



SYNERGY

INNOVATIVE DIVING EQUIPMENT TRADING LLC

INSPIRING • ENGINEERING • INNOVATION



PRODUCT CERTIFICATE
EC Attestation of Conformity

In Compliance with following Directives:

Machinery Directive
2006/42/EC

Low Voltage Directive
2014/35/EU

Pressure Equipment Directive
2014/68/EU

SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS





SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS

Synergy Safety Isolation Switch for underwater cutting / welding

IMCA D037	DESIGN for Surface Oriented (Mix Gas) Diving Systems
IMCA D023	Design for surface oriented (air) diving systems
IMCA D018	Code of practice for the initial and periodic examination, testing and certification of diving plant and equipment

Operating Instructions

Sr.	Description
1	Ensure the unit is situated in a location so the supervisor or welding co-ordinator can operate the switch easily.
2	It is important that the welding cables coming from the welding power source are connected to the Isolation Switch so that the '+' and '-' terminals match.
3	If you are using a power source fitted with a polarity switch, still make sure the welding cables match like-for-like and set the switch on the power-source to negative (-Ve).
Polarity changes may then be set on the Isolation switch as set out below.	
4	NOTE 1:
5	The panel, (top left side) indicates by use of the symbols 'A' and 'B' which polarity may be selected.
6	The desired polarity will depend on whether the welding stinger cable or the return (earth) cable is connected to either 'A' or 'B' terminals.
7	The terminal connections fitted to each Firefly unit are standard DIN (35-50mm ²) plugs/socket (see duty cycle table for ratings).
8	Ensure you only use approved standard DIN cable connections.
9	Ensure you connect cables from the welding power-source to the correct side on the Firefly unit.
10	These should be connected to the panel plug side, as marked on the panel – TO WELDING PLANT.
11	Ensure you connect like-for-like, matching the polarity symbols to the welding power-source.
12	Once the cables from the welding power-source are connected, turn on the machine and check to see that the volt meter registers (no need to connect the welding cables to the diver yet).
13	The volt meter is a zero centred meter and so the needle should rise in an upwards direction.
14	If the meter falls (drops) in a downward direction, then the cables are not matched like-for-like! (Check connections and/or polarity switch and re-test).
NOTE 2:	
15	When using the on/off knob, do not use excessive force, particularly when making COLD, as the switch will operate with the minimum of resistance.
All Isolation switch units are also fitted with an indicator lamp.	
16	Connect the cables to the power-source and ensure the machine is 'on'.
17	Test whether the indicator light operates correctly, pull the red on/off knob to make a live (HOT) connection; the indicator lamp will now illuminate.
18	By pushing the red on/off knob down (making is COLD) the indicator light will extinguish.
19	This procedure now ensures the correct set-up and you are ready to connect the welding cables to the diver.
20	Should the lamp fail to illuminate, then the bulb may have blown. (Please return your unit for inspection).

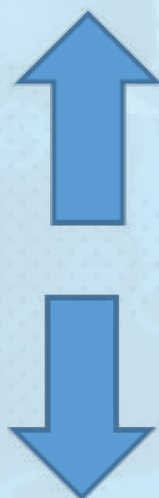
SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS



Once the cables from the welding power-source are connected, turn on the machine and check to see that the volt meter registers (no need to connect the welding cables to the diver yet). The volt meter is a zero centred meter and so the needle should rise in an upwards direction. If the meter falls (drops) in a downward direction, then the cables are not matched like-for-like! (Check connections and/or polarity switch and re-test).

All Isolation switch units are fitted with a large, red bulbous on/off knob. To operate, simply pull in a vertical direction to make it HOT and push down to make it COLD.

NOTE 2: When using the on/off knob, do not use excessive force, particularly when making COLD, as the switch will operate with the minimum of resistance.



All Isolation switch units are also fitted with an indicator lamp.



Connect the cables to the power-source and ensure the machine is 'on'. Test whether the indicator light operates correctly, pull the red on/off knob to make a live (HOT) connection; the indicator lamp will now illuminate. By pushing the red on/off knob down (making is COLD) the indicator light will extinguish. This procedure now ensures the correct set-up and you are ready to connect the welding cables to the diver. Should the lamp fail to illuminate, then the bulb may have blown. (Please return your unit for inspection).

SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS



Now you are ready to connect the welding cables to the diver side on the Firefly unit. You will note that on this side of the panel as well as the usual +/- polarity symbols, you will also see instructions on how to change polarity. All polarity changes **MUST ONLY** be made from the diver side of the panel. To deliver positive (+Ve) polarity to the stinger (electrode holder) connect the stinger cable to the terminal marked [A]. To deliver negative (-Ve) polarity to the stinger cable, connect the stinger cable to the terminal marked [B].

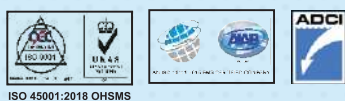
DO NOT ALTER THE CABLES FROM THE WELDING MACHINE SIDE OF THE PANEL, OR CHANGE THE CABLES ON THE WELDING MACHINE.

Additional Technical Data:

The Synergy Safety isolation switch is fitted with an approved 400-amp, dual pole switch; the duty cycle of which is as shown on the data label, affixed to the panel (see copy below). As the switch is fitted in an enclosed space, the duty cycles are adhered too, otherwise serious overheating may occur. If you notice the unit getting hot during operational use, then allow an extended cooling period to take place.

It is important to ensure you use the correct size of welding cable for the selected current. However, please note voltage drop may also need to be taken into account, as the size and length of the welding cable used may also need to be considered. Typical current ratings data for use with copper welding cables manufactured in accordance with BSEN 50525-2-81:2011 are shown below.

Nominal Area	Current ratings measured in Ampere for copper conductors for a single cycle maximum duty cycle per-cent			
	100%	85%	60%	35%
mm ²				
16	135	145	175	230
25	180	195	230	300
35	225	245	290	375
50	285	305	365	480
70	355	385	460	600
95	430	470	560	730
120	500	540	650	850
150	580	630	750	980



SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS

Synergy Safety Isolation Switch units are not fully waterproof, but are rated IP67 with the lid closed*(see details below).

*IP (or "Ingress Protection") ratings are defined in BSEN 60529:1992+A2:2013. They are used to define levels of sealing effectiveness of electrical enclosures against intrusion of foreign bodies (tools, dirt) and moisture, etc. The numbers have a specific meaning. The first digit indicates the degree of protection (for people) from moving parts, as well as the protection of enclosed equipment from foreign bodies. The second digit defines the protection level that the enclosure enjoys from various forms of moisture (drips, sprays, submersion etc).

IP Rated Enclosure chart	
First Digit (intrusion protection)	
0	No special protection
1	Protection from a large part of the body such as a hand (but no protection from deliberate access); from solid objects greater than 50mm in diameter
2	Protection against fingers or other object not greater than 80mm in length and 12mm in diameter.
3	Protection from entry by tools, wires etc, with a diameter of 2.5mm or more.
4	Protection against solid bodies larger than 1mm (eg. fine tools/small etc).
5	Protection against dust that may harm equipment.
6	Totally dust tight.
Second Digit (moisture protection)	
0	No protection
1	Protection against condensation.
2	Protection against water droplets deflected up to 15" from vertical
3	Protected against spray up to 60" from vertical.
4	Protection against water spray from all directions.
5	Protection against low pressure water jets (all directions)
6	Protection against string water jets and waves.
7	Protected against temporary immersion.
8	Protected against prolonged effects of immersion under pressure.

All Isolation switch units use the highest quality, UK manufactured components and we offer a 6 month warranty against any defective parts. The Isolation switch has undergone independent testing by Albright International to validate thermal profiling performance (duty cycle) ratings and the switch is approved by UL and has US and Canadian approvals.

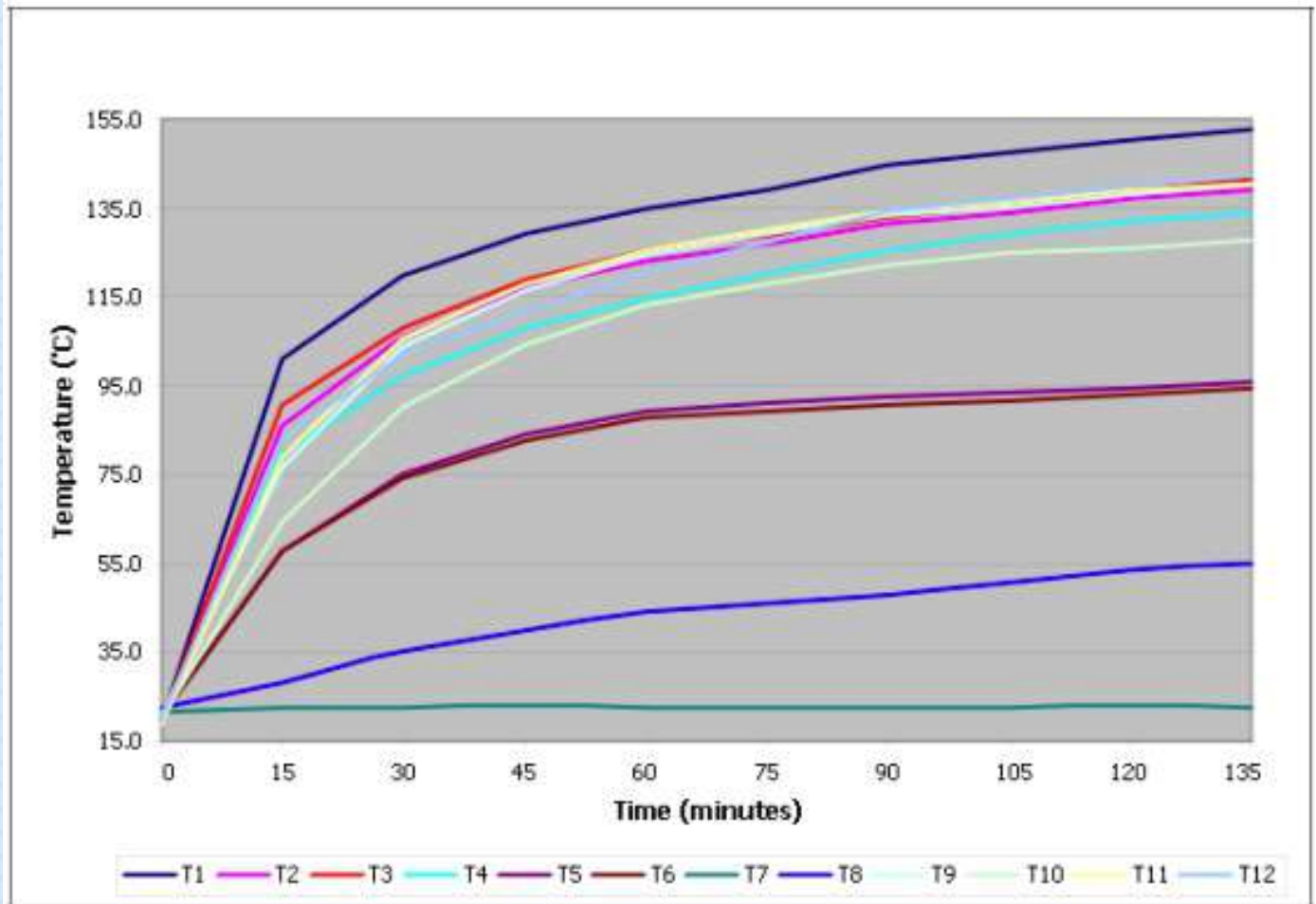
Online certification details may be obtained against file #E181430 on the www.ul.com website. The links to the following file numbers; NRNT2.E181430 and NRNT8.E181430.

NOTE: Access to the UL site has changed, you will now have to register to utilize this website, although this can be done free of charge

All Synergy Safety Isolation switch units are CE marked and a declaration of conformity certificate is available upon request.

SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS

The chart shown below provides details of the thermal testing undertaken by Albright . The graph show details of the temperature gradients involved during testing. The unit was subjected to a continuous 135 minutes testing period at 250 amps DC and shows the moving contact stabilized at 152.8 degrees C. The voltage drop across the unit was 397mV and the switch performed satisfactorily during the test.



Key:-

T1	SW BAR+ [MOVING CONTACT]	T8	DIVER + [AMB. TEMP]
T2	SW PLANT+ [+BOLT ED]	UNUSED	DIVER - [NC]
T3	SW BAR- [MOVING CONTACT]	T9	SHUNT SW.
T4	SW PLANT- [-BOLT ED]	T10	SHUNT OUTER
T5	PLANT + [INPUT BOLT]	T11	SW DIVER +
T6	PLANT - [INPUT BOLT]	T12	SW DIVER -
T7	AMBIENT EXTERNAL		

Enclosure are available in three models; large and small steel and a utility case.

Material: Steel HPX resin

Type: Portable

Body Colour: Olive

Wall Thickness: 1.2mm

IP Rating: IP67

Supplementary Information:

Details with regards to the safe use of electricity underwater may be obtained from the code of practice D045, published by IMCA. It is highly recommended that all persons involved with using electricity underwater be familiar with this document.



SYNERGY INFRASTRUCTURE





SYNERGY

INNOVATIVE DIVING EQUIPMENT TRADING LLC

INSPIRING • ENGINEERING • INNOVATION

UAE • UK



ISO 45001:2018 OHSMS



PRODUCT CERTIFICATE
EC Attestation of Conformity

In Compliance with following
Directives:

Machinery Directive
2006/42/EC

Low Voltage Directive
2014/35/EU

Pressure Equipment Directive
2014/68/EU



SYNERGY UW CUTTING /WELDING SAFETY ISOLATION SWITCH # SY-BRUW-CWS

Contact us

P.O. Box – 237849, Warehouse No 8,
Al Maidoor Warehouse, Al Qusais,
Industrial Area - Dubai - UAE

Tel : 009714 2580533
 Fax : 009714 2580534
 UAE : 00971505648178
 UK : 00447951966260

Website : www.synergiequipment.com
 Email : ram@synergiequipment.com
 For Sale : info@synergiequipment.com

