

# Current and Voltage Controls Frequency Monitoring Control Type EFA

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- Microprocessor-based frequency measurement
- 10-position rotary switch for selection of bandwidth
- Separate setting of upper/lower limits
- Monitors on own power supply
- 2 separately adjustable time functions (0.1-30 s)
- Quartz-controlled digital circuit
- Selectable centre frequency 50/60 Hz
- Output: 2 x 5 A SPDT relays (one relay for each level)
- For mounting on DIN-rail in accordance with DIN/EN 50 022
- 45 mm Euronorm housing
- LED-indication for power supply ON
- Two LED's indicating fault and/or status of relay output (flashing when timing)
- Galvanically separated power supply

## Product Description

EFA is monitoring the frequency of an AC power supply with the possibility of separate adjustment of upper/lower limits. This relay offers

the user many application possibilities e.g. in connection with wind-driven generators or similar equipment.

## Ordering Key

**EFA C 230**

Housing \_\_\_\_\_  
 Function \_\_\_\_\_  
 Type \_\_\_\_\_  
 Output \_\_\_\_\_  
 Power supply \_\_\_\_\_

## Type Selection

Mounting	Output	Measuring range	Supply: 24 VAC	Supply: 115 VAC	Supply: 230 VAC
For DIN-rail	2 x SPDT	50-60 Hz	EFA C 024	EFA C 115	EFA C 230

## Input Specifications

Input	Measuring on own power supply	
Through terminals A1 & A2		
Measuring range	Upper level	Lower level
Bandwidth selectable by 2 separate rotary switches	0.5 Hz	0.5 Hz
	1.0 Hz	1.0 Hz
	1.5 Hz	1.5 Hz
	2.0 Hz	2.0 Hz
	2.5 Hz	2.5 Hz
	3.0 Hz	3.0 Hz
	4.0 Hz	4.0 Hz
	5.0 Hz	5.0 Hz
	6.0 Hz	6.0 Hz
	10.0 Hz	10.0 Hz

## Output Specifications

Output	2 x SPDT relay
Rated insulation voltage	250 VAC (contact/elect.)
Contact ratings (AgCdO)	μ (micro gap)
Resistive loads	AC 1 5 A, 250 VAC
	DC 1 5 A, 24 VDC
Small inductive loads	AC 15 2 A, 250 VAC
	DC 13 3 A, 24 VDC
Mechanical life	≥ 40 x 10 <sup>6</sup> operations
Electrical life	≥ 10 <sup>5</sup> operations (at max load)
Operating frequency	≤ 7200 operations/h
Dielectric strength	
Dielectric voltage	2 kVAC (rms)
Rated impulse withstand volt.	4 kV (1.2/50 μs)

## Supply Specifications

Power supply	Overvoltage cat. III (IEC 60664) (IEC 60038)
Rated operational voltage	24 VAC ±15%, 40 to 70 Hz
Through pins A1 & A2	115 115 VAC ±15%, 40 to 70 Hz
	230 230 VAC ±15%, 40 to 70 Hz
Voltage interruption	≤ 40 ms
Dielectric voltage	≥ 2 kVAC (rms)
Rated impulse withstand voltage	4 kV (1.2/50 μs)
Rated operational power	3 VA

## General Specifications

<b>Power ON delay</b>	200 ms
<b>Power OFF delay</b>	> 250 ms @ 230 VAC
<b>Reaction time</b>	≤ 400 ms
<b>Accuracy</b>	
Frequency	0.01%
Time delay	0.1-30 s ±15%
Temperature drift	≤ 0.01%/°C (≤ 0.006%/°F)
<b>Hysteresis</b>	≤ 0.5%
<b>Indication for</b>	
Power supply ON	LED, green
Output ON	2 LED's, yellow (indicating upper/lower level)
<b>Environment</b>	
Degree of protection	IP 20
Pollution degree	3
Operating temperature	-10° to +50°C (-14° to +122°F)
Storage temperature	-50° to +85°C (-58° to +185°F)
<b>Weight</b>	250 g
<b>Screw terminals</b>	
Tightening torqu	Max. 0.5 Nm acc. to IEC 60947
<b>Approvals</b>	UL, CSA

## Mode of Operation

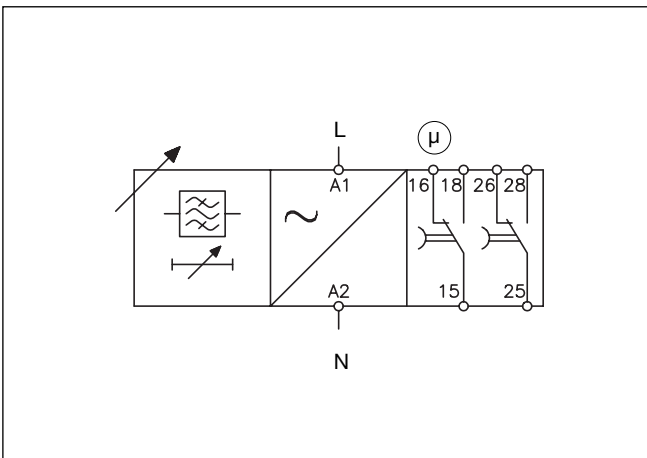
EFA measures the frequency of its own sinusoidal power supply, and the output relay is energized as long as the frequency is within the set upper/lower limits. This is indicated by the two built-in yellow LED's.

If the frequency rises above the set upper limit, then the centre yellow LED starts to flash and the output relay releases after the set time period.

If the frequency drops below the set lower limit, then the right yellow LED starts to flash and the output relay releases after the set time period. There will be no LED-indication after the time delay has expired.

EFA has a power ON delay of approx. 200 ms to prevent the relay from operating under in-rush conditions.

## Wiring Diagram



## Range/Time Setting

### Range setting

Upper left knob: Setting of upper limit on rotary switch.

Lower left knob: Setting of lower limit on rotary switch.

### Frequency range setting

Upper right knob: Rotary switch for selection of frequency range.

### Time setting

Lower right knob: Setting of time delay on absolute scale (0.1-30 s) for lower frequency range.

Centre right knob: Setting of time delay on absolute scale (0.1-30 s) for upper frequency range.

## Operation Diagram

