Technical Information

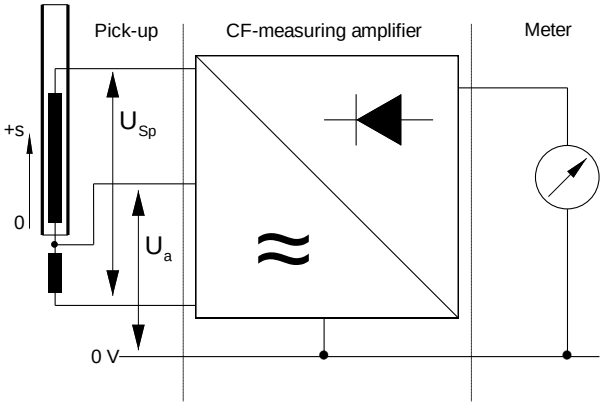
for use of long-stroke transducers, series WP

❶ Characteristics

Long-range transducers of series WP are pressure-tight inductive transducers, designed for mounting in hydraulic or pneumatic cylinders. A tube-shaped sleeved core moves in axial direction over a cylindrical peg-shaped transducer. These transducers feature a good body-to-stroke ratio, easy mounting and the capability to easily and accurately measure displacements of high-dynamics.
Non- or low conductive media do not influence the measurement process.

❷ The electrical system

The displacement (of the sleeved core inserted in a cylinder plunger) is measured in an inductive way, based upon the eddy-current principle. The sleeved core influences a magnetic field induced by two coils in a half-bridge circuit. The variation of this magnetic field is picked up as a displacement proportional signal.
One of the two coils is simulated by a compact equivalent electronic circuitry. Thus, the natural zero is at the inner end position of the stroke (unlike other inductive systems with a default zero-value at stroke center).
An inductive transducer is operated using a carrier frequency (CF) amplifier. The device supplies an AC voltage U_{Sp}, amplifies the transducer amplitude-modulated output signal U_a and converts it to an easy-to-process DC signal (e.g. 0 ... 10 V).



❸ Mechanical design - Installation

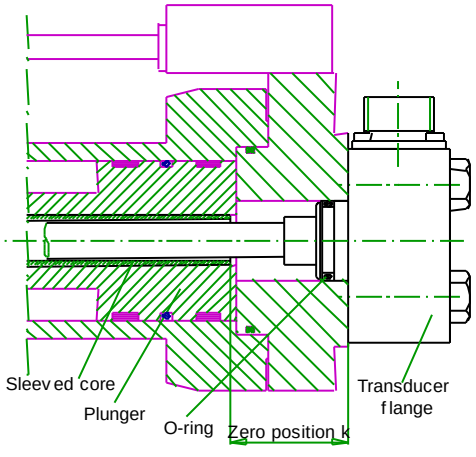
The transducer case is made of high-quality stainless steal.

The electrical system is entirely potted inside the flange. The transducer can sustain operating pressures of up to 320 bar and high vibrations loads.

The 2 mm-clearance between sleeved core and transducer case prevents mechanical contact and eliminates transducer wear-out.

The transducer is flanged to the cylinder bed by 4 screws size-M8. An O-ring Ø20 x 2,5 provides the pressure sealing.

The sleeved core must be inserted in the cylinder plunger in accordance with the specified zero. The amplifier's zero trimming capability allows some adjustment.



❹ Scope of delivery

The transducer is supplied with the pertaining sleeved core. With a connector interface, the mating connector is supplied as well.

❺ Connection

Connect the transducer via a shielded, low-capacitance wire to the amplifier as follows:

Transducer		Signal	MESSOTRON-measuring amplifier MBI 50.33.x		MESSOTRON-measuring amplifier MBI 46.31.xx	
Wire interface	Connector interface		connector	terminal block	connector	terminal block
red	B	supply voltage	ac 4	15	ac 4	15
blue	C	supply voltage	ac 2	16	ac 2	16
white	A	output	ac 8	13	ac 8	13
black		not used				
shield	---	common	ac 10	12	ac 12	11

Only on amplifier side (not on transducer side) connect shield to common (0 V).

Precautions: Make sure that transducer connecting wires are not routed parallel to cables leading high current or control signals. Avoid electromagnetic fields of motors, transformers or thyristor-systems. Observe local regulations for electric installations (in Germany: VDI/VDE 3551).

With appropriate routing of transducer connecting wire, a distance of up to 250 m between transducer and amplifier is tolerable.

❻ Calibration

Perform the calibration at operating temperature and operating pressure.

The natural zero position is at the stroke inner end position, with the sleeved core close to the flange. The zero position is specified in the data sheet.

After sleeved core mounting (see ❸, mechanical design – installation), set the amplifier by the zero trimmer to 0 V (respectively 4 mA with 4 ... 20 mA-output).

Displace the cylinder plunger by approx. ¾ of its stroke. Compensate for the transducer's phase shift by adjusting the amplifier's phase trimmer to output signal maximum. Check again zero position setting and re-adjust as required.

To adjust the amplifier span, displace the cylinder plunger to maximum stroke and set output signal using the span trimmer to the required full-stroke value (e.g 10 V).

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