



GEK-22959

INSTRUCTIONS

CURRENT ISOLATOR ASSEMBLY (331X263)

USED WITH
ADJUSTABLE SPEED
DRIVES

GENERAL  ELECTRIC

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These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

LIST OF EFFECTIVE PAGES

PAGE NO.	ISSUE
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CURRENT ISOLATOR ASSEMBLY (331X263)

1.0 INTRODUCTION

These instructions provide basic information for the operation, adjustment and troubleshooting of the Current Isolator Assembly(s). This assembly provides AC or DC current to voltage conversion with electrical isolation for many applications. There are four different groups providing different ampere ranges for the input with each assembly having a high and low range rating. The mechanical differences are the physical dimensions, window size and mounting hole locations with the group 1, (G01) being the smaller and groups G02 through G04 being larger and having the same dimensions.

1.1 CURRENT ISOLATOR ASSEMBLY PURPOSE

To provide isolated current monitoring or feedback signal for use in such applications as current lockouts, instantaneous overcurrent protection (IOC), current limit, closed loop current regulation, and multimotor current monitoring for protection in AC or DC Drive Systems.

1.2 ASSEMBLY SPECIFICATIONS*

Temperature Range (Ambient)

The assembly is suitable for use at ambient temperatures of 0°C to 75°C (32°F to 167°F). The ambient temperature of 75°C allows for a 40°C room ambient plus a 35°C rise within enclosure.

Operating Voltage Requirements:

See Table I, Section 1.3.

Normal Operating Current Required:

+20vdc supply 15ma max.
-20vdc supply 70ma max.

Environmental Requirements:

This assembly may be stored at ambient temperature of -10°C to +85°C (+14° +185°F) for a period of up to one year. Air must be free of chemical and electrically conductive contaminants, and other conditions must be such that no moisture condensation occurs in or on the assembly.

NOTE:

IF ADDITIONAL DEVICES THAT CONTAIN IRON OR STEEL ARE MOUNTED IN THE FIELD THE FOLLOWING SPACE CLEARANCES MUST BE MAINTAINED TO PREVENT FLUX DISTORTION.

G01 - 1/2 INCH

G02-G04 - 2 INCHES

*These specifications are for the Current Isolator assembly only and are not system specifications. The usual service conditions for a system allow for an ambient temperature range for operation of 10°C to 40°C (50°F to 104°F).

1.2.1 REPLACEMENT AND INTERCHANGEABILITY

It is recommended that only direct replacement by group number be made.

1.3 ASSEMBLY INPUT-OUTPUT REQUIREMENTS.

The following Table 1 lists the functions, voltage range and associated terminal board numbers. All measurements are with respect to common, terminal 4.

1.4 ASSEMBLY ADJUSTMENTS

The only adjustment of the assembly is selecting the high or low range (current rating) by the jumpers on the terminal board, provided at the factory. If field replacement is necessary, connect the assembly as connections were originally supplied using the same number of turns through the window.

2.0 PRINCIPLES OF OPERATION

Section 2 provides theory of operation and troubleshooting information for the Current Isolator Assembly.

2.1 THEORY OF OPERATION

The Current Isolator Assembly is an encapsulated device consisting of a printed circuit card, a pair of "C" cores mechanically bonded in a loop with two fixed air gaps and a Hall generator in one air gap. The Current Isolator is a current-to-flux-to-voltage converter providing up to ±10 volts output proportional to current input, and turns through the isolator window. Applied current through the turns determines the flux density in the "C" cores and air

FUNCTION	VOLTAGE RANGE	TERMINAL	REMARKS
+DC Supply Input	20VDC \pm 1 volt	2	
-DC Supply Input	20VDC \pm 1 volt	6	
Common	N/A	4	
Output Voltage for No Input	\pm .18VDC max	5	All groups within a temperature range of 65°F – 85°F
“Low Range” Output Voltage for Input Current		5	N = Number of wire turns in window of isolator assembly. I _A = applied amperes
G01, G02	$\frac{NI_A(10 \pm .4)}{560} + .18 \text{ volts}$	5	Group Rated NI N (Typical) G01 560 3 G02 560 1 G03 1120 1 G04 2240 1
G03	1/2 G01 calculation		Output may decrease somewhat for N greater than typical.
G04	1/4 G01 calculation		
“High Range” Output Voltage for Input Current		5	Jumper 3-5 and Jumper 1-4
G01, G02	$\frac{NI_A(10 \pm .4)}{800} \pm .18 \text{ volts}$		Group Rated NI N (Typical) G01 800 3 G02 800 1 G03 1600 1 G04 3200 1
G03	1/2 G01 calculation		
G04	1/4 G01 calculation		

TABLE 1

gaps. The flux density is detected by the Hall device and converted to an output voltage that is proportional to the product of the flux density and a bias current from the printed circuit card. An integrated opamp amplifies the Hall output signal to provide a nominal current isolator output of 10 volts, for full scale. Jumpers (3-5 and 1-4) change the amplifier's gain.

2.2 TROUBLESHOOTING

Troubleshooting procedures required for this assembly are based on the input/output voltage requirements as listed

in Table 1. If the output requirements of the assembly fail to meet the requirements of Table 1 when all the input requirements have been verified as correct, the Assembly should be replaced.

2.2.1 GENERAL SYSTEM SYMPTOMS

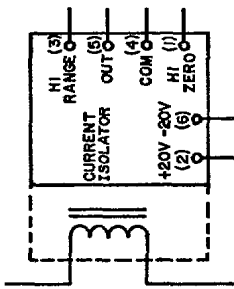
Table 2 provides indications and possible causes to check.

TROUBLESHOOTING TABLE

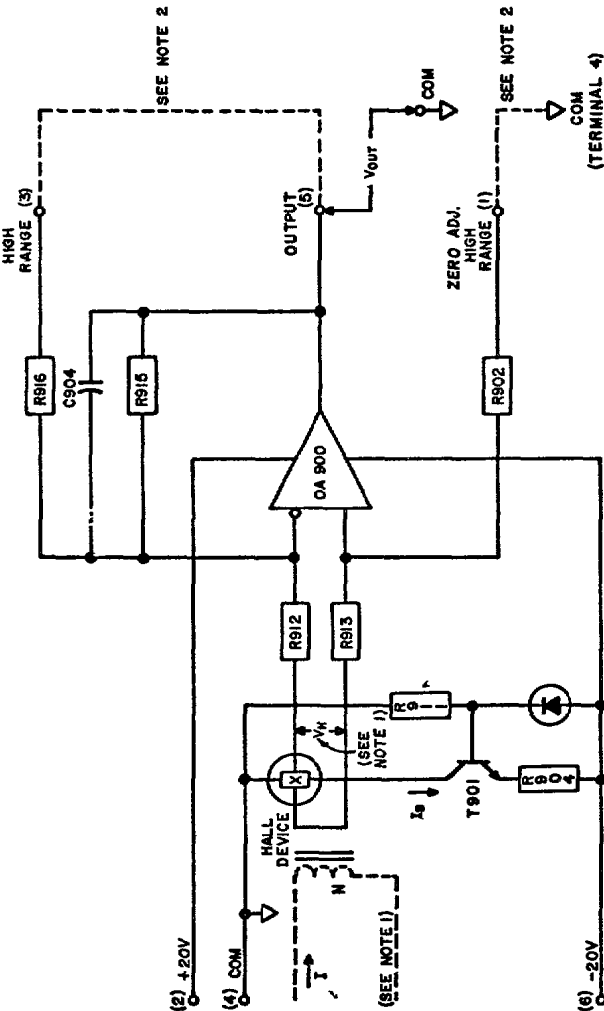
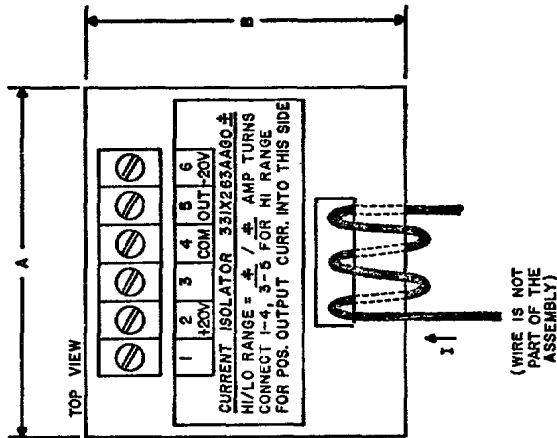
DRIVE SYMPTOM	CHECK/REPLACE CURRENT ISOLATOR	CHECK FOR OTHER CAUSES
<ol style="list-style-type: none"> 1. Reversing drive does not operate in one direction 2. IOC trip 3. Unexpected current limit 4. Poor regulation 5. Fuse failures or circuit breaker trips 6. No IOC 7. No current limit 8. Poor regulation (V+IR) 9. Overspeed 10. Loss of protective circuit 	<p>Output greater than .18 volts with no current input</p> <p>Continuous high output with no current input</p> <p>No output with current input</p>	<ol style="list-style-type: none"> 1. Jumpers (1-4 and 3-5) if required by system elementary diagram 2. Improper $\pm 20\text{vdc}$ supply 3. Noise pickup 1. Jumper 3-5 2. Improper $\pm 20\text{vdc}$ supply 3. Noise pickup 4. Incorrect isolator group number. 1. Noise pickup 2. No $\pm 20\text{vdc}$ or reversed connection; overload on isolator output

TABLE 2

REPRESENTATION FOR SYSTEM ELEMENTARY DIAGRAM



FUNCTIONAL CONNECTION



NOTES

1. WHEN I CURRENT IS FLOWING THRU N TURNS OF EXTERNAL WIRE THRU THE CURRENT ISOLATOR ASSEMBLY WINDOW THE FOLLOWING IS TRUE:

$$V_H = K_2 \phi \quad I_s = K_1 \text{ IN}$$

$$V_{out} = K \text{ IN}$$
2. EACH GROUP OF THE CURRENT ISOLATOR HAS TWO AMP-TURN RANGES AS LISTED IN NOTE 3. THE LOW RANGE REQUIRES CONNECTIONS AS SHOWN BELOW. THE HIGH RANGE REQUIRES ADDITIONAL JUMPERS FROM TERMINALS 5 TO 6 AND 1 TO 4.

TERMINAL CONNECTION	+20V	-20V	OUTPUT
2			
4			
5			
6			

3. DESCRIPTION OF ASSEMBLY GROUPS.

ASSEMBLY	HIGH RANGE / LOW RANGE	DIMENSIONS IN INCHES		
		WINDOW	A	B THK
331 X 263AA801	800 / 560 AMP TURNS	0.38 X 1.25	3.50	3.38 1.12
331 X 263AA802	800 / 560 AMP TURNS	1.00 X 2.88	5.68	4.70 1.12
331 X 263AA803	1600 / 1160 AMP TURNS	1.00 X 2.88	5.68	1.70 1.12
331 X 263AA804	3200 / 2240 AMP TURNS	1.00 X 2.88	5.68	4.70 1.12
331 X 263AA805*	800 / 560 AMP TURNS	0.38 X 1.25	3.50	3.38 1.12

4. CURRENT ISOLATOR OUTPUT VOLTAGE (V_{out}) IS ± 10 VOLTS FULL SCALE FOR ALL CURRENT RANGES.
 ± 4 MILLIAMPS MAXIMUM LOAD.
 * G05 SAME AS G01 EXCEPT G05 HAS MORE INACCURACY; THIS G05 MAY BE REPLACED BY G01.
 5. 4 SEE NOTE 3 FOR GROUP AND VALUES.

CURRENT ISOLATOR ASSEMBLY

NOTES

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