ROTATING DIODE FAILURE DETECTION RELAY

RHS

Microelettrica Scientifica

CAT. J6-88

12-01-99

GENERAL CHARACTERISTICS

The electronic relays RHS have been designed and produced with characteristics and components which make them suitable to the most heavy duty and to the most sophisticated applications.

SETTINGS

Setting is made by two 8-poles DIP-SWITCHES (one for the trip levels, one for the trip time delay) which allow a wide and sensitive setting range with high resolution.

SIGNALIZATIONS

- 1 Green led for signalization of auxiliary supply presence and relay regular operation.
- 1 Yellow led for first level tripping.
- 1 Red led for second level tripping.

COMMANDS

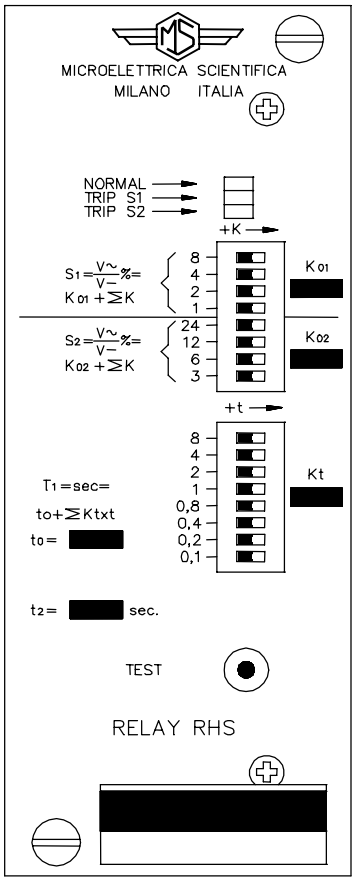
- A test push button on relay's front face, when pressed, simulates a trip condition and allows the complete test of the unit (test does not trip the output relays).

OUTPUT RELAYS

Output relays with 1 or 2 c/o contacts are deenergized in operating conditions (i.e. with auxiliary supply on and input signal below the trip threshold) and are energized when relay trips. Available on request version with normally energized relays.
Reset of output relays after trip is automatic.

APPLICATION

The relay RHS is used to detect the failure of a shaft mounted diode in a brushless generator or motor by measuring the ratio between the peak value of the a.c. ripple superimposed on the exciter d.c. field current and the d.c. current itself; the frequency and the magnitude of the a.c. ripple sensibly change in case of failure of a shaft diode.
The input signal is detected as voltage drop on a resistor in series to the exciter.
The relay by means of two trip levels distinguishes open circuit diode from short circuit diode condition.
The open circuit diode condition causes a small increase of the exciter field current needed to maintain the generator voltage; this increase is normally within the capability of the voltage regulators. The machine can then continue to operate without severe troubles and the relay has only to monitor the failure so that it can be removed as soon as opportune.
On the contrary with a short circuit diode, the exciter field current needed to maintain the generator voltage increases largely with the risk of severe damage to the Automatic Voltage Regulator and to the exciter; the relay has then to trip and to shut the machine down.
The tripping of the relay two levels is timed with an adjustable long time delay for the first one (open circuit diode) and a fixed short time delay for the second one.



ORDERING DATA

- Relay Type
- Exciter Frequency
- Auxiliary Power Supply
- Setting Ranges
- Output Relays Configuration
- Execution
- Options on Request

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OVERALL DIMENSIONS

See Overall Dimensions - **1 Module Relay**.

ELECTRICAL CHARACTERISTICS

Auxiliary power supply	:	24-48-110-220-380V a.c. 24-48-110V d.c.
Burden on power supply	:	3W (d.c.); 6VA (a.c.)

STANDARD SETTING RANGES (Different on request)

$$S_1(\text{open circuit diode}) = \frac{V\sim}{V-}\% = K_{01} + \sum K = (15 \div 30)\%, \text{ step } 1\%$$

$$S_2(\text{short circuit diode}) = \frac{V\sim}{V-}\% = K_{02} + \sum K = (40 \div 85)\%, \text{ step } 3\%$$

$T_1 = t_0 + \sum (Kt \cdot t) = (1 \div 34)$ sec. (To=1, Kt=2)

$T_2 = 5s$

Input signal: voltage drop across series resistor **(*)**
Signal permissible range: 0÷3,6V=(0÷3)Ifn
Signal operating range: 0,12÷1,8V=(0,1÷1,5)Ifn
Exciter frequency: Fn=20÷400 Hz
Operational frequency: Fn ± 30%

(*) Drop resistor: $R \le \frac{1.2}{I_{fn}}[\Omega]$; ($I_{fn}[A]$ = Rated field current); $W \ge 3R \cdot I_{fn}^{\ 2}\ [W]$

WIRING DIAGRAM