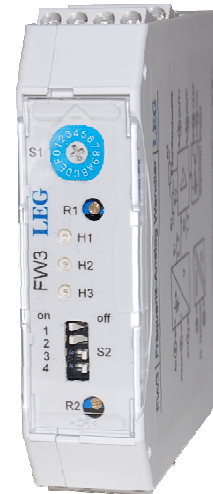


## Frequency / Analog Converter with limit switch

**FW3**

Characteristics:

- Linearity error < 0,2%
- Input frequency 1Hz to 10kHz
- Input frequency arbitrary configurable
- Output voltage/current switchable
- Status display of the input frequency
- Integrated limit switch
- Supply 20...253V<sub>uc</sub>
- Mountable on 35mm cap rail TS35
- Clear terminal labeling
- Narrow design
- Shape 22,5mm
- High reliability, 5 years warranty



Description:

The devices of the series FW3 frequency / analog converter have been developed for proportional converting of low to middle frequencies into a norm signal. With this series frequencies from 0...1Hz to 0...10 kHz can be converted into analog signals from 0...10V or 0/4...20mA. The devices are working according to the principle of the pulse- width- measurement and therefore are providing a valid measurement signal after two signal periods only.

Additional the FW3 is equipped with an integrated limit switch. The input nominal level is 24V, the signal form is set as a square-wave pulse.

The input frequency range can be roughly adjusted by the rotary switch S1, and by potentiometer "V" (R1) you will be able to do the fine adjustment. The offset of the analog output is factory-adjusted.

Via Dip-Switch S2 the output can be switched configured to the standard norm signals 0...10V and 0/4...20mA.

To adjust the switching point of the limit switch the rotary switch S1 has to be set to position "0" and with potentiometer R2 at the analog output the switching threshold will be adjusted. The reaching of the switching point is reported by a potential free optocoupler output (H3).

A LED H1 displays the status of the input frequency. Because of the used measuring principle particularly it can happen, especially at very slow frequencies or sudden failure of the measurement signal that the last valid measurement result stops at the analog output. If this is not desired, you can reset the device via an opto-decoupled reset-input (H2) (Output = 0V).

Application:

Signal switching frequency/analog; Monitoring of slowly rotating machine parts; Speed-zero recording of engines; Over- speed detection at drives; Stop detection; Speed monitoring of gears by means of gearwheel-edge detection.

Switch setting S1	Measurement range
0	Adjustment limit switch
1	0... 1Hz to 0...2Hz
2	0... 2Hz to 0...4Hz
3	0... 4Hz to 0...8Hz
4	0... 8Hz to 0...16Hz
5	0...15Hz to 0...30Hz
6	0...30Hz to 0...60Hz
7	0...60Hz to 0...120Hz
8	0...120Hz to 0... 200Hz
9	0...200Hz to 0...400Hz
A	0...400Hz to 0...800Hz
B	0...800Hz to 0...1600Hz
C	0...1,2kHz to 0...3kHz
D	0...3kHz to 0...5kHz
E	0...5kHz to 0...10kHz

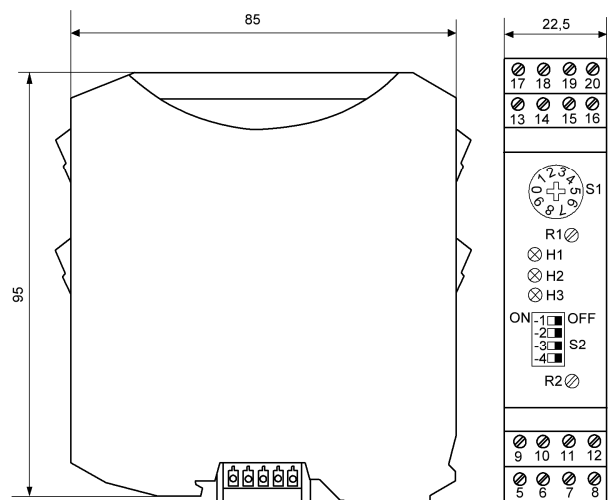
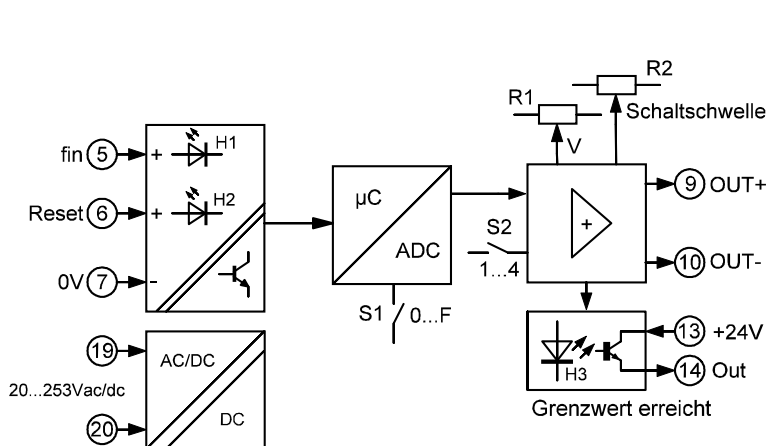
Output	S2 - 1	S2 - 2	S2 - 3	S2 - 4
0...10V	On	On	Off	Off
0...20mA	Off	Off	On	Off
4...20mA	Off	Off	On	On

**Adjustment example:**

Input signal: 100 Hz  
Output signal: 4...20 mA

S1: position 7  
S2: off, off, on, on

Connect input with 100 Hz.  
Adjust output R1 to 20mA.



## Technical data

### Auxiliary power:

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Supply voltage : 19...255V<sub>ac</sub>  
Current consumption : 1W...2,5VA

### Inputs:

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Signal amplitude : 24V (16, 8...30V)  
Signal power : 5...8mA  
Frequency : 0...1Hz to 0...10 kHz adjustable via S1 and potentiometer V (R1)  
See table "switch position S1"  
Signal form : Square wave  
Setting time : Depends on the measurement frequency / 2x Period + 500µs

### Analog output:

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Voltage output : 0...10V / max. 20mA  
Current output : 0(4)...20mA / load resistor max. 500Ω

### Digital output:

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Optocoupler : 24DC / 100mA, short circuit proof  
Switching threshold : 0...100% adjustable with R2  
Switch hysteretic : 5% of the adjusted limit

### Accuracy:

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Linearity error : < 0, 2%  
Measurement resolution: 12 Bit in every measurement range  
Temperature coefficient : < 50ppm / K

### General data:

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Operating temperature : 0...50°C  
Storage temperature : -25...+85°C, condensation before putting into operation is not allowed  
MTBF : 130 years Mean Time Between Failures – according to EN 61709 (SN 29500).  
Requirements: Stationary operation in clean rooms, average ambient temperature 40 ° C, no forced ventilation, continuous operation  
CE conformity : EN 61326-1, EN 61000-4-2/3\*/4/5/6\*, EN 61000-6-4  
\* during measurements small deviations are possible

### Body:

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Dimension : 22,5mm adjoin body, 22,5x114,5x104,5mm (with terminals)  
Material : PA / V0  
Protection category : IP20  
Fixing : M3-screw-type terminal 0, 14 - 2,5mm<sup>2</sup>, flexible or inflexible  
Fixing : Snap-on mounting for norm rail TS35  
Weight : 120g

**Note on safety:**

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Disconnect the power supply before attempting to open the unit.

During the operation of this module it is possible that parts of the module, even there is extra-low voltage, (for example shunt measurement) are under dangerous voltage! Therefore a non-observance of this caution may cause damage of property or physical injury.

Only trained qualified personnel should install or operate the unit. Before installation the qualified personnel should read the documentation and should familiarize themselves with the unit.

If there is visible damage to the body of the unit it should be immediately replaced and not put into operation.



Please ensure that there is a sufficient prevention against electrostatic discharge during installation of the unit.

**Installation Information:**

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Pay attention and make sure the unit is far away from mounted sources that may disturb the device such as magnetic coils, transformers, frequency converters etc.

**Wiring advice:**

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Use only shielded cables. The shield is to be connected extensively to ground. Do not mix power- and signal-wires/cables in the same cable tray.

**Limited warranty:**

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The LEG Industrie-Elektronik GmbH warranted that the product does not have any material or processing defects in a period of 5 years after date of delivery.

It is up to the choice of LEG to repair or to exchange an inoperative unit.

Subsequent damages or any claim for indemnification above the functionality of the unit are excluded.

This limited warranty is only valid if ...

1. the product was installed and put into operation according to the LEG operation documentation;
2. the technical configuration of the power supply was abided;
3. the product was not used for unintended purposes;
4. there were no unauthorized modifications or manipulations, misuse or repairs without previous agreement from LEG .

Our Terms of Trade are based on the "General Conditions for the supply of products and services of the Electrical and Electronics Industry" including the "Complementary Clause: Extended Reservation of Property" of the ZVEI e.V. (German Association of Electrical Manufacturers).

**Miscellaneous:**

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We expressly reserve the right, without previous notice, to correct errors contained in any data of this information brochure, and to make alterations to the program and technical modifications.