

Carrier frequency amplifier with programmable display



MBI 46.41

The MBI 46.41 combines a carrier frequency amplifier with a processor-controlled display unit. It can operate inductive (as well as ohmic or capacitive) sensors in half or full bridge configuration. Positions are directly displayed and can be acquired via digital interfaces.

- Supply 85 to 250 VAC or 11 to 36 VDC
- 5-digit, 14mm-size display with 20 readings/sec
- integrated sensor signal conditioner
- extendable by analogue outputs and digital interface cards (e.g. RS 485, PROFIBUS-DP)
- 16-point sensor linearization
- multiple scaling and programming features
- quick setting via front panel or PC-software
- up to IP 65 protection

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Functional description

The carrier frequency amplifier MBI 46.19 powered (24 VDC/50 mA) from the display unit generates the 5 kHz (other frequencies optional) bridge excitation to operate an inductive (or resistive or capacitive) sensor. The position-proportional sensor signal is conditioned and then acquired and displayed. Scaling, linearization and further signal adjustment can be applied in the display unit's processing capability. The signal can directly be displayed in mm or as voltage.

Pre-adjustment of amplifier and display unit can be done at factory for Messotron sensors. In addition to programmable scaling functions, analogue adjustment facilities are provided in the amplifier for zero and gain, accessible without case opening.

Two slots allow to plug-in cards for analogue output and digital interface. Adjustments can be made via front panel or by PC (via a digital interface card).

The unit is designed for Control panel or case mounting. Protection class IP 65 (front for panel mounting, all sided for case integration) can be achieved.

Model overview

MBI 46.41.xy

| | | | | |
|--------------------|----------|---|----------------|---|
| 85...250 VAC | 2 | } | 0 | w/o output card (direct amplifier output only 0...10 V) |
| 11...36 VDC | 3 | | 5 | analogue output card, 0...10V, 0/4...20 mA-output |
| | | | 6 | Interface card RS 232 |
| | | | 7 | Interface card RS 485 |
| | | | 8 | Interface card Profibus-DP |
| | | | 9 | Interface card DeviceNet (please enquire) |

Options:

| | |
|-------|---|
| / AL | IP 65 aluminium case |
| / KU | IP 40 plastic housing |
| / PRO | Windows programming software and RS 232 interface cable |
| / GR | green display, dimmable |

Specifications

General

| | | |
|------------------------|--|-------|
| Power supply | 24 resp.. 85 ... 250 VAC: | 15 VA |
| | 11 ... 36 VDC: | 11 W |
| Connection | terminal block | |
| Operating temperature | 0 ... +50°C | |
| Storage temperature | -25 ... +85°C | |
| Rel. humidity | max. 85% rF, non-condensing | |
| Dimensions | B 96 x H 48 x T 104 mm | |
| Required cut-out (DIN) | B 92 x H 45 mm, mounting frame and screws | |
| Weight | approx. 0,6 kg | |
| Housing | dark red, impact-resistant plastic | |
| Protection class | IP 65 front sided | |
| Case (Option) | 1) plastic, approx. H83xB168xT220, IP40 2) aluminium, powder-coated, approx. H83xB168xT220, IP65 | |

Sensor signal conditioner

| | | |
|---------------------------------|---|--|
| Carrier frequency | 5 kHz \pm 5% (sine); other frequencies optional | |
| Excitation | approx. 2 V _{eff} | |
| Supply current max. | 12 mA _{eff} | |
| Accuracy | < 0,3% FSO | |
| Linearity | < 0,1% FSO | |
| Temperature coefficient of zero | < 0,1% /10K @ 100 mV/V sensor sensitivity | |
| | < 0,15% /10K @ 20 mV/V sensor sensitivity | |
| Temperature coefficient of span | < 0,05% /10K @ 100 mV/V sensor sensitivity | |
| | < 0,15% /10K @ 100 mV/V sensor sensitivity | |
| Noise (residual carrier) | < 2 mV _{eff} | |
| Input impedance | approx. 200 k Ω | |
| Cut-off frequency (-3 dB) | 200 Hz | |
| Zero adjustment range | approx. \pm 10% of nominal by trimmers | |
| Span adjustment range | approx. \pm 10% of nominal by trimmers | |
| Output | 0...10V (Option: 4 ... 20 mA) | |
| Output current max. | 6 mA | |
| | <i>Please enquiry for specific adaptation on zero and span.</i> | |

Suitable sensors

| | |
|-------------|--|
| Type | inductive (resistive, capacitive) sensor in half- or full-bridge configuration, max. allowed Phase shift 10° |
| sensitivity | 20 ... 600 mV/V |

Display

| | |
|--|--|
| Input | 0...10VDC (used by signal conditioner) |
| Output | 1 mV |
| Accuracy | 0,03% oV + 2 mV (18...28°C) 0,12%oV + 3 mV (0...50°C) |
| Input overload | 300 VDC |
| Zero | compensation in 12 sec intervals |
| Display | 5-digit, 14 mm, red, adjustable intensity |
| Unit | "mm" |
| Reading | 20 / sec @ 16 bit |
| Reaction time | 0,2 sec typical, max. 0,7 sec (larger with digital filtering) |
| Programming functions (on front or via software - Option) | Scaling, Summing, Min-/Maxwert, Tare, 16 point linearisation, 3 user inputs |

Output-/Interface cards

Analogue

| | |
|------------|---|
| Output | 0...20 mA, 4..20mA, 0...10VDC |
| Accuracy | 0,17% (18...28°C) / 0,40% (0...50°C) |
| Resolution | 1/3500 |
| Load | 0...10VDC: min. 10 kOhm 0/4...20mA: max. 500 Ohm |

RS 232

| | |
|----------------------------|----------------------------------|
| Link | point-to-point |
| Baud rate | up to 19200 Baud |
| Logical states (receiving) | 1: -3 ... -15VDC, 0: +3...+15VDC |

RS 485

| | |
|----------------------------|--|
| Link | max. 32 devices on 2-wire line (half-duplex) |
| Max. distance | 130 m |
| Baud rate | up to 19200 Baud |
| Logical states (receiving) | 1: -3 ... -15VDC, 0: +3...+15VDC |

Profibus-DP

| | |
|---------------------|--|
| Field bus: | Profibus-DP acc. to Standard En50170, implemented using SiemensSPC3ASIC |
| BUS interface: | Isolated RS485 on 9-pol. SUB-D connector |
| Network isolation | 500 Vrms for 1 Minute (50V) between Profibus-DP and card inputs (common) |
| Supply | Internal supply |
| Output power | max. +5 VDC @ 90 mA on 9-pol. SUB-D connector pins 5 (GND) and 6 (+5V) |
| Baud range | 9,6 KB to 12 MB |
| Device address | 0 to 126, set by master via network; address stored in permanent on-board memory |
| Supported functions | 'Freeze'- and synchronisation mode |

Subject to change without prior notice