MERLIN Interrupter

Installation Instructions

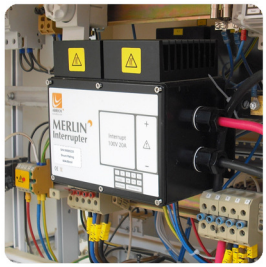
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1. CONTENTS

1. CONTENTS ..... Page 2

2. SAFETY INFORMATION ..... Page 3
- 2.1 General Safety Summary ..... Page 3
- 2.2 Safety Symbols ..... Page 3
- 2.3 Maximum Switching Voltage and Current ..... Page 3
- 2.4 Shunt Output ..... Page 3
- 2.5 Danger of Electric Shock ..... Page 3
- 2.6 Installation in Confined Spaces ..... Page 3
- 2.7 Disclaimer ..... Page 4
- 2.8 Compliance ..... Page 4
- 2.9 Environment ..... Page 4

3. BEFORE GOING TO SITE ..... Page 5
- 3.1 Installation Housing Requirements ..... Page 5
- 3.2 Equipment Check ..... Page 5

4. ON SITE ..... Page 6
- 4.1 Housing the MERLIN Interrupter ..... Page 6
- 4.2 Connect the MERLIN Interrupter to Earth ..... Page 6
- 4.3 Connect the MERLIN Interrupter to the MERLIN Transformer Rectifier Monitor ..... Page 6
- 4.4 Connect the MERLIN Interrupter to the Transformer Rectifier ..... Page 7
- 4.5 Testing the MERLIN Interrupter ..... Page 8
  - 4.5.1 Take a Reading ..... Page 8
  - 4.5.2 Check GPS (Optional) ..... Page 8
  - 4.5.3 Check Interruption ..... Page 8

5. POST SITE CONFIGURATION ..... Page 9

6. INSTALLATION EXAMPLES ..... Page 9
- 6.1 MERLIN Excel with MERLIN Interrupter (Negative Switching) ..... Page 9
- 6.2 MERLIN Excel Dual Current with MERLIN Interrupter (Positive Switching) ..... Page 9

7. DIMENSIONS ..... Page 10

8. NOTES ..... Page 11

2. SAFETY INFORMATION

Please ensure you are familiar with the safety regulations of your company and observe them at all times.

2.1 General Safety Summary

This document contains information and warnings that must be observed to keep the unit in a safe condition and ensure safe operation. Please ensure you fully understand all instructions throughout this document and follow all site safety practices and procedures.

2.2 Safety Symbols

The table below lists safety symbols that appear on the MERLIN Interrupter and within this document.

Symbol	Description
	Risk of danger. Important information. See warnings. This provides safety precaution information, that is, information that you need to be careful about to prevent potential problems.
	Hazardous voltage may be present. Danger of electric shock.
	This is a tip. A tip gives you an alternative way to do a particular step or procedure, or lets you know of an option that you may find helpful.
	This is a note. A note often gives additional information, such as what happens when you choose to do or not do a certain action. A note also provides information that may only be applicable to some situations.

2.3 Maximum Switching Voltage and Current

The **MERLIN Interrupter** can switch up to 100VDC or 75VAC. As most transformer rectifier outputs are not true DC it is generally more prudent to work to the AC limits. The maximum load current that can be switched depends upon the ambient temperature:

Maximum Switching Current	Ambient Temperature
40A	-20ºC to 25ºC (-4ºF to 77ºF)
20A	25ºC to 80ºC (77ºF to 176ºF)

WARNING: DO NOT EXCEED THE MAXIMUM SWITCHING CURRENT AS THIS CAN CAUSE IRREPARABLE DAMAGE TO THE UNIT.

2.4 Shunt Output

The shunt housed within the **MERLIN Interrupter** is on the positive side of the switch. This makes the shunt output terminals sit at the same polarity as the **MERLIN Interrupter** positive input.

2.5 Danger of Electric Shock

When using the **MERLIN Interrupter** on transformer rectifiers with an output greater than 30VAC or 60VDC, care should be taken as there is danger of electric shock on the shunt output connection.

2.6 Installation in Confined Spaces

Care should be taken when installing the **MERLIN Interrupter** in a confined space due to overheating. If the unit is to be installed inside a confined space there must be adequate venting to prevent the unit exceeding it's maximum operating temperature.

WARNING: DO NOT MAKE ANY CHANGES OR MODIFICATIONS TO THE EQUIPMENT UNLESS OTHERWISE SPECIFIED IN THIS MANUAL. IF SUCH CHANGES OR MODIFICATIONS ARE MADE, YOU SHOULD STOP OPERATION OF THE EQUIPMENT.

2.7 Disclaimer

If this equipment is used in a manner not specified by Abriox, the protection provided by the equipment may be impaired. Please ensure you follow all guidance for safe and correct use of your equipment.

2.8 Compliance

CE Declaration of Conformity

This product is CE marked which means that Abriox declares that the product or equipment complies with all applicable European Directives. A copy of the Declaration of Conformity can be obtained from Abriox.

2.9 Environment

Abriox believe that we should all tread as lightly on the planet as possible and are committed to continuous environmental improvement. Consideration of the environment begins with the design of our products, and continues through their life cycle from manufacture to end of life. We have made small, but highly considered decisions about the design, manufacture and distribution of our products in order to lessen their environmental impact and will continue to work with manufacturers and suppliers to achieve improvement wherever we can.



WEEE Directive

In the European Union (EU) this symbol indicates that this product is not to be disposed of with your household waste, according to the WEEE Directive (2002/96/EC) and your national law. This product should be handed over to a designated collection point, e.g., on an authorised one-for -one basis when you buy a new similar product or to an authorised collection site for recycling waste electrical and electronic equipment (WEEE). Improper handling of this type of waste could have a possible negative impact on the environment and human health due to potentially hazardous substances that are generally associated with WEEE. At the same time, your cooperation in the correct disposal of this product will contribute to the effective usage of natural resources.

Abriox, as producer of this Electrical/Electronic Equipment, passes all obligations to the End User for subsequent disposal as Waste EEE. In accordance with our Terms and Conditions of Sale, the End User must finance collection, treatment, recycling, recovery and environmentally sound disposal of this EEE when discarded in the UK. However, Abriox operates a take-back service.

Producer Compliance Registration No. WEE/JG0293UR.

3. BEFORE GOING TO SITE

3.1 Installation Housing Requirements

The **MERLIN Interrupter** is not waterproof and must either be fitted inside the transformer rectifier cabinet or, if there is not room, housed in a separate enclosure with adequate venting.

Please refer to the Dimensions in section 7 (page 10) for further details.

3.2 Equipment Check

Make sure you have the following equipment prior to going to site:

Item	Description
MERLIN Interrupter	The MERLIN Interrupter unit.
Mounting kit	Fixing accessories for mounting the MERLIN Interrupter to a panel or wall.
Multi-meter	Digital Volt Meter to check the voltage and current readings on site.
Tool Kit	Tool kit for installation at the site (including PZ2, PZ3 & small flat head screwdriver's).
Crimps	Crimps for connecting 16mm^2 (AWG6) cable to the ring terminals inside the MERLIN Interrupter.
1.5mm Wires	Wires of suitable lengths and colours (1.5mm) for connecting the MERLIN Interrupter to the MERLIN Transformer Rectifier monitor.
16mm^2 (AWG6) Cable	Cable to make CP connection from the transformer rectifier's output through the MERLIN Interrupter to either the positive (anode bed) or negative (pipe) side of the transformer rectifier.
Documents	MERLIN Interrupter Installation Instructions (this document).
Cell / Mobile Phone	For configuration and testing.

4. ON SITE

WARNING: ENSURE YOU ARE FAMILIAR WITH THE SAFETY REGULATIONS OF YOUR COMPANY AND OBSERVE THEM AT ALL TIMES.

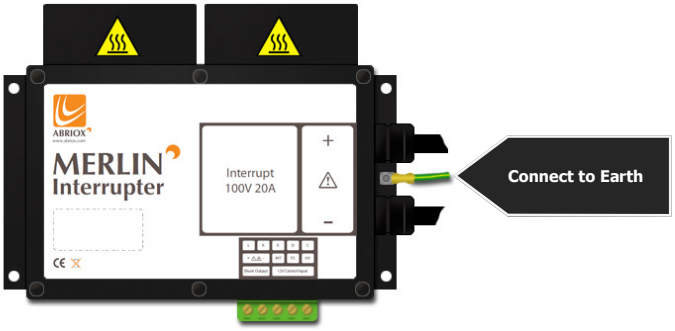
4.1 Housing the MERLIN Interrupter

The **MERLIN Interrupter** has four **5mm** fixing holes that allow it to be screwed to a panel or wall. Please refer to the Dimensions in section 7 (page 10) for further details. Care should be taken when installing the **MERLIN Interrupter** in a confined space due to overheating. If the unit is to be installed inside a confined space there must be adequate venting.

TIP: FOR DIMENSIONS OF THE MOUNTING HOLES, SEE SECTION 7 (PAGE 10).

4.2 Connect the MERLIN Interrupter to Earth

Connect the **MERLIN Interrupter** to a suitable earth point within the transformer rectifier housing or within the enclosure.



4.3 Connect the MERLIN Interrupter to the MERLIN Transformer Rectifier Monitor

Connect the **MERLIN Interrupter** to the **MERLIN Transformer Rectifier monitor** using 1.5mm wire and the supplied connection blocks (using a small flat head screwdriver). Unplugging the connector block can make this part of the install much easier.

Wire*	MERLIN Interrupter	MERLIN TR Monitor	Description	Function
Red	L	L	Positive output	Shunt Output
Black	K	K	Negative output	
Purple	E	E	Interrupt	12 Control Input
Yellow	D	D	Fail Safe	
Black	C	C	0V	

The **MERLIN Interrupter** connector block order is reversed in comparison to the **MERLIN Transformer Rectifier monitor**. This allows a 5 way ribbon cable to be used between both units and yet be folded flat.

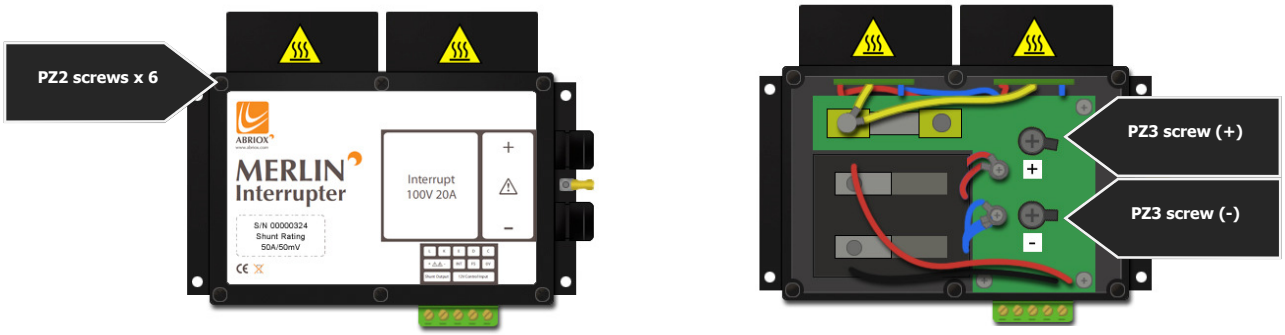
*Colour coding is not required but can aid installation.

TIP: FOR A NEATER INSTALLATION USE 5 WAY RIBBON CABLE FOR CONNECTING THE MERLIN INTERRUPTER TO THE MERLIN TRANSFORMER RECTIFIER MONITOR.

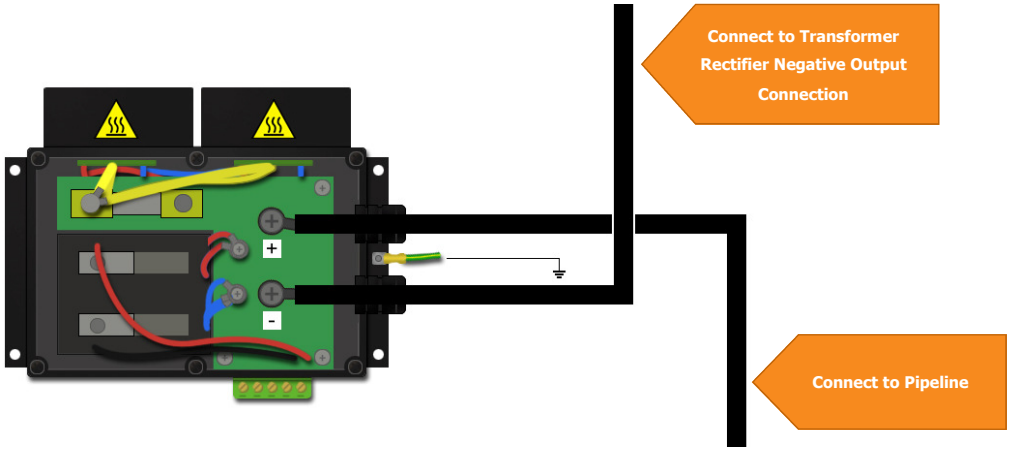
4.4 Connect the MERLIN Interrupter to the Transformer Rectifier

The **MERLIN Interrupter** can be used to switch either the positive or negative side of the transformer rectifier. Typically, where a **single pipeline** is being protected, the **MERLIN Interrupter** is connected to the **negative** output of the transformer rectifier. In installations where there is **more than one pipeline** being protected by a single rectifier, the **MERLIN Interrupter** should be connected to the **positive** output of the transformer rectifier.

With the power isolated, using a **PZ2** screw driver, remove the lid screws (x6) of the **MERLIN Interrupter** and place to one side for safe keeping.



The polarities of the **CP connections** are displayed externally on the **MERLIN Interrupter** label and internally next to the ring terminal contacts for the CP connection cables. Using **16mm²** (AWG6) cable and the supplied **ring terminals** (removed prior to crimping), connect the **MERLIN Interrupter** to the transformer rectifier's **negative output** and the **pipeline** as shown below, tighten the screw terminals to **6Nm** (max).



Once the **CP connections** have been made, tighten the glands to hold the cable in place.

Replace the lid, ensuring the internal earth wire is fully mated. Hand tighten lid screws (x6).

Power can now be switched back on for testing.

TIP: THE MERLIN INTERRUPTER IS POLARISED, IF, ONCE INSTALLED, INTERRUPTION IS NOT SUCCESSFUL, CHECK THE POLARITY OF THE CP CONNECTIONS.

NOTE: ONLY USE A PZ2 OR PZ3 SCREWDRIVER TO TIGHTEN THE POZI PAN SCREWS SUPPLIED. OTHER FIXINGS ARE NOT COMPATIBLE WITH THE MERLIN INTERRUPTER.

4.5 Testing the MERLIN Interrupter

Before leaving site, check the **MERLIN Interrupter** is correctly installed. This is done with power returned to both the **transformer rectifier** and the **MERLIN Transformer Rectifier monitor**.

With power returned, the voltage and current output dials on the transformer rectifier should show the expected readings. This shows that the CP is passing through the **MERLIN Interrupter**.

4.5.1 Take a Reading

A read command can be sent to the **MERLIN Transformer Rectifier monitor** to ensure that all of the monitoring inputs are connected correctly.

To do this, send the text message `CMD:READ` to the telephone number on the front label of the **MERLIN Transformer Rectifier monitor**. The command is not case SenSiTive (i.e. you may use UPPER or lower case text).

Using the shunt rating of the **MERLIN Interrupter** that is given on the bottom left hand side of the units label (below the serial number), the milli-volt read given for the shunt channel can be converted to amps. The result this gives should match the current given by the **Transformer Rectifier** itself.

> **NOTE: THE MERLIN TRANSFORMER RECTIFIER MONITOR MUST BE LOGGED ON TO THE GSM NETWORK IN ORDER TO RECEIVE AND SEND TEXT MESSAGE COMMANDS. FOR FURTHER INFORMATION PLEASE REFER TO THE MERLIN TRANSFORMER RECTIFIER MONITOR USER DOCUMENTATION.**

4.5.2 Check GPS (Optional)

For synchronised interruption a **MERLIN Transformer Rectifier monitor** with GPS is required. On a cold start up, where the **MERLIN Transformer Rectifier monitor** has just been powered up, it can take up to **15 minutes** for the GPS to get a valid location. This time is dependent on the GPS signal strength available; the clearer the view of the sky the faster the unit will find it's valid location.

To find out the status of the GPS in the **MERLIN Transformer Rectifier monitor** send the following command to the telephone number on the front label of the **MERLIN Transformer Rectifier monitor**: `CMD:GPSINFO`

An example message that this command will return is: `CPM:031 UNIT:10000001 GPS VALID:Y LAT:51.4301 LONG:-2.6527 SATELLITES:4 ANTENNA OK:Y`

Along with the **MERLIN Transformer Rectifier monitors** serial number, the GPS status, latitude, longitude, number of satellites the GPS can see and antenna status are given. If GPS VALID is N (no) then interruption is still possible but synchronised interruption (several transformer rectifiers being interrupted on one pipeline at the same time) is not guaranteed. Once GPS VALID becomes Y (yes) then synchronised interruption is guaranteed.

> **NOTE: THE GPS ENABLED MERLIN TRANSFORMER RECTIFIER MONITOR MUST HAVE VALIDATED GPS IN ORDER TO SYNCHRONISE WITH OTHER MERLIN TRANSFORMER RECTIFIER MONITORS.**

4.5.3 Check Interruption

To test the interruption of the CP by the **MERLIN Interrupter** use the interrupt command. Send the following command to the telephone number on the front label of the **MERLIN Transformer Rectifier monitor**: `CMD:INTERRUPT ON:0.8 OFF:0.2`

Once the **MERLIN Transformer Rectifier monitor** has received a valid interruption command it will drive the **MERLIN Interrupter** using the requested timing pattern. The **blue LED** on the **MERLIN Transformer Rectifier monitor** will flash; this shows the off period of the interruption pattern. The pattern should also be seen on the dials of the transformer rectifier, the current dropping each time the CP is interrupted.

To stop interruption send an interrupt end command to the **MERLIN Transformer Rectifier monitor**: `CMD:INTERRUPT END`

With the **MERLIN Interrupter** installed and tested, the cabinet/enclosure can be locked up to finish the installation.

5. POST SITE CONFIGURATION

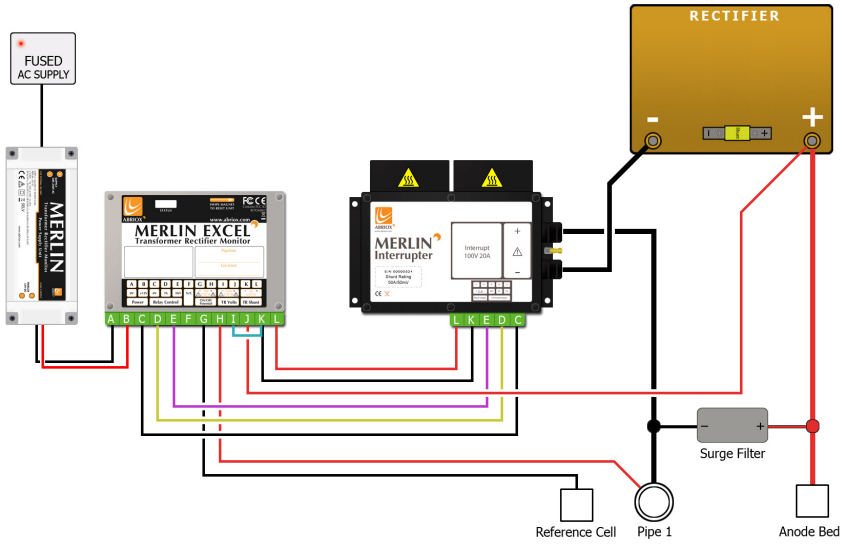
To check/configure the shunt value on the **MERLIN Transformer Rectifier monitor**, launch CPSM or iCPSM (depending on what system you use).

With the correct **MERLIN Transformer Rectifier monitor** highlighted go to "Properties". Select the "Scaling tab" and enter the shunt values in the voltage and current fields. You can select millivolts/Volts and milliamps/Amps from the drop-down menus.

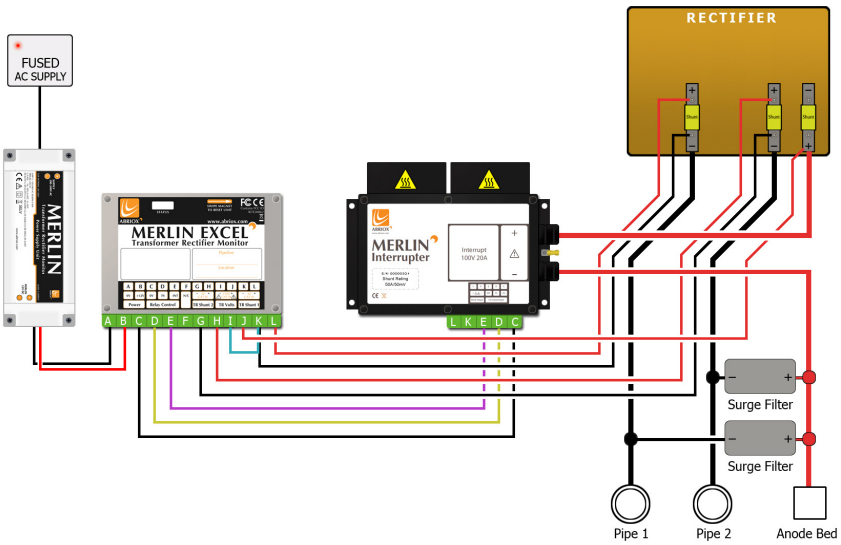
When the shunt information has been entered, click the "Update Now" button. An acknowledgement message will be received. You can now close this window.

6. INSTALLATION EXAMPLES

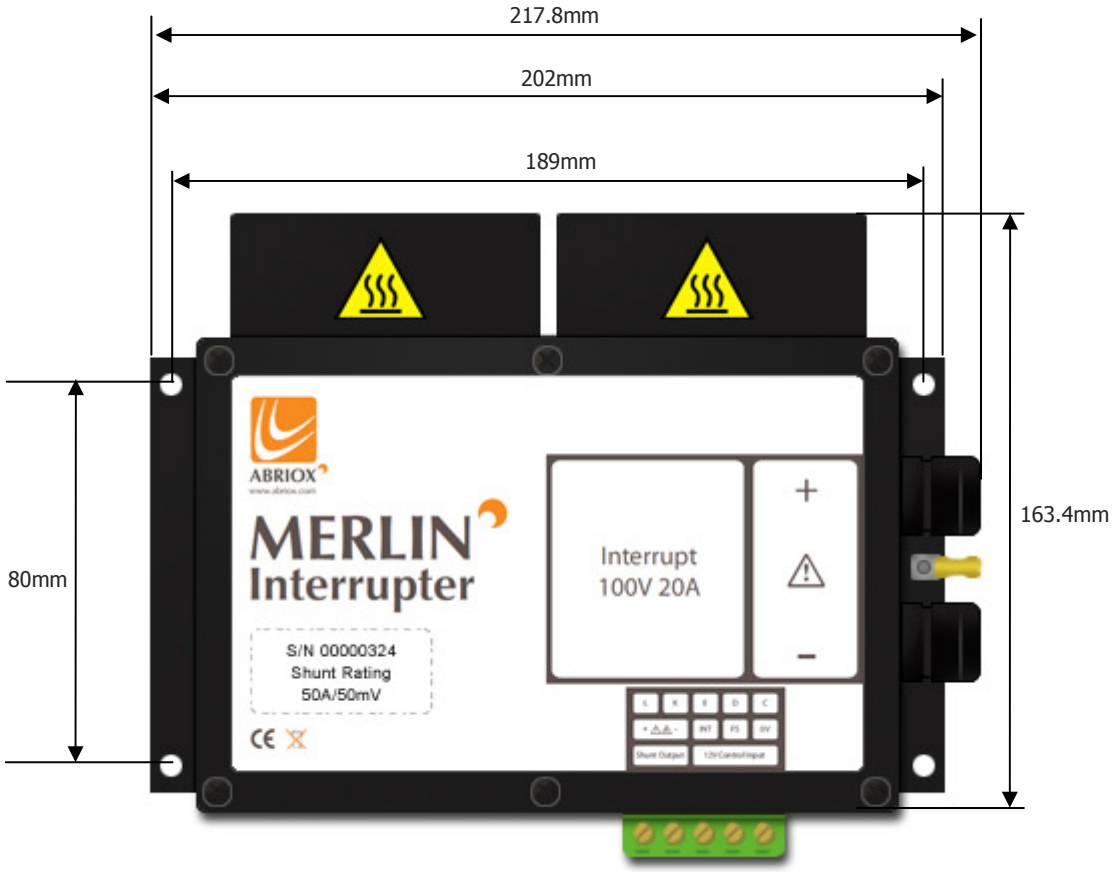
6.1 MERLIN Excel with MERLIN Interrupter (Negative Switching)

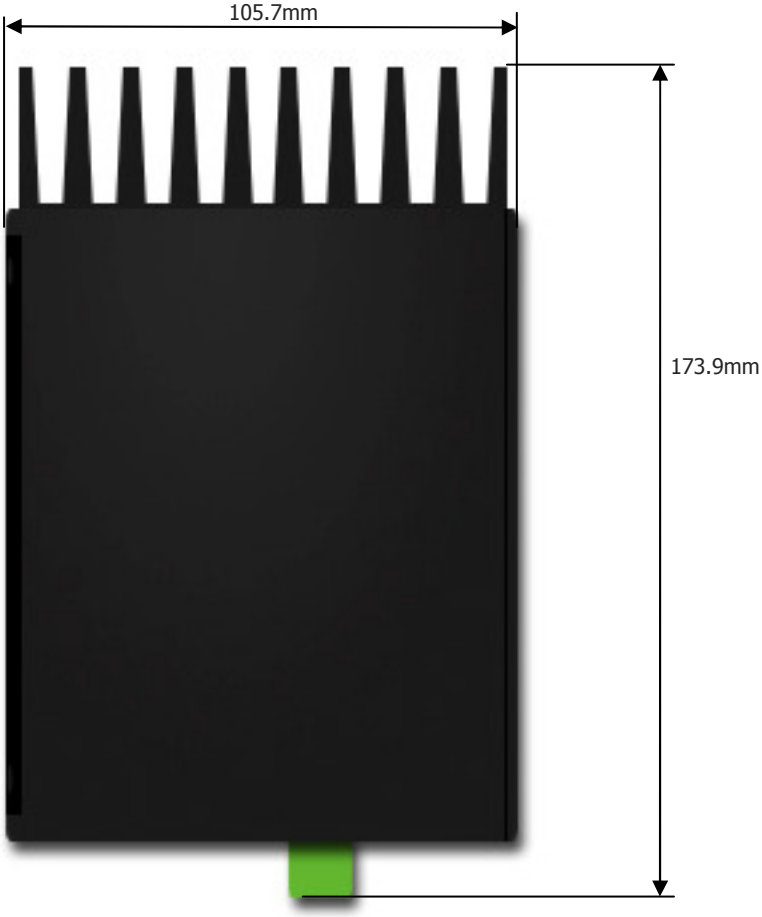


6.2 MERLIN Excel Dual Current with MERLIN Interrupter (Positive Switching)



7. DIMENSIONS





8. NOTES