

# Carrier frequency measuring amplifier

# MBI 46.31



The measuring amplifiers of the MBI 46.31 series were specifically developed to operate inductive measuring transducers in connection with differential inductor or differential transformer circuits.

- ↳ Robust design on European standard size PCB or in housing
- ↳ Compatible with 19"-assemblies and 19"-housings
- ↳ Power supply 220 V,  $\pm 15$  V or +24 V
- ↳ Output 10 V or 4...20 mA
- ↳ Easy zero-value adjustment

**MESSOTRON** Hennig GmbH & Co.KG  
Friedrich-Ebert-Str. 37  
D-64342 Seeheim-Jugenheim  
Germany

Tel.: +49/6257 82331  
Fax: +49/6257 85783

## Technical description

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The carrier frequency measuring amplifier MBI 46.31 supplies the 5 kHz bridge supply voltage required for operating inductive measuring transducers and it interprets the signal from the transducer.

The amplifier is available with either voltage output (max.  $\pm 10$  V) or current output (4 ... 20 mA). The voltage output can be set to  $\pm 1$  V ...  $\pm 10$  V. The zero-value is adjustable to any value within the full range, with symmetric and asymmetric transducers.

As baseline, the amplifier supply is  $\pm 15$  Volt. Optionally, 220 V~ oder +24 V supply is available.

The carrier frequency measuring amplifier MBI 46.31 is accommodated on a European standard size PCB 100 x 160 mm. It can directly be inserted into 19"-units or racks, interfacing via a DIN 41612 connector or a terminal block. Optionally, a housing-integrated (IP 65) version is available.

Adjustment is possible of zero-value setting, the gain and, if necessary, of the phase. Setting is done on trimmers at the front panel - no adjustment on the PCB is required.

In connection with MESSOTRON transducers the adjustments are effected before delivery.

## Types

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### MBI 46.31.xy

Supply $\pm 15$ V .....	1	1 .....	Euro PCB without front panel, 10 V-output; connector
Supply 220 V~ .....	2	2 .....	Euro PCB without front panel, 4 ... 20 mA-output; connector
Supply +24 V .....	3	3 .....	Euro PCB with front panel, 10 V-output; connector
		4 .....	Euro PCB with front panel, 4 ... 20 mA-output; connector
		5 .....	Euro PCB without front panel, 10 V-output; terminal block
		6 .....	Euro PCB without front panel, 4 ... 20 mA-output; terminal block
		7 .....	Housing, 10 V-output
		8 .....	Housing, 4 ... 20 mA-output

**Note:** The 10 V port delivers an output signal of  $\pm 10$  V with symmetric systems (most standard inductive transducers), with asymmetric systems ( e.g. MESSOTRON transducers type WP) between **0 ... 10 V**.  
Signal customisation is possible (option).

## Specifications

### Suitable transducers

Type inductive transducer in differential inductor or transformer circuit  
 Required sensitivity 20 ... 600 mV/V

### Oscillator

Carrier frequency 5 kHz  $\pm 5\%$  (sinusoidal); other frequencies optional  
 Bridge supply voltage approx.  $2 V_{\text{eff}}$   
 Supply current max. 12 mA<sub>eff</sub>

### Amplifier

Linearity error < 0,1%  
 Temperature coefficient of zero-value < 0,1% /10K @ 100 mV/V transducer sensitivity  
 < 0,15% /10K @ 20 mV/V transducer sensitivity  
 Temperature coefficient of sensitivity < 0,05% /10K @ 100 mV/V transducer sensitivity  
 < 0,15% /10K @ 20 mV/V transducer sensitivity  
 Noise level (Residual carrier voltage) < 2 mV<sub>eff</sub>  
 Input resistance approx. 200 k $\Omega$   
 Max. load current 6 mA  
 Zero-value adjustment range ca.  $\pm 10\%$  of nominal range, by trimmer  
 up to 100% of nominal range, by resistor  
 Cut-off frequency of measuring signal (-3 dB) 200 Hz

### General technical data

Power demand max. 2 W @  $\pm 15$  V- or +24 V-supply voltage  
 Zero-value adjustment by trimmers  
 Gain adjustment fine by trimmer  
 coarse by resistor  
 Phase adaptation fine by trimmer  
 coarse by capacitor Dispensible with  
matched amplifier  
 Interface Connector acc. to DIN 41612, 32-pin, type C  
 Special version: 16-pin terminal  
 Mating part Multiple contact strip (DIN 41612) 32-pin, type C / D  
 Operating temperature 0 ... 60°C  
 Storage temperature -25 ... 85°C

### Type dependent technical data

Supply  $\pm 15$  V stabilized; +20 ... +30 V stabilized; 220V~  
 Output  $\pm 10$  V; 4 ... 20 mA  
 Dimensions (without front panel and housing) ca. 100 x 167 x 18 mm  
 ca. 100 x 167 x 26 mm with 220 V-supply  
 Front panel dimensions 35,3 x 128,4 mm (19": 7 TE x 3 HE)  
 Mass (without front panel and housing) ca. 0,1 kg (0,47 kg @ 220V supply)  
 Mass with front panel ca. 0,13 kg (0,5 kg @ 220V supply)

Dimensions and mass of housing-integrated amplifier are specified on the dedicated data sheet 'Amplifier with housing'.

Subject to alteration  
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