

INSTALLATION, OPERATION & MAINTENANCE INSTRUCTIONS FOR ABTECH 'SX' RANGE TERMINAL BOXES

METc File reference:

Marking

The symbol  requires the installer to take particular note of these instructions.

The marking shown left is for an apparatus certified "Increased Safety" terminal box. The maximum power dissipation permitted in this terminal box is marked on the label.

The maximum ambient temperature range for which this product is suitable is marked as T_{amb} (°C). This is related to the maximum dissipated power rating, the maximum voltage, maximum current, and the operating temperature range of the terminals fitted.

Alternatives to the Ex eb marking include: Ex ic, Ex ib, and Ex ia. When the marking is Ex ia, the Gb marking is replaced with Ga.

Boxes marked Ex eb may be used to terminate both intrinsically safe and non-intrinsically safe circuits subject to a minimum circuit separation of 50mm.

The quantity and type of terminals installed is recorded against the serial number.

The marking shown left is for an apparatus certified "Intrinsically safe" optical fibre terminal box.

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.

Alternatives to the Ex op is marking include:

Ex op pr and, Ex op sh.
Where marking includes Ex op pr the maximum optical signal strength is 100mW and the ambient temperature range is limited from -40°C to +60°C.

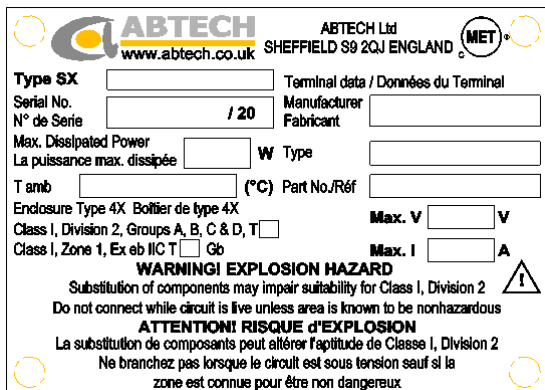
These may be followed by 'eb', 'ia', 'ib' or 'ic' if electrical terminals are included.

When the marking is NOT Ex op is, or the Ex 'op is' marking is followed by 'eb', 'ib' or 'ic' the Ga marking is replaced with Gb.

Enclosures with windows are limited to a maximum operating temperature +80°C and a minimum ambient temperature -40°C.

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.

For additional information see **Notes**: below **Caution**.



ABTECH Ltd SHEFFIELD S9 2QJ ENGLAND (MET)

www.abtech.co.uk

Type SX Terminal data / Données du Terminal

Serial No. / 20 Manufacturer

N° de Serie Fabricant

Max. Dissipated Power W Type


La puissance max. dissipée W Type

T_{amb} (°C) Part No./Réf

Enclosure Type 4X. Boîtier de type 4X

Class I, Division 2, Groups A, B, C & D, T Max. V V

Class I, Zone 1, Ex eb IIC T Gb Max. I A

WARNING! EXPLOSION HAZARD 

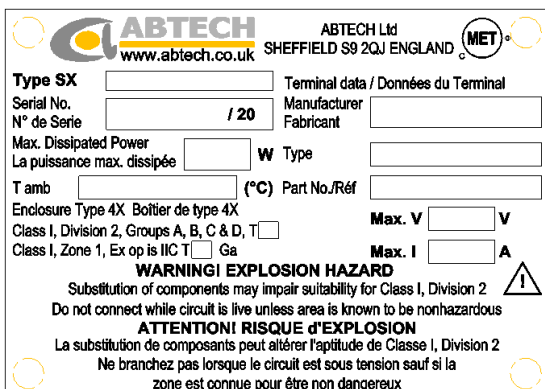
Substitution of components may impair suitability for Class I, Division 2

Do not connect while circuit is live unless area is known to be nonhazardous

ATTENTION! RISQUE d'EXPLOSION

La substitution de composants peut altérer l'aptitude de Classe I, Division 2

Ne branchez pas lorsque le circuit est sous tension sauf si la zone est connue pour être non dangereux



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Type SX Terminal data / Données du Terminal

Serial No. / 20 Manufacturer

N° de Serie Fabricant

Max. Dissipated Power W Type


La puissance max. dissipée W Type

T_{amb} (°C) Part No./Réf

Enclosure Type 4X. Boîtier de type 4X

Class I, Division 2, Groups A, B, C & D, T Max. V V

Class I, Zone 1, Ex op is IIC T Ga Max. I A

WARNING! EXPLOSION HAZARD 

Substitution of components may impair suitability for Class I, Division 2

Do not connect while circuit is live unless area is known to be nonhazardous

ATTENTION! RISQUE d'EXPLOSION

La substitution de composants peut altérer l'aptitude de Classe I, Division 2

Ne branchez pas lorsque le circuit est sous tension sauf si la zone est connue pour être non dangereux

Caution!

Consideration must be given to the possibility of electric fields strong enough to cause air ionisation (corona) which can result in flashover. These may result from inappropriate cable layout and/or inadequate conductor screening. Where such fields are considered possible, steps should be taken to minimise the risk. ABTECH Ltd. do not make recommendations in this respect and the responsible site engineer must be consulted.

Notes:

When used in an EPL ta (Da) application the power supply to the equipment is to be rated for a prospective short circuit current of not more than 10kA.

When the protection concept Ex op is is included the optical signal source supplying the fibre in this equipment shall be suitably certified as compliant with EN60079-28:2006 or later and provide an inherently safe optical source (op is), EPL Gb, subsequently following the parameters listed below:

T6 & T85°C (Ta = +65°C max.)

The 'op is' is used with or without terminals.

The optical source maximum signal strength is limited to 15mW and a maximum irradiance of 5mW/mm² (surface area not exceeding 400mm²).

T4 & T135°C (Ta = +80°C max.)

The 'op is' is used without terminals.

The optical source maximum signal strength is limited to 35mW and a maximum irradiance of 5mW/mm² (surface area not exceeding 400mm²).

When the protection concept Ex op pr or Ex op sh is included the only permitted connection method is a fused connection secured in an Ex op pr certified cassette to prevent damage.

When the protection concept Ex op sh is included the fibre optic source shall be suitably certified as compliant with IEC/EN 60079-28:2015 and provide an interlocked optical source (op sh).

Where Ex op is not included, alternative markings for temperature ratings as follows:

T6 with max Tamb range of $-60^{\circ}\text{C} \leq \text{Ta} \leq +65^{\circ}\text{C}$ and T85°C for dust

T5 with max Tamb range of $-60^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$ and T100°C for dust

T4 with max Tamb range of $-60^{\circ}\text{C} \leq \text{Ta} \leq +80^{\circ}\text{C}$ and T135°C for dust

T3 with max Tamb range of $-60^{\circ}\text{C} \leq \text{Ta} \leq +175^{\circ}\text{C}$ and T200°C for dust

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.

Cables

The operating temperature of the cables within the enclosure may exceed +60°C. The installer shall ensure that cables terminated within SX range enclosures are suitable for use at temperatures 20K higher than the marked 'T' rating.

Installation

- 1) Using the mounting dimensions 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 either M10 fixing studs (for size S64 upwards) or for M6 fixing studs for size S45.
- 3) Insert the top two studs leaving 8 to 10mm protruding and lift the enclosure into position using assistance as required by site health and safety manual handling requirements to avoid injury and hang the top fixing brackets of the box onto the studs.


NOTE:

If the weight of the box at this point of the installation process exceeds 18kg assistance must be sought.

Ensuring that the box is secure, insert and tighten the bottom two studs. Now complete tightening the top two studs.

- 4) Install and secure the cable glands in accordance with the manufacturer's instructions.
- 5) 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.
IEC 60079-7 Annex E.2 requires power dissipation calculation based on a specific cable length of, "[...] 0,5 times the maximum internal dimension (three-dimensional diagonal) of the enclosure, [...]". Should the trailing lead length exceed this there is a risk of the operating temperature exceeding the T rating identified on the label.
- 6) Where slotted trunking has been supplied (solid trunking is not permitted) ensure that it is suitable for the proposed T classification of the final certified product. Where the T6 is the proposed rating any polymeric or metallic slotted trunking may be used. For other T classifications metallic slotted trunking must be used. Trunking may be mounted in any orientation in the box, vertically, horizontally or diagonally.
- 7) 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.
- 8) 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 /sq mm. All cabling used must be capable of carrying a minimum of 10% higher current than the rating required.
- 9) 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 /sq mm. 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 IEC 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 and ensure that all gland plate securing screws are tightened. If a torque setting device is use, set to 2.5 Nm.
- 14) For additional security, a padlock may be fitted to all box sizes larger than and including size S0.

Earthing/Grounding

All S range enclosures are provided with an internal and external earthing/grounding facility, identified . This must be connected to the appropriate earth bonding circuit before electrical power is connected to the contents of the enclosure.

Operation

1. The lid must be secured using all the lid screws provided in order to maintain the Type 4X rating.
2. No attempt must be made to remove the enclosure lid whilst electrical power is connected to the contents of the enclosure.
3. The earthing/grounding facility must be connected to the earth bonding circuit at all times when electrical power is connected to the enclosure.

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 checks that are advisable to ensure the efficiency of ABTECH 'S' 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 all gland plate fixing screws are in place and secured	Each time the enclosure is opened
4 Check that the mounting bolts are tight and free of corrosion	Annually
5 Check the security of all cable glands	Annually
6 Check the enclosure for damage	Annually
7 Check that all screw clamp terminals are secure	As manufacturers recommendation
8 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 S range enclosures are available in stainless steel EN1.4404 (316L). The following additional material are also used :-

Silicone rubber, Brass. The standard fasteners used are A4 stainless steel (316).

Stainless steel enclosures are not painted except to customer specifications.

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

S range enclosures do not present a hazard from static electricity.

Vibration

SX 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.