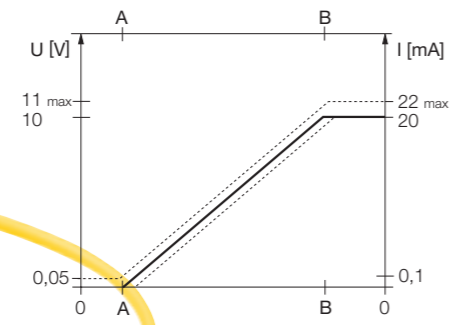


# TYPE OVERVIEW

**General data**  
 Operating voltage  $U_B$  15...30 VDC  
 Repeat accuracy  $\leq 1\%$   
 $\leq 0.5\%$  after 30 minute warm-up  
 Temperature drift  $\leq 0.06\%/^\circ\text{C}$   
 Ambient temperature  $-10...+70^\circ\text{C}$   
 Measuring range A...B

**Protective circuitries**  
 Short-circuit protection  
 Reverse-polarity protection  
 Wire-break protection

**Output types:**  
 Voltage output, 0 ... 10 V or 2 ... 10 V  
 Current output, 0 ... 20 mA or 4 ... 20 mA  
 Frequency output, 1 ... 10 kHz  
 Additional adjustable switching output, PNP  
 Current output, 4 ... 20 mA, passive (2-wire)



Typical curve of TURCK analogue sensors with linear output signal

Sensor	Measuring range [mm]		
	Linear output signal Standard	analog+	non-linear output signal
<b>Threaded barrel/ smooth barrel</b>			
$\varnothing 4/M5 \times 0,5^*$	-	-	1,5 b
$\varnothing 6,5/M8 \times 1$	-	1b	-
M12	1,5 b/3,5 nb	2,5 b	-
M18	2 b/4 nb	4 b/6 nb	-
M30	5 b/10 nb	8 b	-



Sensors in threaded and smooth barrels

\*Amplifier electronics integrated in the connector housing  
 (b = flush mounting, nb = non-flush mounting)



Sensors in rectangular housings

Sensor	Measuring range [mm]	
	Linear output signal Standard	analog+
<b>Rectangular, compact</b>		
Q08, 32 x 20 x 8 mm	3 b	-
Q14, 52 x 30 x 14 mm	5 b	-
Q20, 68 x 40 x 20 mm	7 b	-
Q80, 80 x 80 x 40 mm	-	40 nb
<b>Rectangular, variable</b>		
CP/CK40, 40 x 40 mm	7 b	20 nb

(b = flush mounting, nb = non-flush mounting)

Ring sensor, compact				
Sensor	Measuring range [mm $\varnothing$ ]			
	Ring $\varnothing$	St37	VA	NF-Metalle
Q14, 52 x 30 x 14 mm	20 mm	1 ... 10	2 .. 17	4 ... 19

15 ... 30 VDC supply voltage, 0 ... 10 V output cable or connector versions



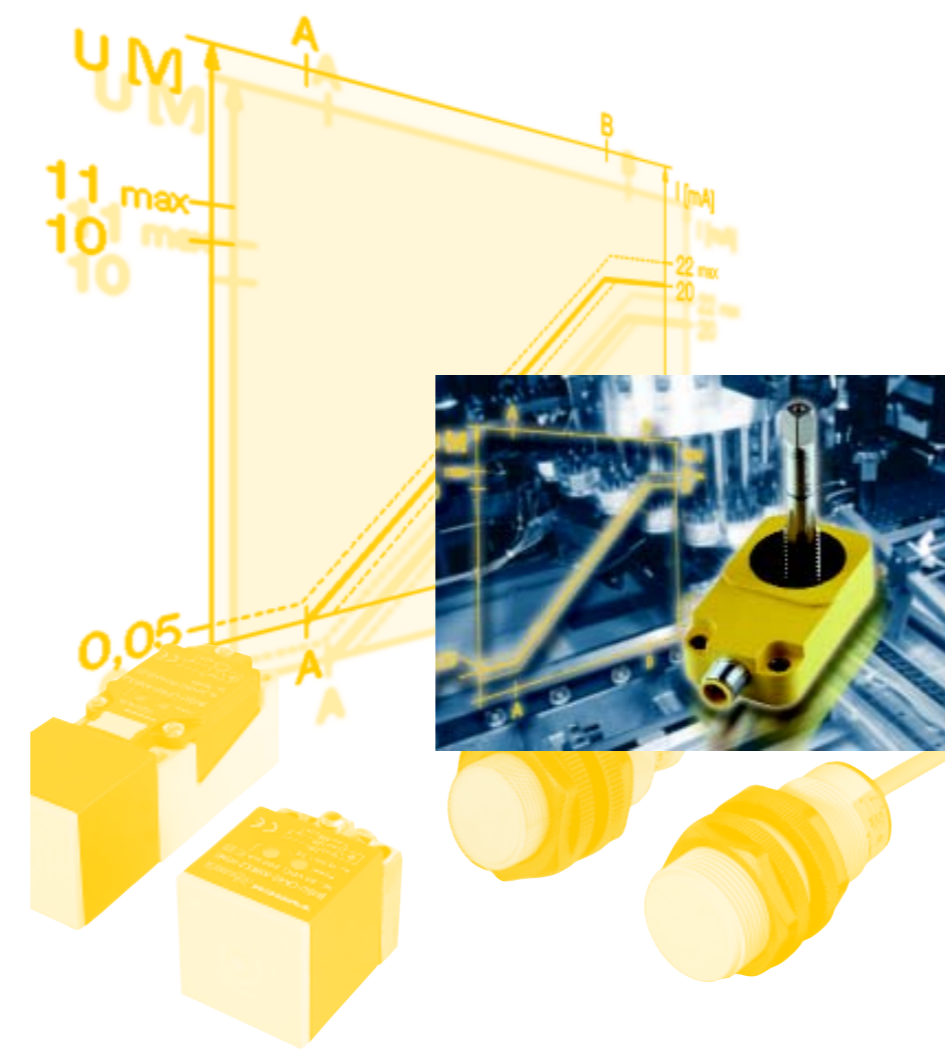
Ring sensors



**TURCK**

Industrial Automation

## INDUCTIVE ANALOG SENSORS



Bitte senden Sie mir Unterlagen:

- Sensortechnik**
- Induktive Sensoren
  - Induktive Sensoren für Schwenkantriebe
  - uprox® induktive Sensoren
  - Kapazitive Sensoren
  - Magnetfeldsensoren
  - Opto-Sensoren
  - Geräte für den Personenschutz
  - Ultraschall-Sensoren
  - levelprox-Füllstandssensoren
  - Strömungswächter
  - Druckwächter
  - Temperaturwächter
  - Identifikations-Systeme
  - Linearweg-Sensoren
  - Drehweg-Sensoren
  - Steckverbinder
  - CD-ROM Sensortechnik

- Interfacetechnik**
- Interfacetechnik im Aufbaugehäuse für Hutschienen- (DIN 50022), Platten- oder Bodenmontage
  - Interfacetechnik auf 19"-Karte für Baugruppenträger (DIN 41494)
  - Miniaturrelais, Industrirelais, Zeitwürfel, Sockel
  - Zeit- und Überwachungsrelais
  - Ex-Schutz - Grundlagen für die Praxis (Übersichtsposter)
  - CD-ROM Interfacetechnik

- Feldbustechnik**
- busstop®-Feldbuskomponenten
  - Bussystem sensoplex®2
  - Bussystem sensoplex®2 Ex
  - Bussystem sensoplex®MC
  - Bussystem AS-Interface®
  - Bussystem DeviceNet™
  - Ethernet Netzwerkkomponenten
  - BL20 I/O-Busklemmensystem
  - Bussystem FOUNDATION™ fieldbus
  - Bussystem PROFIBUS-DP
  - Bussystem PROFIBUS-PA
  - Bussystem piconet®
  - Remote I/O excom®
  - .....

Please send me more information:

- Sensors**
- inductive sensors
  - inductive sensors for rotary actuators
  - uprox® inductive sensors
  - capacitive sensors
  - magnetic-field sensors
  - photoelectric sensors
  - machine safety equipment
  - ultrasonic sensors
  - levelprox level sensors
  - flow controls
  - pressure controls
  - temperature controls
  - identification systems
  - linear position sensors
  - rotary position sensors
  - connectors
  - CD-ROM Sensors

- Interface technology**
- devices in modular housings for top-hat rail (DIN 50022) or panel mounting
  - devices on 19" card for DIN-rail mounting (DIN 41494)
  - miniature relays, industrial relays, time cubes, sockets
  - programmable relays and timers
  - explosion protection - basics for practical application (overview poster)
  - CD-ROM Interface technology

- Fieldbus technology**
- busstop® fieldbus components
  - bus system sensoplex®2
  - bus system sensoplex®2 Ex
  - bus system sensoplex®MC
  - bus system AS-Interface®
  - bus system DeviceNet™
  - Ethernet network components
  - BL20 I/O bus terminal system
  - bus system FOUNDATION™ fieldbus
  - bus system PROFIBUS-DP
  - bus system PROFIBUS-PA
  - bus system piconet®
  - Remote I/O excom®
  - .....

## FAX-ANTWORT/FAX REPLY

Absender/Sender: \_\_\_\_\_

Name: \_\_\_\_\_

Firma/Company: \_\_\_\_\_

Abt./Position: \_\_\_\_\_

Adresse/Address: \_\_\_\_\_

\_\_\_\_\_

Tel./Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-Mail: \_\_\_\_\_

**TURCK**

Industrial Automation



**Hans Turck GmbH & Co. KG**  
 D-45466 Mülheim an der Ruhr  
 Phone (+49) (2 08) 49 52-0  
 Fax (+49) (2 08) 49 52-264  
 E-Mail turckmh@mail.turck-globe.de  
 Internet www.turck.com

D1013020303

## analog+ : SIMPLY THE BEST FOR YOUR APPLICATION

### Analog sensors

Inductive sensors with analog output for simple measuring and control tasks provide a current or voltage signal which is proportional to the target's distance. TURCK's analog sensors provide a linear output signal relative to the distance between the target and the sensor's active face over the entire measuring range.

When monitoring **winding/unwinding procedures**, the analog sensor measures the roller's thickness and converts this value directly into a proportional current or voltage signal.



Further applications suited to analog sensing are for example:

- thickness, gap or distance measurements
- band eccentricity measurements
- band width measurements
- positioning
- positioning control
- absolute position or angular deviation control

**Workpieces of different shape and size** and of **ferritic or non-ferritic materials** will induce the sensor to generate a specific output signal upon attenuation, depending on the typical characteristics and shape of the workpiece. Thus it is possible to distinguish between different kinds of materials.



That's exactly why TURCK's analog sensors are used in many applications requiring more than simple digital positioning control.

In **tensile stress control applications**, in which wire tension is to be monitored, a wire is lead over an elastically supported roller which attenuates the analog sensor. The extent of deflection of the roller depends on the wire's tension. The drive system is controlled via the signal of the analog sensor to ensure that the tensile stress of the wire remains within the specified limits.



Analog sensors made by TURCK provide optimum performance in all respects. They have outstanding properties such as:

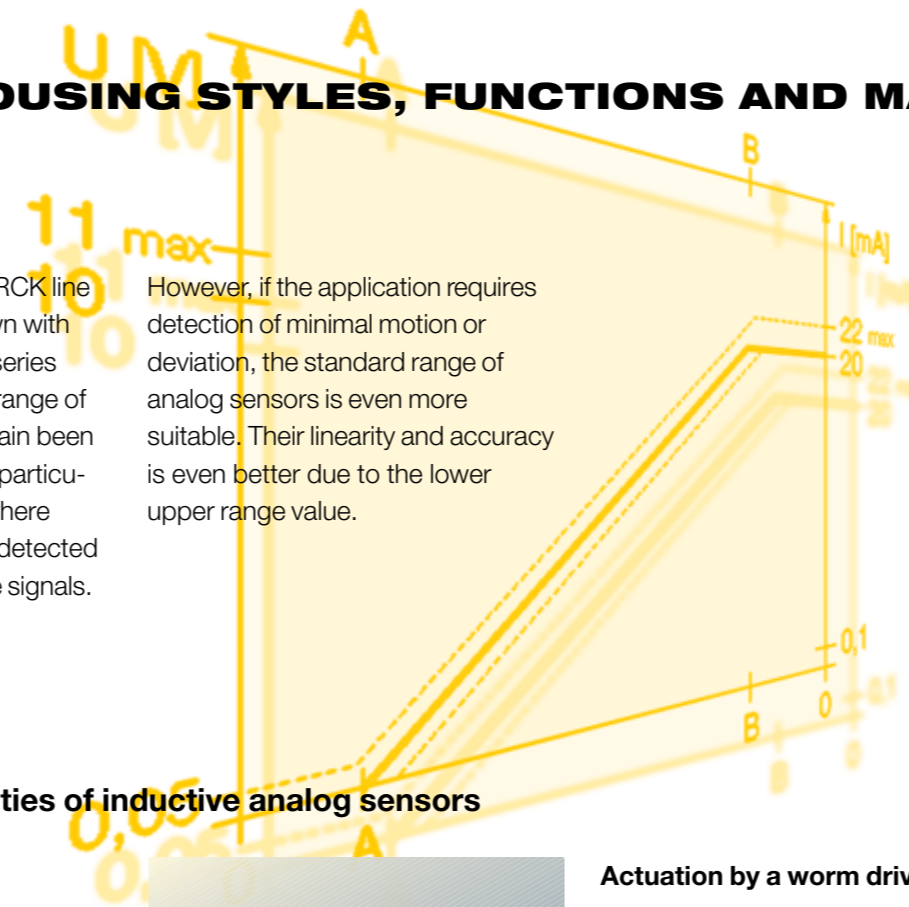
- high accuracy
- large measuring ranges
- current and voltage outputs
- large variety of housings
- excellent EMC protection
- short-circuit and reverse-polarity protection
- all connection types

All these features ensure convenient handling and simple application, quite similar to a digital sensor!

## VARIOUS HOUSING STYLES, FUNCTIONS AND MATERIALS – MADE-TO-MEASURE SOLUTIONS

The known and proven TURCK line of analog sensors has grown with the addition of new types, series **analog+**. The measuring range of these sensors has once again been extended, so that they are particularly useful in applications where large distances have to be detected and expressed by analogue signals.

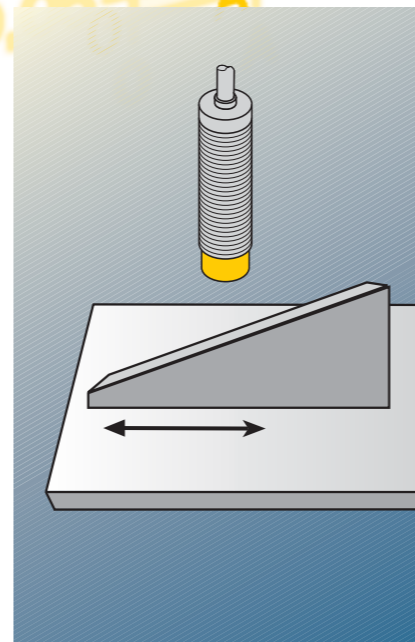
However, if the application requires detection of minimal motion or deviation, the standard range of analog sensors is even more suitable. Their linearity and accuracy is even better due to the lower upper range value.



### Application possibilities of inductive analog sensors

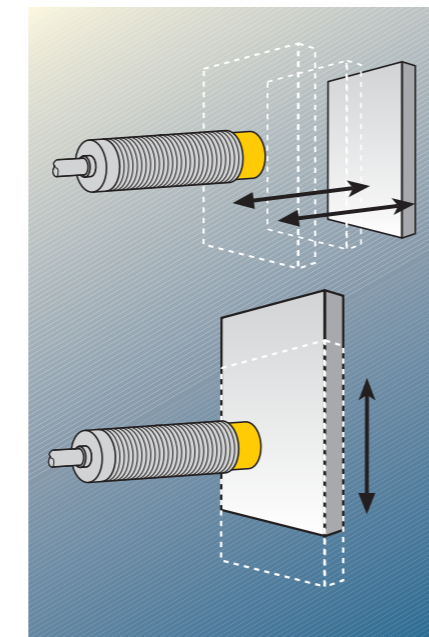
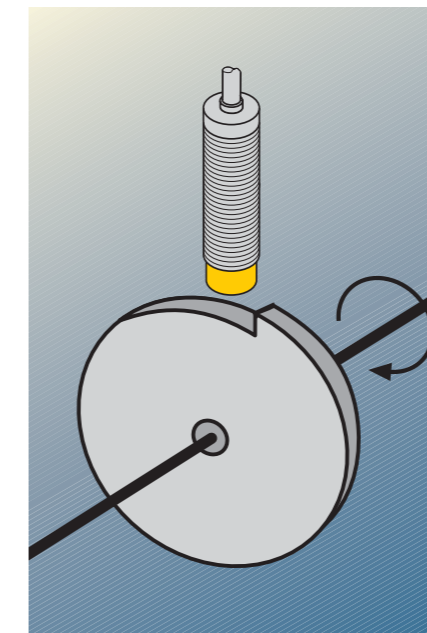
#### Plane-parallel actuation

The highest accuracy is achieved if the sensor is directly actuated by the target. Both side and front actuation is possible. In order to utilise the full measuring range, it is important to work with an appropriately sized target. This may also be a moving part of the machine.



#### Actuation by a worm drive

A rotary movement can be performed by a worm drive. Every angular position of the axis can thus be assigned to a measuring value of the sensor. This is also an ideal sensing solution for incomplete rotary motion (e.g. positioning plates or swivel arms) where merely small angles have to be detected.



#### Actuation over an oblique plane

When detecting extensive linear motion and converting it into analog signals, the large distance across an oblique plane has to be reproducible by the measuring range of the sensor. Consequently, the sensor's resolution is spread over the long distance, but generally this method does not create any problems.

### Ring sensors with analogue output – distinction between small parts and position detection

The analogue ring sensor is a new development in the range of ring sensing devices. The combination of high precision analogue sensing technology with the symmetric coil arrangement of a ring sensor yields distinct advantages for many applications. Due to the

concentrated magnetic field inside the ring sensor, the attenuation variable is hardly affected by exact positioning of the target in the ring. Consequently, a stable and constant output signal is generated, even if the target position in the ring fluctuates. This technology makes it

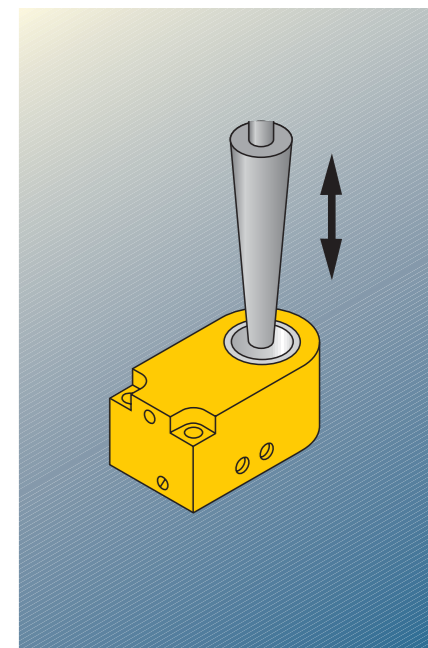
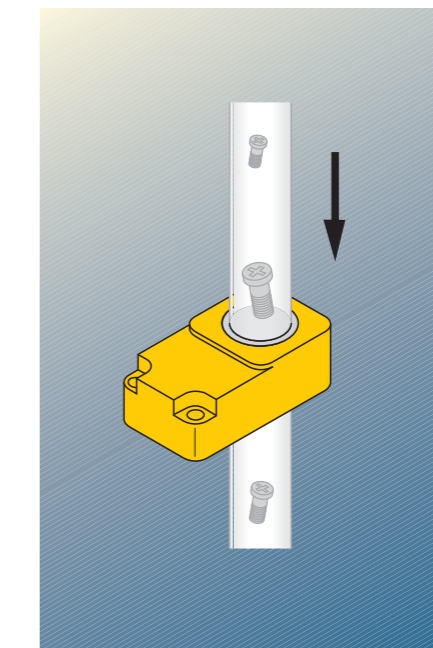
possible to profile small parts (screws, rivets or the like), to distinguish between different tools and to implement an affordable means of position control.



### Application possibilities of analogue ring sensors

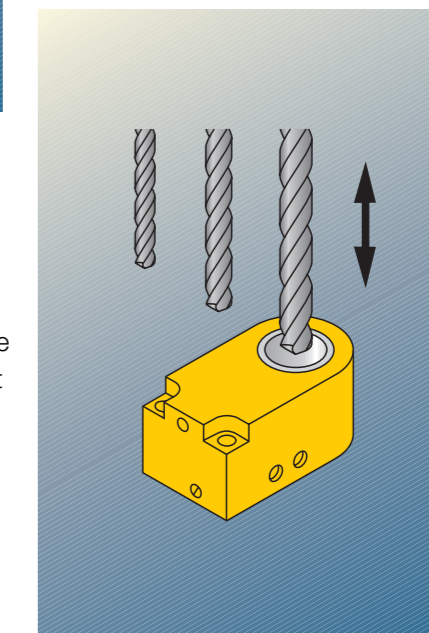
#### Thickness measurement, parts detection

Analogue ring sensors are capable of distinguishing and identifying parts of different shape and size. A tooling change monitoring function can be easily realized with this sensing method.



#### Identification of small parts

When falling through the ring, screws, rivets or other small parts, e.g. screws of different size, generate a characteristic output signal, so that the target can be easily identified. Due to the concentrated magnetic field, also flexibly guided parts can be detected reliably.



#### Position control

Position control can be easily accomplished by means of a cone-shaped target. Measuring ranges can be adapted to specific sensing needs by using targets with an appropriate cone length. These sensors enable precise and simple position detection, even if the targets feature a slight offset.