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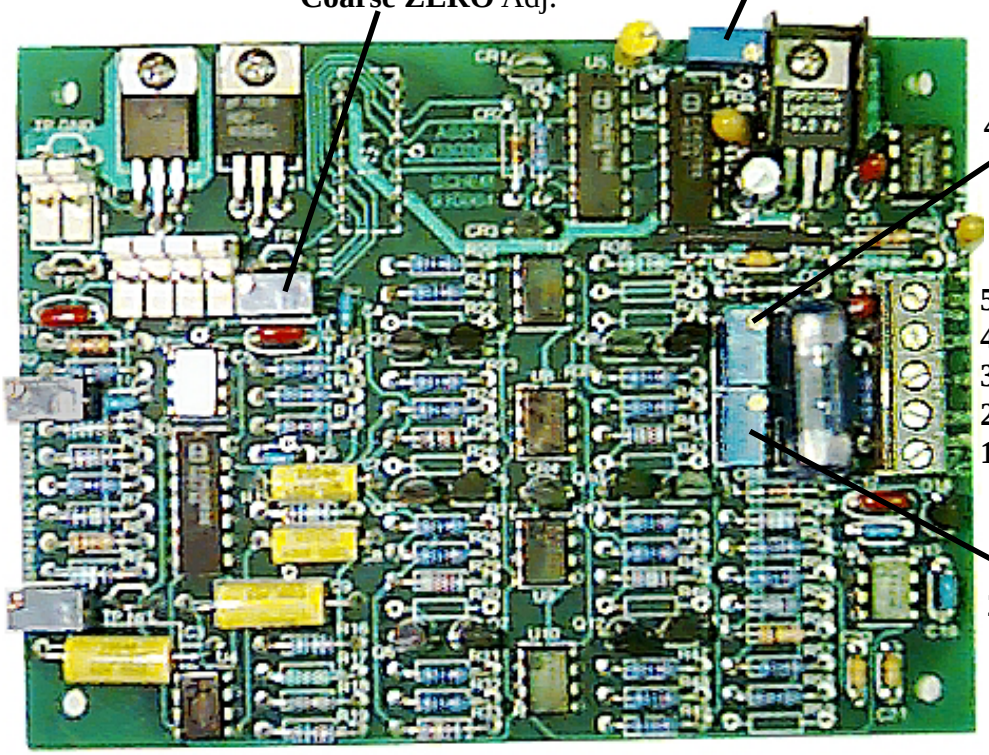
VALTRONICS

Application Note A60

Model **2008 RT** 12 volt & 24 volt powered versions

Shown below is a Model **2008 RT** type circuit board It could be in a Model 2008**L**RT**D-12VDC 1%** CO_2 unit, a 2008**H**RT**B-12VDC 5%** CO_2 unit or a 2008**H**RT**D-12VDC 20%** CO_2 unit are examples of several differnt gas cell types and full scale ranges that are available. The difference between this **12VDC** powered version and a **24VDC** powered version consists of three (3) component changes: The 8 volt regulator chip (U11 a 7808 or LM340T8 type)in a **12VDC** powered sensor is replaced by a 12 volt regulator chip (7812 type or LM340T12 type). The jumper in location **R63** is replaced by a 5 ohm 3 watt resistor for a 24VDC powered version. Resistor **R8** changes from 7.5K (12V config) to 11.3K ohms. See page two for component locations.

Caution: A **12VDC** configured unit will not operate properly on **24 VDC** because the **8 volt regulator will overheat**.



See the complete **specification sheet** for detailed operating specifications like a 2008**H**RT**B-24VDC 5%** CO_2 unit shown partially on page 2:

Method: ..... N.D. I. R. (Non-dispersive Infra-red) gas diffusion sample cell
Gas: ..... Carbon dioxide (CO_2)
Range: ..... 0-5% CO_2
Accuracy: ..... ± 5% of reading from mid to full scale (± 0.125% CO_2 from 0-2..5% CO_2)
Repeatability: ..... ± 1% of full scale (challenge with same gas sample and assure zero)
External Power Source: ..... **24 Volts D.C.** @ 0.4 amp. max.(**20.0** to **26.0** VDC absolute **min./max.**)
Power Consumption: ..... 4 watts typical @ 24.0 VDC
Output Signals, voltage output: .. **0 to 1 volt** = 0 to 5% (linear scale data provided)
current loop output:... **4 to 20 mA** = 0 to 5% (linear scale data provided)**500 Ω max loop resistance**

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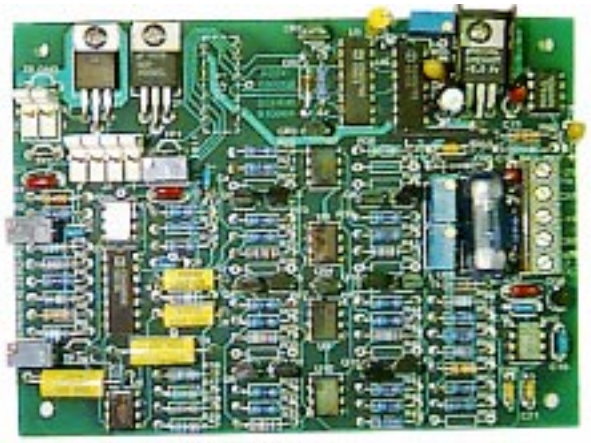
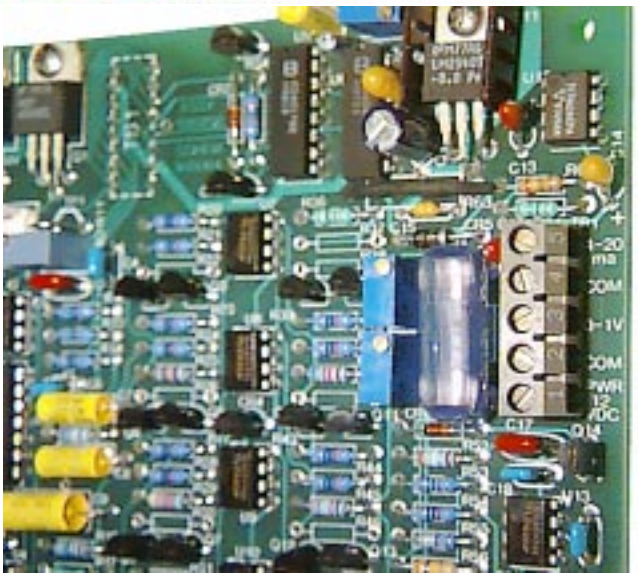
Model 2008 RT
12V PC board



12 VDC
Configuration

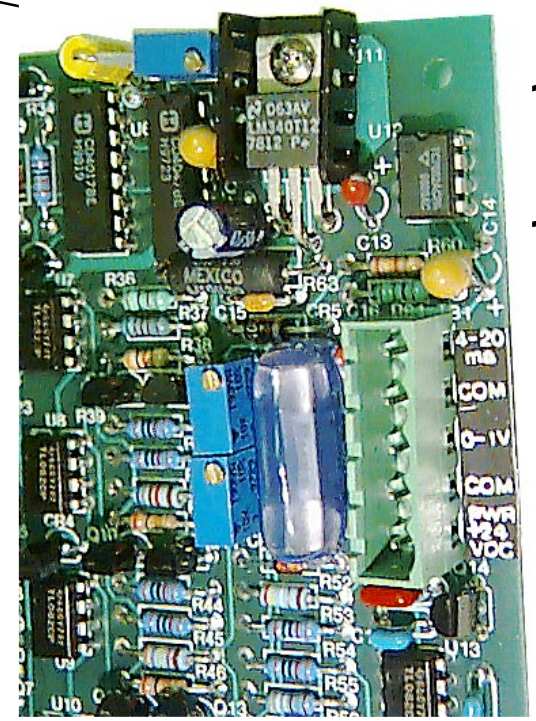
R8 change from **7.5K** (12 v config) to **11.3K** for 24V

+8V regulator
U11, 7808 or LM340T08
R63
Jumper



R65 clock adj only if you have a precision frequency counter

+12V regulator
U11, 7812 or LM340T12
R63
5 ohm, 3 watt



Model 2008 RT
24V PC board

24 VDC
Configuration

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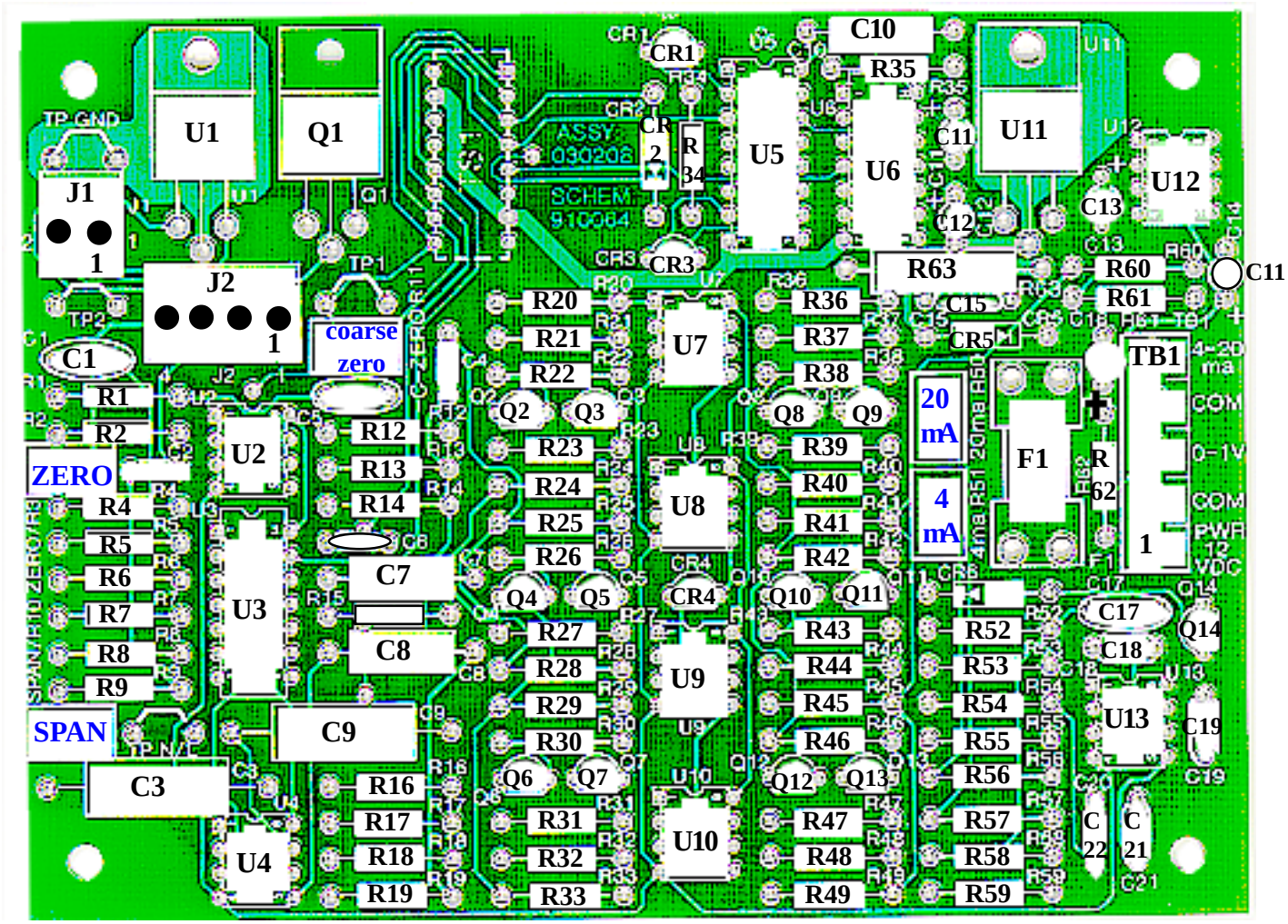
The **COARSE ZERO** adjustment should only be done if you run out of adjustment range using the **FINE ZERO** adjustment (R3). Adjustments should be done very slowly since the output response is delayed about 8 to 10 seconds.



Reference **schematic** number **910070**. U11 is the main DC regulator (either 8V or 12V see page 2). U1 is the IR source 5Vregulator . Q1 switches the **IR source** ON and OFF. Continuity of the **IR source** may be measured using an ohmmeter across pins of J1 for about 3.5 ohms with power off. Clock U6 drives counter U5. The clock adjust R65 should only be done using a precision frequency counter for an **IR source** ON/OFF period of **1.4765** seconds. The **4 mA** adjustment (R51) should only be adjusted if the **ZERO** adjust (R3) is first adjusted with nitrogen in the gas cell for **0.000** volts out of the 0 to 1 volt output (pin #3 with respect to #4 of TB1). The **20 mA** adjustment (R50) should only be adjusted if the **SPAN** adjust (R10) is first adjusted with mid scale span gas in the gas cell for **0.500** volts out of the 0 to 1 volt output (pin #3 of TB1) then adjust 20 mA for an output of **12.0** mA. Use the scale data for you specific unit to look up the correct voltage and current loop outputs for the specific span gas level that you are using. As an example different than the mid-scale example given previously, if you have a Model 2008LRTB-12VDC **1.0**% CO_2 **full scale** unit and you have span calibration gas that is certified to 0.60 % CO_2 then you adjust SPAN for **0.600** volts out of the 0 to 1 volt output and then the **20 mA** adjustment for **13.60 mA** out of the 4-20 mA output (pin #5 with respect to #4 of TB1). The values of resistors R22, R26, R30, R37, R38, R42, and R46 are selected depending upon the full scale option.