the cockpit, within the reach of the driver & co-driver, when seated with harnesses on. It is recommended to mark this switch with the small circular “E” sticker that is supplied, or other label marked “FIRE”, “EXTINGUISHER” etc.

The second switch must be located externally directly next to the electrical cut-off switch in accordance with FIA regulations. The circular “E” sticker must be placed next to the external switch.

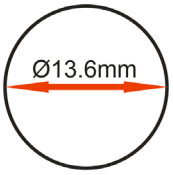


Figure 15 Activation switch panel cut out

Use a 13.6mm diameter panel cutout and the supplied lock nut to secure the switches.

Wiring

Wire the system as per the wiring diagram on page 13. Connectors with flying cables are supplied, cut or extend these cables as required. Solder the joints and seal with glue lined heat shrink to protect from water ingress. There are four coloured wires in the Circuit;

Blue & Brown Connect to the switches.

Black & White Connect to the extinguisher

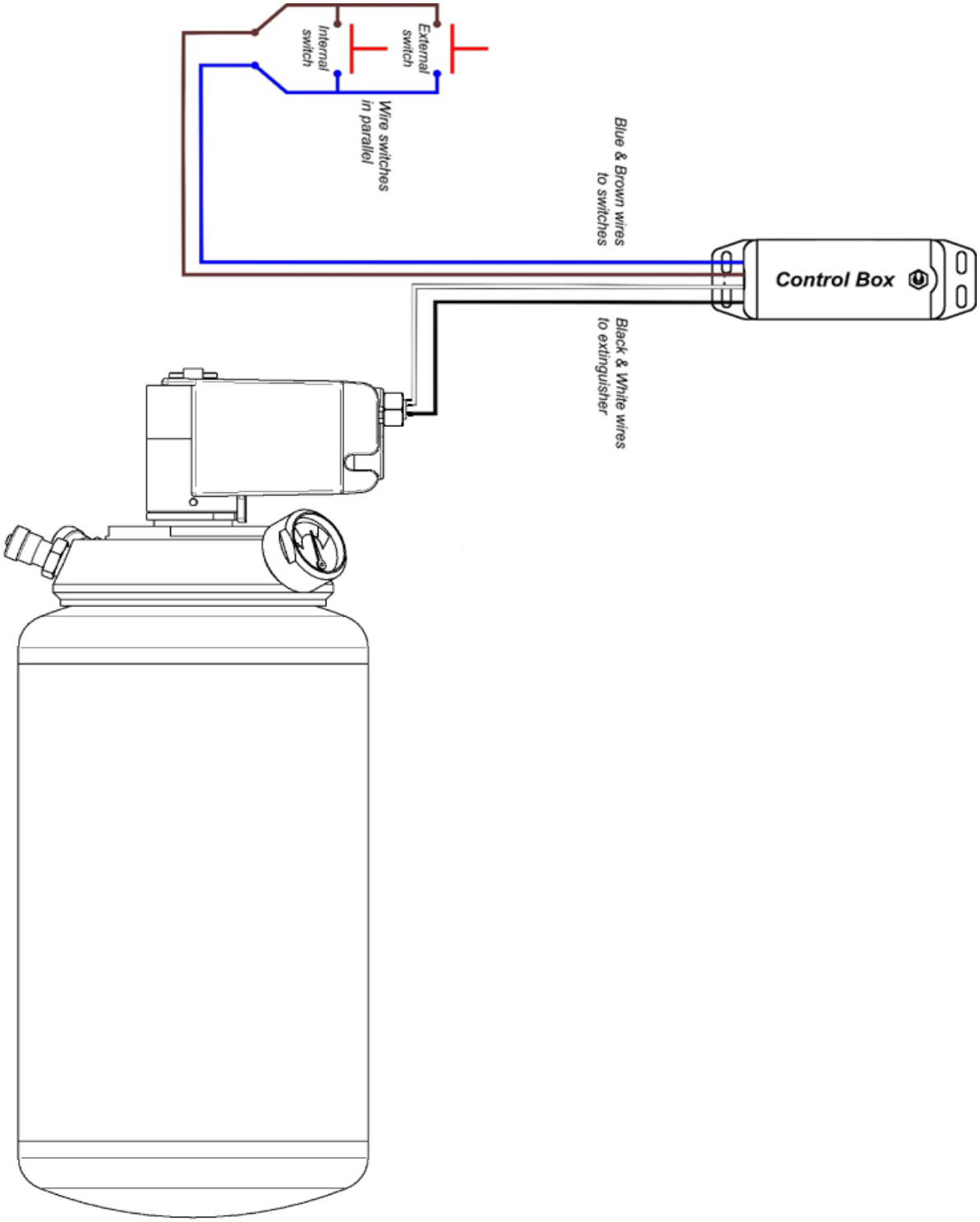


Figure 16 Zero 175 EVO wiring diagram

System Checking and Maintenance

Electrical test

The control box has two modes, Test and Armed. When the vehicle is not on circuit or on stage, set the control box to Test to prevent accidental activation. It is strongly recommended to test the system as described below before every session. This test will also be performed during scrutineering checks.

The test integrity of the electrical system:

1. Set the Control Box to Test mode by using the switch.
2. Press one of the activation switches. The Control Box will then perform its test cycle.
3. If the system is correctly wired and the battery condition is good, the Amber LED will illuminate for 5 seconds then go out.
4. If the Amber LED flashes, there is an error in the system:
    a. 2 flashes = Low/Faulty Battery. The Battery must be replaced.
    b. 3 flashes = Circuit Fault. Check that the wiring circuit is correct and that there are no breaks in the circuit.

If the system is showing no faults, it can be set to Armed mode using the switch on the Control Box. The Red LED will now flash every 3 seconds. If the LED does not flash, there is a fault in the system and the system will not fire!

Control Box Battery

Lifeline recommend removing the control box battery between events to extend battery life.

To change the battery, remove the 4 Pozidrive screws on the rear of the Control Box. The battery is attached to the lid by cable-tie, cut this cable-tie to release the battery from the lid. Replace the battery using a small cable-tie to secure it to the lid and reconnect the battery terminal.

Only use alkaline PP3 batteries to spec 6LR61

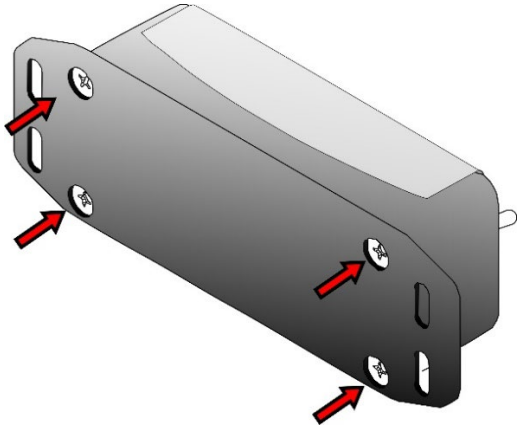
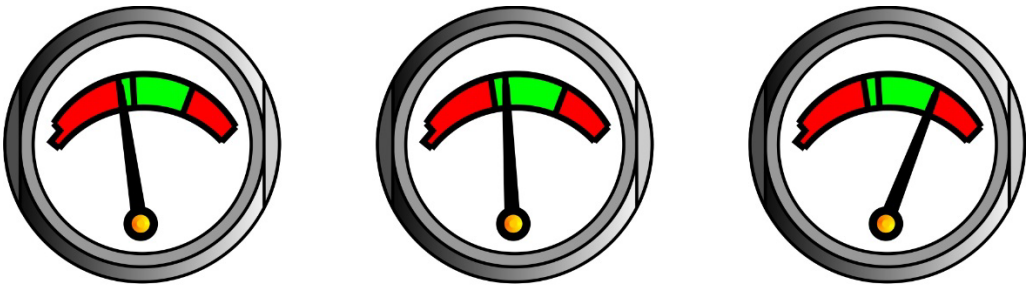


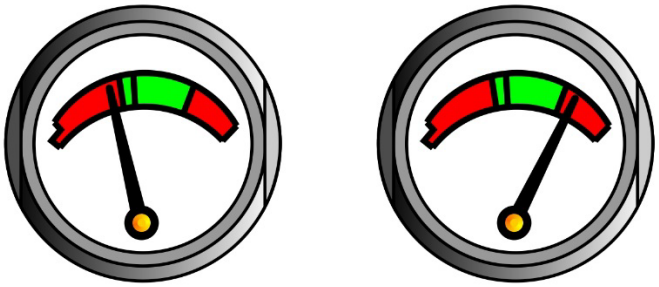
Figure 17 Remove the 4 screws at the rear of the Control Box to change battery

Extinguisher Pressure Check

1. Check that the cylinder is in date and has been serviced every two years as required.
2. Check the weight of the extinguisher against that shown on the serial label. Lifeline use regularly calibrated highly accurate scales and it can be expected that some variance will be found from the weight as shown when using other equipment.
3. Check the pressure gauge is in the green area of the scale. Some fluctuation can be observed in high and low temperatures, this is normal.



Extinguisher systems with a pressure gauge showing the above readings shall be considered OK



Extinguisher systems with a pressure gauge showing the above readings shall be considered NOT OK

(ref FIASDH-17-010|)

Cylinder Maintenance

Check that the cylinder has a valid maintenance label. The cylinder must be serviced every two years by Lifeline or an approved Lifeline service agent. Do not attempt to service the system yourself or have the system serviced by a non-Lifeline approved service agent, this will void the systems validity and potentially cause injury.

Regularly check the weight of the extinguisher against that shown on the label. Some variances will be found when using different weighing equipment. If the system measures significantly underweight, return the system to Lifeline for repair.

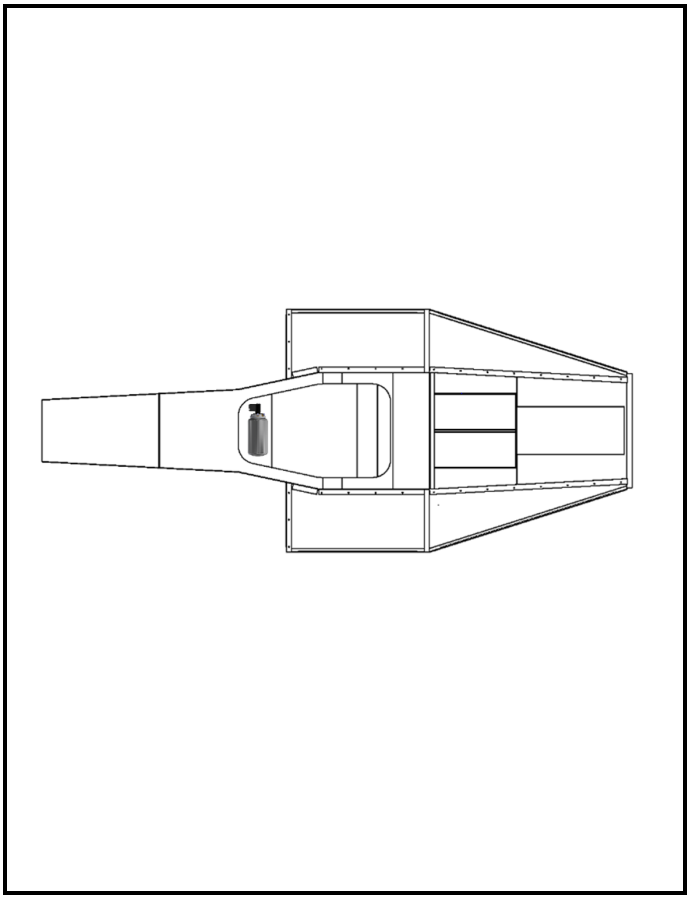
System Part Number	
System Serial Number	
Date of Manufacture	
Service 1 Date	
Service 2 Date	
Service 3 Date	
Service 4 Date	
Service 5 Date	

1. INSTALLATION DU SYSTEME D'EXTINCTION / *FIRE EXTINGUISHER SYSTEM INSTALLATION*

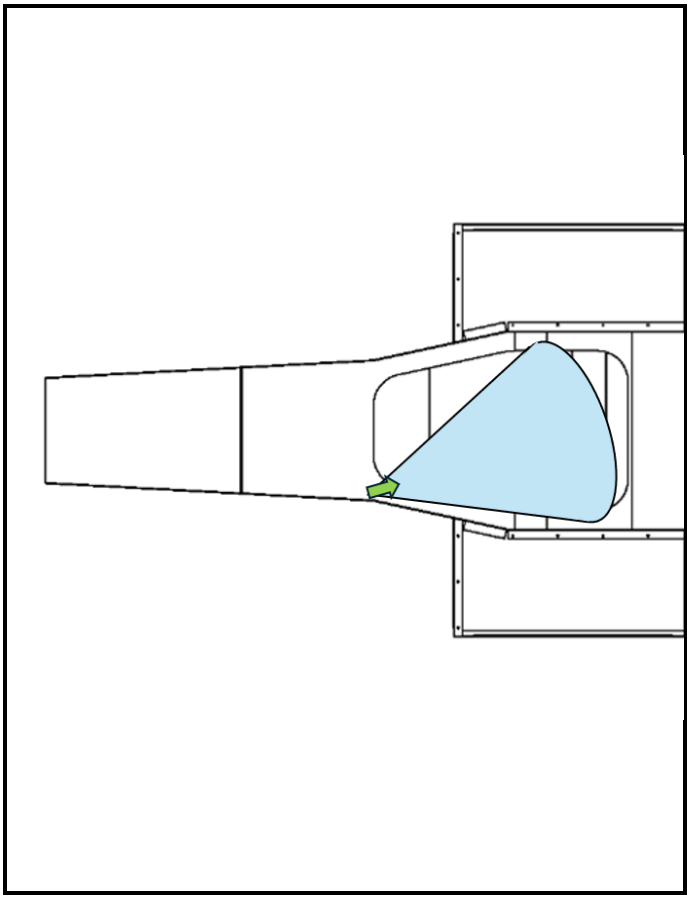
101. INSTALLATION DANS L'HABITACLE / *COCKPIT INSTALLATION*

a) Emplacement et orientation du corps *Location and orientation of body*	**Transversally or longitudinally, and within the safety cell/monocoque**
b) Emplacement et orientation des buses *Location and orientation of nozzles*	**Aimed into the centre of the cockpit**
c) Précaution à prendre lors de l'installation du système *Special care to take with the installation of the system*	**Ensure nozzle is not obstructed. Ensure cylinder is not positioned where it could be damaged or exposed to extreme heat. See Lifeline Technical Bulletin 082 for detailed installation instructions**

E1-1) Installation dans l'habitacle (emplacement et orientation du corps)
Cockpit installation (location and orientation of body)



E1-2) Installation dans l'habitacle (emplacement et orientation des buses)
Cockpit installation (location and orientation of nozzles)



102.	INSTALLATION DANS LE MOTEUR / *ENGINE INSTALLATION*	
	a) Emplacement et orientation du corps *Location and orientation of body*	**Transversally or longitudinally, and within the safety cell/monocoque**
	b) Emplacement et orientation des buses *Location and orientation of nozzles*	**One nozzle in each side pod and one nozzle directed into the engine bay**
	c) Précaution à prendre lors de l'installation du système *Special care to take with the installation of the system*	**Nozzles must not be obstructed in any way. See Lifeline Technical Bulletin 082 for detailed installation instructions**

E2-1) Installation dans le moteur (emplacement et orientation du corps)

Engine installation (location and orientation of body)

E2-2) Installation dans le moteur (emplacement et orientation des buses)

Engine installation (location and orientation of nozzles)