

| Technical data | MFX 500-B |
|---|---------------------------|
| Accuracy class EN ISO 9513 | 0.5 |
| Indication error (rel.)* | 0.5 % |
| Indication error* | 1.5 µm |
| Error in gauge length (L _e) | ± 0.5 % |
| Gauge length (L _e) | 10... 500 mm minus travel |
| Activating force | max. 10 cN |
| Clamping force | 50 - 100 cN |
| Operating temperature range | 0 - 50 °C |
| Weight | approx. 30 kg |

| Measuring system (2 outputs) | Standard | Optional |
|---|--|------------------------|
| Name | LIDA 48 | LIDA 47 |
| Interface (each output) | 1 Vpp | RS422/TTL |
| Measurement principle | Optic-incremental | |
| Travel | 500 mm minus L _e and position | |
| Signal period | 20 µm | 0.2 µm |
| Resolution max. | 0.01 µm | 0.05 µm |
| Voltage supply | DC 5 V ±0.25 V | |
| Current consumption | <100 mA | <255 mA (without load) |
| Integrated interpolation | ===== | 100-fold |
| Sampling rate | ===== | 25kHz |
| Edge distance | ===== | 0.080 µs |
| Movement speed | ≤480 m/min | ≤30 m/min |
| Input frequency of the subsequent electronics | ===== | 8 MHz |
| Edge separation of the subsequent electronics | ===== | ≥0.05 µs |

* The larger of the values is admissible

Sample dimensions

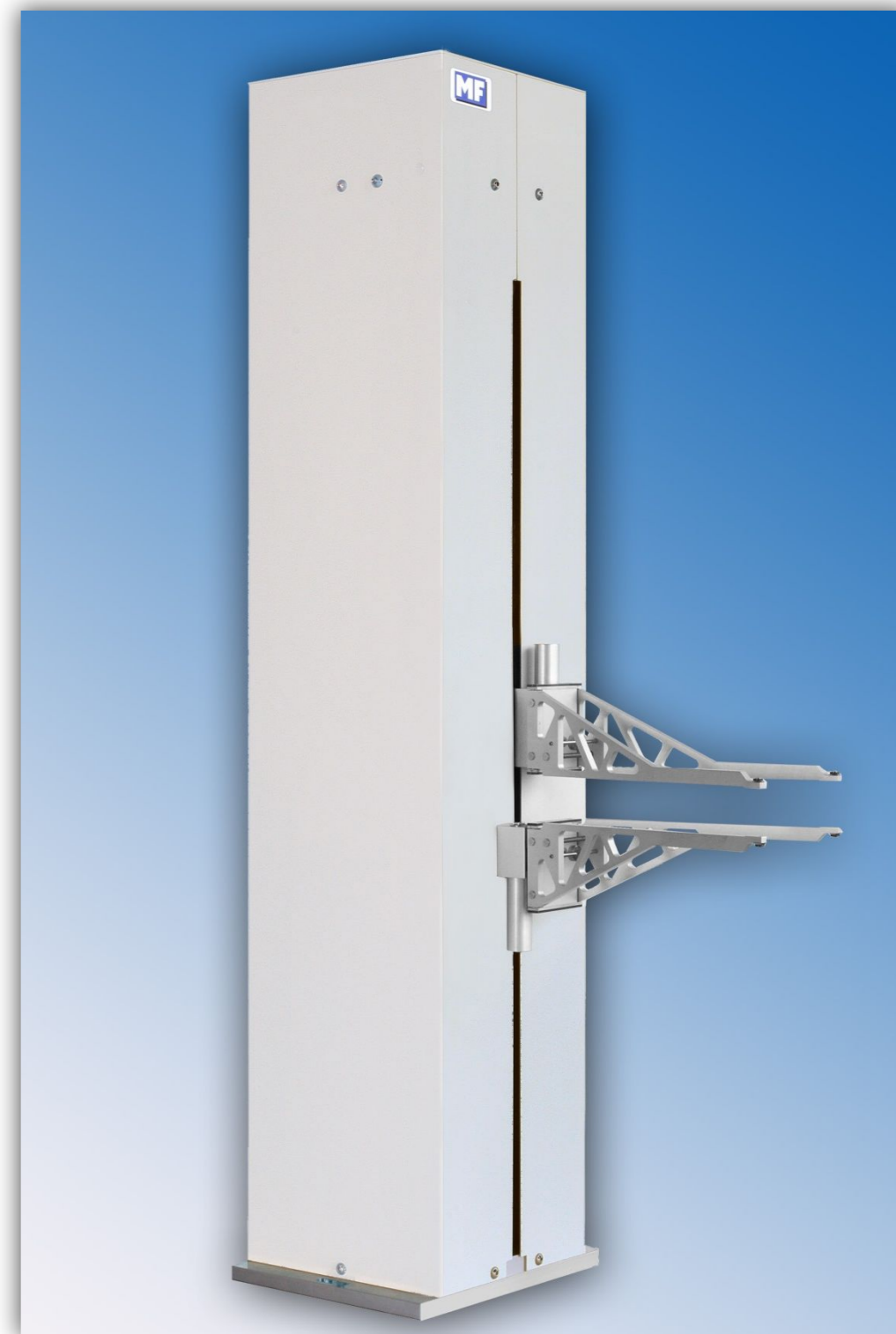
| | |
|---|------------------|
| Round samples | up to Ø 80 mm |
| Square samples | up to 70 x 70 mm |
| Rectangular samples (width / thickness) | 360 / 50 mm |
| Other dimensions are available on request | |

Device options

1. Measuring arms with tilting mechanism with tungsten carbide knife edge circular/straight
2. Adjustable clamping force 20... 100cN
3. Extended measuring arms +45 mm or +90 mm
4. Measuring head for climatic chamber -50° ... + 350° C / Arm length 400 mm and 490 mm
5. Measuring arm for bending tests / Arm length 400 mm and 490 mm

MFX 500-B - Operating instructions

Feeler arm extensometer - automated -



M e s s - & F e i n w e r k t e c h n i k G m b H



P r e c i s i o n t e s t i n g o f l i n e a r s t r a i n

Controlling

Automatic Control:

The MFX 500-B must be controlled via D-Sub connector X1 (15pin). The analogous tensions of gauge length and position have to be connected to pin X1-10/X1-13.

With a pulse to X1-1/X1-2 (approx. 100 ms) the upper and lower measuring heads move to their positions depending of the analogous tensions which are set to X1. The measuring arms close and pins X1-5/X1-6 indicate the closure of internal contact K1-1 (status). Now the MFX 500-B is ready for the measurement process. With a pulse to X1-1/X1-3 (approx. 100 ms) the measuring arms open immediately and the measuring heads move to their former positions.

The open contact k1-1 indicates the end of the test via X1-5/X1-6.

Manual control:

The MFX 500-B can also be controlled by a manual control board (see wiring diagram).

Function: When pushing the button S3 the measuring heads move to their position depending on the analogue tensions set with the potentiometer R1/R2 before. As long as the button S3 is closed adjustments of the gauge length (R1) and position (R2) can be made by operating R1/R2. After gauge length and position are set the button S3 has to be released and the button S1 has to be pushed to start the measuring process.

Pushing the button S2 will end the measuring process, the measuring arms open immediately and the measuring heads take their initial position. The MFX 500-B is now ready for the next test. As long as gauge length and position do not change only the button S1 (start test) respectively S2 (end test) must be activated.

Counter setup/initial gauge length setup

The adjustment of customers counter will be done by a PC controlled movement on $L_e < 9.5$ mm (contact X1/4). The measuring heads move together and the distance between the knife edges is 9.5 mm.

This adjustment can be made by means of the counter's preset function. After this adjustment the counter display indicates the exact knife edge distance (initial gauge length) for every position of the measuring heads. The counter setup is necessary once after switching on the system but not after each test.

Measuring signal

Two different measuring outputs are available. LIDA 48 (1 Vpp) or LIDA 47 (RS422/TTL). Two of each LIDA gauge systems of company Heidenhain are inbuilt for the registration of the tensile strain.

Each measuring head produces a measuring signal, which can be acquired via plug X12 (the upper measuring head) and X10 (the lower measuring head). At LIDA 48 measuring system the sinus incremental signals A and B have a phase difference of 90° and a signal level of typically 1 Vpp. At LIDA 47 measuring system the incremental signals are given out as rectangular pulses Ua1 and Ua2 with 90° phase-shifted. The integrated electronics generates additionally for a noise free transmission inverse signals Ua1 and Ua2 of them.

The initial output signals of the 2 LIDA gauge heads first have to be evaluated separately and afterwards have to be taken in account.

For digitalization respectively counting offers e.g. the company Doli different following electronics or the company Heidehain a counter card IK220 (1 Vss) but without Software.

The connectors X13 /LAN and X14 / USB are in progress and must not be connected.

Installation

The fastening of the MFX has to be done central and right-angled with respect to the test axis. Long holes in the fixing plate allow corrections even later on.

Attention!

When the MFX is set up and fixed to the testing machine it is absolutely necessary to straighten the exact position of the device by means of a spirit level. This is essential for the balance weight to hang absolutely free.

Fastening measuring heads

The measuring heads have to be mounted to the carriages of the MFX

by means of the small guiding pins which also prevent wrong mounting. Upper and lower measuring heads are interchangeable. The measuring heads finally have to be fixed with two hexagon screws.

Alignment of the measuring arms

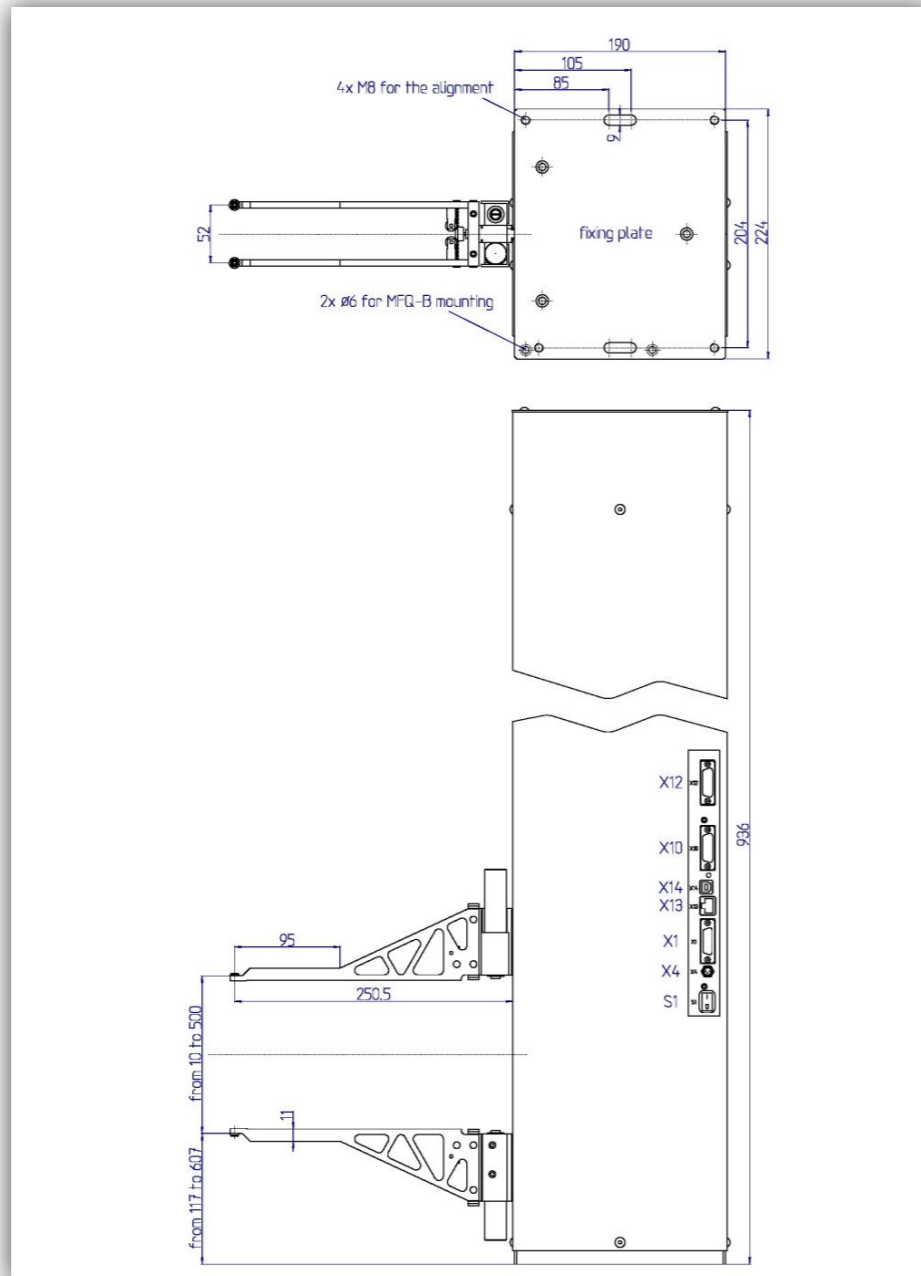
The alignment has to be done in order to ensure the same knife edge distance (L_e) on both sides of the measuring arms. Therefore in the first step the measuring arms have to be moved to the position "open". Afterwards the two hexagon fastening screws of the measuring heads have to be let off slightly ($\frac{1}{4}$ of a turn). After this the measuring arms have to be aligned in front of the knife edges, so that there is no gap on both sides of the arms when they are pushed gently together by hand. In this position

the hexagon screws have to be tightened. This alignment has to be checked again and if necessary it has to be corrected.

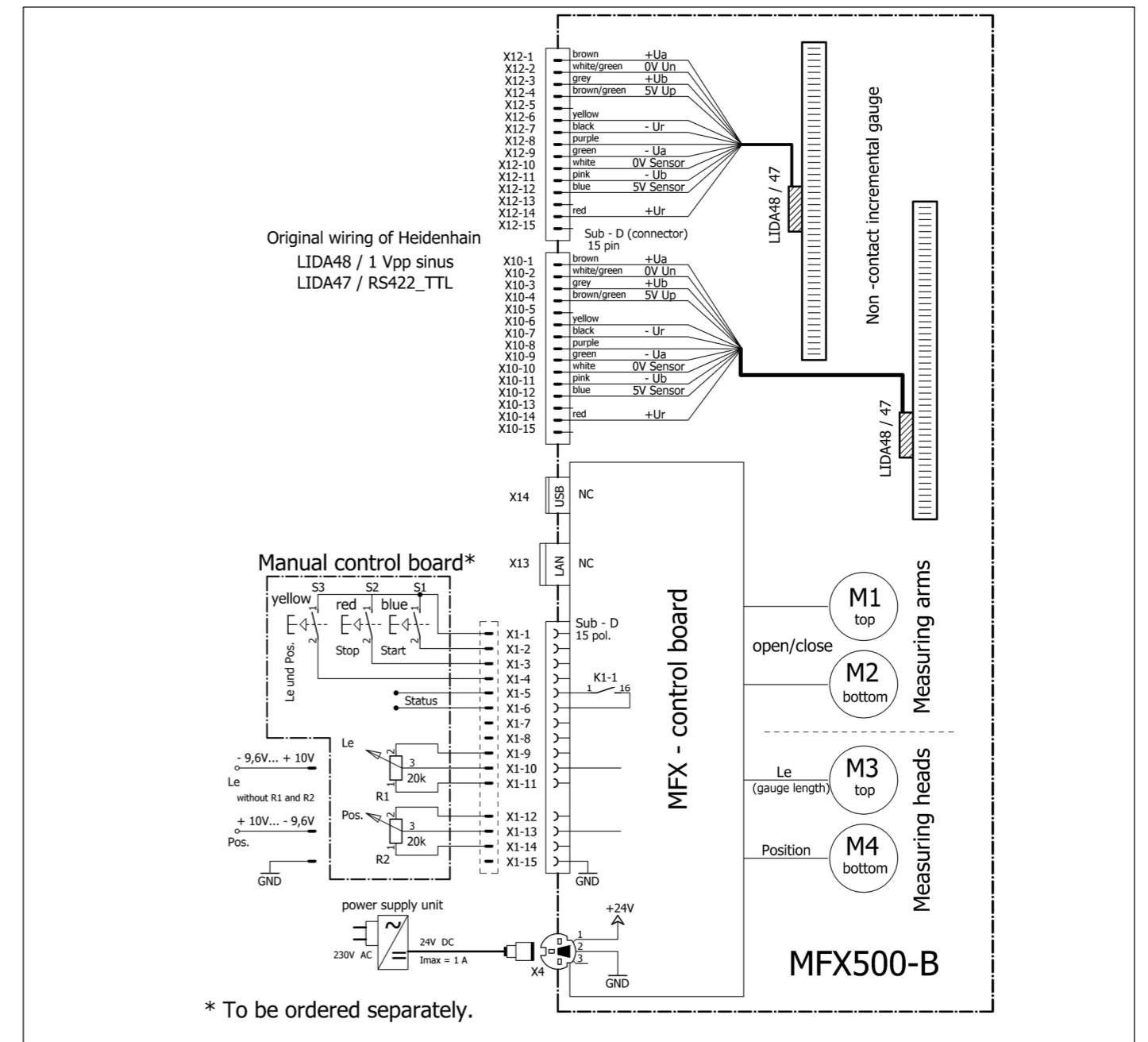
Maintenance

The MFX extensometer is usually maintenance-free. However in dirty environments it may be necessary to clean the columns and ball bearings inside the housing. Therefore the housing has to be removed. Columns and bearings have to be cleaned with a cloth soaked in alcohol or acetone. Care has to be taken not to wash any solvent into the bearings.

The whole guiding system has to be kept dry and free of grease.



Picture 1: MFX 500-B - Dimensions



Picture 2: MFX 500-B - Connection diagram