# Measuring wheel systems

| Performance-Line | Measuring wheel system MWE51 | With spring arm, contact force max. 32.5 N |

**With incremental or absolute encoder with clamping flange ø 58 mm.**

Measuring wheel systems from Kübler are the ideal solution for reliable speed measurement, position detection and length measurement in applications with linear movements. These are recorded rotationally via the measuring wheel with attached encoder directly on the surface of the material to be measured and converted into linear data.

The MWE51 measuring wheel system impresses with its versatile installation options combined with high ease of use. Depending on the requirements, the preload can be set manually in 6 steps from 5 to 30 N.

Push-Pull HTL   RS422 TTL   Open Collector NPN   Analog output   SSI

CANopen   IO-Link   EtherNet/IP   PROFINET   PROFIBUS

RoHS

## Features

- **Flexible mounting options**
  The measuring wheel system can be installed vertically, horizontally or overhead. The encoder can be mounted on both sides of the spring arm in 30° steps.

- **Wide range of encoders**
  Incremental Sendix encoders with a max. resolution of up to 36,000 pulses/revolution as well as absolute encoders for different communication interfaces such as IO-Link or Profinet for integration in Industry 4.0 concepts.

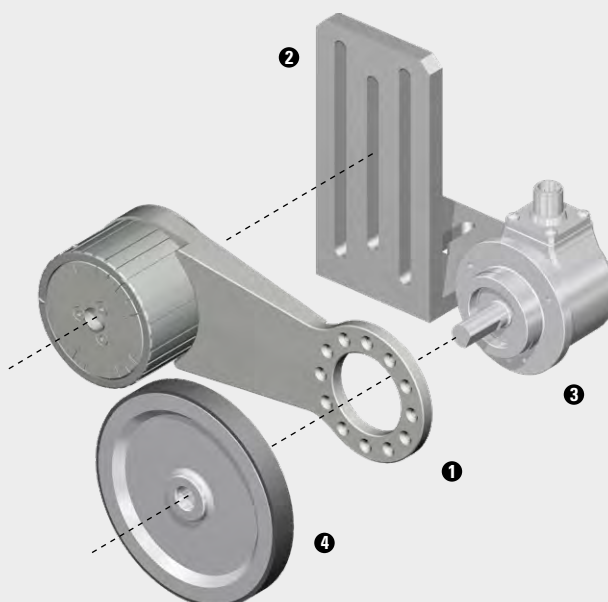- **Suitable measuring wheels for all measuring surfaces**
  Circumferences 300 mm or 12" – measuring wheel coating available with O-ring or double O-Ring, smooth or corrugated plastic, diamond knurl surface and tufted rubber.

- **Contact force up to max. 32.5 N**
  With manually adjustable preload in 6 steps from 5 to 30 N. To compensate for tolerances, the integrated spring ensures a working range of the measuring wheel of ±10 mm vertical to the measuring surface (at ±2.5 N in relation to the respectively set preload). For maintenance, the spring can also be manually brought into a stress-free state.

## Construction

❶ Spring arm:         MWE50
❷ Mounting bracket:   optional
❸ Encoder:            Clamping flange ø 58 mm
❹ Measuring wheel:    Circumference 300 mm or 12"
                      (Circumference 200 mm or 500 mm on request)

# Measuring wheel systems

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|---|---|---|

## Order code with incremental encoder

8.MWE51.1X1.XX.XXXX.XXXX
Type  ❶  ❷  ❸ c d  e

❶ *Mounting bracket*
1 = without mounting bracket
2 = with mounting bracket

❷ *Measuring wheel, circumference / coating*
31 = 300 mm / diamond knurl (aluminum)
34 = 300 mm / plastic smooth (PU)
36 = 300 mm / tufted rubber (PU)
37 = 300 mm / O-ring (NBR)
38 = 300 mm / double O-ring (NBR)
39 = 300 mm / plastic corrugated (PU)

71 = 12" / diamond knurl (aluminum)
74 = 12" / plastic smooth (PU)
76 = 12" / tufted rubber (PU)
77 = 12" / O-Ring (NBR)
78 = 12" / double O-ring (NBR)
79 = 12" / plastic corrugated (PU)

(Measuring wheels with circumference 200 mm and 500 mm on request)

❸ *Mounted encoder* [1]
50 = KIS50    incremental
05 = 5805    incremental

(other encoders on request)

c *Output circuit / supply voltage encoder*
see data sheet encoder

d *Type of connection*
see data sheet encoder

e *Pulse rate*
see data sheet encoder

## Order code with absolute encoder

8.MWE51.1X1.XX.XXXX.XXXX
Type  ❶  ❷  ❸ c d  e f g

❶ *Mounting bracket*
1 = without mounting bracket
2 = with mounting bracket

❷ *Measuring wheel, circumference / coating*
31 = 300 mm / diamond knurl (aluminum)
34 = 300 mm / plastic smooth (PU)
36 = 300 mm / tufted rubber (PU)
37 = 300 mm / O-ring (NBR)
38 = 300 mm / double O-ring (NBR)
39 = 300 mm / plastic corrugated (PU)

71 = 12" / diamond knurl (aluminum)
74 = 12" / plastic smooth (PU)
76 = 12" / tufted rubber (PU)
77 = 12" / O-Ring (NBR)
78 = 12" / double O-ring (NBR)
79 = 12" / plastic corrugated (PU)

(Measuring wheels with circumference 200 mm and 500 mm on request)

❸ *Mounted encoder* [1]
M1 = M5861    Analog output
M3 = M5863    SSI
M8 = M5868    CANopen
M8 = M5868    IO-Link
F8 = F5868    EtherNet/IP
F8 = F5868    (EtherCAT)
68 = 5868    PROFIBUS

(other encoders on request)

c *Output circuit / supply voltage encoder*
see data sheet encoder

d *Type of connection*
see data sheet encoder

e + f + g *Interface specifications*
see data sheet encoder

## Calculation of the linear resolution

| | Measuring step (distance/pulse) | | Resolution (pulses/distance) | |
|---|---|---|---|---|
| Calculation | $\dfrac{distance}{ppr}$ | = $\dfrac{\text{Measuring wheel circumference}}{\text{Pulse number encoder}}$ | $\dfrac{ppr}{distance}$ | = $\dfrac{\text{Pulse number encoder}}{\text{Measuring wheel circumference}}$ |
| Example 1 <br> Measuring wheel circumference = 300 mm <br> Pulse number encoder = 3000 ppr | $\dfrac{300\ mm}{3000\ ppr}$ | = 0.1 mm / puls | $\dfrac{3000\ ppr}{300\ mm}$ | = 10 pulses / mm |
| Example 2 <br> Measuring wheel circumference = 12" <br> Pulse number encoder = 1200 ppr | $\dfrac{12\ inch}{1200\ ppr}$ | = 0.01 inch / puls | $\dfrac{1200\ ppr}{12\ inch}$ | = 100 pulses / inch |

[1] Clamping flange 58 mm / shaft ø 10 mm - only relevant for ordering an encoder as a single component.

# Measuring wheel systems

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|---|---|---|

| Single components | | Order no. |
|---|---|---|

**Spring arm MWE50**

combinable with Kübler encoders:

clamping flange ø 58 mm
incremental: Sendix Base KIS50, 5805
absolute: Sendix F58xx, M58xx, 58xx

**8.MWE50.121.00.0000.0000**

**Measuring wheels**

| Option ❷ | circumference / coating | |
|---|---|---|
| 31 | 300 mm / diamond knurl (aluminum) | 8.0000.3317.0010 |
| 34 | 300 mm / plastic smooth (PU) | 8.0000.3347.0010 |
| 36 | 300 mm / tufted rubber (PU) | 8.0000.3367.0010 |
| 37 | 300 mm / O-ring (NBR70) | 8.0000.3377.0010 |
| 38 | 300 mm / double O-ring (NBR70) | 8.0000.3387.0010 |
| 39 | 300 mm / plastic corrugated (PU) | 8.0000.3397.0010 |
| 71 | 12" / diamond knurl (aluminum) | 8.0000.3717.0010 |
| 74 | 12" / plastic smooth (PU) | 8.0000.3747.0010 |
| 76 | 12" / tufted rubber (PU) | 8.0000.3767.0010 |
| 77 | 12" / O-ring (NBR70) | 8.0000.3777.0010 |
| 78 | 12" / double O-ring (NBR70) | 8.0000.3787.0010 |
| 79 | 12" / plastic corrugated (PU) | 8.0000.3797.0010 |

(Measuring wheels with circumference 200 mm and 500 mm on request)

| Evaluation | | Order no. |
|---|---|---|

**Preset counter Codix 924**

Multifunction device:
- Tachometer with limit values
- Position indicators with limit values
- Time preset counter

**6.924.01XX.XXX**

| Accessories | | Order no. |
|---|---|---|

**Mounting bracket**

Material: Aluminium

**8.0000.7000.0072**

**O-rings**

For measuring wheels with O-ring:
Measuring wheel circumference 300 mm, ❷ = 37 — **8.0000.7000.0074**
Measuring wheel circumference 12", ❷ = 77 — **8.0000.7000.0075**

For measuring wheels with double O-ring:
Measuring wheel circumference 300 mm, ❷ = 38 — **8.0000.7000.0077**
Measuring wheel circumference 12", ❷ = 78 — **8.0000.7000.0078**

Further accessories can be found at: kuebler.com/accessories
Cables and connectors can be found at: kuebler.com/connection-technology
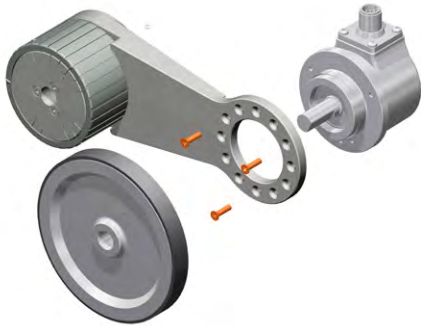
# Measuring wheel systems

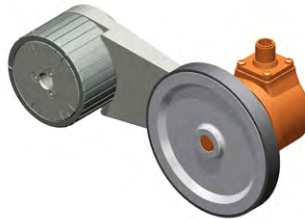| Performance-Line | Measuring wheel system MWE51 | With spring arm, contact force max. 32.5 N |
|---|---|---|

## Technology in detail

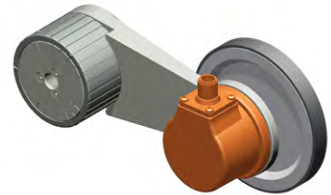### Mounting options encoder on spring arm

The encoder is attached to the spring arm with 3 screws.

The fastening points are designed in such a way that mounting on both sides of the spring arm is possible.

Mounting left (delivery state)          Mounting right

For a flexible outlet direction of the cable or connector, the encoder can additionally be mounted in 30° steps.

0° (delivery state)          30°          60°          90°
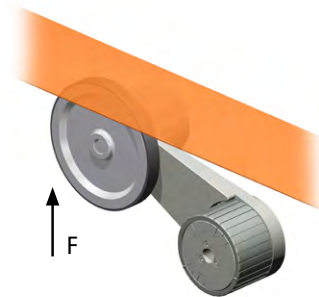
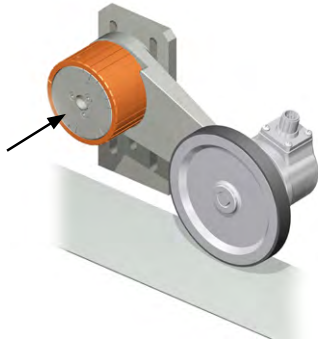### Various mounting options

horizontally          vertically          overhead

F          F          F

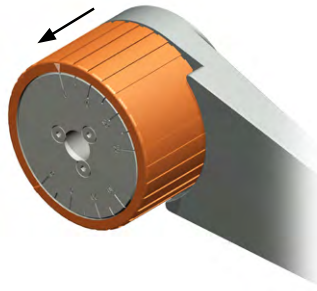# Measuring wheel systems

**Technology in detail**
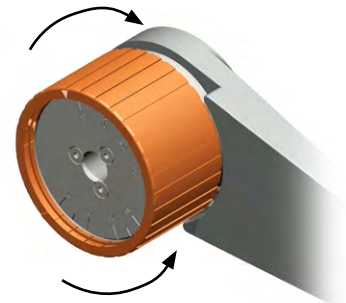
## Setting the preload

**1.** Position the measuring wheel system on the measuring surface and fix the corresponding screws in place.
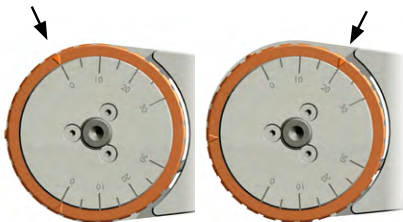
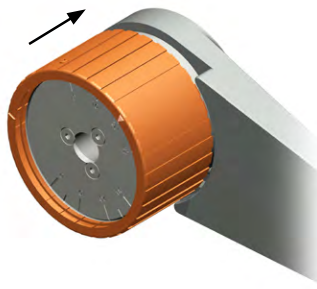**2.** Pull off the setting wheel to the front

**3.** Turn to the desired position for the preload (possible in both directions)
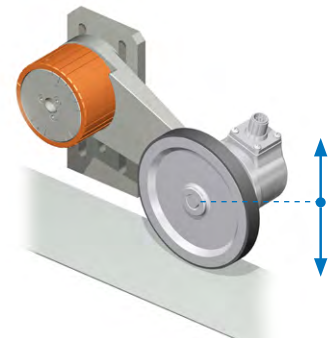
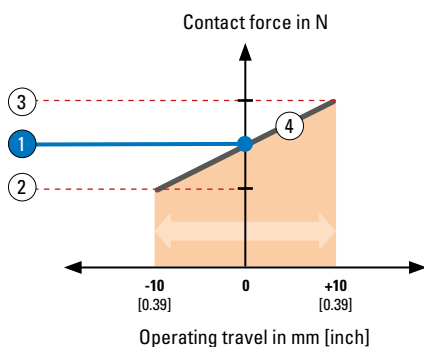**4.** Arrow on the setting wheel points to the corresponding marking

**5.** Engage the setting wheel

**6.** Starting from the set preload, this results in a working range of ±10 mm at ±2.5 N

## Contact force of the measuring wheel on the material to be measured

Contact force in N

Operating travel in mm [inch]

-10 [0.39]  0  +10 [0.39]

④ Contact force in relation to spring deflection

| ① Preload in 6 steps (± 20 %) | ② Contact force min. Operating travel -10 mm | ③ Contact force max. Operating travel +10 mm |
|---|---|---|
| 5 N | 2.5 N | 7.5 N |
| 10 N | 7.5 N | 10.5 N |
| 15 N | 12.5 N | 17.5 N |
| 20 N | 17.5 N | 22.5 N |
| 25 N | 22.5 N | 27.5 N |
| 30 N | 27.5 N | 32.5 N |

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|---|---|---|

## Technical data

### Mechanical characteristics spring arm MWE50

| | | |
|---|---|---|
| **Materials** | spring | spring steel |
| | spring bracket | aluminum |
| **Weight** | | 480 g |
| **Contact force, max.** | | 32.5 N |
| **Preload, adjustable** | | 5, 10, 15, 20, 25, 30 N |
| **Operating travel, max.** | | ± 10 mm |
| **Working temperature range** | | -20 °C ... +70°C [-40 °F ... +176 °F] |
| **Spring operating life** | | 2.0 Mio. cycles [2] |
| **Shock resistance** acc. EN 60068-2-27 | | 1000 m/s$^2$, 6 ms |
| **Vibration resistance** acc. EN 60068-2-6 | | 100 m/s$^2$, 55 ... 2000 Hz |

### Approvals

| | |
|---|---|
| **UL compliant** in accordance with | File no. E224618 |
| **CE compliant** in accordance with | |
| EMC Directive | 2014/30/EU |
| RoHS Directive | 2011/65/EU |
| **UKCA compliant** in accordance with | |
| EMC Regulations | S.I. 2016/1091 |
| RoHS Regulations | S.I. 2012/3032 |

# Measuring wheel systems

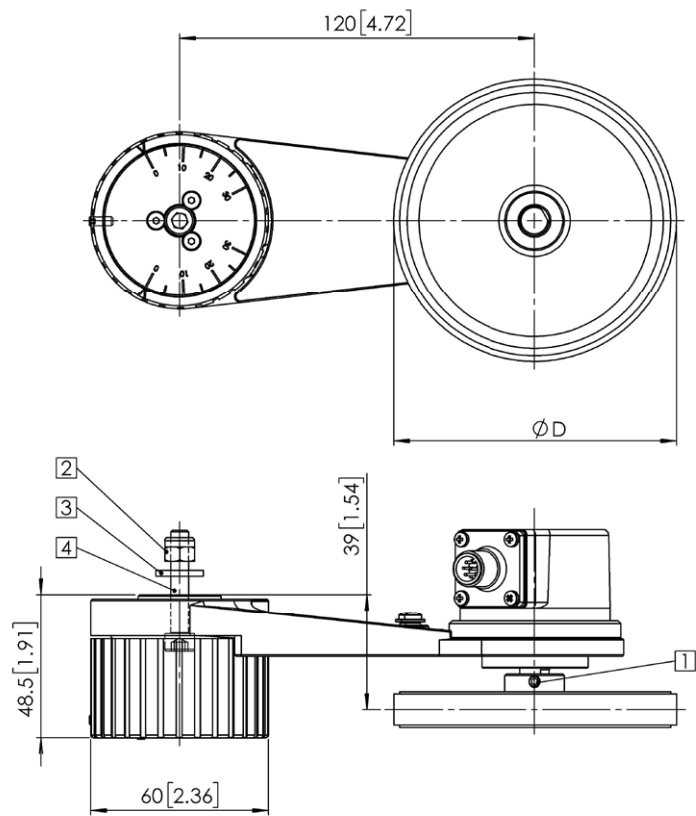| Performance-Line | Measuring wheel system MWE51 | With spring arm, contact force max. 32.5 N |
|---|---|---|

## Dimensions
Dimensions in mm [inch]

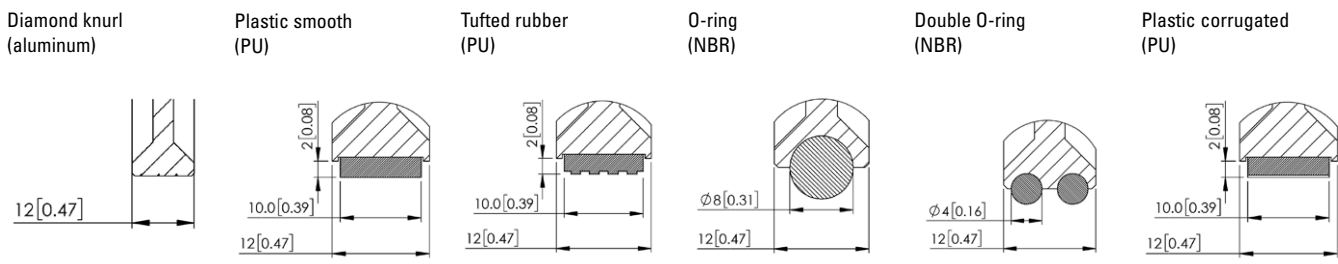**Spring arm MWE50 in combination with meeasuring wheel and encoder KIS50**
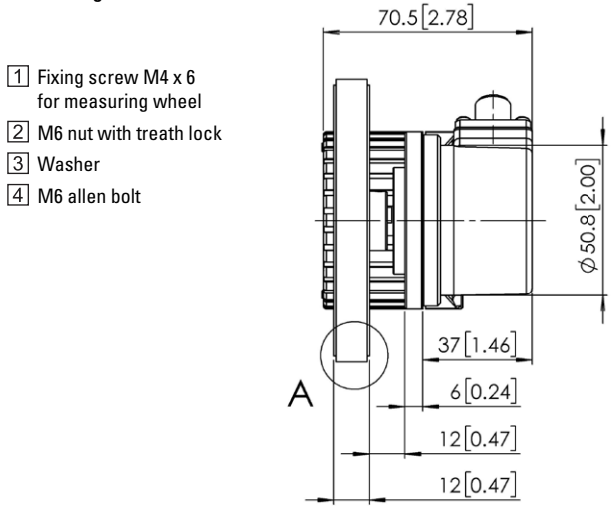
1  Fixing screw M4 x 6
   for measuring wheel
2  M6 nut with treath lock
3  Washer
4  M6 allen bolt



| Measuring wheel circumference | ø D mm [inch] |
|---|---|
| 200 mm | 63.7 [2.50] |
| 300 mm | 95.54 [3.76] |
| 500 mm | 159.23 [6.26] |
| 12" | 97.07 [3.82] |

**A** for measuring wheel with coating:

| Diamond knurl (aluminum) | Plastic smooth (PU) | Tufted rubber (PU) | O-ring (NBR) | Double O-ring (NBR) | Plastic corrugated (PU) |
|---|---|---|---|---|---|



## Mounting bracket