SERIES MIX

MAGNETIC LENGTH MEASURING SYSTEM

- Ideal for hostile environments
- Non-contacting measurement
- Resolution from 1.0 to 0.005 mm
- Marker Reference signal available
- Square wave "Encoder" output signal at TTL or 10-30 V
- Suitable for position indication and control

Only functional with an ELGO MB20-50-10-1-R magnetic tape!
General Description

The MIX Series is a more advanced and accurate version of the well known Elgo MIX system. It comprises a tape of magnetised rubber material in a steel sandwich, a sensor and a translator. The sensor and translator can be supplied as an integrated unit and offers an advantage where space is not a problem.

Construction of tape type MB20-50-10-1-R

The highly flexible magnetised rubber tape A, is supplied bonded to the ferrous backing steel strip B. The protective covering stainless steel tape C is fitted on site by means of double sided sticky tape. This allows flexibility for shipping.

The Tape can be supplied in any length up to 32 m. It is simple to cut to any desired length.

Specification of tape MB20-50-10-1-R

- Operating temperature: -10... +70 °C
- Accuracy (µm) at 20°C: ± (25 + 20 x L)
  Where L is effective length in m
- Temperature coefficient: 16x10^-6 /°C
- Protection class: IP67
**Reference Mark**

The reference mark is generated from a short length (3mm) of tape, stuck by the side of the main measuring Tape. A separate sensor is used and the signal gated with main signal to give a unique accurate reference point.

**Remark:**

MIX4 and MIX5 SN033: The reference mark dice can be mounted inside the real operation range.

MIX5: The reference mark dice **must be mounted outside** the real operation range.
**Sensing Systems**

Three forms of Sensor are available.

- **MIX1**: Small Sensor with separates Translator
- **MIX3**: Translator and Sensor integrated in one unit
- **MIX4**: As MIX3 but with additional Sensor for Reference mark (one time)
- **MIX5**: As MIX4 but with additional Sensor for a permanent Reference mark
- **MIX5 SN033**: Includes an additional input for enabling the reference process

The Translator for the small MIX1 Head has the same physical construction as the integrated Translator/Sensor.

**System MIX1**

This comprises Sensor MS20.60 Translator MIC1 MS20.60

![Diagram of Sensor MS20.60 and Translator MIC1 MS20.60]
Technical Specifications MIX1

Sensor/Translator cable length: 1,3,5,10,15,20 m (other lengths on request)
Protection class:  IP66 (head) IP40 (translator)
Enclosure: zinc cast
Operating temperature: 0 to +50°C
Minimum cable bending radius: 60 mm
The Sensor connects to the Translator by means of special calibrated highly flexible cable with 8 pin connector.

Translator MIX1

BU2: Rectangular wave output cable to controller
   (This screened cable is to be supplied by customer)
   Connector mate provided
BU1: Special cable to Sensor Head, complete with connector mate.
System MIX3/MIX4/MIX5

These are integrated Sensor and Translator systems.
MIX4/MIX5 incorporates Sensor for Reference mark.
All Translators (and Translator/Sensors) have the following features.

The output resolution is selectable by means of a rotary coding switch mounted on the side of the Head.
**Dial setting**

- \(1000 = 1 \text{ mm}\)
- \(500 = 0,5 \text{ mm}\)
- \(100 = 0,1 \text{ mm}\)
- \(50 = 0,05 \text{ mm}\)
- \(10 = 0,01 \text{ mm}\)
- \(5 = 0,005 \text{ mm}\)

**Resolution (only when using 4 edge trigger mode)**

**Pinbelegung Buchse BU1 Sensorkabel**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>Sensor cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+</td>
<td>Black</td>
</tr>
<tr>
<td>2</td>
<td>0 V</td>
<td>Brown</td>
</tr>
<tr>
<td>3</td>
<td>Sin +</td>
<td>Red</td>
</tr>
<tr>
<td>4</td>
<td>Sin -</td>
<td>Orange</td>
</tr>
<tr>
<td>5</td>
<td>Cos -</td>
<td>Green</td>
</tr>
<tr>
<td>6</td>
<td>Cos +</td>
<td>Yellow</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Shield</td>
</tr>
</tbody>
</table>

**Output Connector assignment**

**Pin assignment BU2 Signal cable**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>Colour SKA cable grey</th>
<th>Colour SKB cable black</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0V</td>
<td>blue</td>
<td>white</td>
</tr>
<tr>
<td>2</td>
<td>+ 5 V/10-30 V</td>
<td>red</td>
<td>brown</td>
</tr>
<tr>
<td>3</td>
<td>A channel</td>
<td>green</td>
<td>green</td>
</tr>
<tr>
<td>4</td>
<td>B channel</td>
<td>yellow</td>
<td>yellow</td>
</tr>
<tr>
<td>5</td>
<td>Z marker pulse</td>
<td>brown</td>
<td>Black (only MIX4/5)</td>
</tr>
<tr>
<td>6</td>
<td>A' channel</td>
<td>pink</td>
<td>violet</td>
</tr>
<tr>
<td>7</td>
<td>B' channel</td>
<td>white</td>
<td>orange</td>
</tr>
<tr>
<td>8</td>
<td>Z' marker pulse</td>
<td>grey</td>
<td>Grey (only MIX4/5)</td>
</tr>
</tbody>
</table>

**Plug connector only MIX5 SN033**

**Pin assignment BU2 (only MIX5 SN033)**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Function</th>
<th>cable</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>- GND</td>
<td>white</td>
</tr>
<tr>
<td>L</td>
<td>+ Supply</td>
<td>brown</td>
</tr>
<tr>
<td>J</td>
<td>A</td>
<td>green</td>
</tr>
<tr>
<td>K</td>
<td>A</td>
<td>violet</td>
</tr>
<tr>
<td>C</td>
<td>B</td>
<td>yellow</td>
</tr>
<tr>
<td>E</td>
<td>B</td>
<td>pink</td>
</tr>
<tr>
<td>G</td>
<td>Z</td>
<td>black</td>
</tr>
<tr>
<td>A</td>
<td>Z</td>
<td>grey</td>
</tr>
<tr>
<td>H</td>
<td>Enable</td>
<td>red/blue</td>
</tr>
</tbody>
</table>
Technical specifications MIX 1 - 5

Power supply: 10-30 VDC +/- 10 or 5 VDC (ripple < 2%)
Housing: zinc cast
Protection class:

MIX1 IP67 (sensor head), IP40 (translator)
MIX3/4/5 IP40 standard (IP63 option-V)
Operating temperature: -10 ... +70 °C
Output current: 20 mA/Channel
Output: HTL push/pull, short circuit protected, rectangular waves or TTL line driver
Reference pulse (MIX4/5): approx. 0.2 msec
Operating speed for Reference pulse: 0.1m/sec max (= 6m/min)
Operating frequency for main tape (at chosen resolution)

HTL: 60kHz
TTL: 400kHz

The Translator can be delivered in three different formats

<table>
<thead>
<tr>
<th>Input voltage/load current</th>
<th>Output signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-30 VDC/150mA</td>
<td>10-30 VDC HTL</td>
</tr>
<tr>
<td>5VDC*/200mA</td>
<td>5V TTL with complements</td>
</tr>
<tr>
<td>10-30 VDC/150mA</td>
<td>5V TTL with complements</td>
</tr>
</tbody>
</table>

*Use 0.14 mm² cable minimum. Max. length 10 m.

Power supply version 11 - 27 V / 10-30 V output level

<table>
<thead>
<tr>
<th>Consumption</th>
<th>: max. 150 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counting frequenzy</td>
<td>: max. 64 KHz</td>
</tr>
<tr>
<td>Operation speed when resolution:</td>
<td>0,1 mm 0,64 m/s 38,4 m/min</td>
</tr>
<tr>
<td></td>
<td>0,01 mm 0,64 m/s 38,4 m/min</td>
</tr>
<tr>
<td></td>
<td>0,005 mm 0,32 m/s 19,2 m/min</td>
</tr>
</tbody>
</table>

Power supply version 5 V / 5 V TTL Line Driver out

<table>
<thead>
<tr>
<th>Consumption</th>
<th>: max. 200 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counting frequenzy</td>
<td>: max. 400 KHz</td>
</tr>
<tr>
<td>Max. cable length</td>
<td>: 10 m</td>
</tr>
<tr>
<td>Operation speed when resolution:</td>
<td>0,1 mm 3,0 m/s 180 m/min (4,0m/s, 240m/min SN009)</td>
</tr>
<tr>
<td></td>
<td>0,01 mm 3,0 m/s 180 m/min (4,0m/s, 240m/min SN009)</td>
</tr>
<tr>
<td></td>
<td>0,005 mm 1,5 m/s 90 m/min (2,0m/s, 120m/min SN009)</td>
</tr>
</tbody>
</table>

Power supply version 10-30 V / 5 V TTL Line Driver out

<table>
<thead>
<tr>
<th>Consumption</th>
<th>: max. 150 mA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counting frequenzy</td>
<td>: max. 400 KHz</td>
</tr>
<tr>
<td>Operation speed</td>
<td>: siehe Pos. 5.2</td>
</tr>
</tbody>
</table>
**Mounting of Sensor**

The sensor must operate against the Tape in accordance with the following tolerances.

1. gap max. 2 mm
2. < +/- 10°
3. < +/- 10°
4. < +/- 3°

**Ordering Codes**

**Magnetic Tape**

MB20.50 plus length (meter)

**Sensor/Translator**

MIX1 Translator MIC1, plus
Sensor MS20.60, plus
Sensor cable length (meter)

MIX3 Integrated Sensor/Translator without marker

MIX4/5 Integrated Sensors/Translator with marker

**Accessories**

MBS-1 Magnetic Tape for marker pulse
(for use with MIX4/5)
**Type designation of MIX**

**MIX3-000-03.0-1-00-XXXX**

**Type description**
- MIX1: Small Sensor with separate Translator
- MIX3: Translator and Sensor integrated in one unit
- MIX4: additional Sensor for Reference mark one pulse after power on
- MIX5: additional Sensor for Reference mark permanent signal

**Construction**
- 000 = standard
- 001 = 1st special version
- 033 = Only MIX5 (with enable input for reference)

**Cable length in m for MIX1**

**Resolution**
- 0 = 1 mm
- 1 = 1/10 mm
- 2 = 1/100 mm
- 3 = 5/1000 mm
- 4 = 5/10 mm
- 5 = 5/100 mm

**Power Supply/ Output**
- 00 = 10-30V 10-30V (MIX3 only)
- 01 = 10-30V 5V Line driver
- 11 = 5V/5V Line driver

**Options**
- V = IP 67 version for MIX3/4/5
- SG = with angle connector

**Accessories**

**Incremental Magnetic tape**
- **Pole distance** 5.0 mm

**Length of tape** (Please indicate in XX.X meters)

**Screened signal cable SKA**

**Signal cable** twisted pair 8 line 0.02mm²
- 0 = cable only
- 1 = connector of MIX fitted

**Length of cable**
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