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PRODUCT SAFETY GUIDE

# Sensi+

## Gas Analyzer





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## CHAPTER 1

# General

This guide provides an overview of the safety aspects that must be observed for the installation and operation of the GLA533 Series Gas Analyzer. The following pages provide an overview of the safety precautions that must be observed when operating the instrument. For personnel and system safety, and to obtain optimum performance, read this manual **carefully and thoroughly** before installing, using, or maintaining the instrument.

In this guide, it is assumed that the GLA533 Series Gas Analyzer is to be operated in a hazardous area and that its installation is performed while the area is temporarily declassified to ensure personnel and system safety. It is also assumed that a sampling conditioning system precedes the analyzer to feed a gas sample, as per analyzer specifications.

## Product Description

The GLA533 Series Gas Analyzer continuously monitors contaminant levels in natural gas streams, reports values, and stores data. The unit is a fully functional OA-ICOS laser-based spectrometer for post-processing– and pipeline-quality natural gas.

## General Safety Information

The instrument has been manufactured in accordance with international and local regulations. It is deemed operationally safe. Additionally, it has been tested and was shipped from the factory in perfect working condition.

Only by observing all of the safety information can you minimize the risks of hazards to personnel and/or the environment. Full compliance with all general safety requirements must be observed during handling, installation, operation, and maintenance of the instrument.

The information contained in this safety guide, as well as all applicable documentation and certification, must be observed and adhered to in order to maintain the factory-deployed condition throughout the instrument's period of operation.

In addition to providing general information, individual sections within this guide contain descriptions, processes and/or procedural instructions to which specific safety information has been associated. The provided instructions are intended as an overview only. They do not contain detailed information on all available models or every conceivable scenario that may arise during setup, operation and/or maintenance work. This document shall be used in conjunction with the accompanying installation and commissioning guide and user guide. For additional information, or in the event of specific issues not covered within these operating instructions, contact the manufacturer.

ABB declares that the content of this guide is not part of any prior, or existing, agreements, commitments or legal relationships, and is not intended to amend those that are already in place. Moreover, you must observe all relevant safety regulations regarding the installation and operation of electrical systems and the relevant standards, regulations and guidelines concerning explosion protection that are applicable to your specific installation.

## Information on WEEE Directive 2012/19/EU (WEEE2)

This instrument is subject to the WEEE Directive 2012/19/EU or corresponding national laws (e.g., the German ElektroG Electrical and Electronic Equipment Act). Dispose of the instrument at a specialized recycling facility. Municipal garbage collection points should not be used for this purpose.

According to WEEE Directive 2012/19/EU, only products that are used in private applications may be disposed of at municipal garbage facilities. Proper disposal prevents negative effects on both individuals and the environment and also supports the reuse of valuable raw materials.

ABB can accept and dispose of returns for a fee.

## Pressure Equipment Directive (2014/68/EU)

This instrument is **not** subjected to the pressure equipment directive (PED) as per paragraph 4.3 of the Directive. It is designed in accordance with safe engineering practices to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate.

## Symbol Description

This document uses the following symbols to bring attention to key technical and safety-related information.



### **DANGER—SERIOUS DAMAGE TO HEALTH/RISK TO LIFE**

Indicates a hazardous situation that, if not avoided, **will** result in death or serious injury.



### **DANGER—EXPLOSION PROTECTION**

Indicates this product is suitable and approved for installation into ATEX (Atmosphere Explosive) II 2 G using Ex d Flameproof mode of protection, when **CAREFULLY** following the Specific conditions of use.



### **WARNING—DAMAGE TO HEALTH/RISK TO LIFE**

Indicates a hazardous situation that, if not avoided, **could** result in death or serious injury.



### **CAUTION—DAMAGE TO HEALTH**

Indicates a hazardous situation that, if not avoided, could result in **minor or moderate injury**.



### NOTICE

Indicates information considered important, but not hazard related, that could impact things **other than personal injury**, like property damage.



### WARNING—LASER RADIATION

Indicates the presence of a laser related hazard. It also indicates the type of laser in use, its wavelength and its safety class.



### ELECTROSTATIC DISCHARGES

Indicates a device or part of a device that is susceptible to electrostatic discharges.



Identifies the terminal intended for connection to an external conductor for protection against electrical shock in case of a fault which shall be bonded to a protective earth electrode (ground).



Identifies earth conductor terminals.



Indicates the presence of direct current (DC).

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# Installation in Hazardous Locations

## Explosive Atmospheres Installation

For installation requirements in explosive atmosphere applications, refer to international standard IEC 60079-14 as well as any mandatory local safety or electrical code regulations.

For specific conditions for safe use, see Explosive Atmosphere Markings on page 15.



### CAUTION

Only qualified and authorized personnel are to be tasked with the installation, electrical connection, commissioning, and maintenance of the instrument. Qualified personnel are those individuals who have experience in the installation, electrical connection, commissioning, and operation of this instrument or similar devices and hold the necessary qualifications.

These qualifications include:

- Training or instruction authorization to operate and maintain devices or systems according to safety engineering standards for electrical circuits, high pressures, and aggressive media;
- Training or instruction in accordance with safety engineering standards regarding maintenance and use of adequate safety systems.

For reasons of safety, ABB recommends that only sufficiently insulated tools be used (i.e., conforming to international standard IEC EN 60900). In the event of use in a hazardous area, only non-sparking tools shall be used.

Since the instrument may form a link within a safety chain, it is recommended that the instrument be replaced immediately if defects are detected.

## Safety Information for Electrical Installation



### WARNING

The instrument is intended for field installation by qualified service personnel according to manufacturer's installation instructions and local/national wiring requirements. The electrical connection information in the Installation and Commissioning Guide must be observed. Otherwise, the application protection type may be affected. Ground the instrument according to requirements.

- The GLA533 Series Gas Analyzer is a category I instrument.
- The GLA533 Series Gas Analyzer uses voltages up to 10.5–30 VDC. There are no hazardous voltages present in the device.
- Before opening any part of the analyzer, cut power to the instrument or to the power source supplying it.
- In accordance with international safety standards, the monitoring system uses protective earth (PE) that provides grounding for the monitor chassis.
  - Protective earthing connections (grounding) must always be active.
  - Ensure that the equipment, and any device connected to the analyzer, are properly grounded.
  - Make sure that the analyzer earth is at the same potential as the support’s earth.
- To prevent contamination of the electronics by outside elements, the analyzer shall be opened only under controlled environmental conditions defined in the technical specifications below.

## Technical Specifications



### WARNING

Make sure that all circuits are de-energized prior to installation.

The GLA533 Series Gas Analyzer is designed with both internal and external protective earth (ground) terminals.

All field wiring connected to the GLA533 Series Gas Analyzer must comply with the user’s national electrical code or any other applicable regional electrical codes.

Electrical	
<b>Voltage input</b>	10.5 to 30 V DC
<b>Overvoltage category</b>	1
<b>Electrical installation category</b>	1
<b>Maximum power consumption</b>	50 W
<b>Maximum current</b>	10.0 A
Environmental	
<b>Operating temperature</b>	–14 °C to 55 °C (0 °F to 131 °F) (cold range can be extended when installation is using heated shelter/cabinet)
<b>Survival temperature</b>	–18 °C to 60 °C (0 °F to 140 °F)
<b>Shipping/storage temperature</b>	–30 °C to 60 °C (–22 °F to 140 °F)
<b>Operating ambient humidity</b>	5% to 95% RH, non-condensing (applicable to internal parts only)
<b>Installation location</b>	Indoor/outdoor including wet area (excluding flooding)
<b>Pollution degree</b>	2
<b>Operating altitude (max.)</b>	2000 m (6562 ft)
Mechanical	
<b>Overall dimensions (L × W ×H)</b>	525 × 385 × 364 mm (20.7 × 15.6 × 14.3 in) ( is 641 mm [25.3 in] with optional WiFi antenna)
<b>Weight</b>	50.0 kg (110 lb)
<b>Interface to electronics</b>	1" NPT or M32, female threads (as selected on order)

<b>Enclosure</b>	IP66/TYPE 4X Flameproof Explosion-proof Dual seal with annunciation
<b>Laser</b>	
<b>Type</b>	DFB laser diode
<b>Wavelength</b>	760 nm, 1313.7 nm, 1574.5 nm
<b>Output</b>	50 mW max.
<b>Class</b>	1

## Safety Information for Inspection and Maintenance

Corrective maintenance work may only be performed by trained personnel.

Before removing the instrument or performing operation on the wetted path assembly, ensure all gas lines are depressurized.

Check whether hazardous materials have been used as measured materials before opening the device. Residual amounts of hazardous substances may still be present in the instrument and could escape when the instrument is removed or maintained.

Within the scope of operator responsibility, check the following as part of a regular inspection:

- Covers are properly installed and secured.
- Alarms and warning reported by the instrument have been addressed.
- Electrical and gas connections are free of damages and signs of leakage.
- Breathers/drains are free of obstructions and signs of abnormal discharge.
- Enclosure is free of abnormal wear and corrosion.

The instrument shall only be cleaned with a damp cloth and soft soap.

## Operator Liability

It is the operator's responsibility to ensure that the concentration of H<sub>2</sub>S in the analyzed natural gas blend stays below the maximum limit of 20,000 ppm, thus ensuring instrument integrity.

Any excursion of the process above this limit, and also taking into account the level of H<sub>2</sub>S and the duration of the exposure, could result in premature deterioration or damages to the wetted path seals.

Careful inspection and replacement of damaged components may be required in the event of high concentrations of H<sub>2</sub>S or prolonged exposure to this substance.

**NOTE:** H<sub>2</sub>S is specified above, but should other highly corrosive contaminants be present in the gas stream, compatibility with the instrument should be verified with the manufacturer.

For instruments with a flame-proof enclosure (Ex d type of protection), the housing covers must be secured using the locking screws. The blanking plugs or connectors that must be used with the instrument shall be lubricated at the installation site using Molykote DX. The installer assumes responsibility for any other type of sealing medium used.

# Qualified Personnel

Installing, commissioning and maintaining the instrument may only be performed by trained personnel authorized by the plant operator. This trained personnel must have read and understood this guide and must comply with the installation and commissioning instructions.

## Mounting

Read the installation instructions carefully before proceeding. Failure to observe the warnings and instructions may create a malfunction or a personal hazard. Before installing the instrument, ensure that the instrument design meets the requirements of the measurement point from both measurement technology and safety standpoints.

This applies with respect to:

- Explosion-protection certification
- Measuring range
- Pressure
- Temperature
- Operating voltage

In addition, the relevant directives, regulations, standards and accident prevention regulations must be observed. Measurement accuracy is largely dependent on proper installation of the analyzer and, if applicable, mounting arrangement. In instances where it is possible, the measuring setup should be free from critical ambient conditions such as large variations in temperature, vibrations, or shocks.

## Improper use

It is the responsibility of the user to provide conditioned samples, as per technical specifications, and according to the GLA533 Series Gas Analyzer-specific purchased configuration.



### NOTICE

The analyzer is designed to measure gas mixtures exempt of any liquids, aerosols or solid particles of any size.

It is prohibited to use the monitoring system for any of the following (including, but not limited to):

- A climbing aid, e.g., for mounting purposes.
- A support for external loads, e.g., as a support for pipes.
- By adding material, e.g., by painting over the name plate, or welding/soldering on parts.
- By removing material from analyzer, e.g., by drilling the housing.



### WARNING

Repairs, alterations, and enhancements, or the installation of replacement parts, are only permissible as far as these are described in this manual or allowed by standards, directives and/or any applicable codes. Approval by ABB must be requested in writing for any activities beyond this scope. Repairs performed by ABB-authorized centers are excluded from this article..

## Technical limit values

The instrument is designed for use exclusively within the values stated on the nameplates and within the technical limit values specified in the specification table (see “Technical Specifications” on page 6).

## Certification Nameplates

See Explosive Atmosphere Markings on page 15 of this guide for details.



### NOTICE

Read this guide thoroughly before installing, commissioning and using the instrument.

## IP Protection and Designation

The housing for the GLA533 Series Gas Analyzer is certified as conforming to protection type IP66 (according to international standard IEC 60529) or Type 4X (according to the NEMA 250 standard).

## Cable Connection

The electrical connection is established via a 1" NPT of M32 cable entry, depending on enclosure configuration.



### WARNING

Cables, cable glands, and plugs for unused ports must be certified for the intended type of protection (for example, Ex d type of protection and/or explosion-proof) and degree of protection (for example, IP66 according to IEC EN 60529 or Type 4X according to NEMA 250). See also the section for Ex Safety Aspects and IP Protection.

Ensure that all three plastic dust caps at the instrument electrical inlets have been removed and replaced with suitable connections or plugs during installation.



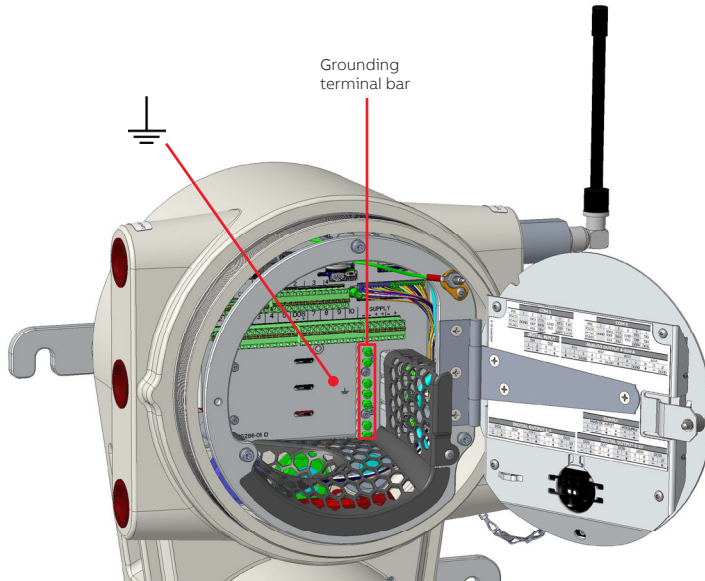
### CAUTION

Cable entry devices, where used, shall be Certified/Listed for the explosive atmosphere/hazardous location, local temperatures, and required enclosure environmental (ingress protection [IP] or Type) rating. For field wiring, use only copper wire rated for at least 90 °C.

# Grounding

Grounding terminals are available inside and outside the instrument housing. Both terminals are electrically connected to one another (see Figure 1). To locate the external protective ground lug, see Figure 2 on page 11.

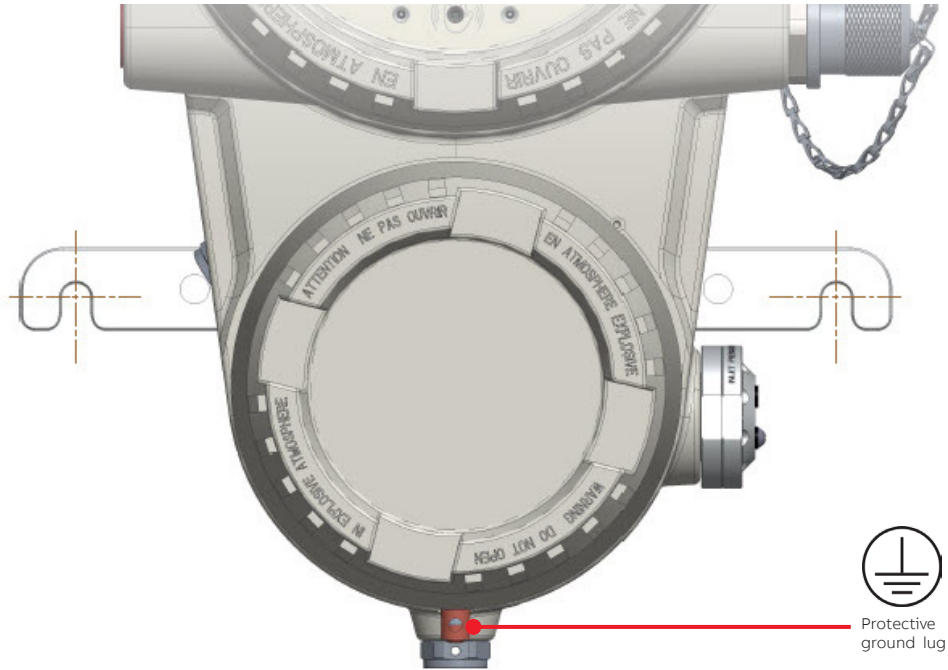
**Figure 1** Ground connection inside instrument housing



# Protective Earth Grounding

All instruments are supplied with an external ground connection for protective earth (PE) grounding. Wire this ground connection to a suitable earth ground. For an instrument measuring loop, an earth ground should maintain a resistance of 5 ohms or less. Use a heavy-duty conductor of at least 4 mm<sup>2</sup> or 10 AWG.

Figure 2 Protective Earth Lug



## WARNING

To ensure personnel protection, to protect against surges and to prevent explosions in potentially explosive environments, **the use of a protective grounding connection is mandatory.**

# Flame-proof/Explosion-proof Installations

## Specific conditions of use

The GLA533 Series Gas Analyzer is designed for use in Division 1 or Zone 1 hazardous area.



### WARNING

Flameproof joints on the instrument are not intended to be repaired. Contact the manufacturer if repair of the flameproof joints is necessary.

Installation and use of instruments in hazardous locations shall be made in accordance with an IEC 60079-14 international standard or applicable regional standard.



### WARNING

The housing cover can only be removed when the unit is installed in a non-hazardous or derated area, when the area is monitored with a gas detector and known to be non-hazardous or derated, or when power is removed from the instrument.

Cable or conduit entries must be fitted with a suitably certified cable entry device, with or without the use of a suitably approved thread adapter. Where conduit is used in the installation, a conduit seal may or may not be required depending on the mode of protection used and the standard applied. Refer to appropriate standard for installation and marking on the product.



### CAUTION

Cable entry devices, where used, shall be Certified/Listed for the explosive atmosphere/hazardous location, local temperatures, and required enclosure environmental (ingress protection [IP] or Type) rating.

For field wiring, use only copper wire rated for at least 90 °C.



### WARNING

To avoid electrostatic discharge, the instrument shall only be cleaned with a damp cloth.

## Electrical connections



### WARNING

All entry closure devices shall be 1" NPT certified (or M32 if metric entries are selected) as "Ex db" IIC, and "IP66" as applicable, (blank and vent).

For more information on electrical connections, refer to chapter 5 of the Sensi+ (GLA533) Installation and Commissioning Guide (p/n 3KXG165001R4401), "Connecting Sensi+".



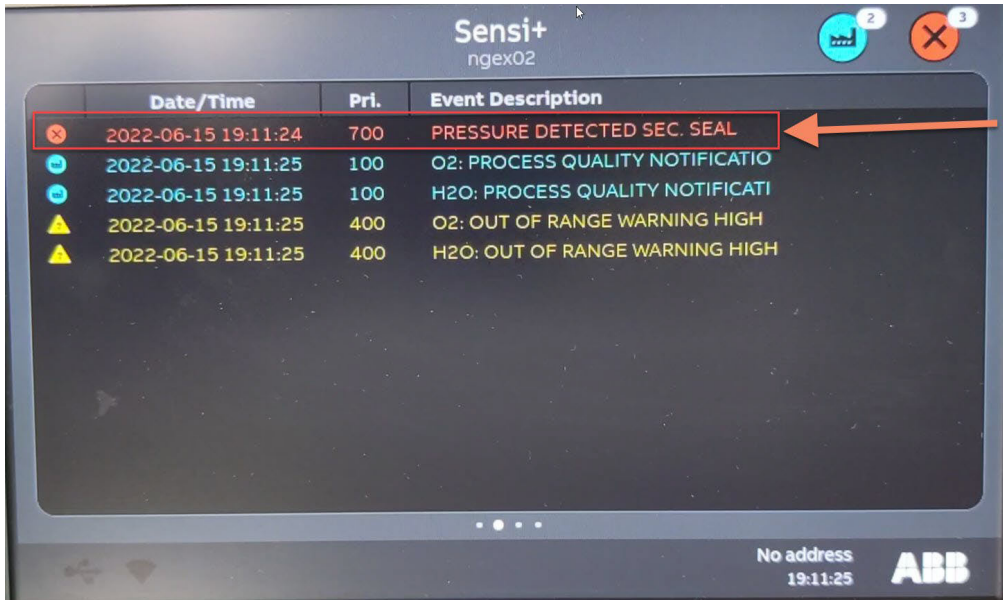
## Dual Process Seal

The instrument enclosure is designed and tested to ensure that the flammable process gas is safely contained in the event of a failure. This design ensures that no flammable process gas can migrate into the premises wiring system and contaminate a non-hazardous area. This design is achieved by providing a primary and secondary seal for the process gas.

With this design, the primary seal is the containment system created by the close gas loop of the gas interface and wetted path assembly module. The secondary seal is created by feedthrough separating the Optobox from the EBox.

If the following error message is being displayed on the GUI, it means that the primary seal has been compromised, is defective, or there is a leak within the bottom compartment (OPTOBOX). If this happens, immediate action must be taken to repair, change, or remedy this situation by any means necessary to ensure that the primary seal is operating back appropriately.

**Figure 3** Error Message on Local GUI



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# Explosive Atmosphere Markings

## ATEX/IECEX/US/Canada/UKCA HazLoc markings (typical)



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**MODEL #:** GLA533-NG-SMOC.WF.NPT.AL.R-XXXX

**SERIAL #:** 3K1234567890

**VER. #:** A

**DATE #:** Sept. 2022



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Class I, Division 1, Groups B, C, D T6  
Class I, Zone 1, AEx db IIB + H2 T6 Gb  
Ex db IIB + H2 T6 Gb  
II 2 G Ex db IIB + H2 T6 Gb

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155295  
C 0344  
US 22CA80115213X

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AMBIENT TEMPERATURE : -30°C (-22°F) To 60°C (140°F)  
 POWER SUPPLY: --- 10.5VDC to 30VDC; 50W (Nominal).  
 CSANe 22ATEX1084X, CSAE 22UKEX1239X, IECEx CSA 22.0020X  
 IP66, TYPE 4X, DUAL SEAL - NO ADDITIONNAL PROCESS SEAL  
 REQUIRED. / PAS DE JOINT D'ÉTANCHÉITÉ ADDITIONNEL REQUIS.  
 MAY CONTAIN WIFI MODULE/PEUT CONTENIR UN MODULE WIFI:  
 FCC ID: RYK-WREA252NIRB / IC: 6158A-WPEA252NRIB

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**WARNING/ATTENTION :**  
**US-DIVISIONS:** INSTALL SEAL WITHIN 2" (50mm) ONLY IF Tamb. ≤-25°C, OTHERWISE 18" (450mm). / INSTALLER UN JOINT ANTIDÉFLAGRANT À MOINS DE 2" (50mm) SI Tamb. ≤-25°C, SINON 18" (450mm).  
**CANADA-ZONES:** INSTALL SEAL WITHIN 2" (50mm). / INSTALLER UN JOINT ANTIDÉFLAGRANT À MOINS DE 2" (50mm).

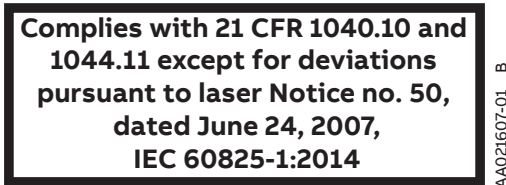
**CONDITIONS OF USE / CONDITIONS D'UTILISATION:**  
 FLAMEPROOF JOINTS ARE NOT INTENDED TO BE REPAIRED. / LES JOINTS ANTIDÉFLAGRANTS NE SONT PAS DESTINÉS À ÊTRE RÉPARÉS.  
 DO NOT REMOVE COVER(S) OR MAKE LIVE CONNECTIONS UNLESS THE AREA IS KNOWN TO BE NON HAZARDOUS / NE PAS OUVRIR LE(S) COUVERCLE(S) OU FAIRE DES RACCORDEMENTS ACTIFS À MOINS QUE L'ATMOSPHÈRE NE SOIT PAS EXPLOSIBLE.  
 POTENTIAL ELECTROSTATIC CHARGING HAZARD – ALWAYS CLEAN WITH A DAMP CLOTH / POTENTIEL DE CHARGE ÉLECTROSTATIQUE - TOUJOURS NETTOYER AVEC UN LINGE HUMIDE.  
 USE ONLY COOPER WIRE & CABLE GLANDS RATED 90°C MINIMUM / UTILISER DES CABLES EN CUIVRE ET SERRE-FILS CALIBRÉS POUR 90°C MINIMUM.

SEE ALL GUIDES ONLINE FOR COMPLETE SAFETY, INSTALLATION AND OPERATING INSTRUCTIONS / VOIR LES GUIDES EN LIGNE POUR LES INSTRUCTIONS COMPLÈTES DE SÉCURITÉ, D'INSTALLATION ET D'UTILISATION.



MADE IN CANADA / FABRIQUÉ AU CANADA AA025723-02 REV A

## Laser Safety Markings



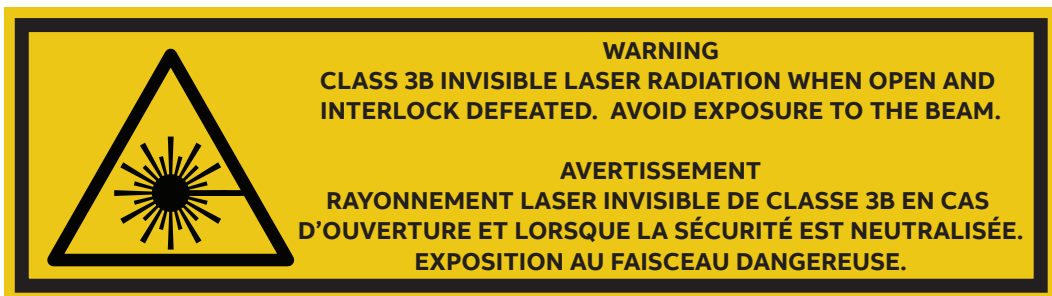
This product may comprise one or more of the following internal invisible laser(s), depending on the instrument's specific configuration:

- 45 mW, 760 nm, Class 4
- 50 mW, 1313.7 nm, Class 3B
- 42 mW, 1574.5 nm, Class 3B

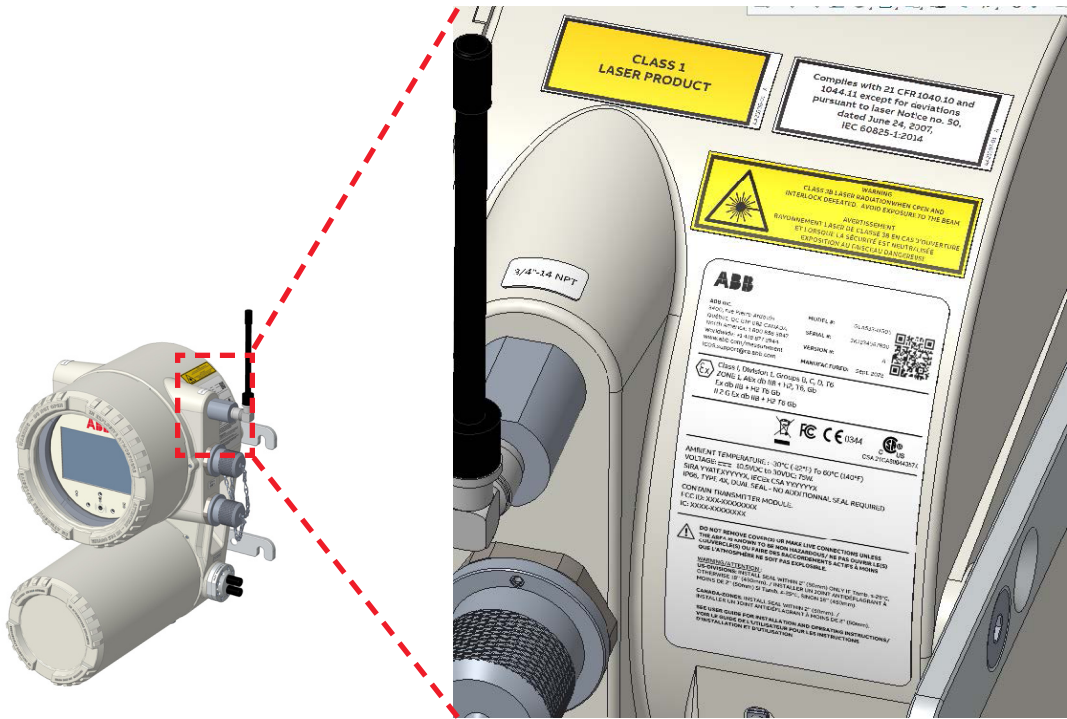
If configuration has "O<sub>2</sub>", 760 nm Class 4 laser, this tag will be on the product:



In all other cases without "O<sub>2</sub>" (760 nm laser), this tag will be on the product:



# Product Labels Location



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**CHAPTER 4**

# **Declaration of Conformity**

For EU declaration of conformity (DoC) for ATEX, refer document no. 3KXG165002D0001 on ABB website at [www.abb.com/analytical](http://www.abb.com/analytical).

You will also find all available approval certificates for ATEX/IECEX/US/Canada/UKCA on the same page.

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