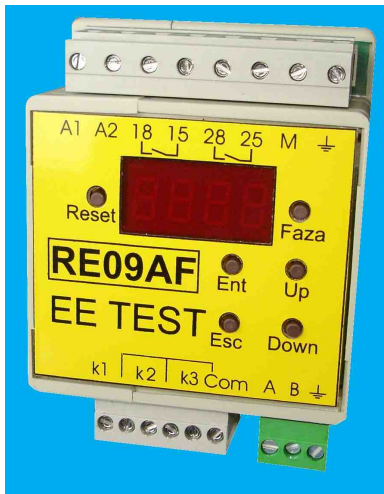


Echipamente de Test si Instalatii Electrice

## Motor Protection Relay, type RE09AF

The RE09AF digital relay is designed to protect three phase AC motors against conditions which can cause damage.

**Applications:** Protection of small to medium sized motors,  $P=(0,37 - 132)KW / 3 X 380Vca$  (pumps, conveyors, compressors, fans, sawmills, etc)



The RE09AF offers the following functions:

### **Thermal overload protection with thermal capacity according to I<sup>2</sup>t characteristic**

When a motor is operated at its rated current  $I_n$ , normally it reaches about half of its max. thermal capacity.

Operating conditions above  $I_n$  lead to further temperature rise which is only permissible up to the max. temperature limit. On the basis of adjustment and current measuring data, the RE09AF simulates an internal model of the motor temperature, based on I<sup>2</sup>t motor temperature characteristic.

If the calculated motor temperature reaches its permissible value the output relay releases.

After tripping due to overload, the RE09AF can only be reset if the motor has cooled down at least by the amount of heat causing the trip.

### **Locked rotor (stalling) protection (blocking possible)**

A stalled rotor after start-up or a torque which is too high is identified by the RE09AF on the motor current criterion: when the current exceeds the value of  $I_{lock}$  for longer than 2s.

### **Protection against current unbalance (blocking possible)**

If the motor current becomes unbalanced due to a conductor break or short circuit in the windings, the RE09AF trips conditional on the current unbalance.

RE09AF calculates the current unbalance „A“ from the two measured conductor currents by using the following formula:  $A=100 \times (I_{max}-I_{min})/I_{max}$

A = Current unbalance (100% = phase failure),  $I_{max}$  = the higher one of the conductor currents,  $I_{min}$  = the lower one of the conductor currents

### **Undercurrent protection (blocking possible)**

For some applications an unloaded motor is undesirable (for example: protection against a pump running dry). In such cases the motor current must be above a minimal value.

### **Insulation deterioration protection**

RE09AF induces a low voltage, low current on motor windings during the motors 'rest' cycle and calculates circuit resistance to ground. If the resistance falls below a level, the relay prohibits the motor from being started.

### **User Interface:**

Data exchange with process management system by serial interface (RS485 serial port).

Keypad

### **Technical data**

**Overload function:** Setting range  $I_r = [0,5 - 1.5] \times I_n$ . Prealarm:  $I > 1,1 \times I_r$

**Asymmetric protection:** Setting range: [30 - 75]%, OFF.

**Rotor blockage:** Setting range: [2 - 3]  $\times I_n$ . Tripping delay: 2s.

**Undercurrent:** Setting range: [20 - 80]  $\times I_n$ , OFF.

**Insulation:**  $R_{iz} < 1 M\Omega$

**Measuring input circuits:** Rated current: 25mA /  $I_n$ .

**Supply voltage:** 230Vca(+/- 15%), 50/60 Hz. Power consumption: 1,5VA

**Output relay:** Number of relays: 2, Contacts: 1 changeover contact, , Max. rated voltage: 250 V AC, Maximum rated current: 5 A

**Dimensions:** 97(height) X 71(width) X 60(depth) mm. Mounting on symmetrical or asymmetrical rail.

**Marking:** CE (73/23/EEC)

**Ambient conditions:** Storage and transport: [-25 - 70]°C, operation: [-25 - 70]°C.

Applications scheme for the relay RE09AF:

