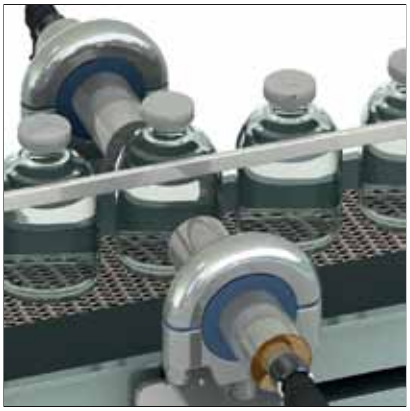
Ultrasonic sensors



Ultrasonic sensing – Versatile solutions for many applications

Ultrasonic sensors detect a multitude of objects contactless and wear-free with ultrasonic waves. In contrast to other sensing technologies, it is not important whether the object is transparent or opaque, metallic or non-metallic, firm, liquid or powdery. More important is the object's surface. The smoother the surface, the better the reflectivity and the larger the range.

The application possibilities for ultrasonic sensors are nearly infinite. Whether level or height detection, measurement of distance or object counting, ultrasonic sensors detect objects of different material qualities and at long distances. Environmental conditions such as spray, dust or rain hardly affect their functionality.

Ultrasonic diffuse mode sensors detect all objects that echo back ultrasonic waves. For this purpose the sensor emits ultrasonic pulses in cyclic periods. The echo is reverberated and transformed into an electrical signal via the sensor's transducer surface. The distance between the sensor and object is determined through the echo propagation principle, whereby the period between pulse emission and reverberation is related to a given sonic speed.

Ultrasonic sensors are also available as opposed and retroreflective mode devices. In opposed mode, ultrasonic waves are continuously propagating between emitter and receiver. If an object crosses the wave, reverberation is cut off and the sensor produces a switching signal.

TURCK's ultrasonic sensors are available in many different designs, measuring ranges, cone angles and output types. Most of them feature temperature compensation, noise suppression and a connection cable for autosynchronization (protection against crosstalk).

Sensors with two switching outputs are suited for the control of minimum and maximum filling levels for example. Analog sensors are available with current and voltage output. Sensors with external transducer are best suited for confined spaces.

Ultrasonic sensors with a cone angle of 6° detect small objects with pinpoint accuracy. Devices with cone angles of 12° to 15° are also available. Sensors with a cone angle of 60° are best suited for monitoring very large areas. They detect smooth and even surfaces easily and are insensitive to tilt.

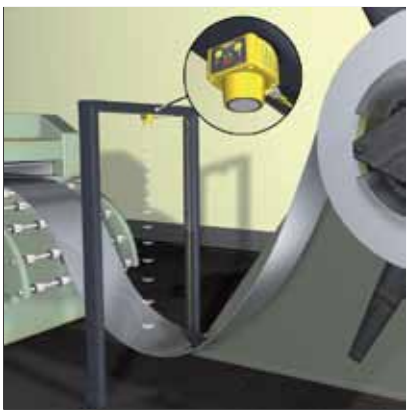
Our strengths – Your advantages

Broad product range - Different designs and cone angles

TURCK ultrasonic sensors are available as metal threaded barrels M18/M30 or plastic rectangular Q30 devices with a narrow cone angle of about 6°. They detect very small objects with pinpoint accuracy. Through focussing energy, ranges of up to 8 m can be achieved. Q45U and T30U have far greater cone angles of 12° to 15°. The cone angle of the CP40 rectangular types is 60°. They are best suited to monitor large areas and are insensitive to tilt when detecting objects with smooth and even surfaces. The right choice for confined spaces is the Q45U with external transducer.

Highly efficient - High accuracy at any given range

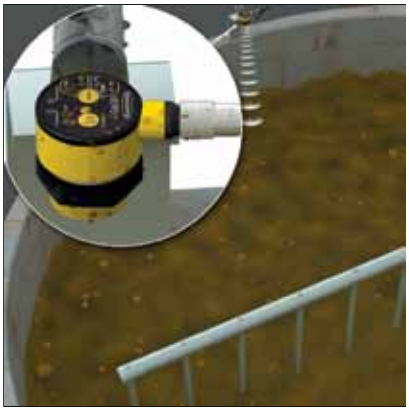
The ranges achieved by ultrasonic sensors depend on the wavelength respectively the frequency used. The greater the wavelength or lower the frequency, the larger the range. Compact sensors achieve ranges from 300 mm to 500 mm. 8 m and more are possible with wavelengths of 5 mm. The accuracy of ultrasonic sensing is not only limited by the wavelength but also by the fluctuation of sonic speed caused by temperature changes. Therefore most of the sensors are equipped with temperature compensation. This enables analog sensors to achieve resolutions of up to 0.6 mm over a wide temperature range.



Protection against interferences – Noise suppression and synchronization

Signal processing is not influenced by metallic clink or compressed air hissing. Such unwanted ambient noises are filtered out through an optimally selected frequency range and a patented noise suppression circuit. Crosstalk between ultrasonic sensors is inhibited through multiplexing or synchronization. Most sensors synchronize automatically after connecting the cable. For this purpose they emit ultrasonic pulses synchronously, behaving like one single sensor with extended sonic cone, provided they are accordingly arranged. You find this technology applied in electronic parking assistants of cars.

Your advantages



T30UX – Accurately measured values and minimal influence of temperature

Thanks to a powerful transducer and temperature compensation, the T30UX provide very accurately measured values. The diffuse mode types achieve ranges of even 3 m with blind zones reduced to 10 % of full scale. Thanks to the integrated temperature compensation, failure rates are reduced by approx. 90 %. The temperature window of -40…+70 °C remains stable with a slight drift of only 2.2 %. The IP67 rated sensors are applied in different industrial sectors such as the automotive industry (detection of glass), paper manufacturing (sag control), pharmaceuticals production (level control) and many other fields.

M25U – All-metal ultrasonic sensors for aseptic applications

The M25U are fully encapsulated in stainless steel and are IP68/IP69K rated. They meet all requirements on hygienic design of the food and beverage as well as the pharmaceutical industry. The stainless steel housing not only resists chemicals and aggressive cleaning agents, it is also thermal-shock proof. The sensors resist hot cleaning at +60 °C immediately followed by cold rinsing at +10 °C easily. Two sensitivities can be adjusted: Normal sensitivity, max. range 1 m (for objects sizing Ø 30 mm and larger); high sensitivity, max. range 40 cm (for objects sizing Ø 15 mm and larger).

QS18U – Also available with focussing adapter

The sonic cone of some ultrasonic sensors such as the QS18U can be focussed with the UWG18 adapter. This allows small objects to be detected free from interfering ambient conditions. Measurements in tubes and barrels are also possible.

Designs and variants

	Design	Output function	Protection class	Ambient temperature	Max. range	Page
QS18 – Switching output 	rectangular 15 x 35 x 33.5 mm	PNP	IP67 IP68	-20…+60 °C	50 cm	305
S18 – Switching or analog output 	cylindrical/threaded Ø 18 x 80.8 mm Ø 18 x 90.9 mm Ø 18 x 85.1 mm Ø 18 x 95.1 mm	Analog output PNP/NPN	IP67	-20…+60 °C	30 cm	307
M18K – Switching or frequency output 	cylindrical/threaded Ø 18 x 63 mm Ø 18 x 81 mm	frequency PNP	IP67	-25…+70 °C	20 cm 70 cm	309
T18 – Switching or analog output 	cylindrical/threaded Ø 18 x 101 mm Ø 18 x 104 mm	PNP Analog output	IP67	-25…+70 °C	30 cm 100 cm	311
M25 – Opposed mode sensor 	smooth barrel Ø 25 x 106 mm	PNP/NPN	IP67 / IP69K	-20…+70 °C	50 cm	313
M30 – Switching and/ or analog output 	cylindrical/threaded Ø 30 x 141.5 mm Ø 30 x 131 mm Ø 30 x 160.5 mm Ø 47.5 x 150 mm Ø 65 x 163.5 mm	PNP PNP/Analog output	IP65	-25…+70 °C	30 cm 130 cm 300 cm 600 cm	315
T30 – Switching and/ or analog output 	cylindrical/threaded Ø 40 x 45 mm	PNP Analog output	IP67	-40…+70 °C	100 cm 200 cm 300 cm	317

ts and variants

	Design	Output function	Protection class	Ambient temperature	Max. range	Page
Q30 – Switching or analog output 	rectangular 65 x 30 x 88 mm	PNP Analog output	IP65	0…+55 °C	30 cm 100 cm	319
CP40 – Switching or analog output 	rectangular 40 x 40 x 160 mm	PNP Analog output	IP40	0…+70 °C	180 cm	321
QT50 – Switching or analog output 	rectangular 74 x 84.2 x 67.4 mm 74 x 100.2 x 67.4 mm	PNP Analog output	IP67	-20…+70 °C	800 cm	323

QS18 – Compact rectangular design

The QS18U are suited for confined spaces. They withstand rough environments thanks to protection rating IP67. The sensors fit in almost any space. They are optionally available with M18 thread and can thus replace M18 threaded barrel sensors. Diffuse and retroreflective mode devices offer sensing ranges of 5 cm respectively 50 cm. They are available with PNP or NPN switching output.

Features

- Very compact rectangular design, 33.5 x 15 x 35 mm
- Plastic housing
- Protection classes IP67/IP68
- Ambient temperature -20…+60 °C
- Diffuse mode
- Retroreflective mode (with adjustable switching output)
- Max. range 100 cm
- Switching output
- LEDs indicate power ON and switching status
- Easy teaching, remote or via pushbutton

Type code QS18U

QS18U P A E Q8

QS18U Series

- **Series**
  - **QS18U** rectangular, 15 x 35 x 33,5 mm

P Output

- **Output**
  - **P** PNP
  - **N** NPN

A Sensing range

- **Sensing range**
  - **A** 50…500 mm

E Design

- **Design**
  - **E** protection class IP68 without teach button
  - **blank** protection class IP67 with teach button

Q8 Electrical connection

- **Electrical connection**
  - **blank** cable connection, 2 m
  - **Q** pigtail with connector, Ø 8 mm
  - **Q5** pigtail with connector, M12 x 1
  - **Q7** connector, Ø 8 mm
  - **Q8** connector, M12 x 1

QS18 – Switching output

General data

Connection	male, M12 x 1	**Operating voltage**	12…30 VDC
Output	PNP	**Housing material**	ABS
Ambient temperature	-20…+60 °C	**Function**	
Range	5…50 cm		

Types and data – selection table

Type	Protection class	w	d
QS18UPAQ8	IP67	w127	d553
QS18UPAEQ8	IP68	w127	d554

Many different types available, also with cable, see type code

w Wiring diagrams on page 658 d Dimension drawing on page 670 Accessories on page 560

Cylindrical design S18U – Threaded barrel

The S18U detect small objects with pinpoint accuracy. They are IP67 rated and thus also applicable in rough environments. The sensors are built in a 18 mm threaded barrel made of plastic and are available as diffuse or retroreflective mode devices with sensing ranges between 3 cm to 30 cm Available with switching or analog output.

Features

- M18, threaded barrel
- Plastic housing, straight/angled
- Protection class IP67
- Ambient temperature -20…+60 °C
- Diffuse mode
- Retroreflective sensing mode adjustable (with switching output)
- Max. range 30 cm
- Cone angle 6°
- Analog or switching output
- Easy teaching
- Via pushbutton or external cable

Type code S18U

S18U B A R Q

S18U Series

Series
S18U cylinder, plastic, thread Ø 18 mm

P Output

Output
B PNP/NPN transistor output adjustable to retroreflective mode switching range adjustable via teach-in
U 0 …10 V, measuring range adjustable via teach-in
I 4 …20 mA, measuring range adjustable via teach-in

A Range

Range
A 3…300 mm

R Design

Design
R housing, angled
blank housing, straight

Q Electrical connection

Electrical connection
Q connector, M12 x 1
blank cable connection, 2 m

S18 – Switching or analog output

General data

Protection class	IP67	**Connection**	male, M12 x 1
Operating voltage	10…30 VDC	**Housing material**	PBT
Ambient temperature	-20…+60 °C	**Function**	
Range	3…30 cm		

Types and data – selection table

Type	Output	w	d
S18UUAQ	Analog output, 0…10 V	w128	d555
S18UIAQ	Analog output, 4…20 mA	w128	d555
S18UUARQ	Analog output, 0…10 V	w128	d556
S18UIARQ	Analog output, 4…20 mA	w128	d556
S18UBAQ	_⟍_, PNP/NPN	w129	d555
S18UBARQ	_⟍_, PNP/NPN	w129	d556

Many different types available, also with cable, see type code

Ultrasonic sensors

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M18K – Threaded barrel

The M18K detect small objects with pinpoint accuracy. They are IP67 rated and thus also applicable in rough environments. The sensors come in a small 18 mm threaded barrel made of nickel-plated brass. Available are diffuse and retroreflective mode devices with a max. range of 20 cm resp. 70 cm and equipped with a PNP transistor or an analog frequency output.

Features

- M18K, threaded barrel
- Nickel-plated brass
- Protection class IP67
- Diffuse mode (RU/RUN) and retroreflective mode (RUR)
- Max. range 70 cm
- Cone angle 6°
- Version with lateral emission (M18KS)
- Switching or analog frequency output
- LED indicates the switching status and teach mode
- Adjustments via teach input

Type code CP40, M18, M18K, M30, Q30

RUR	70	Q30	AP8X	H1141	3GD

RUR Series

Series

RU	ultrasonic sensor, diffuse mode
RUC	ultrasonic sensor, programmable, synchronizable, multiplex function, diffuse mode
RUN	ultrasonic sensor, diffuse mode
RUR	ultrasonic sensor, retroreflective mode

70 Sensing range

Sensing range

70	max. sensing range in cm

Q30 Design

Design

CP40	rectangular, plastic 40 x 40 x 160 mm or 40 x 40 x 177.5 mm
M18	cylinder/thread, M18, metal, CuZn nickel-plated, Ø 18 mm
M18K	compact design, cylinder/thread M18, metal, CuZn, nickel-plated Ø 18 mm
M30	cylinder/thread M30, metal CuZn, nickel-plated, Ø 30 mm
Q30	compact, rectangular plastic, 65 x 30 x 88 mm

AP8X Electrical version

Electrical version

A	NO
2A	2 x NO
F	frequency output
I	analog output 0…20 mA or 4…20 mA
L	analog
N	NPN
P	PNP
U	analog output 0…10 V
X	LED display
X2	2 x LED display
6	10…30 VDC input voltage
8	18…35 VDC input voltage

H1141 Electrical connection

Electrical connection

H1141	connector, M12 x 1, 4-pole
H1151	connector, M12 x 1, 5-pole
V1141	connector, M8 x 1, 4-pole
blank	cable connection, 2 m, with CP40 = terminal chamber

3GD Approval

Approval

3GD	ATEX declaration of conformity 3163M, EX II 3 G EEx nA II T6 X / II 3 D IP65 T 60 °C X (only valid for RUC…M30 family)

M18K – Switching or frequency output

General data

Protection class	IP67	**Connection**	male, M12 x 1
Operating voltage	20…30 VDC	**Housing material**	CuZn
Ambient temperature	-25…+70 °C		

Types and data – selection table

Type	Output	Function	Range	w	d
RU20-M18K-LFX-H1141	Frequency		3…20 cm	w130	d557
RU70-M18K-LFX-H1141	Frequency		10…70 cm	w130	d557
RU20-M18KS-LFX-H1141	Frequency		3…20 cm	w130	d558
RU70-M18KS-LFX-H1141	Frequency		10…70 cm	w130	d558
RUN20-M18K-AP8X-H1141	_⟍_, PNP		3…20 cm	w131	d557
RUN70-M18K-AP8X-H1141	_⟍_, PNP		10…70 cm	w131	d557
RUR20-M18K-AP8X-H1141	_⟍_, PNP		0…20 cm	w131	d557
RUR70-M18K-AP8X-H1141	_⟍_, PNP		0…70 cm	w131	d557
RUN20-M18KS-AP8X-H1141	_⟍_, PNP		3…20 cm	w131	d558
RUN70-M18KS-AP8X-H1141	_⟍_, PNP		10…70 cm	w131	d558
RUR20-M18KS-AP8X-H1141	_⟍_, PNP		0…20 cm	w131	d558
RUR70-M18KS-AP8X-H1141	_⟍_, PNP		0…70 cm	w131	d558

w Wiring diagrams on page 658 d Dimension drawing on page 670 Accessories on page 560

Cylindrical design M18 – Threaded barrel

The M18 detect small objects with pinpoint accuracy. They are IP67 rated and thus also applicable in rough environments. The electronics is incorporated in a small 18 mm threaded barrel made of nickel-plated brass. Devices with 30 cm or 100 cm range are available, either with switching or analog output. In order to avoid crosstalk, up to six devices can be synchronized simply by connecting the power supply. Alternate operation of several sensors is also possible via external control.

Features

- M18, threaded barrel
- Nickel-plated brass
- Protection class IP67
- Ambient temperature: -25…+70 °C
- Diffuse mode
- Max. range 100 cm
- Cone angle 6°
- Switching or analog output
- LED indicates the switching status
- Adjustment of operating range via potentiometer and programming device
- Synchronizing/enable input

Type code CP40, M18, M18K, M30, Q30

RUR	70	Q30	AP8X	H1141	3GD

RUR Series

Series

RU	ultrasonic sensor, diffuse mode
RUC	ultrasonic sensor, programmable, synchronizable, multiplex function, diffuse mode
RUN	ultrasonic sensor, diffuse mode
RUR	ultrasonic sensor, retroreflective mode

70 Sensing range

Sensing range

70	max. sensing range in cm

Q30 Design

Design

CP40	rectangular, plastic 40 x 40 x 160 mm or 40 x 40 x 177.5 mm
M18	cylinder/thread, M18, metal, CuZn nickel-plated, Ø 18 mm
M18K	compact design, cylinder/thread M18, metal, CuZn, nickel-plated Ø 18 mm
M30	cylinder/thread M30, metal CuZn, nickel-plated, Ø 30 mm
Q30	compact, rectangular plastic, 65 x 30 x 88 mm

AP8X Electrical version

Electrical version

A	NO
2A	2 x NO
F	frequency output
I	analog output 0…20 mA or 4…20 mA
L	analog
N	NPN
P	PNP
U	analog output 0…10 V
X	LED display
X2	2 x LED display
6	10…30 VDC input voltage
8	18…35 VDC input voltage

H1141 Electrical connection

Electrical connection

H1141	connector, M12 x 1, 4-pole
H1151	connector, M12 x 1, 5-pole
V1141	connector, M8 x 1, 4-pole
blank	cable connection, 2 m, with CP40 = terminal chamber

3GD Approval

Approval

3GD	ATEX declaration of conformity 3163M, EX II 3 G EEx nA II T6 X / II 3 D IP65 T 60 °C X (only valid for RUC…M30 family)

T18 – Switching or analog output

General data

Protection class	IP67	**Connection**	male, M12 x 1
Operating voltage	20…30 VDC	**Housing material**	CuZn
Ambient temperature	-25…+70 °C	**Function**	

Types and data – selection table

Type	Output	Range	w	d
RU30-M18-AP8X-H1141	_⟍_, PNP	5…30 cm	w132	d559
RU30-M18-LIX-H1141	Analog output, 4…20 mA	5…30 cm	w133	d560
RU100-M18-AP8X-H1141	_⟍_, PNP	15…100 cm	w132	d561
RU100-M18-LIX-H1141	Analog output, 4…20 mA	15…100 cm	w133	d562

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M25U – Smooth barrel – Stainless steel

The M25U are fully encapsulated in stainless steel – barrel and sonic transducer – and are IP68/IP69K rated. This makes them ideally suited for tasks in aseptic applications of the food and beverage as well as the pharmaceutical industry. The ultrasonic opposed mode version incorporates emitter and receiver and achieves a max. range of 75 mm. The device is available with PNP/NPN switching output. Two sensitivities can be adjusted: Normal sensitivity, max. range 1 m (for objects sizing Ø 30 mm and larger); high sensitivity, max. range 40 cm (for objects sizing Ø 15 mm and larger).

Features

- All-metal ultrasonic sensor M25U
- Hygienic design, smooth barrel, stainless steel, Ø 25 mm
- Opposed mode, emitter/receiver
- Max. range 50 cm
- Protection rating IP67 / IP69K
- Resistant to aggressive cleaning agents and disinfectants
- Designed for 200,000 cleaning cycles, 15 min, water +80 °C, rapid cool down
- PNP/NPN switching output
- High sensitivity for small objects (minimum size Ø 15 mm)

Type code M25U

M25U E B Q

M25U Series

Series
M25U cylinder, smooth, stainless steel V4A, IP68/IP69K, Ø 25 mm, length: 106 mm

E Operating mode

Operating mode
E opposed mode emitter
R receiver

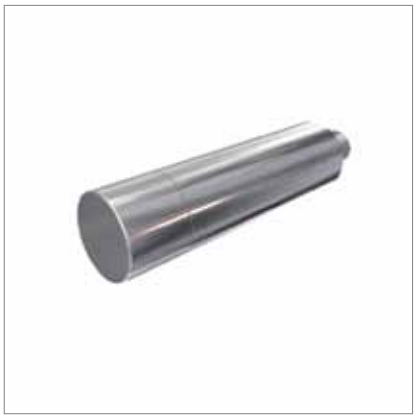
B Electrical output

Electrical output
B PNP/NPN

Q Electrical connection

Electrical connection
Q connector, M12 x 1

M25 – Opposed mode sensor



General data

Protection class	IP67 / IP69K	**Connection**	male, M12 x 1
Operating voltage	10…30 VDC	**Housing material**	V4A 1.4401 (AISI 316)
Ambient temperature	-20…+70 °C	**Range**	0…50 cm

Types and data – selection table

Type	Output	Function	w	d
M25UEQ8	–		w134	d563
M25URBQ8	_◺_, PNP/NPN		w135	d564

w Wiring diagrams on page 658 d Dimension drawing on page 670 Accessories on page 560

Cylindrical design M30 – Threaded barrel

The M30 detect small objects with pinpoint accuracy and are installed in a 30 mm threaded barrel made of nickel-plated brass. Available are versions with 30, 130, 300 and 600 cm range, switching output, switching and analog output or with two switching outputs. In order to avoid crosstalk, up to six RUC devices can be synchronized simply by connecting the power supply. Alternate operation of several sensors is also possible via external control or synchronizing/enable input.

Features

- M30 housing, threaded barrel
- Nickel-plated brass
- Protection class IP65
- Ambient temperature -25 … +70 °C
- Diffuse mode
- Max. range 600 cm
- Cone angle 6°
- Switching or analog output or two switching outputs
- LED indicates the switching status
- Adjustment of operating range via potentiometer and programming device
- Devices with synchronizing/enable input
- 3GD version for explosion hazardous areas

Type code CP40, M18, M18K, M30, Q30

RUR	70	Q30	AP8X	H1141	3GD

RUR Series

Series

RU	ultrasonic sensor, diffuse mode
RUC	ultrasonic sensor, programmable, synchronizable, multiplex function, diffuse mode
RUN	ultrasonic sensor, diffuse mode
RUR	ultrasonic sensor, retroreflective mode

70 Sensing range

Sensing range

70	max. sensing range in cm

Q30 Design

Design

CP40	rectangular, plastic 40 x 40 x 160 mm or 40 x 40 x 177.5 mm
M18	cylinder/thread, M18, metal, CuZn nickel-plated, Ø 18 mm
M18K	compact design, cylinder/thread M18, metal, CuZn, nickel-plated Ø 18 mm
M30	cylinder/thread M30, metal CuZn, nickel-plated, Ø 30 mm
Q30	compact, rectangular plastic, 65 x 30 x 88 mm

AP8X Electrical version

Electrical version

A	NO
2A	2 x NO
F	frequency output
I	analog output 0…20 mA or 4…20 mA
L	analog
N	NPN
P	PNP
U	analog output 0…10 V
X	LED display
X2	2 x LED display
6	10…30 VDC input voltage
8	18…35 VDC input voltage

H1141 Electrical connection

Electrical connection

H1141	connector, M12 x 1, 4-pole
H1151	connector, M12 x 1, 5-pole
V1141	connector, M8 x 1, 4-pole
blank	cable connection, 2 m, with CP40 = terminal chamber

3GD Approval

Approval

3GD	ATEX declaration of conformity 3163M, EX II 3 G EEx nA II T6 X / II 3 D IP65 T 60 °C X (only valid for RUC…M30 family)

M30 – Switching and/or analog output

General data

Protection class	IP65	**Connection**	male, M12 x 1
Operating voltage	20…30 VDC	**Housing material**	CuZn
Ambient temperature	-25…+70 °C	**Function**	

Types and data – selection table

Type	Output	Range	w	d
RUC30-M30-AP8X-H1141	_⌒_, PNP	6…30 cm	w132	d565
RUC30-M30-2AP8X-H1151	2x _⌒_, PNP	6…30 cm	w136	d565
RUC30-M30-LIAP8X-H1151	_⌒_, PNP/analog output, 4…20 mA	6…30 cm	w137	d565
RUC130-M30-AP8X-H1141	_⌒_, PNP	20…130 cm	w132	d565
RUC130-M30-2AP8X-H1151	2x _⌒_, PNP	20…130 cm	w136	d565
RUC130-M30-LIAP8X-H1151	_⌒_, PNP/analog output, 4…20 mA	20…130 cm	w137	d565
RUC300-M3047-AP8X-H1141	_⌒_, PNP	40…300 cm	w132	d566
RUC300-M3047-2AP8X-H1151	2x _⌒_, PNP	40…300 cm	w136	d566
RUC300-M3047-LIAP8X-H1151	_⌒_, PNP/analog output, 4…20 mA	40…300 cm	w137	d566
RUC600-M3065-AP8X-H1141	_⌒_, PNP	60…600 cm	w132	d567
RUC600-M3065-2AP8X-H1151	2x _⌒_, PNP	60…600 cm	w136	d567
RUC600-M3065-LIAP8X-H1151	_⌒_, PNP/analog output, 4…20 mA	60…600 cm	w137	d567

Ultrasonic sensors

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Cylindrical design T30U – Threaded barrel

The T30U offer many output configurations in a universal housing. They are applied to monitor filling levels in tanks or detect transparent materials. Available are versions with two switching outputs as well as one switching and one analog output for current or voltage. Thus measurements and switching operations can be implemented simultaneously. Switching and measuring outputs can be programmed to same or different operating ranges. The sensors are available as diffuse mode devices with max. sensing ranges of 100, 200 or 300 cm.

Features

- T30U, plastic housing with M30 thread
- Protection class IP67
- Ambient temperature -20…+70 °C
- Diffuse mode
- Max. ranges 100, 200, 300 cm
- Analog and switching output or two switching outputs
- The outputs can either be programmed together or separately with rising or falling analog output curve.
- LEDs indicate power ON, signal strength and output status
- Easy teaching via pushbuttons or external cable
- Chemical-resistant and PTFE-coated versions

Type code T30U

T30U DP B Q8

T30U Series

- **T30U** cylinder, thread Ø 40 mm length 45 mm, without temperature compensation
- **T30UX** cylinder, thread Ø 40 mm length 45 mm, with temperature compensation

DP Output

- **DP** PNP (2 x)
- **UP** PNP, analog output 0…10 V
- **IP** PNP, analog output 4…20 mA

B Range

- **A** 15…100 cm
- **B** 30…200 cm
- **C** 40…300 cm

Q8 Electrical connection

- **Q8** connector, M12 x 1
- **blank** cable connection, 2 m

T30 – Switching and/or analog output

General data

Protection class	IP67	**Connection**	male, M12 x 1
Operating voltage	10…30 VDC	**Housing material**	Polyester
Ambient temperature	-40…+70 °C	**Function**	diffuse mode sensor

Types and data – selection table

Type	Output	Range	w	d
T30UXDAQ8	_⟍_, PNP	10…100 cm	w132	d568
T30UXDBQ8	_⟍_, PNP	20…200 cm	w132	d568
T30UXDCQ8	_⟍_, PNP	30…300 cm	w132	d568
T30UXUAQ8	Analog output, 0…10 V	10…100 cm	w138	d568
T30UXUBQ8	Analog output, 0…10 V	20…200 cm	w138	d568
T30UXUCQ8	Analog output, 0…10 V	30…300 cm	w138	d568
T30UXIAQ8	Analog output, 4…20 mA	10…100 cm	w133	d568
T30UXIBQ8	Analog output, 4…20 mA	20…200 cm	w133	d568
T30UXICQ8	Analog output, 4…20 mA	30…300 cm	w133	d568

Many different types available, also with cable, see type code

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Q30 – Compact rectangular design

The Q30 detect small objects with pinpoint accuracy. They are available as diffuse mode sensors with sensing ranges of 30 cm respectively 100 cm, optionally with switching or analog output. In order to avoid crosstalk, up to six devices can be synchronized simply by connecting the power supply. Alternate operation of several sensors is also possible via external control or synchronizing/enable input.

Features

- Compact rectangular design, 88 x 65 x 30 mm
- Plastic housing
- Protection class IP65
- Ambient temperature 0…+55 °C
- Diffuse mode
- Max. range 100 cm
- Cone angle 6°
- Analog or switching output
- LEDs indicate switching status/object detected
- Easy adjustment of operating range via potentiometer
- Synchronizing/enable input

Type code CP40, M18, M18K, M30, Q30

RUR	70	Q30	AP8X	H1141	3GD

RUR Series

Series

RU	ultrasonic sensor, diffuse mode
RUC	ultrasonic sensor, programmable, synchronizable, multiplex function, diffuse mode
RUN	ultrasonic sensor, diffuse mode
RUR	ultrasonic sensor, retroreflective mode

70 Sensing range

Sensing range

70	max. sensing range in cm

Q30 Design

Design

CP40	rectangular, plastic 40 x 40 x 160 mm or 40 x 40 x 177.5 mm
M18	cylinder/thread, M18, metal, CuZn nickel-plated, Ø 18 mm
M18K	compact design, cylinder/thread M18, metal, CuZn, nickel-plated Ø 18 mm
M30	cylinder/thread M30, metal CuZn, nickel-plated, Ø 30 mm
Q30	compact, rectangular plastic, 65 x 30 x 88 mm

AP8X Electrical version

Electrical version

A	NO
2A	2 x NO
F	frequency output
I	analog output 0…20 mA or 4…20 mA
L	analog
N	NPN
P	PNP
U	analog output 0…10 V
X	LED display
X2	2 x LED display
6	10…30 VDC input voltage
8	18…35 VDC input voltage

H1141 Electrical connection

Electrical connection

H1141	connector, M12 x 1, 4-pole
H1151	connector, M12 x 1, 5-pole
V1141	connector, M8 x 1, 4-pole
blank	cable connection, 2 m, with CP40 = terminal chamber

3GD Approval

Approval

3GD	ATEX declaration of conformity 3163M, EX II 3 G EEx nA II T6 X / II 3 D IP65 T 60 °C X (only valid for RUC…M30 family)

Q30 – Switching or analog output

General data

Protection class	IP65	**Connection**	male, M12 x 1
Operating voltage	18…35 VDC	**Housing material**	Crastin, SK645FR
Ambient temperature	0…+55 °C	**Function**	diffuse mode sensor
Housing designation	Q30		

Types and data – selection table

Type	Output	Range	w	d
RU30-Q30-AP8X-H1141	_⟍_, PNP	6…30 cm	w132	d569
RU30-Q30-LUX-H1141	Analog output, 0…10 V	6…30 cm	w138	d569
RU100-Q30-AP8X-H1141	_⟍_, PNP	20…100 cm	w132	d569
RU100-Q30-LUX-H1141	Analog output, 0…10 V	20…100 cm	w138	d569

Ultrasonic sensors

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CP40 – Rectangular design

The CP40 are ideal for detecting glass or metal objects with smooth surfaces, even with oblique propagating sonic waves. They cover a wide sensing range of 5 cm to 180 cm with a cone angle of 60°. They are available with PNP transistor or analog output 0…10 V/0…20 mA.

Features

- Compact rectangular design, 160 x 40 x 40 mm
- Plastic housing
- Protection class IP40
- Ambient temperature 0…+70 °C
- Diffuse mode
- Max. range 180 cm
- Cone angle 60°
- Rotatable sensor head to align sonic cone
- Analog or switching output
- LEDs indicate switching status / object detected
- Adjustment of operating range via potentiometer

Type code CP40, M18, M18K, M30, Q30

RUR	70	Q30	AP8X	H1141	3GD

RUR – Series

Series

RU	ultrasonic sensor, diffuse mode
RUC	ultrasonic sensor, programmable, synchronizable, multiplex function, diffuse mode
RUN	ultrasonic sensor, diffuse mode
RUR	ultrasonic sensor, retroreflective mode

70 – Sensing range

Sensing range

70	max. sensing range in cm

Q30 – Design

Design

CP40	rectangular, plastic 40 x 40 x 160 mm or 40 x 40 x 177.5 mm
M18	cylinder/thread, M18, metal, CuZn nickel-plated, Ø 18 mm
M18K	compact design, cylinder/thread M18, metal, CuZn, nickel-plated Ø 18 mm
M30	cylinder/thread M30, metal CuZn, nickel-plated, Ø 30 mm
Q30	compact, rectangular plastic, 65 x 30 x 88 mm

AP8X – Electrical version

Electrical version

A	NO
2A	2 x NO
F	frequency output
I	analog output 0…20 mA or 4…20 mA
L	analog
N	NPN
P	PNP
U	analog output 0…10 V
X	LED display
X2	2 x LED display
6	10…30 VDC input voltage
8	18…35 VDC input voltage

H1141 – Electrical connection

Electrical connection

H1141	connector, M12 x 1, 4-pole
H1151	connector, M12 x 1, 5-pole
V1141	connector, M8 x 1, 4-pole
blank	cable connection, 2 m, with CP40 = terminal chamber

3GD – Approval

Approval

3GD	ATEX declaration of conformity 3163M, EX II 3 G EEx nA II T6 X / II 3 D IP65 T 60 °C X (only valid for RUC…M30 family)

CP40 – Switching or analog output

General data

Protection class	IP40	**Connection**	Terminal chamber, Terminal box with cable gland
Housing material	PBT	**Ambient temperature**	0…+70 °C
Function	diffuse mode sensor	**Range**	5…180 cm

Types and data – selection table

Type	Operating voltage	Output	w	d
RU100-CP40-AP6X2	10…30 VDC	⎽◺⎽, PNP	w139	d570
RU100-CP40-LIUX	15…30 VDC	Analog output, 0…20 mA, 0…10 V	w140	d571

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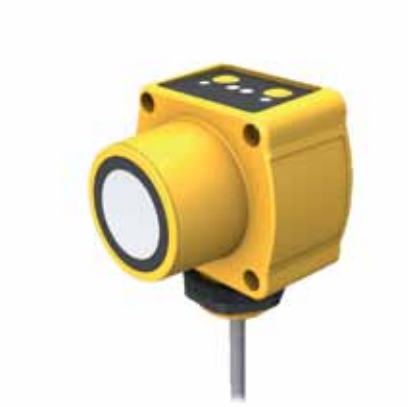
QT50 – Rectangular design



The QT50U are available as diffuse mode sensors with sensing ranges of 20 cm or 800 cm and with switching or analog output. Many configurations can be set via DIP switch, allowing the sensors to be mounted in nearly any application. The fully encapsulated devices are ideally suited for monitoring filling levels of liquids and solids: Versions with analog output are best suited for continuous monitoring. Versions with two digital outputs allow limit values for close and distant range to be adjusted separately for each output.

Features

- Compact rectangular design, 67.4 x 74 x 84.2 mm
- Plastic housing
- Protection class IP67
- Ambient temperature -20…+70 °C
- Diffuse mode
- Max. range 800 cm
- Cone angle 12°
- Analog and switching output
- LEDs indicate the signal strength
- Configuration via DIP/rotary switch
- Easy teaching
- Via pushbutton or external cable

Type code QT50U

QT50U | LB | Q6

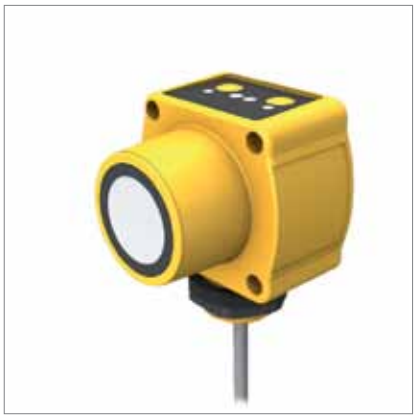
QT50U	Series	**LB**	Electrical output	**Q6**	Electrical connection

Series
QT50U rectangular:
74 x 84 x 67.4 mm
74 x 100.2 x 67.4 mm

Electrical output
LB 2 x analog output,
0…10 V oder 4…20 mA
DB 2 x switching outputs, PNP or NPN

Electrical connection
Q6 connector, M12 x 1, 5-pole
blank cable connection, 2 m

QT50 – Switching or analog output



General data

Protection class	IP67	**Connection**	male, M12 x 1
Operating voltage	10…30 VDC	**Housing material**	ABS
Ambient temperature	-20…+70 °C	**Function**	diffuse mode sensor
Range	20…800 cm		

Types and data – selection table

Type	Output	w	d
QT50UDBQ6	2x ⎓, PNP	w141	d572
QT50ULBQ6	Analog output, 4…20 mA, 0…10 V	w142	d572

Many different types available, also with cable, see type code

Ultrasonic sensors

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