

GDS301

SINGLE POINT SAMPLE UNIT OPERATING HANDBOOK

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System Overview

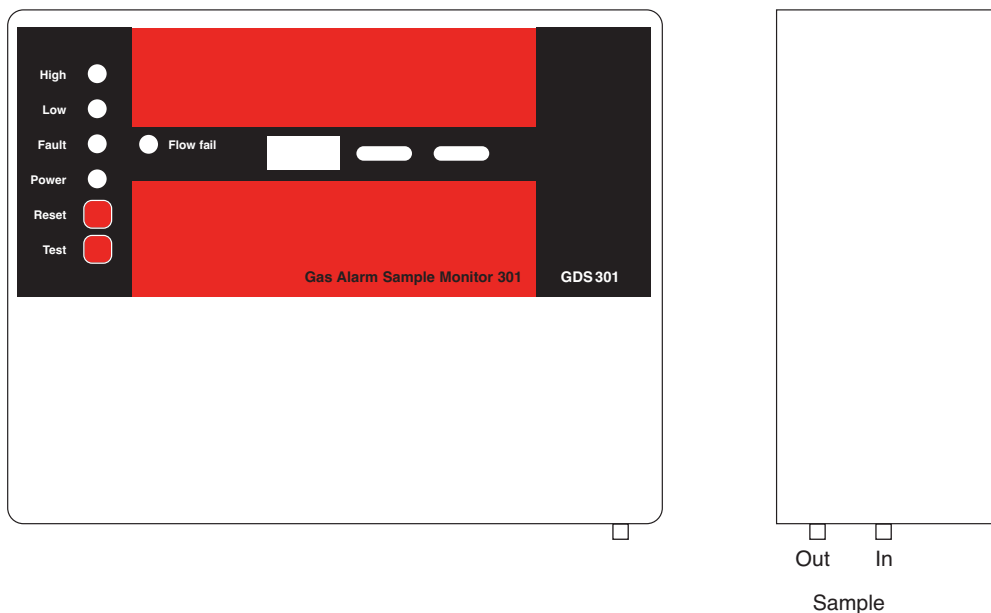
The GDS 301 system is designed to monitor gas levels and provide alarms for the presence of gas in a wide range of environments. The system consists of a sampling unit with the sample tube run out to the target area.

A sample pump is used to extract a continuous sample for analysis by a range of sensor devices. The pumping circuit incorporates a flow-sensing device, which provides indication of pump failure or sample line blockage.

When gas is detected, the digital display will indicate the gas level, with the relevant alarm LED illuminating and a buzzer sounding to alert the operator of the hazard. Relay contacts are provided for control functions. Alarm repeater panels and remote audio-visual devices are available for remote annunciation.

Pump failure or line blockage is indicated by an amber LED indicator located on the front panel, the sounder is muted by pressing the mute button located on the internal flow fail alarm board.

The system is supplied factory programmed and pre-calibrated to enable immediate operation by connection of a mains voltage supply and sample line.



Installation

The unit should be mounted in a position which is accessible and in the field of vision. Mains should be from a fused supply (2A) and connected to the mains input terminals of the power supply unit, see page 6.

The vent port should be piped to atmosphere without reduction, this will prevent possible back pressure affecting the sensor reading.

The positioning of the sample tube depends upon the type of gas to be monitored and its density with respect to air.

Heavy gases (LPG, Propane, Butane, Refrigerant Gases) – locate at 15 to 20 cm from the floor.

Lighter gases (Methane, Natural Gas, Town Gas) – locate at 5 to 10 cm from the ceiling.

Carbon Monoxide – locate at 1.5 to 2 metres from floor level.

Where appropriate the end of line filter nozzle should be positioned directly in the target area and away from any risk of water contamination.

All equipment should be mounted away from direct heat.

Setting up

Having connected the sample pipe and terminated all cables, switch on the power and allow 3 minutes warm up time, if necessary zero the instrument. Using a small terminal screwdriver and with the sensor sampling in clean air adjust the zero potentiometer until the digital meter reads zero for toxic/flammable gases or for oxygen, adjust the calibration potentiometer until the meter reads 20.8% vol, the system is now set up.

Alarm levels are factory set but may be re-adjusted as follows:-

1. For toxic/flammable gases zero the instrument in clean air using the zero potentiometer (for ambient oxygen monitoring the meter should be adjusted to read 20.8 using the calibration potentiometer).
2. Press the alarm set switch for approximately 5 seconds the sounder will bleep and the low alarm indicator will come on, the green power indicator will turn off, release the alarm switch.
3. Using the zero potentiometer adjust the digital display for the required low trip level reading, press the alarm set switch until the high alarm indicator comes on, release the alarm set switch.
4. Adjust the digital display to read the required high trip level reading and again press the alarm set switch both alarm indicators will come on.
5. Zero digital display (toxic/flammable) of 20.8 for oxygen and press alarm set switch, alarm indicators will turn off and the green power indicator will turn on.

For sensor signal transmitter set up see page 10.

Operation

On power up the green power indicator will flash for 60 seconds indicating that the sensors are stabilising, during this period all alarms are held in the off position.

After the stabilisation period any gas detected by the sensor will be indicated on the digital display with any alarm level being exceeded resulting in the sounder and appropriate red LED and relay activating.

Pressing the reset pad will result in the sounder being silenced, alarm indicators and relays may only be reset when the indicated gas level has reduced to below that of the alarm trip points.

Testing

The unit may be electrically tested by pressing the test pad for 15 seconds after which the gas alarm indicators and sounder will activate intermittently, maintaining pressure on the pad for a further 15 seconds will result in constant sounder/indicators and activation of alarm relays.

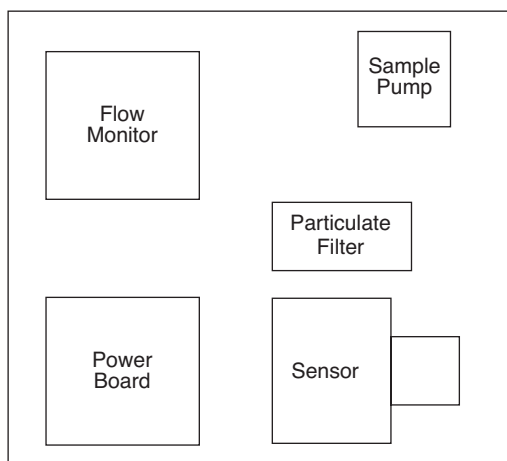
During servicing alarm relays may be isolated by pressing the reset pad for 15 seconds after which the fault indicator will come on indicating inhibit mode, to remove inhibit press the reset pad for 15 seconds the fault indicator will turn off.

To ensure that the system responds correctly to the presence of gas, the sensor should be gas tested by injecting an appropriate test gas sample into the system at point (A) see detail on page 8). It is advisable to carry out this test at six monthly intervals (Minimum).

Operational notes

Water Drain: - where a catch pot is fitted water may collect within the bowl, this will be more noticeable where hot samples are being drawn along the sample line and condensing along its path - water should not be allowed into the system - damage to the sensor will occur.

standard layout

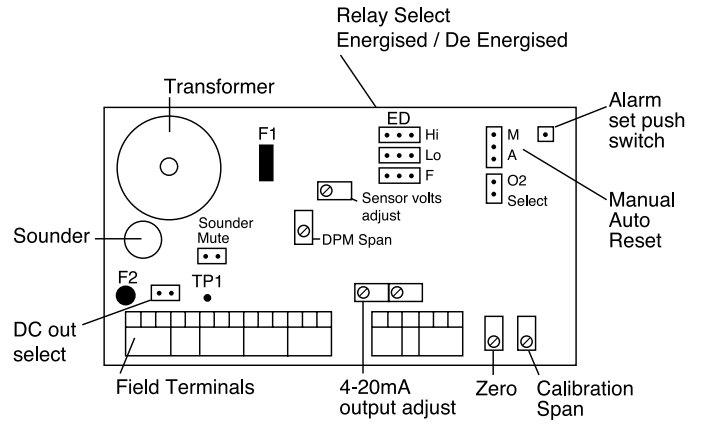


GDS 100 Control Unit – PIB Detail

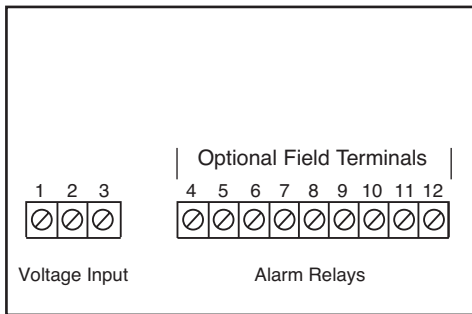
Field Terminals

| | | | | | | | | | | | | | |
|------|-----|---|--------|----|-----|-------|------|-------|-------|----|----|----|----|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| E | L | N | + | - | Nc | C | No | Nc | C | No | Nc | C | No |
| Used | Not | | IN/OUT | DC | Low | Alarm | High | Alarm | Fault | | | | |

| | | | | | |
|--------|----|----|--------|----|----|
| 15 | 16 | 17 | 18 | 19 | 20 |
| - | + | E | P | Y | W |
| 4-20mA | | | Sensor | | |



Power Board

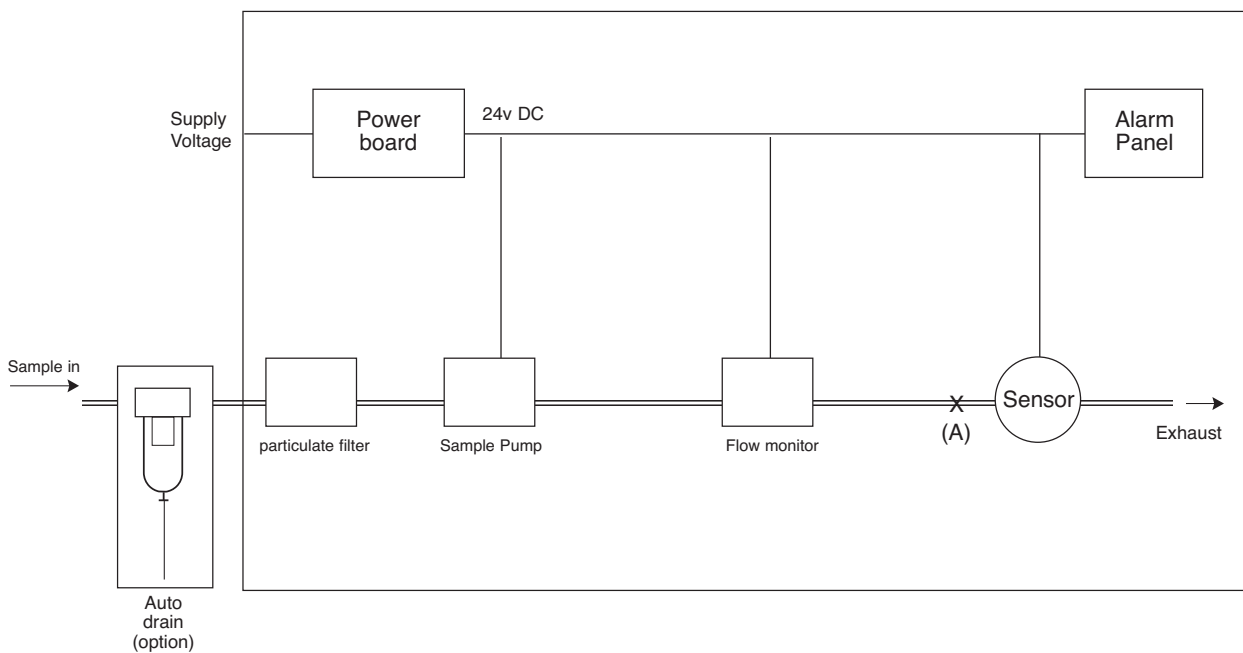


- 1 Live or + DC
- 2 Neutral or - DC
- 3 Earth
- 4 N/C
- 5 C } Low Alarm
- 6 N/O
- 7 N/C
- 8 C } High Alarm
- 9 N/O
- 10 N/C
- 11 C } Fault
- 12 N/O

Technical

| | |
|------------------------|---|
| CE Cert. No. | Ref C567 |
| Sensor Points | One |
| Sensor Type | Catalytic, Electrochemical, Infra-red, Semiconductor |
| Measurements | Combustible gas – L.E.L. % vol. Toxic gas PPM, % vol. Oxygen - % vol. – depletion/enrichment Refrigerant – ppm |
| Power Supply | Input - 230/115v AC – 50/60 Hz - 24v DC – Special 50v DC |
| Consumption | 70W full alarm |
| Field Terminals | Screw Type – accepting up to 2.5 mm cable |
| Indicators | Gas level readout 3½ digital display Power – green L.E.D Low alarm – red L.E.D High alarm – red L.E.D System fault – amber L.E.D Flow fail – amber L.E.D - (Pump fail/line blockage) |
| User Interface | Panel mounted push buttons (two) Reset – Mute sounder, reset alarms, initiate alarm relay inhibit Test – check alarm indicators, sounder and relay action |
| Alarm Settings | Digital setting (fully adjustable between zero and full scale) Normally latched – option auto reset |
| Outputs | Relay – high level gas alarm S.P.C.O. Relay – low level gas alarm S.P.C.O. Relay – system fault S.P.C.O. Relay – flow fail S.P.C.O. – flow fail alarm board All contacts rated 5A 230v AC All relay contacts used to switch inductive loads (relays etc) should have suppressors fitted, typical device Farnell 772-756 4~20mA analogue output or 1~5v Optional data logger 24v DC @ 100mA - Available for auxiliary equipment |
| Audible Alarm | Lo, hi, fault flow fail alarms 98dB @ 38cm |
| Dimensions | H 265mm x W 315mm x D 75mm |
| Cable Entry | Base – Rear |
| Weight | 3.7 kg |

| | |
|----------------------------------|---|
| Finish | Epoxy coated steel |
| Ingress Protection | IP 45 Standard IP65 option |
| Pump | Sample pump – 24v DC vibrating armature - standard Sample pump – 24v DC brushless diaphragm - optional |
| Sample Line | Material – Nylon, PTFE, Stainless Steel, Copper Size – 6 mm OD, 4 mm ID – push fit coupling Maximum length – 30 m – see options |
| Sample Line Length | Pump 1 – 10m Pump 2 – 100m |
| Sample Particulate Filter | End of sample line filter – large particulate removal Catch pot – removal to 40um – option In line filter |
| Sample Vent | 8 mm – push fit |
| Operating Temperature | -10 to +40° C |
| Sample Temperature | -10 to + 50° C – high temperature versions available |
| Response Time | 20 to 80 seconds |
| Options | Catch pot Water auto drain |



Service routine attention

The owner or occupier of the site should place the supervision of the system in the charge of a responsible executive, whose duty it should be to ensure the day to day operation of the system and to lay down the procedure for dealing with a gas alarm or fault warning.

The operating instructions should be kept available preferably with the control unit, all faults, service test and routine attention given should be recorded.

DAILY: A check should be made that any fault condition which may be indicated is in fact being attended to and that all other indicators are normal.

WEEKLY: Check the catch pot for high levels of particulate or water contamination, replace filters as necessary. On sites involving a high risk process or having gases which may cause loss of sensitivity a check on calibration should be carried out.

Twice yearly maintenance schedule

1. Zero check to sensor
2. Sensor to be gas tested and reading logged (sensitivity checked).
3. Field indicators to be tested.
4. Alarm trip points checked and re-aligned.
5. All faulty parts replaced where required.
6. All filter elements checked and replaced as necessary (catch pot filter – end of line filter – in line filter).
7. Power supply – voltage check.
8. Visual inspection made to confirm that the sample line fittings and equipment is secure, undamaged and adequately protected.
9. Logger batteries replaced (if fitted).

12 Monthly maintenance schedule

1. Twice yearly schedule.
2. Draw pump overhaul (diaphragm replacement).
3. Auto drain – pressure tube replacement (if fitted)

24 Monthly maintenance schedule

1. Pump replacement

| |
|-----------------------|
| Recommended test gas: |
|-----------------------|

Project Modifications