

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)	500 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	

Please enquiry for specific adaptation on zero and span.

Suitable sensors

Type	inductive (resistive, capacitive) sensor in half- or full-bridge configuration,
sensitivity	max. allowed Phase shift 10° 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