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8

Other Products

GRN Junction Boxes

BPC Control Stations

SXC Control Stations

Submersible Enclosures

GRN Enclosures

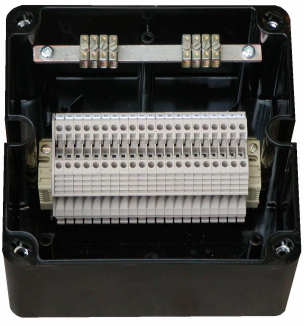
The ABTECH GRN8 enclosure has been designed as a cost-effective junction box for use in hazardous areas. There are a number of terminal and entry configurations available, resulting in a highly versatile enclosure which is suitable for a wide variety of installations.

The enclosure is manufactured in a UL approved UV stabilised polycarbonate and is available as a pre-assembled terminal box or as an empty enclosure for OEM applications.

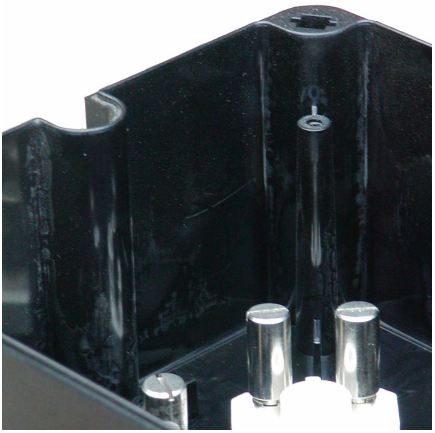
It can be supplied with the option of a terminal rail, an internal chassis plate or directly mounted terminals for cables up to 4 sq mm.

The GRN8 is a competitive product for lower risk applications in both safe and hazardous areas. It is designed to operate within the ambient temperature range of - 20℃ to + 40℃ (-4℉ to 104℉) but for non hazardous application the upper ambient temperature range can be extended to 120℃ (248℉). As well as being UV stable, polycarbonate is resistant to a wide variety of chemicals. The use of silicone rubber lid gasket and 316 stainless steel lid fixings ensures that the chemical resistance of the GRN8 is not compromised.
Earthing can be accomplished by various means. The provision of an internal/external earth/ground stud is optional or one of the terminals can be dedicated to earthing / grounding functions.

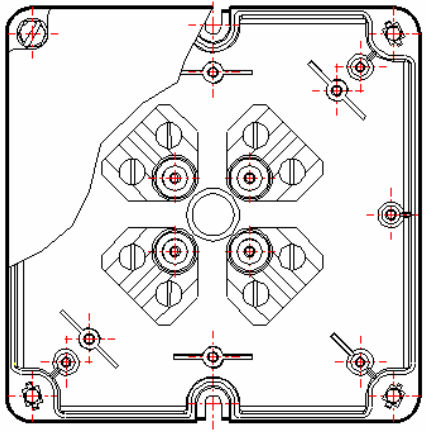
Additionally, there is the facility to mount an earth bar inside the box which can be used to terminate and connect as many earthing wires as there are cable entries.
This method is useful for the equi-potential bonding of metal cable glands and an additional equi-potential wire can be linked to the internal/external earth stud to facilitate a positive connection to the ‘plant dirty’ earthing system. The earth bar can alternatively be used as a clean earth for instrumentation as it can be electrically isolated from the dirty earth.



The GRN8 is ATEX certified for use in Zone 1 hazardous areas EEx‘e’ to BS EN 50019:2000 for Zone 1 and Zone 2 applications, BS EN 50281-1 for Zone 21 and Zone 22 applications and EEx‘nA’ to BS EN 50021 for Zone 2 applications.

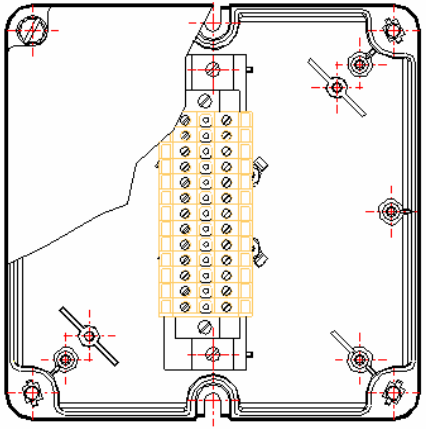


GRN 8 Terminal Options



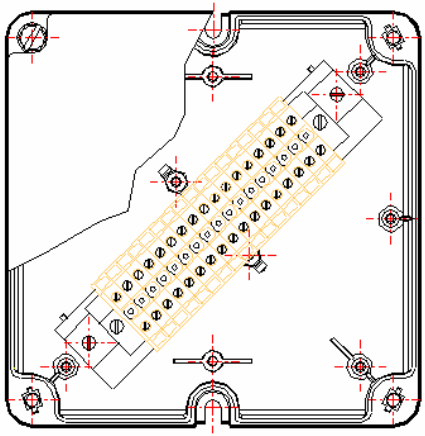
Option One

Up to 8 post / mantle type EEx'e' terminals
(up to 2 x 4mm^2 conductors per terminal)
Star configuration



Option Two

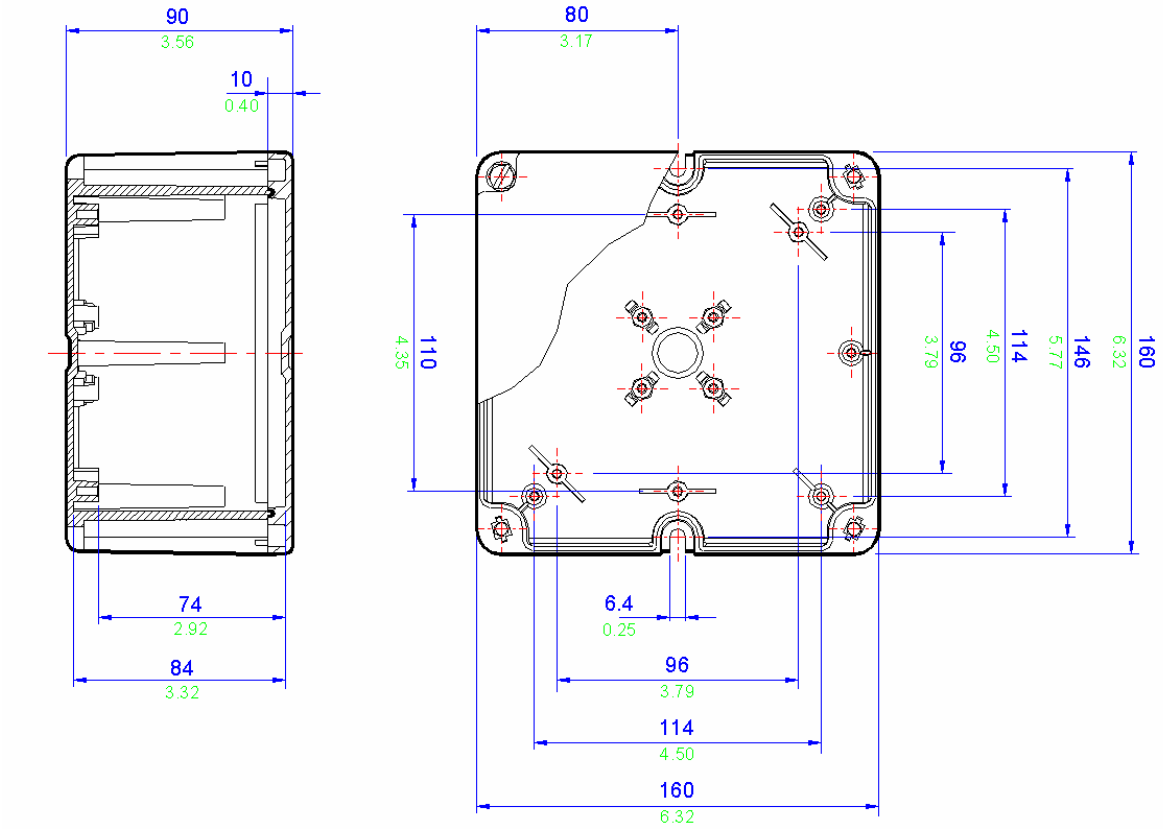
Up to 13 screw/clamp type EEx'e' terminals
(for conductors up to 2.5mm^2)
See table on page 189 for other terminal types
Horizontal / Vertical configuration



Option Three

Up to 17 screw/clamp type EEx'e' terminals
(for conductors up to 2.5mm^2)
See table on page 189 for other terminal types
Diagonal configuration

GRN 8 Drawing



All blue dimensions in mm, all green dimensions in decimal inches (drawing not to scale)

ABTECH

GRN 8 Specifications

Width	160mm
Length	160mm
Depth	90mm
Material	Moulded Polycarbonate (Black)
Weight	500g
IP Rating	65
Temperature	-40℃ to 80℃ (-40℉ to 176℉) (with standard neoprene gasket)
	-40℃ to 120º C (-40℉ to 248℉) (with optional silicone gasket)
	ATEX Certified Version -20º to 40º C (-4℉ to 104℉)
Certification	ATEX EEx'e' T6 BS EN50019 (Zone 1 and 2)
	ATEX EEx'e' T85℃ BS EN50281-1-1 (Zone 1 and 2)
Power Rating	10.0W

Terminal Populations

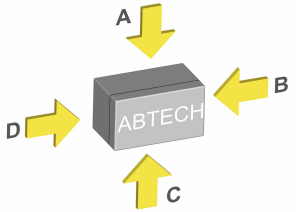
Maximum Number of Rows			1
Weidmuller		**Phoenix**	
BK4 (4 way)	3	G5 \ 4 (4 way)	3
BK6 (6 way)	2	G5 \ 6 (6 way)	2
BK12 (12 way)	1	G5 \ 12 (12 way)	1
MK6/4	2	UK 3 N	21
MK6/6	1	UK 5 N	17
SAK2.5	17	UK 10 N	11
SAK4	17	UK 16 N	9
SAK6N	14	UK 35 N	7
SAK10	11		
SAK16	9		
SAK35	5		
WDU 2.5	20	**Entrelec**	
WDU 4	17	MA2.5/5	21
WDU 6	14	M4/6	17
WDU 10	11	M6/8	14
WDU 16	9	M10/10	11
		M16/12	9
		M35/16	6

Entry Matrix

Entry Size	Side A-C	Side B-D
M16	4	4
M20	4	4
M25	2	2
M32	0	2
M40	0	0

Drilling Envelope

Side A-C	54 x 75mm x 2
Side B-D	48 x 75mm x 2

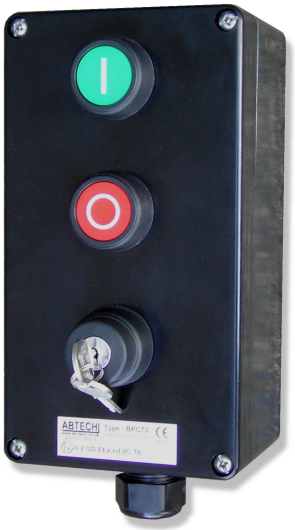


GRN 8 Photo

BPC Range of Control Stations

The BPC range of control stations have been designed for use in potentially explosive atmospheres and are suitable for most gas groups including hydrogen.

Based on the popular BPGC range of enclosures, they are manufactured from carbon loaded glass reinforced polyester (GRP). This material gives excellent mechanical strength and life expectancy, making these control stations particularly suitable for use in harsh environmental conditions. Additionally, the anti-static properties of the enclosure material make them ideal for use in dust hazard environments.



A number of common actuator types can be fitted, including Start, Stop, Emergency Stop and rotary type switches. Tag and individual actuator labels can be fitted as required.

Some typical arrangements of control station size and actuator layouts are shown on the page opposite, however, we are able to supply many other variants as dictated by your required design. Please contact our Sales office for further details.

BPC Specifications	
Size	Depends on base model of enclosure. Smallest base size BPGC6 (120x122x90mm) Largest base size: BPGC15 (400x405x120mm) See BPG Section for further details
Material	Carbon Loaded Glass Reinforced Polyester (Black)
IP Rating	IP66
Temperature	-40º to 80º C (-40℉ to +176℉)
Certification	Ⓔx II 2 GD EEx ed IIC T6
Actuator Types	Start, Stop, Mushroom head emergency stop, key operated switch, Rotary selector switch, Illuminated red indicator, Illuminated green indicator.
Termination	Direct to control elements (2.5mm^2 maximum)
Voltage Rating	415V maximum
Switching Current	6 Amps maximum
Entries	Depends on model. Typically, 1 or 2 x 25mm bottom entry. Fitted with plastic gland
Labels	Self-adhesive silver foil

BPC1310

Control Elements; (x2) Key Switch, Selector, Start, Illuminated Red Indicator, Emergency Stop. Mounted in BPGC13 Enclosure (400 x 150 x 120mm). Glands: 2 x M25

BPC73

Control Elements;
Key Switch, Start, Emergency Stop
Mounted in BPGC7 Enclosure
(220 x 120 x 90mm)
Glands;
1 x M25

BPC62

Control Elements;
Start, Stop
Mounted in BPGC6 Enclosure
(122 x 120 x 90mm)
Glands;
1 x M25

SXC Range of Control Stations

The SXC range of control stations have been designed for use in potentially explosive atmospheres and are suitable for all gas groups including hydrogen.

Based on the SX range of enclosures, they are manufactured from high quality 316 stainless steel. This material offers the highest degree of environmental protection and is suitable for even the most arduous of conditions.

Additionally, stainless steel prevents the build up of static electricity, making these controls stations ideal for use in dust hazard applications.

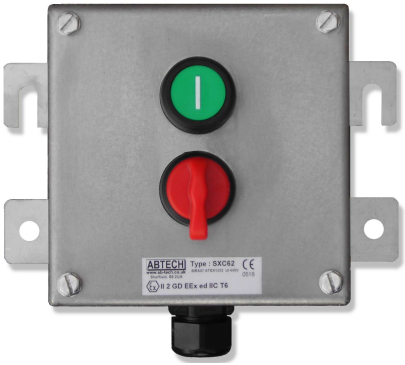
A number of common actuator types can be fitted, including Start, Stop, Emergency Stop and rotary type switches. Tag and individual actuator labels can be fitted as required.

Some typical arrangements of control station size and actuator layouts are shown on the page opposite, however, we are able to supply many other variants as dictated by your required design. Please contact our Sales office for further details.

SXC Specifications	
Size	Depends on base model of enclosure. Smallest base size SX66 (152x152x102mm) Largest base size: SX8 (800x1250x300mm) See SX Section for further details
Material	Stainless Steel 316 (1.4404)
IP Rating	IP66
Temperature	-40º to 80º C (-40℉ to +176℉)
Certification	Ⓔx II 2 GD EEx ed IIC T6
Actuator Types	Start, Stop, Mushroom head emergency stop, key operated switch, Rotary selector switch, Illuminated red indicator, Illuminated green indicator.
Termination	Direct to control elements ($2.5mm^2$ maximum)
Voltage Rating	415V maximum
Switching Current	6 Amps maximum
Entries	Depends on model. Typically, 1 or 2 x 25mm bottom entry. Fitted with plastic gland
Labels	Self-adhesive silver foil

SXC325

Control Elements; (x5) Key Switch, Start, Selector, Illuminated
Green Indicator, Emergency Stop.
Mounted in SX3 Enclosure
(372 x 448 x 140mm). Glands: 2 x M25



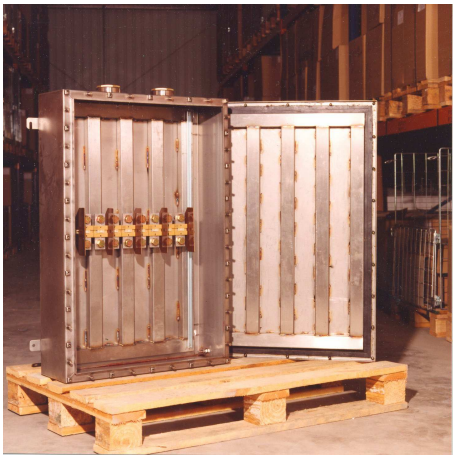
SXC62

Control Elements;
Start, Stop
Mounted in SX66 Enclosure
(152 x 152 x 102mm)
Glands;
1 x M25

Submersible Enclosures

By definition, a submersible enclosure is one which provides complete protection to live or moving parts within the enclosure. Such protection being against the ingress of dust (or other contaminants) as well as protection against the ingress of water.

There are two distinct IP rating for submersible enclosures. These are:
IPX7 - submersion in one metre of water for 30 minutes, and IPX8 - submersion depth and duration to be agreed between manufacturer and client. The degree of protection provided is normally specified to a maximum depth for a pre-determined duration and defined frequency of duration for example “up to 20 metres for 72 hours – weekly”. IEC 529 - BS 5345 Part 1 relates to IP 68.



ABTECH designed their first submersible terminal box over 15 years ago. The IP Rating standard in use at the time was BS5490:1977. This, like its modern replacement BS EN 60529:1992, lists both the test method for ingress protection and the acceptance criteria. In general, the acceptance criteria for water penetration is that the amount of water entering the enclosure, if any, shall be insufficient to interfere with the safety and operation of the equipment inside. However, if the operating requirements include indefinite submersion the only realistic amount of water that can be tolerated is none.

The difficulty in detecting small quantities of water is that water may be present as a vapour, and therefore invisible. In time limited tests water may enter an enclosure in quantities small enough to increase the humidity inside the box, but this would not be apparent using a visual check since it would be invisible. A more objective measurement technique is required.

With the assistance of the University of Sheffield, ABTECH devised a method of detecting very small quantities of water. Two identical enclosures are required, one as a test box and one as a control. A conditioning room is set up in a location with constant humidity. The room must then be equipped with a calibrated high resolution analytical balance. Each box is left open in the same part of the conditioning room, close to the balance for 24 hours to ensure that they are both at the same temperature and both contain air at the same relative humidity. Using the balance one sachet of desiccant is weighed and quickly inserted into each box. The boxes are immediately closed and the lids secured. The weight of the desiccant in each box is recorded. The test box is then subject to the test as agreed with the client or as stated in the current British or international standard. The control box is left in the conditioning room.

When the test is completed the test box is thoroughly dried on the outside and left for several hours, preferably overnight, in a dry place outside of the conditioning room. This ensures that any extraneous water on the outside of the box has evaporated. The test box is then returned to the conditioning room. Both boxes are opened and quickly the desiccant is weighed again. The results are recorded. If no water has entered the test box the increase in weight of each sachet of desiccant will be the same. This is because they have both absorbed all the moisture in the air that was trapped inside the boxes. If any water has entered the test box the desiccant from that box will show a greater increase in weight. It should be noted, however, that it is only possible to measure the amount of water vapour absorbed by the desiccant within the accuracy limits of the balance.

ABTECH have devoted much development effort to the concept of submersible enclosures. Small enclosures are eminently suitable for submersible applications. They are relatively stiff and have little surface area for water pressure to act upon.

For shallow depths (less than 1m) submersion is generally achievable using standard off the shelf enclosures e.g. the ABTECH ZAG, BPG and SX ranges of enclosures.

However, boxes soon become large enough to require reinforcement. A box of only 300mm cube in 10 metres of water will experience over a tonne of pressure on each of its six sides. The actual forces that will be experienced need to be calculated and reinforcement needs to be added whilst leaving as much internal volume as possible free for components, even if that means using external reinforcement.

Added to this is the problem of preventing the cover sealing edges from cutting through the gasket, and reinforced boxes can be very heavy so it may also be necessary to include lifting eyes.

Manufacturing must be of the highest quality. It is essential to ensure high quality welding on fabricated boxes, correctly specified for both the static and dynamic loading they may have to withstand. Water under pressure will find the tiniest pin hole and will leak into the box until the air pressure inside is equal to the water pressure outside.

Once the necessary calculations have been completed then rigorous testing must be endured to ensure that the design meets the pre-agreed requirements of enclosure submersion.

Where submersion over elongated periods of time are to be catered for then consideration must also be given to enclosure material.

By far the most flexible material available for submersible applications is marine grade 316L stainless steel.

With non-submersible applications, cable entry is usually through a proprietary cable gland which itself will normally qualify for an IP rating similar to that of the enclosure to which it is applied. However, due to the greater pressures present with submersible enclosures, cable entry is normally achieved through welded stainless steel hubs suitably positioned to receive incoming multi-core cables.

As with all enclosure applications reliance is placed on the equipment installer to ensure that proper engineering practices are adhered to in order to ensure that the siting and installation of ABTECH Submersible Enclosures is within agreed conditions.

ABTECH have designed submersible boxes for use in a wide variety of applications ranging from prestige projects such as the underwater lighting in Trafalgar Square to severe applications on the legs of unmanned offshore installations.

If you have a submersible box application, the ABTECH technical staff will be happy to advise.