ACTION
CONTROL SYSTEMS

# Diesel Burner (SPRAYER) Controller and Operation Manual

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# 1.0 – INTRODUCTION

The Action Control Systems diesel burner controller suits all models of Cab chassis sprayer or Tanker, the system can be installed as a retrofit upgrade to all models.

The Action Control Diesel Burner installation comprises of a new 24-volt Riello G20 or G10, the Riello unit will be fitted with an ACS developed brushless motor and RPM controller. The Brushless motor and controller work together to ensure the RPM rate stays consistent during the run time of the burner, this result is increased efficiency for heating and decreased emissions.

The G20 series is specific to tanker trailers and A & B sets where the G10 is for smaller tank sizes such as sprayers. The Riello is controlled by a panel that is specifically designed by Action Control Systems and labelled for ease of use, the control panel can be modified to suit single burner or dual burner tankers or sprayers. The control box internals are modified depending on the trailer and customer requirements.

To power the Riello diesel burner system two battery banks are fitted and charged using a diesel generator, the generator is installed with a stand-alone battery (1X-DC24) to help increase the ability for the generator to start regardless of the state of charge in the Riello battery bank, the generator battery is charged through the use of a Victron Charger, this is to ensure the start battery for the generator is receiving the best charge possible while running, a second bank of batteries consisting of two 100AH batteries (2X-DC31) are fitted for the purpose of running the Riello diesel burners only, the generator will charge these batteries through the use of an alternator that is driven off the motor shaft.

A 200-litre diesel tank is fitted to the trailer and connected through to the Riello via a 24-volt electric diesel pump, with 200 litres of diesel you should experience 45-50 hours of run time.

The Riello unit in the tuning phase is fitted with a specific jet size to maximise heating rate while still maintaining efficiency, these values are set and adjusted using a flue exhaust gas meter.

# 2.0 - Starting & Operation Procedure

## 2.1 – Start Up Procedure

**¡¡ WARNING!!** Do not ignite the burner when the material tank level is low. If the level indicator is not working, verify the actual level by inspecting the level visually through the manhole, making sure that the flue/s (tubes at the bottom) are covered with material. The flues transfer the heat from burner(s) to the material. If the flues are heated and not covered with material, this may cause the burner tubes to overheat causing them to crack or rupture.

1) Ensure vehicle is parked on level ground with park brake applied.
2) Ensure surrounding area is free from flammables including plant debris and vegetation.
3) Check and confirm correct heating temperature for product to be heated prior to ignition start
4) Check and confirm internal level of product inside of tank – dip tank to confirm product level.
5) Check and confirm internal product and related heading limitations of product before igniting burner.
6) Open top hatch and (or) any other vents that may be on the tanker (refer manufacturers guidelines).
7) Open control panel to view the displays and switches to operate the burner and generator.
8) Ensure flue cover/s are completely open and pilot light is NOT illuminated on control panel.
9) Turn the system switch to the on position and review the following.
    a) Temperature cut out
    b) System Voltage
    c) Fuel Level
10) Once all the above parameters are confirmed, turn the generator switch to the ignition on position.
11) Push the bypass button and turn the generator switch to start for the engine to crank, do this until the engine starts.
12) Ensure the engine cooling fan is operational before proceeding – if the fan is not operational, shut down the engine immediately and have the issue rectified before restarting engine.
13) Ensure the system voltage increases above 24 Volts before proceeding.

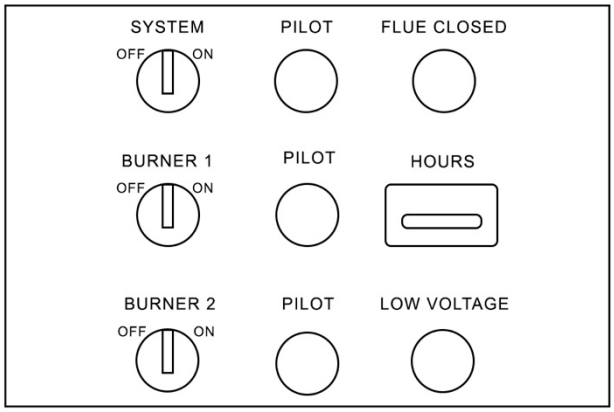
Turn the burner switch to the on position to ignite the burner.

# 3.0 – Shut Down Procedure

1) The Burner emergency shut down E-stop
2) The individual burner switch (“burner 1” or “burner 2” or both)
3) The system switch
4) Closing the Flue cover
5) The vehicle battery isolation switch

# 4.0 - Control Box

## 4.1 – Control Panel Layout




**System** – System on switch – master switch for the control panel.

**Flue Closed** – This pilot light is an indicator that the flue is closed, when this light is illuminated, it will not let you progress and start the burner.

**Hours** – Tracks the amount of run hours on your burners and diesel engine for maintenance purposes.

**Burner 1 Switch** – Move the switch to the on position to ignite your Riello Diesel Burner, the green pilot light will illuminate once this switch is turned on.
Burner 2 switch serves the same purpose.

**Low Voltage** – This pilot light will illuminate when the system is experiencing low voltage – this voltage will depend on where the Victron BP-65 has been set.

**Pilot** – these lights are fitted as indicators for the switches they are next too, when the switch is engaged the pilot light will illuminate if power is available.

## 4.2 - Internal Chargers and Components

### 4.2.2 – Victron Battery Protect – 65Amp (BP-65)

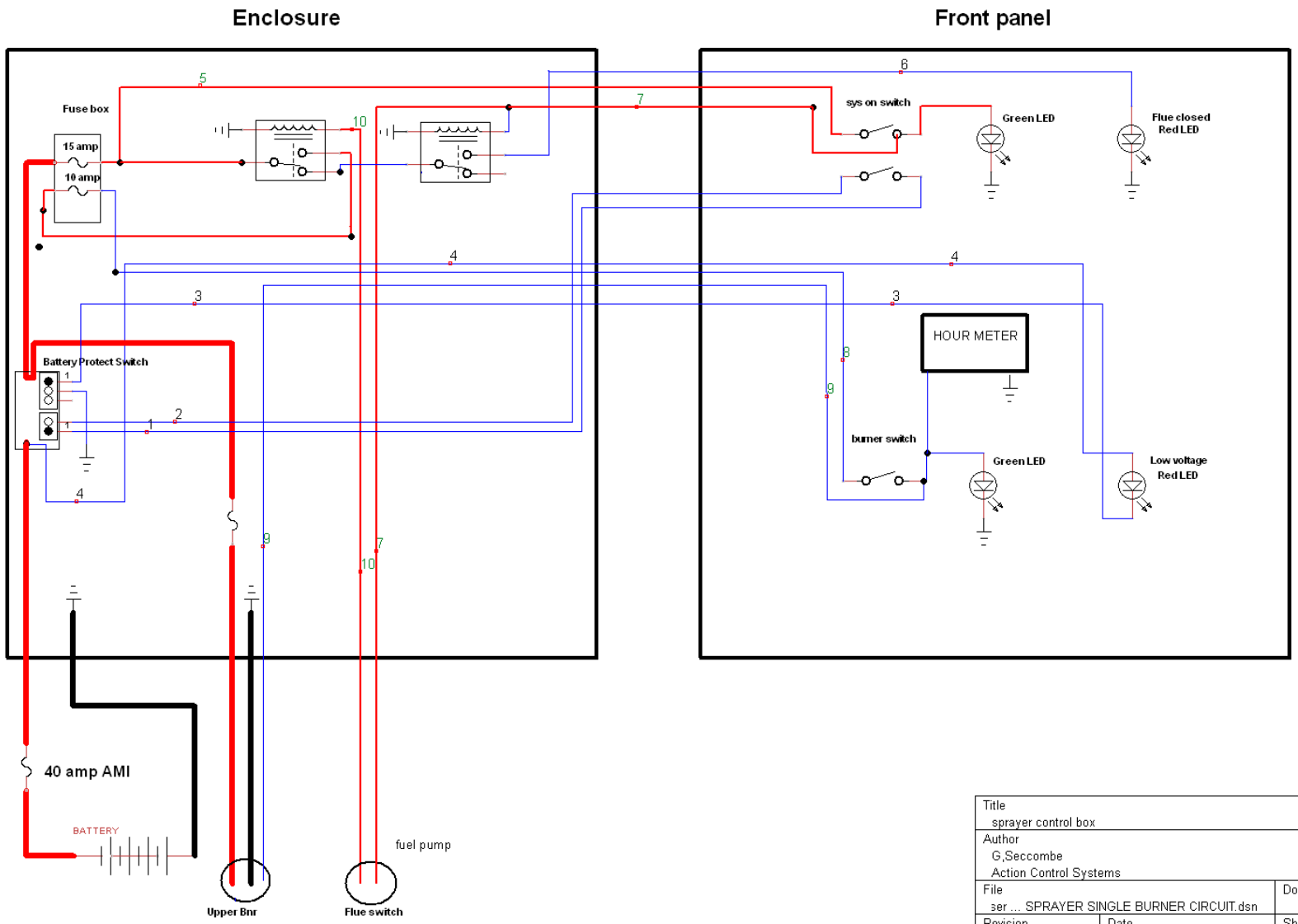
| | |
|---|---|
| Peak current | 250A |
| Operating voltage range | 6 - 35 V |
| Current consumption | When on: 1.5mA When off or LVS: 0.6mA |
| Alarm output delay | 12 seconds |
| Max. load on alarm output | 50mA - short circuit proof |
| Load disconnect delay | 90 seconds (immediate if triggered by a BMS) |
| Load reconnect delay | 30 seconds |
| Default thresholds | Disengage: 10.5 V or 21 V Engage: 12 V or 24 V |
| Operating temperature range | Full load: -40 °C to +40 °C |
| Connection | M6 |
| Weight | 0.2 kg 0.5 lbs |
| Dimensions (hxwxd) | 40 x 48 x 106 mm |

## 5.0 - TECHNICAL INFORMATION

Although the Action Control Systems box is easy to use, problems may occur, the ACS control box and system circuits are all designed for easy diagnosis, however, should only be worked on by a qualified trades professional. The Action control system should not be modified in any way, if you are a qualified trades person and work on the burner system is required, wiring diagrams can be viewed in section **7.0– Wiring Diagrams.**

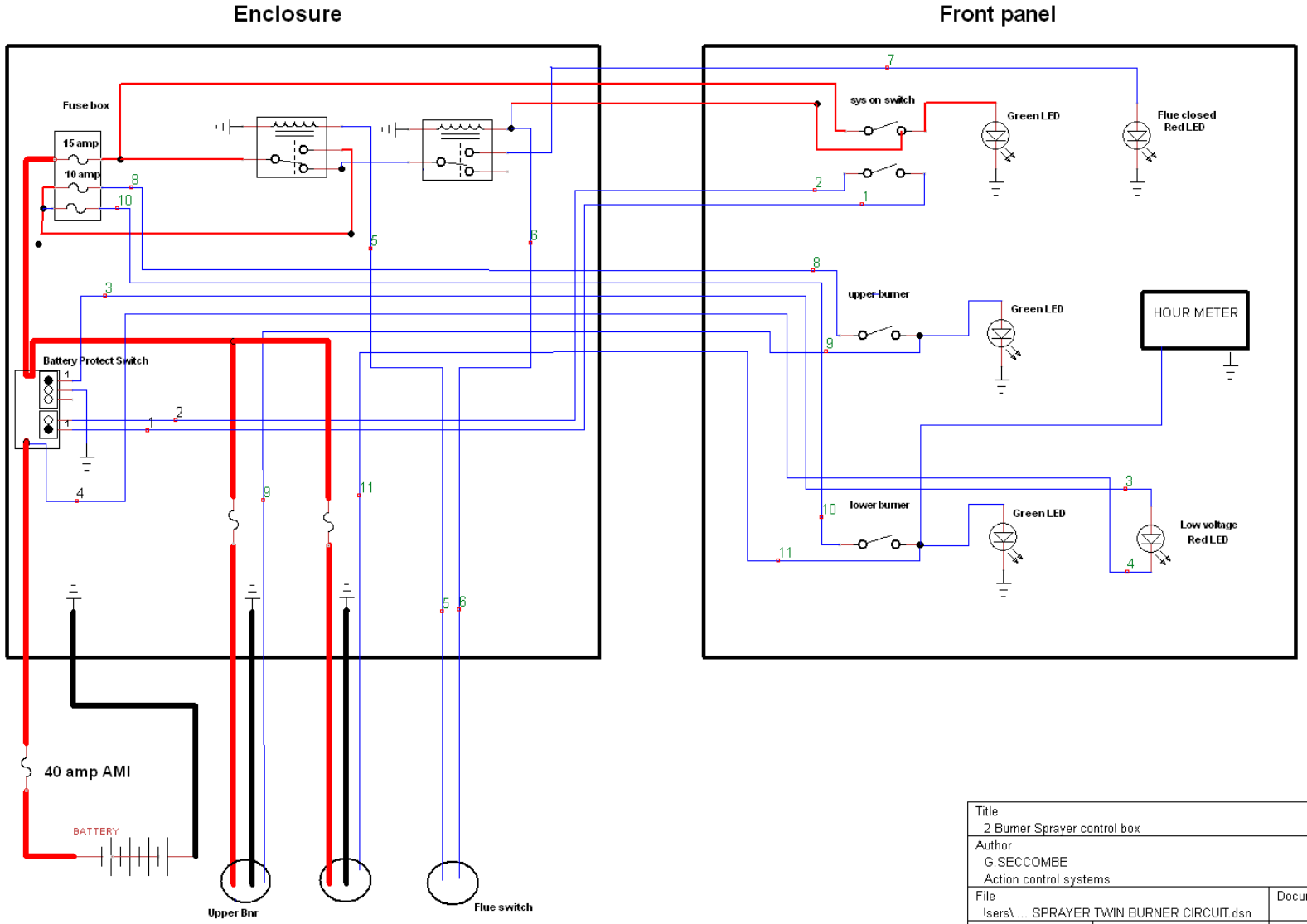
# 6.0 - Electrical Diagrams

## 6.1 – Sprayer – Single Burner – Control Box




| | | |
|---|---|---|
| Title<br>sprayer control box | | |
| Author<br>G,Seccombe<br>Action Control Systems | | |
| File<br>ser ... SPRAYER SINGLE BURNER CIRCUIT.dsn | | Document |
| Revision<br>1.0 | Date<br>21/10/2022 | Sheets<br>1 of 1 |

## 6.2 – SPRAYER – DUAL BURNER – CONTROL BOX




| | | |
|---|---|---|
| Title<br>2 Burner Sprayer control box | | |
| Author<br>G.SECCOMBE<br>Action control systems | | |
| File<br>!sers\ ... SPRAYER TWIN BURNER CIRCUIT.dsn | | Document |
| Revision<br>1.0 | Date<br>1/11/2022 | Sheets<br>1 of 1 |

# 7.0 - Maintenance Programme

## 7.1 - Riello

### 7.1.1 - Maintenance frequency

The combustion system should be checked at least once a year by a representative of the manufacturer or another specialised technician.

### 7.1.2 - Maintenance position

Access to the combustion head, diffuser disc / electrodes unit and nozzle.

- Remove the burner out of the boiler, after loosening the fixing nut to the flange.
- Hook the burner to the flange, by removing the combustion head after loosening the fixing screws.
- Remove the diffuser disc-holder assembly from the nozzle-holder after loosening its fixing screw.
- Screw the nozzle.

### 7.1.3 - Checking and cleaning

**Combustion head -** Open the burner and make sure that all components of the combustion head are in good condition, not deformed by the high temperatures, free of impurities from the surroundings and correctly positioned. Clean the combustion head in the fuel exit area, on the diffuser disc.

**Burner -** Check for excess wear or loose screws and clean the outside of the burner.

**Fan -** Check to make sure that no dust has accumulated inside the fan or on its blades, as this condition will cause a reduction in the air flow rate and provoke polluting combustion.

**Flame sensor -** Clean the flame sensor.

**Electrodes -** Check the correct position of electrodes.

**Nozzles -** It is advisable to replace nozzles every year during regular maintenance operations. Do not clean the nozzle openings; do not even open them.

**Filters -** Check the filtering baskets online and at nozzle present in the system. Clean or replace if necessary. If rust or other impurities are observed inside the pump, use a separate pump to lift any water and other impurities that may have deposited on the bottom of the tank.

**Pump -** Delivery pressure must correspond with product specifications. Please check that the supply line and filters are clear. The use of a pump vacuum gauge will assist in this. This measure permits the cause of the anomaly to be traced to either the suction line or the pump. If the problem lies in the suction line, check to make sure that the filter is clean, and that air is not entering the piping

## 8.0 – PARTS LIST

| Product / Part | Part Number |
|---|---|
| Riello G20 – With Brushless Motor | RI-0-3452736BM |
| Riello G10 – With Brushless Motor | RI-O1-20006157BM |
| Brushless Motor & Controller | M077-50 |
| Riello Mounting Plate | 2567373-M |
| Replacement Jet | GPH-30 DEG |
| Victron Battery Protect | BP-65 |
| Hour Meter | 331.534 |
| Control Box | Upon Request |
| Thermocouple | Upon Request |
| Isolation Switch | 75910 |
| E-stop Assembly | XALK187E |
| Flue Limit Switch | TZ-9208 |
| Anderson Plug | SB50 / SB175 / SB350 |
| Pressure Switch | CPS37 |
| Wika Gauge | Upon Request |

## 9.0 - CONTACT US

Contact Action Control Systems.
Phone support (07) 3623 3200
Alternatively send an email to" *controlsystems@actionauto.com.au* ".

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