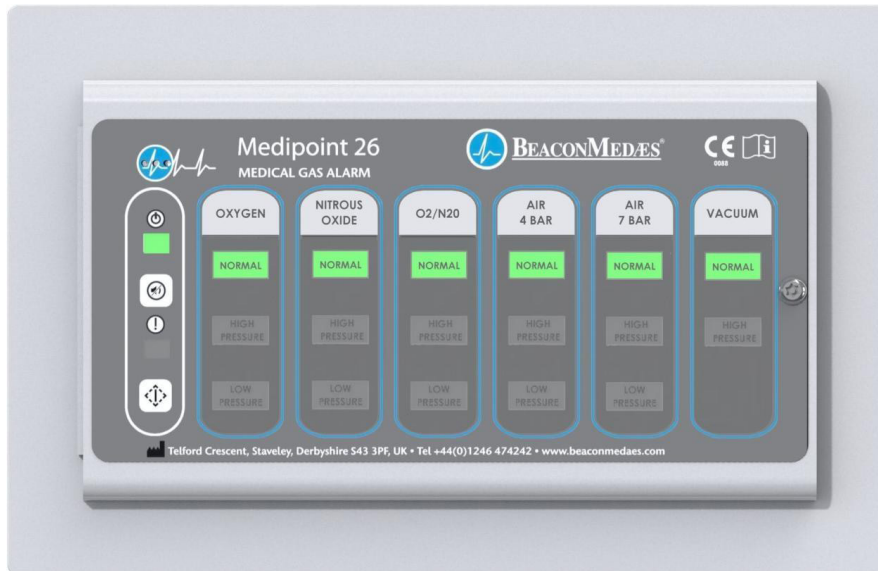


# Operation and Maintenance Instructions



## Medipoint 26 Alarm System Local Alarm

*Part number 2005439*

*Revision 05*

*Feb 01, 2017*

# Operation and Maintenance Manual

## Medipoint 26 Local Alarm System

This unit is purchased from:

Date purchased:

Model number:

Serial number:

Option(s) included:

Any information, service or spare parts requests should include the serial number and be directed to:

BeaconMedæs  
Telford Crescent, Staveley  
Derbyshire S43 3PF

Telephone: +44 (0) 1246 474242  
Email: [gbn.info@beaconmedaes.com](mailto:gbn.info@beaconmedaes.com)  
Website Contacts: [www.beaconmedaes.com](http://www.beaconmedaes.com)

BeaconMedæs reserves the right to make changes and improvements to update products sold previously without notice or obligation.



Atlas Copco Ltd. trading as Atlas Copco Medical  
Unit 18 Nuffield Way, Abingdon, Oxfordshire, UK OX14 1RL



Personnel must make themselves familiar with the contents of this manual and the function of the unit before installing, operating or maintaining.

Abbreviations			
Abbreviation	Full Description	Abbreviation	Full Description
BS	British Standard	kPa	Kilo pascals
BSP	British Standard Pipe	Max	Maximum
CO2	Carbon dioxide	Med	Medical
°C	Degree Celsius	m	Meter
∅	Diameter	mm	Millimetres
ERM	Emergency reserve manifold	Min	Minimum
EN	European Standards	N2	Nitrogen
1st	First	N2O	Nitrous oxide
HTM	Health Technical Memorandum	NRV	Non-return valve
ID	Identification	OD	Outside Diameter
"	Inch	O2	Oxygen
ISO	International Standard Organisation	%	Percentage
Kg	Kilograms	2nd	Second

# Medipoint 26 Local Alarm System

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rectly

11. Gas service indicates normal with a HIGH/LOW PRESSURE condition

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## Safety Precautions

Operator should have carefully read and become familiar with the contents of this manual before maintaining the terminal units.

Operator is expected to use common sense safety precautions, good workmanship practices and follow any related local safety precautions.

Component descriptions and parts lists are available on request.

## 0.1 Environmental Transport and Storage Conditions

All products are separately packaged and stored in controlled conditions.

## 0.2 Environmental Operating Conditions

Adverse environmental conditions and harsh abrasives or chemicals may cause damage to the unit.

## 0.3 Cleaning

The alarm cover and fascia should be wiped over with a damp cloth frequently to remove any dust or foreign substances.

## 0.4 Environmental Protection

Discard the unit and/or components in any standard refuse facility. The unit does not contain any hazardous substances.

## 0.5 Electromagnetic Interference

Ensure any input and data cables are physically separated from other mains and data cables.

## 0.6 Electrical Details

Power source

Mains operated using 110/230V, 50/60Hz, alternating current, from an essential circuit. Please see labelling inside unit for correct voltage.

Current requirements

3.0 amps

Type of protection against electric shock

Class 1 (Mains supplied equipment using a protected earth)

Mode of operation

Continuous (equipment may be left switched on indefinitely)

Degree of protection against ingress of liquids

IPX0 (Not protected)

Degree of mobility

Permanently installed (This unit is electrically connected by permanent means)

Degree of protection

Type B (no Applied Part or with and Applied Part not designed to meet F type (floating) requirements)

Degree of protection against flammable anaesthetic mixtures

Not protected (not suitable for use with flammable gases)

Rechargeable Battery

The rechargeable battery (ref. 1828825) should be replaced every 5 years.



### WARNING...

It is necessary to check the integrity of the power source for safety at regular intervals. These checks should be carried out annually and replacement power supplies used is necessary.

## DESCRIPTION AND OPERATION

### 1.1 Introduction

The BEACONMEDÆS Medipoint 26 medical gas area alarm is suitable for both the United Kingdom and International markets, and fully satisfies the requirements of the National Health Service Model Engineering Specification C11 and is therefore ideal for HTM02-01 and HTM2022 applications.

The Medipoint 26 is designed to line monitor a maximum of six medical gas services in the NORMAL, HIGH and LOW PRESSURE conditions and is suitable for installation into any location within a hospital. Medipoint 26 Medical gas alarms are also suitable for use with laboratory gas installations.

Each Medipoint 26 alarm panel requires a standard AC electrical power supply of 115/230 volts  $\pm 10\%$  at 50 or 60 Hz, and fused at 3 Amps. Internal circuits operate on 15V and 5V DC, provided by an integral transformer and rectifier / regulator circuitry built onto the power PCB.

Displays are controlled by printed circuit boards and are illuminated by long life coloured light emitting diodes (LED's). The alarm panel is operated by pressure sensors fitted in the medical gas pipeline normally downstream of a Zone Service Unit. The sensors provide signals to the alarm panel and initiate a flashing display in both failure modes, accompanied by an audible warning. MUTE and TEST switches mute the audible warning and enable testing of the alarm circuits, displays and audible warning (see figure 1).

Facilities are provided to interconnect any Medipoint 26 to any central alarm system or building management system. A POWER ON and SYSTEM ALARM LED are clearly visible through the alarm panel fascia. In the event of an electrical power failure at the panel, the POWER ON LED is extinguished and powered by a standby battery, the SYSTEM ALARM LED illuminates (flashing) and the audible warning sounds (see figures 1).

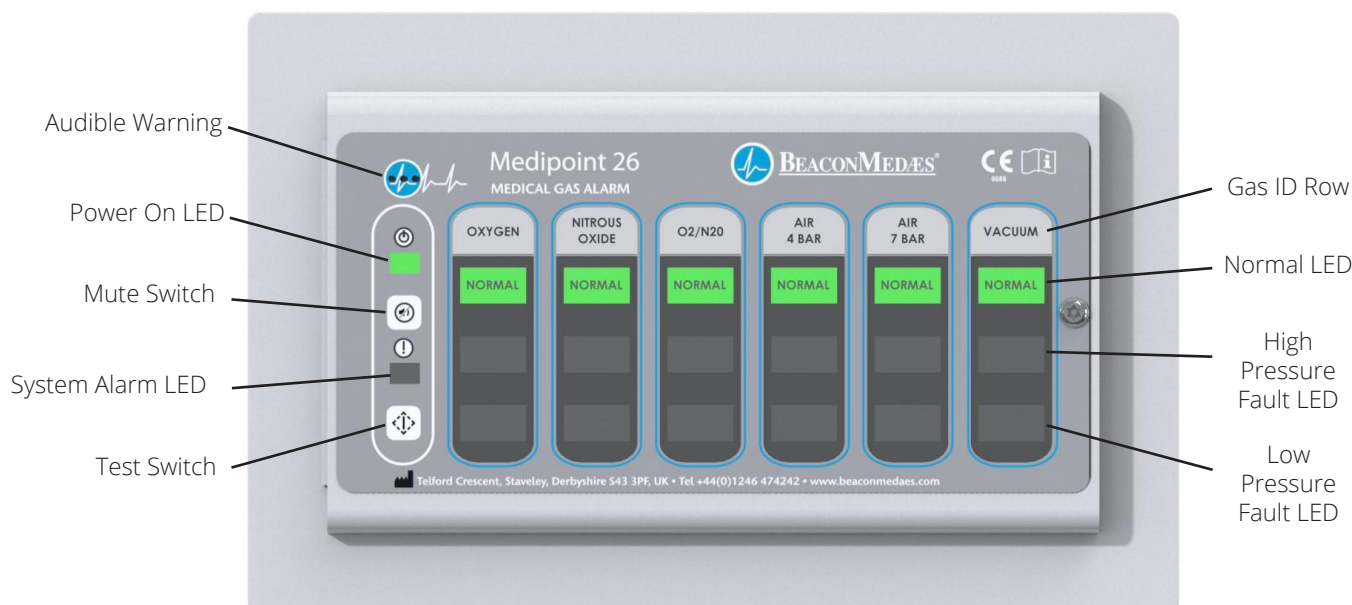
The alarm panel also constantly monitors the integrity of the internal circuits, interconnected wiring and system monitoring pressure sensors. In the event of any defect within the monitored functions, the SYSTEM ALARM LED illuminates (flashing) accompanied by the audible warning, and the defective gas service alarm display illuminates (either HIGH or LOW PRESSURE) (see figure 1). When a line contact or other fault is detected, the flash rate of the affected circuit LED is modulated during the test sequence to aid fault diagnosis.

An internal maintenance push-button is provided for use when the plant or pipeline is shut-down for prolonged periods (see 1.6.3 Power supply printed circuit board figure 8). This facility enables 'permanent' muting of the audible warning for a particular gas service and is automatically reset when pipeline pressure returns to NORMAL.

### 1.2 Standards

BEACONMEDÆS Medipoint 26 alarm panels are fully tested prior to dispatch and packed to provide maximum protection during transit. The alarm panels are designed to operate in an ambient temperature of between 0°C and +50°C. Component assemblies

FIGURE 1 - MP26 DISPLAY, SHOWN IN NORMAL RUNNING.



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must be stored in their packaging in dry conditions and storage temperatures must be between 0°C and +50°C. Alarm panel enclosures provide protection to IP32 (BS EN 60529) and are electrically bonded to earth to provide safe installation.

## 1.3 Alarm Panels

Each alarm panel consists of a first and second fix assembly, and are suitable for use with either surface or concealed installations. A bezel plate is provided for use with concealed installations and is fitted to the first fix assembly to give a neat appearance by covering the plaster joint. The front cover of the enclosure is hinged and retained by a special fastener

which prevents unauthorised access (see figure 2). The assembly contains two printed circuit boards and provides a gas service display through windows in the front cover. The front cover has a flush dark finish polyester fascia to highlight the displays. Each gas service is displayed in the NORMAL (green, steady) and HIGH or LOW PRESSURE (red, flashing) alarm conditions to show the gas service status. All alarm conditions are illuminated by a flashing display and accompanied by an audible warning. Each alarm panel locates all electrical components on either the power supply or light display printed circuit boards, which are interconnected.

Gas service legends are fitted within the front cover to align with display windows. Overall dimensions are detailed at Table 1 & Figure 3.

FIGURE 2 - MP26 ASSEMBLY

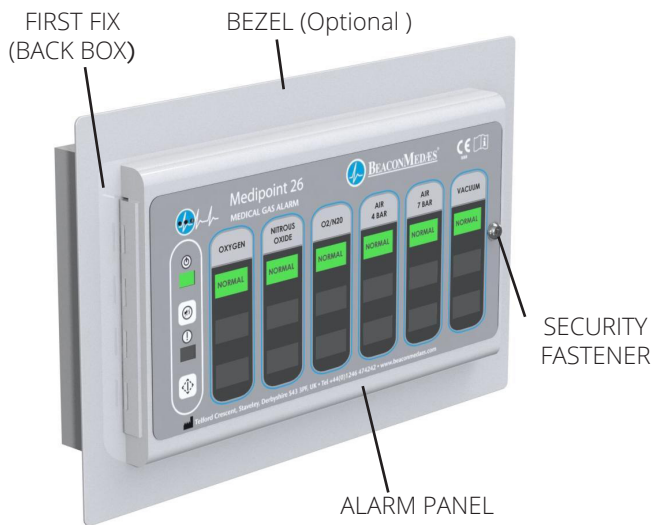
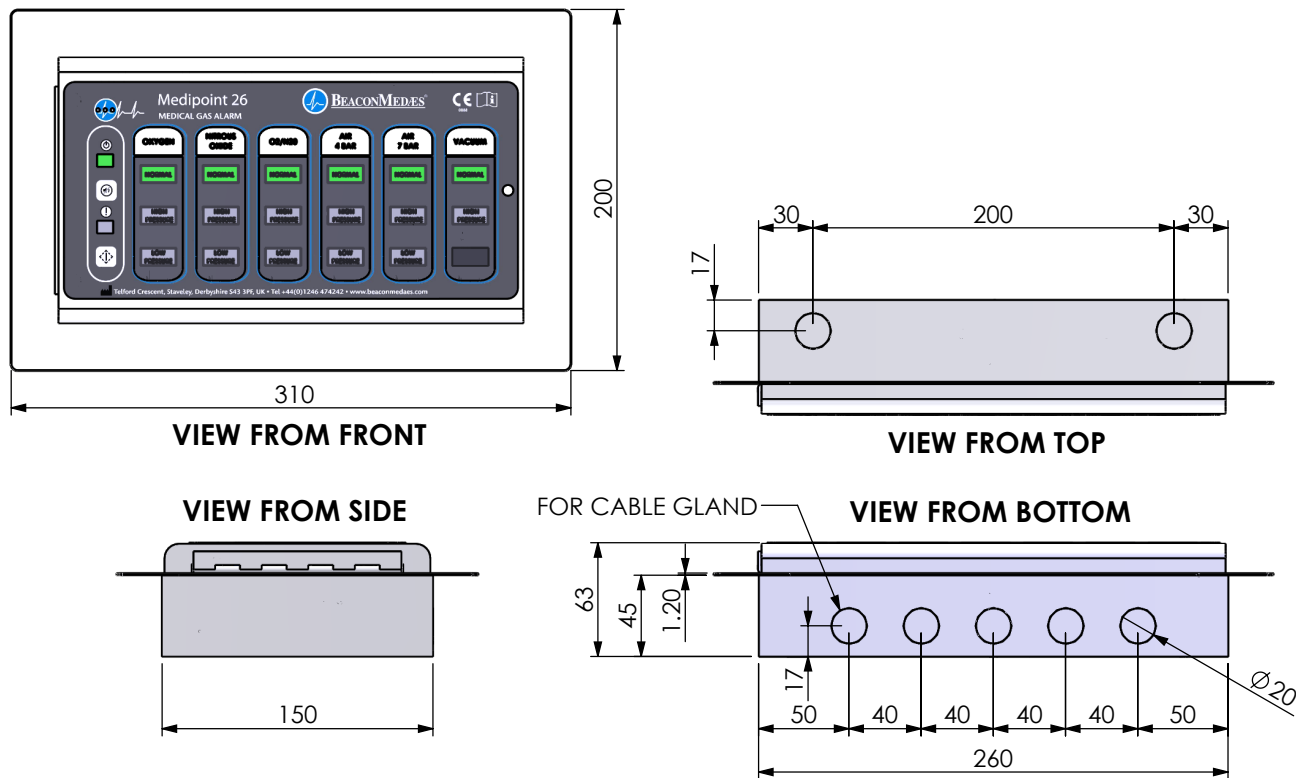


TABLE 1: MEDIPOINT 26 - DIMENSIONS

	Alarm Panel	Bezel
Height (mm)	150.0	200.0
Length (mm)	260.0	310.0
Depth (mm)	61.8	1.2
Chase depth (mm)	45.0	-

FIGURE 3 - MP26 DIMENSIONAL DETAIL





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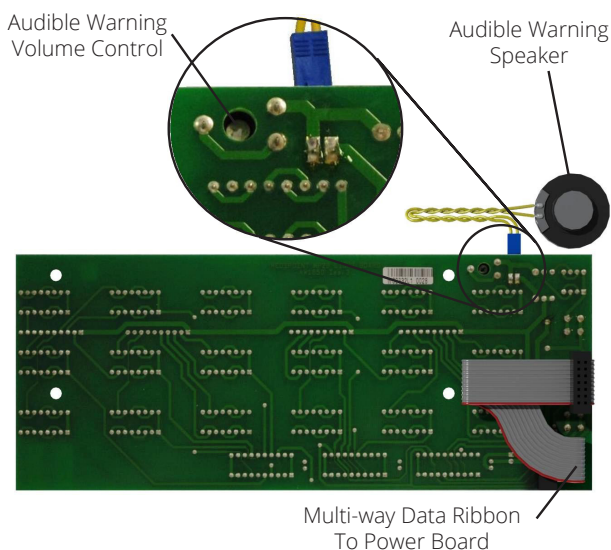
## 1.4 Visual displays

Coloured LED's fitted to the light display PCB provide the visual display detailed in paragraph 1.3. All flashing displays flash at a rate of 0.5 seconds on, 0.5 seconds off in accordance with HTM02-01/HTM2022 and C11.

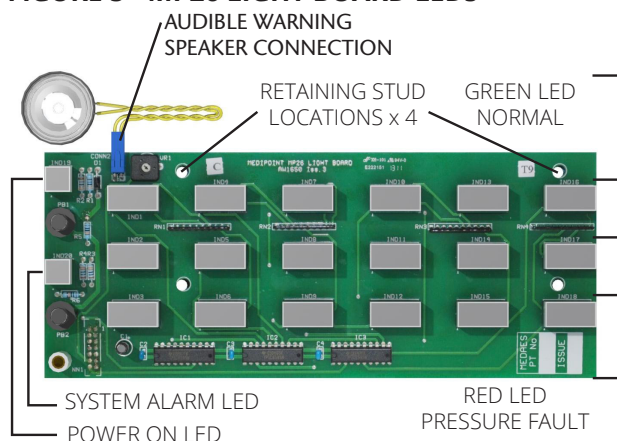
## 1.5 Audible warning

The audible warning speaker fitted to the alarm panel front cover and connected to the light display PCB by plug and socket (see figure 4 & 5) operates simultaneously with any HIGH PRESSURE, LOW PRESSURE or SYSTEM ALARM indication. The audible warning may be muted by pressing the MUTE switch (see figure 1). If following a mute condition another alarm condition occurs, the audible warning will operate simultaneously with the indication. Following a mute condition and a continuing alarm indication, the audible warning will resound after 15 minutes in accordance with HTM02-01/HTM2022 and C11. When the audible resounds further operation of the MUTE switch is necessary to cancel the audible. Audible warning volume may be adjusted by means of a screwdriver slot in the rear face of the light display PCB (see figure 4).

**FIGURE 4 - MP26 LIGHT BOARD**



**FIGURE 5 - MP26 LIGHT BOARD LEDs**



If following an alarm condition no action is taken to MUTE the audible, the audible warning will automatically switch off when the alarm condition reverts to NORMAL. The audible tone consists of a modulation between two tones (F1 and F2). F1 = 440 Hz and F2 = 880Hz. The modulation rate is 4 Hz in accordance with HTM02-01/HTM2022 and C11.

## 1.6 Printed circuit boards

Two printed circuit boards are fitted inside a Medipoint 26 medical gas area alarm; a power supply PCB and a light display PCB. All components are mounted on these PCB's, which are interconnected by means of a multi-way ribbon cable and polarised connector (see figure 3 & 6). The Medipoint 26 internal electrical installation complies with all relevant British Standard specifications, IET wiring regulations and current UK legislation.

### 1.6.1 Light display printed circuit board

The light display PCB is retained inside the alarm panel front cover with four retaining studs. This PCB contains 6 columns of 3 coloured (top green, lower two red) LED block indicators, a green POWER ON and a red SYSTEM ALARM LED block indicator (see figure 5). Each LED block indicator aligns with display windows in the front cover and fascia to provide a clear display. Each gas service indicator contains eight separate long life LED's connected in two banks of four, and both the POWER ON and SYSTEM ALARM LED contains four separate long life LED's connected in parallel in two banks of two.

This duplex circuitry provides system reliability and ensures that illumination continues in the event of either a single LED or circuit failure. Each LED block indicator is a plug-in component enabling easy replacement or subsequent updating of the installation. The ribbon cable is permanently attached to the rear face of the light display PCB and enables interconnection of circuits with the power supply PCB. The audible warning speaker is connected by plug and socket to the light display PCB and locates within the alarm panel front cover when installed.

### 1.6.2 Display positions

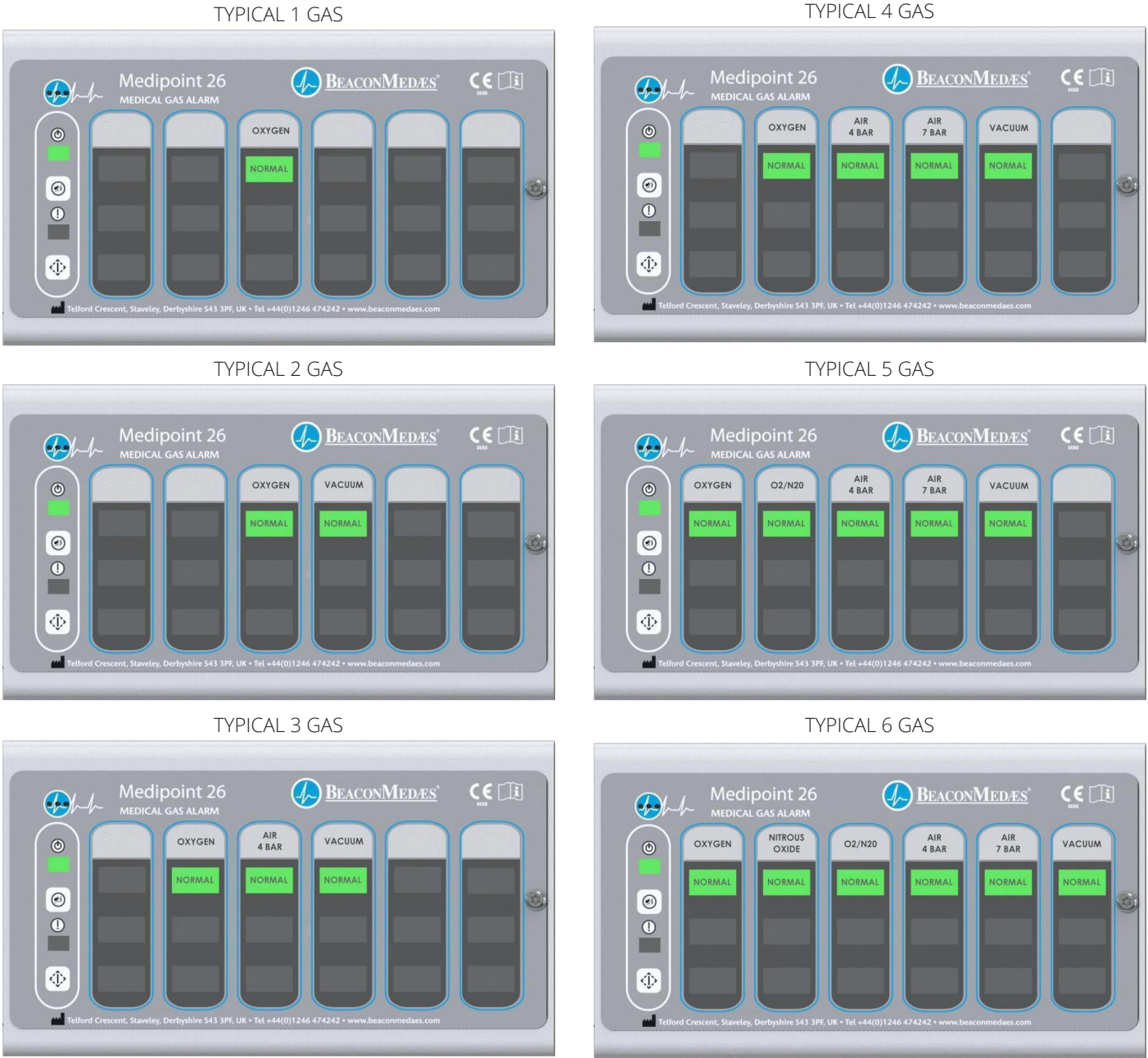
To provide an aesthetic display and maintain consistency in accordance with recognised and established medical gas service sequencing, it is recommended that displays are positioned in the following sequence on each alarm panel commencing with the left hand column:-

- Medical Oxygen
- Nitrous Oxide
- Oxygen/Nitrous Oxide Mix (50/50)
- Medical Air 400 kPa
- Medical Air 700 kPa
- Medical Vacuum

When an alarm panel is required to display less than its maximum of 6 gas services, it is recommended that displays are positioned in accordance with Table 2 & Figure

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FIGURE 6 - EXAMPLES OF RECOMMENDED DISPLAY POSITIONS



6.

TABLE 2: RECOMMENDED DISPLAY POSITIONS

Display column	1	2	3	4	5	6
1 gas			Gas 1			
2 gas			Gas 1	Gas 2		
3 gas		Gas 1	Gas 2	Gas 3		
4 gas		Gas 1	Gas 2	Gas 3	Gas 4	
5 gas	Gas 1	Gas 2	Gas 3	Gas 4	Gas 5	
6 gas	Gas 1	Gas 2	Gas 3	Gas 4	Gas 5	Gas 6

### 1.6.3 Power supply printed circuit board

The power supply PCB is retained inside the alarm panel back box with four retaining studs and connects to the light display PCB multi-way ribbon cable by polarised connectors. The power supply PCB incorporates four mains terminals (2 Earth, Neutral and Live,

see figure 7) connected to a matching plug/socket combination to accept the mains electrical power supply, which preferably should be from an essential circuit, and enables connection of flying earth leads which electrically bond the assembly.

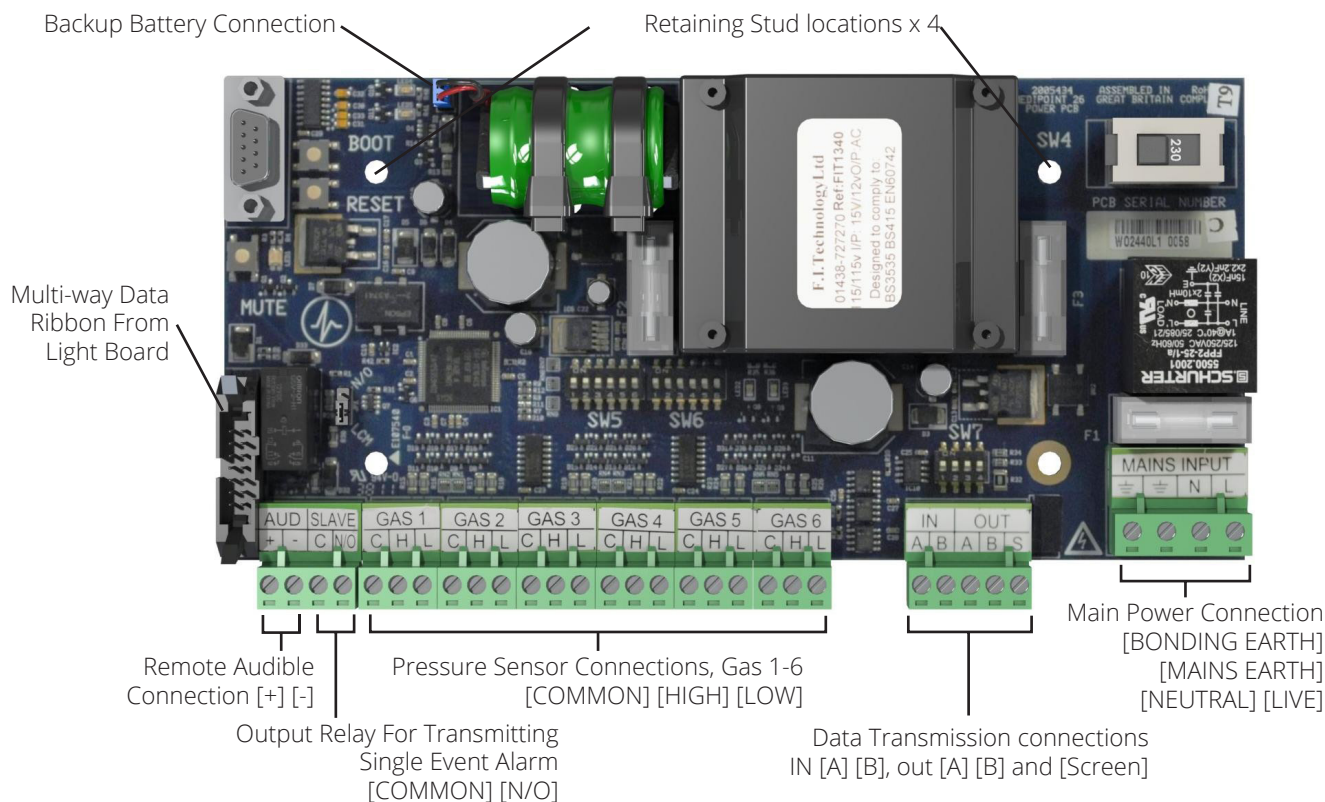
The power supply PCB has a voltage changeover switch to allow on-site voltage selection (see figure 8). A filter protects the alarm system from possible spikes or disturbances of the incoming electrical power supply and an integral transformer provides 15V and 5V d.c. supplies to operate the alarm circuits. Three 5x20mm fuses to BS EN 60127 protect the power supply circuits. F1 is rated at 500mA for 230V supplies and 1A for 115V supplies, F2 is rated at 1A, and F3 at 500mA (see figure 8).

The mains power supply terminal is covered by a clear plastic shield, retained by a single screw. A warning notice reminds personnel to isolate the electrical power supply prior to removal and maintenance. In order to prevent inadvertent

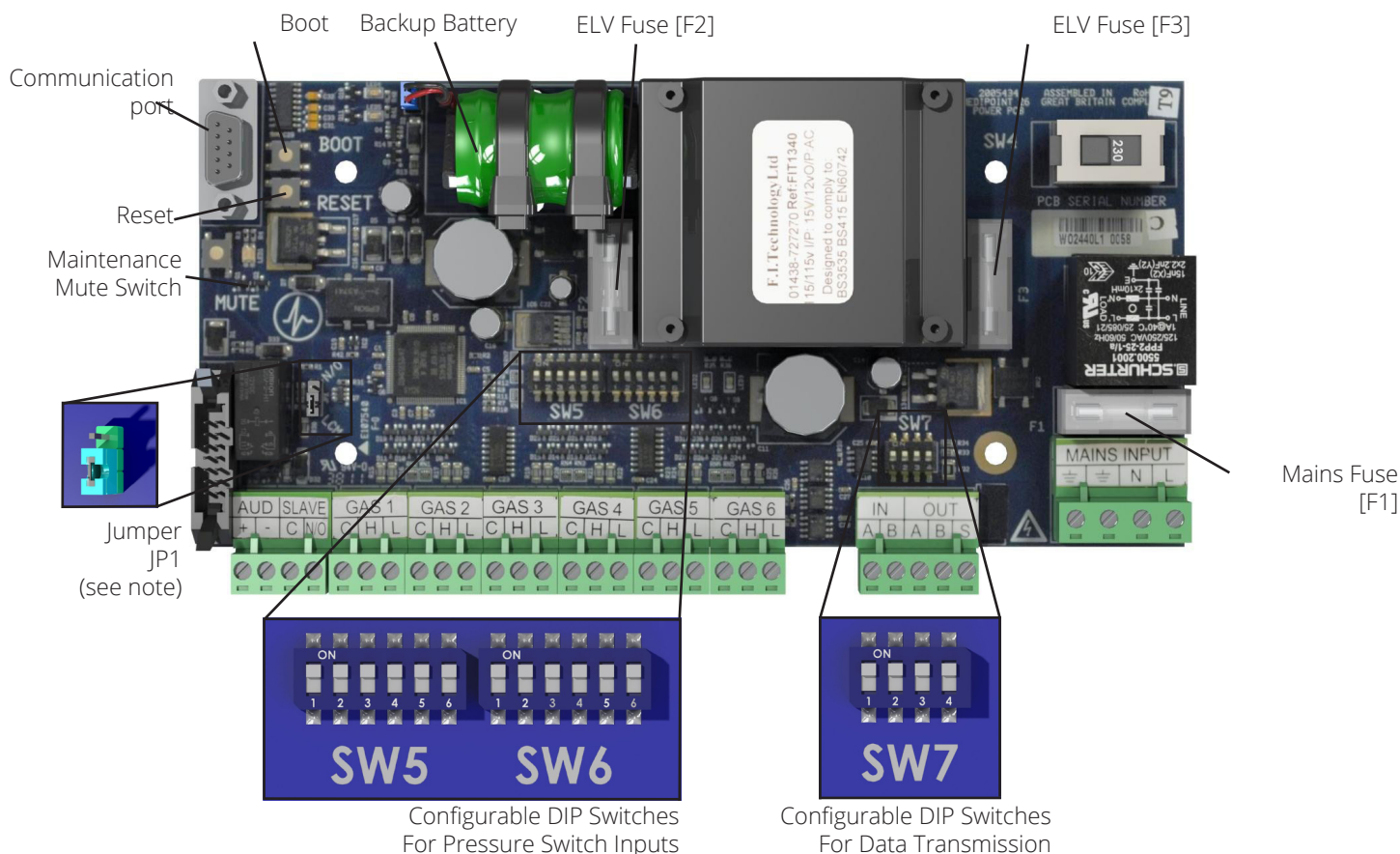


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**FIGURE 7 - MP26 POWER SUPPLY BOARD CONNECTION LAYOUT & MOUNTING**



**FIGURE 8 - MP26 POWER SUPPLY BOARD SWITCH & FUSE LAYOUT, PLUS BACKUP BATTERY**



**NOTE...**  
Jumper JP1 shown on the lower 2 pins [LCM], sets the Output Relay for line contact monitoring. Move to the upper 2 pins [N/O] if line contact monitoring is not desired, for example when the Output Relay is communicating with a non BeaconMedæx alarm.

Operate the RESET after changing any setting on the power supply board.

The BOOT switch & Communication Port is only used during manufacture.

## Medipoint 26 Local Alarm System

cross connection, the mains electrical power supply plug and socket is not mechanically compatible with any other connection to the PCB.

The power supply PCB incorporates a microprocessor which controls the operation of the alarm panel. The PCB also incorporates a 2 x 6-way configuration DIP switch (SW5 & SW6, see figure 8) which programmes each of the two conditions on all six channels ON or OFF, allowing easy programming on site. A miniature 'Maintenance Mute' push button (see figure 8) is fitted on the power supply PCB and is accessible with the alarm panel front cover open. With an alarm condition displayed, operation of this button 'permanently' disables audible reinstatement for that particular displayed alarm condition only. This facility is designed for use when the plant or pipeline is shut-off for a prolonged period. On returning the pipeline pressure to NORMAL this feature automatically re-sets without further manual selection.

Each channel (designated Gas 1 to Gas 6) incorporates three terminals (C - Common, H - High pressure and L - Low pressure, see figure 7) which are connected by matching plug/socket combination to connect wiring from the respective pressure sensor.

A relay (complete with optional line contact monitoring circuit) suitable for switching 50V and a maximum of 0.5 Amps is fitted to the power supply PCB (see figure 7). The relay has volt free, normally open contacts and two terminals (N/O and C) enable connection by a matching plug/socket combination to either a Medipoint central alarm system or other suitable system. The line contact monitoring circuit can be de-selected by means of a jumper on JP1 located on the power supply PCB (see figure 8). The relay is de-energised and contacts open when any of the twelve alarm conditions are initiated. Terminals are also provided to enable connection of a remote audible warning device (AUD+ and AUD-) (see figure 7).

It is recommended that the input cables from the pressure switches are installed separate from the mains cable and maximum cable length between alarm panel and pressure switch should not exceed 100 metres. Alarm panels accept a mains electrical power supply cable of 2.5 sq mm, and all other terminals accept a maximum cable size of 1.5 sq mm.

### 1.6.4 Standby battery

The power supply PCB also contains a standby battery (see figure 8), battery charging and power fail detection circuits. The battery provides power for both the SYSTEM ALARM indication and the audible warning in the event of an electrical power failure. The battery is fully charged after 72 hours and provides sufficient power to operate the specific alarm indications for a minimum of 4 hours. The battery is expected to have a minimum 5 year life.

## 1.7 Alarm contact line fault

**⚠ CAUTION....Only BEACONMEDÆS line contact monitor modules should be fitted, otherwise the fault detection circuits could provide spurious SYSTEM ALARM indications.**

Integrity of the interconnecting wiring and pressure sensors are constantly monitored by the fault detection circuits. The fault detection circuit is designed to detect an open or short circuit as well as normal operation of the pressure sensor. In the event of a line fault the NORMAL LED remains illuminated, the appropriate gas service alarm indicator and SYSTEM ALARM indicator will illuminate and the audible warning sounds. When a line contact fault is detected the flash rate of the affected circuit LED speeds up to show short circuit or slows to show open circuit when the TEST switch is operated. This facility is designed to aid fault diagnosis (see table 3).

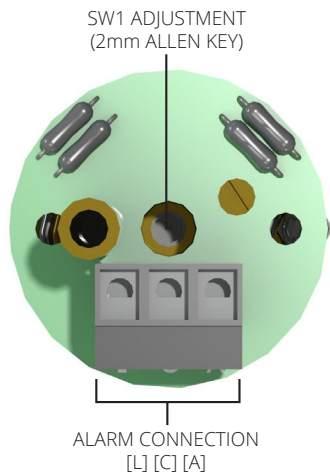
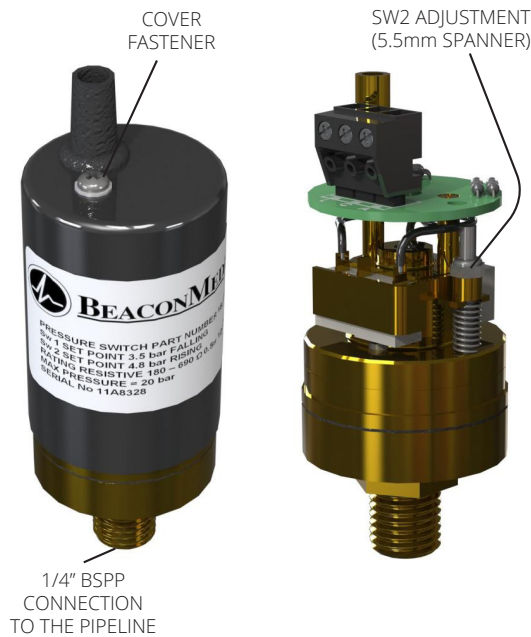
**⚠ CAUTION...As the alarm panel monitors specific resistance values, only one pressure sensor (for each specific gas service) may be connected to an alarm panel. Similarly it is not possible to connect more than one alarm panel to a single pressure sensor.**

## 1.8 Pressure switches

Pressure switches are fitted to monitor line pressure/vacuum within a Medical gas service installation and provide a signal to the power supply PCB if the pressure is outside normal limits. Pressure switches are 'normally closed' with integral line contact monitoring, and 3 types are normally used i.e. vacuum, 400 and 700 kPa (4 and 7 bar) pressure. 400 and 700 kPa pressure switches incorporate dual switching to enable both high and low levels to be detected. Vacuum switches only detect low vacuum condition. Pressure switches are supplied pre-set and fully tested therefore further adjustment should be unnecessary, however all pressure/vacuum switches may be adjusted on-site if necessary. The pressure switch consists of a body, pressure sensor and enclosure for the body. The electrical terminals, micro switch assembly and pressure setting adjusters are mounted on the body. The pressure switch should be installed as close as possible to the medical gas pipeline and is connected by a small bore copper pipe to a 'minimum leak' adaptor connected to a tee. The small bore copper pipe is supported by cleats (see figure 9).

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FIGURE 9 - TYPICAL PRESSURE SWITCH



NOTE...  
4 & 7 BAR PRESSURE SWITCH ADJUSTMENT, AS PER FIGURE 9.  
VACUUM SWITCH ONLY HAS 1 SET POINT, ADJUSTMENT IS FROM A 14mm HEX. MOUNTED CENTRAL TO THE SWITCH.

SEE PRESSURE SWITCH INSTALLATION DOCUMENT 1829960 FOR MORE DETAILS

When the alarm panel is to be used with a flammable gas installation in a laboratory, the panel must be located in a safe area and a suitable intrinsically safe relay interface used. Pressure switches for use with flammable gas installations must be compatible both electrically and structurally (material specification). For advice with any specific installation, contact BEA-CONMEDÆS Ltd, Staveley.

TABLE 3: ALARM TO PRESSURE SWITCH CONNECTIONS

	Terminal connections		
	High Pressure	Low Pressure	Common
4 bar Switch	A	L	C
7 bar Switch	A	L	C
Vac Switch	-	A	C
MP26 Alarm	H	L	C

## 1.9 Data Connection

The power supply PCB incorporates a data connection that allows slave MP26s to be connected with data cable. These slave panels will repeat the signals received from the master panel, allowing additional panels to be installed on nurses bases, or inside operating theatre panels (see figure 7).

## 1.10 Remote audible warning devices

Remote audible warning devices may be fitted in locations where warnings are necessary and alarm panels are not fitted. Remote audible warning devices are housed in a surface mounted enclosure containing a warning buzzer. The audible warning device is connected by input cable to the power supply PCB within the alarm panel (alarm terminals AUD+ and AUD-) (see figure 7). When the alarm panel audible sounds the remote audible also sounds. A maximum of four remote audible warning devices can be fitted to an alarm panel and the total cable length should not exceed 50 metres.

## 1.11 Operation of the Medipoint 26 medical gas area alarm.

Each Medipoint 26 medical gas alarm panel is connected to the mains electrical power supply, preferably to an essential supply. Pressure/vacuum switches provide the input to initiate both the visual displays and audible warning. Programming of the panels is done via switches which can be easily adjusted on site from within the panel. The Medipoint 26 medical gas area alarm uses coloured LED's to indicate the pipeline pressure conditions. The green NORMAL indication is a steady light, whilst the red HIGH and LOW PRESSURE illuminates as a flashing light to draw attention to the failure. During normal conditions, the green NORMAL LED is illuminated. Should either a high or low pressure switch operate, the green (NORMAL) LED is extinguished and the appropriate HIGH or LOW PRESSURE red LED is illuminated (flashing) together with an audible warning. The audible warning continues until either the MUTE switch is operated or the gas pressure returns to NORMAL. If the MUTE



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facility is operated and the alarm condition remains, the audible warning will re-sound after 15 mins and a further MUTE selection will be required. Should a further alarm condition occur after the panel has indicated a fault and has been muted, the audible warning is re-activated. Operation of the TEST switch illuminates (flashing) all LED's and operates the audible warning.

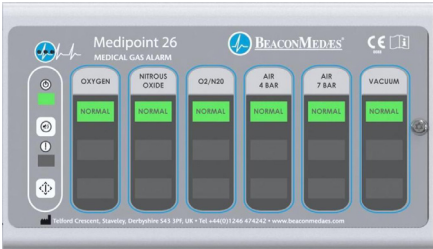
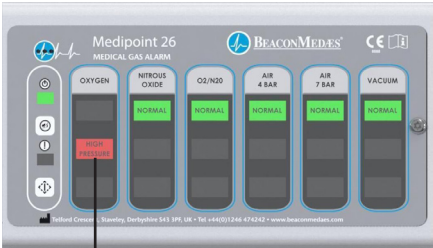
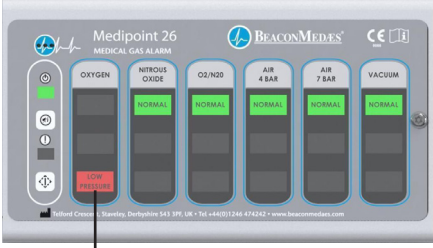
When the slave relay connection is interconnected to either a Medipoint central alarm system or other suitable system, the contacts are closed when all gas services are indicating NORMAL. In the event of any alarm condition, the relay contacts open, breaking the circuit to the remote system. The relay contacts remain open until all alarm conditions return to the NORMAL condition. There is also a line contact monitor integral to the board available across the N/O and C contacts. To select this, the jumper on JP1 is moved to the LCM position, for totally volt free contacts the jumper is moved to the N/O position.

The green POWER ON LED is normally illuminated and is extinguished in the event of an electrical power failure. The red SYSTEM ALARM LED is normally extinguished and illuminates (flashing together with an audible warning in the event of any of the following failures:-

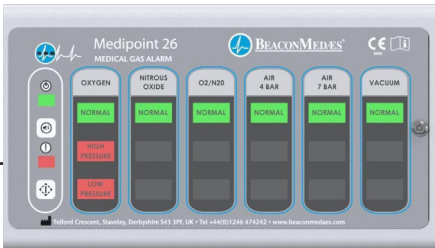
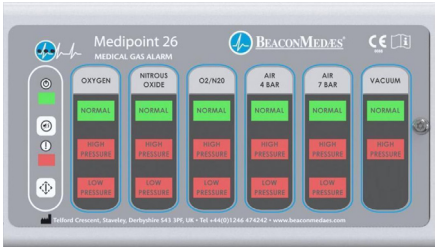
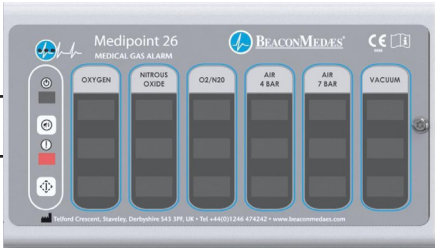
- Alarm contact line fault.
- Electrical power supply failure.
- Internal alarm circuit failure.

When a line contact fault is detected, the NORMAL green LED remains illuminated, the respective alarm LED also illuminates (steady), and the SYSTEM ALARM LED illuminates (flashing) accompanied by an audible warning. Operation of the TEST switch illuminates all alarm LED's (flashing) and the flashing rate of the respective alarm LED indicates the type of fault. If the respective alarm LED flashes at a faster rate, this indicates a short circuit. If the respective alarm LED flashes at a slower rate, this indicates an open circuit. This facility is designed to aid fault diagnosis. The Medipoint 26 medical gas alarm logic is detailed at Table 4.

TABLE 4: MEDIPOINT 26 - ALARM LOGIC

Condition	Alarm panel displays
Normal	<div>NORMAL (steady) </div>
Alarm Condition	<div>Either HIGH PRESSURE (flashing)  Alarm condition Example shows fault on 1st gas column</div>
	<div>LOW PRESSURE (flashing)  Alarm condition Example shows fault on 1st gas column</div>
	<div>All accompanied by audible.</div>

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Line contact fault	<p>NORMAL (steady) Alarm (steady) SYSTEM ALARM (flashing) Audible</p>  <p>Alarm condition System alarm Example shows fault on 1st gas column</p>
	<p>Press TEST switch All alarm conditions will flash, the condition with the line contact fault will flash slower than the other LED's to indicate an open circuit or faster to indicate a short circuit.</p>  <p>Alarm conditions Test switch</p>
Power failure to panel	<p>SYSTEM ALARM (flashing) Audible (after 30 seconds) POWER ON LED extinguished</p>  <p>System alarm Power on LED</p>

### 1.11 Programming of a Medipoint 26

Medipoint 26 medical gas area alarms are programmed specific to the number and type of gases to be input by a bank of switches SW5 & 6. The switches can be seen in figure 8 and are set as detailed in table 5 & figure 8.

**TABLE 5: MEDIPOINT 26 PROGRAMMING**

Switch	Column	Condition
SW5-1	1	High Pressure
SW5-2		Low Pressure

SW5-3	2	High Pressure
SW5-4		Low Pressure
SW5-5	3	High Pressure
SW5-6		Low Pressure
SW6-1	4	High Pressure
SW6-2		Low Pressure
SW6-3	5	High Pressure
SW6-4		Low Pressure
SW6-5	6	High Pressure
SW6-6		Low Pressure
SW7	1-2	OFF To disable RS485 termination
		ON To enable RS485 termination (on cable segment endpoints only)
	3-4	OFF To disable RS485 fail safe biasing
		ON To enable RS485 fail safe biasing (on one panel per cable segment only)

For each individual switch, when ON, the respective condition is enabled, and when OFF, the respective condition is disabled.

For multi-panel installations, the master panel should be programmed as normal, and the slave panels should have SW5 and SW6 all OFF. The slave panels will automatically read information from the data cable.

SW7 selects the termination and fail safe biasing options for the RS-485 port. A network is divided up into segments. Each segment can be up to 1200 metres, subject to cable type and site conditions.

For the two panels at the endpoints of each cable segment on a network, the termination resistor should be switched on with SW7-1 and SW7-2. For all other panels, SW7-1 and SW7-2 should be switched off. If a signal booster is the endpoint of a cable segment, the termination resistor of the booster should be enabled. See the instruction manual enclosed with the signal booster for more details.

For each cable segment on a network the fail safe resistors should be enabled on a single panel, by switching on SW7-3 and SW7-4. For all other panels, SW7-3 and SW7-4 should be switched off.

#### NOTE...

Operate the RESET function (shown in figure 8) after changing any settings on the power supply board.



## 2. COMMISSIONING

### 2.1 Introduction

Commissioning of the Medipoint 26 medical gas area alarm installation is carried out in full after initial installation and the appropriate sections must be carried out after a major component change. The object of commissioning is to ensure that all components are serviceable, pressure switches operate at the correct settings and all alarm functions operate satisfactorily. The commissioning procedure also ensures that anti-confusion checks are carried out and that the correct gas service is displayed in the designated column. Personnel carrying out the following commissioning procedure must be qualified and fully conversant with the information contained in this manual.

**⚠ WARNING... BEFORE COMMENCING THE COMMISSIONING PROCEDURE ENSURE THAT ALL INSTALLATION PROCEDURES ARE COMPLETE AND THAT ALL WIRING IS CORRECTLY CONNECTED. BEFORE SWITCHING ON THE MAINS ELECTRICAL POWER SUPPLY, ENSURE THE SUPPLY IS CORRECTLY FUSED.**

### 2.2 Pipeline installation

Following the installation of pipeline Tees, the medical gas pipeline must be purged to remove all traces of nitrogen with medical quality air. The pipeline must be pressure tested and checked for leaks in the normal manner. On completion the connection to the pressure switch should be made, leak tested at normal working pressure, following which the pipeline must be purged with the working gas, and gas identification, quality and purity checks carried out.

### 2.3 Alarm panel test

Check that the multi-way ribbon cable is correctly connected (see figure 7). Switch on electrical power supply and ensure that the POWER ON light illuminates. Check all displays indicate the status of all gas services (see figure 6). Press TEST switch and check all displays illuminate (flashing) and the audible warning sounds. Ensure that the LED's are the correct colour and correct gas service legends are fitted.

### 2.4 Checking slave panels

If there are any slave panels connected to the data connection, correct operation of the slave panels should be verified at the same time as verifying the master panel during tests in section 2.7 to 2.9.

### 2.5 Checking the slave relay output

If the slave relay is to be used in the installation, op-

eration of the relay can be checked by ensuring that continuity exists between the relay terminals (N/O and C) when all NORMAL indications are illuminated. Check that continuity between the relay contacts is broken, whenever an alarm condition occurs during tests in section 2.7 to 2.9.

### 2.6 Checking the remote audible warning devices.

Whilst carrying out checks described in section 2.7 to 2.9, the opportunity should be taken to ensure that the remote audible warning operates whenever there is an alarm condition on it's parent panel. Check that the remote audible is silenced by operation of the MUTE switch on parent panel.

**⚠ CAUTION...** The TEST and MUTE switches must only be operated by gentle finger pressure. Operation by the use of instruments, tools or other implements will cause damage to the switch and fascia.

### 2.7 Pressure gas service switches - setting

The procedure to check the settings of a pressure switch is as follows:-

Pressure switch. Prepare.

Disconnect male adaptor and small bore pipe from pressure switch. Connect a remote source of regulated medical compressed air to the pressure switch.

Alarm panel. Check NORMAL display.

Pressurise the pressure switch to normal gas working pressure and ensure that the NORMAL (green) display in the correct display column is illuminated (see NORMAL condition table 4).

Pressure switch. Check LOW PRESSURE setting. Continue to slowly decrease pressure to pressure switch. Check that pressure switch operates and the correct LOW PRESSURE display is illuminated (see ALARM condition table 4) at the correct pressure. Adjust pressure switch as necessary (see installation document 1829960 for more details). Check that the MUTE switch operates satisfactorily.

Pressure switch. Check reset. Slowly increase pressure and check that the pressure switch re-sets, LOW PRESSURE light is extinguished and NORMAL display illuminates at the correct pressure.

Pressure switch. Check HIGH PRESSURE setting. Slowly increase pressure to pressure switch and ensure that the pressure switch operates and the cor-

## Medipoint 26 Local Alarm System

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rect HIGH PRESSURE display illuminates (see ALARM condition table 4) at the correct pressure. Adjust pressure switch as necessary (see installation document 1829960 for more details). Check the MUTE switch operates satisfactorily.

Pressure switch. Check reset.

Induce a controlled leak to slowly reduce pressure to pressure switch. Check that the pressure switch resets, HIGH PRESSURE light is extinguished and NORMAL display illuminates at the correct pressure.

Pressure switch. Completion.

Disconnect compressed air source from pressure switch. Re-fit small bore pipe and male adaptor to pressure switch. Test for and rectify leaks. Re-fit pressure switch cover if removed for access to adjusters. With the gas service installation operating at the correct pressure, ensure that the NORMAL display is illuminated.

### 2.8 Medical vacuum switches - setting

Using the normal vacuum system as a source, isolate the section and fit a vacuum gauge to the nearest terminal unit. Induce a leak to slowly decay the vacuum and check vacuum switch operates, and the correct PRESSURE FAULT display illuminates at the correct vacuum level. Adjust the vacuum switch if necessary (see installation document 1829960 for more details). Check that the MUTE switch operates satisfactorily. Restore the vacuum system to normal operating levels and ensure the NORMAL (green) display illuminates.

### 2.9 Checking the SYSTEM ALARM indication.

The procedure for checking that the SYSTEM ALARM circuits are operating correctly is as follows:-

Electrical power supply. Switch OFF.

Indications. Check.

Check that POWER ON LED is extinguished and SYSTEM ALARM LED is illuminated (flashing) (see POWER FAILURE condition table 4), accompanied by an audible warning after 30 seconds.

Electrical power supply. Switch ON.

Ensure that all indications return to NORMAL.

Line contact monitoring. Check open circuit.

Disconnect input plug from gas service channel on power supply PCB (see figure 7). Check that the respective gas service channel indicates NORMAL and both HIGH and LOW PRESSURE conditions are steady illuminations and the SYSTEM ALARM LED illuminates (flashing), accompanied by an audible

warning (see LINE CONTACT FAULT condition table 4). Press the TEST switch and ensure that both HIGH and LOW PRESSURE LED's flash at a faster rate than other displays.

Input. Reconnect.

Reconnect the input plug to gas channel. Repeat above step with all other inputs. On completion, ensure that all input plugs are correctly connected and all indications are NORMAL.

Line contact monitoring. Check short circuit.

Using a small piece of wire as a shorting link, short out input terminals (C and either H or L as applicable, see figure 7). Check that the respective gas service display indicates NORMAL and that the respective HIGH or LOW PRESSURE LED illuminates (steady) and the SYSTEM ALARM LED illuminates (flashing), accompanied by an audible warning (see LINE CONTACT FAULT condition table 4). Press the TEST switch and ensure that the respective HIGH or LOW PRESSURE LED flashes at a faster rate than other displays.

Shorting link. Remove.

Remove shorting link and repeat above step with all other inputs. On completion, ensure that all indications are NORMAL.

Close and secure alarm front cover.

## 3. OPERATING INSTRUCTIONS

### 3.1 General operation

During normal conditions the green (normal) LED's are illuminated. Should a sensor detect abnormal pressure, the green (normal) LED is extinguished and the appropriate alarm mode LED (red) is illuminated and the audible warning sounds (see ALARM CONDITION table 4). The audible warning will continue until either the MUTE switch (see figure 1) is pressed or the gas service is returned to normal. If the mute facility is operated, the audible warning will re-sound after 15 mins, until either the MUTE switch is re-selected or the gas service is returned to normal. Should a further alarm condition occur after the panel has indicated an alarm and has been muted, the audible warning is re-activated.

### 3.2 SYSTEM ALARM light

Should the SYSTEM ALARM light illuminate, a fault within the alarm system has occurred. The fault must be investigated and rectified immediately (see table 4).

### 3.3 TEST switch operation

Pressing the TEST switch illuminates (flashing) all LED's within a panel, sounds the audible warning, and causes the slave relay to de-activate (see LINE CONTACT FAULT, TEST SWITCH on table 4).

### 3.4 MUTE switch operation

Operation of the MUTE switch (see figure 1) following an alarm condition will switch off the audible warning. The audible warning will resound after 15 mins until either the MUTE switch is re-selected or the gas service returns to NORMAL.

## 4. MAINTENANCE

### 4.1 Introduction

Medipoint 26 medical gas area alarms are designed to operate with the minimum of maintenance, however regular routine minor maintenance operations are recommended to prove the system integrity. Maintenance operations are carried out in accordance with the planned preventative maintenance contract purchased by the customer. Maintenance engineers must fully understand the alarm system and must be conversant with the information contained in this manual.

**⚠ WARNING... OBTAIN A WORK PERMIT BEFORE COMMENCING ANY WORK ON A MEDICAL ALARM SYSTEM.**

## 4.2 Tools and equipment

Except for the special key provided to access the panel, no special tools are required, however common hand tools are required and they must be clean and serviceable. All necessary spare parts must be obtained before commencing work.

## 4.3 Customer recommended maintenance

The following routine maintenance operations are detailed in the Operating and Maintenance instructions as the recommended minimum:-

### 4.4 Weekly inspection

Press the TEST button (see LINE CONTACT FAULT, TEST SWITCH on table 4) on each alarm panel and ensure that all LED displays illuminate (flashing) and the audible warning sounds. If the remote audible is connected to the alarm panel, ensure that it operates simultaneously with the panel.

### 4.5 Quarterly inspection

The quarterly inspection proves the integrity of the interconnecting wiring from pressure switch to alarm panel, the line contact monitoring circuits and the integrity of the internal alarm panel circuits. The quarterly inspection consists of the operations detailed in paragraphs 2.6 to 2.9 inclusive.

### 4.6 Annual inspection

The annual inspection proves the correct settings of each pressure switch and consists of the operations detailed in Commissioning section, paragraphs 2.3 to 2.9.

## 4.7 Alarm Component Replacement

Figures 10, 11 & 12 gives details for replacing alarm components

Figure 10 shows details for accessing the alarm panel and disconnection the power supply and light board (see section 1.6.3 figures 7, 8 and table 5 for setting up a power board)

Figure 11 shows details for replacing the fuses, backup battery and disconnecting the electrical and data sockets.

NOTE...

The replacement battery may take up to 72 hours to fully recharge.

Figure 12 shows details for replacing LEDs and speaker.

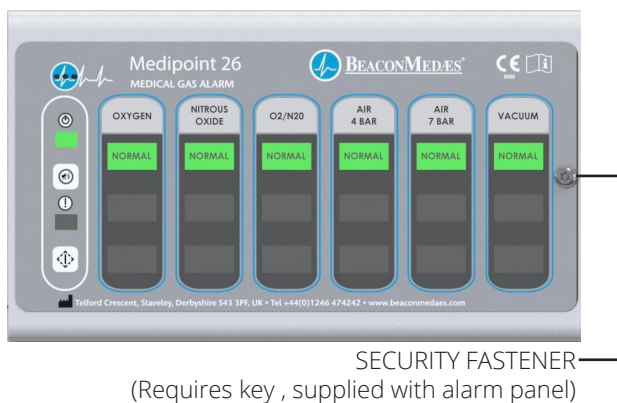
## Medipoint 26 Local Alarm System

To access the LEDs the light board will need to be removed from the alarm panel (see figure 10)

Alarm panel test.

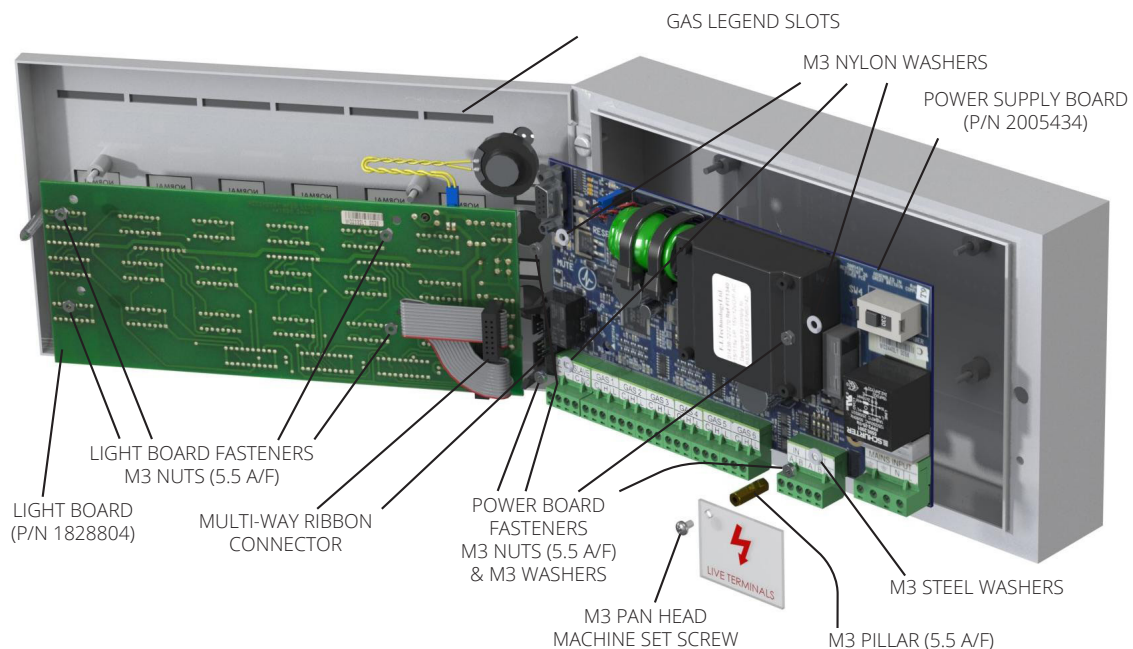
After performing any work on the alarm Ensure that POWER ON LED is illuminated and SYSTEM ALARM LED is extinguished. Press TEST switch and ensure all LED's illuminate (flashing) and audible warning operates (see LINE CONTACT FAULT, TEST SWITCH on table 4).

**FIGURE 10 - POWER SUPPLY AND LIGHT DISPLAY PCB REPLACEMENT**



**WARNING...ENSURE THAT THE MAINS ELECTRICAL POWER SUPPLY IS OFF AND REMAINS ISOLATED DURING WORK ON THE ALARM PANEL.**

**CAUTION...** Printed circuit boards are susceptible to damage by static electricity and must remain enclosed in their anti-static packaging until immediately required for use. Removed printed circuit boards must be placed in their anti-static packaging immediately on removal. To prevent damage to printed circuit boards, handle with care and do not over torque retaining nuts.





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FIGURE 11 - POWER SUPPLY COMPONENT REPLACEMENT

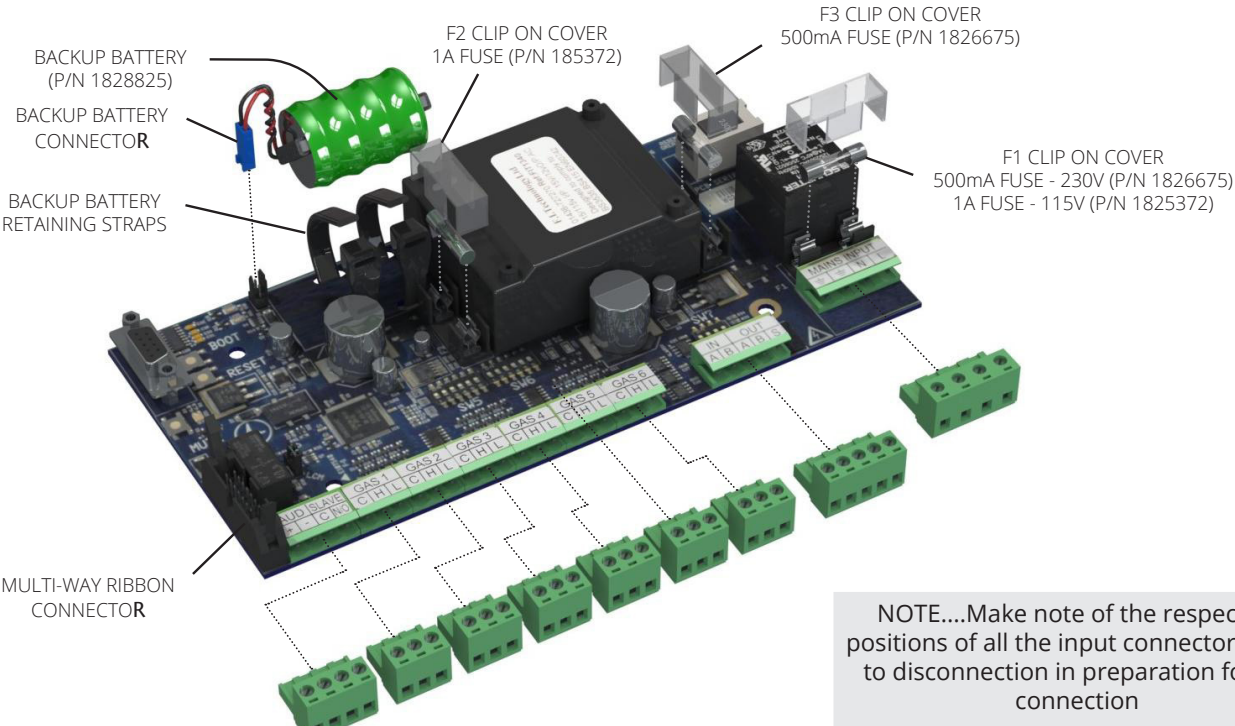
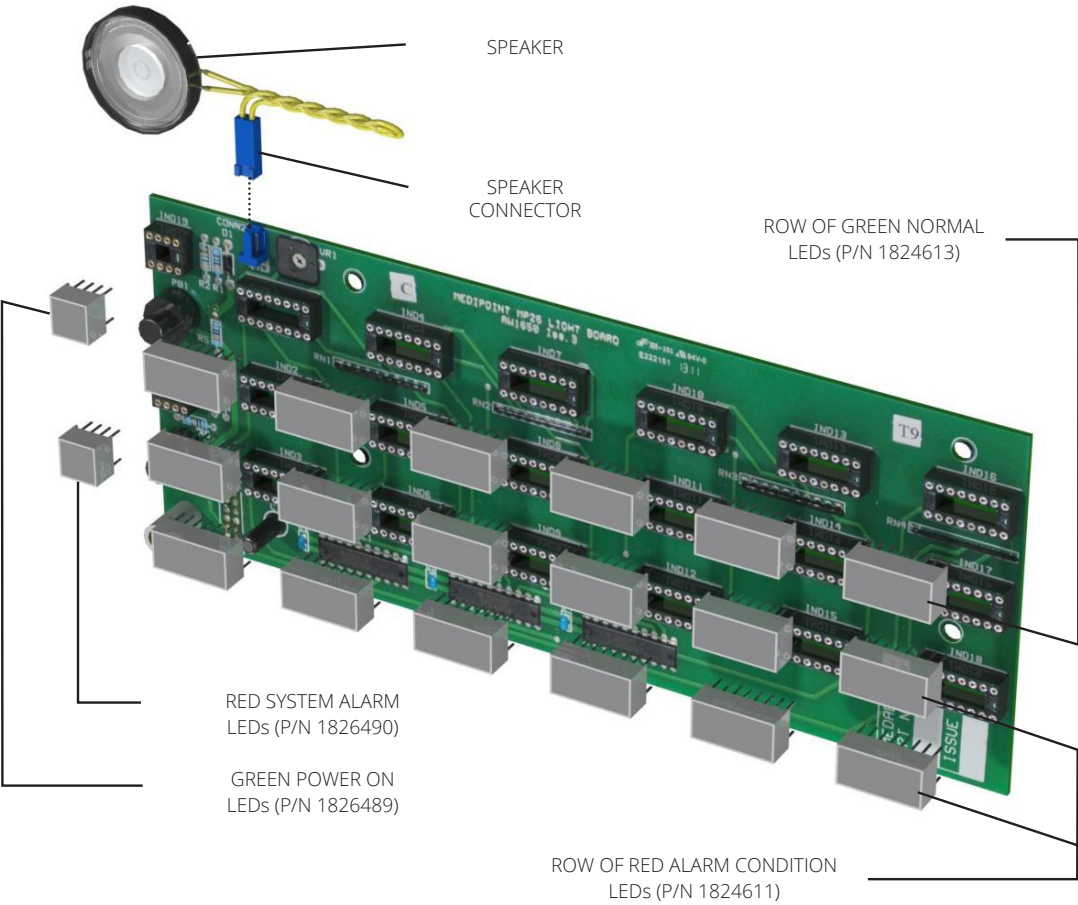


FIGURE 12 - LIGHT BOARD COMPONENT REPLACEMENT





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## 5. FAULT DIAGNOSIS

### 5.1 Introduction

The following Tables detail possible defects/symptoms which may occur with the Medipoint 26 medical gas area alarm, with the necessary rectification action.

**TABLE 6: TEST OR MUTE SWITCH FAILS TO OPERATE**

Possible cause	Remarks/rectification action
Faulty switches.	Replace the light display PCB.

**TABLE 7: SINGLE LED INDICATOR FAILS TO LIGHT**

Possible cause	Remarks/rectification action
Faulty LED indicator.	Replace LED.
Faulty light display PCB.	Replace light display PCB.

**TABLE 8: ALARM PANEL LOSES ALL DISPLAYS EXCEPT SYSTEM ALARM**

Possible cause	Remarks/rectification action
Mains electrical power supply failure.	Check mains electrical power supply into the panel.
Power supply fuses blown.	Check condition of fuses on power supply PCB. Replace as necessary.
Main ribbon cable connector faulty.	Check main ribbon connector on power supply PCB. Replace power supply PCB as necessary.
Main ribbon cable damaged.	Check main ribbon cable. If damaged replace light display PCB.
Power supply PCB faulty.	Replace power supply PCB.
Light display PCB faulty.	If all other checks have failed to rectify the fault, replace the light display PCB.

**TABLE 9: SYSTEM ALARM/FAULT INDICATION WITH A SERVICEABLE GAS**

Possible cause	Remarks/rectification action
Electrical power failure.	Check POWER ON indication is illuminated and other indications are normal.
Gas service pressure incorrect.	Independently check gas service pressure in area being monitored.
Pressure switch stuck in fail position.	Check resistance of interconnecting wiring, line monitor module and pressure switch. (180 +/- 5% ohms with contacts closed), (690 +/- 5% ohms with contacts open). If value is incorrect check continuity exists through pressure switch. Check pressure switch adjustment and replace switch as necessary, complete with line contact module.

Wiring defect between panel and pressure switch.	With a serviceable pressure switch fitted, check resistance of interconnecting wiring and line monitor module (<10 ohms indicates a short circuit or > 5K ohms indicates an open circuit). Locate wiring defect, repair as necessary or replace line monitor module.
Main ribbon cable connector faulty.	Check main ribbon connector on power supply PCB. Replace power supply PCB as necessary.
Main ribbon cable damaged.	Check main ribbon cable. If damaged replace light display PCB.
Power supply PCB faulty	Replace power supply PCB.
Light display PCB faulty.	If all other checks have failed to rectify the fault, replace the light display PCB.

**TABLE 10: REMOTE ALARM/RECORDING SYSTEM NOT OPERATING CORRECTLY**

Possible cause	Remarks/rectification action
JP1 set incorrectly.	Check that the jumper on JP1 is set to the correct position.
Faulty interface relay.	With all gas services indicating NORMAL, check that continuity exists between both relay terminals (N/O and C) on power supply PCB. With a gas service indicating either HIGH or LOW PRESSURE check that relay contacts open and break the circuit between the relay terminals. Replace power supply PCB if relay proves to be faulty.
Interconnecting wiring.	With a serviceable relay fitted and the fault still evident, the interconnecting wiring to the remote system may be faulty. Carry out continuity checks, locate and rectify the defective wiring or replace.
Remote alarm system.	Investigate fault, repair or replace faulty remote system as necessary.

**TABLE 11: GAS SERVICE INDICATES NORMAL WITH A HIGH/LOW PRESSURE CONDITION**

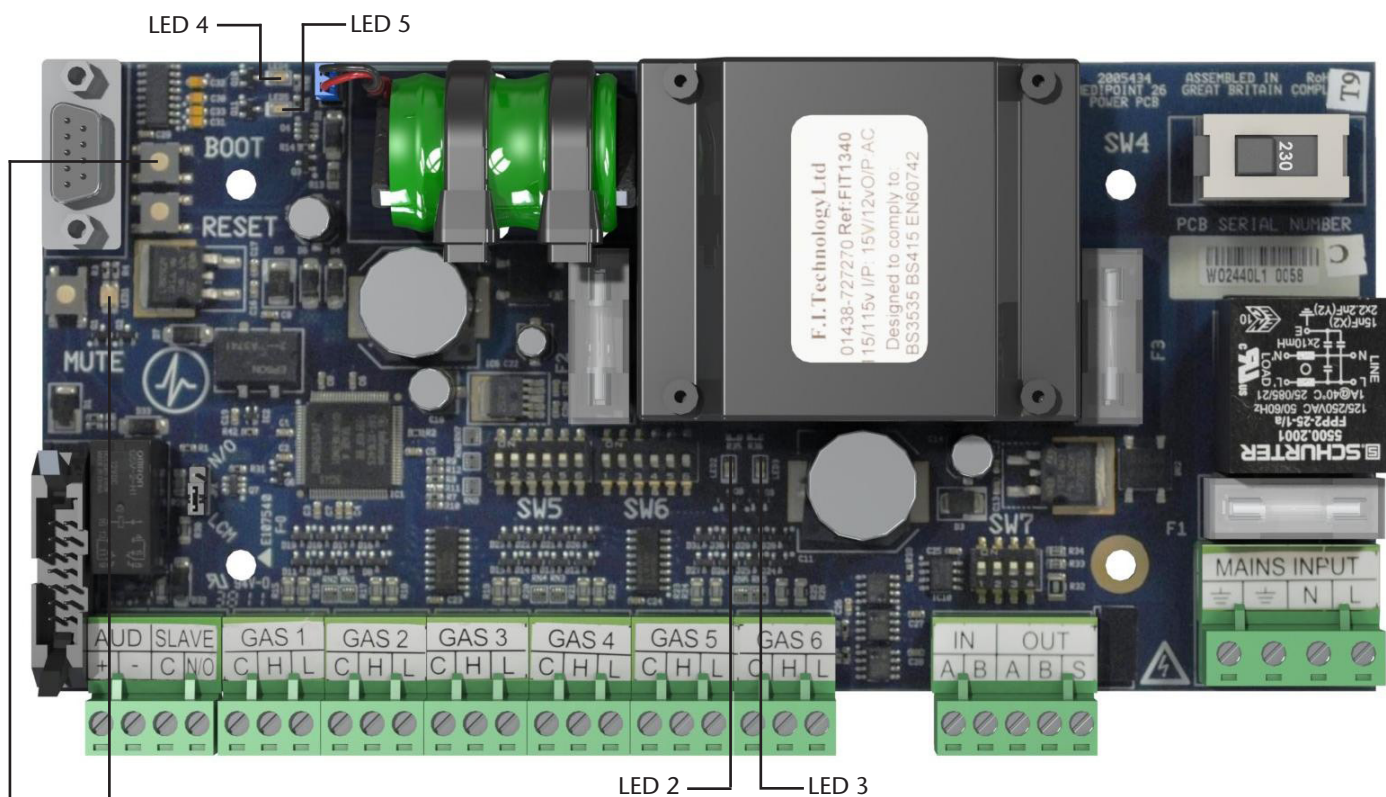
Possible cause	Remarks/rectification action
Pressure switch setting.	Check that the gas service pressure is correct. Switch is operating at the correct pressure.
Faulty wiring.	Carry out resistance checks between pressure switch and alarm panel (Table 8). Repair/replace defective wiring as necessary.
Power supply PCB faulty.	Replace power supply PCB.
Light display PCB faulty.	If all other checks have failed to rectify the fault, replace the light display PCB.

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**TABLE 12: SYSTEM ALARM AND AUDIBLE FAIL TO OPERATE ON POWER FAILURE**

Possible cause	Remarks/rectification action
Pressure switch setting.	Check that the gas service pressure incorrect. Switch is operating at the correct pressure.
Main ribbon connector faulty.	Check main ribbon connector on power supply PCB. Replace power supply PCB as necessary.
Main ribbon cable damaged.	Check main ribbon cable. If damaged replace light display PCB.
Power supply PCB faulty.	Replace power supply PCB.
Light display PCB faulty.	If all other checks have failed to rectify the fault, replace the light display PCB.

**FIGURE 13 - POWER BOARD FAULT DIAGNOSTIC COMPONENTS**



Diagnostic LED	Function	Colour	Status
LED 1	Heartbeat	Green - flashing	OK
		Yellow - flashing	Fault
		Red	Incorrect software for PCB
		Off	Mains power off
LED 2	RS-485 Transmit Activity	Green - blinking	RS-485 transmitting
		Solid or off	No activity
LED 3	RS-485 Receiver Activity	Red - blinking	RS-485 receiving
		Solid or off	No activity
LED 4	RS-232 Transmit Activity	Green - blinking	RS-232 transmitting
		Solid or off	No activity
LED 5	RS-232 Receiver Activity	Red - blinking	RS-232 receiving
		Solid or off	No activity
Boot Button	Factory only reprogramming	n/a	n/a

### 6. RECOMMENDED SPARES

Description	Part Number
Power supply PCB (dual voltage)	2005434
Light display PCB	1828804
Back up battery assembly	1828825
Green LED indicator	1824613
Red LED indicator	1824611
Power on LED indicator	1826489
System alarm LED indicator	1826490
Fuse 500mA	1826675
Fuse 1A	1825372
Line contact monitor module (double)	1826499
Line contact monitor module (single)	1826618
Alarm panel cover	1828378
Alarm panel fascia	1828377

#### 6.1 Spares scheduling

The recommended holding of spares depends upon the number of alarm panels installed and is detailed at Table 12. The number recommended for overseas customers is expressed in brackets and takes into account expected transport delays.

**TABLE 13: MINIMUM RECOMMENDED SPARES SCHEDULING PER ANNUM**

Part Number	Number of alarm panels installed		
	5 - 10	10 - 15	15 - 25
2005434	1 (2)	2 (4)	3 (5)
1828804	1 (1)	2 (2)	2 (3)
1828825	1(2)	2 (4)	3 (5)
1824613	3 (6)	6 (12)	6 (12)
1824611	6 (9)	6 (12)	9 (18)
1826253	2 (4)	4 (8)	6 (12)
1825372	2 (4)	4 (8)	6 (12)
1826675	1 (2)	3 (6)	3 (6)
1826489	1 (2)	3 (6)	3 (6)
1826490	1 (2)	3 (6)	3 (6)
1826499	2 (4)	3 (6)	4 (8)
1826618	2 (4)	3 (6)	4 (8)



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