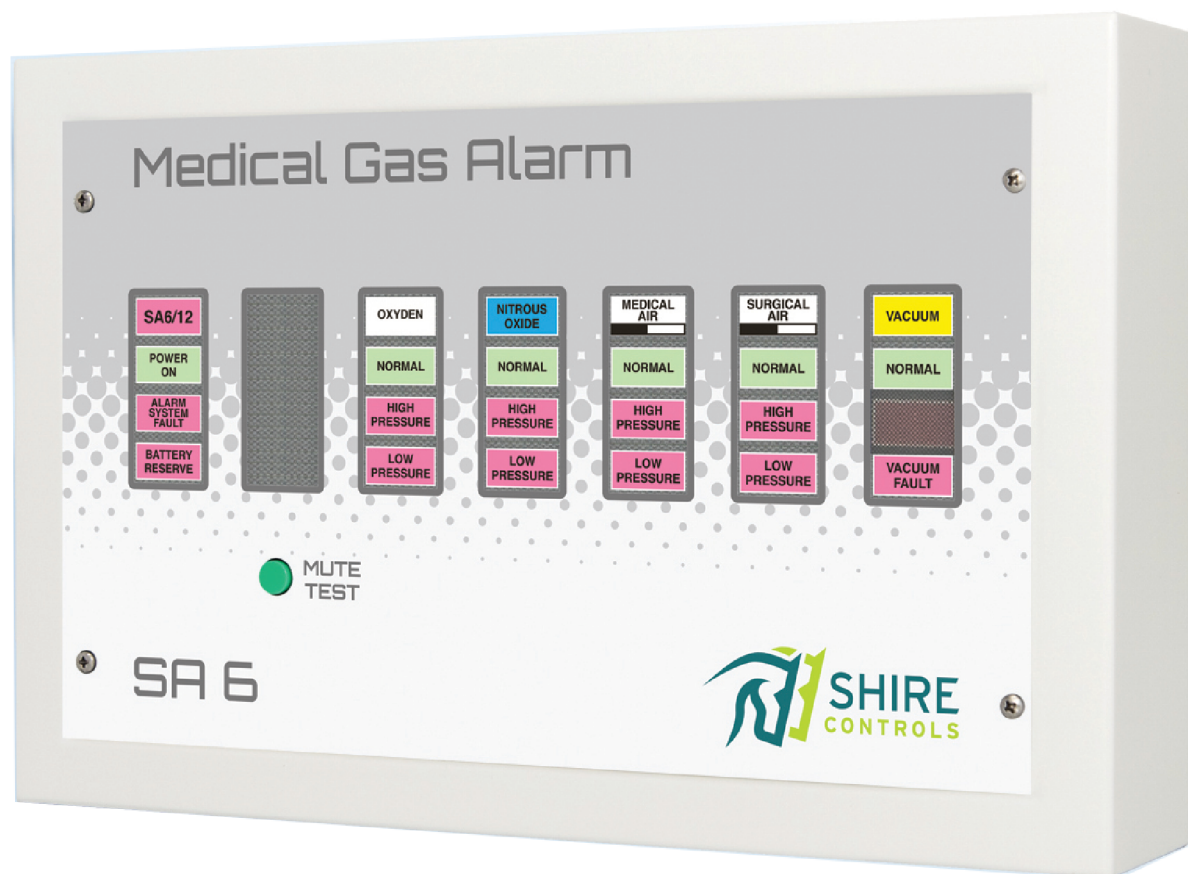


# The SA-6 mk3/12 Area Alarm for Piped Medical Gases



## Installation & Operating Instructions

The SA-6 mk3 area alarm is designed to monitor piped gas pressure, pressure switches, in theatres, wards etc. after final Area Valve Service AVSUs) or in industrial or laboratory applications. The SA-6 mk3 will act as a slave to another SA-6 mk3 within 250 metres, using a three screened cable (4 cores if signals are to be returned to the master unit).



## INTRODUCTION

The SA6 Area Alarm is designed to monitor high & low pipeline pressure on up to 6 gases, using volt-free contacts on pressure switches mounted in the pipeline downstream from the final Area Valve Service Unit. Each gas has a green "Normal", red "High Pressure" & "Low Pressure" lamps. The panel also has a green "Power On" lamp and a red "System Fault" lamp, together with a mutable audible alarm.

## OPERATOR

The SA6 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.

## ABOUT THIS MANUAL



**When you see this symbol, the associated text in bold type refers to something which may cause danger.**

## MOUNTING

Surface mounting - Mount the enclosure with the "TOP" sticker uppermost.

Flush mounting - Fit the back box in the wall so that the front edge is from 2 to 15 mm lower than the finished wall surface. When the wall is finished, attach the bezel to the back box, using the 4no M3 x 25mm countersunk screws provided, with the hinge mounting to the left. Connect the earth lead on the bezel to the adjacent M4 stud in the box.

Take the battery from the packing & stand it on end, in the right hand end of the box. Connect the red & black leads to the red & black terminals and **OBSERVE POLARITY.**

## CONNECTING

For cable entry, bring the cables into the box as shown on the drawings (pages 6/7).

Mount the Power Supply Board on the 5no Spacers on the back box and install the M4 pan-head screw and crinkle washer provided into the threaded hole just to the left of the Live Terminal.



**This equipment is not suitable for 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.**

Remove the "Warning" cover to reveal the mains terminals. Connect Live, Neutral and Earth to L, N & E. Replace the "Warning" Cover, making a cut-out in the side to allow the cable to pass.

The supply required is 230Vac, 50/60 Hz, fused at 3 amp.

Connect signalling devices (i.e. pressure switches) with screened cable, SWA or single core cable in steel conduit or trunking.



**All cable screens must be connected at both ends. Continuity must be maintained through junction boxes.**

**The cable, conduit or trunking must not be shared with any other system. Cables must have a minimum of 20mm clearance from any other cables.**

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

For medical applications which require cable monitoring, a termination board (supplied with the panel) must be mounted in or by the plant or pressure switches for each service. (The termination boards supplied, can be mounted in boxes if required). The plant or pressure switches are connected to the "PLANT" terminals on this board, and the alarm terminals are connected to the "ALARM" terminals.

At the Alarm, terminal "L" is for low pressure or vacuum, "H" is for high pressure and "C" is common. Unused conditions should be set to normal by connecting a 56k resistor (colour coded green/blue/orange/silver or gold) between "C" and the "L" or "H" terminal on the alarm power supply board as required. Failure to do this will create a "System Fault" (open circuit) resulting in the condition staying at fault and the System Fault lamp flashing.

For medical applications which do not require cable monitoring (when the alarm panel is mounted in the same enclosure as the pressure switches) and for non medical applications, the H, L & C terminals are connected directly to the pressure switches. Unused inputs are linked to C for fail-safe operation (or left open when the alarm is set to operate with normally open contacts).

A Common Fault Relay output is provided, which incorporates change-over contacts. The relay out terminals are clearly marked and in the following state when all conditions are at normal.

*"CM"=common, "C"=closed & "O"=open.*

*These contacts are rated at:*

*0.5 amp, 110Vac, 1 amp, 24Vdc resistive.*

Where a Repeater/Slave Alarm is required, the inter-panel wiring between the Alarms is:

Master		Slave
SO (Strobe Out)	to	SI (Strobe In)
DO (Data Out)	to	Gas Inputs H & L
CM (Common)	to	CM (Common)

The following connection is only required if a gas is to be sent from slave to master:

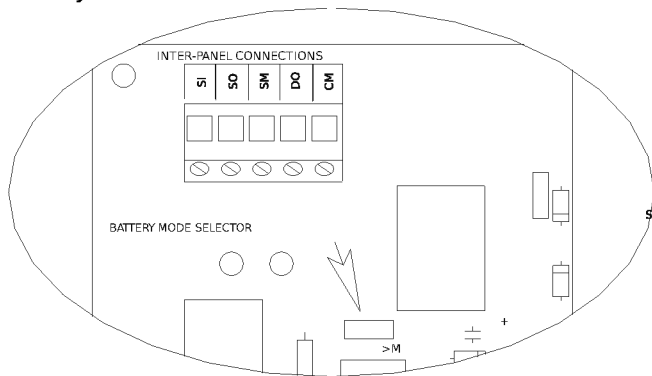
Slave		Master
DO (Data Out)	to	Gas Inputs H & L

In addition, units to be used as masters must have SO (Strobe Out) connected to their SM(Strobe Monitor) terminal (all panels are dispatched with this connection made).

If the unit is to be used as a slave, this link must be removed and the SM (Strobe Monitor) terminal must be connected to the SI (Strobe In) terminal.

## BATTERY

Select the required mode of battery operation with the Battery Mode Selector. With the red jumper across the centre & right hand pins (marked >M) full battery reserve is M operation. With the jumper across the centre & left hand pins, HTM02 mode is in operation (only supporting system fault and audible warnings for maximum battery life).



## INSTALL & SET-UP THE LED CONTROL BOARD

Connect the ribbon cable from the Power Supply to the 26way socket on the back of the Control Board. Locate the hinge ends to the centre right copper P clips (top & bottom) on the rear of the board.



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

There are 6no jumper settings to check. 3no to the far bottom right to set number of gases (vertically mounted) and 3no to the left of the main PLCC Chip to set operating mode (horizontally mounted).

Jumpers for number of gases, will not normally need to change. These are factory set.

Jumpers for mode of operation are to switch between enabling/disabling the use of Termination boards, use of fail-safe/normally open input signals and enabling/disabling medical mode (15 audible re-trigger). See Page 5.

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 terminal screwdriver in the component marked VOLUME, on the reverse of the board, until suitable.

Locate the fascia plate over the front of the Control board and push through the 5no spacer clips until they lock (click). One in each corner and one central.

## 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 a pressure is out of range.

## OPERATION

When all conditions and the power supply are at normal, only the "Power On" and "Normal" lamps energise. 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, the alarm condition will operate as above but the "System Fault" lamp will also flash. In the event of power failure, if the battery mode is set to HTM02 mode, only the "System Fault" lamp and the audible will operate otherwise operation is as follows: When the power fails, the "Power On" lamp will go out, the "System Fault" lamp will flash and the audible will sound. All other lamps will continue to function normally. A fault on the Strobe line on a unit used as a slave (for example, failure of the master or its power supply or damage to the cabling) will cause the "System Fault" lamp to flash, all "High" & "Low" lamps to flash and the audible to sound. Failure of the Data In line on a unit receiving signals from another unit (Master or Slave) will create a "System Fault" on all gases received by this unit. 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.

## MUTING

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

## LOCKOUT

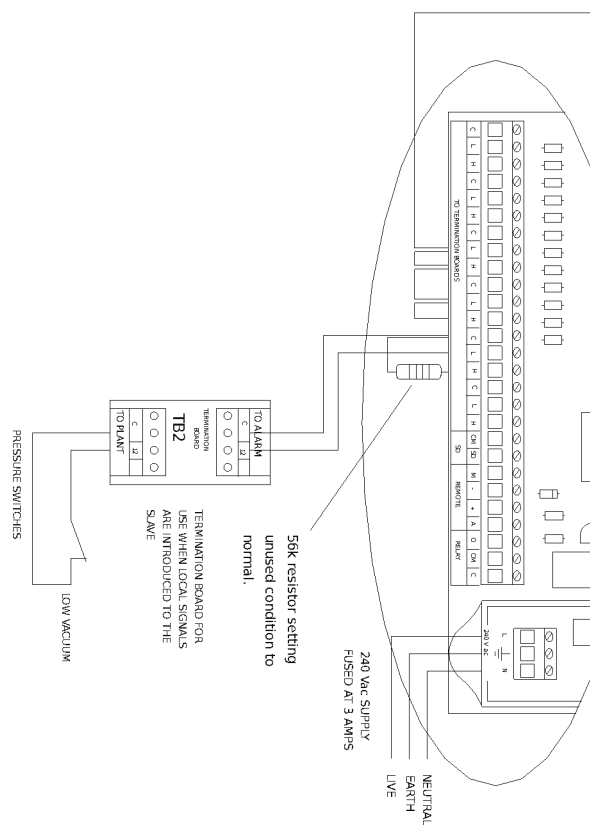
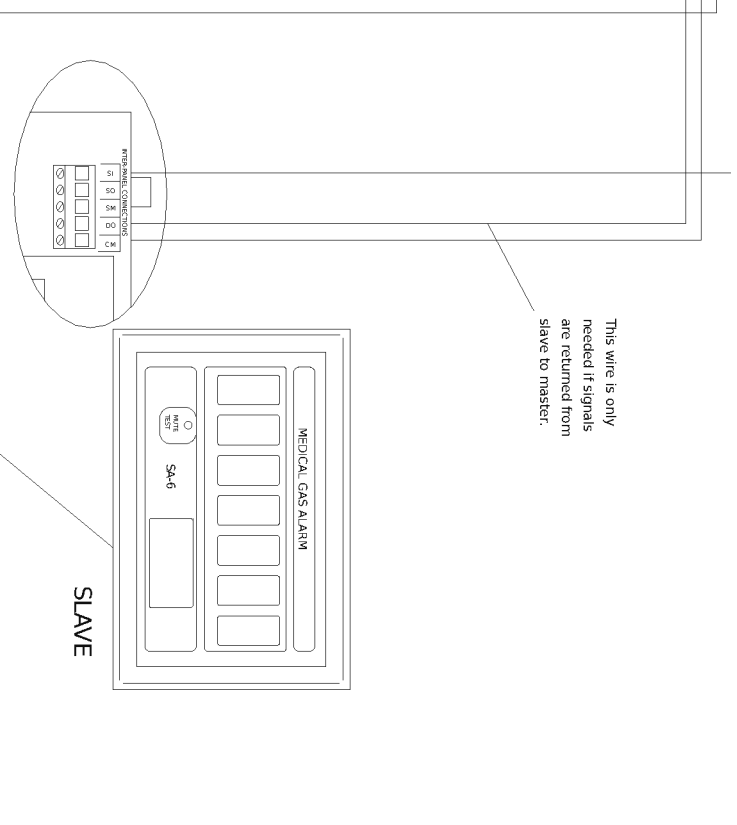
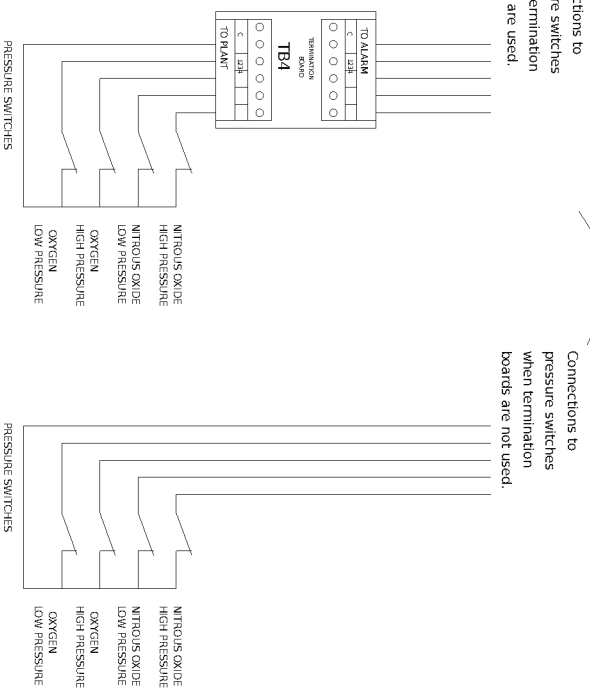
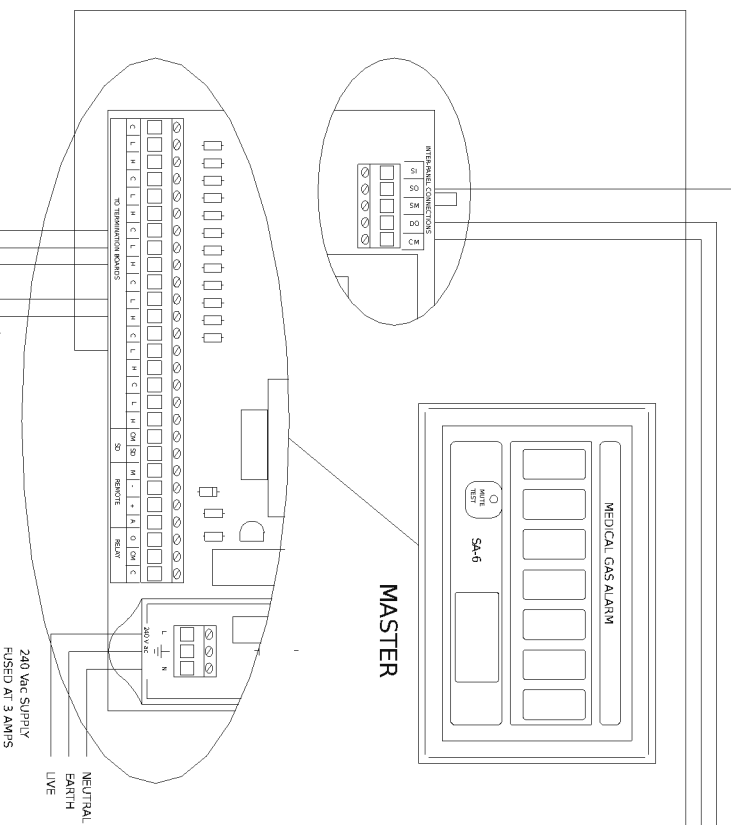
If an alarm condition is to be in a fault condition for a prolonged period, the audible on this condition can be permanently muted from the large white flat push button on the centre rear of the Control Board.

Note. Any other conditions present at this time, if 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 steady. The lockout condition is cancelled as soon as the condition returns to normal. A system fault cannot be locked out.

## TESTING

Periodically operate the Mute/Test button. Hold in until all red alarm lamps flash, all green lamps and the "System Fault" lamp show continuously and the audible sounds. Red alarm lamps 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.

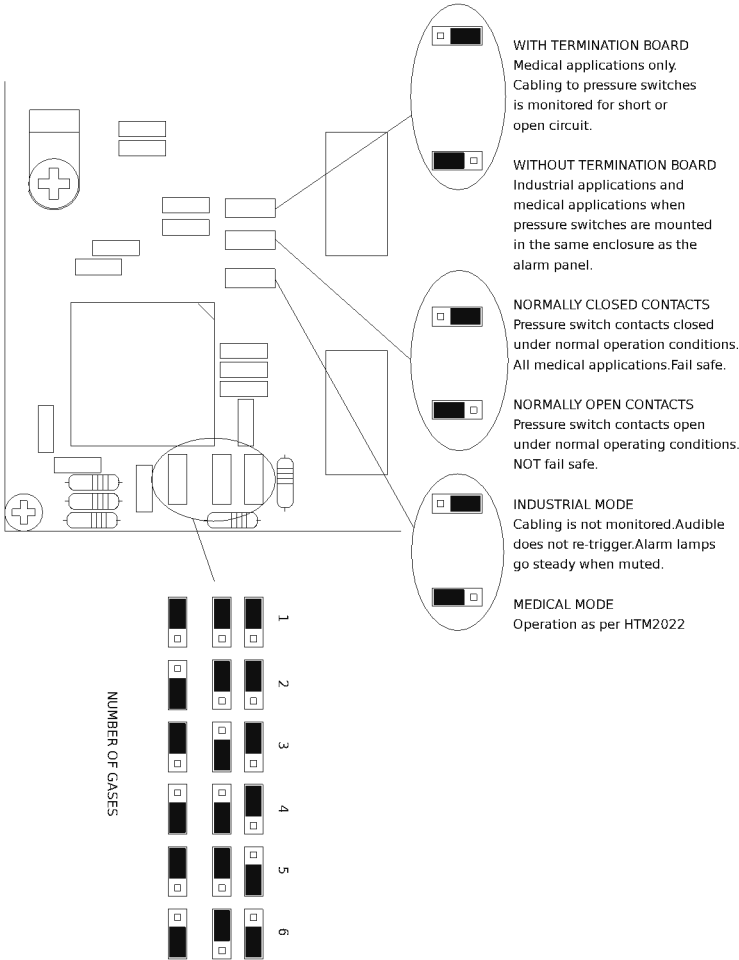


## TYPICAL SA-6 ALARM CONNECTIONS

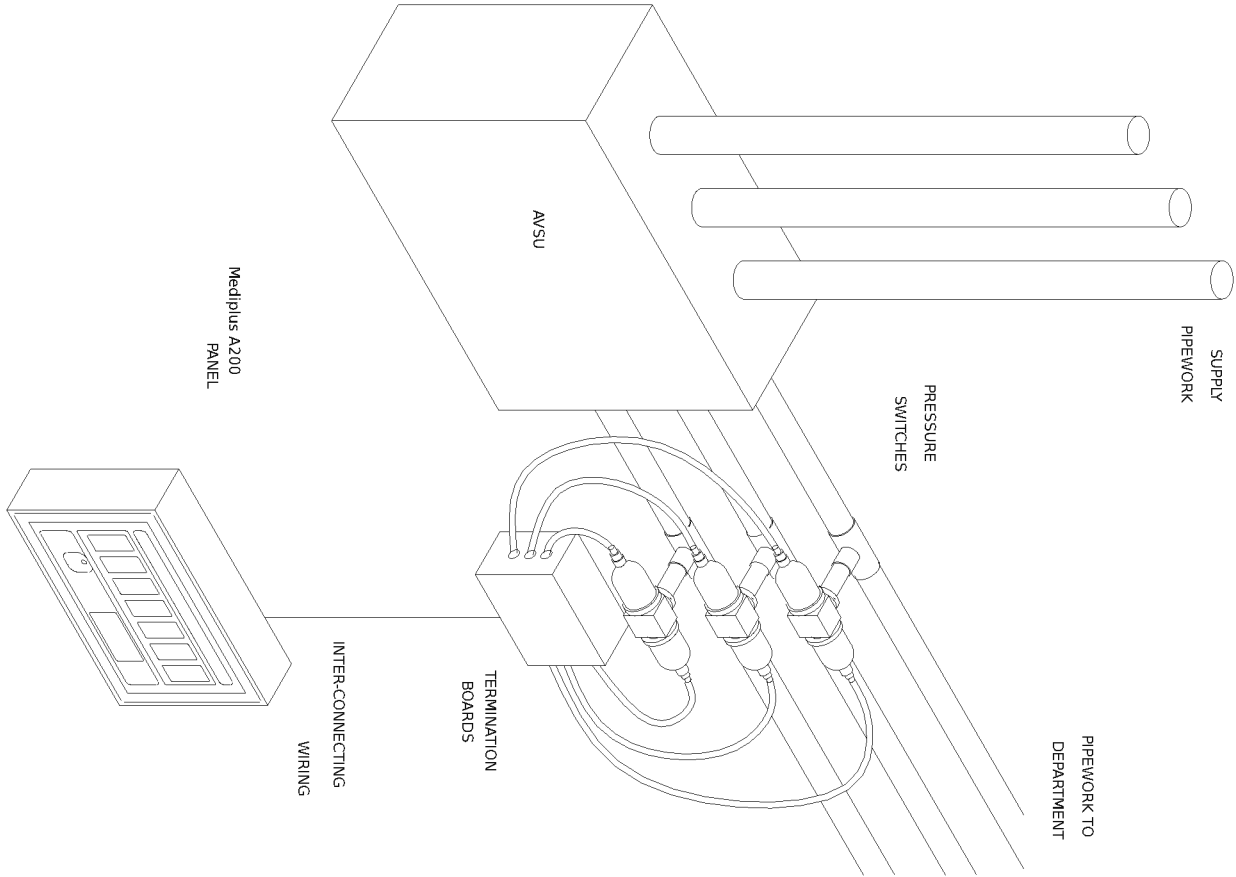
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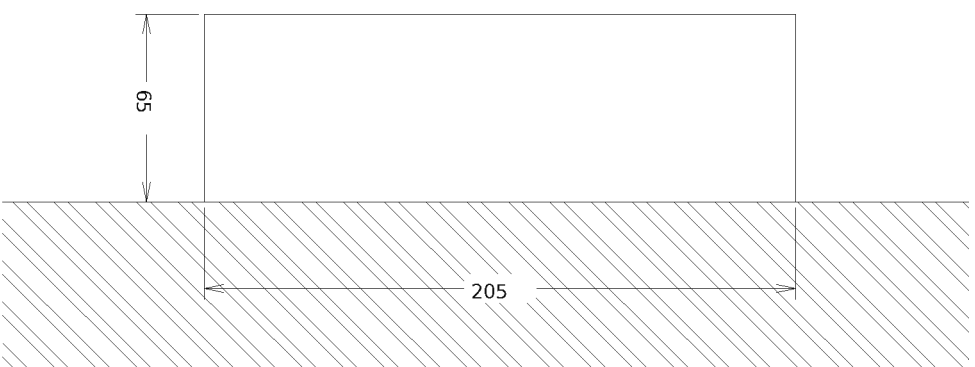
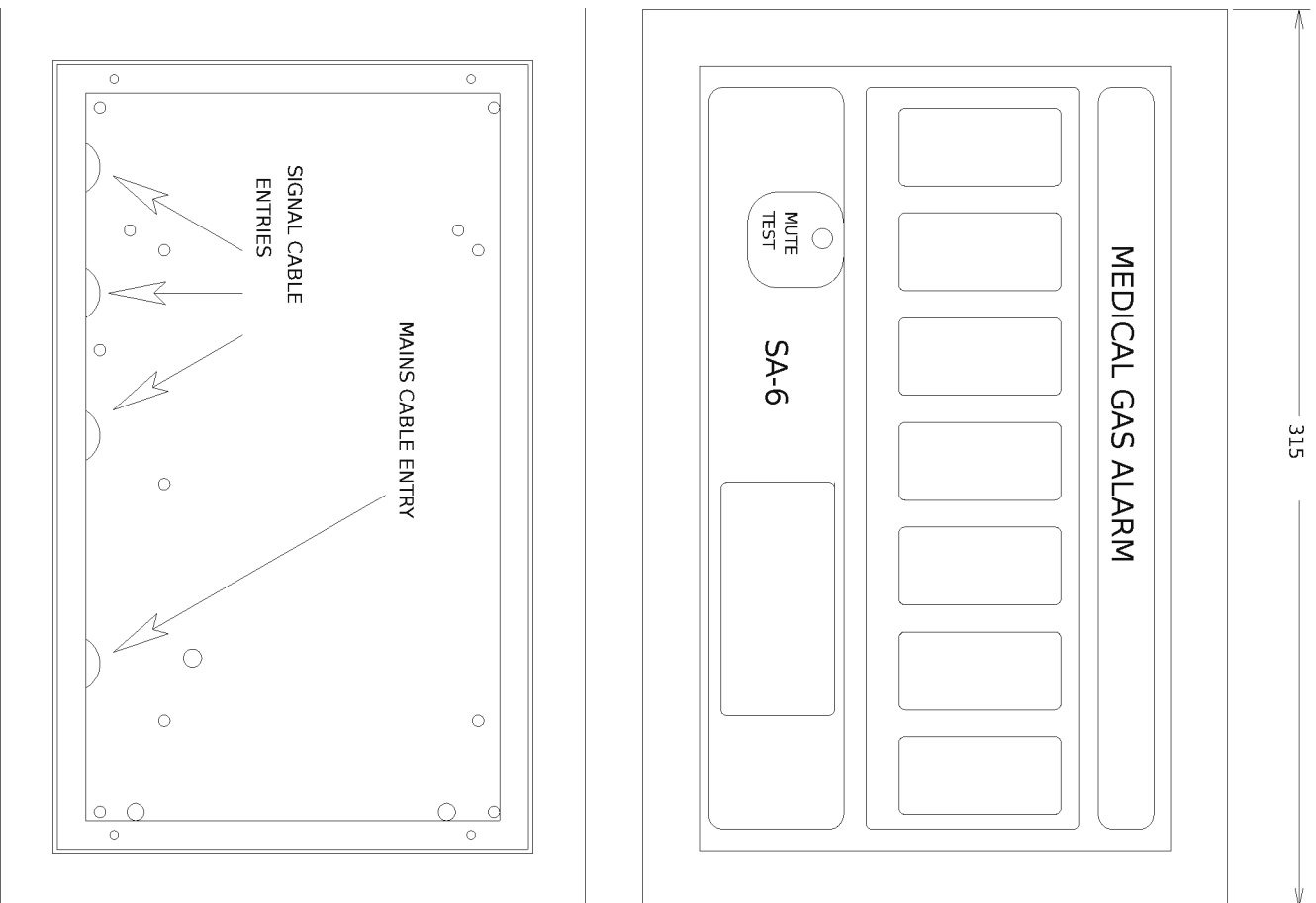
# JUMPER SETTINGS FOR SA-6 area alarm

## MODE OF OPERATION

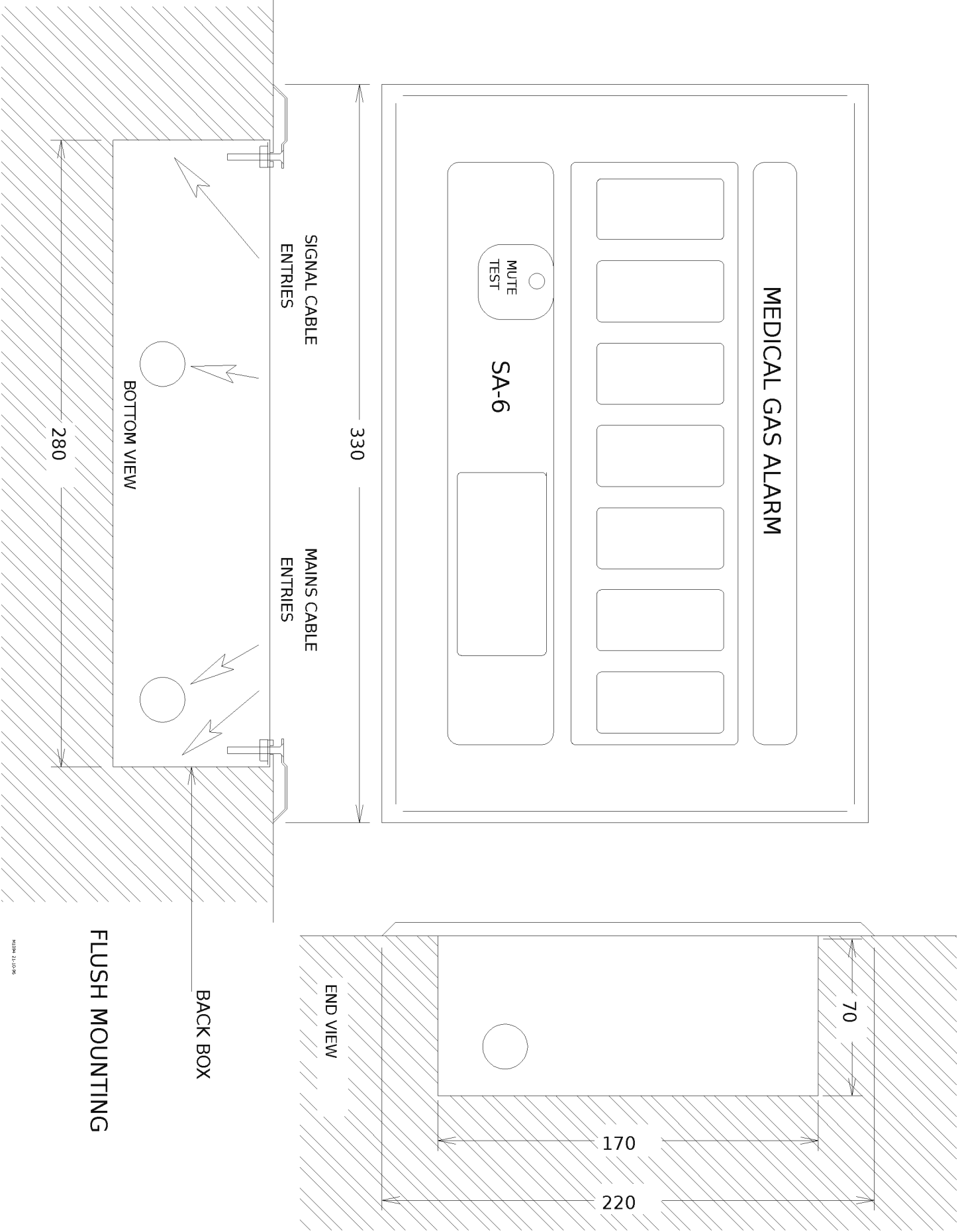


## TYPICAL AREA ALARM INSTALLATION





## SURFACE MOUNTING



# DECLARATION OF CONFORMITY

EU EMC Directive 2014/30/EU

The Low Voltage Directive 2006/95/EG

Medical Devices Directive 93/42/EEC

## Manufacturer

Shire Controls Ltd  
Studio 3 Channocks Farm,  
Gilston, Harlow  
Essex CM20 2RL  
United Kingdom

## Product Type

SA-6 Area Alarm System

## Year of manufacture

2019

## Standards used

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

**EN61000-3-2 2014** Harmonic Current Fluctuations

**EN61000-3-3 2013** Voltage Fluctuation and Flicker

**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

Authorised representative

I.R.Couchman Technical Director

Signature



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