

# Inclinometers

<b>For static applications 1- and 2-axis, compact design</b>	<b>IS40</b>	<b>Analog</b>
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The inclination sensors in the IS40 series can be used to measure 2-axis inclinations in the measuring range of  $\pm 10^\circ$ ,  $\pm 45^\circ$  or  $\pm 60^\circ$  as well as 1-axis inclinations of up to  $360^\circ$ .

The compact and robust design makes the sensor a suitable angle measuring device in harsh environments.



Analog Output

### Features and benefits

- **Analog sensor for precise measurement**
  - Stable accuracy over the entire temperature range
  - Analog interface for current and voltage ranges
- **Individual "Easy-Teach" settings via Teach Adapter**
  - Define preset (zero point / midpoint position)
  - Scaling of the analog measuring range (start/end position)
  - Resetting to factory settings
- **Robust, compact design**
  - Also suitable for the smallest installation spaces
  - Robust design with high shock resistance
- **Versatile use**
  - in vehicle technology, solar installations, cranes and hoists or in commercial vehicles.

Order code	8.IS40	. 1	4	X	2	1
<b>1-axis</b>	Type		a	b	c	d

**a** Measuring range  
4 = 0 ... 360° ( $\pm 180^\circ$ )

**b** Interface  
1 = 4 ... 20 mA  
3 = 0.1 ... 4.9 V DC

**c** Power supply  
2 = 10 ... 30 V DC

**d** Type of connection  
1 = M12 connector, 5-pin

Order code	8.IS40	. 2	X	X	X	1
<b>2-axis</b>	Type		a	b	c	d

**a** Measuring range  
1 =  $\pm 10^\circ$   
2 =  $\pm 45^\circ$   
3 =  $\pm 60^\circ$

**b** Interface  
1 = 4 ... 20 mA <sup>1)</sup>  
3 = 0.1 ... 4.9 V DC <sup>1)</sup>  
4 = ratiometric 2 % ... 98 % <sup>2)</sup>

**c** Power supply  
1 = 5 V DC  
2 = 10 ... 30 V DC


**d** Type of connection  
1 = M12 connector, 5-pin

1) Available only in combination with power supply 10 ... 30 V DC  
2) In relation to the power supply 5 V DC (available only in combination with power supply 5 V DC)

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Accessories		Order no.
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<b>Teach-Adapter</b> 	for activating the control inputs for the following functions: - Reset to factory setting - Center point of the measurement - Start and end point for 1-axis measurement	<b>05.TX40.1</b>
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Cables and connectors		Order no.
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<b>Preassembled cables</b>	M12 female connector with coupling nut, 5-pin, A coded, straight single ended 2 m [6.56'] PVC cable	<b>05.00.6021.E211.002M</b>
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<b>Connectors</b>	M12 female connector with coupling nut, 5-pin, A coded, straight (metal)	<b>8.0000.5116.0000</b>
	M12 female connector with coupling nut, 5-pin, A coded, straight (stainless steel V4A)	<b>8.0000.5116.0000.V4A</b>

Further Kübler accessories can be found at: [kuebler.com/accessories](http://kuebler.com/accessories)  
 Further Kübler cables and connectors can be found at: [kuebler.com/connection-technology](http://kuebler.com/connection-technology)

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## Technical data

General data 1-axis measurement	
<b>Measuring range</b>	0 ... 360°
<b>Resolution</b>	≤ 0.14°
<b>Repeat accuracy</b>	≤ 0.2 % of measuring range ≤ 0.1 % after a warm-up period of 30 min
<b>Temperature coefficient</b>	0.03°/K
<b>Reaction time</b>	0.1 s – Time that the output signal requires to reach 90 % full scale

General data 2-axis measurement	
<b>Measuring range</b>	±10°, ±45°, ±60°
<b>Resolution</b>	for version ±10° ≤ 0.05° for version ±45° ≤ 0.1° for version ±60° ≤ 0.15°
<b>Repeat accuracy</b>	≤ 0.2 % of measuring range ≤ 0.1 % after a warm-up period of 30 min
<b>Absolute accuracy</b>	for version ±10° 0.3° for version ±45° and ±60° 0.5°
<b>Cross sensitivity</b>	3 %
<b>Temperature coefficient</b>	for version ±10° typ. 0.01°/K for version ±45° and ±60° 0.03°/K
<b>Reaction time</b>	0.1 s – time that the output signal requires to reach 90 % full scale, if the angle is changed from -60° to +60°
<b>Zero point adjustment</b>	for version ±10° ±5° for version ±45° and ±60° ±15°

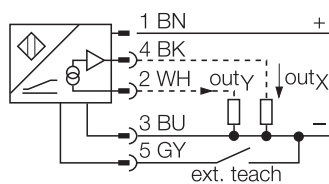
Mechanical characteristics	
<b>Connection</b>	M12 connector
<b>Weight</b>	50 g
<b>Protection acc. to EN 60529</b>	IP68 / IP69k
<b>Working temperature range</b>	-30 °C ... +70 °C [-22 °F ... +158 °F]
<b>Material</b>	plastic PBT-GF20-V0
<b>Shock resistance acc. to EN 60068-2-27</b>	300 m/s <sup>2</sup> , 11 ms
<b>Vibration resistance acc. to EN 60068-2-6</b>	100 m/s <sup>2</sup> , 10 ... 2000 Hz
<b>Dimensions</b>	60 x 30 x 20 mm [2.36 x 1.18 x 0.79"]

Interface characteristics	
<b>Voltage output</b>	at +V 10 ... 30 V DC 0.1 ... 4.9 V DC short-circuit protected to +V at +V 5 V DC 2 ... 98 % ratiometric (im in relation to +V)
<b>Load resistance voltage output</b>	≥ 40 kΩ
<b>Load resistance voltage output</b>	99 ... 105 Ω
<b>Current output</b>	4 ... 20 mA
<b>Load resistance current output</b>	≤ 200 Ω

Electrical characteristics	
<b>Power supply</b>	5 V DC ±0.25 V oder 10 ... 30 V DC (depending on version)
<b>Power consumption</b>	1-axis 50 ... 105 mA (depending on voltage) 2-axis ≤ 20 mA
<b>Reverse polarity protection</b>	yes

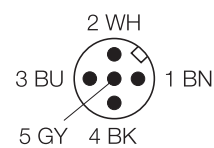
Approvals	
<b>CE compliant</b> in accordance with	EMC Directive 2014/30/EU

## Connections



ext. teach: if this input is connected to 0 V, then the output of the inclinometer is reset to 0°.

## Terminal assignment



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## Dimensions

Dimensions in mm [inch]

