MODEL:

GasAlert II

SINGLE ZONE GAS MONITOR

USER MANUAL (REV: 0.1)

ARJAY ENGINEERING		
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NOTICE	***Please*** read the Installation Notes (4.0) prior to locating and mounting the instrument.

TABLE OF FIGURES

1.0 SPECIFICATION

Specifications are subject to change without notice

Specification	*Details*
Power Input:	
Controller	24VDC, 200mA maximum Required extra current for external EC-Gold transmiters.
Optional 24VDC 3.2A Power Supply (Part# E90680) (mounted separate form controller)	100VAC – 240VAC +/- 10%, 50/60 Hz, 2A maximum ***Note:*** DC input models must be supplied by Limited Energy power source. Limited Energy means compliance with one of the following requirements: - Class 2 circuit according to Canadian Electrical Code, Part, I, C22.1; - Class 2 circuit according to National Electrical Code, NFPA-70; - Limited Power Supply (LPS) according to IEC 60950-1; - Limited-energy circuit according to IEC 61010-1.
User Interface:	
Display & Keypad	Two line LCD display, Alarm status LEDs and Keypad for select menu or enter values
Push-Test	Pushbutton and Keypad
Network	Modbus (RS485) protocol
Outputs	
Relay Outputs	3 SPDT relays for High, High and Low alarms, Dry Contacts are 3A @ 250 VAC (Resistive), selectable failsafe or non-failsafe
Alarm Indication	High (Red), Low (Yellow) and a 2 color LED for Sensor Fault (Red) & No Alarm (Green).
Time Delay	Adjustable /Independent 7200 seconds time delay to On and Delay to Off for High and Low alarms and on board buzzer
Inputs	
RLU DVO Input (TB3)	When EC-Gold sensor configured for Discrete Voltage output mode: 0V = No Alarm; 1.8V = Low Alarm; 2.8V = High Alarm

Specification	*Details*
Environmental:	
Operating conditions	Continuous, indoor use
Ambient Temperature	-20 °C to +55 °C controller
Relative humidity	90% max. with non-condensation
Altitude	≤2000 m
Installation Category	II
Pollution Degree	2
Equipment mobility	Fixed
Mechanical Specification:	Refer to Dimensional Drawing
Protection Degree of Controller Enclosure	Type 1 Wall Mount Type 4x / IP66 Polycarbonate (Gray)
Audio Buzzer	Board level audible alarm (86db @ 30cm) with keypad silence Optional door mounted buzzer (97db @ 61cm) on type 4x enclosure

2.0 USE HAZARD INFORMATION

CAUTION	Indicates a potentially hazardous situation that may result in minor or moderate injury.
WARNING	Indicates a potentially or imminently hazardous situation which, if not avoided, could result in death or serious injury.
DANGER	Indicates a potentially or imminently hazardous situation which, if not avoided, will result in death or serious injury.
NOTICE	Indicates a situation which, if not avoided, may cause damage to the instrument. Information that requires special emphasis.

3.0 INSTRUMENT OVERVIEW

The GasAlert II gas detector control panel monitors a field of EC-Gold sensors for common alarms and relays.

This system is ideal for single zone areas where one or more sensors or gas types are required to control a set of ventilation fans or interlocks to a Building Automation System (BAS).

The unique Discrete Voltage Output (DVO) signal from the EC-Gold sensors allow for one common 3-conductor wire from the controller to serve all sensors. This simplifies wiring by not requiring dedicated 'home' runs or communication cabling and addressing.

The control panel will typically mount near the fan motor starters or in a mechanical room and has one Low alarm relay and two High alarm relays. One of these high relays is typically used for a remote audio or visual alarm.

There are 3 on board relays and outputs available to communicate with remote devices such as alarms, fans and building automation systems.

The GasAlert II provides 3 relays, and an RS-485 interface. An LCD display of Alarm level, buzzer with silence, and keypad interface.

The relays are common to all sensors and are set to ppm or % LEL values specific and proper for each sensor type.

The LCD display will provide an indication of normal, low or high alarm condition.

3.1 Features

- Microprocessor based controller
- Three Alarm relays (SPDT, 3A @ 250VAC), one for low alarm, two for high alarm
- Modbus protocol via RS-485 to communication to a BAS system
- On-board Audio alarm with keypad silence
- Optional Door mounted Audio alarm with cover-to-mute (only offered with Type 4x enclosure)
- Gas Monitor for variety of gas EC-Gold sensors
- Can Monitor up to 32 EC-Gold sensors on one zone.
- Carbon Monoxide sensor has expected life of 5 years min. (3 year guarantee)
- Other sensors have expected life of 2 years (1 year guarantee)
- Input requires Arjay's Discrete Voltage Output (DVO) of EC-Gold sensors
- Convenient keypad test of alarm levels
- Push-test feature: On demand using the push to test pushbutton
- High and Low alarm and second High Alarm for buzzer
- High and Low alarm levels based on each EC-Gold sensor's alarm level
- Use specified custom features might be added by contacting Arjay Engineering

3.2 Model Number Table

Part #	DESCRIPTION
E90854	wall mount standard Type 1 metal housing, 24 vdc power input
E90855	wall mount standard Type 4 polycarbonate housing, 24 vdc power input
E90680	80-240vac to 24vdc power supply, serves controller and up to 32 EC-Gold sensors

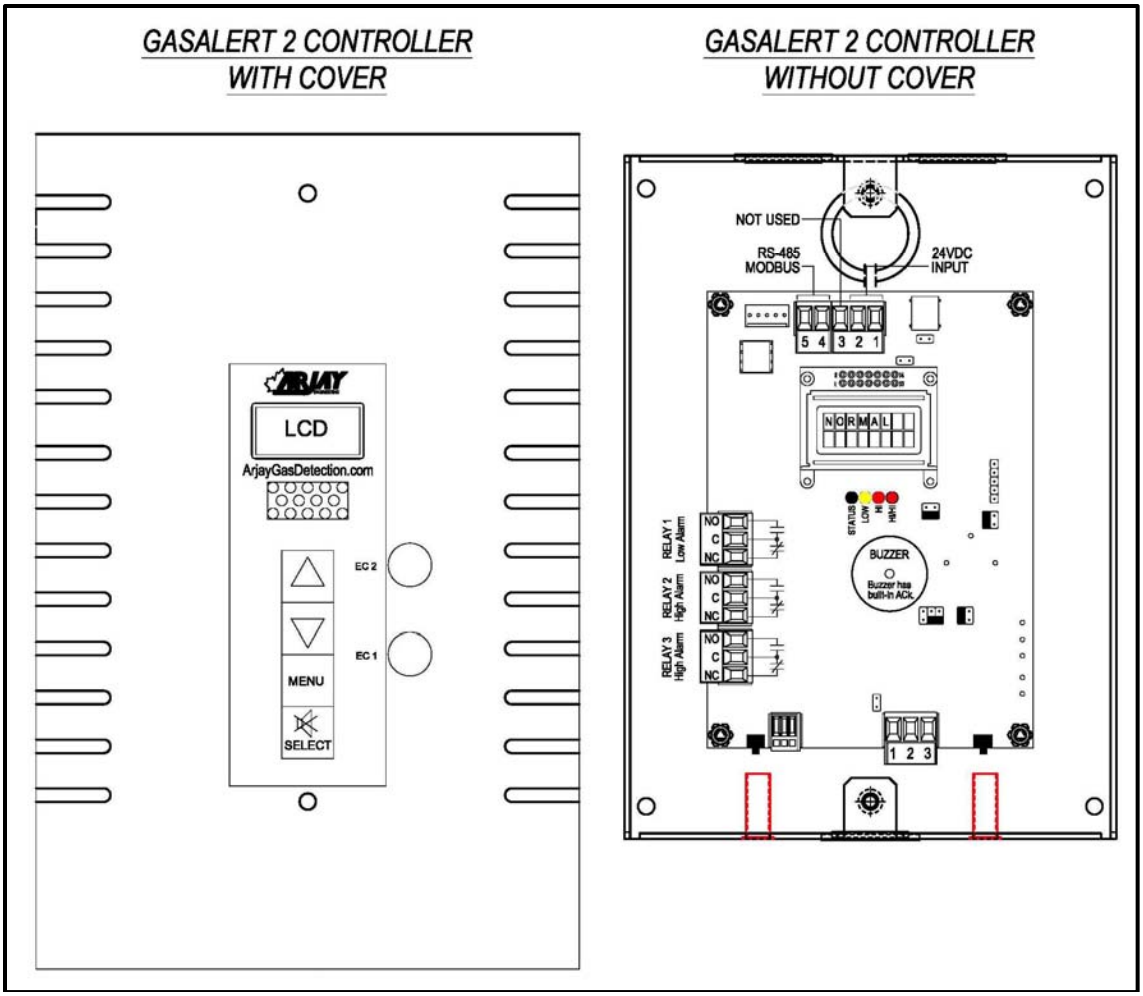


Figure 1 – INSTRUMENT OVERVIEW – P/N: E90854

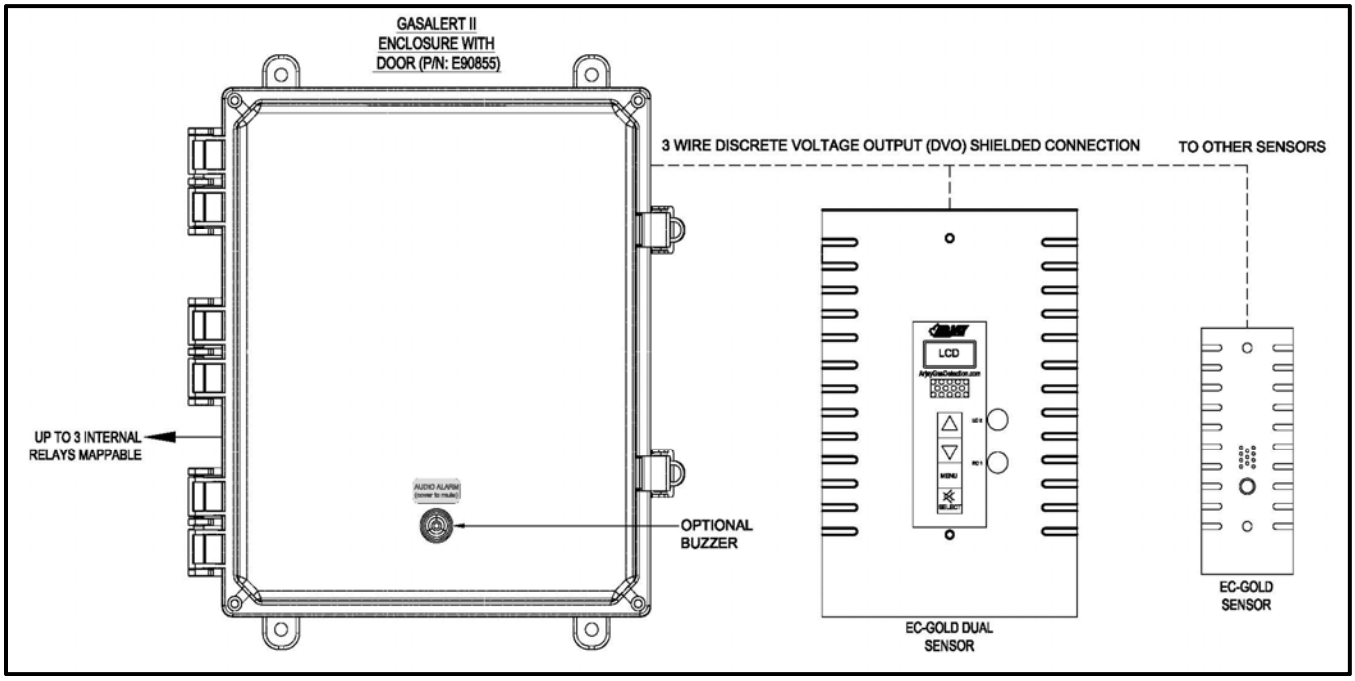


Figure 2 – INSTRUMENT OVERVIEW –– P/N: E90855

4.0 INSTALLATION

NOTICE	**If any damage to the instrument is found, please notify an Arjay Engineering representative as soon as possible prior to installation.**
NOTICE	**Qualified Personnel must undertake all installations.**

⚠ WARNING	**If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.**

4.1 Controller Installation

Choose a mounting location in accordance with good instrument practice. Extremes of ambient temperature and vibration should be avoided (see specifications and installation drawing). Locate the GasAlert II on a vertical surface away from drafts, open doors or windows, condensation or dripping moisture.

Check the polarity of the 24VDC + and - wiring between the controller and the sensors prior to powering on the unit; + to + and - to - to avoid damage.

NOTICE	**Failsafe Mode (Optional – Contact Factory)** *This means that the relays are in an energized state during normal operation. The N.O. relay contact will be held closed and the N.C. relay contact will be held open during a normal condition. This will allow the relay to return to its non-energized (shelf) state during an alarm, fault or power failure condition. Wire accordingly.* Note: the bank of LEDS indicates the status of the relay energized or de-energized condition. As such, when in FailSafe mode, the relay LEDS will be ON during a normal condition.

⚠ CAUTION	THE UNIT HOUSES SENSITIVE ELECTRONIC COMPONENTS AND SHOULD BE HANDLED WITH CARE. IF PUNCHING OR DRILLING THROUGH THE ENCLOSURE WALLS IS NECESSARY MAKE SURE THAT THE INTERNAL ELECTRONIC MODULES ARE SHIELDED FROM DEBRIS ESPECIALLY METAL PARTICLES. PLEASE MAKE SURE THAT THE CONNECTIONS HAVE THE POLARITY AS INDICATED OR THE CONTROLLER MAY BE DAMAGED. USE GOOD INSTALLATION PRACTICE! DO NOT RUN HIGH VOLTAGE CABLE IN THE SAME CONDUIT AS SIGNAL WIRES

4.2 Sensor Installation

NOTICE	Read the following information ***before*** installation.

Read the operation manual that accompanies the sensor transmitter being used with this controller. Be sure to note that this controller requires a DVO (digital voltage output) from the sensor transmitters.

The typical sensor models used with this controller are the Arjay EC-Gold, EC-Gold II and the EC-Gold Dual.

NOTICE	**Install the sensors with care. Protect the sensors from water or dust, especially if installed during a building construction phase.**

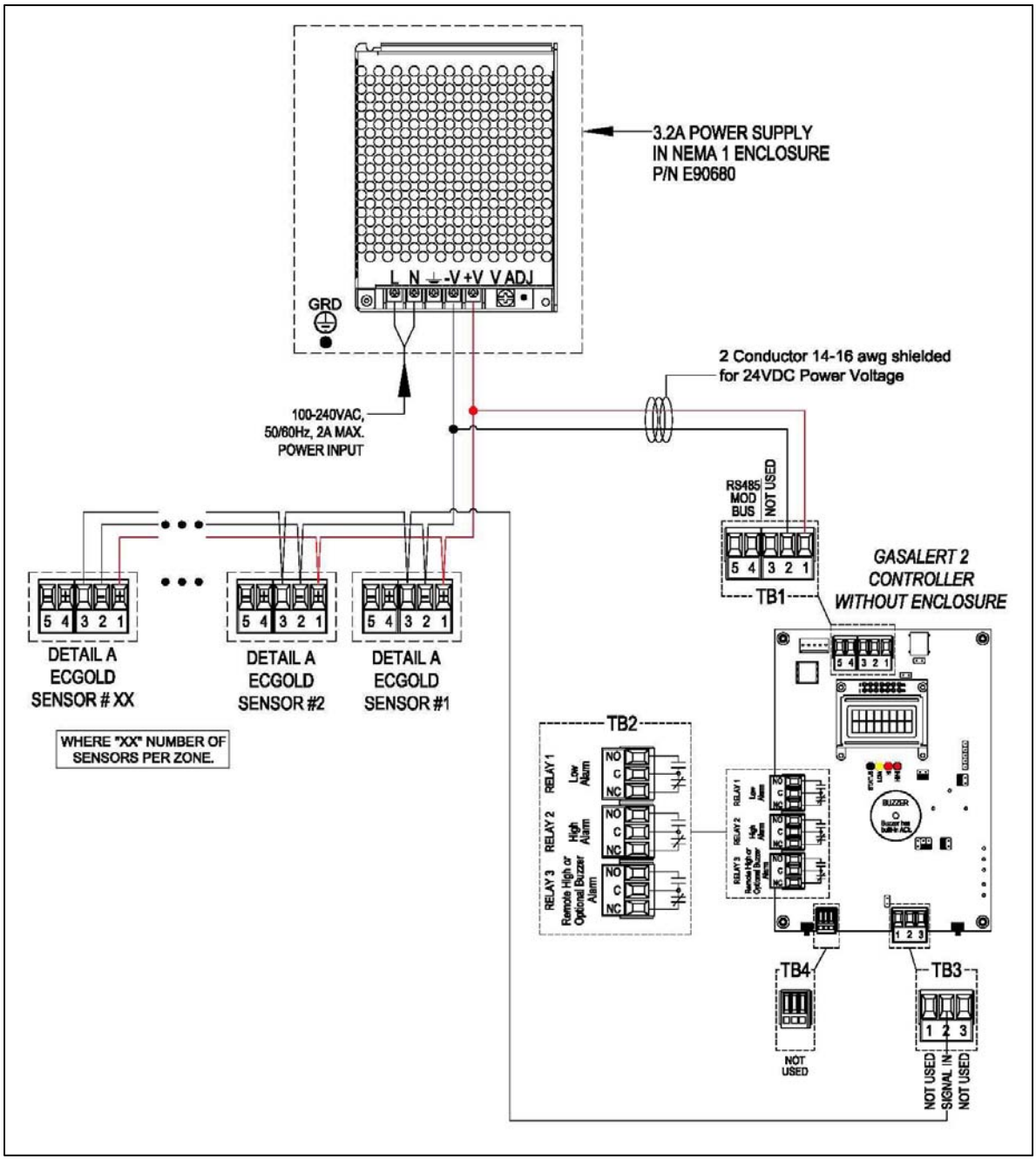


Figure 3 – TYPICAL INSTALLATION OVERVIEW

5.0 CONTROLLER OVERVIEW

See specific drawing(s) attached to this manual for more detail

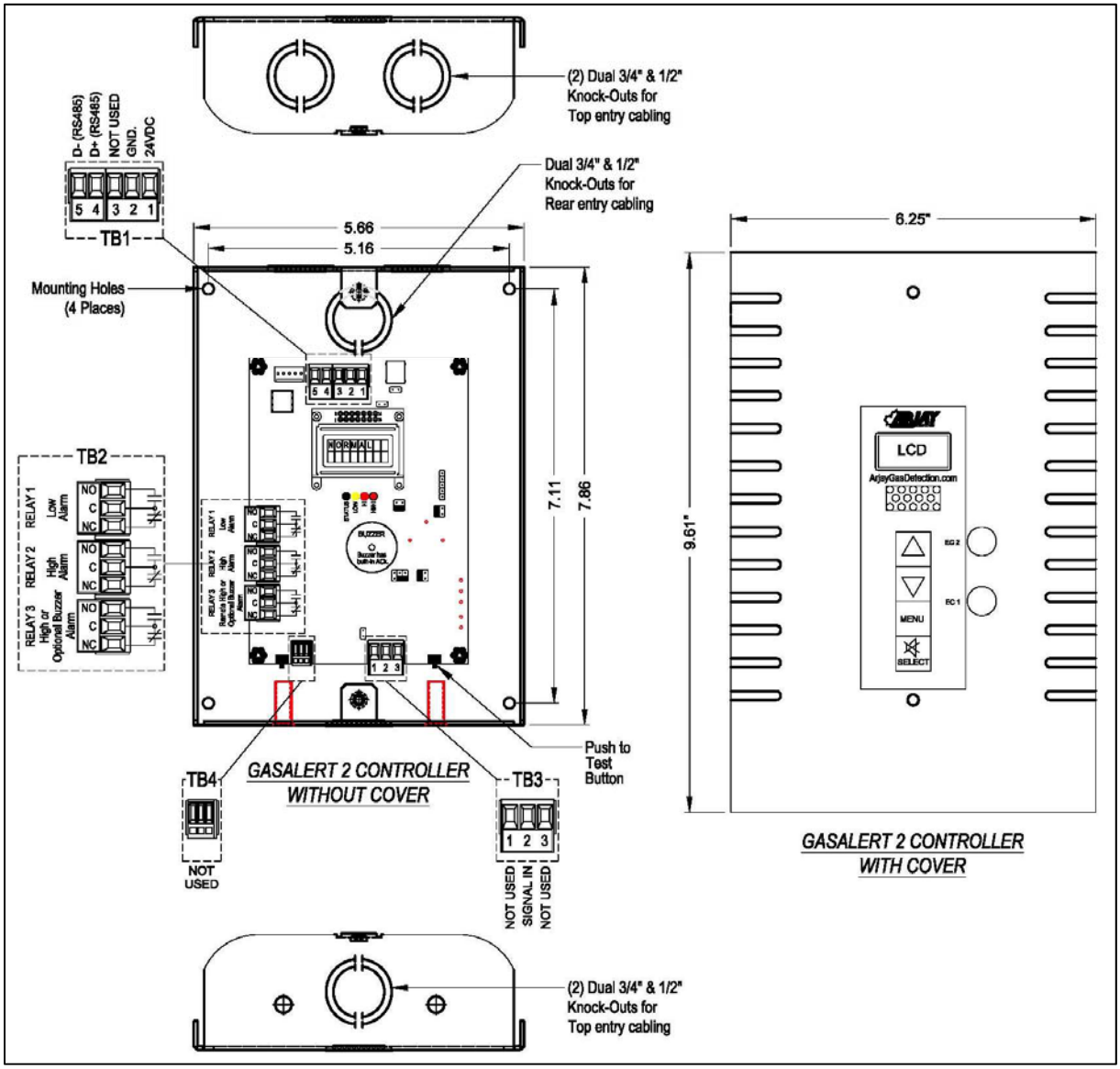


Figure 4 – CONTROLLER OVERVIEW

TB1 – Pin 1 (+) and 2 (-) Power Input

TB2 – Relay Output
3 SPDT relay, Dry Contacts are 3A @ 250 VAC (Resistive), selectable failsafe or non-failsafe, programmable time delay: 0 – 7200 seconds,

NOTICE	**The controller relays are factory set in a Failsafe mode.**

TB3 - Signal Input
Signal Input - Pin 2

TB1 – Pin 4 and 5 Network Output
Connect RS485 + and – to the network - Pin 4 (D+) and Pin 5 (D-)

TB4 – Not Used

5.1 Input / Output Terminal Specification

Input Terminals – Power Source					
Terminal ID	**Overvoltage category**	**Rated Voltage (V)**	**Rated Current/power (A/W/VA)**	**___ HZ or DC**	**Specified Mains fluctuation**
TB1 (1 & 2)	*II*	*24V*	*200mA*	*DC*	*+15% –10%*

Input Terminals – Measuring Circuits					
Terminal ID	**Function**	**Measurement Category**	**Nominal a.c. or d.c line to neutral voltage / if CAT I, Max. transient overvoltage Ut**	**Nominal a.c. or d.c current**	**Rating of insulation required for external circuit**
TB1 (5 & 6)	*RS485 Communication*	*I*	*5V, 5mA / 0*	*--*	*DI * or RI***
TB3 (2)	*Signal Input*			*--*	*--*

** Double Insulation*
***Reinforced Insulation*

Output Terminals					
Terminal ID	**Function**	**Isolation or protection**	**Rated V, A**	**Max. V, A**	**Load type and nominal**
TB2	*Load*	*Relays*	*3A Contact @250VAC*	*--*	*--*

5.2 AC Power Supply (if ordered with equipment)

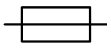
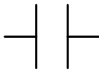
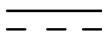
1) Connection to the building wiring system shall be in accordance with the Canadian Electrical Code (CEC), Part 1 in Canada, the National Electrical Code, ANSI/NFPA 70 in the USA, or the local electrical codes of the country where the equipment is being installed.
2) A disconnecting device is required. The disconnecting means shall disconnect all current-carrying conductors.
3) 15A circuit breaker or equivalent fuse is required.
4) An external switch or breaker shall be in close proximity to the equipment and within easy reach of the operator. The switch shall be marked as the disconnecting device for the equipment and include the symbols to its “ON” and “OFF” positions using the following symbols:


Power Off


Power On

5) The wiring for AC power should be minimum 18 AWG / 300V or as required by local / country codes.
6) After field wiring, the primary wires must be secured to the enclosure by tie-wraps to maintain the separation from the signal wires.
7) Wiring diagram for permanent connection: See drawings at the back of this manual.
8) Use copper conductors only.

5.3 Glossary Of Symbols

	Attention, consult accompanying documents *Attention, veuillez consulter les documents ci-joints.*		
	Primary Protective Earth Ground *Primaire de terre de protection*		Fuse *Coupe-circuit; fusible*
	Secondary Earth Ground *Mise à la terre de secondaire*		Normally open relay contacts *Contacts travail*
	Direct Current (DC) *Courant continu*		Power off *ArróÕ (mise hors tension)*
	Normally closed relay contacts *Contacts Repos*	**L**	Live *Sous tension*
	Power on *Marche (mise sous tension)*	**G**	Ground *Terre*
		N	Neutral *Neutre*

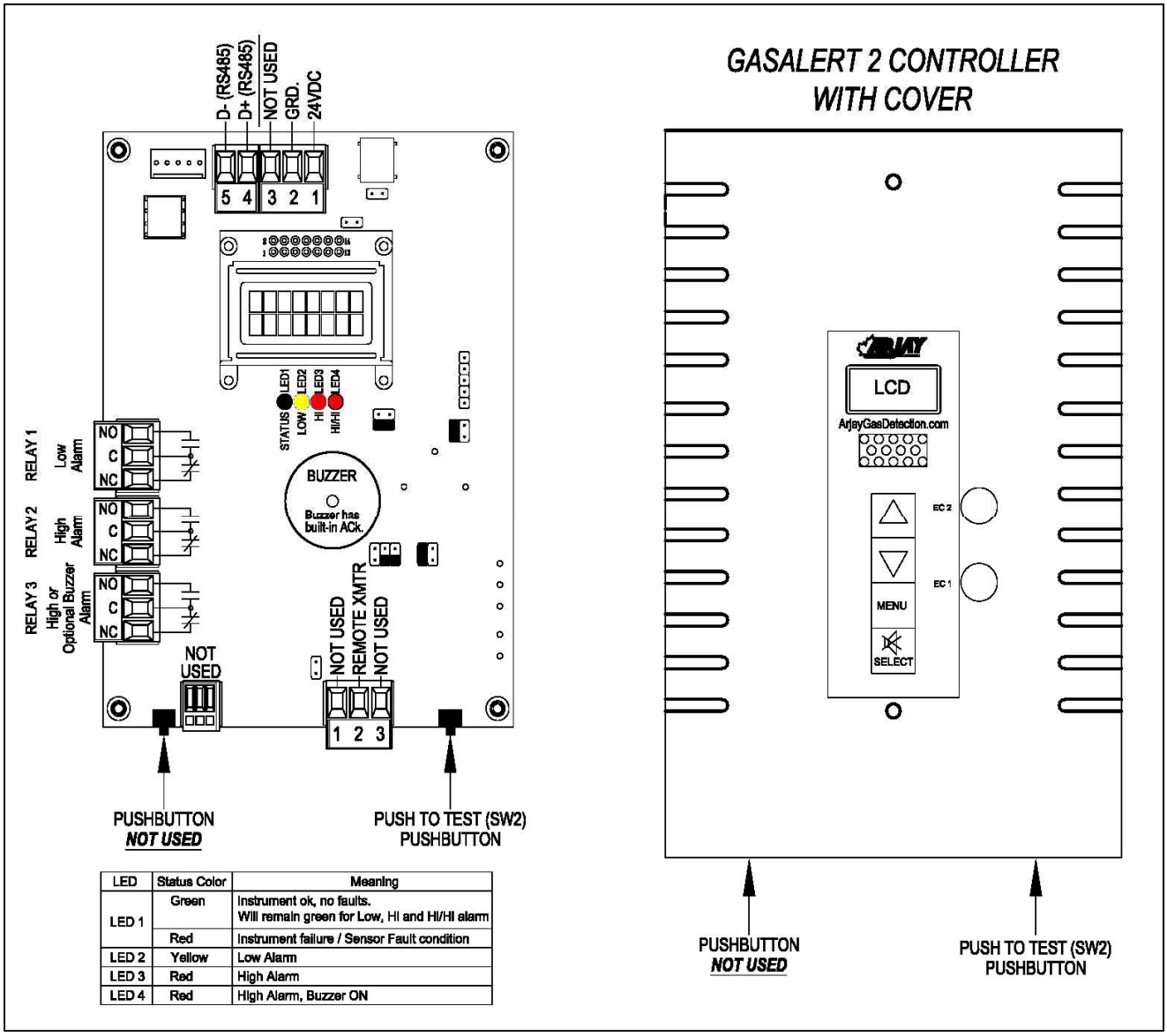
6.0 STARTUP

6.1 Startup

Check that the power wiring, sensor wiring and interlocks are wired in accordance with the electrical installation drawing.

The controller menu allows the user to set up certain alarm operating parameters. These are described below or see section 10.0 Menu Flow Chart.

NOTICE	**The GasAlert II controller provides common relay alarms for a field of sensors. There is no calibration required at the controller. Refer to the specific sensor manuals for sensor calibration.**



LED	Status Color	Meaning
LED 1	Green	Instrument ok, no faults. Will remain green for Low, HI and HI/HI alarm
	Red	Instrument failure / Sensor Fault condition
LED 2	Yellow	Low Alarm
LED 3	Red	High Alarm
LED 4	Red	High Alarm, Buzzer ON

Figure 5 – USER INTERFACE OVERVIEW

6.2 Menu Flow Chart Background Information

The controller setup is accessed using the display and keypad on the controller. The Flow Chart in Section 10.0 provides an overview to the various menus and features. Keep a copy of the flow chart at hand when accessing the internal controller features.

Below is a description of the menu functions.

6.2.1 Menu Description

The GasAlert II controller will display **Normal** in its normal operating condition and **LO Alarm** or **HI Alarm** during a gas alarm condition.

The controller has a password protect feature for changing alarm parameters. The default password is 2000.

6.2.2 Data Entry

Data Entry

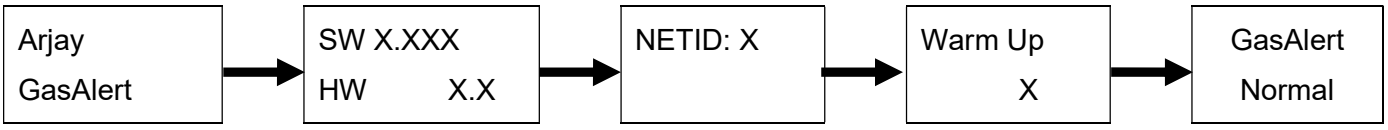
Press <▲> / <▼> key to increase / decrease the digital value.

Press <SELECT> key to move the cursor.

Press <MENU> key to abort certain screens.

6.3 GasAlert Controller Setup

Power up the Controller. The status LED should be green. The LCD will scroll to the normal operating screen after a series of the following screens (each displays for 2 sec.) and a 10 second countdown..



6.3.1 Setup and Network

Since the GasAlert receives it's alarm signals from the field of sensors, there is minimal setup at at the controller.

The user can:

- Test alarm Relays
- set Time Delay ON and OFF on the relays
- set Time Delay ON on the onboard buzzer
- enable or disable the onboard buzzer

To enter the SETUP menus, press and hold the MENU key. The display will request a Password. The unit is shipped with password "2000". Use the <▲> key to display "2". Then press SELECT repeatedly to move the cursor until SETUP is displayed.

There are four menus to toggle through using the <▼> key.

Menu 1: Alarm Test

This menu lets the user Test the relays, Press <Select> key and low alarm relay will energize. Press <Select> key again and both High alarm relays will energize plus buzzer.

When using the push to test on keypad the time delay is bypassed. If using the push to test on the circuit board (SW2) then the time is present

Menu 2: Setup Alarm delay

Alarm Delay

Each relay can be delayed ON and OFF when a gas alarm is indicated.

Typically, Delay ON is prescribed to avoid a spurious activation of a fan or alarm due to a minor puff of gas.

DELAY OFF is prescribed to keep fans operating after the sensor indicates a normal level. This is to ensure nooks or other areas of the garage have a chance to clear as well.

To set or change the delay times of the relays, enter the SETUP menu and use the < ▼ > arrow key to display SETUP Alrm Del. Press SELECT. SELECT K1 (Low) or toggle to K2 (HI1) or K3 (HI2) & buzzer. Follow the prompts to enter Delay ON and Delay OFF (Max 7200 seconds)

Menu 3: Buzzer

The display will now indicate if the onboard buzzer is Enabled or Disabled. Press SELECT to change and use the < ▼ > Use the arrow key to toggle from Enable? or Disable? and then press SELECT to choose.

Menu 4 Setup NET ID

The ID number is used only for network applications where multiple GasAlert controllers would be daisy-changed together to communicate to a master controller or Building Automation System.

To communicate on a network, each controller must have a unique ID number. The factory default ID number is 1. To change the address number, reach the SETUP Alarms display and toggle down to SETUP NetID. Press SELECT key and use the arrow keys and SELECT keys to enter a new address.

NOTICE	**If multiple units on a network have the same address, network errors will result.**

Menu 5 Exit

Press the < ▼ > key to scroll through the menu items again or SELECT to exit the menus and return to the operating screen.

f there is any issue, call Arjay Engineering Ltd.: Toll free: (800) 387-9487 (North America Only), tel. +1 (905) 829-2418.

This completes the setup for the GasALert II Control Panel

7.0 CONTROLLER NETWORK

The GasAlert II Controller can be accessed using the RS-485 protocol compatible digital communication.

Typical features are:

1. Ease of wiring in multiple level point monitoring:

Up to 254 GasAler II t controllers may be connected together in a daisy chain (2 wire communication plus power wiring) connection to an Arjay Remote Access monitor or customer control system which allows viewing data and setup of any of the transmitters on the network. The relay and analog outputs may still be used if necessary.

2. Setup for the GasAlert II network operation:

Each GasAlert II controller must have a unique ID number to connect in a network system. See section 10.0 Flow Chart for more detail.

7.1 MODBUS Configuration

Parameter settings: 9600 Baud Rate; Even Parity, 8 Data Bits and 1 Stop Bit.
Wiring connection: RS485 (+) connect to D+; RS485 (-) connect to D-.
See section 7.2 for Modbus Register mapping.

7.2 GasAlert II MODBUS Register Mapping

REG	DESCRIPTION	TYPE	No. of Reg	Read/write
40001	Serial Number	0000	int	1
40002	Hardware Rev / Software Rev	0002	byte	1
40003	Instrument status / Mode byte	0004		1
40004	mA Output Link / Node Address	0006		1
40005	Spare / Alarm failsafe or non-failsafe mode	0008		1
40006	Delay On Relay 1	000A	int	1
40007	Delay On Relay 2	000C		1
40008	Delay On Relay 3	000E		1
40009	Delay On Buzzer	0010		1
40010	Delay Off Relay 1	0012		1
40011	Delay Off Relay 2	0014		1
40012	Delay Off Relay 3	0016		1
40013	Output trim slope (Factory use only)	0018		2
40015	Output trim offset (Factory use only)	001C		2
40017	High High Alarm set value	0020		2
40019	High Alarm set value	0024		2
40021	Low Alarm set value	0028		2

8.0 MAINTENANCE

There is no routine cleaning required for this controller.

9.0 TROUBLESHOOTING

CONDITION	DO THIS
1. No Output and all lights off	• Check the power to the unit. The voltage should be 24VDC at the power connector with the positive and negative connected as shown on the connector label. • Make sure JP1 is in place for DC voltage • If the Power checks out, call Arjay Service.
2. Gas Alert II is in Alarm but ECGold sensor is normal	• Make sure that the EC-Gold output mode is set to Discrete Voltage Output mode and not to Analog.
1. False Alarms	• Add some time delay in the unit

ARJAY ENGINEERING TECHNICAL SUPPORT
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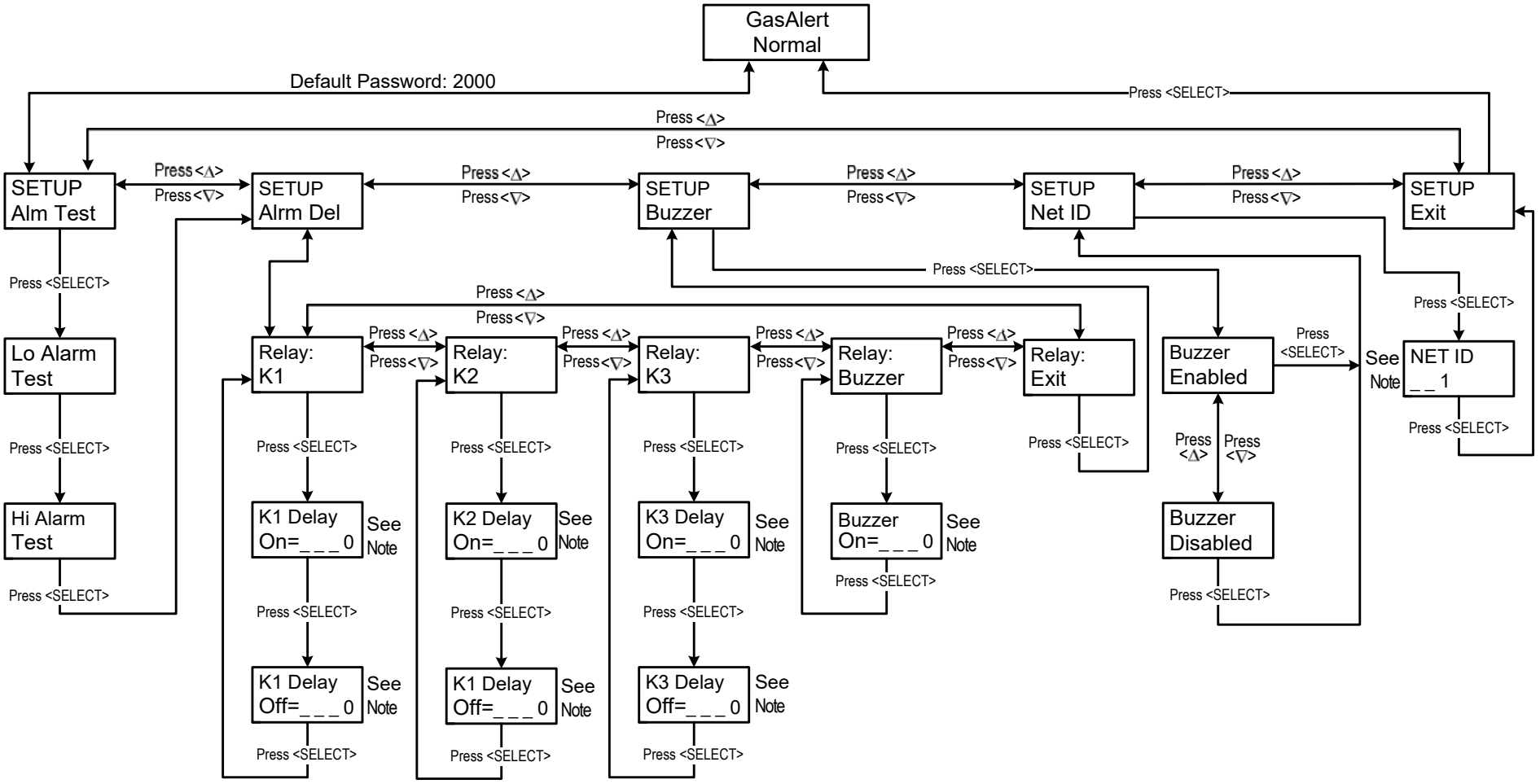
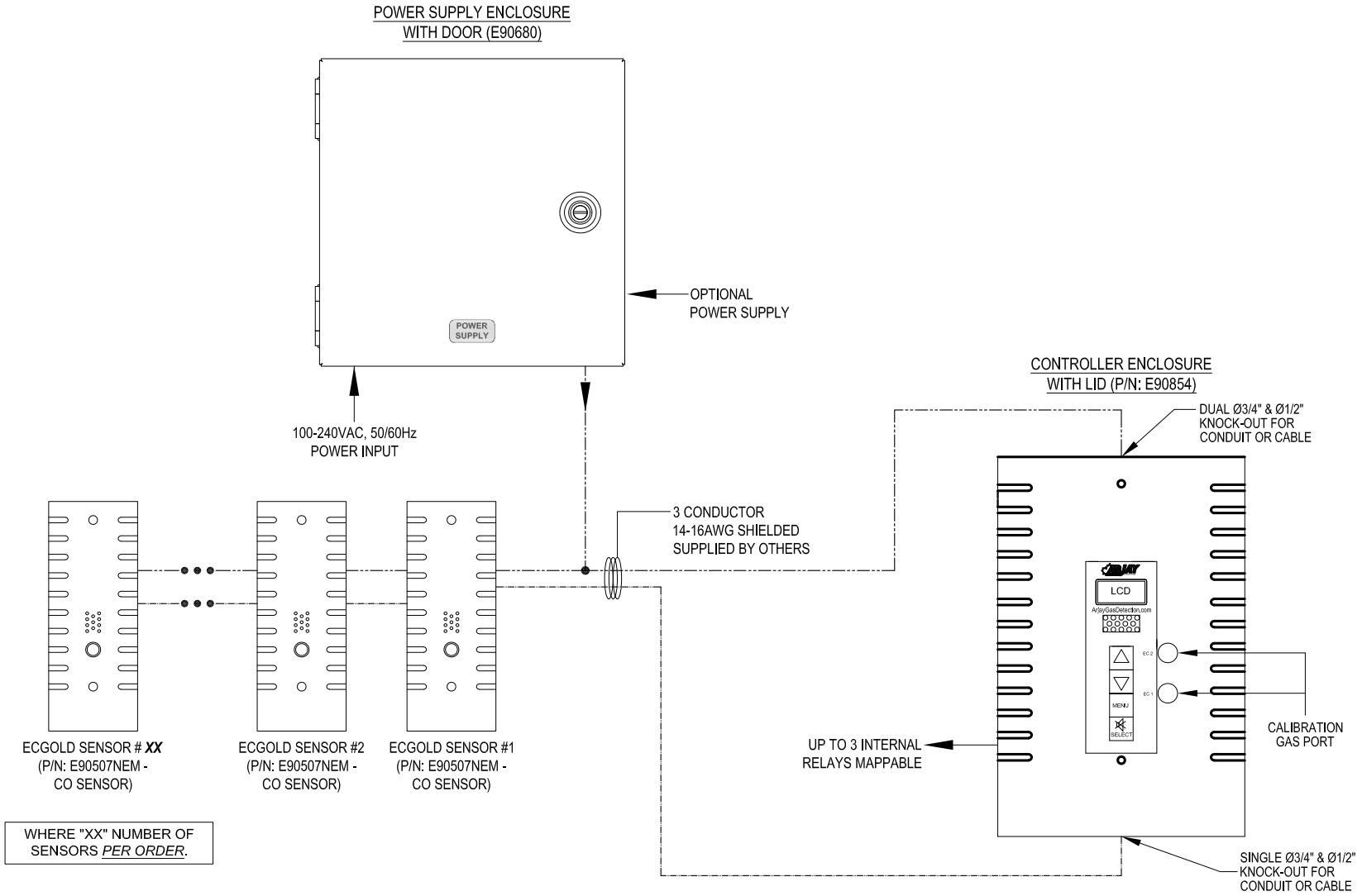
10.0 FLOW CHARTS

10.1 Normal Operation Menu Flow Chart



Note:
Press <SELECT> to move cursor;
Press <Δ> / <∇> to increase / decrease the value.



GENERAL NOTES:

1. DIMENSIONS ARE IN mm [inches].
2. TOLERANCE +1mm (0.04 inches).
3. GASALERT II CONTROLLER ENCLOSURE:
   - *MATERIAL:* ALUMINUM.
   - *OUTSIDE DIMENSIONS:* 244.1 X 160.1 X 53.86D (9.6 X 6.3 X 2.081D).
   - *MOUNTING DIMENSIONS:* 180.6 X 131.1 (7.11 x 5.16).
3. SENSOR ENCLOSURE:
   - *MATERIAL:* ALUMINUM.
   - *OUTSIDE DIMENSIONS:* 196.85 X 76.2 X 53.86D (7.75 X 3.0 X 2.081D).
   - *MOUNTING DIMENSIONS:* 133.35 X 57.15 (5.25 x 2.25).
4. POWER SUPPLY ENCLOSURE (OPTIONAL):
   - *MATERIAL:* NEMA 1 STEEL ENCLOSURE WITH POLYESTER POWDER GRAY (ANSI 61) PAINT.
   - *MODEL:* HAMMOND CHKO101004.
   - *OUTSIDE DIMENSIONS:* 254 X 254 X 101.6D (10 X 10 X 4D).
   - *MOUNTING DIMENSIONS:* 177.8 X 228.6 (7 x 9).

REV	DATE	DESCRIPTION	CHK'D	APP'D
1	16/12/21	REVISED.		

REVISIONS

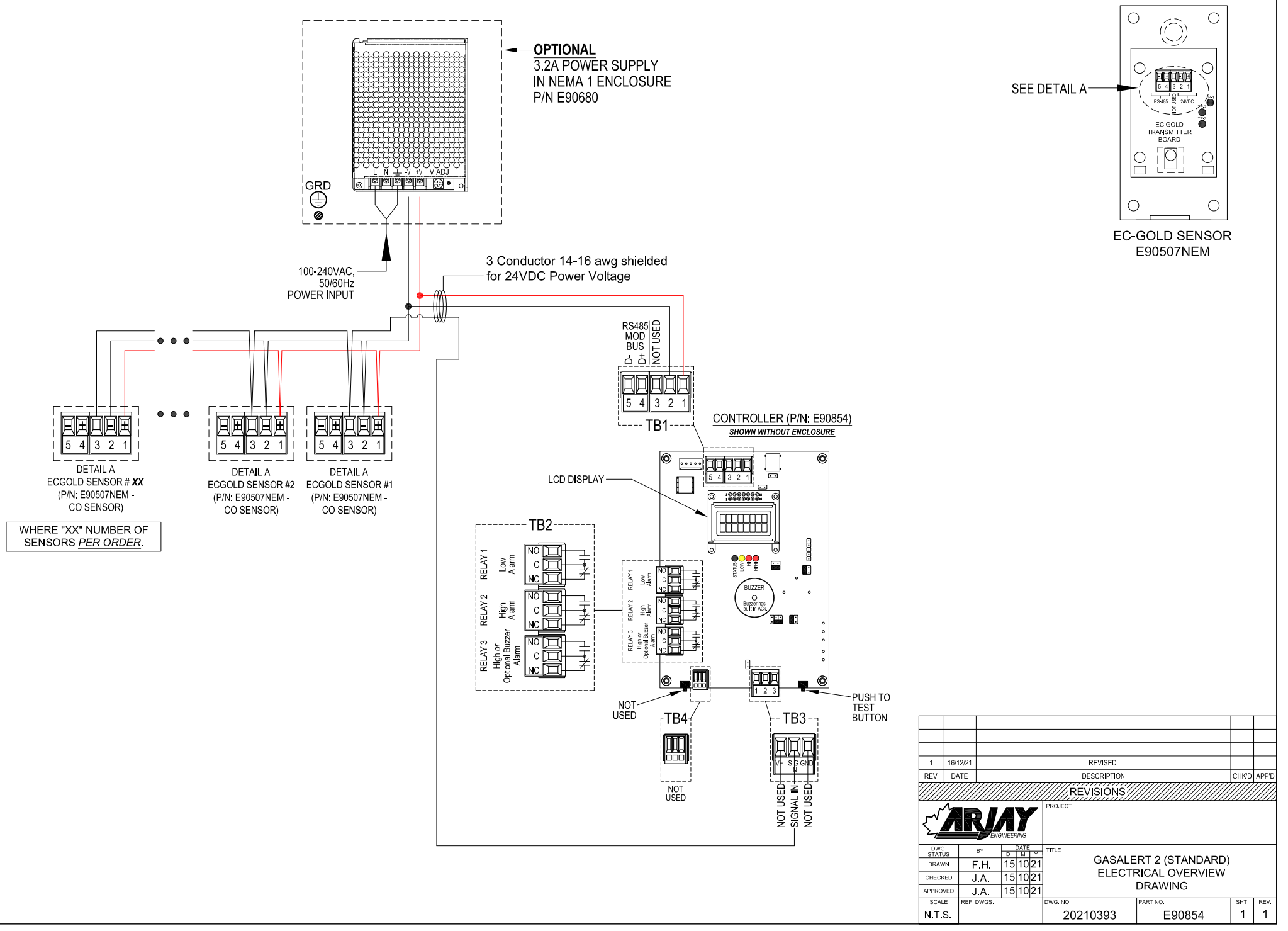
ARJAY ENGINEERING

PROJECT

DWG. STATUS	BY	DATE D	M	Y
DRAWN	F.H.	15	10	21
CHECKED	J.A.	15	10	21
APPROVED	J.A.	15	10	21

TITLE: GASALERT II (STANDARD) SYSTEM OVERVIEW DRAWING

SCALE	REF. DWGS.	DWG. NO.	PART NO.	SHT.	REV.
N.T.S.		20210392	E90854	1	1



REV	DATE	DESCRIPTION	CHK'D	APP'D
1	16/12/21	REVISED.		

REVISIONS

ARJAY ENGINEERING

PROJECT

DWG. STATUS	BY	DATE D	M	Y
DRAWN	F.H.	15	10	21
CHECKED	J.A.	15	10	21
APPROVED	J.A.	15	10	21

TITLE

GASALERT 2 (STANDARD)
ELECTRICAL OVERVIEW
DRAWING

SCALE	REF. DWGS.	DWG. NO.	PART NO.	SHT.	REV.
N.T.S.		20210393	E90854	1	1

WARRANTY STATEMENT

with options for: Extended Warranty by Purchase
Extended Warranty by Start-Up Service
New Home Warranty Act

Seller's Express Warranty. Seller warrants the Purchased Items to be free from defects in materials and workmanship under normal use and service for a period of one year from time of purchase. Seller further warrants that it will perform the Services in a professional and workmanlike manner. Buyer agrees that it has the sole responsibility for the proper selection, application, installation, and/or use of the Purchased Items and for instructions to ultimate users, if any, concerning use, application, periodic maintenance, and cautions regarding the Purchased Items. Buyer agrees that the warranties provided herein shall not apply to any Purchased Item which: (1) has been repaired or altered outside of Seller's factory in any way so as, in Seller's judgment, to affect such Purchased Item's reliability; (2) has been subject to misuse, negligence, or accident; (3) has been operated other than in accordance with the applicable printed instructions provided by Seller; or (4) has been subject to wear of wetted or reactive parts caused by Buyer's application of the Purchased Items.

Seller's Exclusive Obligations Under Warranty. Seller may, at its option, repair or replace, or refund the purchase price of Purchased Items which shall be returned to Seller, no later than one month after the expiration of the applicable warranty period in the manner set forth in this clause, and which Seller's examination shall disclose to Seller's satisfaction to be defective as specified in the warranty clause hereof.

All such Purchased Items shall be returned to Seller at Oakville, Canada; freight, duty and brokerage prepaid, accompanied, or preceded by a particularized statement of the claimed defect. Under such circumstances and if confirmed warranty applicable by Seller, Seller shall bear the cost of repair or replacement and the risk of loss while the Purchased Items are in Seller's possession at Seller's plant. Seller will return warranty product to Buyer prepaid by a freight method of Sellers discretion. SELLER'S OPTION TO REPAIR, REPLACE, OR REFUND THE PURCHASE PRICE FOR PURCHASED ITEMS IS BUYER'S EXCLUSIVE REMEDY AGAINST SELLER WITH RESPECT TO THE PURCHASED ITEMS. SELLER SHALL NOT BE LIABLE TO BUYER, ITS AGENTS, EMPLOYEES, OFFICERS, OR DIRECTORS, FOR ANY CONSEQUENTIAL OR INCIDENTAL DAMAGES, LOSS OF REVENUE OR PROFIT, OR ANY OTHER INDIRECT DAMAGES RELATED TO THE PURCHASED ITEMS OR SERVICES.

Fee based extension:
For an additional fee, the standard factory warranty can be extended. To initiate this process please contact an Arjay Representative to determine price and time allotment.

Start-up Services extension:
The basic factory warranty of one year will be extended if the Arjay Start-up services are purchased along with the instruments on the original order. An additional one year of warranty will apply in addition to the standard one year warranty supplied. Carbon Monoxide sensors cells are included in this extended warranty. All other consumable gas sensor cells are excluded from this additional warranty.

New Home Warranty Act extension:
If the Arjay Start-up services are purchased along with the instruments on the original order and the instrument is further maintained and calibrated a minimum of once per year during the warranty period by an Arjay Authorized Service company, an additional two years of warranty will apply in addition to the standard one year warranty supplied. This warranty extends to Arjay supplied equipment and includes carbon monoxide sensing cells. All other consumable gas sensor cells are excluded from this additional warranty.

Arjay Engineering Ltd.
arjayeng.com

Gas Detection Calibration Services

- single visit calibration and repair
- multi-visit contracts with discounts on multi-year
- on-site or in-shop (Oakville, Ontario) services

We provide:

- ☑ fully trained technicians
- ☑ WSIB Certificates
- ☑ full insurance (2 million liability)
- ☑ Calibration Certificates
- ☑ Stock parts in vehicles and Oakville facility
- ☑ Calibration gas certified to NIST Standards

Our Technicians have:

- ☑ Dangerous Goods Handling Certification
- ☑ St. Johns First Aid Training
- ☑ Fall Arrest Training
- ☑ Confined Space Training (special request)
- ☑ WHMIS Training

Call for a no obligation quote

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