

The **SS (Solenoid Switch)** is a robust, heavy duty, solenoid controlled, key operated switch. It is available in three versions:-

Back of Board (BOB) - This unit can be fixed behind a machine control panel.

Front of Board (FOB) - This unit is housed in an Polycarbonate enclosure or stainless steel and is designed to be fixed in front of a machine control panel.

Waterproof (FOB) - This unit is similar to the FOB product but is sealed against ingress of liquids and dust. A Waterproof (BOB) is available as a special.

IMPORTANT

This product is designed for use according to the installation and operating instructions enclosed. It must be installed by competent and qualified personnel who have read and understood the whole of this document prior to commencing installation. Any modification to or deviation from these instructions invalidates all warranties. Fortress Interlocks Ltd accepts no liability whatsoever for any situation arising from misuse or mis-application of this product. This product is not to be used as a Mains Isolator or Emergency Stop. The unit is a component to be added to a permanent electrical installation meeting the requirements of the applicable IEC/EN standards.

The voltages used on the SS1 terminals must all be of the same type. i.e. ALL Hazardous Live or ALL Machine Extra Low Voltage.

IF YOU HAVE ANY QUESTIONS OR QUERIES OF ANY NATURE PLEASE CONTACT THE SUPPLIER WHO WILL BE PLEASED TO ADVISE AND ASSIST.

Tools and Fixings Required

Back of Board

- M6 Tap or Dia. 6.5 Drill
- 3.5mm Flat Blade Electrical Screwdriver
- 4 x M6 Screws
- 4 x M6 Nuts
- 4 x M6 Washers

Tools and Fixings Required

Front of Board

- M4 Tap or Dia. 4.5 Drill
- 3.5mm Flat Blade Electrical Screwdriver
- 4 x M4 Screws
- 4 x M4 Nuts
- 4 x M4 Washers

Mounting

Mount this unit well away from sources of vibration or use anti-vibration mountings in order to avoid the effects of vibration, shock and bump.

Back of Board (BOB) Mounting

Mount the unit only in its correctly assembled condition to flat metal plate of minimum thickness 3.0mm. The plate must be bonded to earth potential. A sound earth connection must be made to the front plate of the product. A shake-proof washer may be required on at least one fixing, to ensure Earth continuity

1. Locate the unit so that all the locks are within easy reach.
2. Machine the panel as shown in figure 3.
3. Mount the unit to the panel using the 4 M6 screws, nuts and washers, as applicable.
4. All fixing screws must be permanently prevented from removal, either by vibrator or by personnell using standard tools.

Front of Board (FOB) Mounting

Mount the unit only in its correctly assembled condition to flat metal plate of minimum thickness 3.0mm.

1. Locate the unit so that all the locks are wthin easy reach.
2. Mount the unit to the panel using the 4 M4 screws, nuts and washers, as applicable. The fixing holes are accessible with the lid removed and will not be within the sealed area.
3. All fixing screws must be permanently prevented from removal, either by vibrations or by personnel using standard tools.
4. For Waterproof units, cable glands must be sealed against ingress of dust and liquids.

Multiple Lock FOB

For multiple lock FOB units, please contact Fortress for dimensional drawings.

Electrical Connection

Check that the unit to be installed is of the same electrical type and voltage rating as the machine control circuits. Note that all units are designed to operate at +/-10% of the nominal supply voltage. The use of an incorrect voltage can seriously damage the unit.

The electrical system must incorporate fuse protection for all circuits, using a Quick-Acting (F) fuse (maximum rating 3A, 250v to IEC 127).

Terminals A-B and E-F are N/C contacts opened mechanically by the solenoid operating. These are normally used as the solenoid operated safety circuits.

Terminals C-D are the solenoid power supply.

The earth wire used to bond the unit to Earth potential must be multi-stranded Yellow and Green PVC sheathed and approved to BS 6231 with conductor cross-sectional area of 2.5mm². The Earth lead must be fitted such that it will be the last to be broken if the wiring loom is pulled from the product.

When all the wiring is complete, conduct a Protective Earth Test to BS 60204, clause 20 to all accessible metal parts. Test the unit for correct operation:

Functionality

Key Trapped State

(With all Gate Keys Inserted)

When the solenoid is not energised, all the keys are trapped. The solenoid operated safety circuits are closed.

Key Unlocked State

When voltage is applied to the solenoid, the solenoid safety circuits are positively opened.

Key Free State

When the control key is removed, the contacts on the rotary switch change state. This allows the removal of any other keys.

Commissioning

Mechanical Function Test

1. Isolate electrical supplies.
2. Insert all the keys (starting from the bottom lock and working downwards).
3. Check that all the keys are trapped in position.
4. Manually override the solenoid to allow the removal of the keys, starting from the top working downwards.

Electrical Function Test

5. Check that all the switches are in the states shown in the wiring diagrams.
6. Apply voltage to the solenoid.
7. Check that the solenoid safety circuits are open.
8. Remove the control key.
9. Check that the key operated rotary switch changes state.

Maximum Permissible Wire Gauge

Wire Type	Units	20A	32A	63A
Single Core or Stranded Wire	mm ² AWG	2 x 2.5 2 x 12	2 x 6 2 x 8	2 x 16 2 x 6
Flexible Wire	mm ² AWG	2 x 2.5 2 x 14	2 x 4 2 x 10	2 x 10 2 x 6

The 20A, 32A and 63A switches will accept 2 wires per terminal, one either side of the terminal screw. Only copper wires are to be used.

Wire Strip Length

The wire strip length is the length of wire left exposed at the end of a cable when the insulation is removed. The recommended lengths are shown below.

Switch	Strip Length (mm)
20A	8
32A	11
63A	15

Minimum Voltage and Current

The standard of 20A switch has been tested to work down to 5mA at 20V. For lower voltage and current requirements, please contact Fortress.

DC Ratings

The rotary switches are all AC but have the following DC ratings:

DC Voltage	20A Switch	32A Switch	63A Switch
24V	20A	32A	63A
48V	12A	25A	50A
60V	4.5A	10A	16A
110V	1A	2A	3A
220V	0.4A	0.6A	0.7A
440V	0.27A	0.3A	-

Mechanical and Electrical Life

The mechanical life of the lock mechanism is 1,000,000 operations. The life of the rotary switch is shown below:

Switch Type	Mechanical Life (No of Operations)	AC-21A Electrical Life (No of Operations)
20A	1,500,000	100,000
32A	1,500,000	100,000
63A	1,500,000	100,000

Once the maximum electrical or mechanical number of operations has been reached, the unit must be replaced.

Approvals

The switches are approved to the following:

- 20A BS, CCC, CSA, GOST, IEC, UL
- 32A BS, CSA, GOST, IEC, UL
- 63A BS, CSA, GOST, IEC, UL
- 150A BS, CSA, GOST, IEC, UL

where

- BS = BS EN 60947 (British and EU)
- CCC = China Compulsory Certification
- CSA = Canadian Standards Association
- GOST = Gosudarstvennyj Standard (Russian)
- IEC = IEC 60947 - International Electrical Commission (Global)
- UL = Underwriters Laboratory (USA)

Service and Inspection

Regular weekly inspection of the following is necessary to ensure trouble-free, lasting operation:

1. Correct switching function.
2. Secure mounting of components.
3. Debris and wear.
4. Loose cable terminals.

There are no user serviceable parts in this unit. If damage or wear is found the whole unit must be replaced. If lubrication/cleaning is required use WD40. **Do not use dry lubricant.** Lubrication/cleaning will depend on the environment. Lubricate/clean at least once a week when used in the concrete industry.

Disposal

This interlock does not contain any certified hazardous materials so should be disposed of as industrial waste.

Liability coverage is voided under the following conditions:

1. if these instructions are not followed.
2. Non-compliance with safety regulations.
3. Installation and electrical connection not performed by authorised personnel.
4. Non-implementation of functional checks.

Environment Specification

Environment Type	Indoor
Max. Altitude	2000m
Ambient Temperature	-5°C to +40°C
Maximum Relative Humidity	80% @ ≤31°C 50% @ 40°C
Transient Overvoltages Installation	Uimp 2500V
Pollution Degree (IEC 664)	Degree 2
Ingress Protection	BOB - IP00 FOB - IP40
Waterproof	FOB - IP66

The manufacturer reserves the right to modify the design at any time and without notice.

This guide should be retained for future reference.

Figure 1

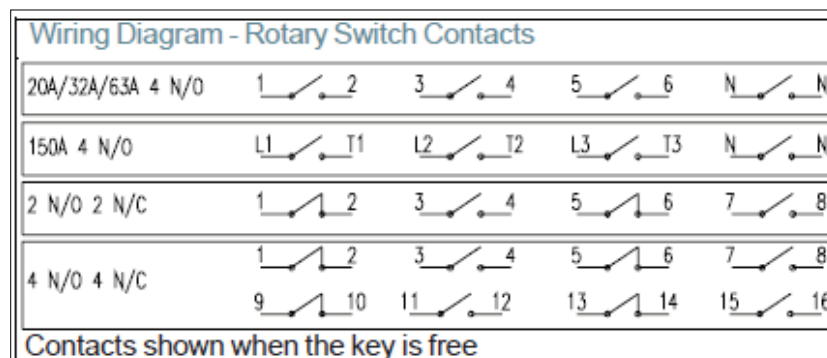


Figure 2

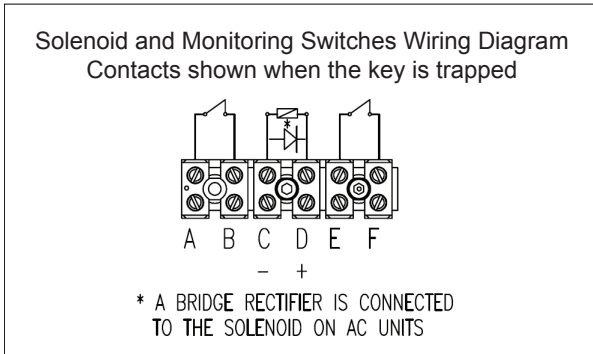


Figure 3

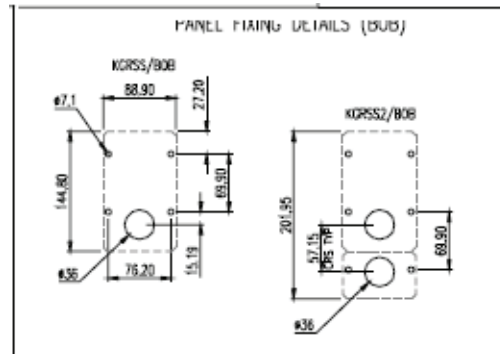


Figure 4

