



Safety Instructions – MW – Zone 20/21, Zone 21



IECEX

Gladiator Microwave Switch

HAWK G1 Microwave Switch Series
HAWK Gen 3 Microwave Switch Series



IECEX Zone 20/21, Zone 21

Dust proof Enclosure

IECEX TSA 16.0005X
Ex ta tb IIIC T* Da Db
IP 66



Equipment types:

G1XX

G1 Microwave Switch Series

GMSXX / GMRXX

Gen 3 Microwave Switch Series

Including other variations and accessories

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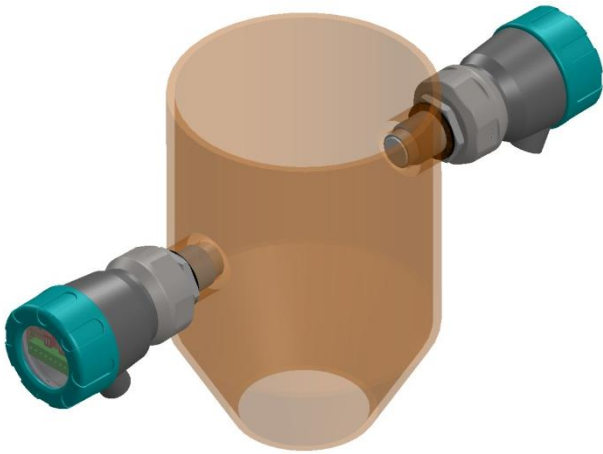
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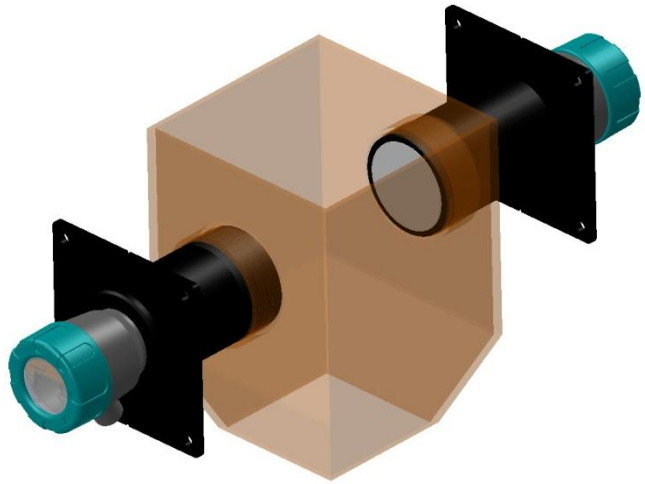
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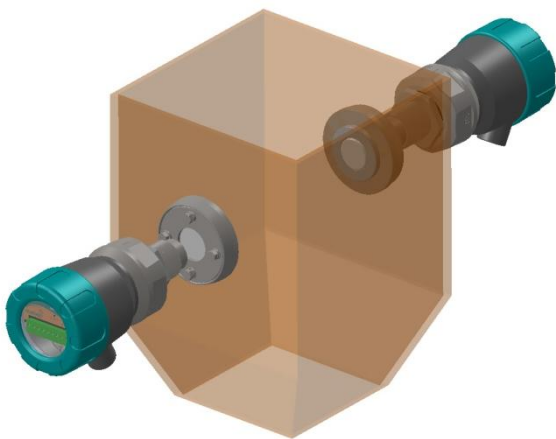
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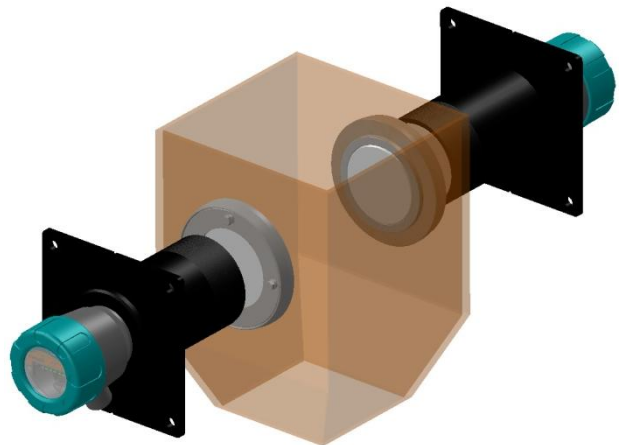
G1 Gladiator Microwave Switch Series



Gen 3 Gladiator Microwave Switch Series



G1 Gladiator Microwave Switch with Weldment Window



Gen 3 Gladiator Microwave Switch with Weldment Window

1. General

This document provides safety instructions for HAWK's Gladiator Microwave Switch (Gen 3 / G1) Series equipment, which is a level and barrier detection instrument

Hawk Gladiator Microwave Switch series equipment is used for presence/absence detection, Material flow and Moisture Content of materials. Each of the equipment comprises of Sender and a Receiver as a pair, Sender transmits a Microwave pulse which is received by the Receiver. If the RF pulse is disturbed or blocked between the Sender and Receiver the unit will trigger an in built relay or transmit analogue reading for process control and automation purposes.

Gladiator Microwave unit consist of an Antenna with window and Electronics and control circuits mounted in a Dust protected housing.

Units are usually mounted externally at the side of the process vessel or chute at a Level measurement point with the front of the antenna window facing into the Zone 20 (EPL Da) Hazardous location and the Enclosure located in Zone 21 or 22 (EPL Db or Dc) Hazardous location. Alternatively, the complete unit can be mounted external to process vessel or chute in Zone 21 or 22 (EPL Db or Dc) Hazardous location behind a sealed window made of UHMW, PTFE, Ceramic or other low dielectric material secured into Weldment accessory welded on the chute across the boundary of Zone 20/21 or 20/22 or 21/22 (EPL Da Db or Da Dc or Db Dc). Microwave antenna window as well as weldment window is sealed off in boundary region using O-rings (NBR / Viton) and ensuring the window is retained within the unit or weldment.

The system can be Integral or Remote and is available as G1 (1 inch) & Gen 3 options. Integral unit has the built in relay logic, whereas the Remote units has the relay logic built into the remote amplifier mounted in a safe zone. Units are available with DC and AC power inputs. The Integral system has either one SPDT or DPDT relay. The Remote system has 2 x SPDT Relays or 4-20mA output and RS485.

Enclosure is single compartment housing made of stainless steel or aluminium diecast with powder coated finish. The housing Series is of a cylinder shape comprising a base and cover making a threaded joint with the base. Cover is made of either stainless steel or powdercoated aluminium diecast with a glass window or a solid lid. This enclosure is IP66 and dust proof housing. Enclosure is provided 2 thread entries of M20x1.5P each for external connection which can be fitted with suitable certified glands.

2. Hazardous Areas

The Gladiator Microwave is certified under IECEx standards for installation in hazardous dust location according to IECEx Certificate of Conformity IECEx TSA 16.005X.

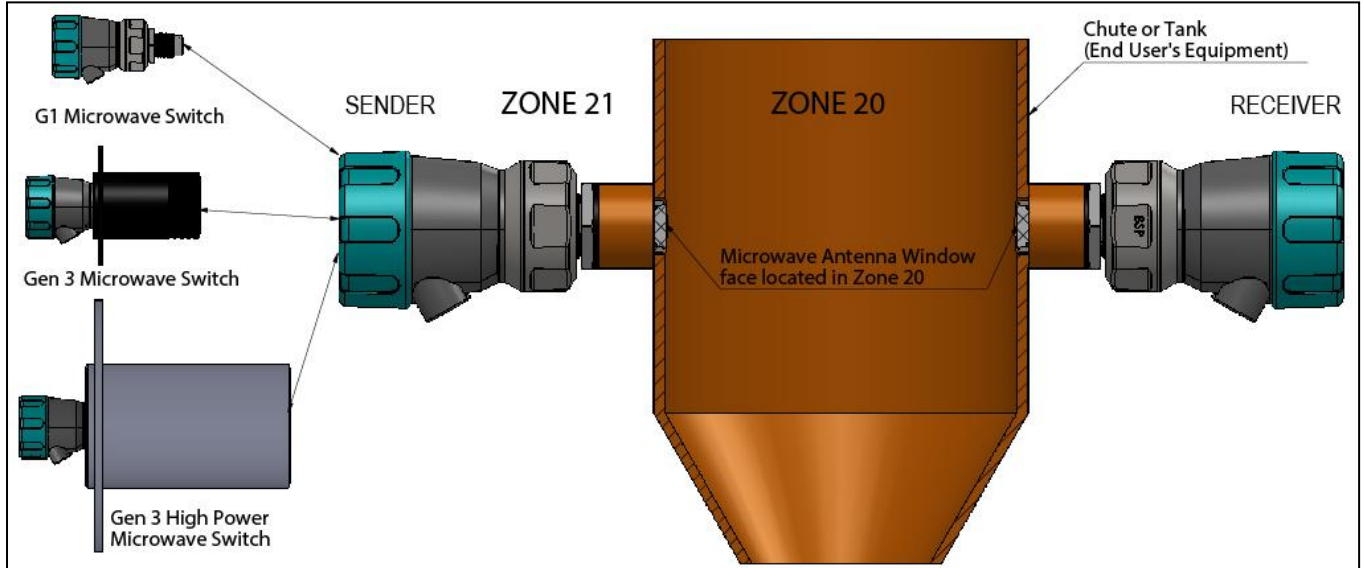
When HAWK's Gladiator Microwave Switch series equipment is installed in hazardous areas, these Safety Instructions, User Manual, Operating Instructions, the corresponding Ex installation regulations or standards and the general installation regulations for electrical equipment must all be observed.

Installation of Ex instruments should only be made by suitably trained and qualified personnel.

Zones and Hazardous Area Markings

Zone 20/21 or Zone 20/22 areas (EPL Da Db or Da Dc)

The antenna window face of Microwave Switch unit can be installed into hazardous zones 20, 21 or 22, in dust groups IIIC, IIIB or IIIA, whereas the amplifier enclosure with electronics can only be installed into zones 21 or 22.



Microwave Unit Types	Facing Material	Haz Area Marking & Ambient Temperature
Gen 3 (3") Microwave: GMS**0*** / GMR**0*** / GMSR**0***	UHMW	Ex ta tb IIIC T* Da Db Tamb = -30°C to +55°C
G1 (1") Microwave: G1*****	Teflon (PTFE)	Ex ta tb IIIC T* Da Db Tamb = -30°C to +80°C
Gen 3 (3") Microwave: GMS**0*** / GMR**0*** / GMSR**0***		
Gen 3 High Power (6") Microwave: GMSH**1**** / GMSRH**1**** / GMRRH*1****		

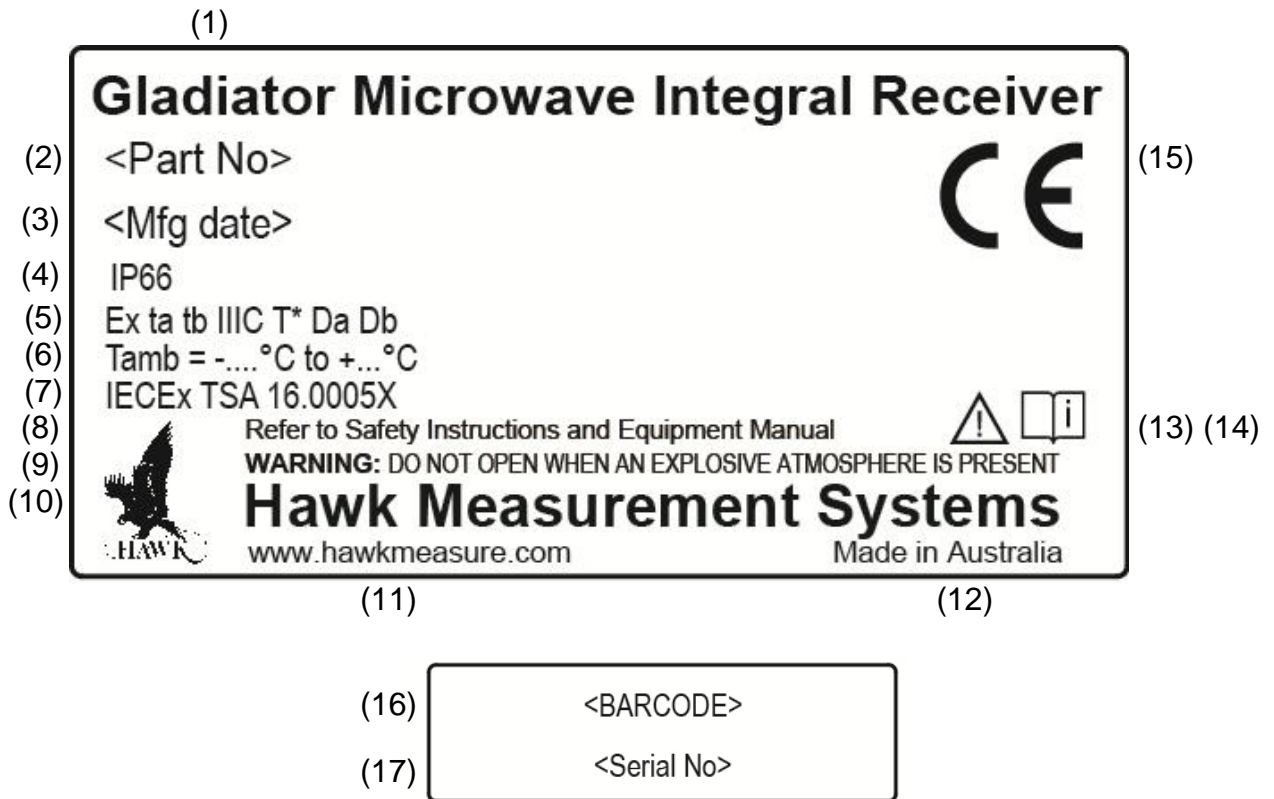
Surface Temperature Increase on Sensor Face = 14°C

* Max Surface Temperature on Sensor (Facing Material) = Process / Ambient Temperature + 14°C

Max Surface Temperature on Electronic Enclosure = Ambient Temperature + 5°C

3. Equipment Identification

An image of the IECEx marking Label is shown below.



- (1) Product Name
- (2) Part Number
- (3) Manufacture Date
- (4) Ingress Protection rating
- (5) Hazardous Locations Marking codes
- (6) Ambient Temperature Range
- (7) IECEx Certificate of Conformity number
- (8) Statement: Refer to Safety Instruction and Equipment Manual
- (9) Warning message
- (10) Manufacturer Logo and Name
- (11) Manufacturer's Web Address
- (12) Manufacturer's country
- (13) Warning Symbol
- (14) Reference to written Instructions
- (15) CE marking symbols
- (16) Manufacturer's Barcode
- (17) Serial Number

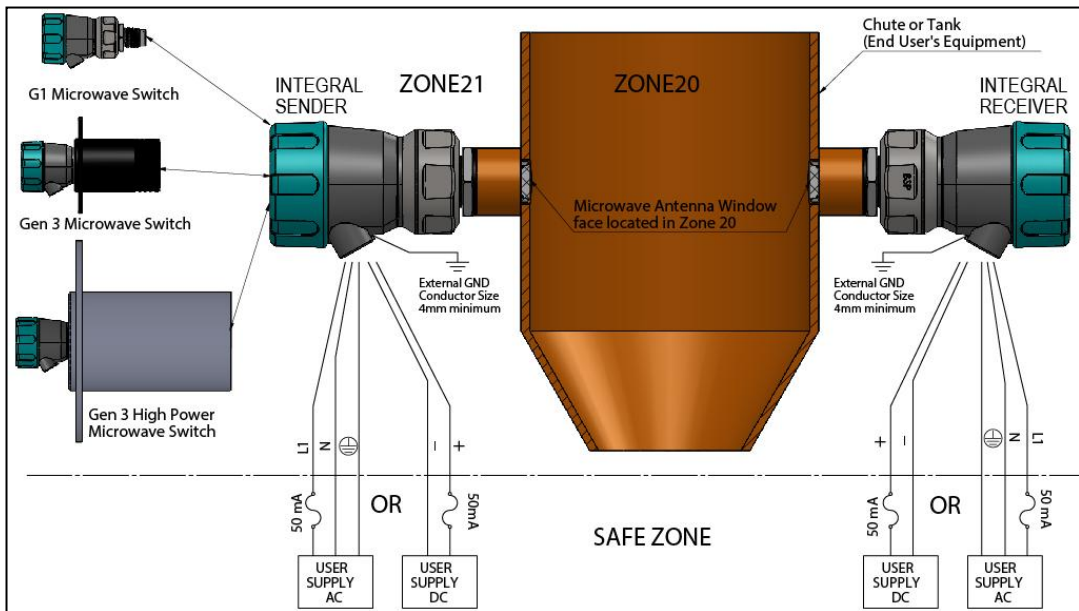
4. Putting Into Service

To put a HAWK Gladiator Microwave Switch unit safely into service, the following steps must be taken:

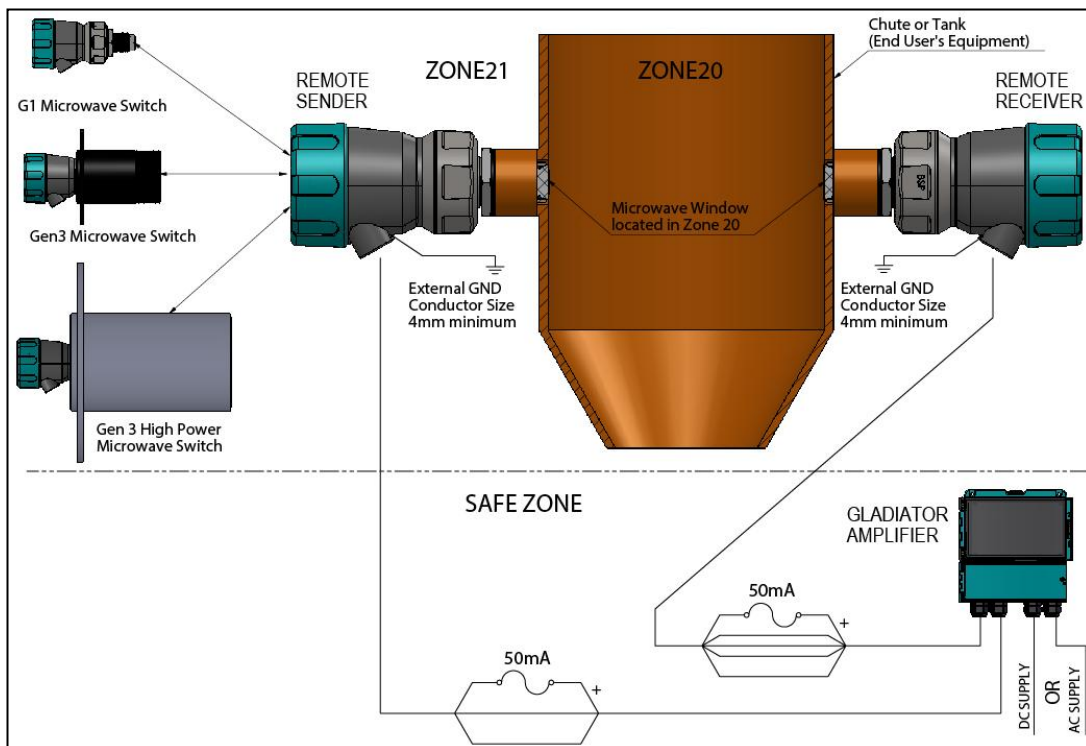
a) Follow the instructions in Typical Installations and Installation Guide, as well as the relevant conditions on the IECEx Certificate of Conformity:-

➤ Zone 20/21 (EPL Da/Db) Installation – Fuse* is to be used in line with external power supply:

- For Integral Units
 - ❖ With AC or DC power supply – use **50mA** slow blow fuse



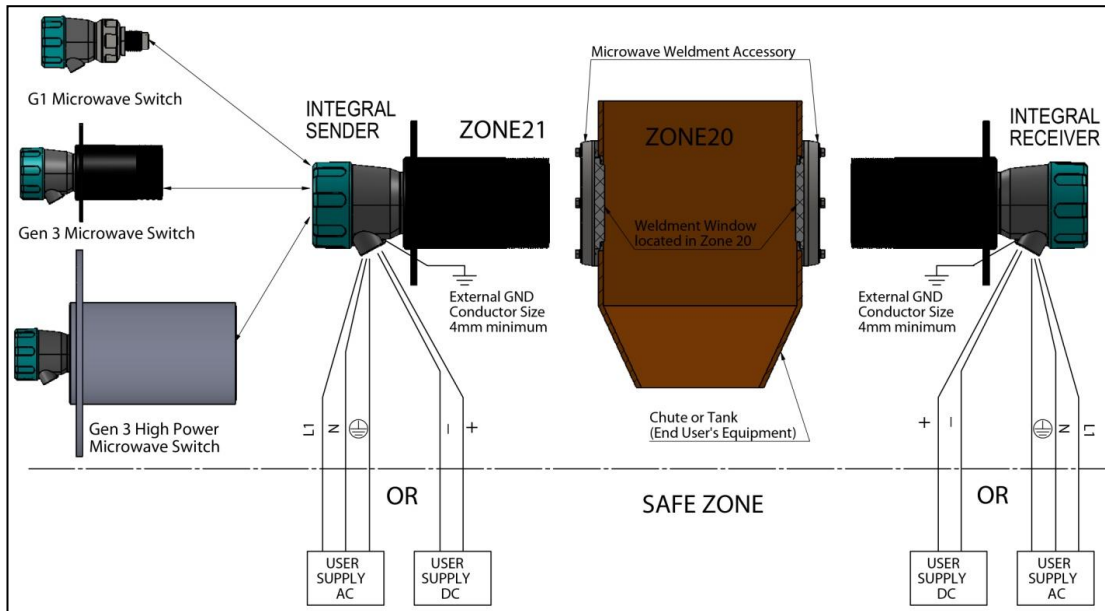
- For Remote Units
 - ❖ Use 50mA slow blow fuse between Amplifier and Sender & Receiver.



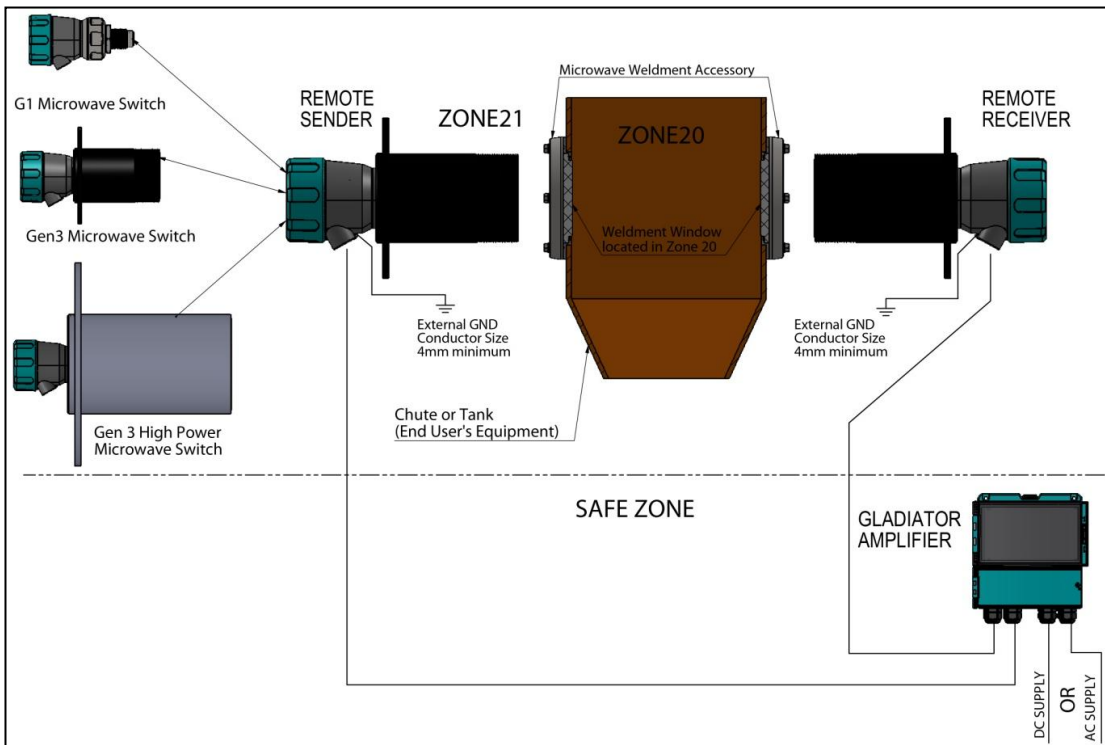
* Refer Instruction Manual for details of Fuse.

➤ Zone 21 (EPL Db) Installation – Microwave unit is in EPL Db sitting behind Weldment window. No Fuse is required.

- For Integral Units:



- For Remote Units:



b) Housing has 2 cable gland entries at one side and can be rotated, in its connection plane with process connection of unit, in order to prevent moisture ingress via cable entries. Cables coming into the Microwave unit shall be sealed using certified Ex t cable glands and all unused cable entry points shall be sealed using certified Ex t blanking plugs. **These cable glands and blanking plugs should be certified to same or higher EPL, IP rating and T_{amb} as Gladiator Microwave Switch unit and fitted by the qualified technician.**

c) Antenna window of the Microwave unit and/or Weldment window, which may present an electrostatic hazard, should not be rubbed or cleaned with a dry cloth. **It can be cleaned only with damp cloth or equivalent.**

d) Correct wiring.

Follow the instructions in the **Wiring Diagram** sections. Wiring should be in accordance with relevant installation standards for hazardous area equipment or other local codes of practice.

e) Safe temperature

Temperature must not exceed the operating range of the Microwave unit. In particular, Ex rated equipment must not exceed the temperature limits shown on the marking label (see Pg.6).

f) Safe power supply.

Power supply values must be according to those stated in the Datasheet and User Manual.

5. Conditions of Safe Use

The instructions for safe use of the Gladiator Microwave Switch unit are as follows:

- a) The Microwave equipment must put into service safely. (see **Putting Into Service**, Section 4).
- b) Warning: **Do not open the enclosure when an explosive atmosphere is present.**
- c) The User Manual must be read and understood by any person involved with this unit.
- d) Environment and installation conditions should be checked regularly.
- e) When opening the cover of any Gladiator Microwave Switch unit, prevent dust, liquids or chemical substances from getting inside the unit. Do not leave any cover open in rain or snow conditions.
- f) The Remote Gladiator Microwave Switch units are connected to a GSA series Gladiator System Amplifier which is located in Safe Zone.
- g) Before making any wiring or hardware configuration changes, it is important to disconnect power from the equipment.
- h) The enclosure has a non-conducting coating and may generate an ignition-capable level of electrostatic charge under certain extreme conditions. The user shall ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.
- i) When incorporated into an electrical system, the service temperature range the enclosure is exposed to shall not exceed the temperature range as marked on the label of that unit.

6. Assembling and dismantling

Follow the Mounting/Installation section of Instruction Manual / Datasheet for various mounting options.

Do not attempt to tighten or remove unit by gripping the upper part of the enclosure or lid, because it has almost a full turn of rotational freedom to align the cable entries.

Enclosure Lid can be opened for access to user controls and terminal connections, **ONLY** when explosive atmosphere is not present. A strap wrench tool can simplify the removal of the lid. User should ensure the lid is screwed down tight before turning ON the unit.

It is absolutely essential that this procedure is not done if an explosive atmosphere is present.

7. Installation and Wiring

Carefully follow Typical Installations, Installation Guide and Wiring Diagram section in the User Manual. Follow all points listed in Putting Into Service, above.

Wiring should be in accordance with relevant installation standards for hazardous area equipment (eg, IEC 60079-14) and any other local codes of practice.

8. Adjustment

For software adjustment of Gladiator Microwave Switch unit parameter adjustment and data entry, refer to instructions in Entering Data, and all of the Setup sections. User can refer to HAWK website: <http://www.hawkmeasure.com>

9. Application Conditions

a) Voltage Supply:

Must be according to the voltage supplies given in Datasheet or User Manual

b) Temperature:

Temperature must not exceed the operating temperature range stated in Putting Into Service, above.

c) Cable Connection:

Cables and wiring must be installed according to the appropriate standards.
Cables and wiring must have continuous operating temperature of $\geq 85^{\circ}\text{C}$

Cable connections must be sealed using appropriate glands and blanking plugs (Refer to Section 4.b of Putting Into Service).

If extending the cable, it must be protected in a junction box and terminated in an enclosure suitable for the environment.

Refer to Wiring Diagrams

d) Earthing:

HAWK Gladiator Microwave Switch unit must be earthed to ensure that shielded cabling is effective.

e) Electrostatic Discharge:

Warning: Avoid Electrostatic Discharge

Do not rub the non-metallic surface of this equipment with a dry cloth.

f) Industrial Conditions:

This equipment is designed for use in normal industrial conditions relating to humidity, vibration, etc. If the user intends to operate the equipment in more severe environmental conditions, the manufacturer or local distributor should be consulted for advice.

10. List of IECEx certified equipment types:

G1 Gladiator Microwave Integral Switch Series	G1S (sender)/G1R (receiver) series G1XX (additional options)
Gen 3 Gladiator Microwave Integral Switch Series	GMS (sender)/GMSR (receiver) series GMSRS (receiver) GMSRQ (receiver) GMSXX (additional options)
Gen 3 Gladiator Microwave Remote Switch Series	GMSB (sender)/GMRR (receiver) series GMRRS (receiver) GMRXX (additional options)
Gen 3 Gladiator High Power Microwave Integral Switch Series	GMSH (sender) / GMSRH (receiver) series
Gen 3 Gladiator High Power Microwave Remote Switch Series	GMSHB (sender) / GMRRH (receiver) series
Weldment, Flange and Accessory selection in any combination	

11. Wiring configuration drawings:

Refer to Wiring Diagrams in User Manual as well as Putting into Service (especially section 4.a.)

12. Approval Standards:

IEC 60079-0:2011, Sixth edition Explosive Atmospheres – Equipment - General Requirements.
IEC 60079-31:2013, Ed. 2.0 Equipment dust ignition protection by enclosure "t"

These standards specify test requirements at standard temperature, pressure and oxygen content. Additional consideration and/or testing may be required for equipment operating outside these limits.

13. IECEx Certificate of Conformity:

IECEx Certificate of Conformity IECEx TSA 16.0005X can be accessed directly on line using the following hyperlink ...

<http://iecex.iec.ch/iecex/iecexweb.nsf/certificatesAjax/IECEX TSA 16.0005X issue No. 0?opendocument>

or go to <http://www.iecex.com/>

select 'View Certificates & Licenses'

then click the 'Certified Equipment' box

then enter IECEx TSA 16.0005X

and click the 'View certificate' box to begin the search.

14. Manufacturer Contact Information

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Technical data is subject to change without notice.
Images shown may differ from equipment supplied.

NOTES: