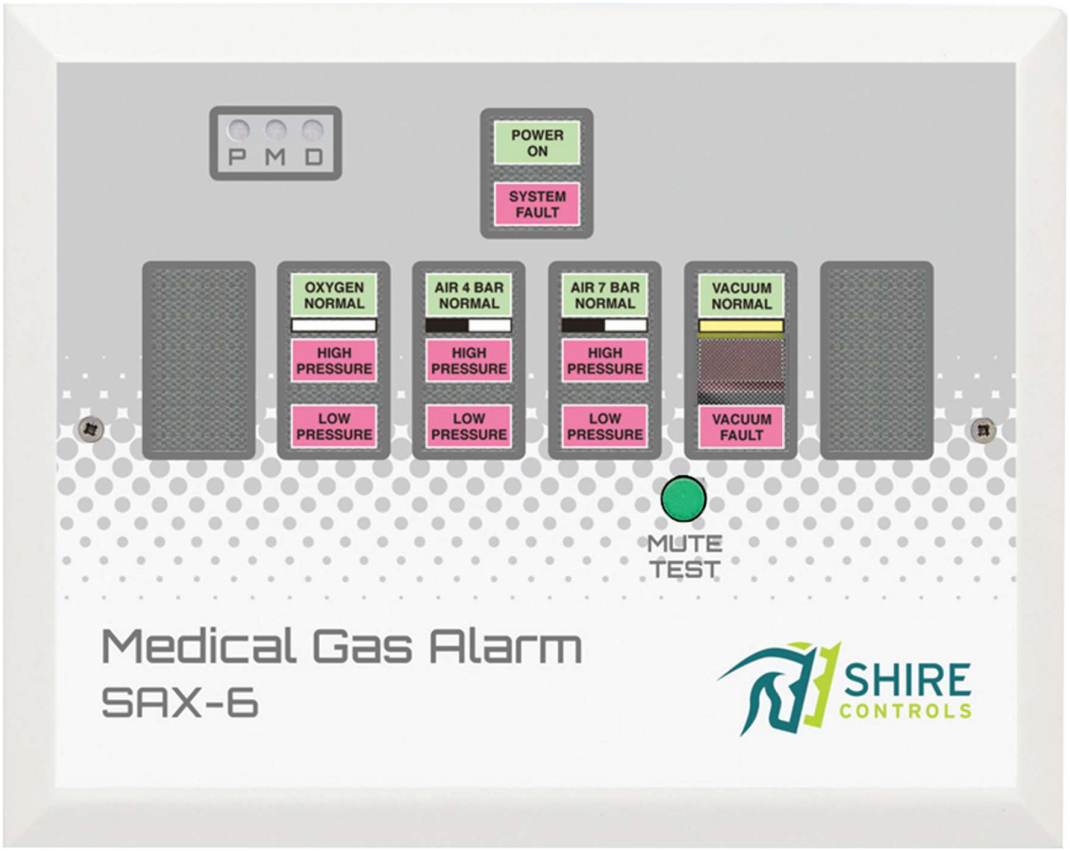
SAX-6 Area Alarm
for
Piped Medical Gases



Contents

Table of Figures

1. Introduction

The SAX-6 area alarm is designed to monitor piped gas pressure. The SAX-6 will function as a stand-alone Alarm or be configured to operate as a Repeater to another SAX-6 alarm within 100 meters, using a 3-core screened data cable.

The SAX-6 area alarm panel is designed to monitor high & low pipeline pressure on up to 6 gases, using volt-free, normally closed, contacts on pressure sensors mounted in the pipeline downstream from the final Area Valve Service Unit (AVSU).

Each gas has a green "Normal", red "High Pressure" and "Low Pressure" lamps. The panel also has a green "Power On" lamp and a red "System Fault" lamp, together with a mutable audible alarm.

In addition, the panel has 3no 5mm Round Led indicators to show how the panel is connected, and the status of the connection.

The SAX-6 Alarm can operate within a small network of alarms as direct Repeater alarms or in a D type (Dual Circuit) Operation where two Alarms (3 Gas or less) can be collectively displayed on a standard operation Alarm (up to 6 Gases).

The SAX-6 can also transmit data to the MEDCON bus as used by the SDX-15 plant alarm system.

2. Safety-Related Information

2.1. Intended Purpose:

Shire Controls Ltd. Area Alarm is intended to monitor the pressure in area gas supply pipelines. The Device is designed to monitor up to 6 gases using volt-free contacts on pressure switches mounted in the pipeline.

2.2. Intended User group:

The device is intended to alert operators including technical and clinical staff of abnormal operating pressures downstream from the Area Valve Service Unit.

2.3. Target Patient Group:

Not applicable as device does not diagnose, treat, prevent, cure or mitigate any diseases. It is used in maintaining normal operating conditions of the Medical Gas Pipeline Systems.

2.4. Indications and Contraindications:

Not applicable. Shire Controls Ltd. Area Alarms are not intended to be used by patients as the Device does not directly diagnose, treat, or monitor any medical conditions.

2.5. Environment Of Use

The SAX6 Area Alarm has been designed and validated for use in controlled indoor hospital environments and complies with the environmental requirements set forth under both EU MDR 2017/745 and UK MDR 2002 regulations.

The environmental tolerances are suitable for typical clinical installations and comply with IEC 60601-1 requirements under expected transport and use conditions.

The device housing is unsealed; therefore, it must be installed in dry, climate-controlled interiors as per HTM 02-01. Risk management activities have confirmed that no unacceptable environmental risks exist under the validated conditions.

2.6. Structural (EU MDR – Annex II, Section 1.1):

The SAX-6 Area Alarm is an electrical medical device designed to monitor pipeline pressures of up to six medical gases downstream from Area Valve Service Units (AVSUs), using volt-free pressure switch contacts. It comprises mechanical and electronic subassemblies enclosed in wall- or surface-mounted housings. All materials and structural components have been selected to comply with requirements of HTM 02-01, ISO 7396-1, and IEC 60601-1 for electrical and structural safety.

Structural Components and Materials

1. Alarm Enclosures and Fascia Assemblies

- Flush Mount Dimensions: 240 mm × 194 mm × 45 mm (W×H×D)
  - Weight: 1.988 kg
  - Back Box (Flush): M1239, Zintec steel, 1.6 mm
- Deep Flush Mount Dimensions: 240 mm × 194 mm × 65 mm
  - Weight: 2.329 kg
  - Back Box (Deep Flush): M1260, Zintec steel, 1.6 mm
- Surface Mount Dimensions: 225 mm × 80 mm × 45 mm
  - Weight: 2.078 kg
  - Back Box: M1231, Steel, 1.5 mm

All variants incorporate a 1.5 mm steel bezel:

- Bezel: M1238 or M1230 depending on type, mild steel construction.

2. PCB Assemblies

- SAX-6 Control PCB: Main logic and display driver board
- SATBTX-A Transmitter PCB: Signal conditioning and line monitoring board

3. Fixings and Mounting Hardware

- Mounting Pillars:
  - M1240 (Short, Brass) – Flush variant
  - M1261 (Long, Brass) – Deep Flush variant

- Hex Spacer: M1244, Mild Steel
- Spring Pillars: SH816 HSN003245, Stainless Steel 302EN58A

4. Electrical Safety Covers
   - Protective Mains Cover: M1243, Acrylic, 3 mm, transparent and non-conductive
5. Power Backup
   - Battery Pack: SH435/540 – 10-cell, NBPA1530, 12V, 280mAh Ni-MH, mounted on reverse of PCB, with adhesive pads and Molex connector.

The SAX-6 Area Alarm has been designed and constructed to eliminate or reduce mechanical hazards in accordance with IEC 60601-1 Clause 9. All accessible mechanical parts are free of sharp edges and constructed from robust, medical-grade materials including steel, Zintec, brass, and acrylic. Enclosures and structural components (e.g., bezels, back boxes, and mounting hardware) are securely fixed and mechanically stable to prevent crushing, impact, shearing, or instability during normal use, maintenance, or foreseeable misuse.

3. Operator

The SAX-6 Area Alarm is designed for manual operation via the Test/Mute push-button. Hence it is envisaged that the operator is able to visually monitor from within 900mm.

The inherent design includes Red/Green indicator LED's and the use of gas colour recognition within the title bar of each gas window, which ensures that the alarm can be monitored comfortably from 3-4 metres away.

Consideration should be made for final location, in accordance with the latest HTM guidelines, prior to installation.

Note: When you see this symbol, the associated text refers to something which may cause damage or danger.

4. Mounting

The Sax6 is available in 3 variations for mounting:

- Surface mounting
  - Mount the enclosure with the "TOP" sticker uppermost.
  - Fit the PCB on the Top Left & Right 4mm fixing holes and locate in the spacers provided.
  - Fit 2no M4x20 earth screws (with copper washers) to bottom centre of PCB and secure to back box.
  - Once connected fit fascia bezel and secure with 2no M3x6 CSK screws.

- Flush mounting
  - Fit the back box in the wall so that the front edge is 2-15 mm lower than the finished wall surface.
  - Fit PCB on 3no sprung brass pillars (part of back box assembly)
  - Secure PCB with 3no M3x6 screws and M3 plain washer (1no for each pillar).
  - Once connected and when the wall is finished/filled/painted, attach the fascia bezel to the back box, using the 2no M3 x 25mm countersunk screws provided.
- For Both mounting types:
  - Connect the earth lead on the fascia bezel to the M3 stud on the inner side wall of the back box.
  - Locate the termination box adjacent to the pressure switches (contact source). Mount the transmitter box directly via minimum of 2no corner fixing points.

  Note: remove the transmitter PCB from the box whilst fixing, to avoid damage to the PCB or connectors.

WARNING

The SAX-6 Area alarm is designed and built in accordance with HTM 02-01 and ISO 7396-1 regulations. Persons undertaking installation (or maintenance) should be trained in work of this nature. The "PERMIT TO WORK" procedure must be adhered to for all installations once commissioned.

Read and become familiar with the contents of this manual before installing (or maintaining) this device.

- **Before the device is handed over to the operator, the proper functioning of the system must be proven as part of the acceptance tests for the completely installed system. This verifies compliance with national regulations.**
- **Equipment must be approved before commissioning the system and after installing the components.**
- **If the test fails, these medical devices must NOT be put into service.**
- **An improperly mounted device may compromise the safety of patient care and endanger the user.**
- **DO NOT USE OIL OR GREASE on any parts in contact with medical gases for any reason. This could lead to an EXPLOSION.**

5. Connection

WARNING

Always ensure that you are in contact with earth when handling electronic components to avoid damage by static discharges.

All cable screens must be connected at both ends. Continuity must be maintained through any junction boxes. A minimum of 20mm clearance must be maintained between the alarm system cabling and any other cables (including the 230Vac to the alarm system).

FAILURE TO CARRY OUT THESE INSTRUCTIONS MAY CAUSE INTERMITTENT FAULTS AND INVALIDATES THE DECLARATION OF CONFORMITY RELATING TO THIS ALARM

If cable entry is from behind the panel, remove the two knockouts in the back of the panel. Mount the panel with the TOP label uppermost, using the 4 holes provided.

If the panel is to receive data directly from pressure switches, a 3-core screened cable, minimum 0.5 square mm CSA, is required between the main alarm panel and the termination box.

Connect the 3-core screened cable from the alarm panel into the terminals marked A, B & C, ensuring that the screen is clamped using the copper clip provided.

The diagram opposite shows the 4 stages for stripping and bonding the screen to the P-Clip earth points provided.

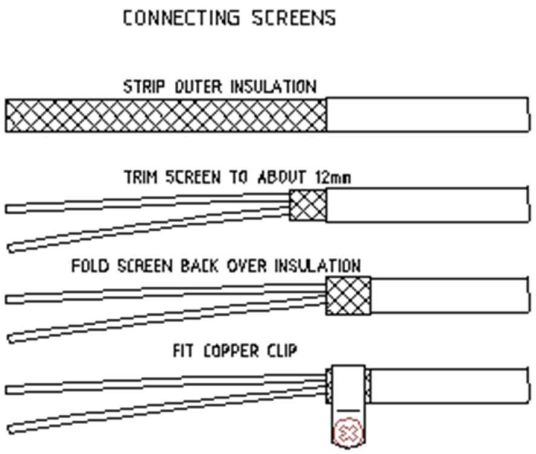


Figure 1: Data Cable Screen Connection

Repeat the process for connection of terminals marked A, B & C at the transmitter PCB, again ensuring correct connection of cable screen to the earth point provided.

If the panel is to be connected to an SDX-15 system, a 2-core screened cable, minimum 0.5 square mm CSA, is required between the panel and the nearest point on the SDX-15 system. Connect the 2-core screened cable from the alarm panel into the terminals marked 1& 2, ensuring that the screen is clamped using the copper clip provided.

For connection of the remote end of the 2-core cable refer to SDX Plant Alarm manual.

Use a 2-core cable for each pressure (or vacuum) switch required and plug the crimp connectors on the flexes onto the pressure switches (polarity not relevant).

WARNING

This equipment is not suitable for a connection to an IT power system. A readily accessible means of disconnecting the supply must be provided. The maximum prospective fault current must not exceed 1500 amps.

Mains Supply

Connect the Live, Neutral and Earth to L, N & E on the ST18 White Wieland Connection (refer to label on Back box for correct connection). The supply required is 230Vac, 50/60 Hz, fused at 3 amp.

Battery

Provide continuity for the battery connections, by placing the jumper link provided across the 2-pins (bottom right of the speaker on front of PCB – see page 10). Note: The battery is already mounted on the reverse of the PCB assembly.

Input Data Signals

For all applications, cable monitoring is provided by means of a transmitter (supplied with the panel), which must be mounted in or by the contact source (plant or pressure switches) for each service. The terminations enable:

A 2-core termination for each of up to 12no input conditions (6no High & 6 no Low)

- Unused conditions can be set to normal by connecting a wire link across the 2no input terminals for the unused condition.

A 3-core termination for connection Medcon Data bus between SAX transmitter and SAX-6 Alarm panel.

- Terminals marked.
  - A for 5vdc supply to transmitter
  - B for multiplex data signal
  - C for Common reference for supply and data.

At the Alarm, these terminations are provided for similar means:

- Terminals marked.
  - A for 5vdc supply to transmitter
  - B for multiplex data signal
  - C for Common reference for supply and data.

There are connection points for optional SDX Interface:

- Terminals marked.
  - 1 for multiplex data signal
  - 2 for Common reference for data.

A Common Fault Relay output is provided. The relay terminals are clearly marked and have continuity when all conditions are at normal. The Relay operates (i.e. Continuity between Relay terminals become Open), when there is:

- Any High- or Low-Pressure Gas Condition Fault Present
- System Fault (Wiring/Line Monitoring Fault) is Present
- Under Battery Back Up – Loss of Mains Supply 230Vac

Where a Repeater Alarm is required, the 3-core data cable may be extended from any point on the network. You may even break into a longer cable run, create a junction point and tee-off to the new repeater location.
Note: Remember to connection through the A, B, C as well as the Cable Screen

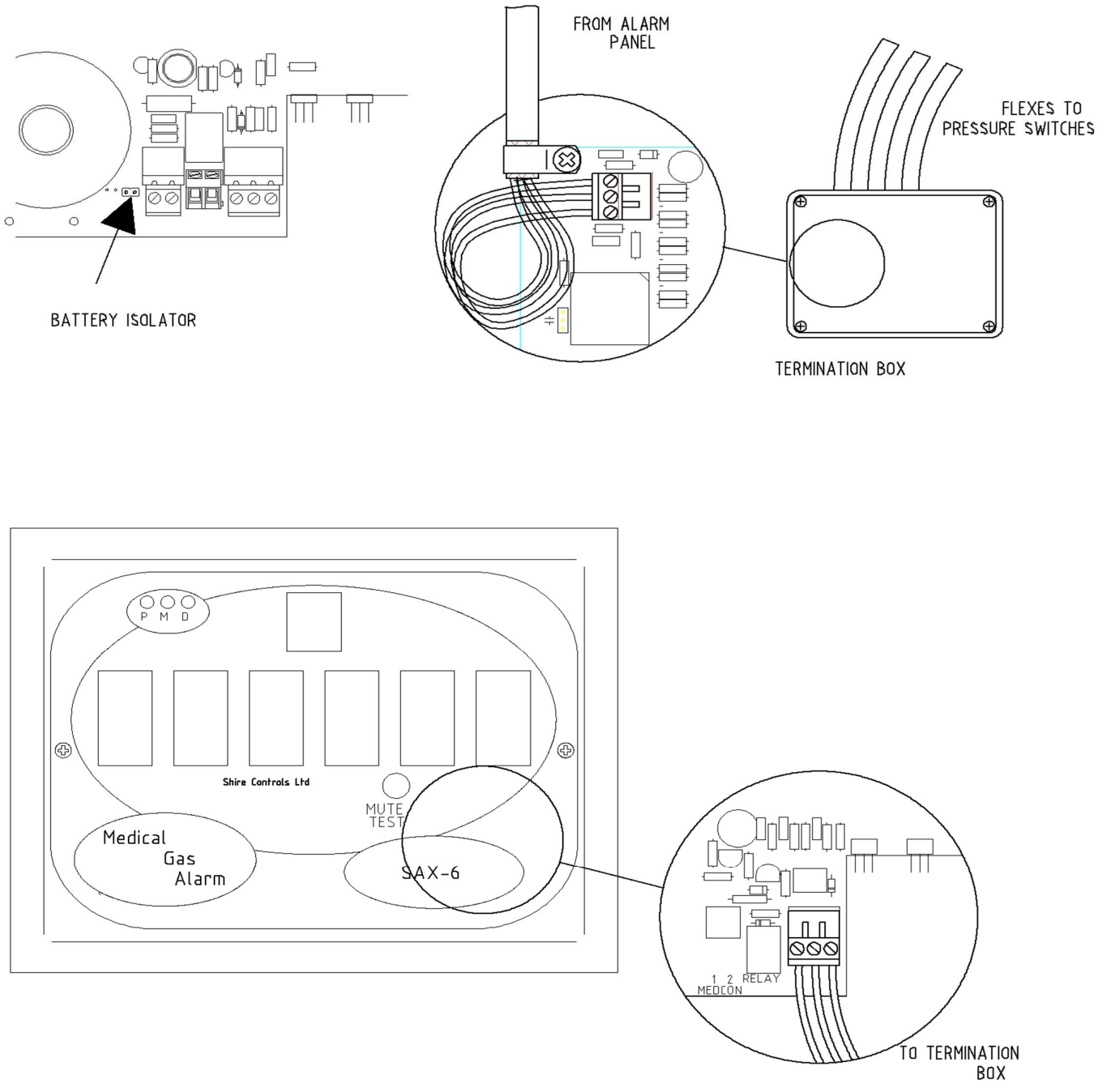


Figure 2: Alarm, Battery and Transmitter Connection

6. Display Unit

This section outlines the display components and their corresponding conditions during use and in case of an alarm.

Alarm Condition	Power On LED	System Fault LED	Red Gas Condition LED	Relay Output CM & C	Audible Output (2-Tone)	Comment
Normal	On	Off	Off	Closed	No	
Mute-Test (With Alarm at Normal)	On	Off	Flashing	Closed	Yes	Gas Condition Green Normal's All On
Gas Fault	On	Off	Specific Condition Flashing	Open	Yes	Temporary & Permanent Mute can be used
Mute-Test (With Gas Fault Present)	On	Flashing	On* (If Permanent Muted) or Flashing	Open	Yes	Gas Condition Green Normal's All On
System Fault (Loss Of Line Monitoring)	On	Flashing With P Led	All Conditions Flashing	Open	Yes	Temporary Mute Only can be used
Gas Fault & System Fault (Loss Of Line Monitoring)	On	Flashing With P Led	All Conditions Flashing	Open	Yes	Temporary Mute Only can be used
System Fault (Optional Loss of Line Monitoring To SDX System)	On	Flashing With M Led	N/A	Open	Yes	Temporary Mute Only can be used. (If M Led is On or Flashes then SAX/SDX Medcon Interface PCB is in use)
System Fault (Optional D Type) Selected From 6-Way DIL Switch SW4	On	Flashing with D Led	N/A	Open	Yes	Temporary Mute Only can be used. (If D Led is On or Flashes then Alarm Is Selected For D type Operation)
Loss Of Mains	Off	Flashing	N/A	Open	Yes	Temporary Mute Only can be used

7. Battery

The 400mah 12v (10 x 2/3AAA) battery pack should be mounted on the reverse side of the Display PCB assembly, behind the speaker. The battery comes with:

- Pre-fitted 2-way Molex connector, which should be plugged into the Molex header on the PCB.
- 2no double sided adhesive pads, so that the battery can be located.
- Fit battery jumper isolator - see page 10.

WARNING

When replacing a battery-pack DO NOT use a screwdriver (or similar tool) to lever the old unit away. Rock the battery-pack up/down/up until the adhesive pads become unstuck.

INSTALL & SET-UP THE LED CONTROL BOARD.

WARNING

Always ensure that you are in contact with earth when handling electronic components to avoid damage by static discharges.

Set the 6no jumpers as follows (the settings are shown on the label in the back box):

Jumpers 1,2 & 3 are for displayed number of gases.

- These are normally factory set, and you should not need to change these.
- If you are amending the number of gasses being displayed, see Fig 6.

Jumper 4 is for D Type Operation.

- This enables/disables the Alarm Display for Dual Circuit (D Type) Operation and Switches D Led (On/Off).
  - Up= Enables D Type Operation, with D Led On (the Display can now only display 1, 2 or 3 Gases).
  - Down=Disabled D Type and Revert Alarms to Standard Operation (D Led is Off).
- Jumper 5 is for audible output options.
  - Up = to enable the EN475 standard audible,
  - Down = to enable HTM two-tone audible type.
- Jumper 6 is only used when the (optional) SAX/SDX Medcon Interface is required, enabling the transmission of a single gas condition onto the SDX-15 Plant alarm system.
  - Up = “Enabled” allows Common Fault status to be transmitted and Switches On M Led,
  - Down = “Disabled” and Switches off M Led.

Set the volume control to the required level, by holding in the mute button until a permanent audible is heard. Then by rotating a small 3mm terminal screwdriver in the component marked VOLUME, on the reverse of the board, until suitable (see Fig 3).

Also see Fig 3 for connection and Fig 6 for setting up data transmission.

Locate the fascia plate over the front of the Control PCB and fix the 2no M3 countersunk screws to secure the fascia (Surface = 2no M3x6: Flush = 2no M3x25).

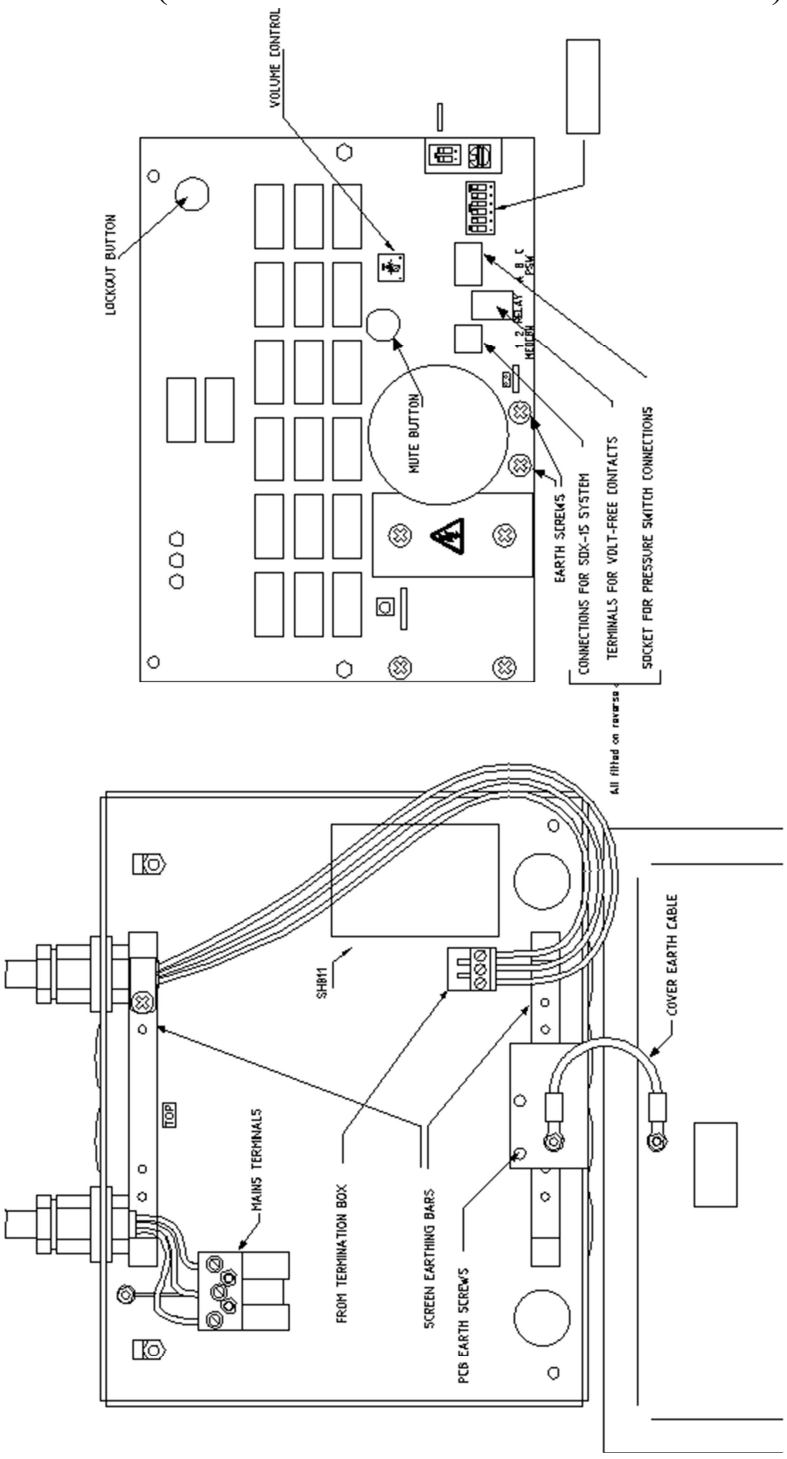


Figure 3: Alarm Connection & Set-up

8. Priority Signals

All normal conditions are represented by Green LEDs (Power On if 230Vac is present & Normal when neither fault on a gas is present).

All fault conditions are represented by flashing Red LEDs. A System Fault is displayed if there is a cable fault or mains loss. Gas warnings are displayed if the pressure is out of range.

In addition to assist with System Fault diagnosis the SAX-6 has 3 LED 5mm Round Red LED indicators marked P, M & D on the front panel which indicate the following:

- The P LED represents pressure switch inputs.
  - LED is On. This indicates that the SAX Alarm and transmitter board are set up and communicating correctly.
  - LED is flashing. The panel has been set up to detect pressure switch inputs via the end of line transmitter board but has not been connected correctly.
- The M LED represents use with our MEDCON protocol (as with our SDX Plant Alarm System).
  - LED is on, this indicates that the SAX panel is working in conjunction with the SDX network and can transmit the local alarm condition onto the SDX system.
  - LED is off, then the panel has not been set up to work with our SDX system.
  - LED is flashing, then function has been enabled, to use with our SDX system, but the 2-core data bus used for such systems has not been connected correctly.
- The D LED indicates where Alarms are set to indicate part of a Dual Circuit system (D type).
  - The LED is either on or off and is designed to show at a glance whether a unit is set to operate as Standard (D Led off) or for Dual Circuit operation (D Led on).

Note: The purpose of the program setting is to enable 2no panels (each 3-gas max) to provide status to 1no 6 gas central unit using standard boards and cabling. Here the 2no 3 Gas Panels should be D type and the 6 Gas should be standard.

9. Operation

When all conditions and the power supply are at normal, only the “Power On” and “Normal” lamps energize. If any signal contact opens, the appropriate “Normal” lamp goes out, the appropriate Red “Fault” lamp will flash, and the audible will sound.

If the signal cable is short or open circuited on any of the A, B or C cores, ALL “Fault” gas conditions, the “System Fault” & P LED flash and the audible will sound.

In the event of power failure, the “Power On” lamp will go out within 15 seconds, the “System Fault” lamp will flash, and the audible will sound. All other lamps will continue to function normally. If the mute button is not used for over 40 minutes, the “Normal” & “Fault” gas conditions will disable (switch off) and just the “System Fault” & audible will continue for the remainder of the battery life.

Failure of the data connection between Master/Repeater alarms will mean that the repeater alarm will show ALL “Fault” gas conditions, the “System Fault” & P LED flash and audible.

If any gas or system fault is present, the Common Fault Relay output relay will be de-energised, only re-energising when all gases and power are at normal.

WARNING

Inadequately installing a device could jeopardize patient safety and put the user at risk. Prior to handing over the device to the operator, it is essential to confirm that the system functions correctly through an acceptance test, ensuring adherence to national standards.

- **Prior to system deployment and following component installation, the equipment must undergo approval.**
- **In the event of a test failure, medical devices must NOT be utilized.**

a. Muting (Temporary)

The audible is muted by pressing the Mute/Testbutton then releasing. The audible will then stop.
The audible will re-trigger after a nominal 15 minutes. It can then be re-muted.

b. Muting (Permanent) or Lockout

If an alarm condition is to be in fault condition for a prolonged period, the audible on this condition can be permanently muted from the large white push button on the top right of the Control PCB.

Note: Any other conditions present at this time, whether muted or not, will also be locked out. The lockout can be verified by pressing the Mute/Test button. Lamps for conditions which are locked out will be lit & steady. The lockout condition is cancelled as soon as the condition returns to normal.

A system fault cannot be locked out.

c. Testing

Periodically operate the Mute/Test button.

Hold in until All Red Gas Condition LEDs flash, The “System Fault” flashes (opposite timing to the Gas Condition flashing) All Green LEDs show continuously the audible sounds. Any Red alarm LEDs for conditions which are locked out will be steady.

Release the button. After a short delay, all conditions should return to normal operation and the audible should stop.

Periodically switch off the mains supply.

Lamps should operate as described earlier. After a short delay, the audible should sound and the "System Fault" lamp should flash.

When the mains supply is switched back on, all conditions should return to normal operation.

d. Clinical Benefits

The Area Alarm is crucial for hospital gas pipeline systems. A properly functioning Medical Gas Pipeline System avoids any delay in treatment. The claims of Shire Controls Ltd. Area Alarm include:

- The Area Alarm used as instructed aims to indicate normal functioning of the Medical Gas Pipeline System by means of visual indicators on the alarm panel.
- The Area Alarm helps to inform the user by providing visual and audible emergency alarms that abnormal conditions have occurred which may require immediate action by the user or clinical staff or Medical Gas Pipeline System (MGPS) operator.

e. Disposal

This product must be disposed of in accordance with national regulations.
The unit does not contain any hazardous substances.

f. Technical Data

- **Environmental Conditions**

  The device meets the following operational and storage environmental limits:
  - Operating Temperature: –10°C to +40°C
  - Storage Temperature: –10°C to +50°C
  - Operating and Storage Humidity: 10% to 90% RH, non-condensing
  - Atmospheric Pressure Range: Tested between 860 mbar and 1060 mbar

- **Operating Data**

  Operating voltage: 230vac
  Power Consumption: 6va
  Protection Class: Class 1 (Mains supplied equipment using protected earth).
  Fuse: 5x20mm 250ma (Slow Blow) Ceramic

- **Display Unit**

  Status display of pressure ratios: None Displayed
  Pressure display: Red LEDs denote High- or Low-Pressure warning received from a Pressure Switch (By others)
  Maximum Pressure: Pressure Levels are set at the pressure switches as part of the system installation.

- **Relay Module**
  A Common Fault Relay is incorporated within the Power Supply PCB of the Alarm
  At Normal "Relay" Terminals have continuity.
  When a Fault is present "relay" Terminals are Open Circuit.
  Relay Contacts are Volt-free and are rated at 0.5amp for 110Vac & 1-amp 24Vdc (minimum)

  Environmental Transport and Storage Conditions
  All products are separately packaged and stored in controlled conditions.

- **Modes Of Operation**
  Set For 1-6 Gases (High & Low detection)
  Set for either EN475 or HTM audible
  Optional SDX15 Interface (transmitting Common Fault Relay Status to Plant Alarm System)
  Indoor use
  Continuous (equipment may be switched on indefinitely)

- **Risk Classification**
  Class IIb as per the Annex VIII Classification Rules under Rule 9 of EU MDR 2017/745

g. Maintenance

Recommended cleaning method:
- Use a soft, anti-static brush to remove loose dust particles.
- Wipe surfaces with a lint-free, non-abrasive cloth lightly moistened with Isopropyl Alcohol (IPA), 70–90% concentration.
- Ensure all visible marks or debris are removed.
- Allow the surface to air-dry fully or wipe until dry before packaging or installation.

Justification: Providing detailed cleaning instructions ensures consistent product presentation and reduces the risk of residue or debris interfering with product operation or user perception of quality.

h. Fault Troubleshooting

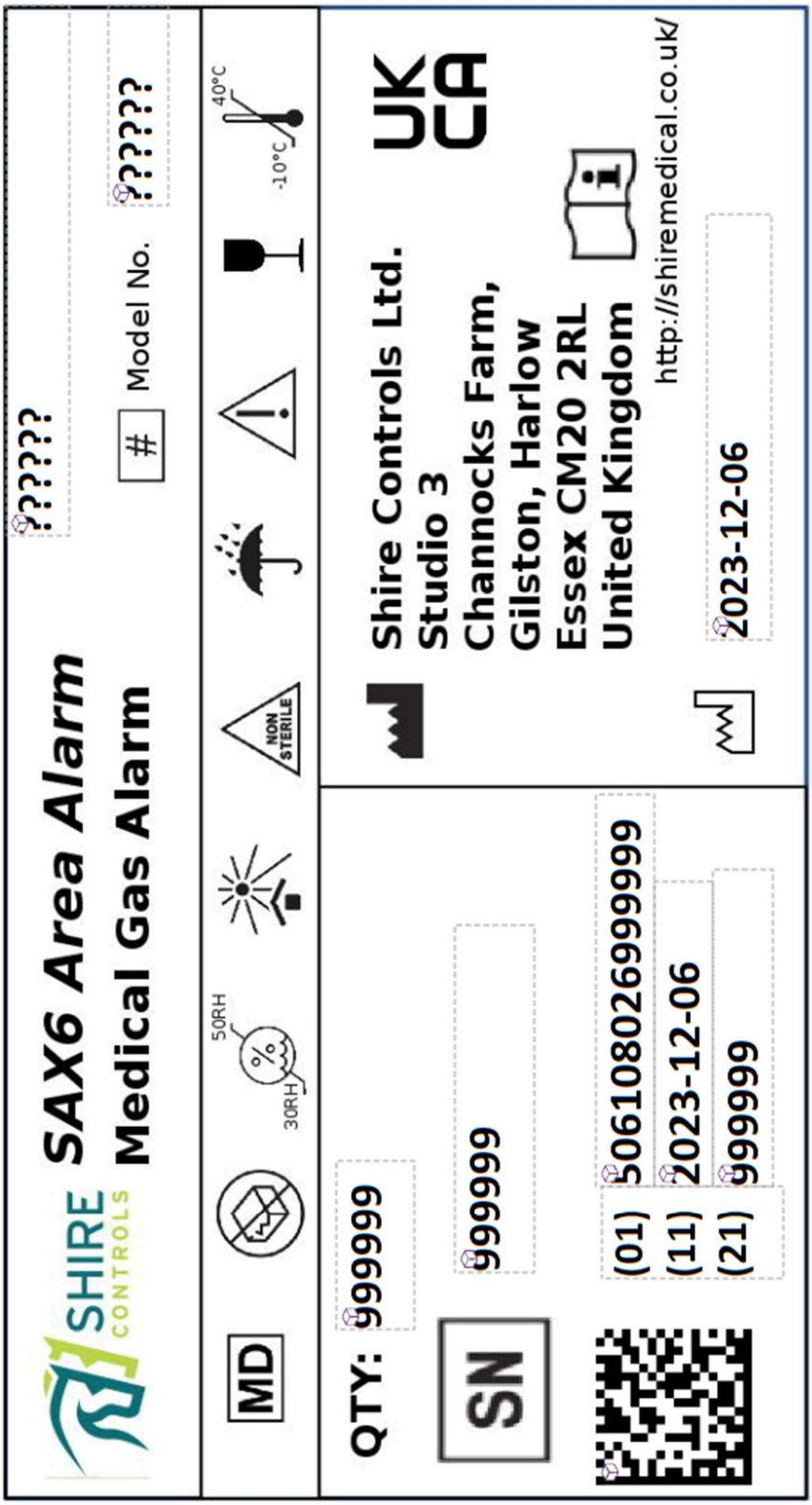
Fault	Cause	Remedy
Alarm does not switch on	No 230vac connected	Check site supplies to fused spur adjacent to alarm.
	If 230vac is present	Check both Ceramic 250ma & 500ma glass fuses. Replace as necessary fuse.
	If the fuse blows again	Call Shire Controls for assistance.
Alarm Condition Does not switch On when Gas level is out of Operating Range	Pressure Switches incorrect or set incorrectly	Remove wiring to SAX Transmitter input terminals and check for Visual/Audible indication.
	If after removing the wiring to Pressure Switch wiring from SAX transmitter terminals, the alarm does not respond.	PCB may have been damaged, Call Shire Controls for assistance.
Alarm Condition Does not switch Off when Gas level is in Normal Operating Range	Pressure Switches incorrect or set incorrectly	Create a shorting link across relevant SAX Transmitter input terminals and check that condition (RED LED) switches off.
	If after replacing pressure switch wiring with shorting link wire, the alarm does not respond.	PCB may have been damaged, Call Shire Controls for assistance.
Audible not sounding with visual warning	Possible damaged speaker/audible circuit	Press & hold Mute/Test button and check audible sounds
	If audible sounds when tested, possible external interference	Press & hold Mute/Test button and check that visual warning flashes or is light steady.
	Visual condition is permanently lit under test function	Retest for another gas condition to see if the audible is working correctly.
	If the 2nd test produced different outcomes, the original fault may have been permanently muted from the Lockout button.	If the 2nd test produced the same outcome, there may be interference from external sources.
	Check for correct earthing of ALL screened data cables on Alarm earth stud.	Call Shire Controls for assistance.
Battery Back Up not functioning.	Battery may have exceeded it life cycle.	Check for date code on tested label on battery.

	If the battery code is OK, is battery still sound	Check DC voltage across terminals (should be 12vdc)
	If battery is OK, check jumper link on control pcb is fitted	Is jumper is fitted across both header pins
	If no jumper is fitted, fit jumper links to middle-right pins and test	If jumper is fitted, pcb may be damaged, call Shire Controls for assistance
Intermittent faults on same conditions	May be due to broken cables between pressure switches & SAX transmitter PCB	Check cabling between these points.
	Faulty pressure switch.	Check the operation of pressure switch.
Intermittent faults on different conditions	Are these faults lasting for 3-4 seconds before changing/clearing	Check all data cables are screened & Earthed at **Both** ends.
	Faults still persist after cabling screened check	PCB may be damaged, call Shire Controls for assistance.

i. Symbol

Symbol	Explanation
	Medical Device
	Do not use it if the package is damaged and consult the instructions for use
	Humidity Limitation
	Keep Away from Sunlight
	Non-Sterile
	Keep Dry
	Caution
	Fragile
	Storage Temperature
	Manufacturer
	Date of Manufacture
	Serial Number
	Observe the Instructions for use
	UKCA Marking
	CE Marking European Union directives & regulations (including (EU) 2017/745 MDR)

j. UDI-DI & UDI-PI Label



k. Alarm Variations

Description	Part Number	Supplier
1 Gas SAX6 Alarm (Flush) c/w SATBTX in GW44206	sax1f	Shire Controls Ltd
2 Gas SAX6 Alarm (Flush) c/w SATBTX in GW44206	sax2f	Shire Controls Ltd
3 Gas SAX6 Alarm (Flush) c/w SATBTX in GW44206	sax3f	Shire Controls Ltd
4 Gas SAX6 Alarm (Flush) c/w SATBTX in GW44206	sax4f	Shire Controls Ltd
5 Gas SAX6 Alarm (Flush) c/w SATBTX in GW44206	sax5f	Shire Controls Ltd
6 Gas SAX6 Alarm (Flush) c/w SATBTX in GW44206	sax6f	Shire Controls Ltd
1 Gas SAX6 Alarm (Flush Deep) c/w SATBTX in GW44206	sax1f	Shire Controls Ltd
2 Gas SAX6 Alarm (Flush Deep) c/w SATBTX in GW44206	sax2f	Shire Controls Ltd
3 Gas SAX6 Alarm (Flush Deep) c/w SATBTX in GW44206	sax3f	Shire Controls Ltd
4 Gas SAX6 Alarm (Flush Deep) c/w SATBTX in GW44206	sax4f	Shire Controls Ltd
5 Gas SAX6 Alarm (Flush Deep) c/w SATBTX in GW44206	sax5f	Shire Controls Ltd
6 Gas SAX6 Alarm (Flush Deep) c/w SATBTX in GW44206	sax6f	Shire Controls Ltd
1 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax1f or s	Shire Controls Ltd
2 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax2f or s	Shire Controls Ltd
3 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax3f or s	Shire Controls Ltd
4 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax4f or s	Shire Controls Ltd
5 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax5f or s	Shire Controls Ltd
6 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax6f or s	Shire Controls Ltd
1 Gas SAX6 Alarm (Surface) c/w SATBTX in GW44206	sax1f or s	Shire Controls Ltd
1 Gas SAX6 Pre-Wired c/w PCB	saxpw1	Shire Controls Ltd
2 Gas SAX6 Pre-Wired c/w PCB	saxpw2	Shire Controls Ltd
3 Gas SAX6 Pre-Wired c/w PCB	saxpw3	Shire Controls Ltd
4 Gas SAX6 Pre-Wired c/w PCB	saxpw4	Shire Controls Ltd
5 Gas SAX6 Pre-Wired c/w PCB	saxpw5	Shire Controls Ltd
6 Gas SAX6 Pre-Wired c/w PCB	saxpw6	Shire Controls Ltd

l. Alarm Spares

Description	Part Number	Supplier
SAX/SDX Adaptor PCB (upto Issue 6 Control PCB)	saxsdx	Shire Controls Ltd
SAX Computer Interface in GW44208	saxci	Shire Controls Ltd
Surface Back Box	saxboxsurfacebase	Shire Controls Ltd
Surface Fascia	saxsurfacefront	Shire Controls Ltd
Flush Back Box (Flush shallow)	saxboxf	Shire Controls Ltd
Flush Back Box (Flush deep)	saxboxfd	Shire Controls Ltd
Flush Bezel	saxflushfascia	Shire Controls Ltd
Battery 12 volt	Sh435	Shire Controls Ltd
Battery 12 volt 20+ (No Test)	sh435	Shire Controls Ltd
Membrane & Window	sh766	Shire Controls Ltd
Weather Proof Box	sh700	Shire Controls Ltd
1 Gas Control PCB	sax1control	Shire Controls Ltd
2 Gas Control PCB	sax2control	Shire Controls Ltd
3 Gas Control PCB	sax3control	Shire Controls Ltd
4 Gas Control PCB	sax4control	Shire Controls Ltd
5 Gas Control PCB	sax5control	Shire Controls Ltd
6 Gas Control PCB	sax6control	Shire Controls Ltd
SAX Transmitter PCB In Box	satbtx6	Shire Controls Ltd
SAX Transmitter PCB Only	satbtx6board	Shire Controls Ltd
SAX/SDX Adaptor PCB	saxsdx	Shire Controls Ltd
SAX Transmitter BOX Only (44206)	sh474	Shire Controls Ltd

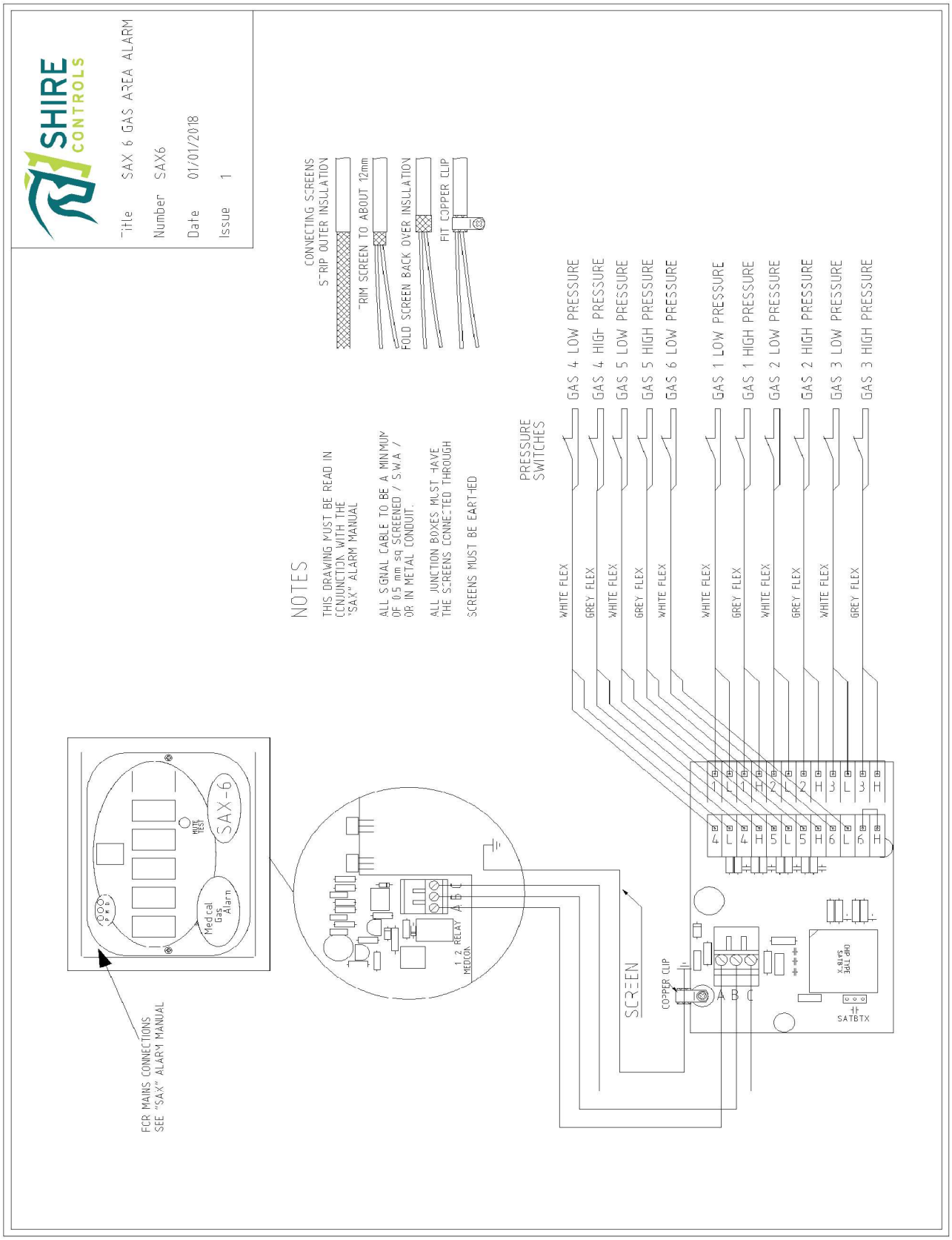


Figure 4: Typical SAX-6 Standard Alarm Connections

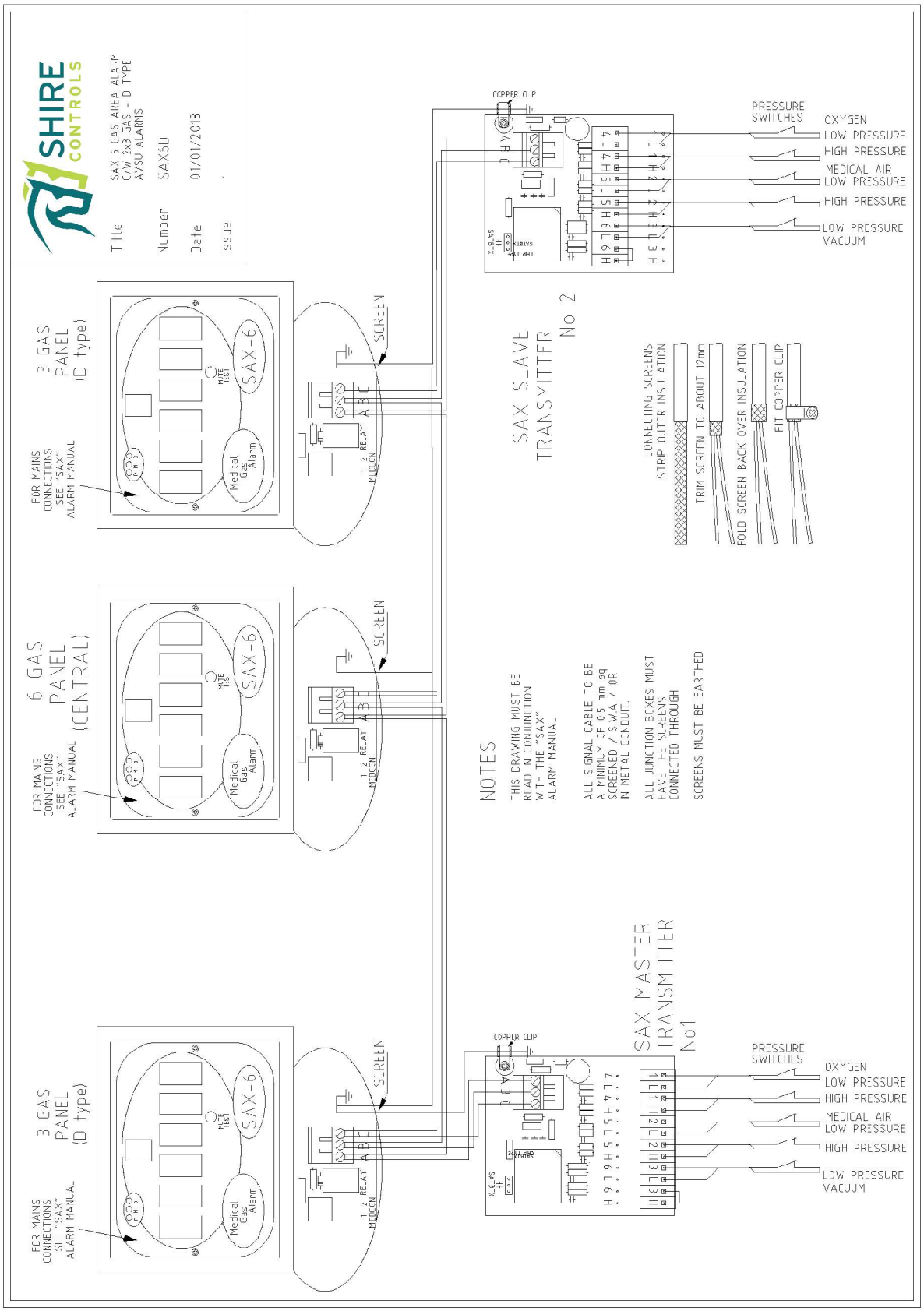


Figure 5: Typical SAX-6 D Type (Dual Circuit Operation) Alarm Connections

Switch Settings & Modes

Standard Medical Operation (SW2.1-3 used to set number of gases – see below).

Switch	On	Off
SW2.1	SAX Channel Select '1'	SAX Channel Select '0'
SW2.2	SAX Channel Select '2'	SAX Channel Select '0'
SW2.3	SAX Channel Select '4'	SAX Channel Select '0'
SW2.4	Display D-Type	Display Standard
SW2.5	Alarm Tone EN475	Alarm Tone HTM02-01
SW2.6	SAX-SDX Interface Enabled	SAX-SDX Interface Disabled

Non-Medical Operation (SW2.1-3 used to set number of gases – see below).
Activated by shorting 2-pins on LK2 with jumper link.
No 15-minute audible re-instatement on Gas Fault Conditions.

Switch	On	Off
SW2.1	SAX Channel Select '1'	SAX Channel Select '0'
SW2.2	SAX Channel Select '2'	SAX Channel Select '0'
SW2.3	SAX Channel Select '4'	SAX Channel Select '0'
SW2.4	Display D-Type	Display Standard
SW2.5	Alarm Tone EN475 Half Cycle	Alarm Tone HTM02-01 Half Cycle
SW2.6	SAX-SDX Interface Enabled	SAX-SDX Interface Disabled

For Standard & Non-Medical Operation Set Gas Variations as follows:

For 1 Gas Alarm	SW2.1 = Down,	SW2.2 = Down	SW2.3 = Down
For 2 Gas Alarm	SW2.1 = Up,	SW2.2 = Down	SW2.3 = Down
For 3 Gas Alarm	SW2.1 = Down,	SW2.2 = Up	SW2.3 = Down
For 4 Gas Alarm	SW2.1 = Up,	SW2.2 = Up	SW2.3 = Down
For 5 Gas Alarm	SW2.1 = Down,	SW2.2 = Down	SW2.3 = Up
For 6 Gas Alarm	SW2.1 = Up,	SW2.2 = Down	SW2.3 = Up

Dual Circuit Standard Operation (SW2.4 = Up)

For 1 Gas Alarm (channel 3)	SW2.1 = Down,	SW2.2 = Down	SW2.3 = Down
For 2 Gas Alarm (channels 2 & 3)	SW2.1 = Up,	SW2.2 = Down	SW2.3 = Down
For 3 Gas Alarm (channels 1, 2 & 3)	SW2.1 = Down,	SW2.2 = Up	SW2.3 = Down
For 1 Gas Alarm (channel 4)	SW2.1 = Down,	SW2.2 = Down	SW2.3 = Up
For 2 Gas Alarm (channels 4 & 5)	SW2.1 = Up,	SW2.2 = Down	SW2.3 = Up
For 3 Gas Alarm (channels 4, 5 & 6)	SW2.1 = Down,	SW2.2 = Up	SW2.3 = Up

SAX-SDX Interface (Enables by SW2.6 = Up)

Set Rotary 16-way (Hexadecimal) switch to required channel setting for SDX15 Plant Alarm System
Once selected, set SW5 4-way switch for specific window location.

SW5.1	SW5.2	SDX Fault Window
Off	Off	Window 1
Off	On	Window 2
On	Off	Window 3
On	On	Window 4

Figure 6: Mode of Operation (Switch Settings)

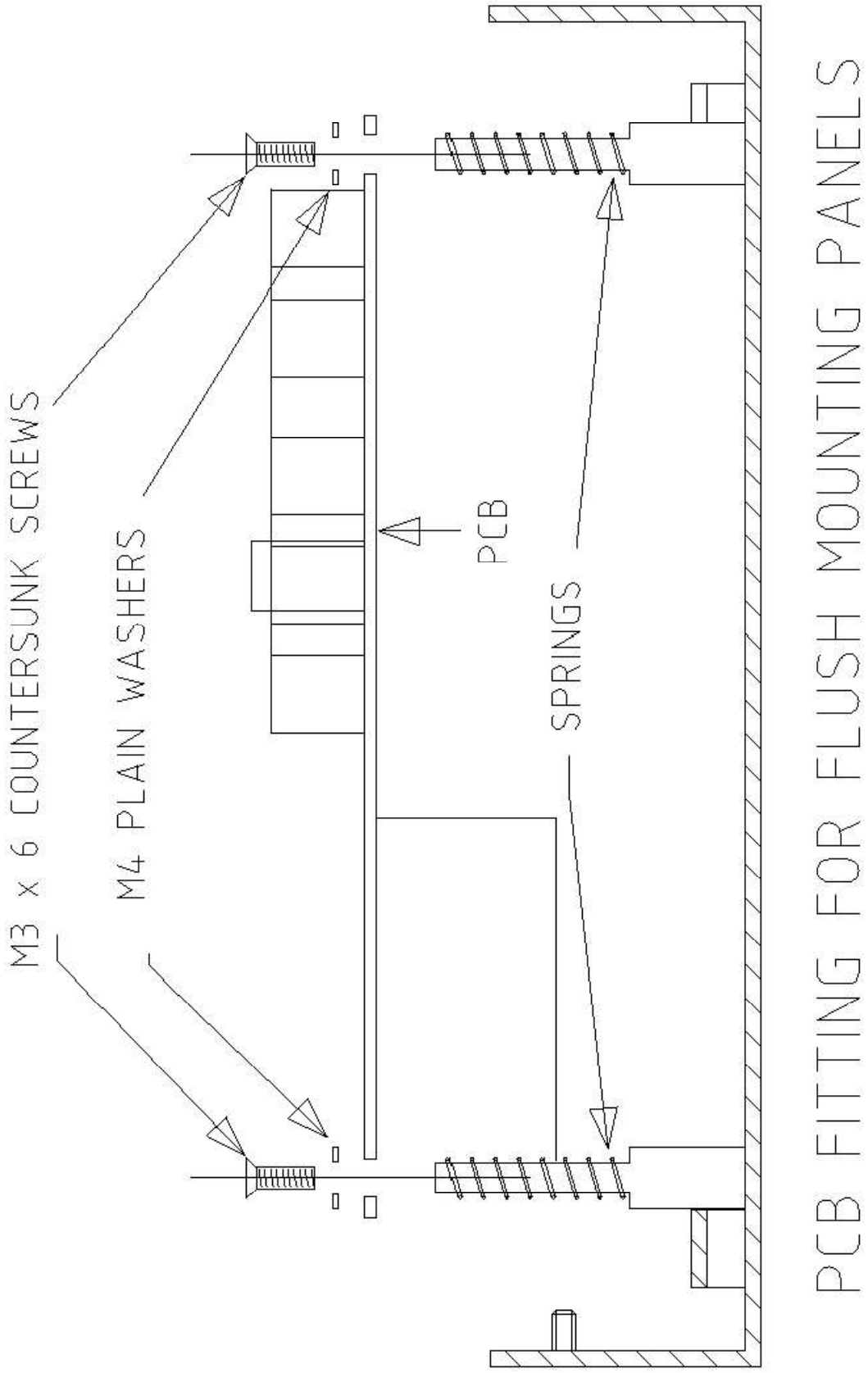
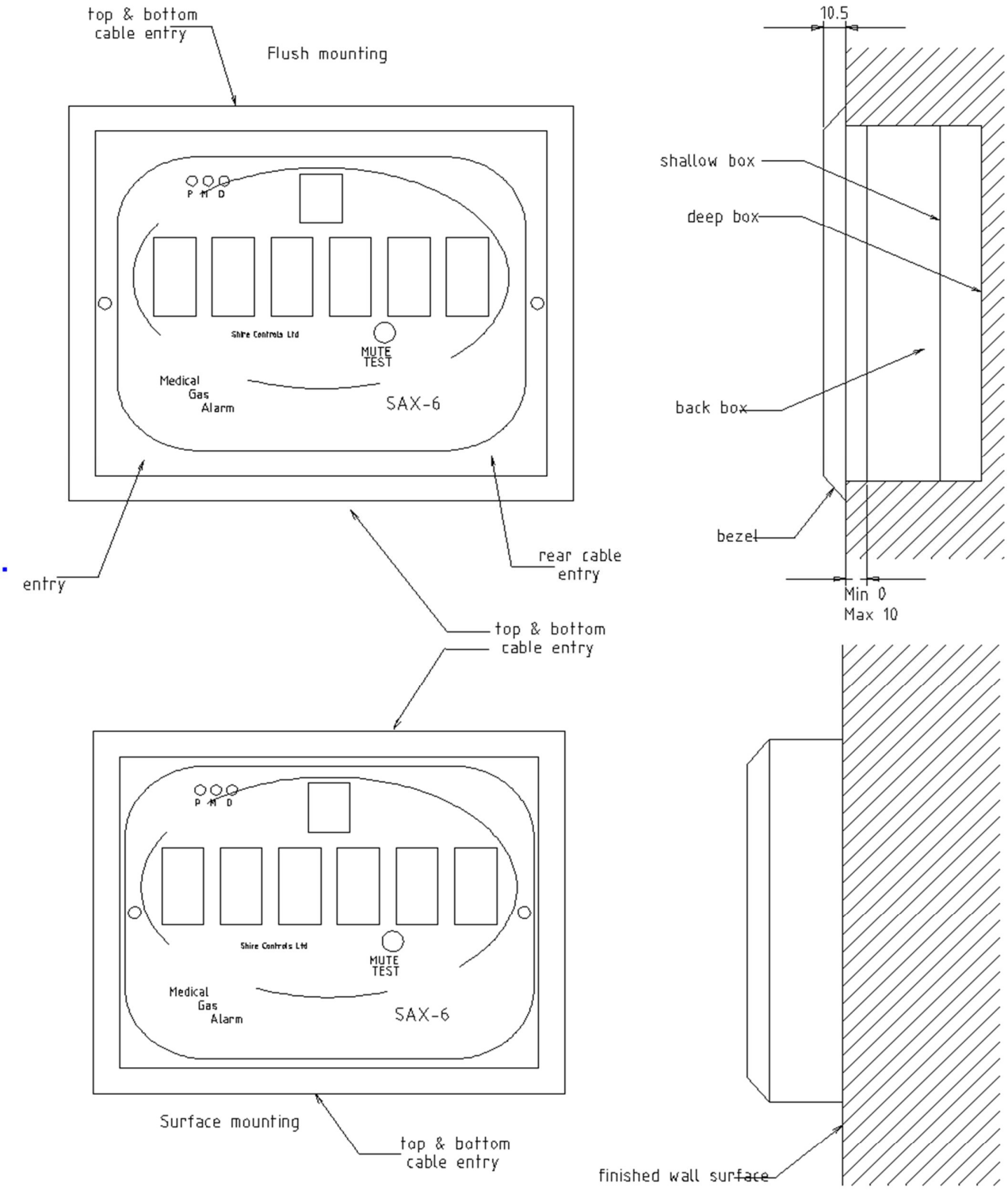


Figure 7: Flush Alarm Assembly



Back Box Dimensions:

Surface	(W) 221mm x (H) 175mm x (D) 31mm
Shallow Flush	(W) 207mm x (H) 122mm x (D) 35mm
Deep Flush	(W) 207mm x (H) 122mm x (D) 55mm

Figure 8: Mounting Details

m. Regulatory Standards

To which this declaration relates is in conformity with the following standards:

EN60601-1-2 4th Edition 2015 - Emissions Standard for Medical Equipment

EN55011, Class A 2016 + A1:2017 - Emissions Standard for ISM Equipment

EN60601-1-2 4th Edition 2015 - Immunity Standard for Medical Equipment

EN61000-4-2 2009 - ESD Requirements

EN61000-4-3 2006 + A1 + A2 - Radiated Susceptibility

EN61000-4-4 2016 - Electrical Fast Transient Burst Requirement

EN61000-4-5 2017 - Surges Requirements

EN61000-4-6 2014 - Conducted Susceptibility

EN61000-4-8 2012 - Magnetic Field Immunity

EN61000-4-11 2017 - Voltage Dips and Interruptions

Version 1	For Production
Assembly	Display SAX-6 Issue5 & Transmitter SAXTBTX-A PTH Issue 1
Software	Display SAX 2011.AFM & SAXD.AFM & Transmitter SATBTXA.AFM
Version 2	
Assembly	Encoder SAXTBTX-a Issue 5
Assembly	Display SAX LED V010 RC003 or SAX LED V010 RC004
Software	Encoder V003RC005 & Display SAX LED V010 RC014
Version 2.1	Updating of Spare Lists & Product Variations, Maintenance, Environment, Symbols, Labelling, & Structural