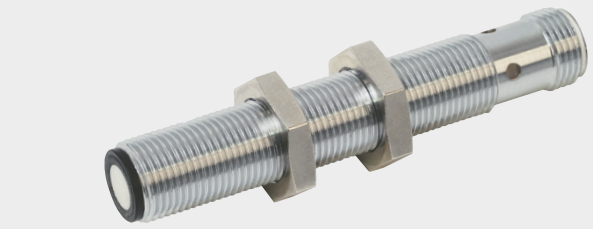
Your Global Automation Partner

TURCK

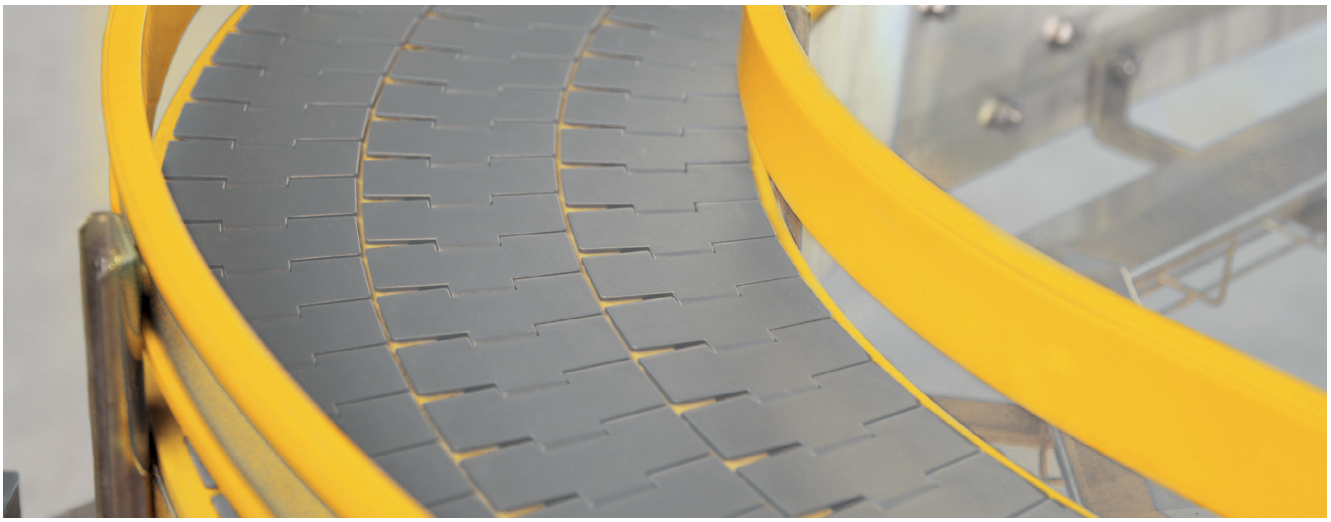
Complete Portfolio
Ultrasonic Sensors



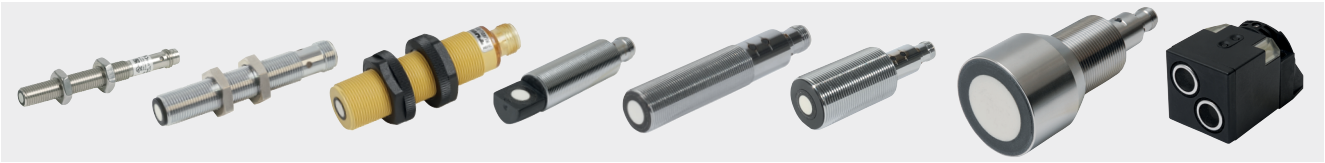
Contents

Ultrasonic Sensors	3
Features	4
Benefits for the User	8
Application Examples	9
Variants	11
Accessories	33
Performance Curves	34

Ultrasonic Sensors



The RU-U ultrasonic sensor series from Turck enables the user to cover large sensing ranges with fewer sensor variants. The Turck ultrasonic sensors in M08, M12, M18 and M30 and 40 x 40 housing styles thus effectively reduce the range of variants required for stock-keeping. This is made possible by the particularly short blind zones of the sensors, which offer large sensing ranges at the same time. In order to offer the right sensor for every application with only a few sensor variants, Turck has increased the versatility of the individual models: The simple, compact version of the RU40 and RU100 modules thus enables the user to set diffuse mode and retroreflective operation as well as NC and NO switching outputs with a teach adapter. The standard sensor variants offer several operating modes and enable the setting of switch windows or two separate switch points, either by a teach adapter or via a teach button directly on the sensor. The High-End versions can be operated as a switch and as an analog sensor. Different operating modes, temperature compensation or the output function can also be set via IO-Link. If several sensors are installed next to each other, the customer can set the sensor parameters in synchronization or multiplex mode, in order to prevent mutual interference of the sensors.



Operating principle

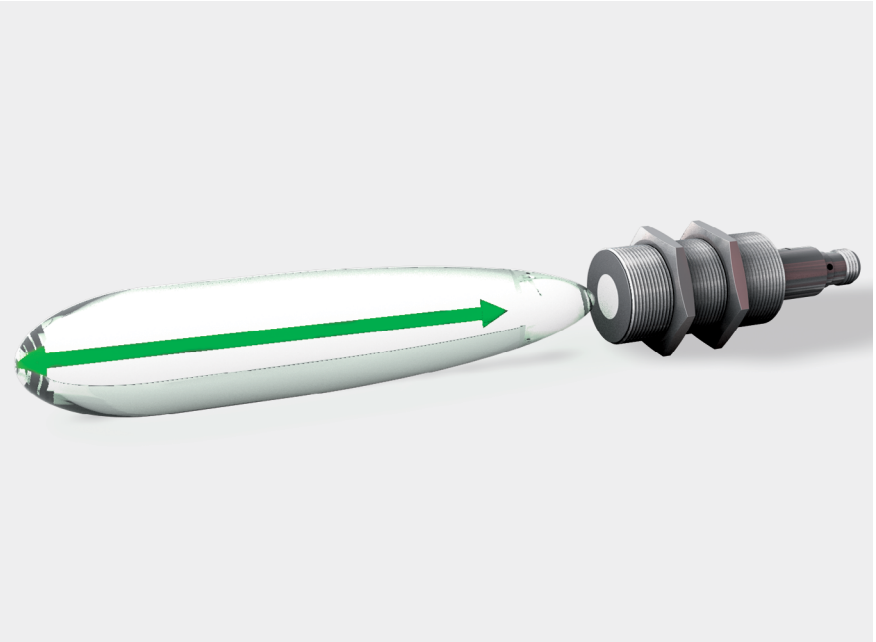
The operation of the sensors is based on the time of flight principle. When a sonic pulse is emitted and the time required by the reflected signal to be received again by the same sonic transducer is measured. The distance to the object is calculated on the basis of the known speed of sound in air and output as the measured value or as a switch signal. As the speed of sound depends on the air temperature, the sensors use a separate temperature measurement to compensate the time of flight difference at different temperatures.

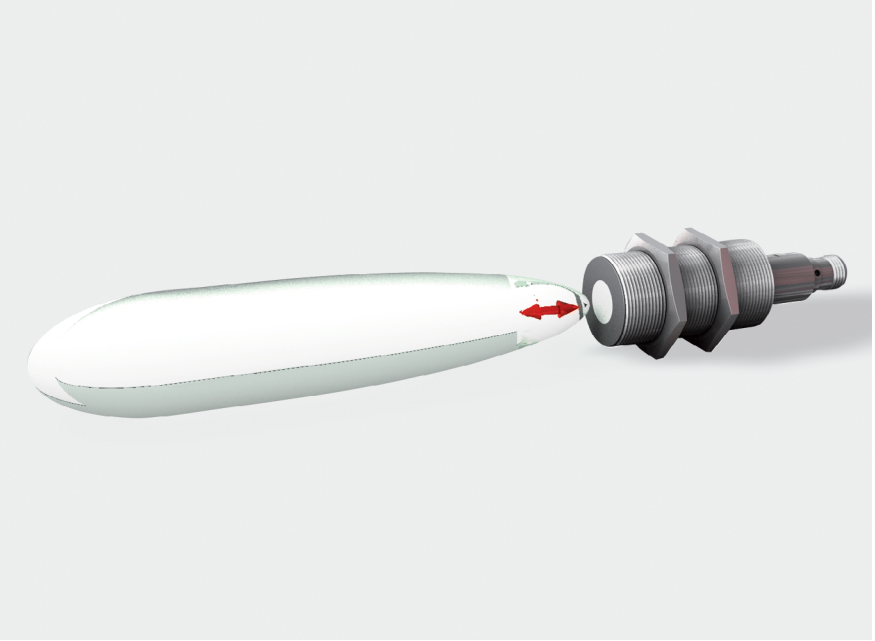
Ultrasonic sensor technology is generally an important link in the field of industrial sensors, which is positioned between inductive and photoelectric sensors due to its possible object detection ranges. However, the measuring principle is not based on an electromagnetic but a mechanical operating principle and therefore requires some additional knowledge for the application.

Features

Large measuring range

The newly developed sonic transducers enable large measuring ranges for the entire sensor series of up to 130 cm in the M18 version and 600 cm in the M30 version. The 300 cm version in the M30 in particular operates without the need for an enlarged transducer head. This increases the options available in existing applications and enlarges the application range.



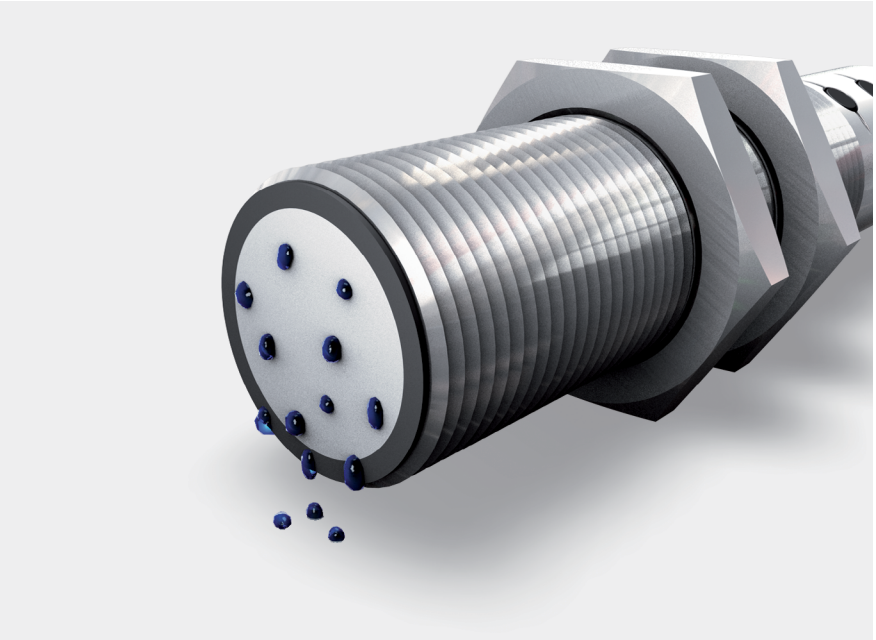


Short blind zone

The extremely short blind zone (e.g., only 2.5 cm in the M18 version with 40 cm range) ensures maximum downward compatibility. This enables the reliable detection of objects close to the sensor and optimum adaption of mounting depths – such as for level monitoring applications. As the blind zone has to be kept free to exclude signal errors, a short blind zone also increases mounting options and effective object detection.

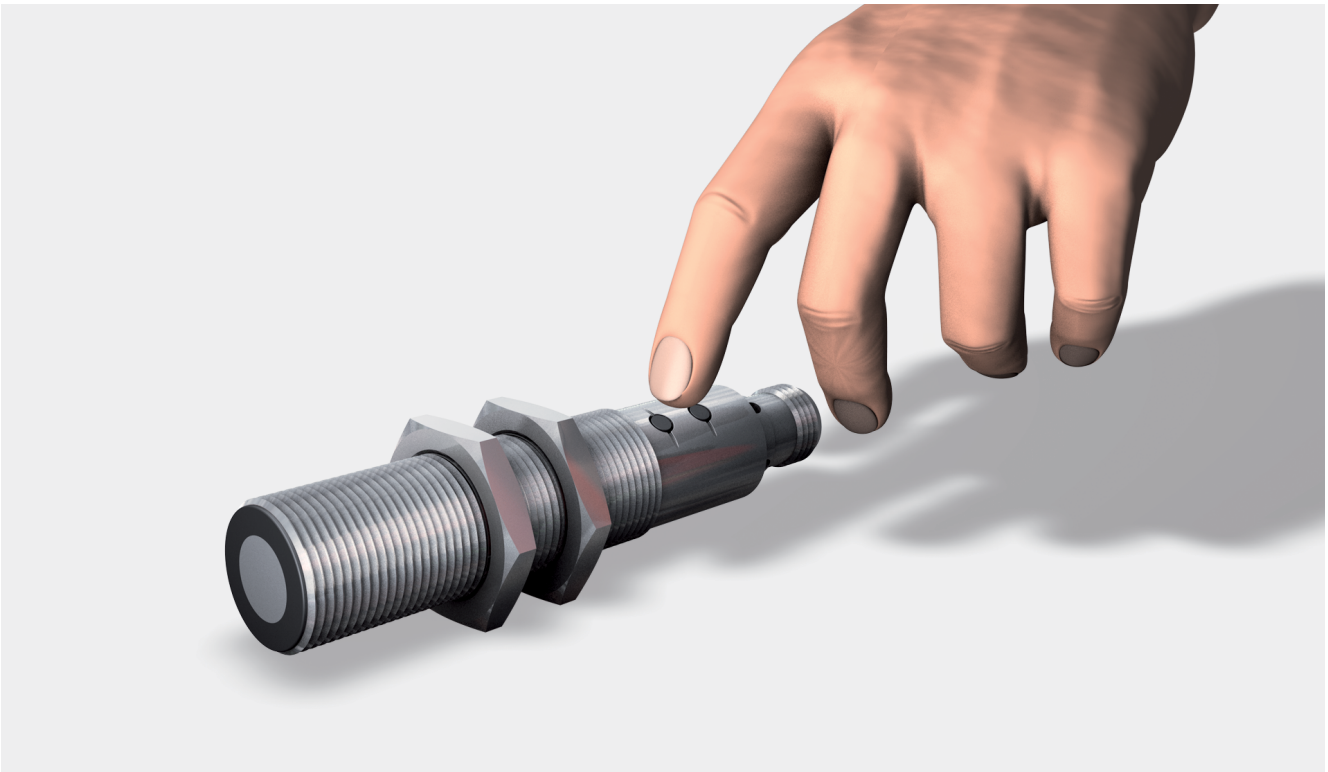
Robust mechanical design

The highly robust housing with a continuous threaded barrel completely made of metal is particularly short and stands out on account of the metal M12 connector, which is turned as one piece with the threaded sleeve. This eliminates any potential weak points that could cause damage in harsh environments and at low temperatures. The thread runs over the entire length of the sensor so that the mounting position can be varied as required within the mounting bracket.



Flush-front membrane

The smooth sonic transducer front of the M18 and M30 sensors reliably prevents contamination and the formation of particle deposits.
The mechanical movement of the membrane even shakes off deposits and thus cleans itself. Particle deposits that can occur when humidity is high can likewise be simply wiped off completely, without any residue remaining in the transition area between the transducer layer and the transducer ring. Damage arising from sharp and pointed cleaning objects therefore becomes a thing of the past.



Easy teach

To ensure simple and intuitive parameter setting, all M18 and M30 ultrasonic sensors offer a teach-in function that can be implemented via pin 5. The start of switch and measuring ranges can thus be set easily without the use of any external software.

The teach-in is carried out either via the teach adapter using the typical TURCK Easy Teach function or via sensor variants with integrated pushbuttons. The pushbuttons are fitted inside the metal housing and are thus protected from accidental actuation. The setting is carried out inside a fixed time window after a preceding voltage reset. The subsequent automatic lock reliably excludes the possibility of the sensor settings from being accidentally changed.

The compact M18 family of devices also have a teach input on pin 2, which makes this series 100% downward compatible with the previous series.

IO-Link interface

Besides setting via the teach-in function, the High-End variants with a switch and analog output can also be parameterized via the version 1.1 IO-Link interface. The devices can be configured in different operating modes such as in opposed mode with exclusive send and receive operation. Other features include settings for the time in which the teach button can be used after a voltage reset or also the temperature compensation setting via the internal or optional external temperature sensor. This last feature enables a more precise measuring result by including the ambient temperature in the calculation.

The user has the choice between a rising or falling characteristic for the analog output signal, and the user can set the hysteresis for the switching output. If two independent switching outputs are required instead of the switching output and analog output, these can be set to PNP or NPN switching output types with an NC or NO function.

Several devices are installed in the same environment, any mutual interference must be prevented. The sensors can therefore be synchronized or set to multiplex mode, in which the individual devices operate sequentially. The 16-bit data width of the process value can be read at a transfer rate of 38,400 baud via the supported COM2 communication type.

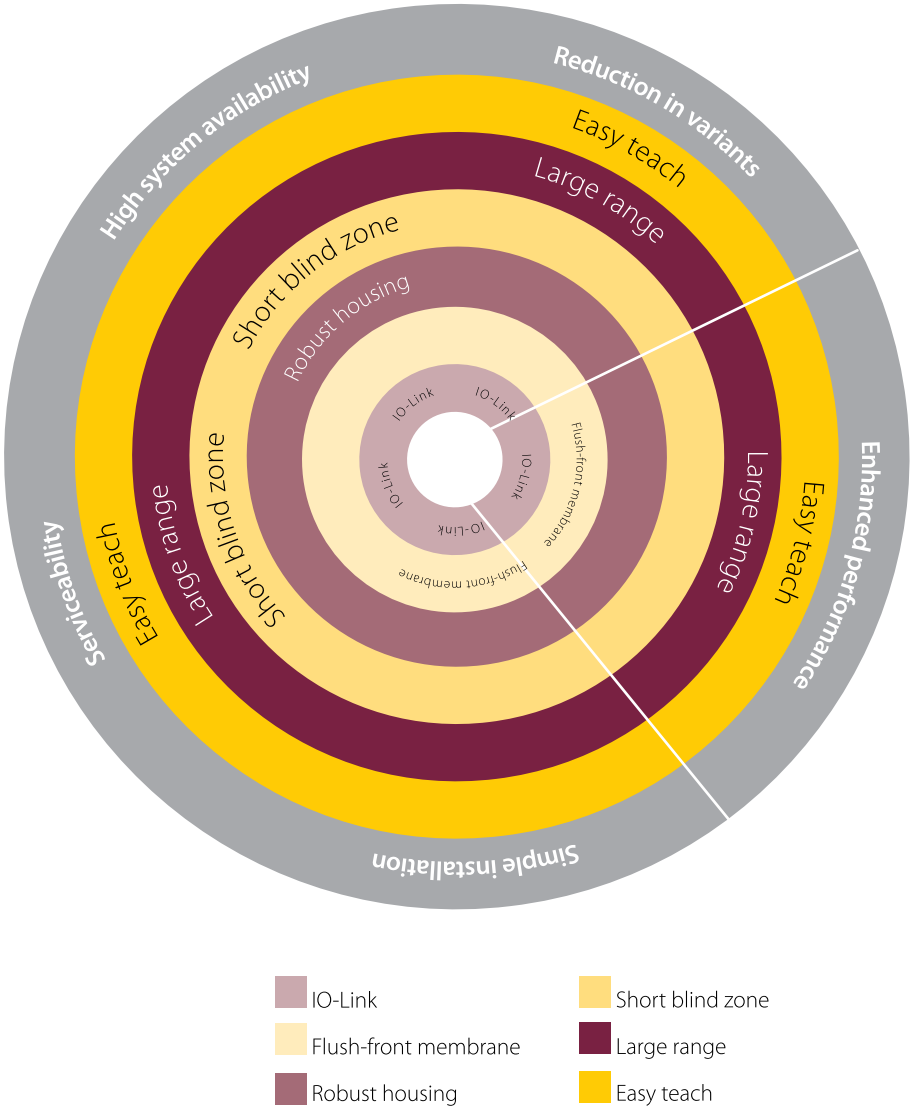
Benefits for the User

Serviceability

As an alternative to the flexibly configurable PNP or NPN switching outputs and the current or voltage analog outputs, IO-Link enables the sensor to be precisely configured via software to meet application requirements. Besides the parameterization functions, IO-Link also enables the process value to be read out routinely at any time if the standard is used as a communication channel. This flexibility enormously increases serviceability and shortens the replacement lead time.

Installation

Turck Easy Teach simplifies the installation and commissioning of the new ultrasonic sensors. The concept enables the user, for example, to precisely define the switching or measuring range limits without the uncertainty arising from turning a potentiometer. It is also possible to set parameters via IO-Link using the PACTware™ software standard popular with many suppliers. No proprietary software modules complicate the entry of the different settings and the maintenance of updates is considerably easier.



Enhanced performance

The newly developed sonic transducers enable larger measuring ranges up to 130 cm in the M18 design and 600 cm in the M30 version. Larger transducer heads for larger ranges are no longer required. Together with the short blind zones this increases the options available in existing applications and widens the application range.

Variant reduction

With their extremely short blind zones the sensors can also detect very close objects, thus providing greater flexibility for mounting. Together with the larger measuring ranges and the possibility to teach diffuse mode, retroreflective mode as well as NC and NO operation, the user can cover a wide range of applications with fewer models of Turck's new ultrasonic sensor series.

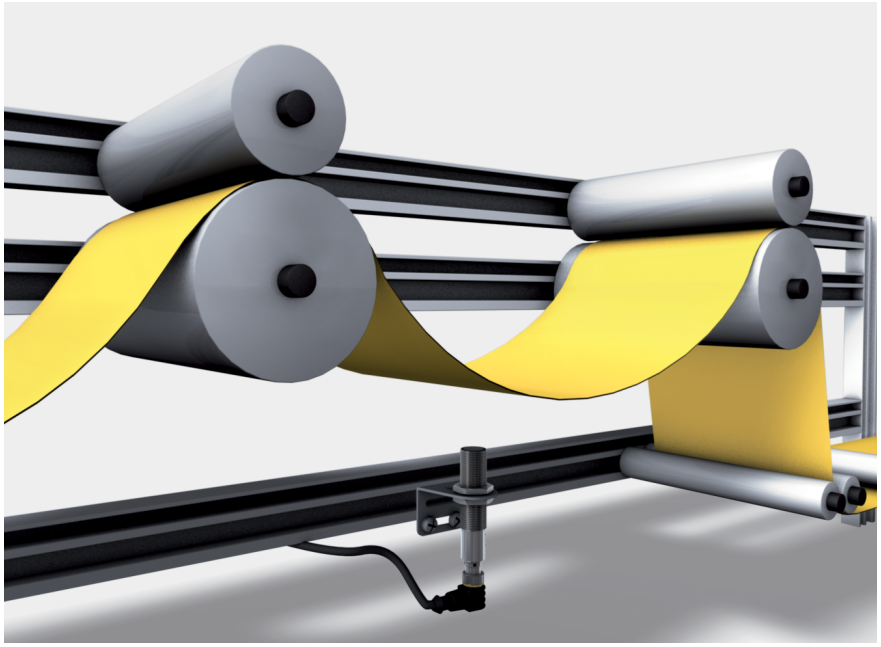
System availability

Maximum process safety is provided by the robust metal housing design in which the threaded sleeve and the connector thread are made from one piece, and also from the smooth front on which helps prevent dirt from accumulating. The sensor's high immunity to interference also significantly contributes to the reliability of this product line.

Application Examples

Conveyor belt

Ultrasonic sensors are ideal for measuring the profile of bulk material on a conveyor belt in harsh and dust-laden environments. Measurements are captured above the conveyor belt. Several sensors are mounted here next to each other in order to detect the entire width of the belt. To prevent any mutual interaction the sensor combination uses multiplex operation in which each sensor has its own address. In this mode the sensors operate cyclically in sequence. It is also possible to selectively activate each individual sensor via the controller. If the sensors are arranged further apart, the combination can also be synchronized.

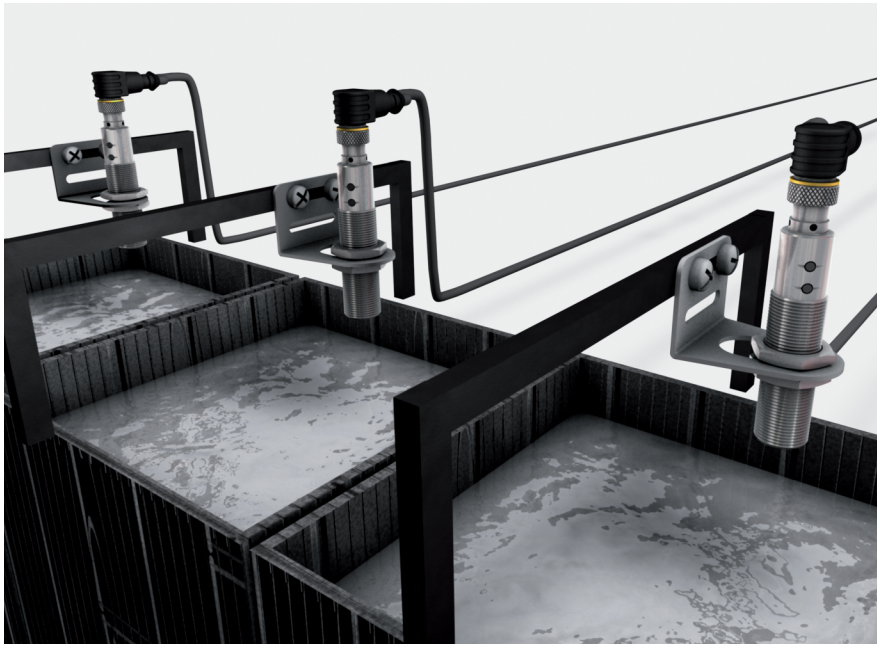


Sag control

Foils, paper and other materials are often checked for sag when wound or unwound. This task is mostly carried out by ultrasonic sensors as they are not affected by surface features such as the color of the material or by dust produced from wear. Depending on the size of the sag, detection ranges of up to several meters can be measured accurately to the nearest millimeter. As a limit switch the sensor is used for starting and stopping the drive. However, it can also be used to control speed via the analog output.

Level monitoring

Liquids are a very good reflector of ultrasonic waves if they do not form any foam. Ultrasonic sensors are therefore ideal for monitoring the level of liquid containers. Spray and droplets do not affect the sensor and it even cleans itself through the through the movement of the sonic transducer. The sensor enables several switch limit values, continuous level measuring or also the direct activation of a pump. Due to its short blind zone, the sensor can be mounted where space is limited, as a minimum clearance from the surface of the liquid is no longer required.



Conveyor belt

Ultrasonic sensors are ideal for measuring the profile of bulk material on a conveyor belt in harsh and dust-laden environments. Measurements are captured above the conveyor belt. Several sensors are mounted here next to each other in order to detect the entire width of the belt. To prevent any mutual interaction the sensor combination uses multiplex operation in which each sensor has its own address. In this mode the sensors operate cyclically in sequence. It is also possible to selectively activate each individual sensor via the controller. If the sensors are arranged further apart, the combination can also be synchronized.

Variants

Miniature sensors

In confined spaces, only small designs can be used. The housings in the M8 and M12 standard designs are robustly designed with IP67 protection and, thanks to their fully encapsulated design, can also be used in pressure ranges from 0.5 to 5 bar in the case of filling level tasks. The front-flush transducer diaphragm is largely insensitive to contamination, as adhering particles are virtually removed by the user's own movement. Both series feature IO-Link communication, so that the switching variant can also be used directly as a measuring sensor via the process value output. The M12 version is also available as a pure analog version.

ECO series

The RU50 Eco sensors are available with switching and analog outputs. You can choose between a variant with M12 plug output and a variant with cable output. The translucent end cap also has the advantage that the switching status of the sensor can be clearly seen from almost any angle.

Metal cylindrical rectangle design

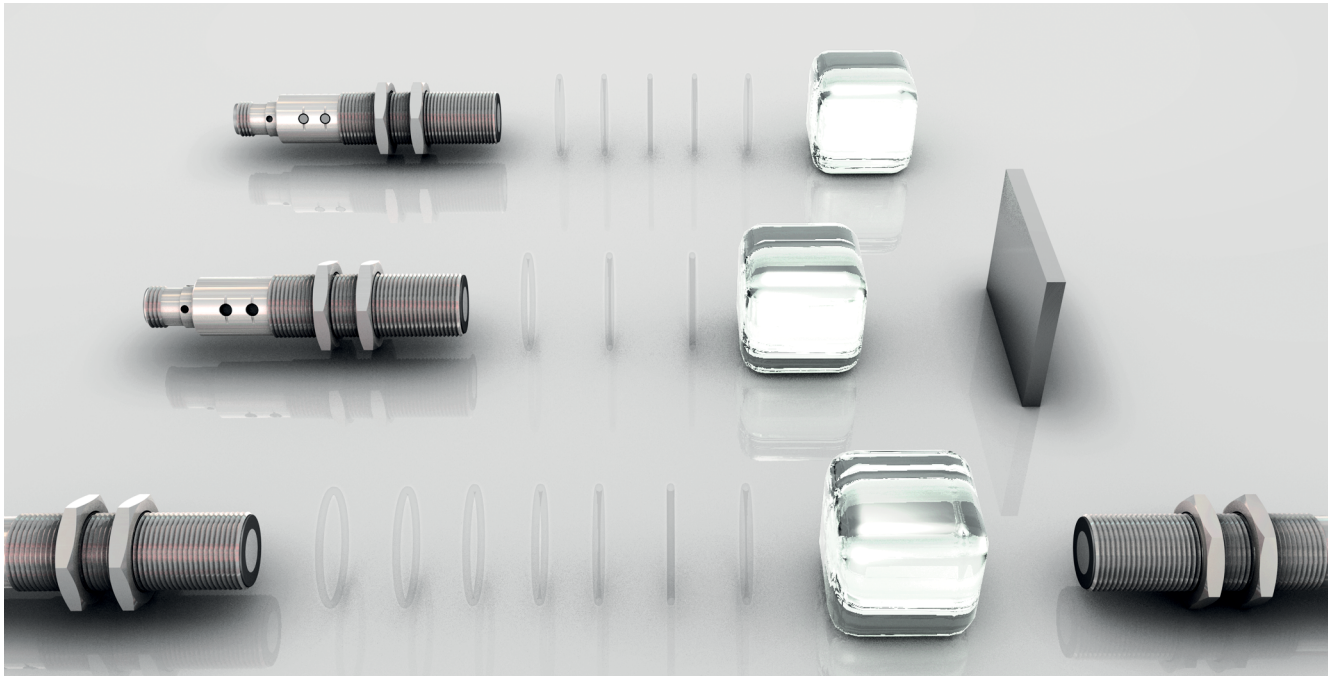
The M18 and M30 ultrasonic sensors feature smooth transducer faces, short blind zones, adjustable sensing fields, and robust chrome plated brass barrels, along with multiple options for outputs and configurations that enable users to select the best design for their application.
Output configurations range from a single output with an adjustable set point to versions with configurable outputs either as dual set point, analog, window, retroreflective, or IO-Link. Sensors can be taught via wire, integral buttons, or IO-Link.

Hazardous cylindrical

Available in M18 and M30 sizes, in a robust 316 SST housing. The hazardous area sensors are suitable for use in Ex-zones 2 and 22.

Rectangle design

The rectangular CK40 with integrated connector or the CP40 variants with terminal chamber combine the advantages of a large detection range with a wide opening angle and a very small blind zone. These sensors are ideally suited for safe detection of objects that provide only a weak reflection signal due to their geometry or are moved in a large environment.



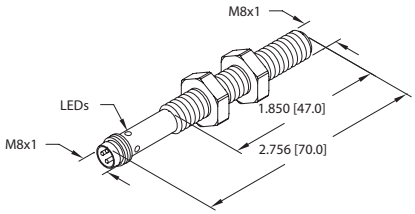
The High-end series can be set to different operating modes such diffuse mode, retroreflective opposed mode for a fixed reflector or also to opposed mode with an emitter and receiver.

Ultrasonic sensors – Range overview

	M08	M12	S18	M18		M30		CK40
Compact/ Miniature 1 switching output	10 cm	20 cm 40 cm		40 cm 100 cm				
ECO switching or analog output			50 cm					
Standard 2 switching outputs					40 cm 130 cm	40 cm 130 cm 300 cm	600 cm	200 cm
Standard switching or analog output		20 cm 40 cm		40 cm 130 cm		130 cm 300 cm	600 cm	200 cm
High-End switching or analog output					40 cm 130 cm	130 cm 300 cm	600 cm	

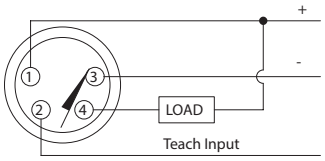
Miniature Sensors | 8 mm

Front Sensing Transducer

Housing Style	Dimension Drawings
	A  8 mm - Metal Barrel with M8 Picofast Connection, Teach-by-Wire

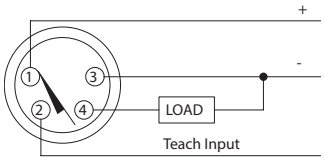
Wiring Diagrams/Mating Cordsets

1



PKG 4M-*

2



PKG 4M-*

Ultrasonic Barrels

Operating Voltage:	18-30 VDC	Short-Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
Voltage Drop Across Conducting Sensor:	≤2.5 V	Ambient Temp:	0 to +50 °C
No-Load Current:	≤50 mA	Internal Protection Rating:	IP67
Residual Current:	≤0.1 mA	Housing Material:	Metal/CuZn/Nickel-plated
Load Resistance:	≤1000 Ω	Transducer Material:	Plastic, Epoxyd resin/PU foam
Readiness Delay:	≤300 ms		
Repeatability:	0.15% of full scale		

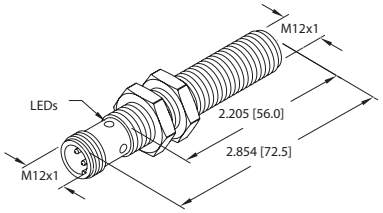
Miniature Sensors | 8 mm

Front Sensing Transducer

Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	1 X NPN Output	Retroreflective	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU10U-M08-UN8X-V1141 100003158	10		●		●	2	9°	0.2	5	20	A	1
RU10U-M08-UP8X-V1141 100003157	10	●			●	2	9°	0.2	5	20	A	2
RU10L-M08-UN8X-V1141 100003160	10		●	●	●	2	9°	0.2	5	20	A	1
RU10L-M08-UP8X-V1141 100003159	10	●		●	●	2	9°	0.2	5	20	A	2

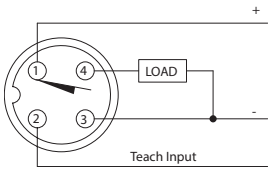
Miniature Sensors | 12 mm

Front Sensing Transducer

Housing Style	Dimension Drawings
	A  12 mm - Metal Barrel with M12 Eurofast Connection, Teach-by-Wire

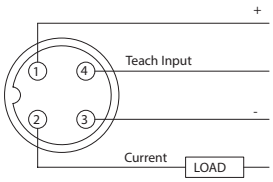
Wiring Diagrams/Mating Cordsets

1



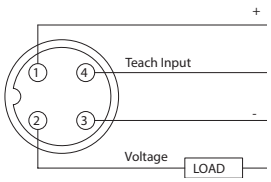
Mating Cordset: RK 4.4T-*

2



Mating Cordset: RK 4.4T-*

3



Mating Cordset: RK 4.4T-*

Ultrasonic Barrels

Operating Voltage:	15-30 VDC (LI/LU) 10-30 VDC (AP)	Short-Circuit Protection:	Yes
		Reverse Polarity Protection:	Yes
Continuous Switching Current:	≤150 mA	Ambient Temp:	-10 to +60°C
Voltage Drop Across Conducting Sensor:	≤2.5 VDC	Temperature Drift:	1.5% of full scale
No-Load Current:	≤50 mA	Internal Protection Rating:	IP67
Residual Current:	≤0.1 mA	Housing Material:	Metal/CuZn/Nickel-plated
Readiness Delay:	≤300 ms	Transducer Material:	Plastic/Epoxyd resin/PU foam
Repeatability:	0.15% of full scale	LED:	Yellow

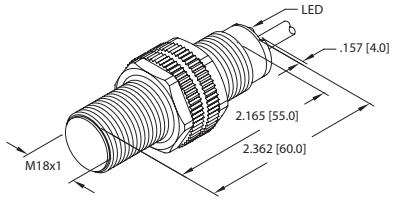
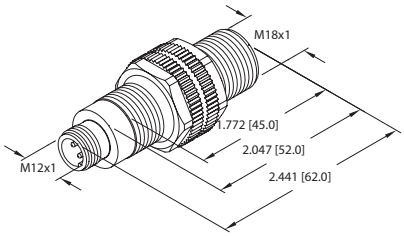
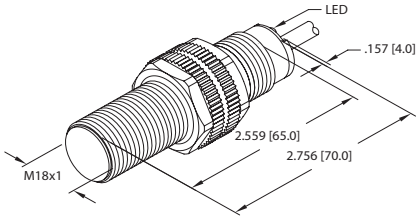
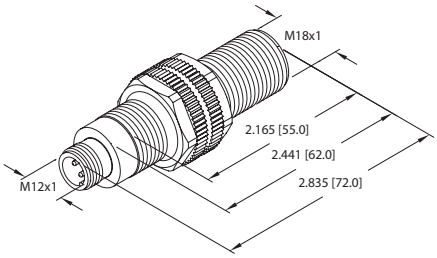
Miniature Sensors | 12 mm

Front Sensing Transducer

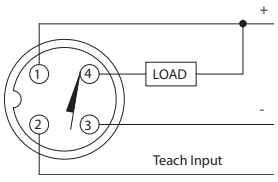
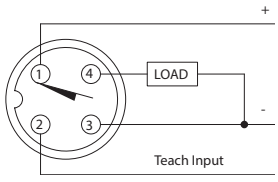
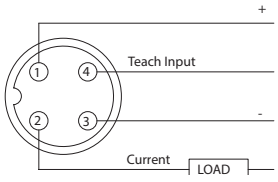
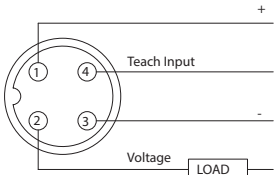
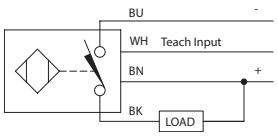
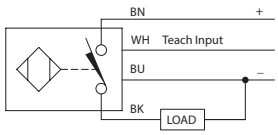
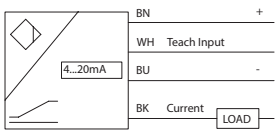
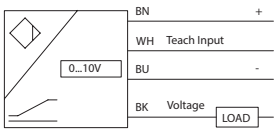
Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	Analog 0-10v	Analog 4-20mA	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU20U-M12-AP6X2-H1141 100000278	20	●			●	2.5	9°	0.5	3	12.5	A	1
RU20U-M12-LI8X2-H1141 100000280	20			●		2.5	9°	0.5			A	2
RU20U-M12-LU8X2-H1141 100000282	20		●			2.5	9°	0.5			A	3
RU40U-M12-AP6X2-H1141 100000279	40	●			●	4	15°	0.5	5	10.4	A	1
RU40U-M12-LI8X2-H1141 100000281	40			●		4	15°	0.5			A	2
RU40U-M12-LU8X2-H1141 100000283	40		●			4	15°	0.5			A	3

ECO Series | Cylindrical Design

Front Sensing Transducer

Housing Style	Dimension Drawings
	A  12 mm - Plastic Barrel with 2M cable, Teach-by-Wire
B  12 mm - Plastic Barrel with M12 Eurofast Connection, Teach-by-Wire	C  12 mm - Plastic Barrel with 2M cable, Teach-by-Wire
D  12 mm - Plastic Barrel with M12 Eurofast Connection, Teach-by-Wire	

Wiring Diagrams/Mating Cordsets

1  Mating Cordset: RK 4.4T-*	2  Mating Cordset: RK 4.5T-*	3  Mating Cordset: RK 4.4T-*	4  Mating Cordset: RK 4.4T-*
5  RK 4.4T-*	6  RK 4.4T-*	7  RK 4.4T-*	8  RK 4.4T-*

ECO Series | Cylindrical Design

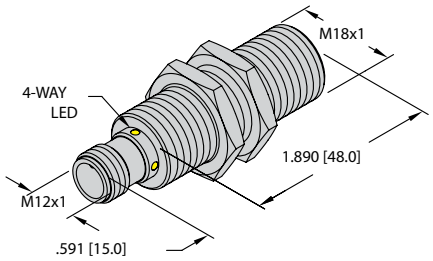
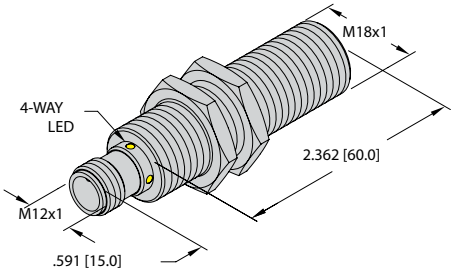
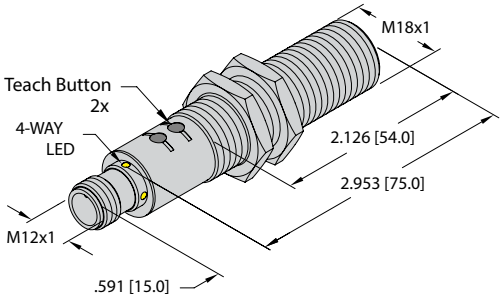
Front Sensing Transducer

Ultrasonic Barrels			
Operating Voltage:	15-30 VDC	Short-Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
Voltage Drop Across Conducting Sensor:	≤2.5 V	Ambient Temp:	-20 to +50 °C
No-Load Current:	≤50 mA	Temperature Drift:	1.5% of full scale
Residual Current:	≤0.1 mA	Internal Protection Rating:	IP67
Readiness Delay:	≤300 ms	Housing Material:	Plastic/LCP
Repeatability:	0.15% of full scale	Transducer Material:	Plastic/Epoxyd resin/PU foam
		LED:	Yellow

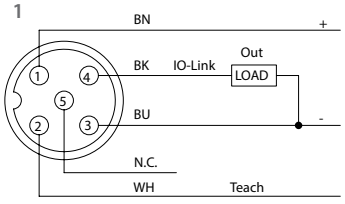
Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	1 X NPN Output	Analog 0-10v	Analog 4-20mA	Retroreflective	Teach By Wire	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU50U-S18-AN8X 100000984	50		●				●	5	20°	0.2	5	9.6	A	5
RU50U-S18-AN8X-H1141 100000983	50		●				●	5	20°	0.2	5	9.6	B	1
RU50U-S18-AP8X 100000394	50	●					●	5	20°	0.2	5	9.6	A	6
RU50U-S18-AP8X-H1141 100000746	50	●					●	5	20°	0.2	5	9.6	B	2
RU50L-S18-AN8X 100002166	50		●			●	●	5	20°	0.2	5	9.6	A	5
RU50L-S18-AN8X-H1141 100002168	50		●			●	●	5	20°	0.2	5	9.6	B	1
RU50L-S18-AP8X 100002165	50	●				●	●	5	20°	0.2	5	9.6	A	6
RU50L-S18-AP8X-H1141 100002167	50	●				●	●	5	20°	0.2	5	9.6	B	2
RU50U-S18-LI8X 100000747	50				●		●	5	20°	0.2			C	7
RU50U-S18-LI8X-H1141 100000748	50				●		●	5	20°	0.2			D	3
RU50U-S18-LU8X 100000749	50			●			●	5	20°	0.2			C	8
RU50U-S18-LU8X-H1141 100000750	50			●			●	5	20°	0.2			D	4

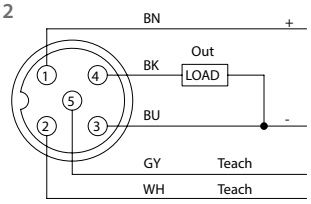
Ultrasonics Sensors | 18 mm

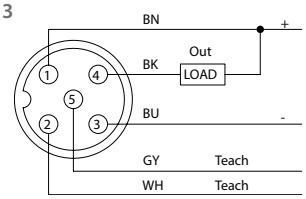
Front Sensing Transducer

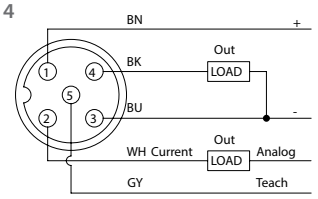
Housing Style	Dimension Drawings
	A  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**
B  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**	C  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**

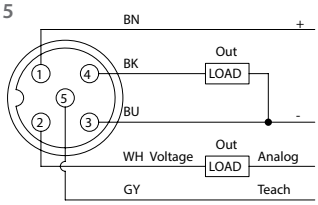
Wiring Diagrams/Mating Cordsets

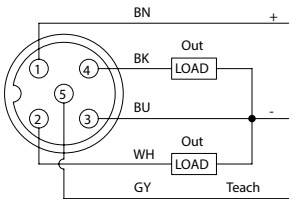
1 
Mating Cordset: RK 4.4T-*

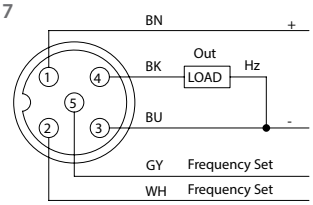
2 
Mating Cordset: RK 4.5T-*

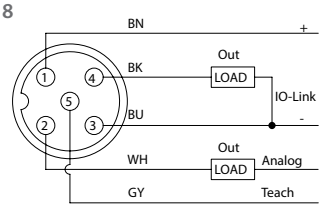
3 
Mating Cordset: RK 4.5T-*

4 
Mating Cordset: RK 4.5T-*

5 
Mating Cordset: RK 4.5T-*

6 
Mating Cordset: RK 4.5T-*

7 
Mating Cordset: RK 4.5T-*

8 
Mating Cordset: RK 4.5T-*

Ultrasonic Barrels

Operating Voltage:	15-30 VDC	Frequency Output (where applicable):	240-1600 Hz or 60-400 Hz Selectable
Voltage Drop Across Conducting Sensor:	≤2.5 V	Short-Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
No-Load Current:	≤50 mA	Operating Temp:	-25 to +70 °C
Residual Current:	≤0.1 mA	Temperature Drift:	1.5% of full scale
Load Resistance:	≤1000 Ω	Internal Protection Rating:	IP67
Readiness Delay:	≤300 ms	Housing Material:	CPB
Repeatability:	0.15% of full scale	Transducer Material:	PET/PU/Epoxy
Switching Output:	Programmable NO or NC	LED:	Yellow/Green

Ultrasonics Sensors | 18 mm

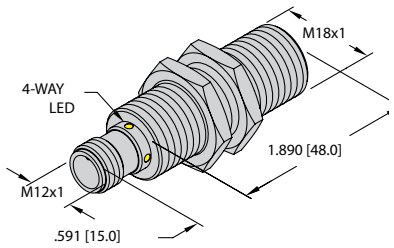
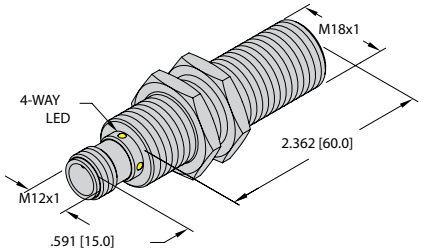
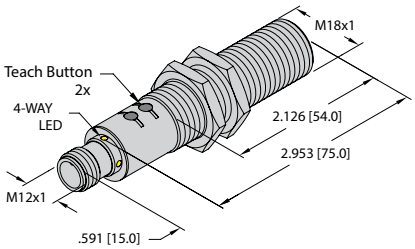
Front Sensing Transducer

Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	1 X NPN Output	2 X PNP Output	2X PNP/NPN or Programmable 4-20 mA/0-10 v Analog & 1 X PNP/NPN output	Analog 0-10v	Analog 4-20mA	Frequency Output	Retroreflective Programmable	Retroreflective Only	Window Mode Programmable	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU40U-M18M-AP8X2-H1151 1610094	40	●							●		●	●	2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	1
RU40U-M18M-UP8X2-H1151 1610008	40	●											2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	2
RU40U-M18M-UN8X2-H1151 1610080	40		●										2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	3
RU40U-M18E-LI8X2-H1151 1610069	40	●[1]					●						2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	B	4
RU40U-M18E-LU8X2-H1151 1610109	40	●[1]				●							2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	B	5
RU40U-M18E-2UP8X2-H1151 1610012	40			●					●		●		2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	B	6
RU40U-M18E-2UP8X2T-H1151 1610016	40			●					●		●		2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	C	6
RU40U-M18M-LFX-H1151 1610021	40							●					2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s		A	7
RU40L-M18M-UP8X2-H1151 1610076	40	●								●			2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	5.2	A	2
RU40L-M18M-UN8X2-H1151 1610084	40		●							●			2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	5.2	A	3
RU40U-M18E-LIU2PN8X2T-H1151 1610024	40				●				●		●	●[2]	2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	C	8

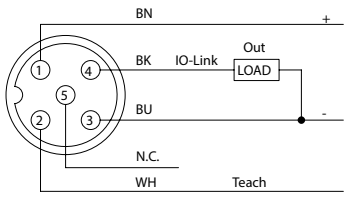
[1] Switching output is not adjustable

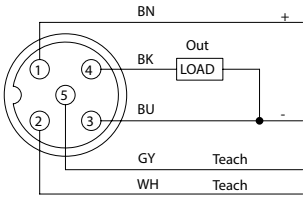
[2] Multiplexing and synchronization modes supported

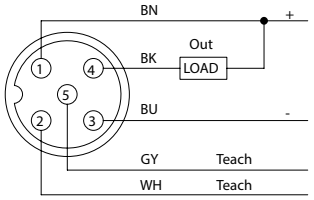
Front Sensing Transducer

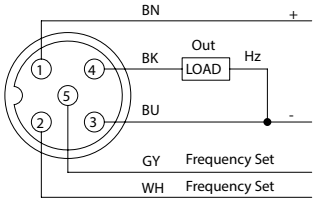
Housing Style	Dimension Drawings
	A  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**
B  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**	C  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**

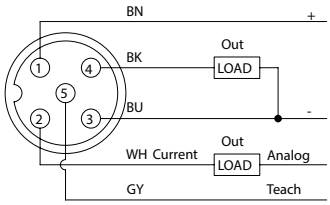
Wiring Diagrams/Mating Cordsets

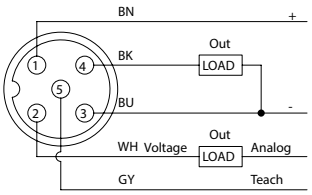
1 
Mating Cordset: RK 4.4T-*

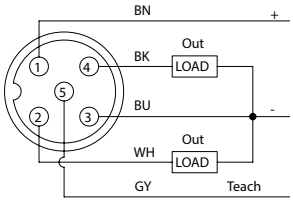
2 
Mating Cordset: RK 4.5T-*

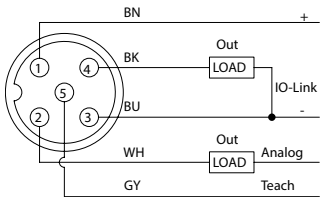
3 
Mating Cordset: RK 4.5T-*

4 
Mating Cordset: RK 4.5T-*

5 
Mating Cordset: RK 4.5T-*

6 
Mating Cordset: RK 4.5T-*

7 
Mating Cordset: RK 4.5T-*

8 
Mating Cordset: RK 4.5T-*

Ultrasonics Sensors | 18 mm

Front Sensing Transducer

Ultrasonic Barrels			
Operating Voltage:	15-30 VDC	Frequency Output (where applicable):	300-2000 Hz or 150-1000 Hz Selectable
Voltage Drop Across Conducting Sensor:	≤2.5 V	Short-Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
No-Load Current:	≤50 mA	Operating Temp:	-25 to +70 °C
Residual Current:	≤0.1 mA	Temperature Drift:	1.5% of full scale
Load Resistance:	≤1000 Ω	Internal Protection Rating:	IP67
Readiness Delay:	≤300 ms	Housing Material:	CPB
Repeatability:	0.15% of full scale	Transducer Material:	PET/PU/Epoxy
Switching Output:	Programmable NO or NC	LED:	Yellow/Green

Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	1 X NPN Output	2 X PNP Output	2X PNP/NPN or Programmable 4-20 mA/0-10 v Analog & 1 X PNP/NPN output	Analog 0-10v	Analog 4-20mA	Frequency Output	Retroreflective Programmable	Retroreflective Only	Window Mode Programmable	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU100U-M18M-AP8X2-H1151 1610095	100	●							●		●	●	15	16°	1	5	≤ 8 m/s	≤ 2 m/s	6.9	A	1
RU100U-M18M-UP8X2-H1151 1610010	100	●											15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	2
RU100U-M18M-UN8X2-H1151 1610081	100		●										15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	3
RU100U-M18M-LFX-H1151 1610022	100							●					15	16°	1		≤ 8 m/s	≤ 2 m/s		A	4
RU100L-M18M-UP8X2-H1151 1610077	100	●								●			15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	2
RU100L-M18M-UN8X2-H1151 1610085	100		●							●			15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	3
RU130U-M18E-LI8X2-H1151 1610089	130	●[1]					●						15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	5
RU130U-M18E-LU8X2-H1151 1610110	130	●[1]				●							15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	6
RU130U-M18E-2UP8X2-H1151 1610014	130			●					●		●		15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	7
RU130U-M18E-2UP8X2T-H1151 1610018	130			●					●		●		15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	C	7
RU130U-M18E-LIU2PN8X2T-H1151 1610026	130				●				●		●	●[2]	15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	C	8

[1] Switching output is not adjustable

[2] Multiplexing and synchronization modes supported

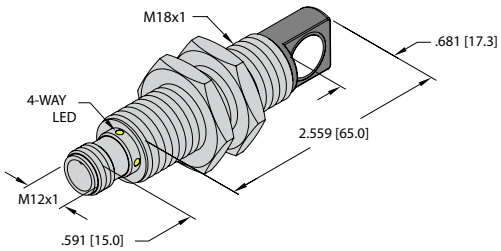
Ultrasonics Sensors | 18 mm

Side Sensing Transducer

Housing Style

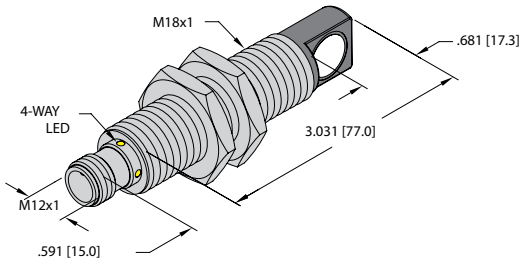
Dimension Drawings

A



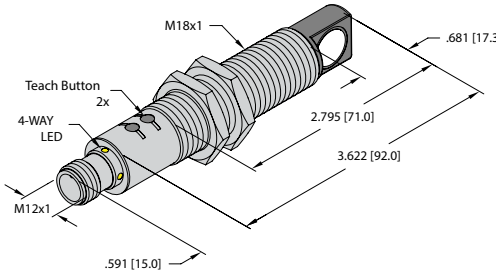
18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**

B



18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**

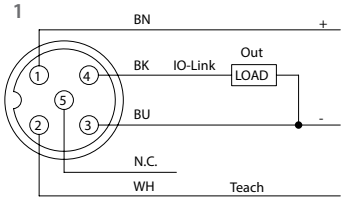
C



18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**

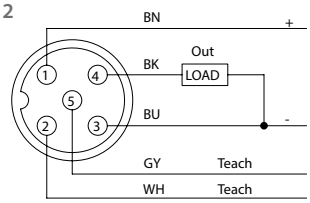
Wiring Diagrams/Mating Cordsets

1



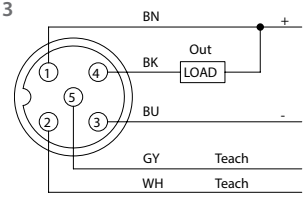
Mating Cordset: RK 4.4T-*

2



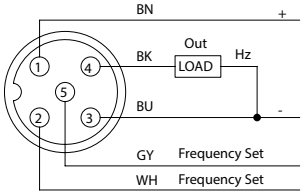
Mating Cordset: RK 4.5T-*

3



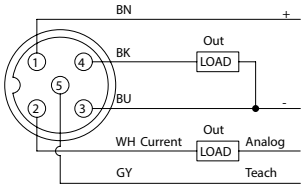
Mating Cordset: RK 4.5T-*

4



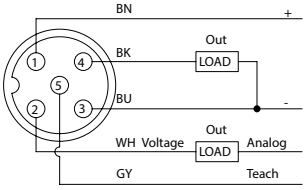
Mating Cordset: RK 4.5T-*

5



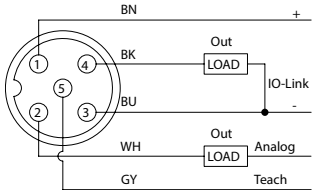
Mating Cordset: RK 4.5T-*

6



Mating Cordset: RK 4.5T-*

7



Mating Cordset: RK 4.5T-*

Ultrasonic Barrels

Operating Voltage:	15-30 VDC	Frequency Output (where applicable):	240-1600 Hz or 60-400 Hz Selectable
Voltage Drop Across Conducting Sensor:	≤2.5 V	Short-Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
No-Load Current:	≤50 mA	Operating Temp:	-25 to +70 °C
Residual Current:	≤0.1 mA	Temperature Drift:	1.5% of full scale
Load Resistance:	≤1000 Ω	Internal Protection Rating:	IP67
Readiness Delay:	≤300 ms	Housing Material:	CPB
Repeatability:	0.15% of full scale	Transducer Material:	PET/PU/Epoxy
Switching Output:	Programmable NO or NC	LED:	Yellow/Green

Ultrasonics Sensors | 18 mm

Side Sensing Transducer

Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	1 X NPN Output	2X PNP/NPN or Programmable 4-20 mA/0-10 v Analog & 1 X PNP/NPN output	Analog 0-10v	Analog 4-20mA	Frequency Output	Retroreflective Programmable	Retroreflective Only	Window Mode Programmable	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU40U-M18MS-AP8X2-H1151 1610105	40	●						●		●	●	2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	1
RU40U-M18MS-UP8X2-H1151 1610009	40	●										2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	2
RU40U-M18MS-UN8X2-H1151 1610082	40		●									2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	3
RU40U-M18MS-LFX-H1151 1610019	40						●					2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	4
RU40U-M18ES-LI8X2-H1151 1610097	40	●[1]				●						2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	B	5
RU40U-M18ES-LU8X2-H1151 1610111	40	●[1]			●							2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	B	6
RU40L-M18MS-UP8X2-H1151 1610078	40	●							●			2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	5.2	A	2
RU40L-M18MS-UN8X2-H1151 1610086	40		●						●			2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	5.2	A	3
RU40U-M18ES-LIU2PN8X2T-H1151 1610025	40			●				●		●	●[2]	2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	C	7

[1] Switching output is not adjustable

[2] Multiplexing and synchronization modes supported

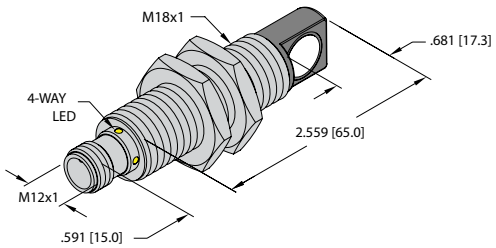
Ultrasonics Sensors | 18 mm

Side Sensing Transducer

Housing Style

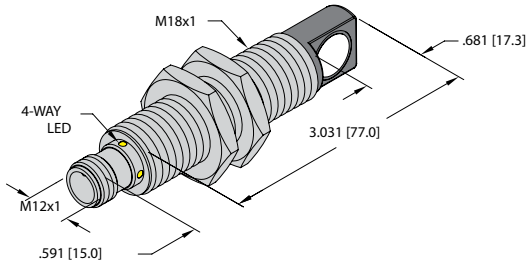
Dimension Drawings

A



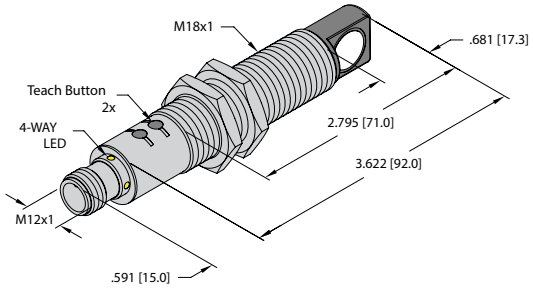
18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**

B



18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**

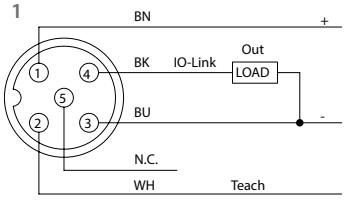
C



18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**

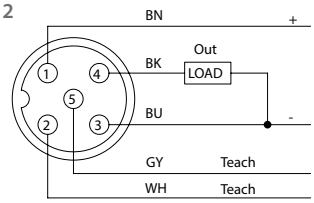
Wiring Diagrams/Mating Cordsets

1



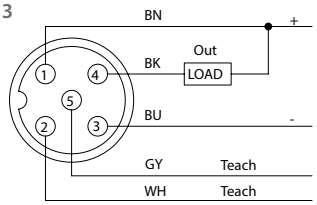
Mating Cordset: RK 4.4T-*

2



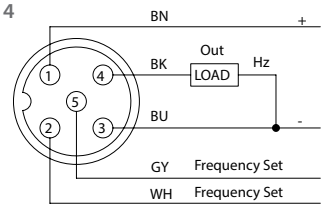
Mating Cordset: RK 4.5T-*

3



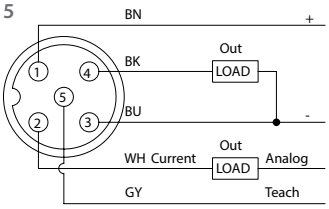
Mating Cordset: RK 4.5T-*

4



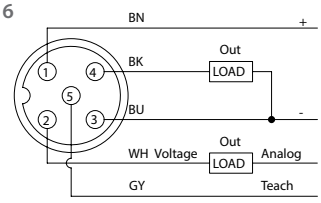
Mating Cordset: RK 4.5T-*

5



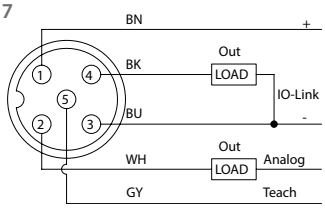
Mating Cordset: RK 4.5T-*

6



Mating Cordset: RK 4.5T-*

7



Mating Cordset: RK 4.5T-*

Ultrasonic Barrels

Operating Voltage:	15-30 VDC	Frequency Output (where applicable):	300-2000 Hz or 150-1000 Hz Selectable
Voltage Drop Across Conducting Sensor:	≤2.5 V	Short-Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
No-Load Current:	≤50 mA	Operating Temp:	-25 to +70 °C
Residual Current:	≤0.1 mA	Temperature Drift:	1.5% of full scale
Load Resistance:	≤1000 Ω	Internal Protection Rating:	IP67
Readiness Delay:	≤300 ms	Housing Material:	CPB
Repeatability:	0.15% of full scale	Transducer Material:	PET/PU/Epoxy
Switching Output:	Programmable NO or NC	LED:	Yellow/Green

Ultrasonics Sensors | 18 mm

Side Sensing Transducer

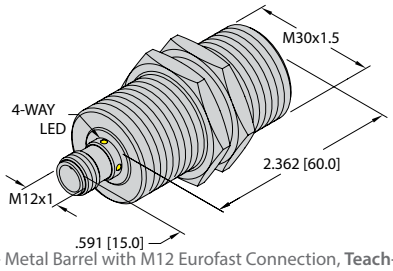
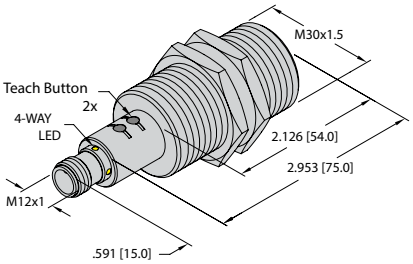
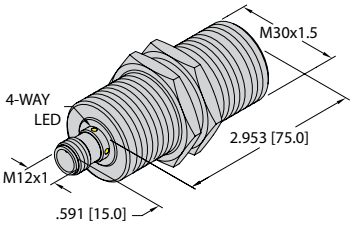
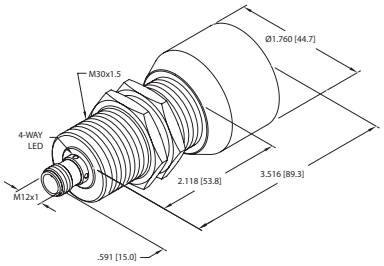
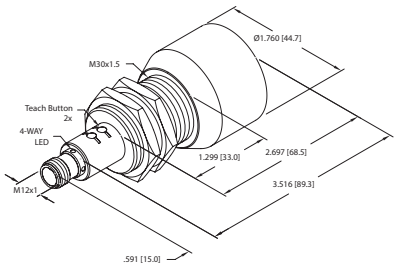
Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	1 X NPN Output	2X PNP/NPN or Programmable 4-20 mA/0-10 v Analog & 1 X PNP/NPN output	Analog 0-10v	Analog 4-20mA	Frequency Output	Retroreflective Programmable	Retroreflective Only	Window Mode Programmable	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU100U-M18MS-AP8X2-H1151 1610106	100	●						●		●	●	15	16°	1	5	≤ 8 m/s	≤ 2 m/s	6.9	A	1
RU100U-M18MS-UP8X2-H1151 1610011	100	●										15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	2
RU100U-M18MS-UN8X2-H1151 1610083	100		●									15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	3
RU100U-M18MS-LFX-H1151 1610020	100						●					15	16°	1		≤ 8 m/s	≤ 2 m/s	6.9	A	4
RU100L-M18MS-UP8X2-H1151 1610079	100	●							●			15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	2
RU100L-M18MS-UN8X2-H1151 1610087	100		●						●			15	16°	1	10	≤ 8 m/s	≤ 2 m/s	6.9	A	3
RU130U-M18ES-LI8X2-H1151 1610098	130	●[1]				●						15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	5
RU130U-M18ES-LU8X2-H1151 1610112	130	●[1]			●							15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	6
RU130U-M18ES-LIU2PN8X2T-H1151 1610027	130			●				●		●	●[2]	15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	C	7

[1] Switching output is not adjustable

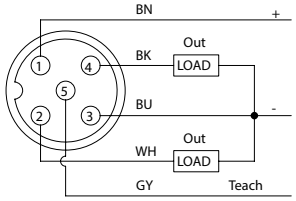
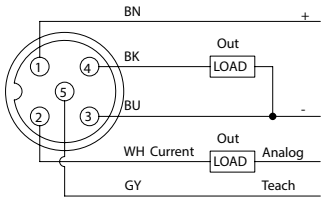
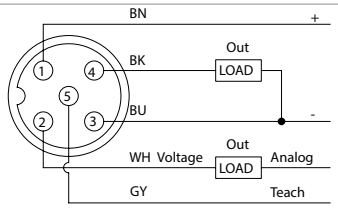
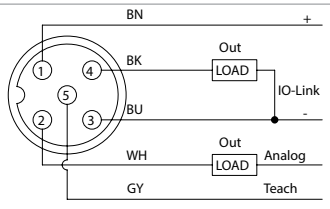
[2] Multiplexing and synchronization modes supported

Ultrasonics Sensors | 30 mm

Front Sensing Transducer

Housing Style	Dimension Drawings
	A  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**
B  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**	C  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**
D  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire**	E  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**

Wiring Diagrams/Mating Cordsets

1  Mating Cordset: RK 4.5T-*	2  Mating Cordset: RK 4.5T-*
3  Mating Cordset: RK 4.5T-*	4  Mating Cordset: RK 4.5T-*

Ultrasonics Sensors | 30 mm

Front Sensing Transducer

Ultrasonic Barrels

Operating Voltage:	15-30 VDC	Short-Circuit Protection:	Yes
Voltage Drop Across Conducting Sensor:	≤2.5 V	Reverse Polarity Protection:	Yes
Continuous Switching Current:	≤150 mA	Operating Temp:	-25 to +50 °C
No-Load Current:	≤50 mA	Temperature Drift:	1.5% of full scale
Residual Current:	≤0.1 mA	Internal Protection Rating:	IP67
Load Resistance:	≤1000 Ω	Housing Material:	CPB
Readiness Delay:	≤300 ms	Transducer Material:	PET/PU/Epoxy
Repeatability:	0.15% of full scale	LED:	Yellow/Green
Switching Output:	Programmable NO or NC		

Part Number/ ID Number	Rated Operating Distance (cm)	1 X PNP Output	2 X PNP Output	2X PNP/NPN or Programmable 4-20 mA/0-10 v Analog & 1 X PNP/NPN output	Analog 0-10v	Analog 4-20mA	Retroreflective Programmable	Window Mode Programmable	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU40U-M30M-2UP8X2-H1151 1610032	40		●				●	●		2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	1
RU130U-M30M-2UP8X2-H1151 1610034	130		●				●	●		15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	A	1
RU130U-M30E-2UP8X2T-H1151 1610038	130		●				●	●		15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	1
RU130U-M30E-LIU2PN8X2T-H1151 1610046	130			●			●	●	●[2]	15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	4
RU300U-M30M-2UP8X2-H1151 1610036	300		●				●	●		30	15°	1	25	≤ 11 m/s	≤ 4.2 m/s	3.3	C	1
RU300U-M30E-LI8X2-H1151 1610099	300	●[1]				●				30	15°	1	25	≤ 11 m/s	≤ 4.2 m/s	3.3	A	2
RU300U-M30E-LU8X2-H1151 1610113	300	●[1]			●					30	15°	1	25	≤ 11 m/s	≤ 4.2 m/s	3.3	A	3
RU300U-M30E-2UP8X2T-H1151 1610040	300		●				●	●		30	15°	1	25	≤ 11 m/s	≤ 4.2 m/s	3.3	B	1
RU300U-M30E-LIU2PN8X2T-H1151 1610048	300			●			●	●	●[2]	30	15°	1	25	≤ 11 m/s	≤ 4.2 m/s	3.3	B	4
RU600U-M30M-2UP8X2-H1151 1610037	600		●				●	●		60	15°	1	50	≤ 11 m/s	≤ 3.7 m/s	1.6	D	1
RU600U-M30E-LI8X2-H1151 1610100	600	●[1]				●				60	15°	1	50	≤ 11 m/s	≤ 3.7 m/s	1.6	D	2
RU600U-M30E-LU8X2-H1151 1610114	600	●[1]			●					60	15°	1	50	≤ 11 m/s	≤ 3.7 m/s	1.6	D	3
RU600U-M30E-2UP8X2T-H1151 1610041	600		●				●	●		60	15°	1	50	≤ 11 m/s	≤ 3.7 m/s	1.6	E	1
RU600U-M30E-LIU2PN8X2T-H1151 1610049	600			●			●	●	●[2]	60	15°	1	50	≤ 11 m/s	≤ 3.7 m/s	1.6	E	4

[1] Switching output is not adjustable

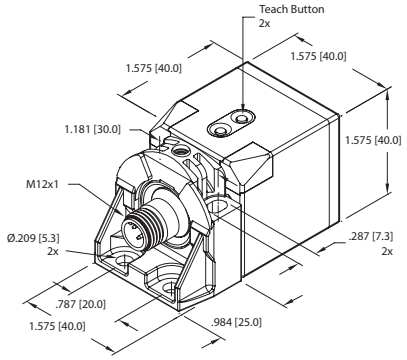
[2] Multiplexing and synchronization modes supported

5 Way Rotatable Sensing Head

Housing Style

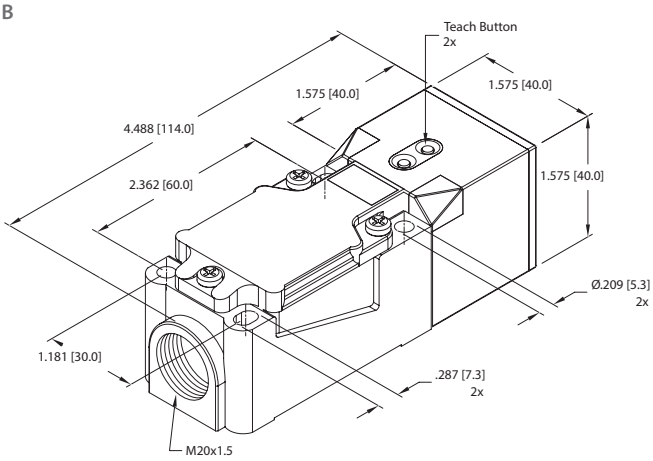
Dimension Drawings

A



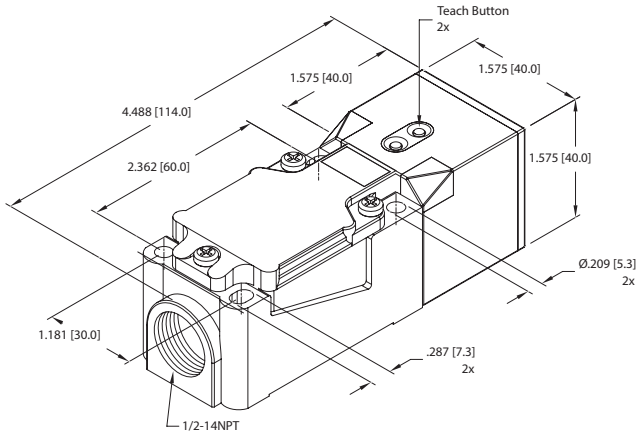
CK40 - M12 Eurofast Connection, **Teach-by-Wire or Button**

B



CP40 - Terminal Chamber with M20x1.5 Conduit Connection, **Teach-by-Button**

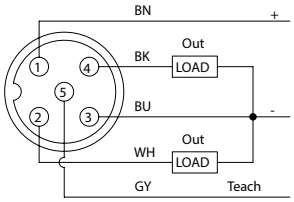
C



CP40 - Terminal Chamber with 1/2 NPT Conduit Connection, **Teach-by-Button**

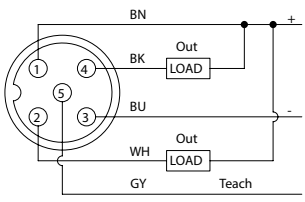
Wiring Diagrams/Mating Cordsets

1



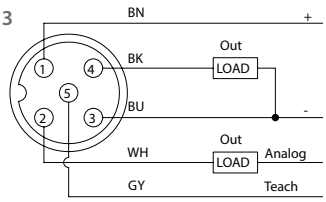
Mating Cordset: RK 4.4T-*

2



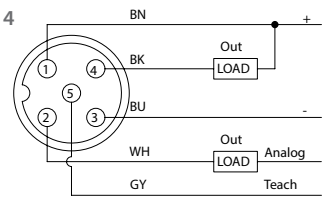
Mating Cordset: RK 4.5T-*

3



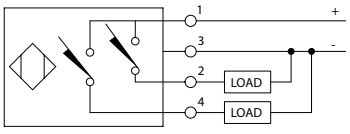
Mating Cordset: RK 4.5T-*

4

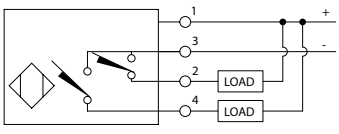


Mating Cordset: RK 4.5T-*

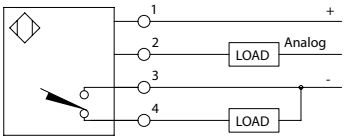
5



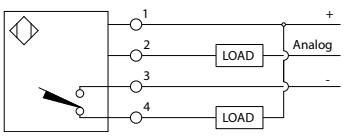
6



7



8



5 Way Rotatable Sensing Head

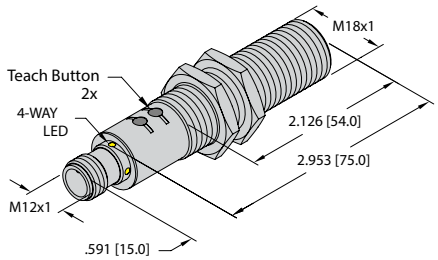
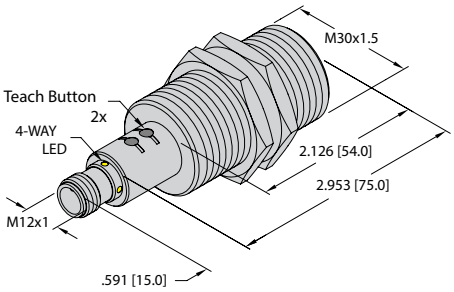
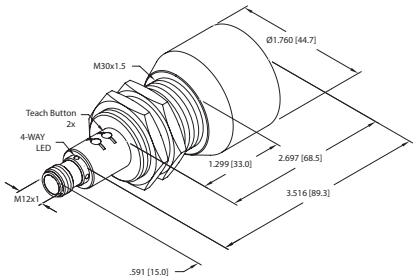
Ultrasonic Rectangular

Operating Voltage:	15-30 VDC	Analog Output:	4-20 mA or 0-10 V Programmable
Voltage Drop Across Conducting Sensor:	≤2.5 V	Short Circuit Protection:	Yes
Continuous Switching Current:	≤150 mA	Reverse Polarity Protection:	Yes
No-Load Current:	≤50 mA	Operating Temp:	0 to +70 °C
Residual Current:	≤0.1 mA	Temperature Drift:	1.5% of full scale
Load Resistance:	≤1000 Ω	Internal Protection Rating:	IP40
Readiness Delay:	≤300 ms	Housing Material:	PBT-GF30
Repeatability:	0.25% of full scale	Transducer Material:	AL/Ceramic
Switching Output:	Programmable NO or NC	LED:	Yellow/Green

Part Number/ ID Number	Rated Operating Distance (cm)	2 X PNP Output	2 X NPN Output	Programmable 4-20 mA/0-10 v Analog & 1 X PNP output	Programmable 4-20 mA/0-10 v Analog & 1 X NPN output	Retroreflective Programmable	Window Mode Programmable	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU200-CK40-2UP8X2T-H1151 1610051	200	●				●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	A	1
RU200-CK40-2UN8X2T-H1151 1610057	200		●			●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	A	2
RU200-CK40-LIU2P8X2T-H1151 1610053	200			●		●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	A	3
RU200-CK40-LIU2N8X2T-H1151 1610058	200				●	●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	A	4
RU200-CP40-2UP8X2T 1610052	200	●				●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	B	5
RU200-CP40-2UN8X2T 1610055	200		●			●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	B	6
RU200-CP40-2UP8X2T/S10* 1610092	200	●				●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	C	5
RU200-CP40-2UN8X2T/S10* 1610090	200		●			●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	C	6
RU200-CP40-LIU2P8X2T 1610054	200			●		●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	B	7
RU200-CP40-LIU2N8X2T 1610056	200				●	●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	B	8
RU200-CP40-LIU2P8X2T/S10* 1610093	200			●		●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	C	7
RU200-CP40-LIU2NP8X2T/S10* 1610091	200				●	●	●	5	60°	1	20	≤ 3 m/s	≤ 3 m/s	3	C	8

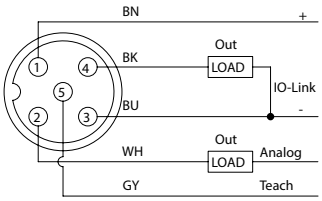
* /S10 designates 1/2-14 NPT conduit connection

ATEX and IECEx Approval

Housing Style	Dimension Drawings
	A  18 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**
B  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**	C  30 mm - Metal Barrel with M12 Eurofast Connection, **Teach-by-Wire or Button**

Wiring Diagrams/Mating Cordsets

1



Mating Cordset: RK 4.5T-*

Ultrasonic Barrel w/ ATEX Approval

Operating Voltage:	15-30 VDC
Voltage Drop Across Conducting Sensor:	≤2.5 V
Continuous Switching Current:	≤150 mA
No-Load Current:	≤50 mA
Residual Current:	≤0.1 mA
Load Resistance:	≤1000 Ω
Readiness Delay:	≤300 ms
Repeatability:	0.15% of full scale
Switching Output:	Programmable NO or NC
Short-Circuit Protection:	Yes
Reverse Polarity Protection:	Yes

Operating Temp:	-25 to +70 °C
Temperature Drift:	1.5% of full scale
Internal Protection Rating:	IP67
Housing Material:	SS
Transducer Material:	PET/PU/Epoxy
LED:	Yellow/Green
Approval with Teach Button:	II 3G Ex nA nC IIC T6 Gc II 3D Ex tc IIIC T70°C Dc

Ultrasonics Sensors | Hazardous Area

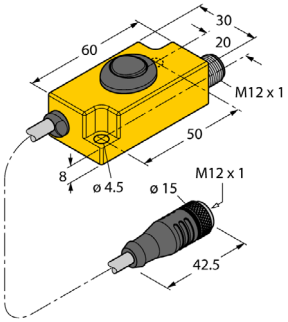
ATEX and IECEx Approval

Part Number/ ID Number	Rated Operating Distance (cm)	2X PNP/NPN or Programmable 4-20 mA/0-10 v Analog & 1 X PNP/NPN output	Retroreflective Programmable	Window Mode Programmable	IO-Link V1.1	Blind Zone (cm)	Sonic Cone Angle	Resolution (mm)	Switching Hyst. (mm)	Max Approach Speed	Max Pass Speed	Switching Freq. (Hz)	Dimension Drawings	Wiring Diagrams
RU40U-EM18E-LIU2PN8X2T-H1151/3GD 1610071	40	●	●	●	●[1]	2.5	15°	0.5	5	≤ 3 m/s	≤ 1.3 m/s	10.4	A	1
RU130U-EM18E-LIU2PN8X2T-H1151/3GD 1610072	130	●	●	●	●[1]	15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	A	1
RU130U-EM30E-LIU2PN8X2T-H1151/3GD 1610073	130	●	●	●	●[1]	15	16°	1	10	≤ 10 m/s	≤ 2 m/s	6.9	B	1
RU300U-EM30E-LIU2PN8X2T-H1151/3GD 1610074	300	●	●	●	●[1]	30	15°	1	25	≤ 11 m/s	≤ 4.2 m/s	3.3	B	1
RU600U-EM30E-LIU2PN8X2T-H1151/3GD 1610075	600	●	●	●	●[1]	60	15°	1	50	≤ 11 m/s	≤ 3.7 m/s	1.6	C	1

[1] Multiplexing and synchronization modes supported.

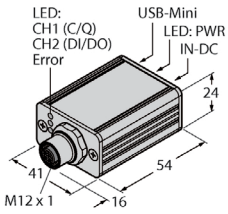
Accessories

TX1-Q20L60



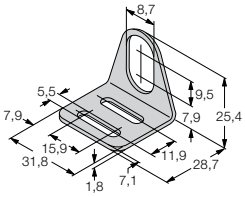
Teach adapter for inductive encoders, linear position, angle, ultrasonic and capacitive sensors

USB-2-IOL-0002



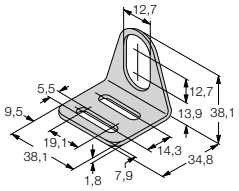
IO-Link Master with integrated USB port

MW-08



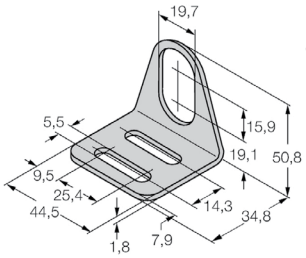
Mounting bracket for threaded barrel sensors, M8 x 1; material: Stainless steel A2 1.4301 (AISI 304)

MW-12



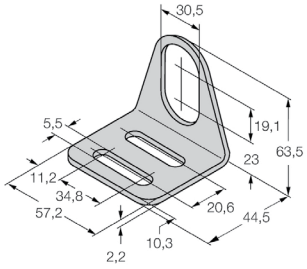
Mounting bracket for threaded barrel sensors, M12 x 1; material: Stainless steel A2 1.4301 (AISI 304)

MW-18



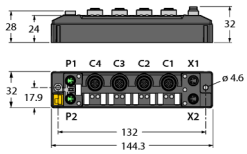
Mounting bracket for threaded barrel devices; material: Stainless steel A2 1.4301 (AISI 304)

MW-30



Mounting bracket for threaded barrel devices; material: Stainless steel A2 1.4301 (AISI 304)

TBEN-S2-4IOL

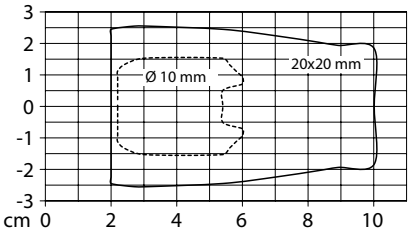


Compact multiprotocol I/O module, 4 IO-Link Master 1.1 Class A, 4 universal PNP digital channels 0.5 A

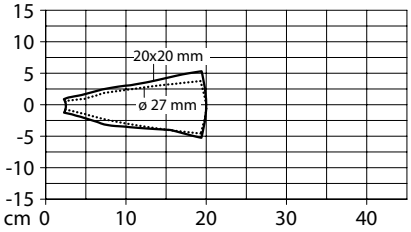
Performance Curves

The diagrams show the detection ranges of the individual ultrasonic sensors, covering reaches of 40 to 600 cm. There are different targets used in sizes 20 x 20 mm, 100 x 100 mm according to the EN standard 60947-5-2, as well as a round rod with a diameter of 27 mm in order to compare the detection ranges of different ultrasonic sensors. When using other targets than the aforementioned standard ones, the detection ranges may vary due to different reflection properties and geometries.

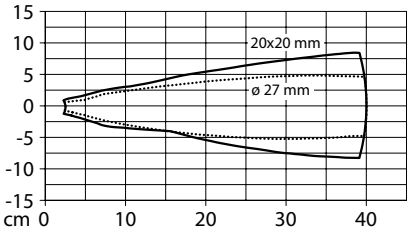
RU10 (M8)



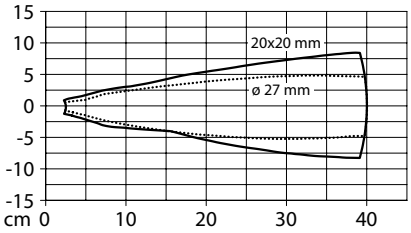
RU20 (M12)



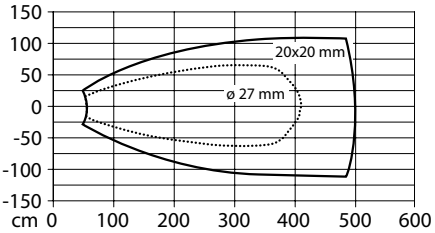
RU40 (M12)



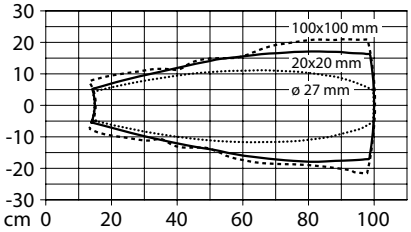
RU40 (M18)



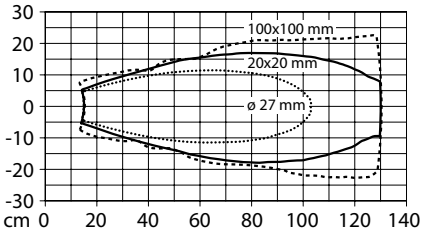
RU50



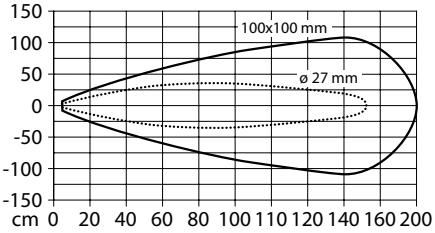
RU100



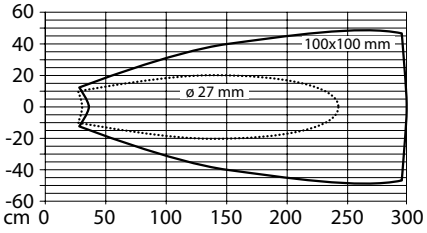
RU130



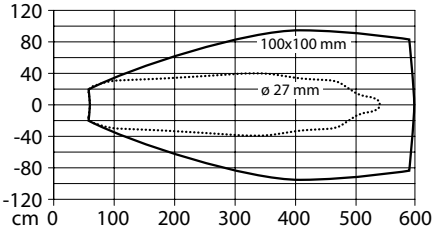
RU200



RU300



RU600



30 subsidiaries and over
60 representations worldwide!

Printed in USA

©2024 by Turck Inc. All rights reserved. No part of the
publication may be reproduced without written permission.

B1115 D 01/24

www.turck.com