

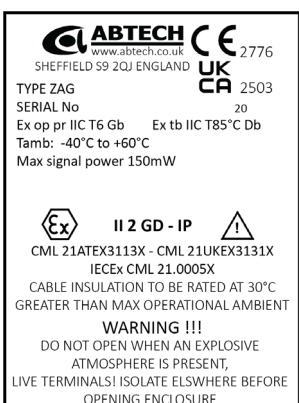
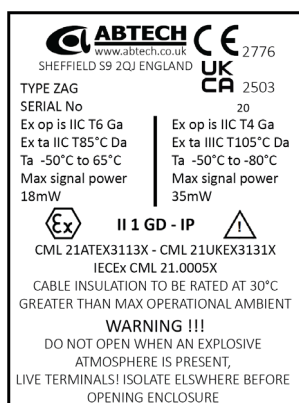
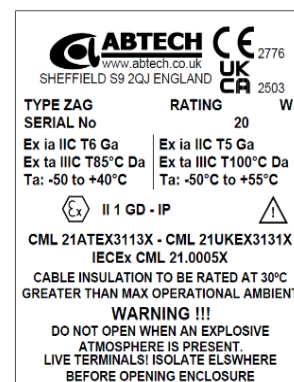
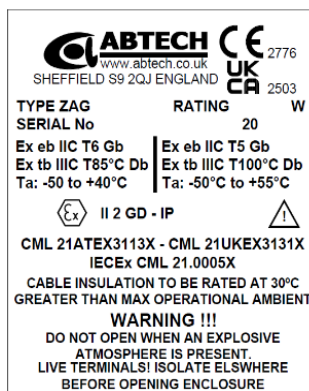
# Installation, Operation, Maintenance:

## ZAG RANGE (APPARATUS)



### Certification Details

ATEX: ABTECH Ltd. CML 21ATEX3113X  
 UKEX: ABTECH Ltd. CML 21UKEX3131X  
 IECEX: ABTECH Ltd. CML21.0005X



### Marking

The marking shown is for an equipment certified terminal box.

The maximum power dissipation permitted in this terminal box is marked on the label and identified by RATING \_\_\_\_\_ Watts.

The ambient temperature range for which this product is suitable is marked on the label and identified by Ta ..... (°C)

The 'T' rating is variable depending on ambient temperature range and power dissipation. This rating must be equal to or better than the 'T' rating assigned to the hazardous area in which it is installed.

The Ex eb marking may be replaced by Ex ia or Ex ib. Enclosures marked Ex ia or Ex ib may only be used for terminating appropriate intrinsically safe circuits. Non-IS electrical circuits are not permitted in boxes marked Ex ia or Ex ib.

Boxes marked Ex eb may be used to terminate Ex ib and non-IS circuits, subject to a minimum circuit separation of 50mm.

Additional or alternative marking may be present relating to the connection of optical fibres.

Where the marking includes Ex op is (see left) the optical signal strength must not exceed the following maximums:

- For a box marked T6 the maximum optical signal strength is 15mW.
- For a box marked T4 the maximum optical signal strength is 35mW.

For marking including Ex 'op pr' the maximum optical signal strength is 100mW and the ambient temperature range is limited from -40°C to +60°C.



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
For marking including Ex 'op sh' the ambient temperature range is limited from -40°C to +60°C.

The marking 'op is', 'op pr' or 'op sh' may be followed by 'eb', 'ia' or 'ib' or stand alone.

When 'op is' is followed by 'ia' the EPL for gas will be Ga and for dust Da. See Special Conditions of Safe Use.

When 'op pr' or 'op sh' is followed by 'ia' the EPL for gas will be Gb and for dust Db. See Special Conditions of Safe Use.

The Ex marking may include 'db' if enclosure is fitted with 'Ex d e' or 'Ex db eb' certified plug & sockets, as well as the appropriate gas/dust group marking if not 'IIC' and 'IIIC', as defined by the plug and socket equipment approval.

**Note:** The symbol  is not always present. When it is present the installer must take particular note of these instructions.

The gas group IIC marking may be replaced by IIB marking. When marked IIC the maximum coating thickness is 200 microns. When marked IIB the maximum coating thickness is 2.0mm. If the coating is conductive these thickness limitations do not apply.

### Special Conditions of Safe Use

- i. The materials used in the construction of this equipment contain levels of Al, Mg, Ti and Zi that are greater than that allowed for EPL Ga and Gb by clause 8 of EN IEC 60079-0, therefore in rare cases, ignition sources due to impact and friction sparks could occur. The equipment shall therefore be protected from such impact and friction when installed
- ii. When used for Ex ia, Ex ib and Ex ta applications, over-power fault protection shall be provided and shall take into account the 'EPL' fault requirements necessary:
  - Ex ia – Two countable faults is to be applied to the current and/or voltage limiter.
  - Ex ib or Ex ta – Gb and Da applications – One countable fault is to be applied to the current and/or voltage limiter.
- iii. When used in an EPL Da (Ex ta) application, the power supply to the equipment is to be rated for a prospective short circuit current of not more than 10 kA.
- iv. When fitted with 'op pr' splice case, the fibre cable outside the enclosure shall be installed such, that mechanical damage is prevented.
- v. When marked 'Ex op is', the fibre optic source supplying this equipment shall be suitably certified as compliant with EN 60079-28, Ed 2 and provide an inherently safe optical source (op is), EPL Gb, subsequently the parameters in Table 3 apply.
- vi. When marked 'Ex e op pr', the fibre ST connectors contained within the increased safety enclosure must not be separated whilst energised if an explosive atmosphere may be present.
- vii. If not used, fibre ST connectors within the increased safety enclosure must have dust covers fitted.
- viii. The fibre cables entering or exiting the increased safety enclosure must be suitably protected from breakages and satisfy the requirements of EN 60079-28 'op pr'.

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- ix. All optical components used with the Fibre Optic Cassette shall be suitable for the ratings and service temperature range of the cassette.
- x. When marked “op sh”, the fibre optic source shall be suitably certified as compliant with EN 60079-28, Ed 2 and provide an interlocked optical source (op sh).
- xi. Cable insulation shall be rated at 30°C greater than max operation ambient.

### NOTE:

*The ambient temperature range identified on the certification label refers to the enclosure and the terminals fitted within. It does not necessarily refer to the permitted temperature range of any cable entry devices that may be fitted. The user must check that the cable entry devices fitted are suitable for the lowest ambient temperature marked on the certification label and for the maximum permitted operating temperature. The IP rating identified on the certification label refers only to the enclosure. The user must ensure that the cable entry devices fitted provide an equivalent degree of protection when installed with their manufacturer's instructions.*

### Installation

These instructions assume that the required cable entries have been pre-drilled. Cable entries may be threaded.

- 1) Using the mounting dimensions data provided, either in the product catalogue data sheets or on the drawings supplied, (as part of the project documentation), mark out the positions for the mounting holes on the surface where installation is required.
- 2) Drill the mounting holes for M4 fixing studs (for size ZAG 1 to Zag 8) or for M6 fixing studs (for size ZAG 9 upwards) as applicable.
- 3) Tap thread into mounting holes if required.
- 4) Place a mounting screw through one mounting hole in the box so that the thread of the screw protrudes from the back of the box. Lift the box into place, using such assistance as may be necessary to avoid personal injury and:-
  - a) If clearance mounting holes are used, insert the protruding thread through the appropriate clearance hole and secure with a nut on the other side of the mounting surface.Or
  - b) If threaded holes are used, locate the end of the mounting screw over the threaded hole and, using an appropriate screwdriver tighten the screw.
- 5) Rotate the box to line up the remaining mountings and repeat (4) above until all mounting screws have been fitted.
- 6) Install and secure the cable entry devices, cable glands and blanking plugs in accordance with the manufacturer's instructions. Ensure that the torque applied during the installation of these devices does not exceed 20 Nm.
- 7) Pull the cables into the box, leaving trailing leads of a length specified by site practice or the site engineer and secure any cable armour in accordance with site practice.

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- 8) Where slotted trunking has been supplied (solid trunking is not permitted) ensure that it is suitable for the proposed service temperature of the enclosure. Where a window is fitted metallic slotted trunking must be used. Trunking may be mounted in any orientation in the box, vertically, horizontally or diagonally.
- 9) When laying cables into trunking; No more than 50% of the trunking internal area shall be occupied by conductors, when instrumentation currents of 1A or less are carried. All cabling used must be capable of carrying a minimum of 3A.
- 10) For cables carrying more than 1A - No more than 25% of the trunking internal area shall be occupied by conductors, these shall be de-rated to a maximum of  $4A / mm^2$ . All cabling used must be capable of carrying a minimum of 10% higher current than the rating required.
- 11) Terminate the cables in the terminals provided in accordance with the requirements of BS EN 60079-14. Consideration must be given to any use limitations or special conditions detailed on the certificates for the terminals fitted.
- 12) Optical fibres carrying op is signals may be joined using bulkhead connectors and/or fused joints installed in cassettes. Optical fibres carrying signals which do not meet the op is limitations must be joined by fusing and the fused joints then secured in the Ex op pr certified cassette. The attention of the installer is drawn to the installation, operation and maintenance instructions provided by the manufacturer of the Ex op pr certified fibre cassette. When such a cassette is provided by ABTECH a copy of the relevant instructions will append, and form part of this document. In Ex op sh applications, the enclosure must be used in conjunction with a shutdown functional safety system based on the ignition delay time of the explosive atmosphere.
- 13) Secure the lid by closing the lid and tightening the lid fixing screws to a torque of 1.5Nm minimum, 2.0Nm maximum.

Torque Ratings for Lid Fixings	
1.5Nm Minimum	2.0Nm Maximum

**NOTE:**  
*If the terminals provided with the enclosure are changed either in type or in quantity the terminal box certification may become invalid. Advice from ABTECH is recommended before any changes are made.*

### Earthing/Grounding

The enclosure may be provided with an external earth/ground connection. If such a connection is provided it must be connected to the appropriate earth bonding circuit before electrical power is connected to the contents of the enclosure.

An equipotential bonding connection is provided between the box and the lid. Care must be taken to ensure this is not damaged during installation or maintenance.

### Operation

- 1) The lid must be secured using all of the lid screws provided in order to maintain the IP rating.
- 2) No attempt must be made to remove the enclosure lid whilst electrical power is connected to the contents of the enclosure.

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- 3) The enclosure external earth/ground facility must be connected to the earth bonding circuit at all times when power is connected to the enclosure contents.

### Maintenance

Routine maintenance is likely to be a requirement of local Health and Safety legislation. The laws of the applicable country must be considered and maintenance checks carried out accordingly.

Additional periodic checks that are advisable to ensure the efficiency of ABTECH range enclosures are: -

Activity		Frequency
1	Check that the lid seal is not damaged and is in place	Each time the enclosure is opened
2	Check that all lid fixing screws are in place and secured	Each time the enclosure is opened
3	Check that the mounting bolts are tight and free of corrosion	Every 3 years
4	Check the security of all cable glands and entry devices	Every 3 years
5	Check the enclosure for damage	Every 3 years
6	Check that all screw clamp terminals are secure	As manufacturers recommendation
7	When the enclosure contains Ex op pr connections, check that the incoming fibre is not under any tensile stress, that the fibres are not damaged and that no escape of optical radiation can be detected inside the enclosure.	After one year initially, then every 3 years and each time the enclosure is opened.

### Chemical Attack

The ABTECH ZAG range of enclosures are manufactured using the following materials: -

- Aluminium Alloy
- Silicone rubber
- 316 stainless steel
- Brass

Consideration should be given to the environment in which these enclosures are to be used to determine the suitability of these materials to withstand any corrosive agents that may be present.

### Static Hazard

The ZAG range do not normally present a hazard from static discharge. Ensure that the marking is appropriate to the gas group as this may be affected by a client specified coating thickness.

### Vibration

ZAG range terminal boxes are designed for use in areas subject to normal industrial levels of vibration. They are not designed for use in areas subject to intentional or extreme conditions of vibration.

### Protection from Foreseeable Faults

Circuits connected in the enclosure must be externally protected using suitable circuit interruption devices to prevent overloading. Provided the enclosure is correctly installed, there should be no foreseeable faults.