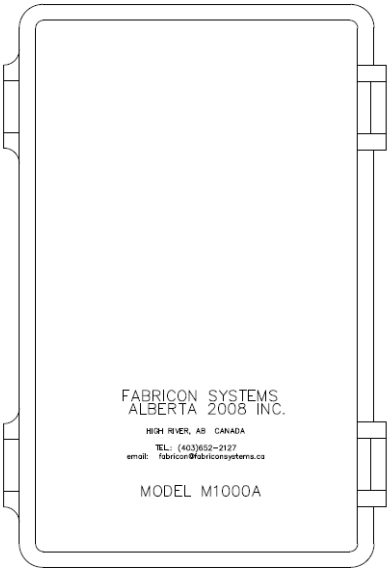
FABRICON SYSTEMS

ALBERTA 2008 INC.

Keeping you in Front



M1000A
Low Voltage Power Supply and Output Control Unit
Operator's Manual

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Introduction

The Fabricon Systems Alberta 2008 Inc. M1000A Low Voltage Power Supply and Output Control Unit is designed to provide a 10VAC supply for the M2050 and M3050 Gas Detectors from a nominal 120VAC primary supply while also providing two relays 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.

The Model M1000A has selectable time delays built into the unit that provide Low Alarm "On Delays" of one or two minutes and "Off Delays" of five or ten minutes. The "On Delay" is used to prevent short term cycling of the exhaust fans in the event of a momentary low alarm. If the gas detectors do not stay in the alarm condition for a time greater than the "On Delay" the fans will not be activated. The "Off Delay" is used to ensure that once the exhaust fans are activated that they will continue to run for five or ten minutes after the gas detector recovers from the alarm condition. This ensures the area being monitored is completely evacuated of the target gas. The High Alarm output is instantaneous when the alarm threshold is reached. In addition, if the high alarm output is activated it will automatically override the low alarm "On Delay" in the event the output is still timing out. The M1000A is equipped with a High Alarm buzzer that can be disabled by the internal buzzer “on/off” switch.

Other features of the M1000A include; a manual "On/Off" switch to activate the low alarm relay and any external equipment attached thereto, and field selection of "Fail Safe or Non-Fail Safe" condition of the low alarm relay. Additionally, the M1000A may be used to provide a regulated 12VDC output at up to one ampere to run external equipment such as sirens or sonalerts. The M1000A input transformer is rated either 12VA or 20VA (optional) therefore total current draw (AC and DC combined) should not exceed 1.8 amperes total.

The Model M1000A Low Voltage Power Supply and Output Control Unit is capable of powering up to eight Model M2050 or twenty Model M3050 Gas Detectors and providing output control for two alarm levels. (12VA transformer will power 1-4 M2050 or 1-10 M3050 detectors. 20VA transformer will power 5-8 M2050 or 11-20 M3050 detectors.)

An optional M1300 Alarm Status Display unit, may be used to inform maintenance personnel or management of the status of the system. The M1300 has a LED display for power, and LED display and audible alarm for fail, low alarm and high alarm. The M1000A power supply printed circuit board has a terminal block (TB-3) that interfaces with the M1300. The M1300 unit is fitted with its own housing for remote status display. This allows the system to be monitored from any location in the building.

Features

- A fan switch has been provided so that maintenance personnel can activate the ventilation fans manually. (See #1 on page 4 drawing for switch location.) With the switch in the up position the fans will operate continuously. In the down position (Auto) the fans are controlled by the gas detector alarm outputs.

- An "On Delay" of zero, one or two minutes has been provided to prevent nuisance tripping of the fans. At the time of shipping the system was set for one minute delay. This delay prevents the fans from activating until an alarm condition has occurred for at least one minute. If a longer time delay is required, move the jumper indicated #2 on page 4 drawing so that it is over the two posts marked 2 on the circuit board. If zero "On Delay" is wanted, move the jumper indicated #3 on page 4 drawing so it covers the two terminals marked "out" on the printed circuit board.

  Note: For system testing purposes, the "On Delay" is normally turned off by positioning the jumper indicated #3 to the "off" position. This allows the system to activate instantly when the test buttons on the front of the gas detectors are depressed.
  Do not forget to put this jumper back in the "In" position after testing is complete.

- An "Off Delay" of five or ten minutes has been provided that allows the ventilation fans to continue to operate for a period of time after the alarm condition has cleared. This ensures that the fumes in the area are sufficiently reduced so the gas detectors are well below their alarm threshold level. This prevents short term cycling of the fans each time a small leak occurs. At the time of shipping, the system was set for a five minute delay. If a longer "Off Delay" is wanted, move the jumper indicated #4 on page 4 drawing so it covers the terminals marked 10 on the printed circuit board.

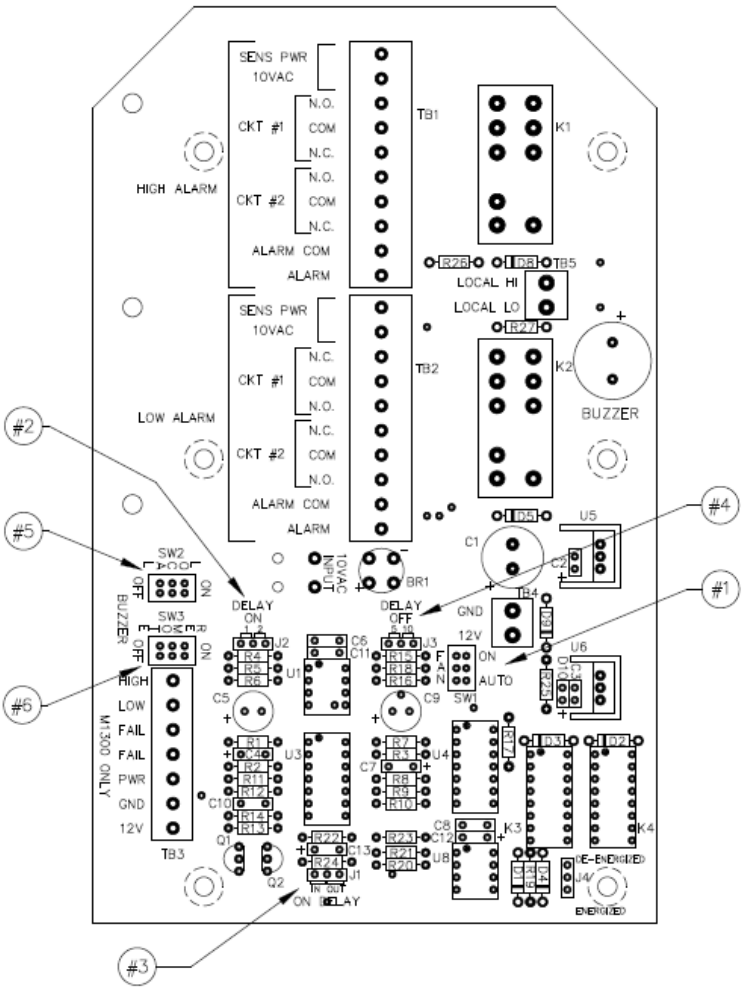
  Note: The "Off Delay" cannot be overridden.

- The Low Alarm output control relay is held normally energized. In the event of a power failure to the system the fans will activate automatically and continue to run until power is reinstated to the system.

- The occurrence of a high alarm state in the system will automatically override the low alarm delay mechanism and activate the fans immediately. At the end of the high alarm state the function of the equipment reverts to its normal delay settings.

- During the testing process it is possible to activate the "Off Delay" and the ventilation fans will continue to run after the test buttons are released. This is caused by the timer that activates the "On Delay". The timer is started by the first "Low Alarm" signal it receives. The timer continues to time out even though the alarm condition is removed. If a second test button is depressed and the low alarm condition coincides with the one minute time out of the "On Delay" timer, the system will activate the "Off Delay". To avoid this, wait two minutes between low alarm test button activations. This will ensure that the "On Delay" timer has reset itself. In the event that you inadvertently activate the "Off Delay" you will have to wait five minutes for the system to time out.

- The occurrence of a High Alarm state in the system activates an internal buzzer for the duration of the High Alarm condition. This buzzer can be disabled by switching the internal buzzer switch, indicated #5, to the “off” position.



1. Fan Switch (SW1)
   ON – activates low alarm relay.
   AUTO – activates low alarm relay automatically when detectors reach low alarm threshold.
2. Low Alarm On Delay Jumper (J2)
   Selectable for one or two minute on delay.
3. Low Alarm On Delay Jumper (J1)
   Selectable for no delay (OUT) or delay (IN), duration set at J2.
4. Off Delay Jumper (J3)
   Selectable for five minute or ten minute off delay of low alarm relay.
5. Local Buzzer Switch (SW2)
   Silences local buzzer in OFF position, in ON position local buzzer will sound with high alarm.
6. Remote Buzzer Switch (SW3)
   Silences remote buzzer in OFF position, in ON position remote buzzer will sound with high alarm.

Specifications

The MI000A Low Voltage Power Supply and Output Control Unit provides the low voltage supply for the Model M2050 and M3050 Gas Detectors while also providing two DPDT relays for activation of external equipment (ventilation fans, etc).

In normal operation the M1000A may be mounted in the electrical room in close proximity to the 120VAC primary power and the supply circuits for the external equipment. A typical application is to have the M1000A switch the control voltage for an electromagnetic contactor that provides power to the ventilation system.

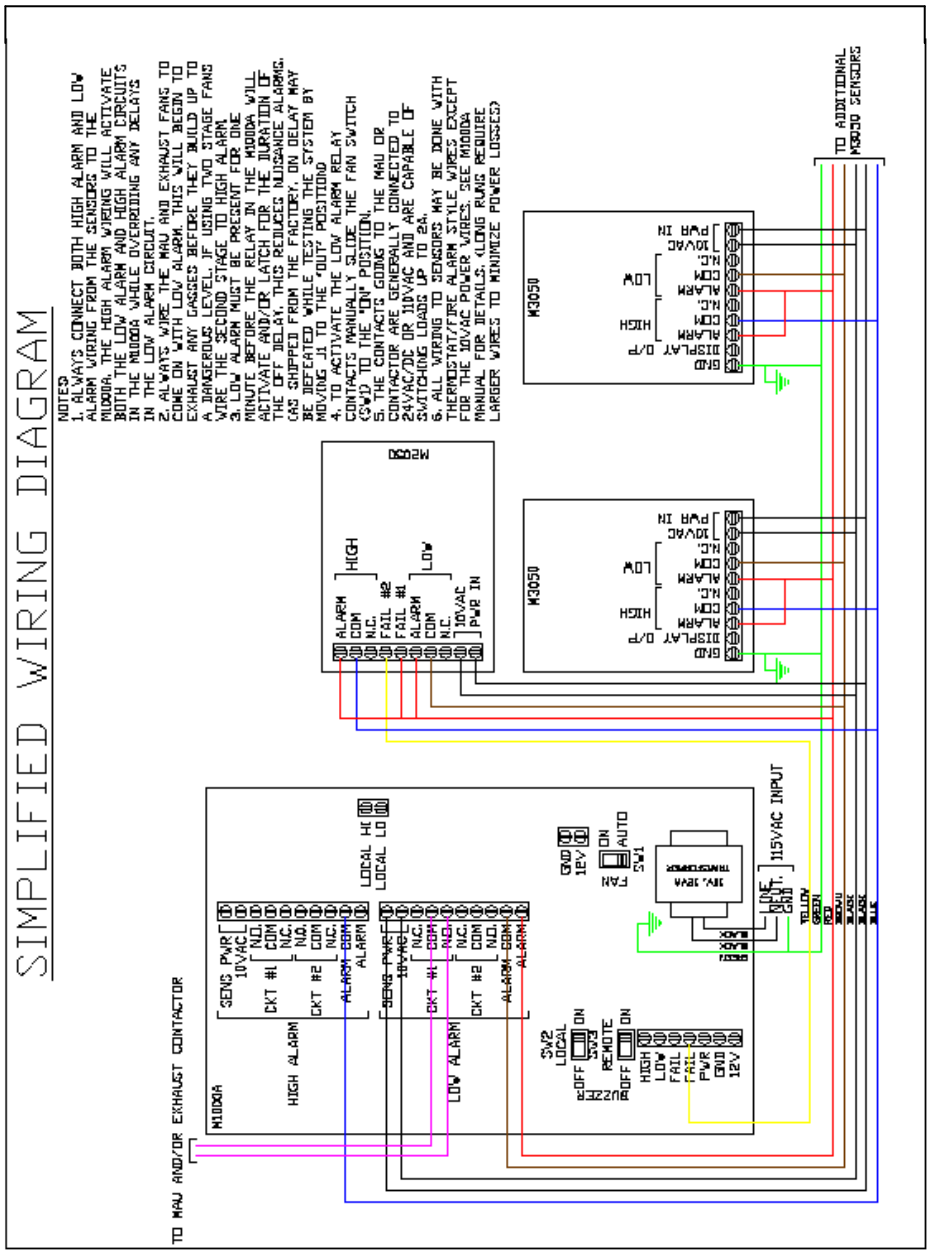
As stated above, the M1000A provides the low voltage (10VAC) power required by the gas detectors. In order to ensure that sufficient voltage is available to power the detectors some consideration must be given to the gauge of wire to be used for power distribution. The M1000A is capable of providing sufficient power to operate up to eight M2050 or twenty M3050 gas detectors with 20VA input transformer. Assuming that the gas detectors are "daisy chained" together on a continuous power run, the most distant detector determines the gauge of wire that must be used. The following table provides the recommended wire gauge based on the number of gas detectors on the circuit and the distance from the M1000A to the most remote gas detector unit. The distance is based on the actual wire length, not on the linear distance between the M1000A and the gas detector unit. The wire gauge used to connect low alarm, high alarm and fail circuits is not critical and may be anything from 16-22AWG.

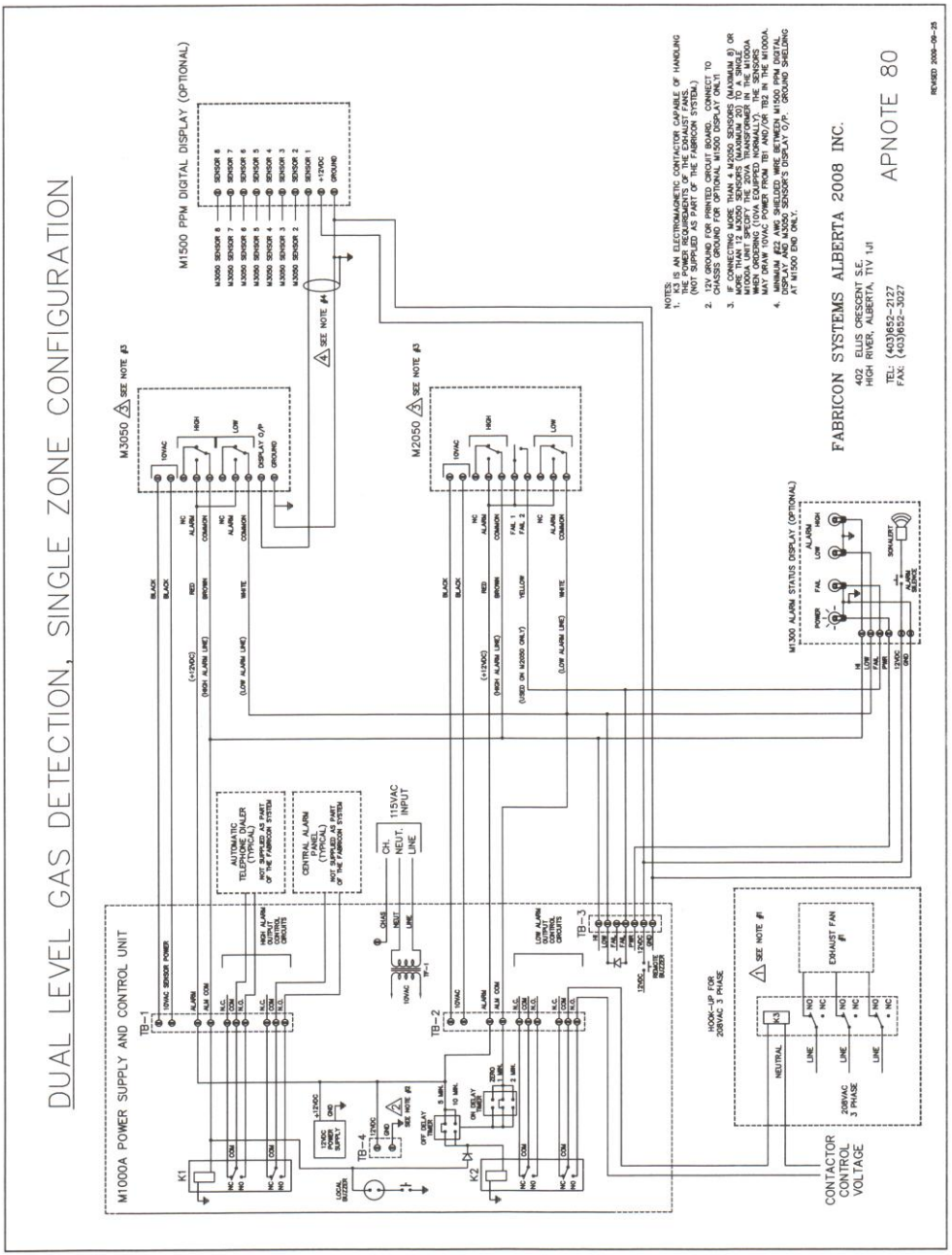
10VAC Power Distribution

Wire Gauge Recommendations

		Number of M2050 detectors equipped and wire gauge recommended							
Distance to most remote detector (feet)		1	2	3	4	5	6	7	8
	25	18	18	18	18	18	18	16	16
	50	18	18	18	18	18	16	16	16
	75	18	18	18	18	18	16	16	16
	100	18	18	18	18	16	16	16	16
	150	18	18	18	16	16	16	16	16
	200	16	16	16	16	16	16	16	16
	300	16	16	16	16	16	16	14	14
	400	16	16	16	16	14	14	14	14
	500	16	16	14	14	14	14	14	14

Chart is for M2050 models. For M3050 models the number of detectors can be doubled.


SIMPLIFIED WIRING DIAGRAM
NOTES:
1. ALWAYS CONNECT BOTH HIGH ALARM AND LOW ALARM WIRING FROM THE SENSORS TO THE M1000A. THE HIGH ALARM WIRING WILL ACTIVATE BOTH THE LOW ALARM AND HIGH ALARM CIRCUITS IN THE M1000A WHILE OVERRIDING 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 M1000A WILL ACTIVATE AND/OR LATCH FOR THE DURATION OF THE OFF DELAY. THIS REDUCES NUISANCE ALARMS.
CAS SHIPPED FROM THE FACTORY. ON DELAY MAY BE DEFEATED WHILE TESTING THE SYSTEM BY MOVING J1 TO THE "OUT" POSITION
4. TO ACTIVATE THE LOW ALARM RELAY CONTACTS MANUALLY SLIDE THE FAN SWITCH (SW1) TO THE "ON" POSITION.
5. THE CONTACTS GOING TO THE MAU OR CONTACTOR ARE GENERALLY CONNECTED TO 24VAC/DC OR 115VAC AND ARE CAPABLE OF SWITCHING LOADS UP TO 2A.
6. ALL WIRING TO SENSORS MAY BE DONE WITH THERMOSTAT/FIRE ALARM STYLE WIRES EXCEPT FOR THE 10VAC POWER WIRES. SEE M1000A MANUAL FOR DETAILS. LONG RUNS REQUIRE LARGER WIRES TO MINIMIZE POWER LOSSES.
TO MAU AND/OR EXHAUST CONTACTOR
M1000A
HIGH ALARM
SENS PWR 10VAC
CKT #1 N.O. COM N.C.
CKT #2 N.O. COM N.C.
ALARM COM ALARM
LOW ALARM
SENS PWR 10VAC
CKT #1 N.C. COM N.O.
CKT #2 N.C. COM N.O.
ALARM COM ALARM
LOCAL HI
LOCAL LO
SW2 LOCAL OFF ON
SW3 REMOTE OFF ON
HIGH
LOW
FAIL
FAIL
PWR
GND
12V
GND
12V
FAN SW1 AUTO ON
115VAC INPUT
LINE
NEUT.
GND
YELLOW
GREEN
RED
WHITE
BLACK
BLACK
BLUE
DS02W
ALARM COM N.C. FAIL #2 FAIL #1 ALARM COM N.C. 10VAC PWR IN
HIGH
LOW
M3050
GND DISPLAY O/P ALARM COM N.C. ALARM COM N.C. 10VAC PWR IN
HIGH
LOW
M3050
GND DISPLAY O/P ALARM COM N.C. ALARM COM N.C. 10VAC PWR IN
HIGH
LOW
TO ADDITIONAL M3000 SENSORS


DUAL LEVEL GAS DETECTION, SINGLE ZONE CONFIGURATION
M1000A POWER SUPPLY AND CONTROL UNIT
M1500 PPM DIGITAL DISPLAY (OPTIONAL)
M3050
M2050
M1500 ALARM STATUS DISPLAY (OPTIONAL)
AUTOMATIC TELEPHONE DIALER (TYPICAL)
CENTRAL ALARM PANEL (TYPICAL)
HOOK-UP FOR 208VAC 3 PHASE
CONTACTOR CONTROL VOLTAGE
EXHAUST FAN #1
FABRICON SYSTEMS ALBERTA 2008 INC.
402 ELLIS CRESCENT S.E.
HIGH RIVER, ALBERTA, T1V 1J1
TEL: (403)652-2127
FAX: (403)652-3027
APNOTE 80
NOTES:
1. K3 IS AN ELECTROMAGNETIC CONTACTOR CAPABLE OF HANDLING THE POWER REQUIREMENTS OF EXHAUST FANS. (NOT SUPPLIED AS PART OF THE FABRICON SYSTEM.)
2. 12V GROUND FOR PRINTED CIRCUIT BOARD. CONNECT TO CHASSIS GROUND FOR OPTIONAL M1500 DISPLAY ONLY!!
3. IF CONNECTING MORE THAN 8 M2050 SENSORS (MAXIMUM 8) OR MORE THAN 12 M3050 SENSORS (MAXIMUM 12) TO THE M1000A UNIT SPECIFY THE 20VA TRANSFORMER IN THE M1000A MAIN UNIT (10VA EQUIPPED AS STANDARD).
4. MINIMUM #22 AWG SHIELDED WIRE BETWEEN M1500 PPM DIGITAL DISPLAY AND M3050 SENSOR'S DISPLAY O/P. GROUND SHIELDING AT M1500 END ONLY.
REVISED 2008-06-25

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.