

**Frequency To Analog-Converter  
Model FA 9001**

**General**

The new converter **FA 9001** is a frequency to analog converter designed to generate a output current proportional to an input frequency. When using incremental encoders it is possible to obtain an output signal proportional to a velocity or revolutions per minute.

**Function**

The functional structure of the converter is shown in figure 1. There are two input channels provided. These input channels are optically isolated from the internal cuircuity.

The inputs channels are supplied with resistor networks. These network can be used as voltage divider. By this way the different input voltage levels can realized. In addition a high noise immunity will be reached. The input voltage range may be in the range of 5 V to 48 V. When ordering the desired input voltage value must be specified.

The input frequency gets to a doubling stage. Attention must be paid, that the pulse width high to low is about 50% (180° or 1/2 cycle). If both input channels are used the second input pulse must have 90 degrees out of phase.

When input frequencies have passed the doubling stages the output frequencies of the doubling stages are added. By this way input frequencies are quadrupled. The quadrupled frequency comes to a frequency divider. The frequency divider is programmable. Programming is done by a internal 8-pole dip switch. With the aid of the dip switch input frequency can be divided by values from 1 to 255.

The output pulses of the frequency divider gets to the frequency to analog converter. The frequency to analog converter generates a voltage which is proportional to the output frequency of the frequency divider. The output voltage of the frequency to analog converter is controlling a voltage to current converter.

The frequency to analog converter is configurated in this way that an input frequency of 1000 Hz is generating an output current of 20 mA. If the input frequencys at both input channels are 25 kHz (=100 kHz at the input of the converter) and the user wants an output current of 20 mA, the frequency

**Highlights**

- High Reliability
- Case For Harsh Environments
- Low Power Consumption
- Programmable Frequency Ranges

divider must be programmend with the value 100. The range of the output current can be chosen between 0...20 mA or 4...20 mA. When ordering the desired output current range must be specified. The output current is isolated from input channels as well as from the power supply. The max current load resistor is 1 k.

**Construction**

The unit **FA 9001** is designed for DIN-rail mounting according to EN 50022.

The **case** is of Polyamid PA 6.6 (color green) and can endure temperature from -40 °C to 100 °C. The operating temperature range is 0°C to 50°C. The unit is designed for use in harsh environments.

The screw terminals are provided for wires from 0,2 to 2,5 mm<sup>2</sup>.

**Start-Up**

Connections have to be made according to figure 1. The supply voltage is connected to the screw terminals 4 (+) and 5 (-).

Input frequencies are connected to 1 (+) respectively 2 (+) and the common line to 3 (-).

The output current is available at the screw terminals 7 (+) and 9 (-).

**Ordering Guide**

<b>FA 9001 -</b>	<b>0</b>		
		<b>Current Output</b>	
	<b>0</b>	0...20 mA	
	<b>1</b>	4...20 mA	
		<b>Frequency Input</b>	
	<b>0</b>	24 V	
	<b>1</b>	12 V	
	<b>2</b>	5 V	
	<b>3</b>	48 V	
		<b>Power Supply</b>	
	<b>0</b>	12 ... 36 V DC	

## Connections

### FA 9001-0XX

Screw Terminal 1	Frequency Channel 1 (+)
Screw Terminal 2	Frequency Channel 2 (+)
Screw Terminal 3	Common Input GND
Screw Terminal 4	Power Supply V DC (+)
Screw Terminal 5	Power Supply V DC (-)
Screw Terminal 6	Ground connection
Screw Terminal 7	Output Current (+)
Screw Terminal 8	nc
Screw Terminal 9	Output Current (-)
Screw Terminal 10	nc
Screw Terminal 11	nc
Screw Terminal 12	nc

## Specifications

<b>Input Channels</b>	
Voltage	: 5 V ... 48 V *)
Current	: 5 mA
Max. Frequency	: 25 kHz
<b>Output Channel</b>	
Current	: 0...20 mA/4...20 mA *)
Resistance	: < 1 k
<b>Accuracy</b>	
Input/Output	: < 0.2%
Temperature	: Typ. 50 ppm/°C
<b>Power Supply</b>	
Power Supply	: 12 ... 36 V DC
Power consumption	: max.135mA (10V DC)
<b>Operating Temperature</b>	
Operating Temperature	: 0 to + 50 °C
<b>Storage Temperature</b>	
Storage Temperature	: -20 to + 70 °C
<b>Environmental Conditions</b>	
EMV	: acc. ENV 50121-3-2
Protection	: IP40
Classe	: VO (UL94)
Mounting	: EN 50022
<b>Dimensions</b>	
Dimensions	: 99 x 114,5 x 17,5 mm
Weight	: 100 g

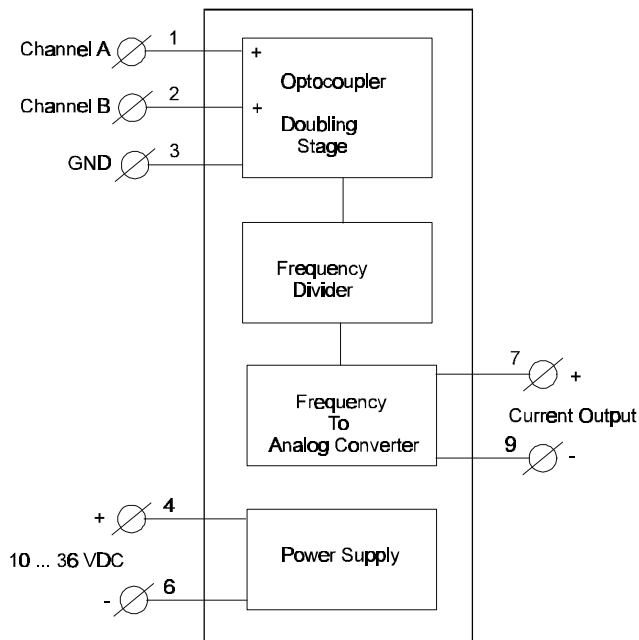


Figure 1

## Dimensions

