

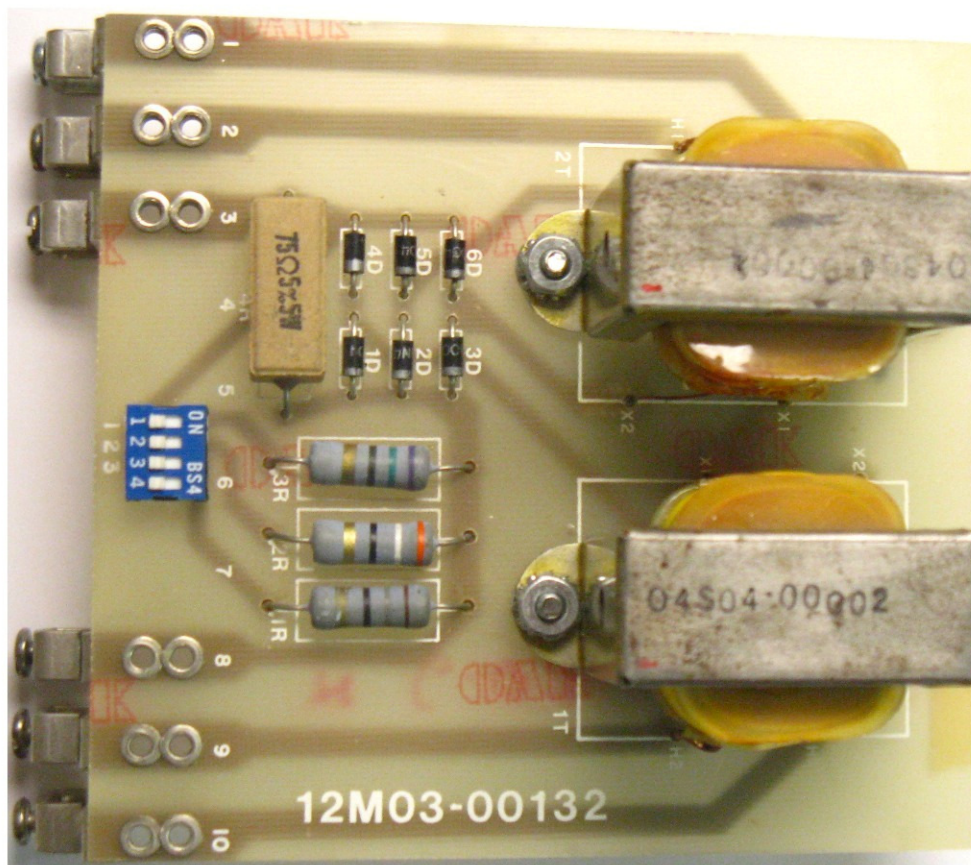


# Trouble-shooting Manual

## MODEL 242

### CURRENT ISOLATOR

PART NUMBER 12M03-00132-01



#### BENCH TEST

1. Set all DIP switches to the off position (OPEN).
2. Jumper terminal 2 to terminal 9.
3. Connect a 60Hz supply to terminals 1 and 10 that is capable of 5 amps continuous AC current. This can be done by connecting a 600 watt load in series with the Current Isolator to a 120V AC line. Caution: The AC current should not exceed 5 amps.
4. Connect an oscilloscope to terminal 3 (low) and terminal 8 (high).
5. Adjust the oscilloscope's vertical gain for eight divisions and the horizontal sweep for four or more pulses.
6. Check the waveform. It should be a typical full wave rectified wave. The pulses should be uniform in shape and magnitude without any flat spots at the base line. If not, it is not functioning properly.
7. Look at the chart below for the approximate oscilloscope reading with the corresponding DIP switch in the ON position. Only one DIP switch should be on at any given time.

#### DIP SWITCH POSITIONS

ALL OFF  
 1 - ON, 2 and 3 - OFF  
 2 - ON, 1 and 3 - OFF  
 3 - ON, 1 and 2 - OFF

#### APPROXIMATE VERTICAL GAIN

3 DIVISIONS  
 4 DIVISIONS  
 3 DIVISIONS  
 1.5 DIVISIONS

# GEMINI CONTROLS MODEL 242 CURRENT ISOLATOR

PART NUMBER 12M03-00132-01

SCHEMATIC DIAGRAM 12M03-00132-01

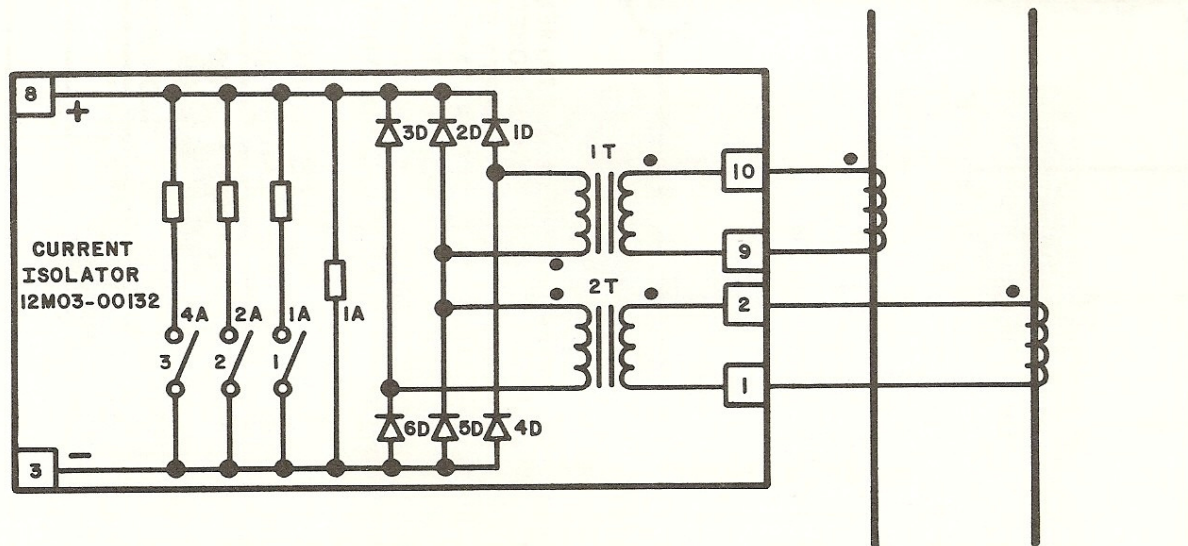


FIGURE 1. SIMPLIFIED SCHEMATIC

## I. SPECIFICATIONS

### INPUT:

- 50/60 Hz at 0 to 5 amperes AC nominal, from two 5 Amp, 5VA Current Transformers

### OUTPUT:

- Scaling by setting a 3-position binary switch to produce a nominal 2 volts DC with balanced inputs of 1 to 8 amperes AC RMS.
- Impedance, 9.2 to 75 ohms depending on switch position.

### AMBIENT TEMPERATURE:

- 0° to 40°C (32° to 104°F)
- 50°C in cabinet

### ACCURACY:

- $\pm 2\%$  of full scale. Overall accuracy depends on current transformers used.

### MOUNTING:

- **Gemini** Standard 10 terminal Chassis.

## II. THEORY OF OPERATION

The **Gemini** Model 242 Current Isolator is used to provide isolated current feedback from a three phase, full wave (6 pulse) thyristor power converter such as the **Gemini** Series 2200 (AC-DC) and Series 3200 (AC-AC). Use of passive components avoids the excitation requirements common to transducers.

The design takes advantage of the fact that in any three-phase full-wave power converter the sum of all three line currents is always zero. It is necessary to measure only two lines to know exactly what is happening in all three lines since the third is the algebraic sum of the other two.

Two current to voltage transformers, 1T and 2T, are connected to current transformers in each of two AC lines as shown in the Simplified Schematic Diagram, Figure 1.

The output of the current to voltage transformers is rectified by diodes 1D through 6D and fed to an adjustable "burden." The term "burden" is used to describe the loading on a current transformer. The burden is adjusted in binary steps to provide a nominal 2 volts DC output, with AC input currents from 1 to 8 amperes in increments of one ampere.

With all switches open, one ampere will produce 2 volts DC. Each switch position is assigned a value of current which adds to the minimum one ampere and the sum of the current values assigned to the other closed switch positions.

NOTE: The proper polarization of the two current transformers is **extremely** important as reversal of either transformer will result in readings which do not represent the true current.

UNDER NO CIRCUMSTANCES SHOULD A CURRENT TRANSFORMER BE ALLOWED TO OPERATE WITH ITS OUTPUT OPEN CIRCUITED. IF THE CURRENT ISOLATOR ASSEMBLY IS REMOVED FROM THE CHASSIS, SHORT THE LEADS FROM EACH CURRENT TRANSFORMER!

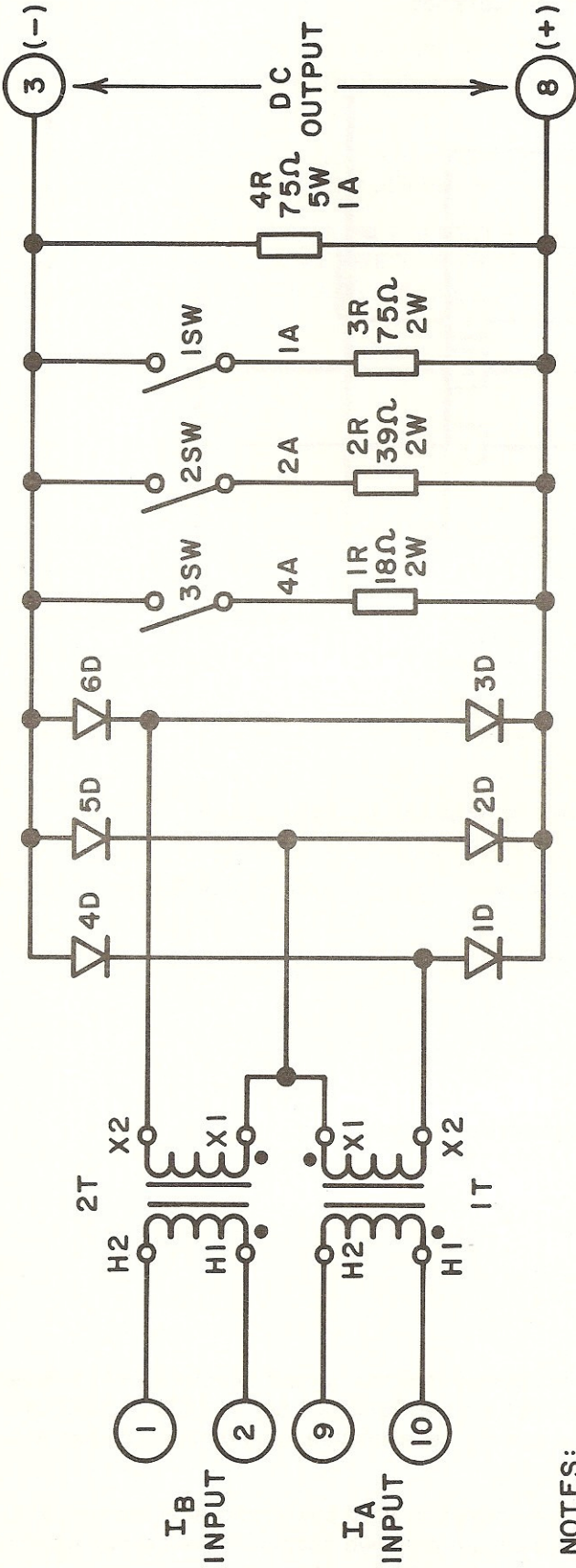
### COMPONENT LIST — ASSEMBLY #12M03-00132-01

Symbol	Part #	Description (Acceptable Substitute)*
1,2CT	04S04-00002	Current Transformer – 2VA, 5A to 100mA
1-6D	05P01-00001	Diode - Power, 1A, 400PIV (1N4004)
1-3SW	09P01-00004	Switch, 4PST, DIP (Grayhill-78B04)
1R	01P01-18003-02	Resistor, 18 ohm, 2W, 5%
2R	01P01-39003-02	Resistor, 39 ohm, 2W, 5%
3R	01P01-75003-02	Resistor, 75 ohm, 2W, 5%
4R	01P01-75005-02	Resistor, 75 ohm, 5W, 5%
* OR EQUAL		



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**NOTES:**

- 1 - INPUTS ARE FROM 5A CURRENT TRANSFORMERS IN TWO OF THE 3 AC LINES. MINIMUM SIZE OF C.T.'S IS 5VA. OBSERVE RELATIVE POLARITY MARKINGS.
- 2 - CURRENT VALUES NOTED NEAR RESISTORS INDICATE PRIMARY RMS CURRENT THAT WILL PRODUCE 2.0 VOLTS NOMINAL DC OUTPUT. SEE APPLICATION NOTE FOR SIZING.

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PCB. NO. 13S01 -00132  
LAYOUT NO. 12M03 -00132

DR.	MY	CK'D.	APP'D.	G GEMINI GEMINI Controls LLC Cedarburg, WI		REF. (FILE No.)
DATE	08-05-11	SCALE	SHEET	OF		JOB No.
PRODUCT				CURRENT TO VOLTAGE CONVERTER		
CUSTOMER				5A NOMINAL INPUTS		
TITLE				SCHEMATIC DIAGRAM		
REV.	DESCRIPTION		DATE	INT.	DWG. NO. 12M03-00132-01	