

Earth-Rite® II RTR

Static Earthing System

For use on 110-120 Volt and 220-240 Volt AC Supplies

Installation & Operating Instructions



 II 2 (1) GD

Model: ER11 - June 11



The safety of any system incorporating the equipment referred to in this manual is the responsibility of the installer of the system.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Any warranty is made void if the equipment is not installed, or used, in accordance with the manufacturers instructions.

Earth-Rite II

Static Earth Monitoring System

System using an Exd IIC Control Unit

Tri-Mode

The **Earth-Rite II RTR** system operates using “Tri-Mode” technology which uses the electrical capacitance of the road tanker to ensure the presence of an affective Static Earth Point to which the road tanker is connected. It also monitors that the clamp is connected to a road tanker rather than directly to earthed structures or isolated items of metal. Once permissive, the system continues to monitor the resistive loop circuit from tanker to the Static Earth Point.

The **Earth-Rite II RTR** is a **Tri-Mode** system (capacitive / resistive monitoring), it is intended for use with Road Tankers. It is set to show permissive only when the system detects the presence of a road tanker and when the connection to earth is less than 10 Ohms nominal resistance. Until this condition is achieved, the system remains non-permissive.

A device known as the RTR Tester is available to allow the Earth-Rite II RTR to switch to permissive for test purposes when a road tanker is not present.

Installation

The installation shall be carried out by suitably trained personnel in accordance with the relevant sections of IEC 60079 and EN 60079.

All cables entering the monitoring unit must be connected through approved cable glands in accordance with EN 60079-14

The glands should be fitted in such a way as to maintain the ingress protection rating of the enclosure.

The system should be connected as per the enclosed installation drawings.

The Earth-Rite II system should be powered from 110-120 Volts or 220-240 Volts 50Hz.

The system should be protected using a 2A fast blow fuse, or Miniature Circuit Breaker, mounted in the distribution board / fuse box.

The monitoring unit should be mounted, with the indicator window facing away from direct sunlight, at a convenient location, visible to the operator.

The lid of the Monitoring Unit enclosure is removed by rotating it in an anti-clockwise direction. A pair of tools, which locate in the two holes in the lid, are provided to assist in this operation.

After installation of wiring, secure the cover to the body making sure it is tight.

For correct operation, the cable between the Junction Box (or Cable Reel) and the Monitoring Unit must not exceed 3m in length. If the cable is to be less than 3m in length, an approved barrier (compound-filled) gland shall be used. Refer to the latest edition of IEC 60079-14 or EN 60079-14 for more information.

Note: It is recommended that the transfer operation is interlocked with the contacts of the Earth-Rite II unit. This will ensure that the operation is stopped if the earth connection is inadvertently lost.

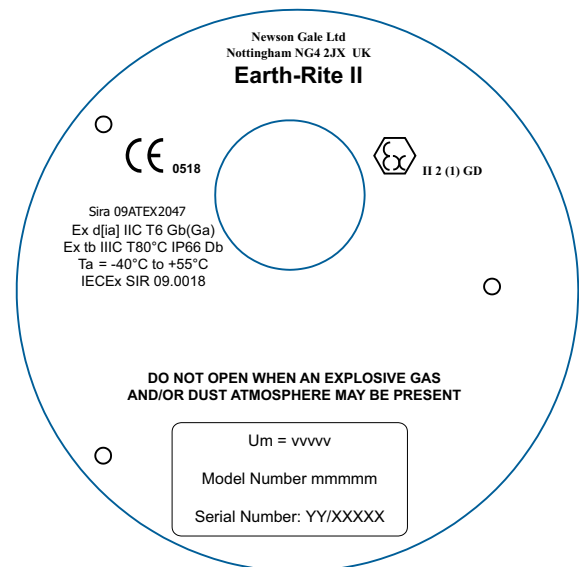
Maintenance: Periodically check exterior of enclosure for damage.

IF YOU ARE IN ANY QUERIES REGARDING THE ABOVE POINTS THEN PLEASE CONTACT NEWSON GALE, OR THEIR APPROVED DISTRIBUTOR, WITHOUT DELAY

RTR Tester

A device known as the RTR Tester is available to allow the Earth-Rite II RTR to switch to permissive for test purposes when a road tanker is not present.

Certification Label Detail



This label is fitted behind the window of the Earth-Rite II Exd enclosure

Other Approvals

Functional Safety

The Earth-Rite II has been given a SIL (Safety Integrity Level) rating of 2.

Electromagnetic Compatibility

The Earth-Rite II has been tested and shown conformity to European Directive 2004/108/EC, and FCC Part 15 Emissions.

Conformity has been proven to BS EN 61000-6-3 and BS EN 61000-6-2.

Customer Supplied Cable Specification

Recommended Specification

Cable from ERII Monitoring Unit to ERII Junction Box

1.0mm² 2 core Cable with blue sheath or identifier (IS Circuit). **Length: Please refer to page 2.**

Cable from ERII Unit to Pump Starter

1.0mm² 2 core cable + Earth

Cable from Supply to the ERII Unit

1.0mm² 2 core cable + Earth

Cables from ERII Unit to Site Static Earthing Point

4mm² single core cable with green sheath.

Cable from ERII Unit to optional Mode Selector Key Switch

1.0mm² 2 core cable (IS circuit). **Length: 3m or more.**

NOTE: Cables must be secured close to the enclosure in order to prevent them being accidentally pulled out.

Cable Glands

Please refer to the latest edition of IEC 60079-14 or EN 60079-14 for more information on suitable cable glands and acceptable cable lengths.

IF YOU ARE IN ANY DOUBT REGARDING THE INSTALLATION THEN PLEASE CONTACT NEWSON GALE, OR THEIR APPROVED DISTRIBUTOR, WITHOUT DELAY.

Optional Mode Selector Key Switch

The switch allows the ERII system to be used for grounding both road tanker and other items of plant.

Key Switch Positions

In the normal OFF position (with key removed) the system is designed to operate with road tankers only. This is the safest option for road tankers as it monitors the capacitance and resistance of the road tanker with respect to ground.

In the ON position (with key held in the switch unit) the system is designed to operate with any item of conductive metal plant, e.g. railcars, drums and IBCs, and other items of low conductivity plant (<10 ohms).

This option monitors the resistance of the plant item with respect to the site static bonding bar / tape.

RTR (TRI-MODE) Operation

In the normal quiescent state, with clamp stowed on the insulated pin, the Red Negative Ground Connection LED will show.

Attach the earthing clamp onto the tanker, at a suitable position, and ensure that both of the pointed contacts are positively located.

If the connection is healthy then the Green Positive Ground Connection LEDs will flash and the interlock contacts will close.

The product transfer operation can now take place.

If the earth connection is broken during the transfer / mixing operation then the Red Negative Ground Connection LED will show and the interlock contacts will open.

On completion the earthing clamp should be removed from the tanker and stowed on the insulated pin on the front of the junction box. The Red Negative Ground Connection LED will show.

Important Note - The earthing clamp should be fitted prior to any other operation as per the recommendations of IEC TS 60079-32-1, CLC/TR: 60079-32-1, NFPA 77 and API RP 2003. It is important that the clamp is fitted before hoses are connected to the road tanker and before articulated trailer legs are deployed.

Advanced Safety Feature

The Earth-Rite II RTR has a System Reboot facility in response to Power Outages. This safety feature is designed to maintain high site safety during interlocked transfer operations using hoses. Should the mains supply be lost during the transfer process, the system will become non-permissive and the transfer operation will stop.

The following procedure will ensure that the system can safely continue to monitor the clamp connection following a Power Outage situation:

1 Attach the clamp to the tanker in the same position as it was originally attached.

2 Turn OFF the supply to the ERII system.

3 Wait 10 seconds.

4 Turn ON the supply to the ERII system.

The system should become permissive as indicated by the green flashing LEDs.

The benefits of the System Reboot facility also apply to the situation where the clamp is accidentally removed during the transfer process and the system goes non-permissive. If this happens, the above procedure should be used to allow the transfer operation to continue safely.

Exd Monitoring Unit

Copper-free Cast-aluminium Enclosure

Installation & Maintenance Instructions

The lid of the enclosure is removed by rotating it in an anti-clockwise direction. A pair of tools, which locate in the two holes in the lid, can be provided to assist in this operation.

After installation of wiring, secure the cover to the body making sure it is fully tightened.

Periodically check exterior of enclosure for damage or deterioration.

IF YOU HAVE ANY QUERIES REGARDING THE ABOVE POINTS THEN PLEASE CONTACT NEWSON GALE, OR THEIR APPROVED DISTRIBUTOR, WITHOUT DELAY.

Troubleshooting at the time of Installation – Earth-Rite II - RTR Tri-Mode System

Before contacting Newson Gale please check the following points:-

Symptom: Red and/or Green LEDs are NOT showing

Check that the system is installed in accordance with the supplied manual.

Check that there is power to the monitoring unit, and that it is the correct voltage.

Caution - Ensure all Health & Safety precautions are taken during the above procedures.

Symptom: System is NOT switching to permissive state when clamp is fitted to road tanker (RED LED continues to show).

Check that the system is installed in accordance with the supplied manual.

Check that a hose is not connected to the road tanker and that there is no accidental contact between the tanker and ground with items such as loading arms, ladders, railings, gates etc. Ensure that the trailer (where applicable) does not have support legs deployed.

Check correct operation using the RTR Tester.

Check That the grounding clamp is in good condition: that the contacts are level with each other, sharp and not loose.

Caution - Ensure all Health & Safety precautions are taken during the above procedures.

If the system still does not switch to permissive state when clamp is fitted to road tanker please contact Newson Gale and confirm the following:-

Serial number _____

Company which ordered the system

Date of order _____

Any other information

Please contact Newson Gale Ltd if you require a translation of this manual.

Component Identification – **EARTH-RITE II SYSTEM**

Earth-Rite II RTR MONITORING PCB



VAC - FORM INSULATING COVER



AC POWER SUPPLY PCB

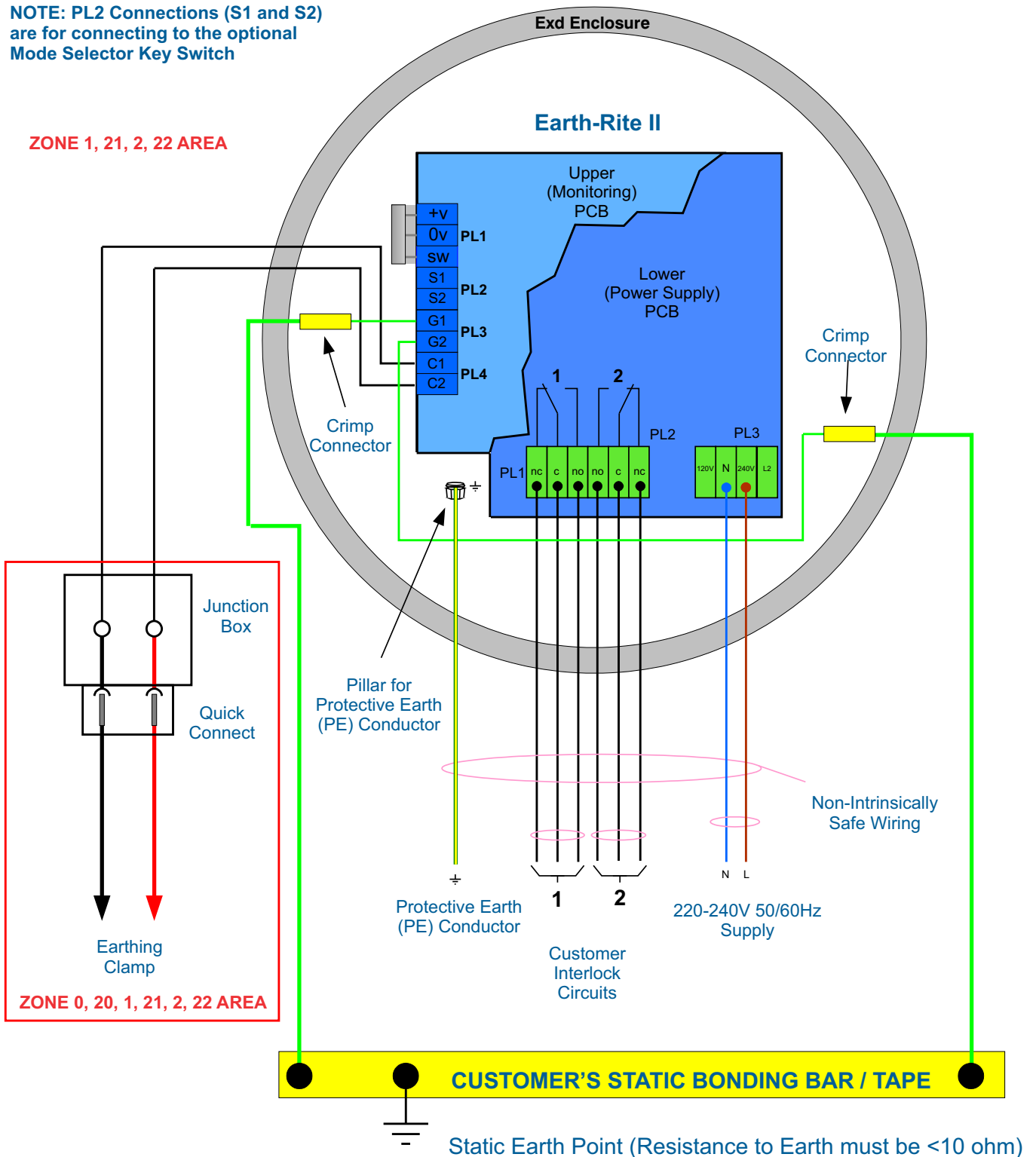


Earth-Rite II RTR

Cable Connections - AC Version

220-240V 50/60Hz Live and Neutral Supply

NOTE: PL2 Connections (S1 and S2) are for connecting to the optional Mode Selector Key Switch



Verification of the Static Earth Point

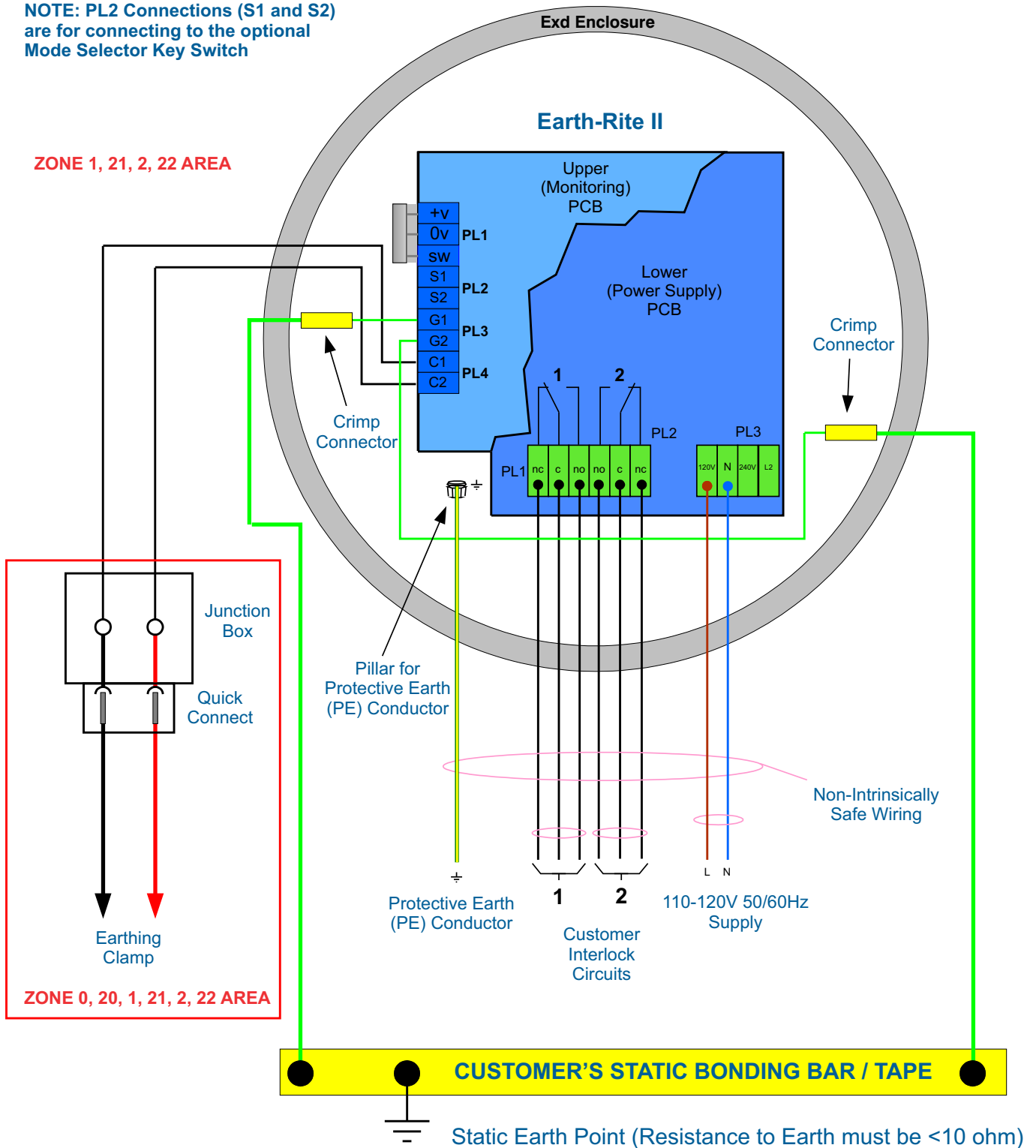
The system monitors the static dissipation path, from the object to which the Static Earth Clamp or lead is connected to, as far as the Static Earth Point. It is the responsibility of the end user to provide the Static Earth Point and ensure that it is suitable for dissipating electrostatic charges.

Earth-Rite II RTR

Cable Connections - AC Version

110-120V 50/60Hz Live and Neutral Supply

NOTE: PL2 Connections (S1 and S2) are for connecting to the optional Mode Selector Key Switch

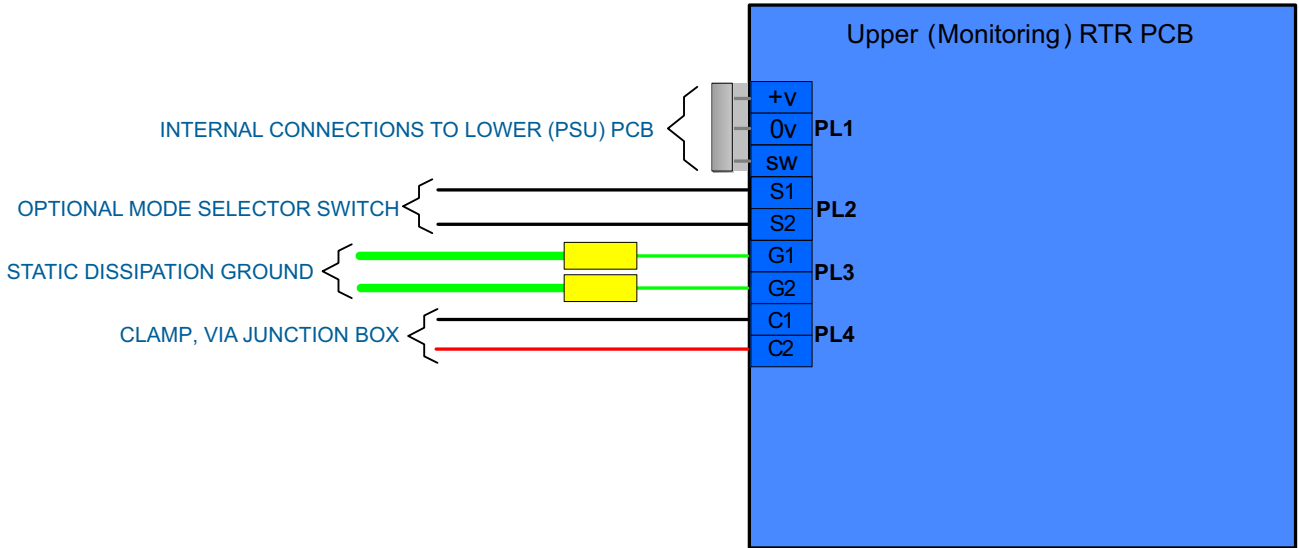


Verification of the Static Earth Point

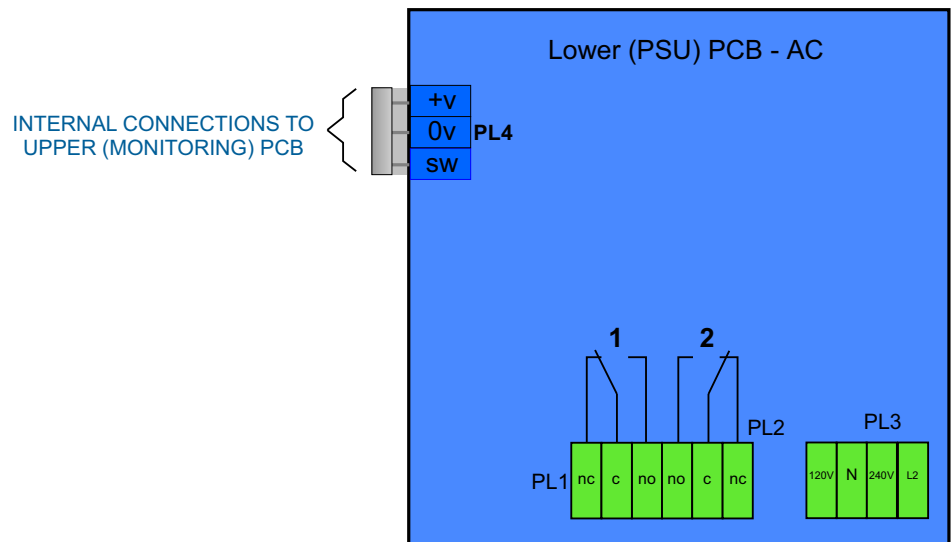
The system monitors the static dissipation path, from the object to which the Static Earth Clamp or lead is connected to, as far as the Static Earth Point. It is the responsibility of the end user to provide the Static Earth Point and ensure that it is suitable for dissipating electrostatic charges.

Intrinsically Safe PCB Connections

Monitoring PCB



POWER SUPPLY PCB

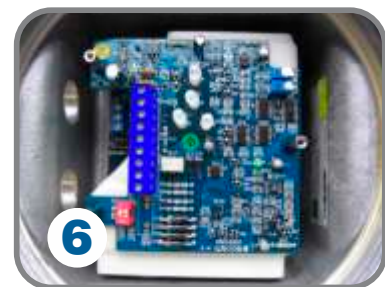


Internal Component Assembly



Metal Pillars

Insulated Pillar



Internal Component Assembly

Always observe precautions against damage to the PCB's from electrostatic discharge.

1. Remove the lid of the enclosure and remove the blue approval label. This can be achieved by unscrewing the left-hand screws 4 revolutions anti-clockwise and removing the right-hand screw completely.
2. Disconnect the three wires, of the ribbon cable, from the terminal block. Remove the monitoring PCB by unscrewing the three hexagonal metal pillars. Place the PCB in the anti-static bag provided and keep it safe.
3. Remove the vac-form insulating cover.
4. Install the various cables into the enclosure using suitable glands. Make the connections to the Power Supply PCB.
5. Replace the vac-form insulating cover.
6. Replace the monitoring PCB and secure using the three hexagonal metal pillars. Re-connect the ribbon cable and make the external I.S. wiring connections into the Terminal block.
7. Replace the blue approval label and secure using the screws provided. Replace the lid of the enclosure securely.

Avoiding Electrostatic Discharge (ESD) damage to the ERII monitoring PCB /Card

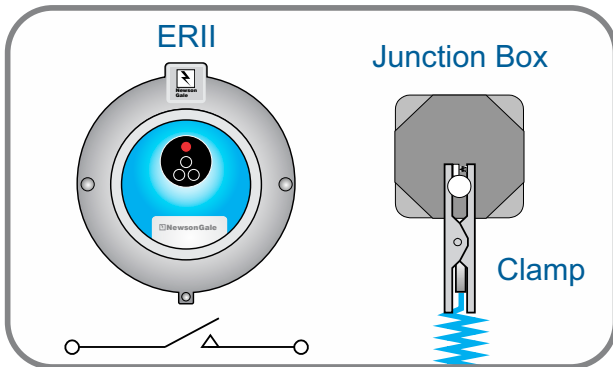
Always take precautions to ensure that you are not electrostatically charged whilst handling the monitoring PCB / Card.

Always handle the PCB / Card by the edges, or terminal block, and avoid touching the components.

When not fitted inside the ERII enclosure, always keep the PCB / Card in the static dissipative bag provided.

Operation - RTR Tri-Mode

Note: The Earthing Clamp should be fitted prior to fitting hoses, or any other operation.



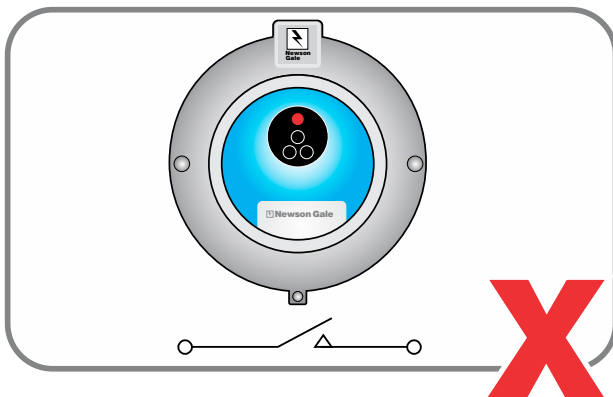
A. In the normal "rest" state, with the Earthing Clamp stowed on the insulated pin, the **Red** Negative Earth Condition LED will be showing.



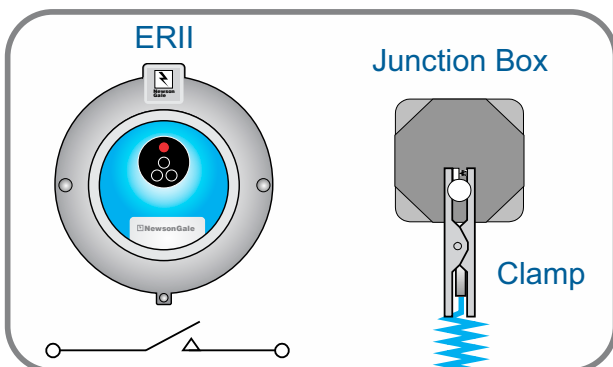
B. Attach the Earthing Clamp onto the Road Tanker at a suitable point which is in contact with the tank/frame and ensure that the pointed contacts are positively located.

If the connection to the Road Tanker and Earth is good, then the **Green** Positive Earth Condition LEDs will flash and the interlock contacts will close.

The product transfer operation can now take place.



C. If the connection between the Road Tanker and Earth is broken during the transfer operation, then the **Red** Negative Earth Condition LED will show and the interlock contacts will open.

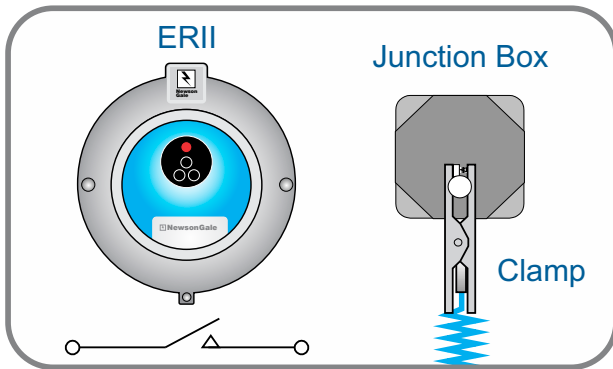


D. On completion the clamp should be removed from the tanker and stowed on the insulated pin on the front of the junction box. The **Red** Negative Earth Condition LED will show.

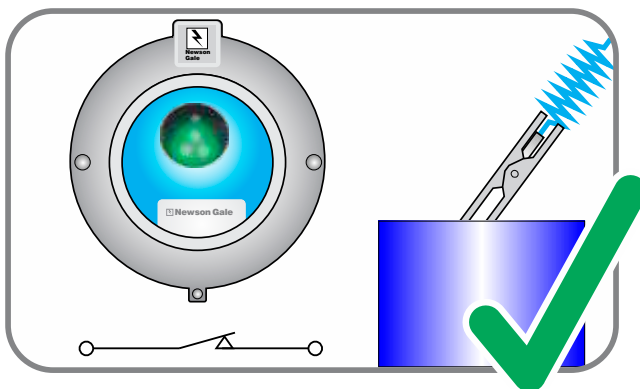
Operation

With system switched to Single-Mode using the Mode Selector Key Switch

Note: The Earthing Clamp should be fitted prior to fitting hoses, or any other operation.



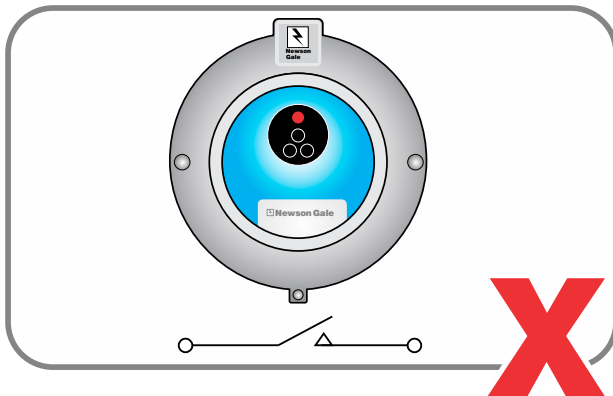
A. In the normal "rest" state, with the Earthing Clamp stowed on the insulated pin, the **Red** Negative Earth Condition LED will be showing.



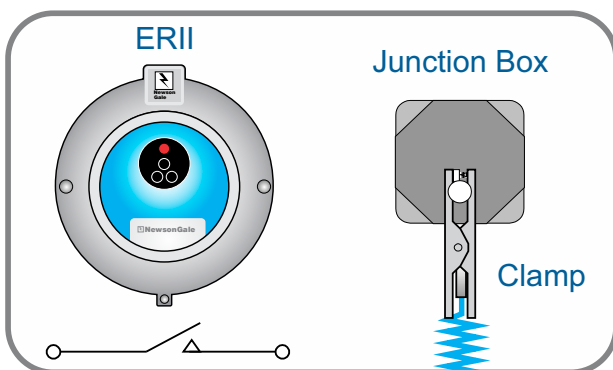
B. Attach the Earthing Clamp onto the conductive plant item at a suitable point and ensure that the pointed contacts are positively located.

If the connection to the plant item and Earth is good, then the **Green** Positive Earth Condition LEDs will flash and the interlock contacts will close.

The product transfer / mixing operation can now take place.



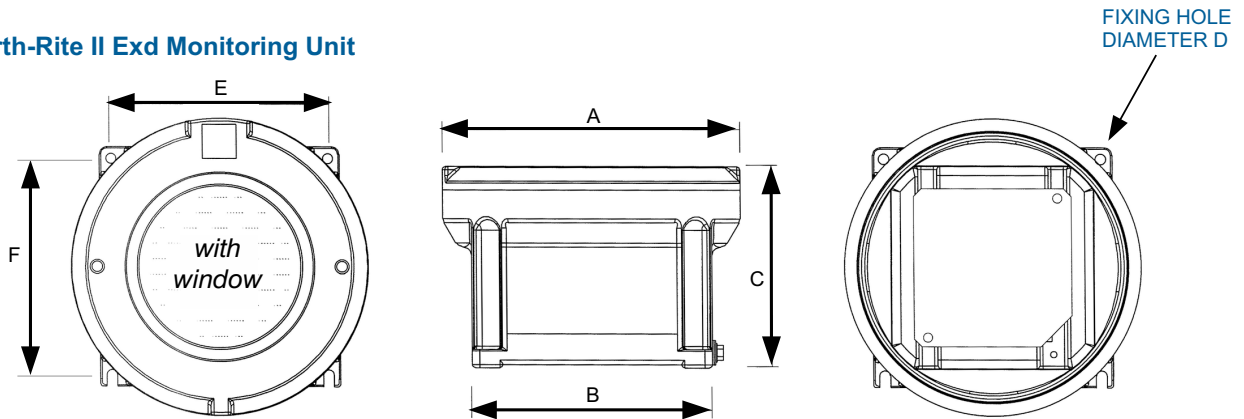
C. If the connection between the plant item and Earth is broken during the transfer operation, then the **Red** Negative Earth Condition LED will show and the interlock contacts will open.



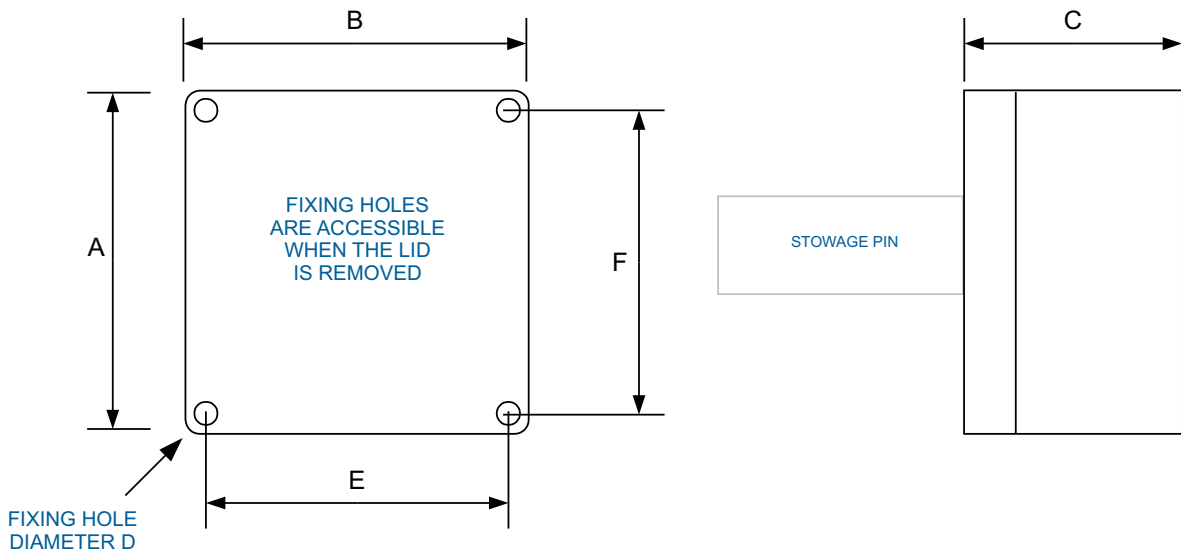
D. On completion the Earthing Clamp should be removed from the plant item and stowed on the insulated pin on the front of the junction box. The **Red** Negative Earth Condition LED will show.

Earth-Rite ERII Dimensions

Earth-Rite II Exd Monitoring Unit



Junction Box



PRODUCT DESCRIPTION	MAIN DIMENSIONS			FIXING DIMENSIONS		
	A mm	B mm	C mm	D mm	E mm	F mm
Exd Earth-Rite II Monitoring Unit	192	155	132	7	140	140
Junction Box with Stowage Pin	75	80	57	4.5	68	45

Earth-Rite II - AC Technical Specification

Monitoring Unit

Power supply	230/240V 50Hz system (Supply voltage range: 216V to 250V) 110/120V 50Hz system (Supply voltage range: 108V to 125V)
Power rating	10 watt
Ambient temperature range	-40°C to +55°C
Ingress protection	IP66
Weight	4.5 kgs (nett)
Construction	Copper-free cast-alloy
Certification	Ex d[ia] IIC T6 Gb(Ga) Ex tb IIIC T80°C IP66 Db Ta = -40°C to +55°C
Monitoring circuit	Intrinsically safe
Minimum tanker capacitance	1000 pF
Operational series ground resistance	</= 10 Ohm
Output Relay contact rating	2 off voltage free change-over switch contacts, 250Vac, 5A, 500VA max resistive 30Vdc, 2A, 60W max resistive
Cable entries	7 x M20 (2 x plugged)

Junction box/stowage point

Enclosure	GRP with carbon loading
Terminals	2 x 2.5mm ² conductor capacity
Stowage device	Insulated pin
Cable entries	1 x 20mm
Clamp Cable Connection	Quick Connect

Earthing Clamp

Clamp design	2 pole with tungsten carbide contacts
Body	Stainless steel

Spiral Cable

Cover	Blue Cen-Stat Hytrel sheath (Static dissipative, chemical & abrasion resistant)
Conductors	2 x 1.00mm ² copper
Length	10 metres extended, 1 metre unextended (other options available)

Optional Mode Selector Key Switch Unit

Certification	Simple Apparatus
Construction	Glass Reinforced Polyester
Cable entry	1 x M20

NB: In line with our policy of continual product development, we reserve the right to alter specifications at any time.

User instructions in compliance with IEC 60079-0:2007 clause 30

The following instructions apply to the **Earth-Rite II Earth Monitoring Unit, Ex d[ia]**, covered by certificate numbers **IECEx SIR 09.0018** and **Sira 09ATEX2047**.

Instructions for **safe selection, installation, use, maintenance and repair**

The equipment may be used in zones 1, 2, 21 and 22 with flammable gases and dusts.

The equipment may be used in the presence of flammable gases and vapours with apparatus groups IIC or IIB or IIA and with temperature classes T1 or T2 or T3 or T4 or T5 or T6.

The equipment may be used in the presence of flammable dusts, powders and flyings, conductive or non-conductive, the only limitation being the maximum external surface temperature of 80°C.

The equipment is certified for use in ambient temperatures in the range of -40°C to +55°C and should not be used outside this range.

The equipment is to be installed by suitably trained personnel in accordance with the applicable code of practice (typically IEC/EN 60079-14).

Protective insulated plugs are fitted to help prevent the supply cables from being connected to the wrong terminals. Check which supply voltage is required and remove the plug from that terminal only.

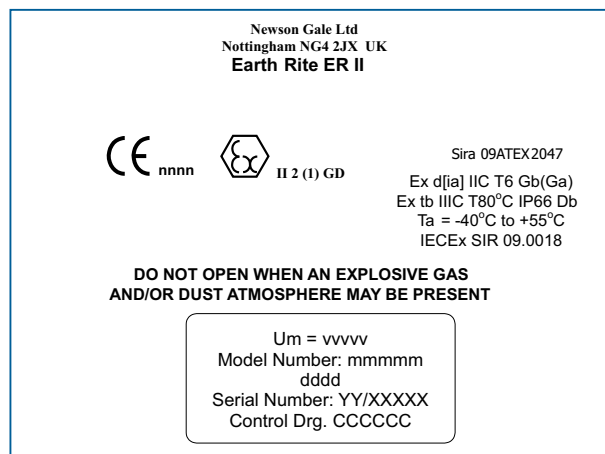
No user adjustment is required.

Regular periodic inspection of the equipment should be performed by suitably trained personnel in accordance with the applicable code of practice (typically IEC/EN 60079-17) to ensure it is maintained in a satisfactory condition.

The equipment is not intended to be repaired by the user. Repair of the equipment is to be carried out by the manufacturer, or their approved agents, in accordance with the applicable code of practice.

The equipment contains no user-replaceable parts.

Certification Label Detail



Intrinsically safe output at PL3/PL4 combined:

Tri-Mode: $U_o = 8.61V$, $I_o = 0.060A$, $P_o = 0.129W$, $C_o = 1.0\mu F$, $L_o = 9868\mu H$

NOTE:

vvvvv = UM = 125/250Vac
mmmmm = RTRMEA
dddd = RTR
YY = Year of Manufacture
XXXXX = Specific Serial Number
CCCCC = ERII-Q-09246-2 AI

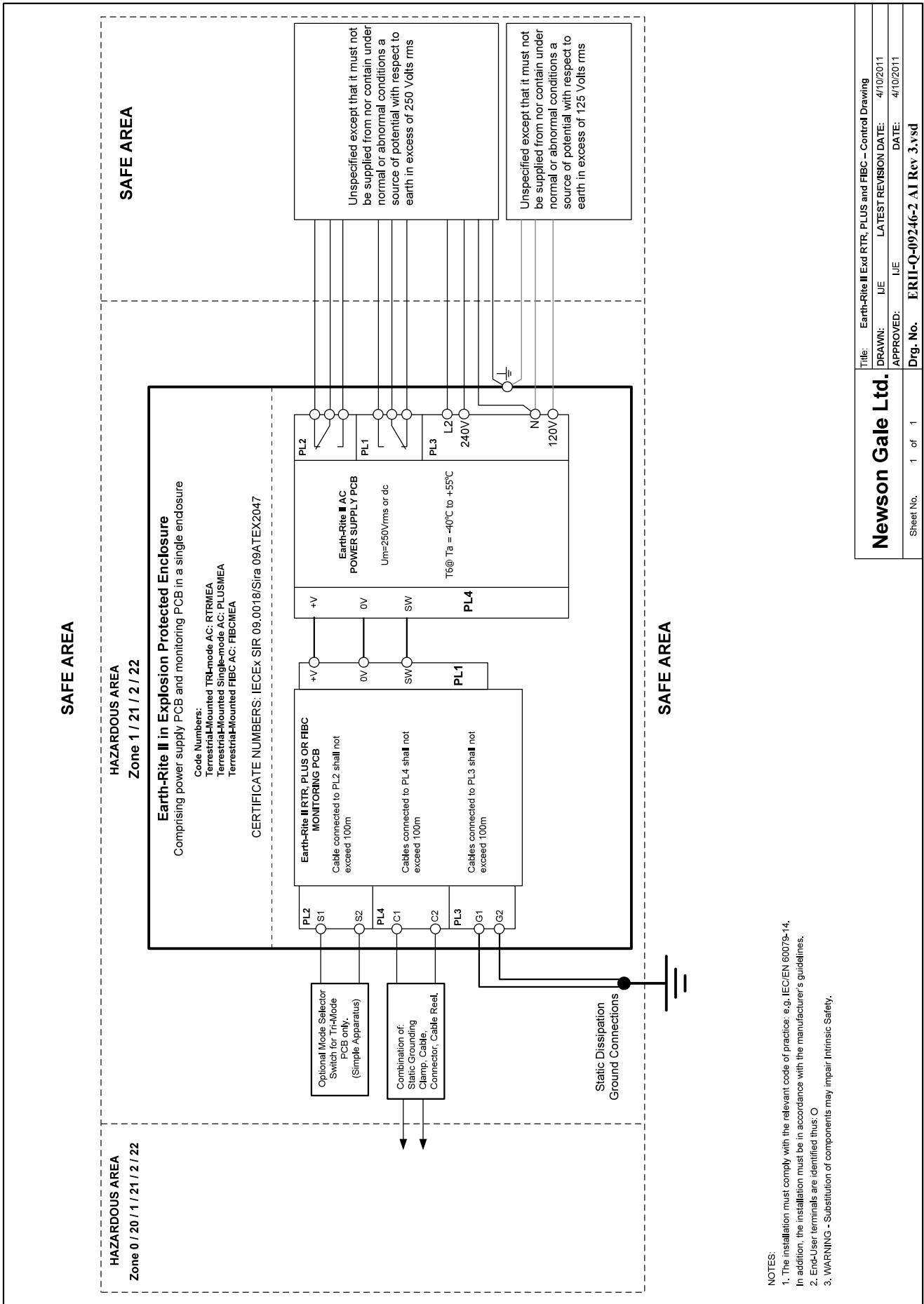
Verification of the Static Earthing Point

The system monitors the static dissipation path, from the object to which the Static Earthing Clamp or lead is connected to, as far as the Static Earthing Point.

It is the responsibility of the end user to provide the Static Earthing Point and ensure that it is suitable for dissipating electrostatic charges. Reference to ATEX 2014/34/EU, ATEX 137, EN 60079-14, IEC TS 60079-32-1, CLC/TR: 60079-32-1, or other equivalent international standard, will give guidance on the installation of a suitable Static Earthing Point.

The above does not apply to any system used to monitor a bond connection only.

IF YOU HAVE ANY QUERIES REGARDING THE ABOVE POINTS THEN PLEASE CONTACT NEWSON GALE WITHOUT DELAY.



- NOTES:
1. The installation must comply with the relevant code of practice: e.g. IEC/EN 60079-14. In addition, the installation must be in accordance with the manufacturer's guidelines.
 2. End-User terminals are identified thus: O
 3. WARNING - Substitution of components may impair Intrinsic Safety.



Earth-Rite II



Important

The cables must enter the enclosure through the entries as shown to ensure certification is maintained.

Always use correctly specified and certified cable glands or conduit fittings.

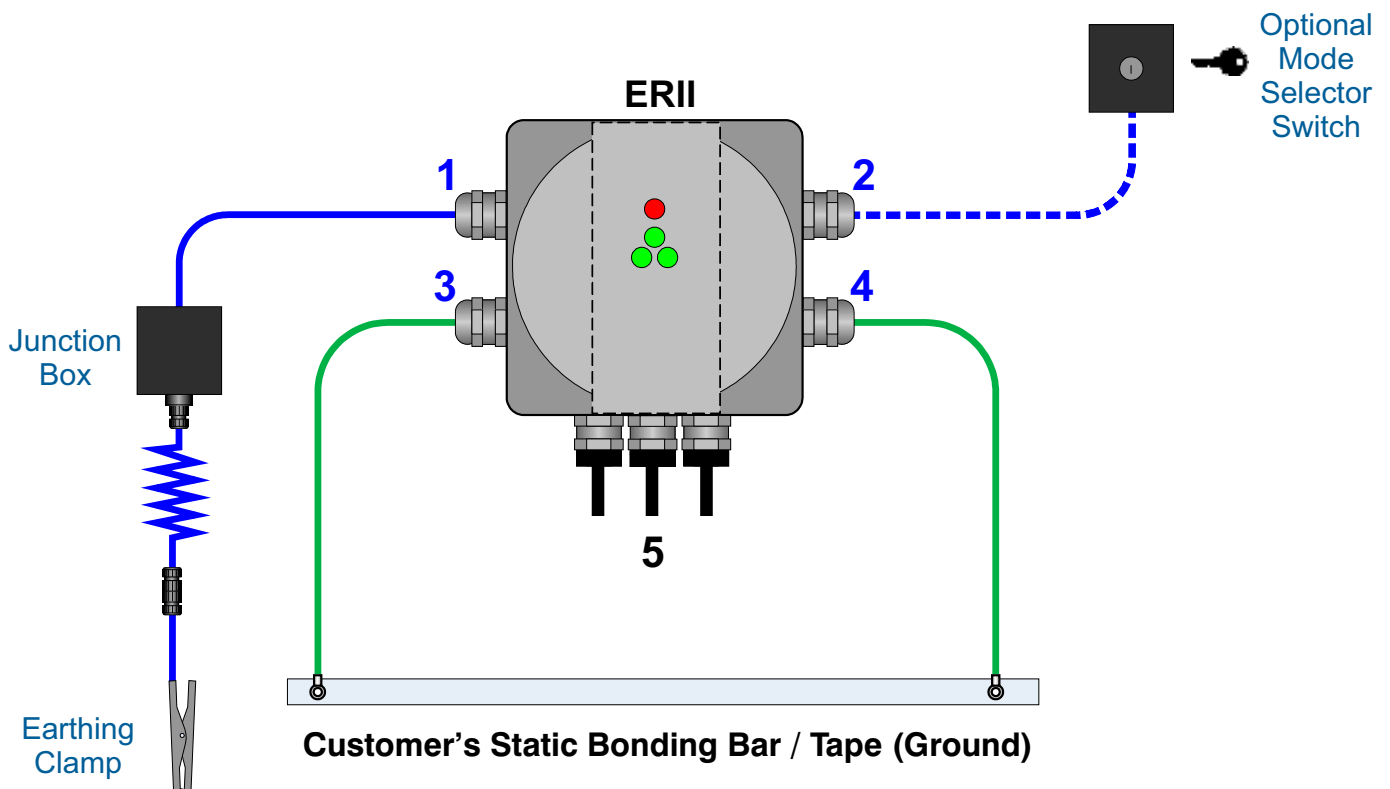
You will invalidate the certification if you do not install as per the instructions

1. CABLE ENTRY FOR CLAMP CIRCUIT CABLE (FROM MONITORING PCB TERMINALS C1 AND C2).
2. CABLE ENTRY FOR CONNECTION CABLE TO THE OPTIONAL MODE SELECTOR KEY SWITCH (FROM TERMINALS S1 AND S2).
3. CABLE ENTRY FOR GROUND CONNECTION CABLE (FROM MONITORING PCB TERMINAL G1).
4. CABLE ENTRY FOR GROUND CONNECTION CABLE (FROM MONITORING PCB TERMINAL G2).
5. CABLE ENTRIES FOR NON-INTRINSICALLY SAFE CABLES (FROM POWER SUPPLY PCB TERMINAL BLOCKS PL1, PL2, PL3 AND PROTECTIVE EARTH TERMINAL).

Earth-Rite II RTR Cable Considerations

The use of conduit, armoured, braided or screened cable between the monitoring unit and junction box will affect the factory set permissive threshold of the Earth Rite II RTR / MGV system and is not recommended.

Where regulations insist on its use, conduit, armoured or braided cable should have a maximum length of 1 metre (3') between the monitoring unit and junction box.



Avoiding Electrostatic Discharge (ESD) damage to the ERII monitoring PCB / Card



- Always take precautions to ensure that you are not electrostatically charged whilst handling the monitoring PCB / Card.
- Always handle the PCB / Card by the edges, or terminal block, and avoid touching the components.
- When not fitted inside the ERII enclosure, always keep the PCB / Card in the static dissipative bag provided.

United Kingdom
Newson Gale Ltd
Omega House
Private Road 8
Colwick, Nottingham
NG4 2JX, UK
+44 (0)115 940 7500
groundit@newson-gale.co.uk

Deutschland
IEP Technologies GmbH
Kaiserswerther Str. 85C
40878 Ratingen
Germany
+49 (0)2102 5889 0
erdung@newson-gale.de

United States
IEP Technologies LLC
417-1 South Street
Marlborough, MA 01752
USA
+1 732 961 7610
groundit@newson-gale.com

South East Asia
Newson Gale S.E.A. Pte Ltd
136 Joo Seng Road, #03-01
Singapore
368360
+65 6704 9461
ngsea@newson-gale.com



www.newson-gale.co.uk