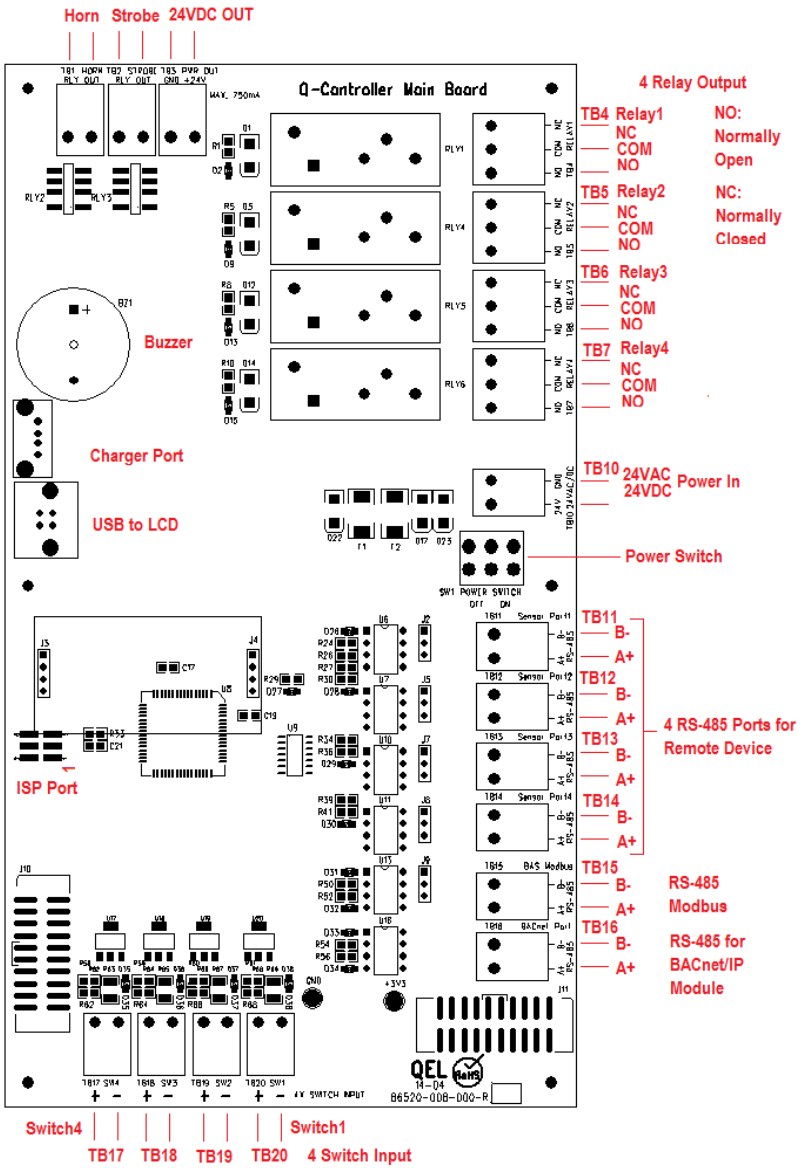
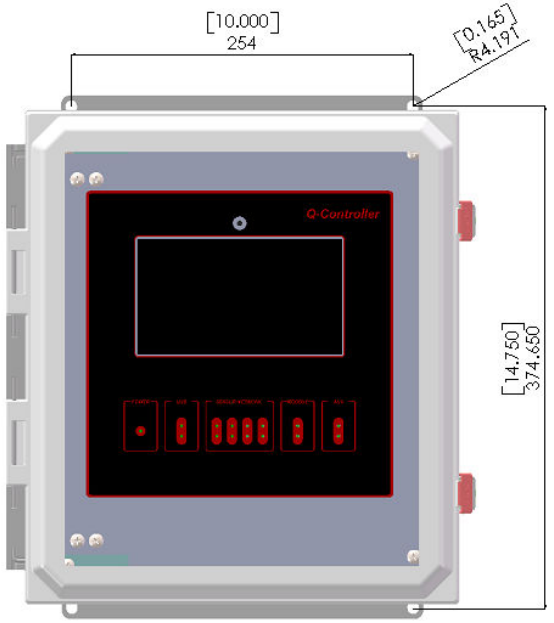
REVISIONS				
ECN	REV.	DESCRIPTION	DATE	APPROVED
1041	A	FIRST RELEASE	2015-02-05	XY
	B	UL2017 APPROVED & RELEASED	2017-06-09	XY





		UNLESS OTHERWISE SPECIFIED:		NAME	DATE
		DIMENSIONS ARE IN INCHES TOLERANCES: FRACTIONAL ± ANGULAR: MACH ± BEND ± TWO PLACE DECIMAL ± THREE PLACE DECIMAL ±	DRAWN	XY	15-02-09
			CHECKED		
			ENG APPR.		
			MFG APPR.		
		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	COMMENTS:		
		FINISH			
NEXT ASSY	USED ON				
APPLICATION		DO NOT SCALE DRAWING			

QUATROSENSE ENVIRONMENTAL LTD.

TITLE:

Q-Controller Installation Drawing

SIZE	DWG. NO.	REV
B	86550-002-000	B

SCALE: 1:4	WEIGHT:	SHEET 1 OF 7

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-

Specification:	
Power Supply	Voltage: 24VDC nominal, range 18 to 30VDC 24VAC nominal, range 15 to 24VAC 50/60HZ Note: Input Power is half-wave rectifier circuit, it can be either floating or grounded. You will damage devices if you mix half wave and full wave rectifiers on the same AC source. Use extreme caution when sharing a common AC source. Sharing a common DC source is less problematic. Current: Q-Controller: max. 0.75 A (fuse protected) Strobe & Horn: max. 0.75 A (fuse protected) Total actual power is dependent on the system design. The power may be supplied to sensors and modules or each may have separate power supplies. Each type of sensor varies in its power requirements. **Note: No external over-current protection is required. Over-current protection is provided by means of fuses F1 and F2. See fuse specification below.**
Fuse	F1, F2 on Main Board: Polyswitch 750mA Polyswitch device resets after the fault is cleared and power to the circuit is removed
Power Switch	Slide switch on circuit card (SW1). This switch disconnects power to the main circuit cards and LCD display. NOTICE: A switch or circuit breaker must be provided in the installation, which can remove power from the Q-Controller in case of emergency or any other related requirement. Since the Q-Controller enclosure can be locked to prevent unwanted tampering, the internal power switch is not guaranteed to be accessible. Feeding the Q-Controller power from a rack main switch or from a switch in a distribution box is adequate.

Enclosure	UL 508 Type 1, 2, 3, 4, 4X, 12 and 13 CSA Type 1, 2, 3, 4, 4X, 12 and 13 NEMA Type 1, 2, 3, 4, 4X, 12 and 13 IEC 60529, IP66 Flammability V-O per UL 94 UV rating (f1) per UL746C
Environmental conditions	Location: Indoor use only Altitude: Up to 2 000 m Temperature: 0 °C to 49 °C Relative Humidity: 85±5% for temperatures up to 31 °C decreasing linearly to 50 % at 40 °C. Pollution Degree: 3, in accordance with IEC 664. Installation Categories (Overvoltage Categories) II
Display & Keypad	7 inch LCD touchscreen display delivers 800 x 480 resolution and offers a capacitive multi-touch TN panel for easily navigate screen
Panel Indicators	15 Status LEDs Power Status USB TX/RX status 4 RS-485 port TX/RX Status for Sensor Network 1 RS-485 port TX/RX Status for Modbus 1 RS-485 port TX/RX Status for BACnet Module or AUX
On-Board Relays	4 pluggable Relays SPDT, Dry contacts Resistive load: 10A at 250VAC 10A at 30VDC Inductive load: 7.5A at 250VAC 5A at 30VDC

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TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±
INTERPRET GEOMETRIC TOLERANCING PER:
MATERIAL
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DO NOT SCALE DRAWING

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Q.A.		
COMMENTS:		

QUATROSENSE ENVIRONMENTAL LTD.

TITLE: Q-Controller Installation Drawing

SIZE	DWG. NO.	REV
B	86550-002-000	B

SCALE: 1:4 | 1 | SHEET 2 OF 7

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-

NOTE: Input Power is half-wave rectifier circuit, it can be either non-grounded or grounded. You will damage devices if you mix half wave and full wave rectifiers on the same AC source. Use extreme caution when sharing a common AC source. Sharing a common DC source is less problematic.

Power Supply General Guideline:

- Q-Controller uses half-wave rectifier only
- Q5 TB5 is half-wave rectifier
- Q8 TB6 is half-wave rectifier
- All I/O boxes are half-wave rectifier
- It is okay to connect multiple devices to the same AC transformer and share signal commons if
  - Every device uses a half-wave rectifier
  - And the same AC lead on every device is used for common
- If the power supply is 24VAC, no matter it is GROUNDED (one side of AC is connected to ground), or FLOATING (neither side of AC is connected to ground), the polarization is important, make sure the Neutral or the same AC lead is connected to the GND of TB10. Make sure the same AC lead is connected to ground in all devices that share the AC source. Treat AC like DC for purposes of watching polarity in this case.
  - For Q5, the TB5 of Q5 can only be connected to the same AC source
  - For Q8, the TB6 of Q8 can only be connected to the same AC source
  - For I/O boxes, they can be directly connected to the same AC source
  - For other devices, only the device with half-wave rectifier can be connected to the same AC source. If it doesn't have, or any doubt exists, provide a dedicated isolated transformer to the device
- If the power supply is 24VDC, all the devices can be powered by the same DC source.
- Whenever you have different devices from different manufacturers, be careful to separate those devices that utilize a Full-wave rectifier from those using a Half-wave rectifier. When any doubt exists, provide a separate transformer. The small expense of an additional transformer or two will more than make up for all of the time and money spent on troubleshooting
- It is necessary to bear in mind the actual installation when sizing the transformer. The installation requirements can run theoretically from only 15 VA to over 200 VA. These systems ranging from a single controller, a few electrochemical sensors to a full 128 Combustible sensors with several remote relay modules.
- It is always best to allow some safety margin in designing power supplies, and 25% to 50% allowance for startup surges and future requirements is recommended.

QEL supplies one standard transformer

M-Transformer 120 to 24 VAC 200 VA

On-Board Switch Inputs:	4 channel switch inputs The switch can be Q-Switch or any ON-OFF switch
On-Board Buzzer	Used for internal warning and alarm, 3700 Hz Continuous It's not used for Alarm-Sounding Appliance. For external Alarm-Sounding Appliance, they can be connected to the below Horn/Strobe terminal blocks, the Alarm-Sounding Appliance sound-pressure level should be at least 85dB at 10 feet according standard UL2017 Audibility Test
Horn & Strobe	Two relay dry contact are for Horn and Strobe Dedicated 24VDC terminals are supplied for connection to standard strobe and horn set. Maximum of 750mA on the 24VDC power supply
Remote Devices	4x RS-485 Ports with QEL Controller Protocol - Available transmitter: Q5, Q8, QIRF… - Available I/O box: 8CH-AI-Box, 8CH-AO-Box, 4CH-BI-Box, 4CH-Relay-Box
Modbus Slave Port	RS-485 port Responds as a Modbus Slave using RTU protocol. Q-Controller supplies read status information only
BACnet Port	RS-485 port Connect to QEL BACnet/IP module
Certification	UL2017 Standard for Safety General-Purpose Signaling Device and Systems Project#: G103011776 for Canada, G103014445 for US For details, contact QEL. Tested with QEL gas transmitter Q5C and IO-Box QEL Q5C is certified with UL2075 Standard for Safety

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TOLERANCES:
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TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±
INTERPRET GEOMETRIC TOLERANCING PER:
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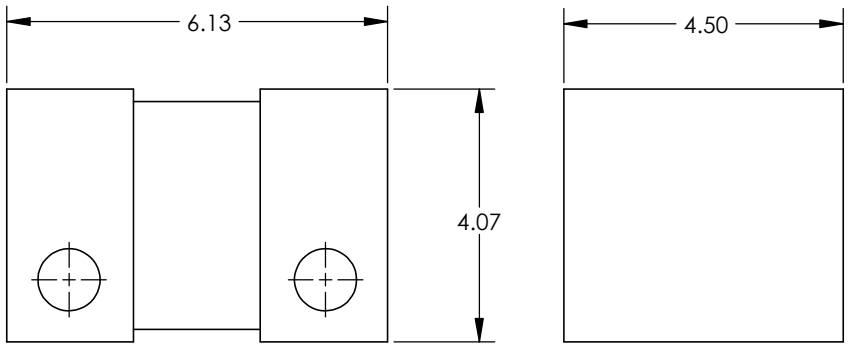
QUATROSENSE ENVIRONMENTAL LTD.

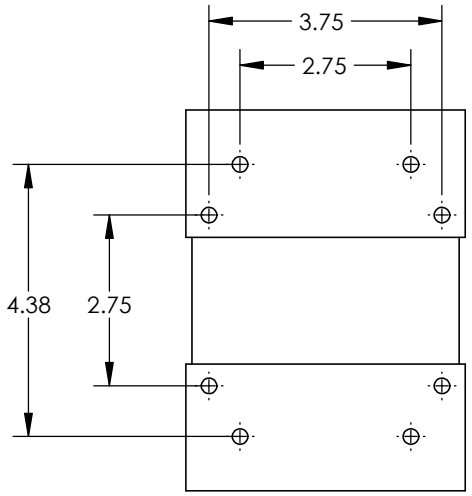
TITLE: Q-Controller Installation Drawing

SIZE	DWG. NO.	REV
B	86550-002-000	B

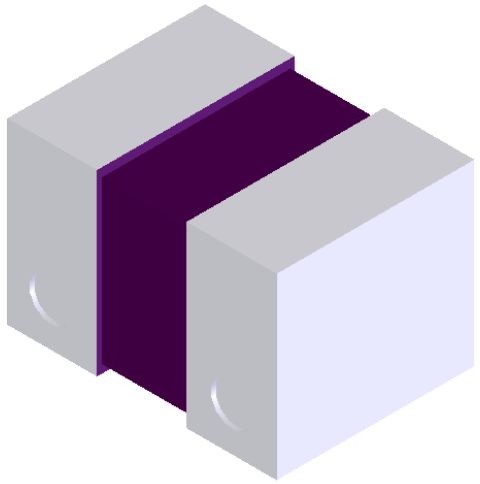
SCALE: 1:4 | 1 | SHEET 3 OF 7

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-





BOTTOM VIEW
MOUNTING HOLES



QEL M-TRANSFORMER
DIMENSIONS AND SPECIFICATIONS

NOTE;
INDOOR TYPE ENCLOSED TRANSFORMER

PRIMARY	120VAC 60Hz
SECONDARY	24VAC
POWER	250VA

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MATERIAL
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COMMENTS:

QUATROSENSE ENVIRONMENTAL LTD

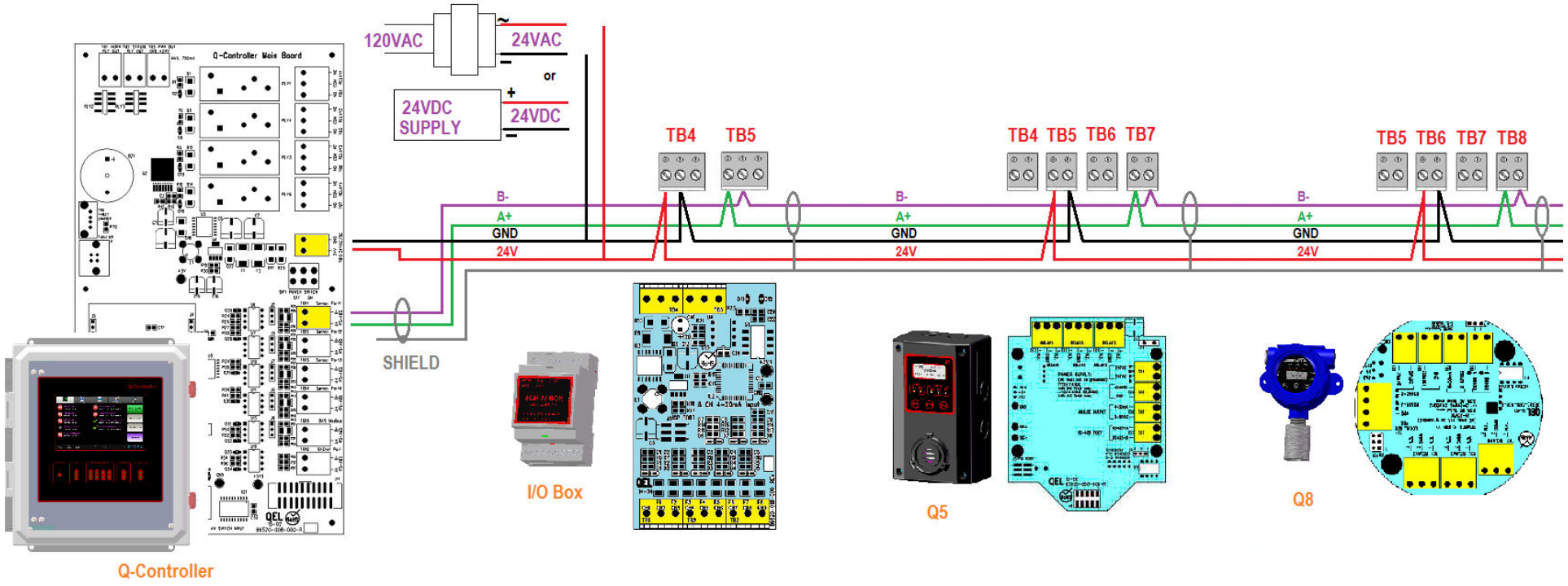
TITLE:
Q-Controller
Installation Drawing

SIZE	DWG. NO.	REV
B	86550-002-000	B

SCALE: 1:1 | 1 | SHEET 4 OF 7

Recommend Connection for New Installations

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-



Note:
1. The power supply can be 24VAC or DC as every device uses a half-wave rectifier in the drawing
2. The power negative may be grounded or floating
3. Don't mix full wave rectifiers device with this system
4. RS-485 cable should wired from one sensor to another without tees or stub. Power cable does not matter
5. Before power up, the polarity of the 24VAC power supply should be checked carefully, reversing polarity on the network will cause the RS-485 driver chips blow up

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APPLICATION		DO NOT SCALE DRAWING

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TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

FINISH

COMMENTS:

	NAME	DATE
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QUATROSENSE ENVIRONMENTAL LTD

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Q-Controller Installation Drawing

SIZE	DWG. NO.	REV
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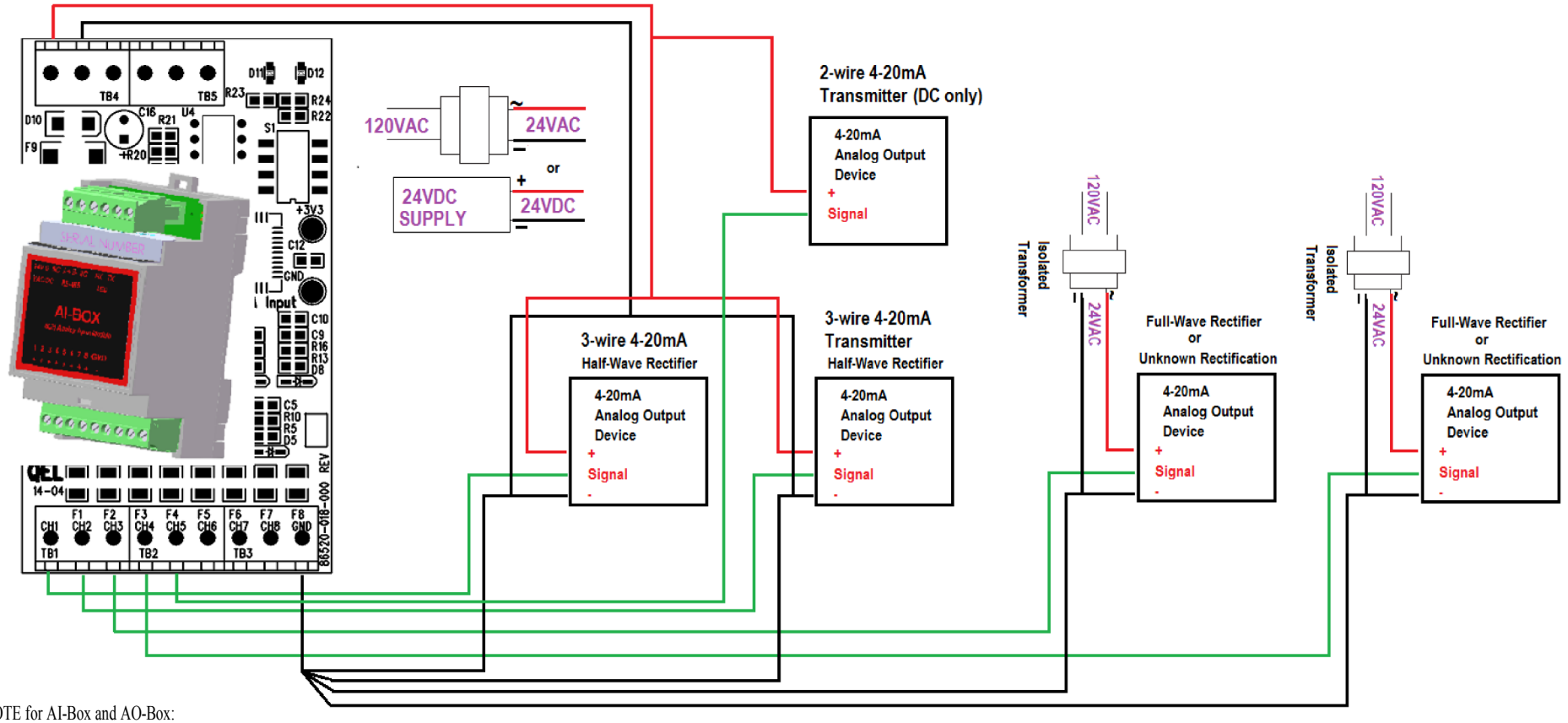
SCALE: 1:4 | 1 | SHEET 5 OF 7

AI-BOX Connection

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-



NOTE for AI-Box and AO-Box:

- All I/O boxes are non-isolated devices with a half-wave rectifier on the 24VAC/DC power input terminal. Therefore, to prevent equipment damage, multiple devices that are powered by a common 24VAC transformer must use common device power connections (e.g.24VAC input power to other device power inputs, and ground to other device grounds), or dedicated isolated transformers must be provided for each non-isolated device.
- The AI-Box 24VAC/DC input power ground and analog input signal returns are common.
- The AO-Box 24VAC/DC input power ground and analog output signal returns are common.
- If it is known that the connected analog device is half-wave rectified, it can share the same AC power supply with the AI-Box and AO-Bor.
- If the rectification of the other device is unknown, it is recommended that a separate transformer is used to power other device.

NEXT ASSY	USED ON	
APPLICATION	DO NOT SCALE DRAWING	

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TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL

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	NAME	DATE
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COMMENTS:

Quatrosense Environmental Ltd

TITLE:

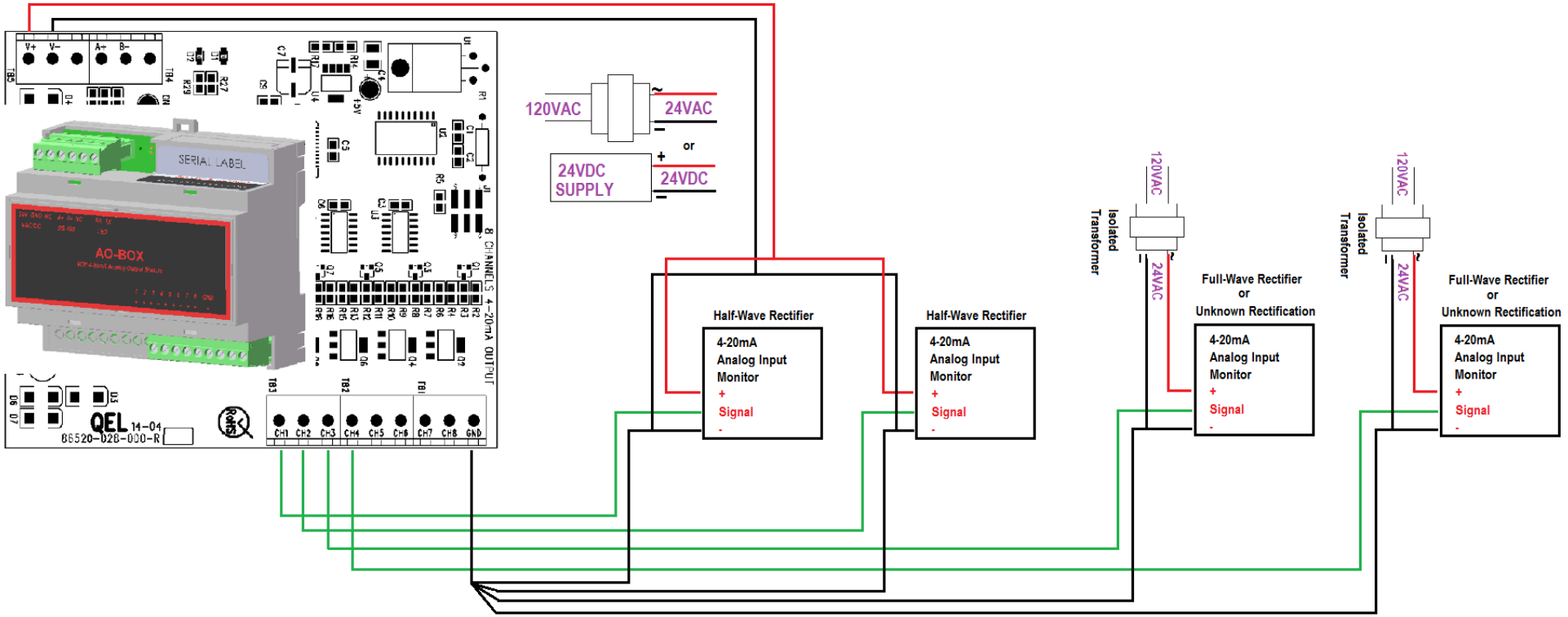
Q-Controller Installation Drawing

SIZE	DWG. NO.	REV
B	86550-002-000	B

SCALE: 1:4 | WEIGHT: | SHEET 6 OF 7

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
-	-	See Sheet1	-	-

AO-BOX Connection



NOTE for AI-Box and AO-Box:

- All I/O boxes are non-isolated devices with a half-wave rectifier on the 24VAC/DC power input terminal. Therefore, to prevent equipment damage, multiple devices that are powered by a common 24VAC transformer must use common device power connections (e.g.24VAC input power to other device power inputs, and ground to other device grounds), or dedicated isolated transformers must be provided for each non-isolated device.
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- The AO-Box 24VAC/DC input power ground and analog output signal returns are common.
- If it is known that the connected analog device is half-wave rectified, it can share the same AC power supply with the AI-Box and AO-Bor.
- If the rectification of the other device is unknown, it is recommended that a separate transformer is used to power other device.

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		INTERPRET GEOMETRIC TOLERANCING PER:	Q.A.		
		MATERIAL	COMMENTS:		
NEXT ASSY	USED ON	FINISH			
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QUATROSENSE ENVIRONMENTAL LTD

TITLE: Q-Controller Installation Drawing

SIZE	DWG. NO.	REV
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SCALE: 1:4 | 1 | SHEET 7 OF 7