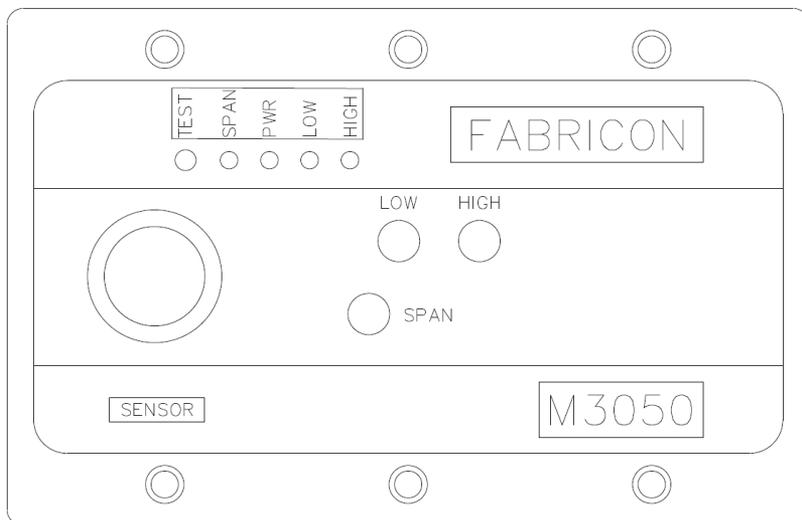


FABRICON SYSTEMS

ALBERTA 2008 INC.

Keeping you in Front



M3050 Detector Operator's Manual

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Introduction

For situations that require dual level gas monitoring, the M3050 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 alarm 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 M3050 can be equipped with an external interposing relay to control external devices. The M3050 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

- Low Maintenance, Long Life Expectancy, Fail Safe Design.
- Accurate monitoring of carbon monoxide or nitrogen dioxide gas.
- Low sensor drift over time and temperature variations.

General

- Very low maintenance costs due to use of electrochemical sensors, with a long life expectancy.
- Periodic calibration to ensure reliable operation is required. The recommended calibration interval is six months (twelve months maximum).
- Typical life expectancy for carbon monoxide sensors exceeds five years and is approximately two years for nitrogen dioxide sensors. Unit is covered by manufacturer's warranty for 12 months. See manufacturer's warranty for details.
- The sensor is mounted in a socket which allows for easy replacement. The calibration adjustments are located behind removable plug buttons on the face of the unit. Span and alarm levels are easily adjusted in the field.
- The unit mounts in a modified three ganged switch box (type VEB-3) available from the manufacturer.
- Can be powered by either 10VAC (standard bell transformer), or any 12VDC source. No polarity to be observed.
- The M3050 gas detectors typically are capable of monitoring 7000 square feet (650 sq. meters). If centrally located the gas detector monitors 45 – 50 feet in all directions.
- Visual LED displays for Power, Low Alarm, High Alarm and Span are located on the front of the unit.
- The M3050 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 @ 100mA
Low Alarm Output Relay		Normally energized SPDT
High Alarm Output Relay		Normally de-energized SPDT
Relay Contact Ratings		Resistive (P.F.=1) 30VDC@2A 125VAC@0.6A
Operating Temperature		-20° to 40° C
Weight		0.62 Pounds
Recommended Calibration Interval		Every Six Months
Sensing Technology		Electrochemical sensor
Coverage		45' to 50' radius
Carbon Monoxide	Standard Calibration	25ppm Low Alarm 100ppm High Alarm
	Standard Span Setting	250ppm
	Repeatability	±2% of set value
	Mounting – Mounts in VEB-3 Electrical Box Housing	Carbon Monoxide (CO) is 97% the weight of air. Sensors are normally mounted 36" – 60" above the floor level. Check your local building code for requirements in your area.
Nitrogen Dioxide	Standard Calibration	1ppm Low Alarm 3ppm High Alarm
	Standard Span Setting	5ppm
	Repeatability	±5% of set value
	Mounting – Mounts in VEB-3 Electrical Box Housing	NO2 is heavier than air. The sensor should be mounted 36" – 60" above the floor level. Check your local building code for requirements in your area.

Calibration Procedure

This section describes the procedure for calibrating a Fabricon M3050 series dual level gas detector. The recommended calibration interval for the M3050 series sensors is six months.

Required Equipment

- 0.5 slpm flow regulator for carbon monoxide, 1 slpm flow regulator for nitrogen dioxide
- Calibration cup
- Low alarm level calibration gas cylinder:
 - 25ppm carbon monoxide in air
 - 1ppm nitrogen dioxide in air
- High alarm level calibration gas cylinder:
 - 100ppm carbon monoxide in air
 - 3ppm nitrogen dioxide in air
- Small flat-blade screwdriver

Glossary of Terms and Abbreviations

pot – potentiometer (variable resistor)

ppm – parts per million

slpm – standard litres per minute

Calibration Procedure

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 M3050 gas detector may be calibrated using only the high alarm level calibration gas and the SPAN pot. If this is the desired method, follow Step 1 through Step 6, Step 12 and Step 13, substituting the high alarm calibration gas (100ppm for carbon monoxide sensors, and 3ppm for nitrogen dioxide sensors) for the low alarm calibration gas and adjust the SPAN pot for the HIGH LED just coming on instead of the LOW LED (the LOW LED should be lit the entire time that the high alarm calibration gas is applied to the sensor).

1. Connect the calibration cup to the appropriate flow regulator (0.5slpm for carbon monoxide, 1slpm for nitrogen dioxide) using a short length of flexible hose.
2. Install the appropriate flow regulator (0.5slpm for carbon monoxide, 1slpm for nitrogen dioxide) on the appropriate low alarm level calibration gas cylinder (25ppm for carbon monoxide sensors, 1ppm for nitrogen dioxide sensors).

3. Remove the black hole plugs from the SPAN and HIGH holes to expose the adjusting pots. Note: The LOW pot should only be adjusted by factory authorized technicians.
4. Insert the calibration cup into the nose piece (the large black ring) on the detector.
5. Flow the low alarm level gas over the sensor for two minutes before making adjustments.
6. Adjust the SPAN pot (screw seen through the SPAN hole) until the LOW LED just lights. If the LED is not lit, turning the pot clockwise will cause it to light. If already lit, turning the pot several turns counter-clockwise will extinguish it. There will be a difference between where the LED lights and extinguishes due to hysteresis built into the detector.
7. Remove the low alarm level gas.
8. Install the appropriate flow regulator (0.5slpm for carbon monoxide, 1slpm for nitrogen dioxide) on the appropriate high alarm level calibration gas cylinder (100ppm for carbon monoxide detectors, 3ppm for nitrogen dioxide detectors).
9. Insert the calibration cup into the nose piece on the detector.
10. Flow the high alarm level gas over the sensor for two minutes before making adjustments.
11. Adjust the HIGH pot (screw seen through the HIGH hole) until the HIGH LED just lights. If the LED is not lit, turning the pot clockwise will cause it to light. If already lit, turning the pot several turns counter-clockwise will extinguish it. There will be a difference between where the LED lights and extinguishes due to hysteresis built into the detector.
12. Remove the high alarm level gas and insert the black hole covers back into the SPAN and HIGH holes.
13. Wait until the HIGH and LOW LEDs extinguish. If the LEDs do not extinguish after several minutes, check the ambient gas levels near the detector with a hand held meter. The LOW LED will not extinguish until the ambient gas levels drop below approximately 15ppm for carbon monoxide detectors or approximately 0.7ppm for nitrogen dioxide detectors.

Contact the factory if any problems are encountered.

Accessories

M1000A

The M1000A Low Voltage Power Supply and Output Control Unit is designed to provide a 10VAC supply for the M2050 or 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.

VEB-3

Electrical box housing for the M2050 or M3050 detector.

MISC-2

Protective cage for the M2050 or M3050 detector.

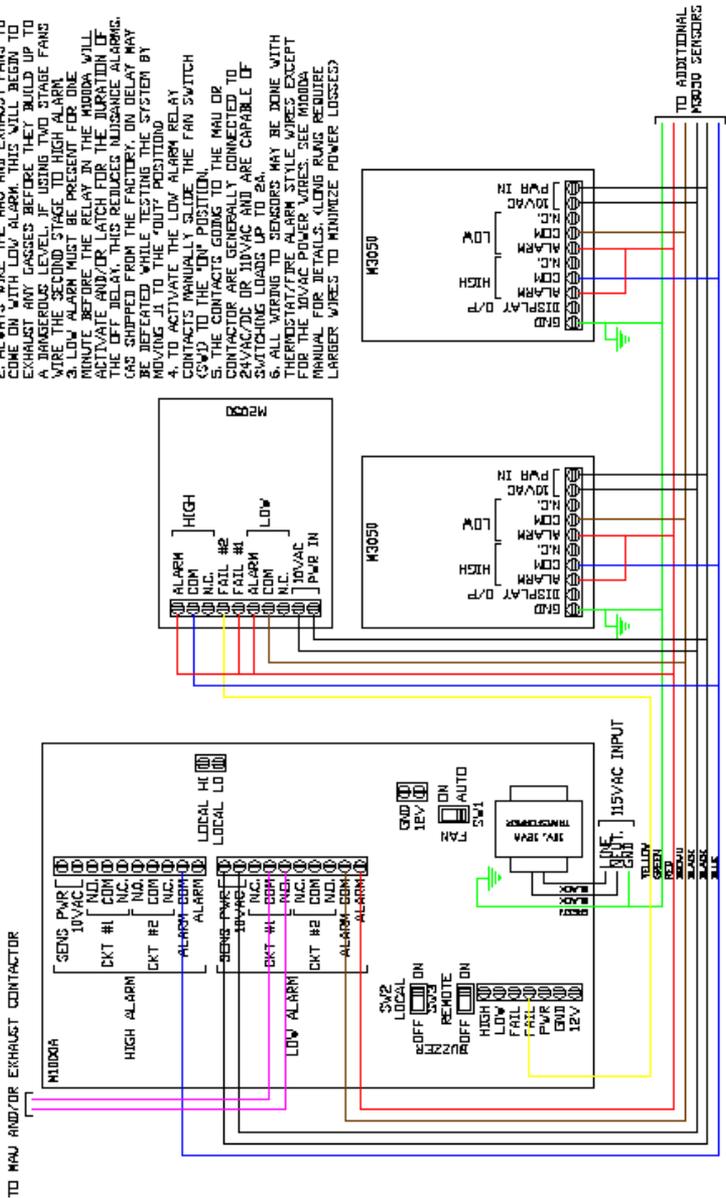
ASP-H-1 and ASP-H-2

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

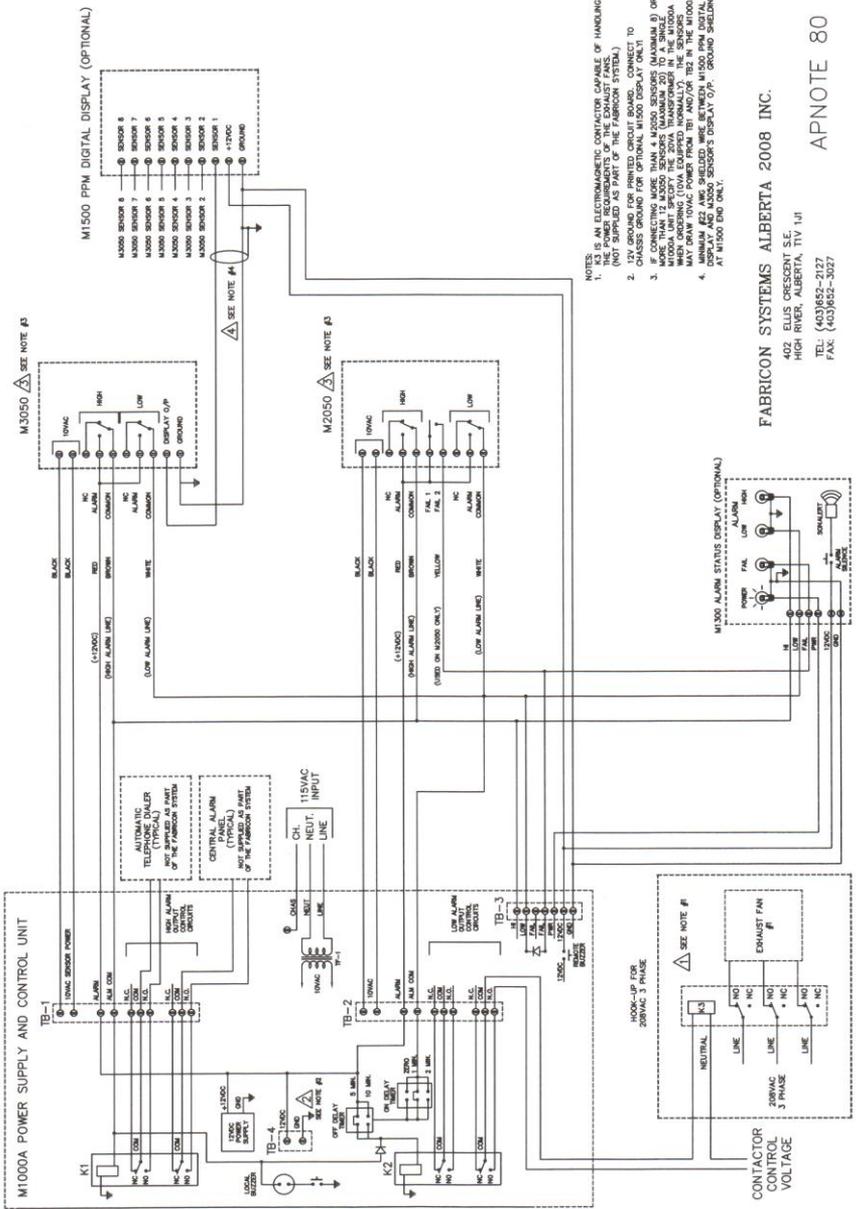
SIMPLIFIED WIRING DIAGRAM

NOTES

1. ALWAYS CONNECT BOTH HIGH ALARM AND LOW ALARM WIRING FROM THE SENSORS TO THE MODBA. THE HIGH ALARM WIRING WILL ACTIVATE BOTH THE LOW ALARM AND HIGH ALARM CIRCUITS IN THE MODBA 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 MODBA WILL PICK UP AND OPEN THE SENSORS. IN CASE OF A FALSE OFF DELAY, THIS DELAYS INCREASES ALARM GAS SHUTTER 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 TO THE 'ON' POSITION.
5. THE CONTACTS GOING TO THE MAU OR CONTACTOR ARE GENERALLY CONNECTED TO THE MAU OR CONTACTOR THROUGH A SWITCHING LOAD. ALL WIRING TO SENSORS MAY BE DONE WITH THERMOSTAT/FIRE ALARM STYLE WIRES EXCEPT FOR THE 10VAC POWER WIRES. SEE MODBA MANUAL FOR DETAILS. (LONG RUNS REQUIRE LARGER WIRES TO MINIMIZE POWER LOSSES)



DUAL LEVEL GAS DETECTION, SINGLE ZONE CONFIGURATION

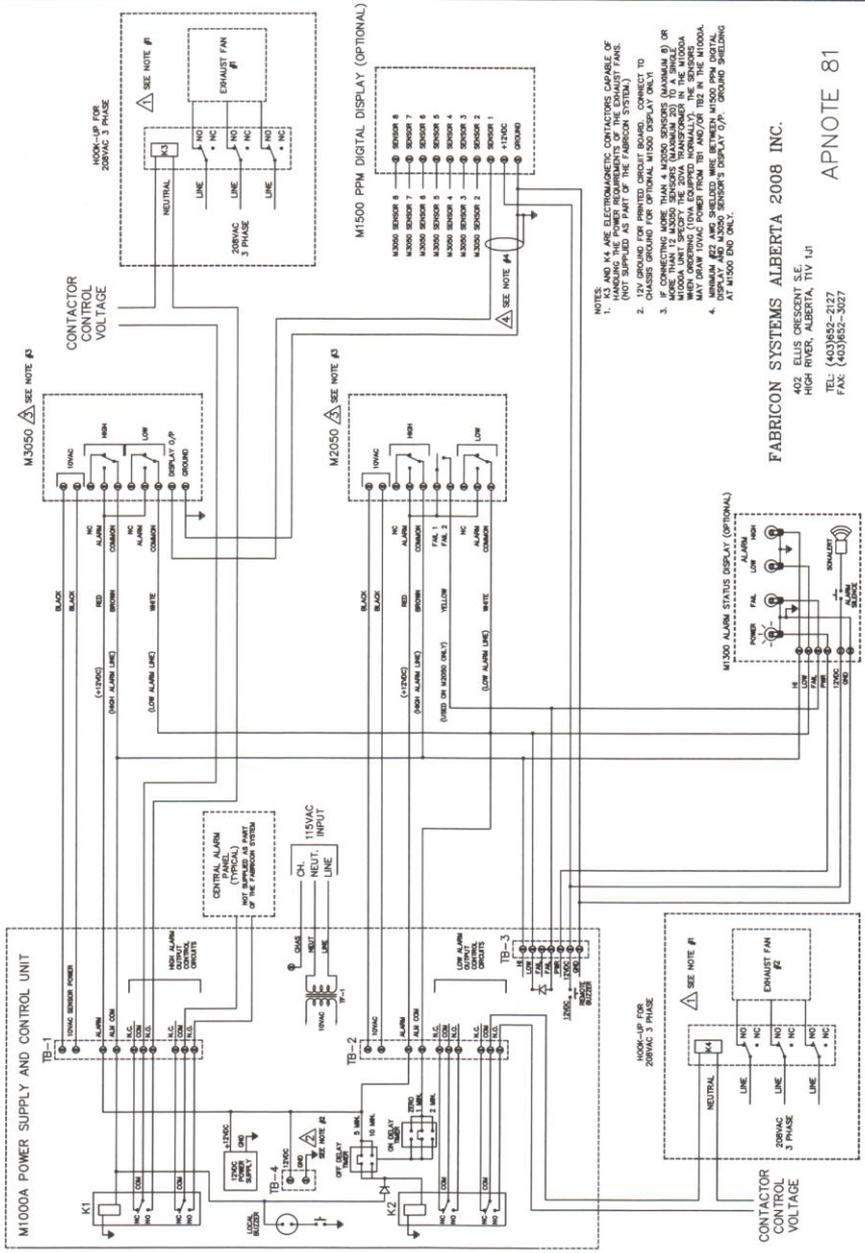


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APNOTE 80

REVISED 2008-09-28

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



- NOTES:
1. K1 AND K4 ARE ELECTROMAGNETIC CONTACTORS CAPABLE OF SWITCHING 15VDC AT 100mA. (NOT SUPPLIED AS PART OF THE FABRICATION SYSTEM)
 2. 12V GROUND FOR PRINTED CIRCUIT BOARD. CONNECT TO COMMON OF CONTACTOR CONTROL VOLTAGE.
 3. IF CONNECTING MORE THAN 4 M2050 SENSORS (MAXIMUM 8) OR MORE THAN 12 M3050 SENSORS (MAXIMUM 20) TO A SINGLE M1000A, THE M1000A MUST BE ORDERED WITH A SINGLE ZONE CONFIGURATION. WHEN ORDERING (TOWA EQUIPPED NORMALLY), THE SENSORS MUST BE ORDERED WITH A SINGLE ZONE CONFIGURATION. ADDITIONAL DISPLAY AND M2050 SENSORS WILL BE ORDERED WITH 15000 PPM DISPLAY AT \$2500 USD ONLY.

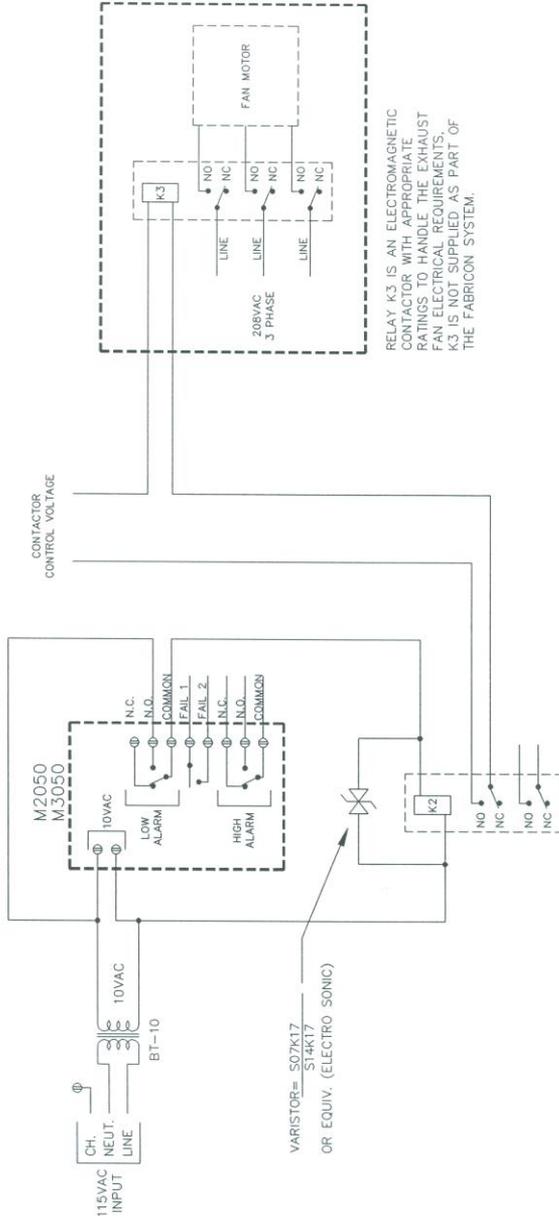
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APNOTE 81

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 THESE 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.

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.