

TYPE H2S FUSE SWITCH AND SWITCH

TYPE H1S FUSE SWITCH AND SWITCH

INSTALLATION AND SERVICE MANUAL

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Type H2S Fuse Switch and Switch) For Unimet
Type H1S Fuse Switch and Switch) Switchboards only

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1. DESCRIPTION OF EQUIPMENT

These instructions cover a range of air-break devices complying with BS.5419 and IEC 408, designed only for fitting in Unimet Switchboards.

Full compliance with the mechanical life operations and load making and breaking requirements of these specifications has been proved by typetests. Silver plating of all switch contacts should ensure long service with minimum maintenance.

Type H2S Fuse Switch is double break having top and bottom contacts arranged either side of the Fuse Link.

Type H1S Switch Fuse is single break having top contacts only arranged to isolate the fuse link from the busbar supply.

Modular Sizes and Ratings:

Module 1

H1S6 - AC23 rating 63A 37kW
H2S6 - " " " "

H1S10 - AC23 rating 100A 55kW
H2S10 - " " " "

H1S16 - AC23 rating 160A 90kW
H2S16 - " " " "

Module 2

H2S20 - AC23 rating 200A 110kW

Switches are suitable for Ottermill 'T' Type fuse links to BS 88 (See 3.2 for full list).

Correspondence referring to the switches should quote type and rating details given on rating label.

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2. INSTALLATION:

Before commissioning refer to UNIMET Installation and Service Instructions Publication UNI 201.

Normally reference need only be made to 2.1, but if significant delay has occurred before commissioning, or the switchboard has been stored in damp and/or dusty conditions, or any doubt exists, remove switches from switchboard (see 3.4) and proceed according to 2.2.

2.1 Switches in Switchboards

2.1.1 Preliminary Inspection

BEFORE ENERGISING THE SYSTEM the equipment should be inspected and its operation checked as follows.

Remove any dust and packing material and ensure that there are no loose parts, e.g. nuts, washers etc., in the switch. Check for any visible signs of damage. Make sure there are no loose CONDUCTING objects near the terminals or live parts e.g. nuts, washers, screws, wire etc.

Check closing and opening operations are fast and positive. See 3.6 if checking with door open.

2.1.2 Cabling

Access is via duct immediately to right of devices. Note that design permits upwards or downwards cabling.

Module 1 - Maximum copper cable size 95 sq.mm. Thread shrouds and covers provided over cable ends and attach lugs. Ensure cable length sufficient to avoid straining terminal moulding and that terminal nuts are properly tightened.

Pull covers and shrouds towards device and secure covers to dividing trays immediately above and below using Taptite screws and washers provided.

Module 2 - Maximum copper cable size 120 sq.mm. Proceed as for Module 1, but after making terminations secure covers to brackets on dividing tray above and to lower bracket on case side, using Taptite screws and washers provided.

2.2 Switches Supplied Separately

2.2.1 Preliminary Inspection

As for 2.1.1

2.2.2 Insulation

If there is any sign of dust or damp, wipe all insulation with a dry clean lint-free cloth. If the equipment is damp, for example due to poor storage, allow to dry out thoroughly before energising the system. If in doubt, check the insulation resistance and values in excess of 100 Megohms should be obtained.

2.2.3 Contacts

These have been greased prior to assembly and the top set is visible through the transparent cover. With device in open (OFF) position, check that contacts are clean and that gap between closest points of fixed and moving is approx. 9mm. In the closed (ON) position almost all of each moving contact should overlap its mating fixed contact face. See 3.5 regarding Type H2S which has a bottom set of contacts.

2.2.4 Mechanism

Check closing and opening operations. With a loose switch it is necessary to defeat the interlocks (See 3.6).

Contact beam movement should be fast and positive whatever the speed of handle operation.

2.2.5 Installation in Switchboard

First check that plug-on moulding assys at rear have not been damaged in transit. Plug contact faces should be lightly smeared with a proprietary contact grease. Refer to latter part of 3.4 for re-fitting. Proceed as 2.1.2 for main cabling.

Auxiliary switch wiring routed via grommet at rear of case, should be connected to appropriate terminal on cubicle internal upright adjacent to rear of device.

Current transformer secondary wiring routed via LH bottom of case should be connected to Ammeter/Selector Switch, as appropriate, on hinged front cover.

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3. SERVICING:

3.1 Safety

Before changing fuses or carrying out any inspection or service, ensure that the equipment is isolated from the supply and is safe to work on.

It must be emphasised that the consequences of causing a short circuit on high capacity medium voltage systems can be very serious as the current flowing in an arc can release a very large amount of energy, resulting in severe flame and damage.

3.2 Fuse Link and Link Replacement

In the event of fuse links blowing, the fault should be traced and rectified and the fuse links replaced with the correct size and type of ASTA certified fuse links to BS 88. These are obtainable from Ottermill Switchgear Limited.

Warning: Only suitable fuse links must be used. Open fuse wire is extremely dangerous and must not be used.

Except for motor starter applications, fuse links having a higher normal current rating than that stated on the switch rating label MUST NOT BE USED. Fuse Links should not be removed or replaced until it is ascertained that the switch is properly in the open position and safe to work on. This is particularly important for Type HIS (Single Break) devices where the fuse link is not isolated from the (normally) outgoing terminal. When replacing fuse links, ensure that the fixing nuts are fully tightened and that no nuts, washers, etc., are left in the switch.

Solid links, fitted in place of fuse links, to switches and isolators do not normally require replacement. If, however, these are removed for any reason, ensure upon replacement that fixing nuts are fully tightened.

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Fuse Link Types

Device Type & Max. Rating	BS.88 Ref.	Fuse Link Rating Amps	Fuse Link Ref. No.
H1S 6 and H2S 6 63A	A2	25 32 35 * 40 * 50 * 63 *	TIA 25 TIA 32 TIA 32M35 TIA 32M40 TIA 32M50 TIA 32M63
	A3	35 40 50 63 80 * 100 *	TIS 35 TIS 40 TIS 50 TIS 63 TIS 63M80 TIS 63M100
H1S10 and H2S10 100A	A4	80 100 125 * 160 * 200 *	TCP 80 TCP 100 TCP 100M120 TCP 100M160 TCP 100M200
H1S 16 and H2S 16 160A	NON- BS	32 35 50 63	TBC 32 TBC 35 TBC 50 TBC 63
	B1	80 100	TC 80 TC 100
	B2	125 160	TF 125 TF 160
	B1	80 100	TC 80 TC 100
H2S20 200A	B2	125 160 200 250 * 315 *	TF 125 TF 160 TF 200 TF 200M250 TF 200M315

* FOR MOTOR STARTING ONLY

3.3 Normal Service

In general lightly loaded or infrequently operated devices should have their operation checked at least every 12 months whilst in the switchboard.

Heavily loaded and/or frequently operated devices should be checked about every 3 to 6 months.

3.4 Removal from Switchboard and Re-Fitting

When it is required to remove switch from switchboard for inspection ensure switch is in open (OFF) position and ensure cable terminals are not energised and proceed as follows:-

Open device door and remove switchboard cable duct cover which is at R.H. side of device. Remove screws securing cable terminal covers and slide these with their shrouds along cable to expose lugs and disconnect. For a Module 2 device also remove lower terminal cover bracket.

Any auxiliary wiring at rear and metering wiring to front cover, must also be disconnected.

Via the cable duct, remove the screw near front of dividing tray which screws into side of switch case. At front L.H. bottom of switch case, the screw adjacent to the red warning label must be unlocked and unscrewed to clear front flange of dividing tray below.

If an ammeter is fitted the front cover must be lifted off by tapping sharply underneath adjacent to hinge with the door in the fully open position.

The device can now be pulled out, carefully, without slewing using bracket or channel at left bottom, and escutcheon; avoid pulling on fuse links. Take care to support device properly before runners reach front of tray guides. Avoid striking rear plug-on moulding assemblies when lifting away.

Re-Fitting

Care must be taken; proceed in reverse order to above. Enter switch slowly along tray guide runners, without slewing, until stopped by contact with riser busbars. Then retract switch approximately 40mm. and without using unnecessary force apply pressure equally at both sides to smartly push switch fully home. Secure with locking screws and reconnect auxiliary and meter wiring, where applicable (See 2.2.5).

Refer to 2.1.2 if necessary, for main cabling.

3.5 Contacts

When device is removed from switchboard (see 3.4), top set of contacts can be inspected through the transparent cover.

If transparent cover is obscured by arc products, inspection of top contacts can only be made after removing top clamp plate and transparent cover. This is done after removing the ten nuts and one screw and shakeproof washers.

Light burning or erosion of top contact leading edges should not adversely affect further service but burning extending onto main (flat) contact faces is indicative that it would be unwise to subject device to further service.

Note that Type H2S switch also has a bottom set of phase contacts, arranged to close before and open after the top set to ensure that their duty is less onerous.

Therefore top contact condition is the criterion on which assessment can reliably be based.

After inspection re-assemble in reverse order to above, after checking splitter plates are properly located.

Ensure replacement of shakeproof washers and tighten nuts to 55-60 lbs ins or 6.2-6.7 Nm-torque. Note that stated torques must not be exceeded.

Check mechanism operation (see 2.2.4) before re-fitting to switch-board (See last part of 3.4). See 2.1.2 for cabling. See 2.2.5 for small wiring.

3.6 Mechanism & Interlocks

The switch door is interlocked with the mechanism, so that the door can be opened only when the switch is OFF, and the switch normally cannot be put into the ON position when the door is open.

However, for service purposes etc., this interlock can be defeated while the door is open. The interlock plate is visible through the slotted projection on the escutcheon and by holding the plate to the right with a small screwdriver the switch can be operated. This interlock is not adjustable and should be checked when inspecting the switch.

A figure type interlock may be fitted as an integral part of the escutcheon. When checking switch operation turn the figure lock key fully before operating the switch.

When checking closing and opening operations, the contact beam movement should be fast and positive whatever the speed of handle operation. The escutcheon window should display the appropriately coloured sector of the flag driven by the lever on the mechanism output shaft.

At each end of the traverse the spring loaded latch should drop into the slot in the lever attached to the mechanism output shaft.

3.7 Padlocks

Provision for padlocking the operating handle in the open (OFF) position is standard. This requires a standard 1½" (38mm) padlock with ¼" (6mm) hasp which is available from Ottermill Switchgear Limited.

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When fitting, thread the hasp through the slot in the underside of the handle and snap the padlock shut.

Where the optional facility for padlocking in the closed (ON) position has been provided fitting is achieved by threading the hasp through the handle slot and also the hole in the surrounding handle boss.

3.8 Auxiliary Switches

A maximum of two auxiliary switches each with NO and NC contacts may be fitted. These are small moulded case switches operated by the cam on the drive output shaft. The switch or contacts should require no maintenance, and it is only necessary to check that the fixings are tight, and that the switch lever arm operates the switches satisfactorily. Should a switch be damaged, it must be replaced by a new switch. Refer to 2.2.5 for wiring.

3.9 Gaskets

For IP54 enclosures dust protecting gaskets are used on the switch escutcheon and door. If they require replacement to maintain their efficiency, correct replacement material obtained from Ottermill Switchgear Limited must be fitted after removing the old gasket. The gasket must be stuck in the groove formed by the angle inside the escutcheon or door.

4. MAJOR OVERHAUL:

If a major overhaul or repair of a switch is necessary, it should be returned to Ottermill Switchgear Limited.