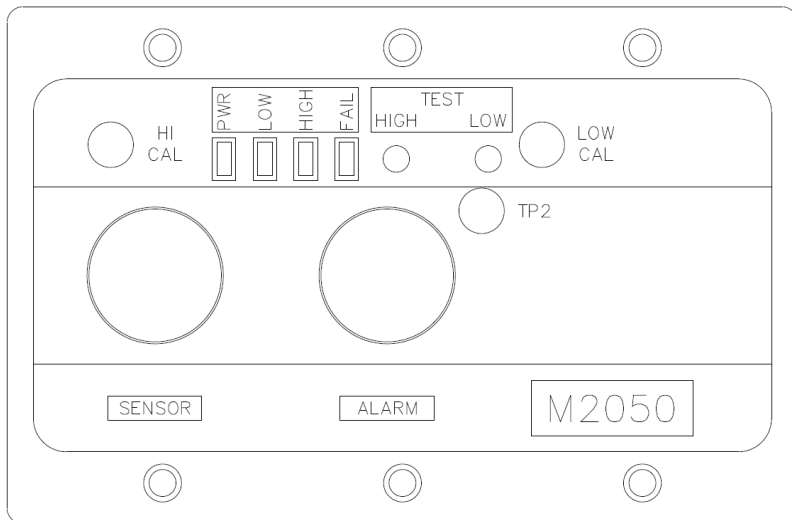


FABRICON SYSTEMS

ALBERTA 2008 INC.

Keeping you in Front



M2050 Detector Operator's Manual

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Table of Contents

Introduction.....	1
Features.....	1
General.....	1
Specifications.....	2
Standard Alarm Levels.....	3
Calibration.....	3-4
Accessories.....	5
Simplified Wiring Diagram.....	6
Apnote 80.....	7
Apnote 81.....	8
Apnote 66.....	9
General Terms and Conditions of Sale.....	10-11

Introduction

For situations that require dual level gas monitoring of combustible gasses or refrigerants, the M2050 is ideal. The unit samples small amounts of air and measures the gas content against preset levels. When the ambient gas level exceeds the lower threshold a relay output is provided which may be used to activate power relays in the M1000A that control exhaust fans via an electromagnetic contactor. When the upper alarm threshold is exceeded, relay outputs are provided to sound audible alarms, actuate automatic dialers, or provide an input signal to a central alarm system. In the event that the M1000A Controller is not used, the M2050 can be equipped with an external interposing relay to control external devices. The M2050 sensor relays should not be used to activate external devices directly. See Application Note 66 for details of how to connect an interposing relay.

Features

- Fail Safe design.
- Monitors for combustible gases or refrigerants.
- Self contained diagnostics.

General

- Very low maintenance costs due to solid state circuitry with a long sensor life. (Typically more than five years.)
- Periodic calibration testing to ensure reliable operation is required.
- Mounts in a 4" x 6" (3 gang) switch box (or our VEB-3 box).
- Can be powered by either 10VAC (standard bell transformer), or any 12VDC source. No polarity to be observed. (Normally powered by our M1000A controller.)
- The sensor is mounted in a socket, which allows for easy replacement. The calibration adjustments and calibration LED indicators are located behind removable plug buttons.
- The model M2050 units have an internal two minute time delay that lights the FAIL LED and prevents LOW and HIGH alarm outputs during the warm-up period of the gas sensor upon initial power-up or upon re-application of power after a power failure.
- When the presence of the applicable combustible gas reaches the threshold value of the low alarm set-point, the LOW LED will light and the low alarm output relay will deactivate, closing contacts.
- If the presence of the applicable combustible gas increases to the threshold value of the high alarm set-point, the HIGH LED will light, the internal audible alarm will beep, and the high alarm output relay will activate, closing contacts.
- If the sensor in the unit should fail, the FAIL LED will light, and a set of contacts will close or open (factory set for close).
- The M2050 is designed 'Fail Safe' and will simulate an alarm condition in the event of a power failure.

Specifications

Housing Size	6" x 4" x 1.5" sensor unit or 6" x 4" x 2.5" mounted in VEB-3 Box	
Power Requirements	10VAC/12VDC @ 250mA	
Low Alarm Output Relay	Normally energized SPDT	
High Alarm Output Relay	Normally de-energized SPDT	
Fail Alarm Output Relay	Normally de-energized SPDT selectable NO (default) or NC	
Relay Contact Ratings	Resistive (P.F.=1) 30VDC@2A 125VAC@0.6A	
Operating Temperature	0° to 40° C	
Weight	0.62 Pounds	
Recommended Calibration Interval	Every Six Months	
Sensing Technology	Solid state sensor	
Repeatability	±10% of set value	
Coverage	45' to 50' radius	
Mounting Height *	Ammonia NH3	1 foot from ceiling
	Methane CH4	1 foot from ceiling
	Propane C3H8	1 foot from floor
	Refrigerants R11, R12, R22, R134A, R404A	1 foot from floor

* Check your local building code for requirements in your area

Standard Alarm Levels

Gas Type	Low Alarm	High Alarm
Ammonia NH ₃	35ppm	75ppm
Methane CH ₄	10% LEL	20% LEL
Propane C ₃ H ₈	10% LEL	20% LEL
Refrigerants R11, R12, R22, R134A, R404A	300ppm	600ppm

Custom calibration levels are available upon request.

Calibration

This section describes the procedure for calibrating a Fabricon M2050 series dual level gas detector. The recommended calibration interval for the M2050 series sensors is six months.

Required Equipment

- 0.2 slpm flow regulator
- Calibration cup
- Low alarm level calibration gas cylinder:
- High alarm level calibration gas cylinder:
- Small flat-blade screwdriver

Glossary of Terms and Abbreviations

pot – potentiometer (variable resistor)

LEL – lower explosive level

slpm – standard litres per minute

Calibration Procedure

Caution: Gas detectors should not be calibrated unless the unit has been continuously powered up and operational for at least 72 hours.

Note: If you are sure that both the low alarm level and high alarm level (pots) have not been tampered with since the detector was delivered from the factory, or that the alarm levels were set properly by a reputable technician at the last scheduled calibration interval, the M2050 gas detector may be calibrated using only the high alarm level calibration gas and the LOW CAL pot. If this is the desired method, follow Step 1 through Step 7 and Step 13, substituting the high alarm calibration gas for the low alarm calibration gas and adjust the LOW CAL pot for the TP2 red LED just coming on instead of the TP2 yellow LED (the yellow LED should be lit the entire time that the high alarm calibration gas is applied to the sensor).

1. Remove the small hole plugs labeled HI CAL, LOW CAL, and TP2. These can normally be removed by forcing your fingernails under the outside edge of a plug, then rotating and pulling the plug.
2. The unit is equipped with a pair of LED indicators at TP2 to indicate the calibration thresholds. The yellow LED is used for LOW CAL and the red LED is used for HI CAL.
3. Connect the calibration cup to the flow regulator using a short length of flexible hose.
4. Install the flow regulator on the low alarm level calibration gas cylinder.
5. Insert the calibration cup into the nose piece (the large black ring) on the sensor.
6. Flow the low alarm level gas over the sensor for two minutes before making adjustments.
7. Adjust the LOW CAL pot until the yellow TP2 LED just lights. If the LED is not lit turning the pot counter-clockwise will cause it to light.
8. Remove the low alarm level gas.
9. Install the flow regulator on the high alarm level calibration gas cylinder.
10. Insert the calibration cup into the nose piece on the sensor.
11. Flow the high alarm level gas over the sensor for two minutes before making adjustments.
12. Adjust the HI CAL pot until the red TP2 LED just lights. If the LED is not lit turning the pot clockwise will cause it to light.
13. Remove the high alarm level gas and insert the black hole covers back into the HI CAL, LOW CAL, and TP2 holes.

Accessories

M1000A

The M1000A Low Voltage Power Supply and Output Control Unit is designed to provide the 10VAC supply for the M2050 or M3050 Gas Detectors from a nominal 120VAC primary supply while also providing two relays each containing DPDT contacts, which are activated by the alarm output from the M2050 or M3050 units. These relays are capable of switching up to 5A into a resistive load, or 2A into an inductive load (P.F.= 0.4) such as an electromagnetic contactor used in controlling ventilation fans, at voltages up to and including 250VAC.

VEB-3

Electrical box housing for the M2050 or M3050 detector.

MISC-2

Protective cage for the M2050 or M3050 detector.

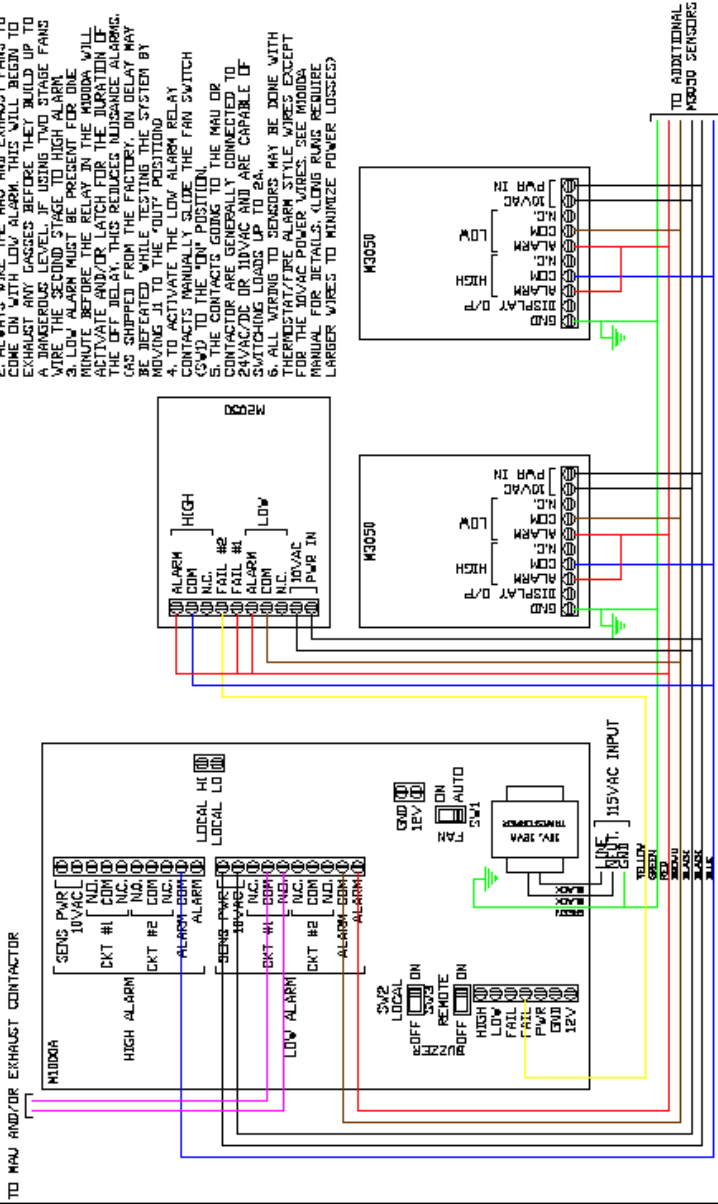
ASP-H-1 and ASP-H-2

Aspirated water-resistant housing for one or two M2050 or M3050 detectors.

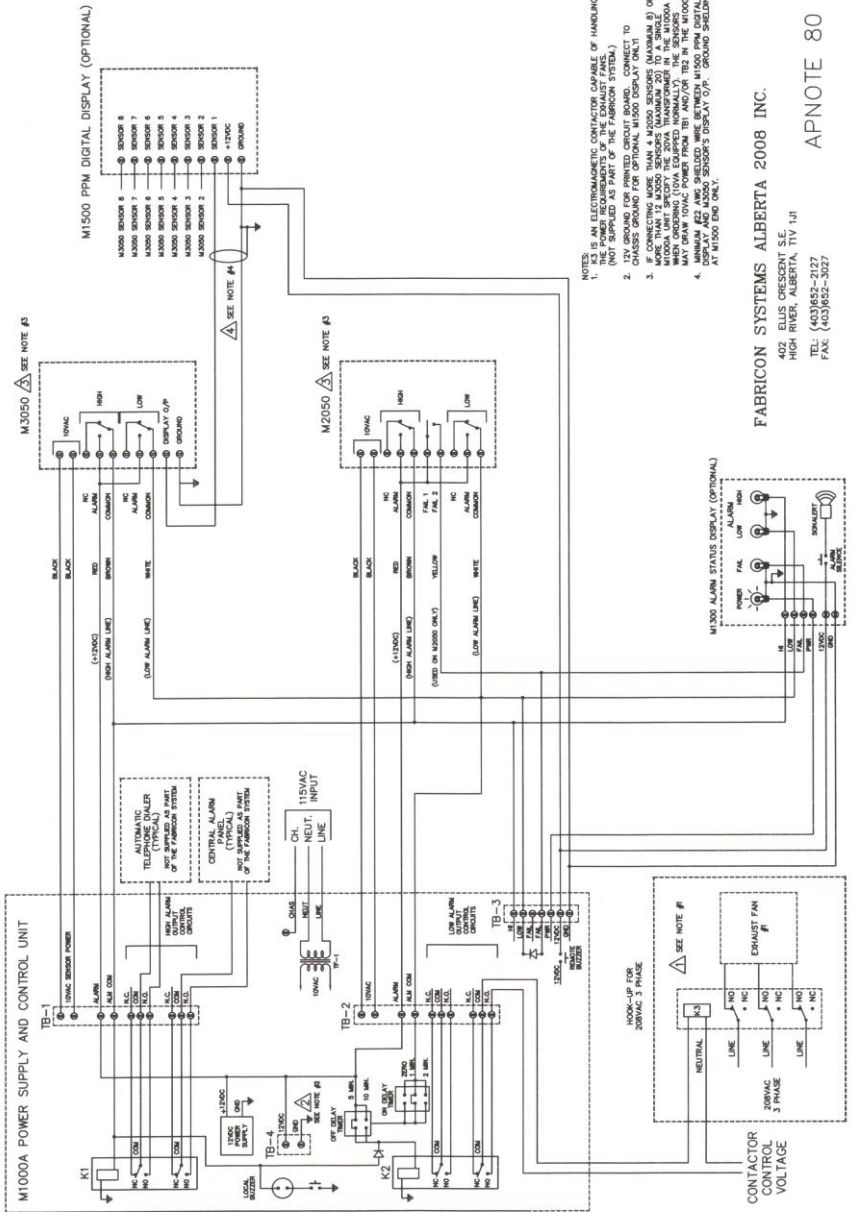
SIMPLIFIED WIRING DIAGRAM

NOTES

1. ALWAYS CONNECT BOTH HIGH ALARM AND LOW ALARM WIRING FROM THE SENSORS TO THE MODOA. THE HIGH ALARM WIRING WILL ACTIVATE BOTH HIGH AND LOW ALARM CIRCUITS IN THE MODOA WHILE OPERATING ANY DELAYS IN THE LOW ALARM CIRCUIT.
2. ALWAYS WIRE THE MAU AND EXHAUST FANS TO COME ON WITH LOW ALARM. THIS WILL BEGIN TO EXHAUST ANY GASSES BEFORE THEY BUILD UP TO A DANGEROUS LEVEL. IF USING TWO STAGE FANS WIRE THE SECOND STAGE TO HIGH ALARM.
3. LOW ALARM MUST BE PRESENT FOR ONE MINUTE BEFORE THE RELAY IN THE MODOA WILL ACTIVATE. THIS DELAY FOR MESSAGE ALARMS, THE OFF DELAY FOR DELAYS, MESSAGE ALARMS, GAS SHUTTED WHILE TESTING, ON DELAY MAY BE DEFEATED WHILE THE SYSTEM IS MOVING J1 TO THE "OUT" POSITION.
4. TO ACTIVATE THE LOW ALARM RELAY CONTACTS MANUALLY SLIDE THE FAN SWITCH COWD TO THE "ON" POSITION.
5. THE CONTACTS GOING TO THE MAU OR EXHAUST FANS ARE GENERALLY CONNECTED TO SWITCHES LOCATED UP TO 20' AWAY.
6. ALL WIRING TO SENSORS MAY BE DONE WITH THERMOSTAT/FIRE ALARM STYLE WIRES EXCEPT FOR THE 120VAC POWER WIRES. SEE MODOA MANUAL FOR DETAILS. (LONG RUNS REQUIRE LARGER WIRES TO MINIMIZE POWER LOSSES)



DUAL LEVEL GAS DETECTION, SINGLE ZONE CONFIGURATION

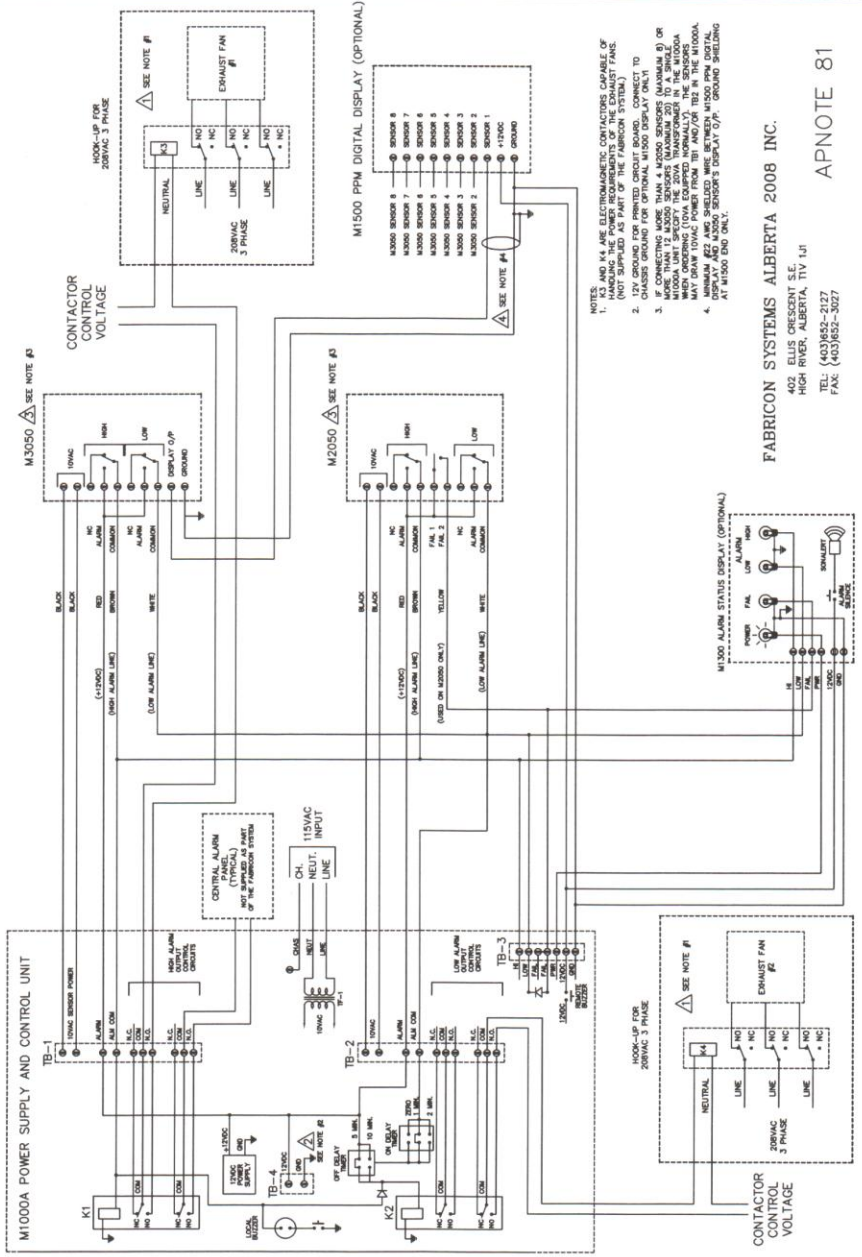


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APNOTE 80

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DUAL LEVEL GAS DETECTION, SINGLE ZONE CONFIGURATION SINGLE FAN ACTIVATION ON LOW, ADDITIONAL FAN ON HIGH ALARM



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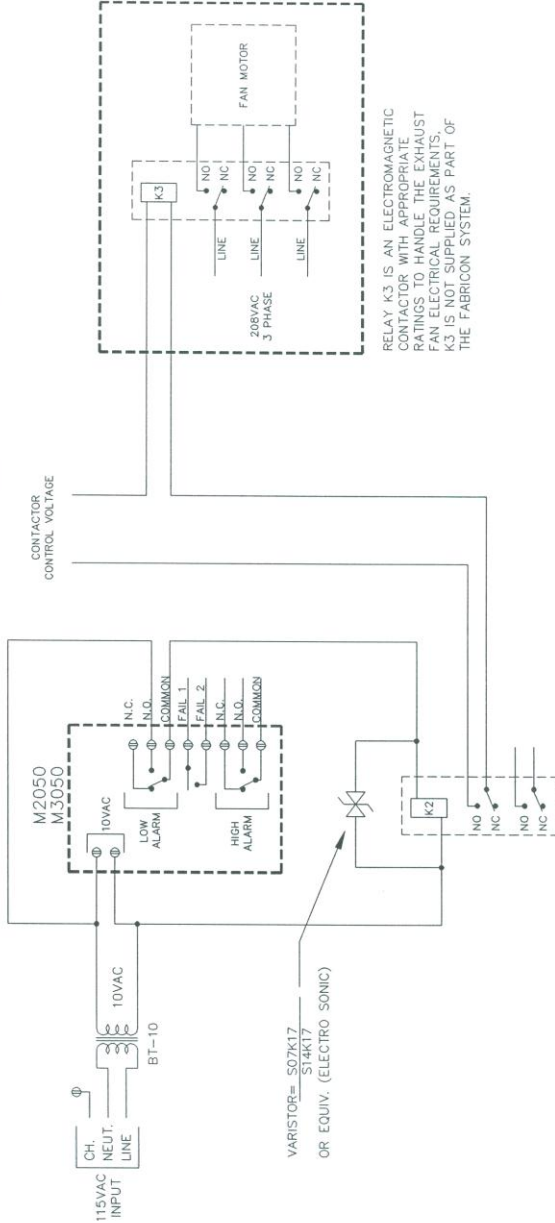
APNOTE 81

REVISED 2008-09-28

EXHAUST FAN CONTROLLED BY M2050 OR M3050 GAS DETECTORS

NOTE:
RELAYS ARE SHOWN IN THEIR NORMAL
OPERATING POSITION WITH THE SYSTEM
IN THE "NON-ALARM" STATE.

NOTE:
DO NOT ATTEMPT TO OPERATE THE MOTOR. START SOLENOID
DIRECTLY OFF THE SENSOR CONTACTS AS THEY ARE NOT
CAPABLE OF HANDLING THIS MUCH LOAD. USE EXTERNAL
RELAY K2 AS SHOWN BELOW.



NOTE:
K2 IS A 12VAC DPDT RELAY WITH 5 AMP/125VAC CONTACT RATING.
K2 IS NOT SUPPLIED AS PART OF THE FABRICON SYSTEM UNLESS
SPECIFICALLY REQUESTED. AN EXTRA COST WILL APPLY.

RELAY K3 IS AN ELECTROMAGNETIC
CONTACTOR WITH APPROPRIATE
RATINGS FOR THE EXHAUST
FAN MOTOR. CONTACT REQUIREMENTS
K3 IS NOT SUPPLIED AS PART OF
THE FABRICON SYSTEM.

APNOTE 66

GENERAL TERMS AND CONDITIONS OF SALE

TERMS:

Domestic payment terms are net thirty days, subject to Credit Department approval. Export Payment terms are subject to negotiation at time of order. All payments are to be in Canadian Dollars.

PRICES:

Fabricon Systems Alberta 2008 Inc. quotations remain in force for 60 days from the date of issue unless stated otherwise. Prices are thereafter subject to change without notice. All applicable federal, provincial, or local sales, excise, use, or other taxes levied on the equipment subject to the agreement shall be paid by the purchaser.

ERRORS:

We reserve the right to correct clerical or stenographic errors or omissions.

SHIPMENTS:

Shipments and deliveries shall be subject to the approval of the Credit Department. Shipping shall be F.O.B. High River, Alberta, with freight charges collect. Title and risk of loss shall pass to the purchaser at the point of shipment. We are not responsible for any loss, damage, or delay that may occur after goods have been accepted for shipment by the transportation company. Claims for shipping damages should be made directly to the carriers.

Prices include products having standard domestic packing only. Where packing for overseas shipment is required, contact Fabricon Systems Inc. for additional costs.

PARTIAL SHIPMENTS:

Partial shipments will be invoiced as shipped. Payments are due as invoiced.

DELIVERY:

Delivery dates are given to the best of our knowledge based on conditions existing at the time of quotation. Fabricon will make every effort to ship within the time estimated but cannot guarantee to do so. Failure to make shipment as scheduled does not constitute cause for cancellation and/or damages of any nature. The execution of an order is contingent upon strikes, fires, shortage of raw material, government approvals, delays of carriers and other delays or causes either unavoidable or beyond our control.

CANCELLATION:

Cancellation of orders will be accepted only on written notice to Fabricon Systems Alberta 2008 Inc. and upon payment of reasonable and proper cancellation charges. These charges are calculated to offset any expense incurred by Fabricon in the processing of the original Purchase Order and the

ordering of inventory from outside vendors to fulfil the said Purchase Order, but in no event shall it be less than 15% of the selling price.

WARRANTY:

Each new instrument manufactured and/or sold by Fabricon is warranted to be free of defects in material and workmanship. Fabricon's responsibility is limited to the repair or replacement of any instrument or part thereof for a period of one year from the date of shipment when, in our opinion, the repair or replacement is caused by an inherent flaw in the design, assembly, or components of the instrument. Field service is not included. This warranty does not cover components that are considered consumable in normal operation, nor does it apply to equipment that has been misused, abused, or tampered with by unqualified personnel.

FABRICON SHALL HAVE NO LIABILITY FOR ANY PERSONAL INJURY, PROPERTY DAMAGE, OR ANY SPECIAL, INCIDENTAL, CONTINGENT OR CONSEQUENTIAL DAMAGES OF ANY KIND RESULTING FROM A GAS LEAK OR THE PRESENCE OF TOXIC GASES. THE EXCLUSIVE REMEDY FOR BREACH OF THE LIMITED WARRANTY CONTAINED HEREIN IS THE REPAIR OR REPLACEMENT OF THE DEFECTIVE PRODUCT AT THE MANUFACTURERS OPTION. IN NO CASE SHALL FABRICON'S LIABILITY, UNDER ANY OTHER REMEDY PRESCRIBED BY LAW, EXCEED THE PURCHASE PRICE OF THE INSTRUMENT.

RETURNS:

All unserviceable equipment must be returned to Fabricon on a Return Material Authorisation (RMA) number provided by Fabricon's inside sales staff. This RMA number provides instrument tracking in Fabricon's facility to ensure that instruments are properly serviced and returned to their original owner. Any defective equipment must be returned to Fabricon's facility freight prepaid. After servicing, the instrument will be returned to the owner with the freight prepaid by Fabricon. Please provide telephone, email, and fax and the name of the contact person in your organization with all returned items so that Fabricon personnel have someone to contact in the event that is necessary.

NON-WARRANTY RETURNS:

Instruments that are returned to Fabricon for service or repair that are not covered by warranty will be inspected by the service department and an estimate of the repair costs will be produced. This estimate will be sent to the owner of the instrument for his/her approval prior to undertaking repair of the instrument. Final invoicing shall not vary more than 10% from the original estimate.