

Ultrasonic sensors

Reliable on almost all surfaces

UT 20

from Page 650

UT 20-S – miniature ultrasonic sensors with soundpipe

- Reliable detection through the smallest of openings and drilled holes
- Ideal for measuring filling levels of microplates and for scanning circuit boards
- Small housings for installation in smallest of spaces
- PNP, NPN or analogue output options

>> Page 650

UT 20 – miniature ultrasonic sensors

- Small housing for installation in smallest of spaces
- High scanning distances of up to 700 mm with compact miniature housing
- PNP, NPN or analogue output options

>> Page 654

UT 12

from Page 666

UT 12 – M12 ultrasonic sensors

- Robust metal housings for harsh operating conditions
- Simple installation with universal M12 standard thread
- Simple sensor setting via control input

>> Page 666

UT/UM 18

from Page 670

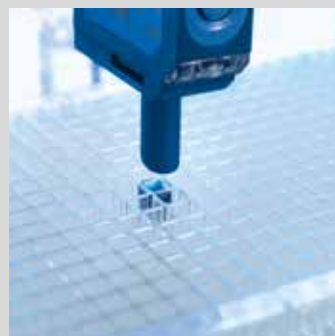
UT/UM 18 – M18 ultrasonic sensors

- Robust brass or stainless steel housings for harsh operating conditions
- Simple installation with universal M18 standard thread
- Simple sensor setting via control input

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Ultrasonic sensors may be a useful alternative where optical sensors come up against their physical limits. This applies, for example, for objects with uneven surfaces or under difficult ambient conditions, or with highly transparent media as well as moving, highly reflective liquid surfaces. Typical uses of ultrasonic sensors are therefore checking the presence of highly transparent foils and measuring the filling levels in liquid containers. A major advantage of ultrasonic sensors is the absolutely reliable background suppression resulting from their sound time-of-flight measurement principle.



The UT 20-S measuring levels in microplate wells.



Deflection mirrors are available for deflecting the sound beam when machine space is limited.

The new ultrasonic sensor with soundpipe (UT 20S), in its very compact cubic housing, is a special product variant. As a result of its narrow sound cone, it allows the detection of objects even through the smallest of openings and drilled holes with a diameter of less than 5 mm. This makes it ideal for special applications, such as level measurement in the wells of microplates in medical analysis systems or for scanning circuit boards in the electronics industry.

The ultrasonic sensors of the UMT 30 series are real multifunctional artists. A three-digit display makes all sensor settings easy for users. The add-on menu with numerous supplementary functions, e.g. the synchronisation of several sensors or multiplex operation, in which several sensors measure after one another in ascending order, allows the UMT 30 to offer extremely flexible use for a wide range of applications.

UMT 30

from Page 680

**UMT 30 – M30 ultrasonic sensors
with display**

- Long scanning distances up to 6 m
- Simple adjustment and direct measurement value output via display
- Automatic synchronisation and multiplex operation for the simultaneous operation of up to 10 sensors
- Numerous supplementary functions (add-on menu)

>> Page 680



 made in Germany

TYPICAL SENSOPART

- Reliable detection of objects with critical surfaces and highly transparent objects
- Available in cubic (32 x 20 x 12 mm) or cylindrical (M12/M18/M30) housing options
- Simple adjustment via teach-in, control input or display
- PNP, NPN or analogue output options
- Tight metal or plastic housings (IP 67 & IP 65)
- Wide range of mounting accessories

10

Ultrasonic Sensors – Product Overview				
	Adjustment	Scanning distances	Special features	Page
UT 20	Teach-in 	140 mm / 150 mm / 240 mm / 700 mm	Ultrasonic sensors with soundpipe, PNP, NPN, analogue output	650
UT 12	Via control input	400 mm	PNP, NPN, analogue output	666
UT/UM 18	Via control input	250 mm / 300 mm / 800 mm	Variants with stainless steel housings, PNP, NPN, analogue output	670
UMT 30	Teach-in or display  	350 mm / 1300 mm / 3400 mm / 6000 mm	Display, PNP, 2 x PNP or analogue output	680

Ultrasonic sensors

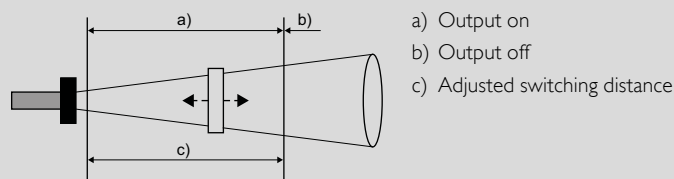
System description

Method of function

Ultrasonic diffuse types operate on the basis of echo time-of-flight measurement. An ultrasonic pulse emitted by the sensor is reflected when it hits an object. The sensor calculates the distance from the time elapsed between emission of the ultrasonic pulse and receipt of the echo. Depending on the power

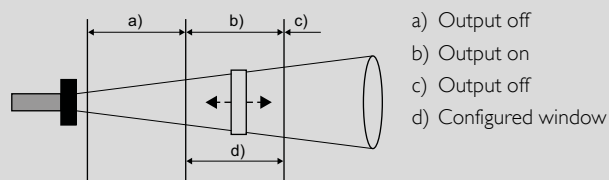
amplifier, the measured distance is converted to a current or voltage signal (analogue sensor) proportional to the distance or the switching output is activated, depending on the set switching point.

Applications



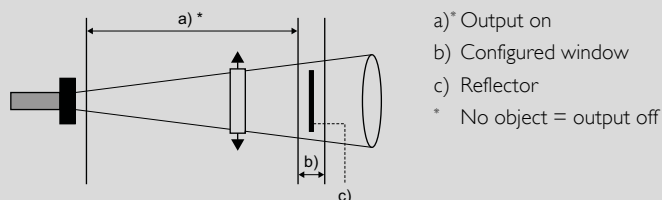
As a reflex scanner (diffuse type)

The classic operating mode uses background suppression, superior to other sensor principles. The switching output is activated when the object is located within the set switching distance. The switching point is subject to a hysteresis. This operating mode is suitable, for example, for detecting objects on a conveyor belt or for checking presence.



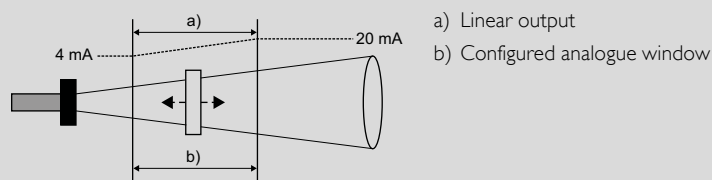
In window mode

The switching output is only activated when the object is located within a window that has been defined by setting two window limits. This can be used to monitor, for example, the correct bottle size in a crate of drinks. Bottles that are too tall or too short are diverted out.



As a barrier or reflex switch

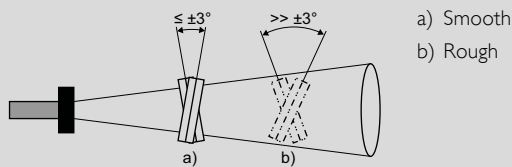
An ultrasonic sensor is used like a light barrier here, though no special reflector is employed (a piece of sheet metal is entirely sufficient here). For this purpose, the sensor in window mode is set in such a way that the reflector is located within the window. The ultrasonic reflex switch provides a signal as soon as an object is completely covered by the reflector. Whereby it is irrelevant whether the object absorbs the sound or even deflects it away. This operating mode is used for poorly detected material with irregular surfaces, e.g. foam.



Ultrasonic sensors with analogue output

In these models a voltage (0...10 V) or current (4...20 mA) is transmitted in proportion to the object distance. The window limits can be defined and selected between falling and rising characteristic curves.

Installation



Ultrasonic sensors can be installed and operated in any orientation. Though installation locations that could lead to contamination of the sensor surface should be avoided because water droplets and encrustation can impair functional performance. Thin layers of dust and paint droplets generally have no effect.

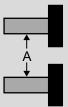
If smooth surfaces are to be detected, sensors should be mounted as vertically as possible, i.e. at an angle of from 87° to 93° to the surface.

Rough surfaces, on the other hand, permit considerably greater angular deviations. A surface whose valley-to-peak depth is greater than or equal to the wavelength of the ultrasonic frequency is considered rough. The sound, however, is then reflected diffusely, which can lead to a reduction of the operating scanning distance. In this case the maximum permissible angular deviation and maximum scanning distance should be determined in trials.

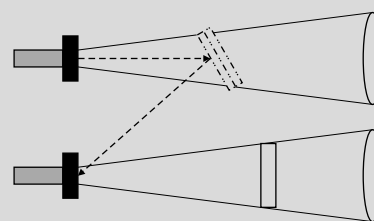
Sound-absorbing materials (such as cotton wool or foam) can further reduce the scanning distance. In contrast, liquids and solid materials are good reflectors.

Mounting distances

a) Switching distance

		
0.25 m	≥ 0.35 m	≥ 2.50 m
0.35 m	≥ 0.40 m	≥ 2.50 m
1.30 m	≥ 1.10 m	≥ 8.00 m
3.40 m	≥ 2.00 m	≥ 18.00 m
6.00 m	≥ 4.00 m	≥ 30.00 m

The table provides the minimum distances between non-synchronised ultrasonic sensors. Sensors may mutually influence one another if these distances are not observed.



The above-mentioned mounting distances are only intended as a guide. In the case of tilting, the sound can be reflected towards the neighbouring sensor. The minimum distance should then be determined by means of trials. Some sensors permit synchronisation with one another and thus allow considerably lower scanning distances.

UT 20-S150

Ultrasonic sensor with soundpipe and switching output



PRODUCT HIGHLIGHTS

- Ideal for level control, particularly in narrow containers
- Narrow sound beam for precise detection even through small openings and drilled holes
- Reliable detection of highly transparent objects
- Detection independent of object colour and surface
- Compact miniature housings for use when space in machine is limited

Sensor data		Functions	
Limiting scanning distance	250 mm	LED indicator, green	Operating voltage indicator
Operating scanning distance	20 ... 140 mm	LED indicator, yellow	Switching output indicator
Ultrasonic frequency	~ 380 kHz	Scanning distance adjustment	Via Teach-in button
Resolution	0.20 mm	Teach-in modes	Mode 1: set switching point
Repeatability	± 0.15 % ¹	Adjustment possibilities	Mode 2: set Window Mode
Hysteresis	2 mm		Mode 3: set two-way / reflex switch
Temperature drift	0.17 % / °C	Default settings	N.O. / N.C. via Teach-in button
			Button lock via Teach-in button
			Synchronisation via control input
			Default settings via Teach-in button
			Max. sensitivity and N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ²	Dimensions	32 x 38.5 x 12 mm
No-load current, I ₀	≤ 25 mA	Enclosure rating	IP 67 ³
Output current, I _e	200 mA	Material, housing	ABS
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protection Class	2	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature, operation	-25 ... +70 °C
Switching output, Q	PNP / NPN (see selection table)	Ambient temperature, storage	-40 ... +85 °C
Output function	N.O. / N.C.	Weight	10 g
Switching frequency, f (ti/tp 1:1)	25 Hz	Vibration and impact resistance	EN 60947-5-2
Response time	24 ms		
Connection, WH	Sync.		

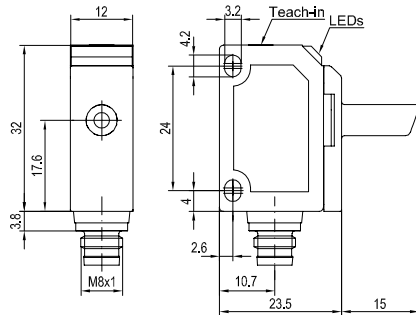
¹ From final value of limit scanning distance

² Max. 10 % ripple, within U_B

³ With connected IP 67 plug

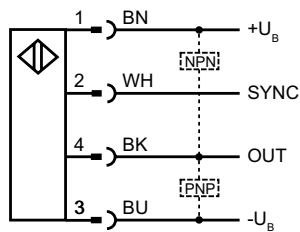
Operating scanning distance	Switching output	Type of connection	Part number	Article number
20 ... 140 mm	PNP	Metal plug, M8x1, 4-pin	UT 20-S150-PSM4	693-11012
20 ... 140 mm	NPN	Metal plug, M8x1, 4-pin	UT 20-S150-NSM4	693-11013

Plug connection



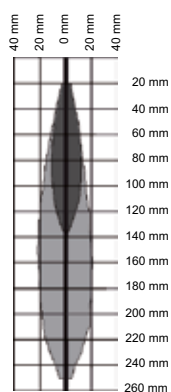
153-00982

Connection, 4-pin



154-00116

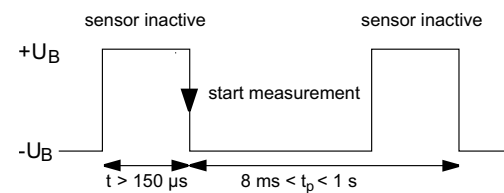
Sound cone



155-01528

Synchronisation / triggering

10



155-00131

Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu s$, repeat rate, $t_p = 8 ms \dots 1 s$.
A high level, +U_B at Sync input deactivates the sensor.

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 20-S150-A

Ultrasonic sensor with soundpipe and analogue output



PRODUCT HIGHLIGHTS

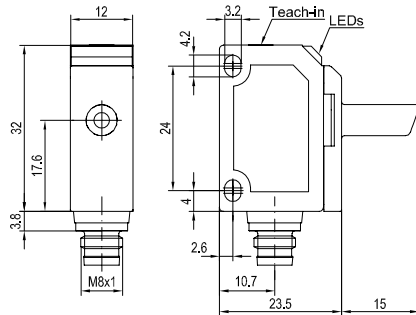
- Ideal for level control, particularly in narrow containers
- Narrow sound beam for precise detection even through small openings and drilled holes
- Reliable detection of highly transparent objects
- Compact miniature housings for use when space in machine is limited
- Analogue output 0 ... 10V or 4 ... 20 mA

Sensor data ¹		Functions	
Limiting scanning distance	250 mm	LED indicator, green	Operating voltage indicator
Operating scanning distance	20 ... 140 mm	LED indicator, yellow	Switching output indicator
Ultrasonic frequency	~ 380 kHz	Set analogue characteristic	Via Teach-in button
Resolution	0.20 mm	Adjustment possibilities	Rising / falling edge via Teach-in button
Repeatability	± 0.15 % ²		Button lock via Teach-in button
Temperature drift	≤ 2 %		Synchronisation via control input
			Default settings via Teach-in button
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ³	Dimensions	32 x 38.5 x 12 mm
No-load current, I ₀	≤ 25 mA	Enclosure rating	IP 67 ⁴
Current output	R _a < 500 Ω	Material, housing	ABS
Voltage output	R _a > 500 Ω	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Protection Class	2	Ambient temperature, operation	-25 ... +70 °C
Power On Delay	< 300 ms	Ambient temperature, storage	-40 ... +85 °C
Analogue output	0 ... 10V / 4 ... 20 mA (see selection table)	Weight	10 g
Response time	30 ms	Vibration and impact resistance	EN 60947-5-2
Connection, WH	Sync.		

¹ After 30 min. settling time ² From final value of limit scanning distance ³ Max. 10 % ripple, within U_B ⁴ With connected IP 67 plug

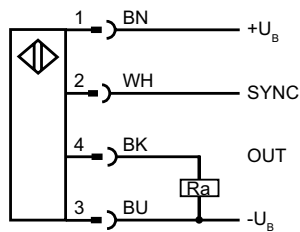
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
20 ... 140 mm	0 ... 10V	Metal plug, M8x1, 4-pin	UT 20-S150-AUM4	693-11014
20 ... 140 mm	4 ... 20 mA	Metal plug, M8x1, 4-pin	UT 20-S150-AIM4	693-11015

Plug connection



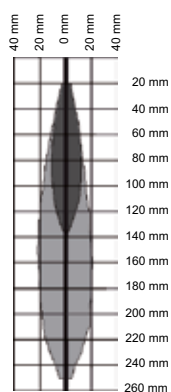
153-00982

Connection, 4-pin



154-00115

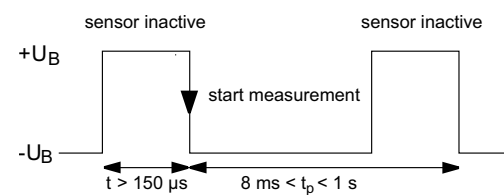
Sound cone



155-01528

Synchronisation / triggering

10



155-00131

Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu s$, repeat rate, $t_p = 8 ms \dots 1 s$.
A high level, +U_B at Sync input deactivates the sensor.

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 20-150

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

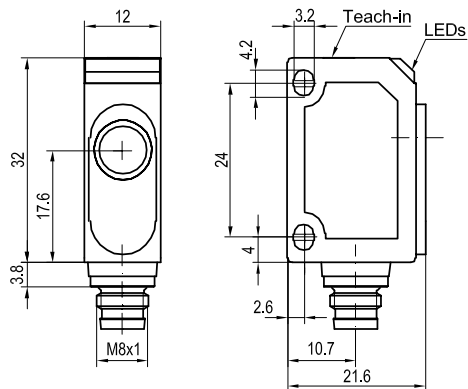
- Detection regardless of object colour and surface
- Compact miniature housing for use when machine space is limited
- Robust ambient conditions have no effect on sensor
- Reliable detection of highly transparent objects

Sensor data		Functions	
Limit scanning distance	250 mm	Indicator LED, green	Operating voltage indicator
Operating scanning distance	20 ... 150 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 380 kHz	Scanning distance adjustment	Via Teach-in button
Resolution	0.20 mm	Teach-in modes	Mode 1: set switching point
Repeatability	± 0.15 % ¹		Mode 2: set window operation
Hysteresis	2 mm	Adjustment possibilities	Mode 3: set two-way / retroreflective sensor
Temperature drift	0.17 % / °C		N.O. / N.C. via Teach-in button
		Default settings	Button lock via Teach-in button
			Synchronisation via control input
			Default settings via Teach-in button
			Max. sensitivity and N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ²	Dimensions	32 x 21.6 x 12 mm
No-load current, I ₀	≤ 25 mA	Enclosure rating	IP 67 ³
Output current, I _e	200 mA	Material, housing	ABS
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protection Class	2	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature: operation	-25 ... +70 °C
Switching output, Q	PNP / NPN (see selection table)	Ambient temperature: storage	-40 ... +85 °C
Output function	N.O. / N.C.	Weight	10 g
Switching frequency, f (ti/tp 1:1)	25 Hz	Vibration and impact resistance	EN 60947-5-2
Response time	24 ms		
Connection, WH	Sync.		

¹ From end-value of limit scanning distance ² Max. 10 % ripple, within U_B ³ With connected IP 67 plug

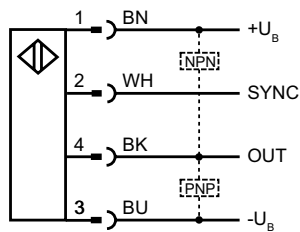
Operating scanning distance	Switching output	Type of connection	Part number	Article number
20 ... 150 mm	PNP	Metal plug, M8x1, 4-pin	UT 20-150-PSM4	693-11000
20 ... 150 mm	NPN	Metal plug, M8x1, 4-pin	UT 20-150-NSM4	693-11001

Plug connection



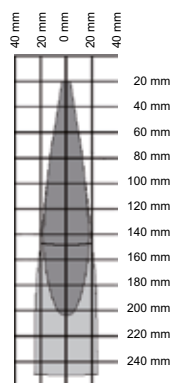
153-00391

Connection, 4-pin



154-00116

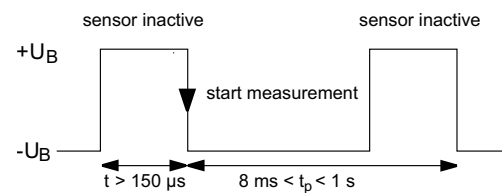
Sound cone



155-00132

Synchronisation / triggering

10



155-00131

Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu\text{s}$, repeat rate, $t_p = 8 \text{ ms} \dots 1 \text{ s}$.
A high level, $+U_B$ at Sync input deactivates the sensor.

Accessories

Connection cables	From Page A-46
Brackets	From Page A-4

UT 20-150-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

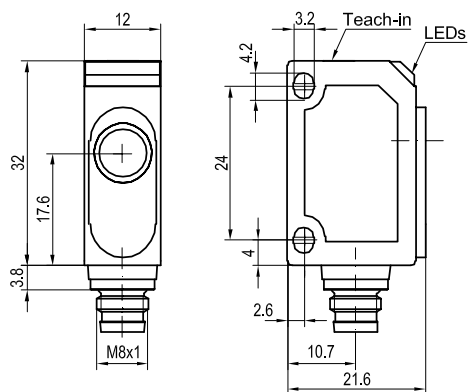
- Detection regardless of object colour and surface
- Compact miniature housing for use when machine space is limited
- Synchronisation input – simultaneous operation of several sensors in highly limited spaces
- Analogue output: 0 ... 10V or 4 ... 20 mA

Sensor data ¹		Functions	
Limit scanning distance	250 mm	Indicator LED, green	Operating voltage indicator
Operating scanning distance	20 ... 150 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 380 kHz	Set characteristic analogue curve	Via Teach-in button
Resolution	0.20 mm	Adjustment possibilities	Rising / falling slope via Teach-in button
Repeatability	± 0.15 % ²		Button lock via Teach-in button
Temperature drift	≤ 2 %		Synchronisation via control input
			Default settings via Teach-in button
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ³	Dimensions	32 x 21.6 x 12 mm
No-load current, I ₀	≤ 25 mA	Enclosure rating	IP 67 ⁴
Current output	R _a < 500 Ω	Material, housing	ABS
Voltage output	R _a > 500 Ω	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Protection Class	2	Ambient temperature: operation	-25 ... +70 °C
Power On Delay	< 300 ms	Ambient temperature: storage	-40 ... +85 °C
Analogue output	0 ... 10V / 4 ... 20 mA (see selection table)	Weight	10 g
Response time	30 ms	Vibration and impact resistance	EN 60947-5-2
Connection, WH	Sync.		

¹ After 30 minutes settling time ² From end-value of limit scanning distance ³ Max. 10 % ripple, within U_B ⁴ With connected IP 67 plug

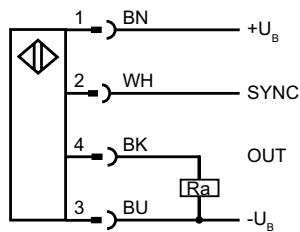
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
20 ... 150 mm	0 ... 10V	Metal plug, M8x1, 4-pin	UT 20-150-AUM4	693-11004
20 ... 150 mm	4 ... 20 mA	Metal plug, M8x1, 4-pin	UT 20-150-AIM4	693-11005

Plug connection



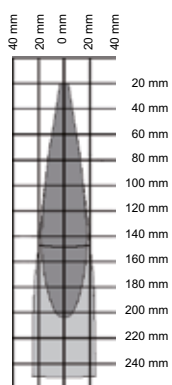
153-00391

Connection, 4-pin



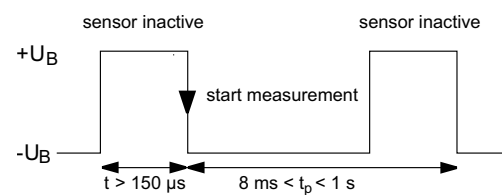
154-00115

Sound cone



155-00132

Synchronisation / triggering



155-00131

Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu s$, repeat rate, $t_p = 8 \text{ ms} \dots 1 \text{ s}$.
A high level, $+U_B$ at Sync input deactivates the sensor.

Accessories

Connection cables
Brackets

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UT 20-240

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

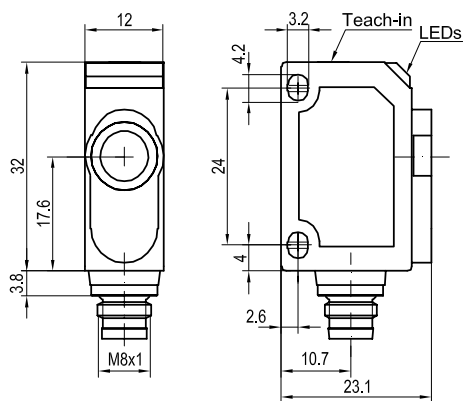
- Ideal for monitoring filling levels, e.g. of liquids
- Reliable detection of highly transparent objects
- Detection regardless of object colour and surface
- Compact miniature housings for use when machine space is limited

Sensor data		Functions	
Limit scanning distance	350 mm	Indicator LED, green	Operating voltage indicator
Operating scanning distance	50 ... 240 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~500 kHz	Scanning distance adjustment	Via Teach-in button
Resolution	0.20 mm	Teach-in modes	Mode 1: set switching point
Repeatability	± 0.15 % ¹		Mode 2: set window operation
Hysteresis	2 mm	Adjustment possibilities	Mode 3: set two-way / retroreflective sensor
Temperature drift	0.17 % / °C		N.O. / N.C. via Teach-in button
		Default settings	Button lock via Teach-in button
			Synchronisation via control input
			Default settings via Teach-in button
			Max. sensitivity and N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ²	Dimensions	32 x 23.1 x 12 mm
No-load current, I ₀	≤ 25 mA	Enclosure rating	IP 67 ³
Output current, I _e	200 mA	Material, housing	ABS
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protection Class	2	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature: operation	-25 ... +70 °C
Switching output, Q	PNP / NPN (see selection table)	Ambient temperature: storage	-40 ... +85 °C
Output function	N.O. / N.C.	Weight	10 g
Switching frequency, f (ti/tp 1:1)	25 Hz	Vibration and impact resistance	EN 60947-5-2
Response time	24 ms		
Connection, WH	Sync.		

¹ From end-value of limit scanning distance ² Max. 10 % ripple, within U_B ³ With connected IP 67 plug

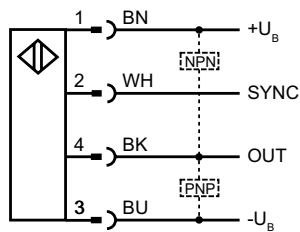
Operating scanning distance	Switching output	Type of connection	Part number	Article number
50 ... 240 mm	PNP	Metal plug, M8x1, 4-pin	UT 20-240-PSM4	693-11002
50 ... 240 mm	NPN	Metal plug, M8x1, 4-pin	UT 20-240-NSM4	693-11003

Plug connection



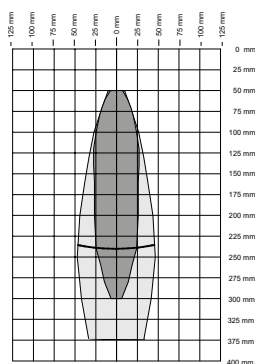
153-00469

Connection, 4-pin



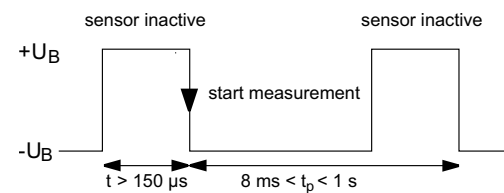
154-00116

Sound cone



155-00286

Synchronisation / triggering



Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu s$, repeat rate, $t_p = 8 ms \dots 1 s$.
A high level, $+U_B$ at Sync input deactivates the sensor.

155-00131

Accessories

Connection cables
Brackets

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UT 20-240-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

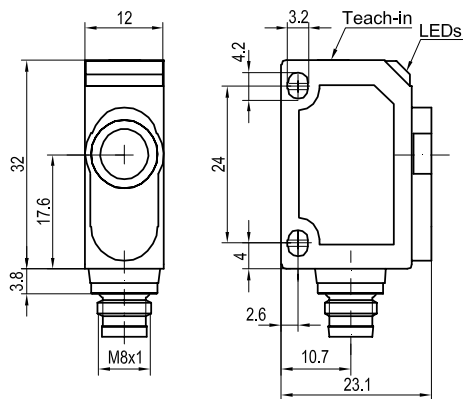
- Detection regardless of object colour and surface
- Compact miniature housing for use when machine space is limited
- Analogue output: 0 ... 10V or 4 ... 20 mA
- Synchronisation input – simultaneous operation of several sensors in highly limited spaces

Sensor data ¹		Functions	
Limit scanning distance	350 mm	Indicator LED, green	Operating voltage indicator
Operating scanning distance	50 ... 240 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 500 kHz	Set characteristic analogue curve	Via Teach-in button
Resolution	0.20 mm	Adjustment possibilities	Rising / falling slope via Teach-in button
Repeatability	± 0.15 % ²		Button lock via Teach-in button
Temperature drift	≤ 2 %		Synchronisation via control input
			Default settings via Teach-in button
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ³	Dimensions	32 × 23,1 × 12 mm
No-load current, I ₀	≤ 25 mA	Enclosure rating	IP 67 ⁴
Current output	R _a < 500 Ω	Material, housing	ABS
Voltage output	R _a > 500 Ω	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Protection Class	2	Ambient temperature: operation	-25 ... +70 °C
Power On Delay	< 300 ms	Ambient temperature: storage	-40 ... +85 °C
Analogue output	0 ... 10V / 4 ... 20 mA (see selection table)	Weight	10 g
Response time	30 ms	Vibration and impact resistance	EN 60947-5-2
Connection, WH	Sync.		

¹ After 30 minutes settling time ² From end-value of limit scanning distance ³ Max. 10 % ripple, within U_B ⁴ With connected IP 67 plug

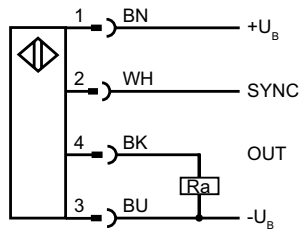
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
50 ... 240 mm	0 ... 10V	Metal plug, M8x1, 4-pin	UT 20-240-AUM4	693-11006
50 ... 240 mm	4 ... 20 mA	Metal plug, M8x1, 4-pin	UT 20-240-AIM4	693-11007

Plug connection



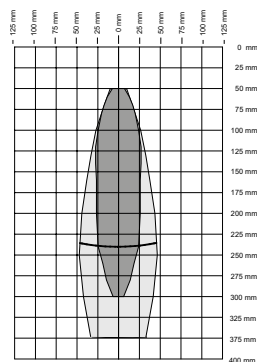
153-00469

Connection, 4-pin



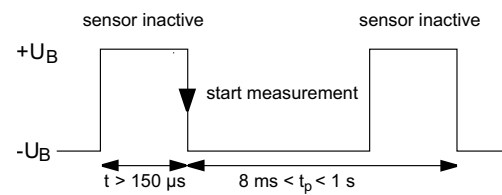
154-00115

Sound cone



155-00286

Synchronisation / triggering



Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu\text{s}$, repeat rate, $t_p = 8 \text{ ms} \dots 1 \text{ s}$.
A high level, $+U_B$ at Sync input deactivates the sensor.

155-00131

Accessories

Connection cables	From Page A-46
Brackets	From Page A-4

UT 20-700

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

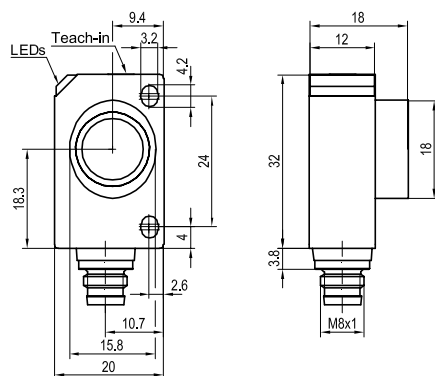
- Long scanning distance of 700 mm with small and compact housing
- Ideal for monitoring filling levels, e.g. of liquids
- Detection regardless of object colour and surface
- Synchronisation input – simultaneous operation of several sensors in highly limited spaces

Sensor data		Functions	
Limit scanning distance	1000 mm	Indicator LED, green	Operating voltage indicator
Operating scanning distance	120 ... 700 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 300 kHz	Scanning distance adjustment	Via Teach-in button
Resolution	0.20 mm	Teach-in modes	Mode 1: set switching point
Repeatability	± 0.15 % ¹		Mode 2: set window operation
Hysteresis	2 mm	Adjustment possibilities	Mode 3: set two-way / retroreflective sensor
Temperature drift	0.17 % / °C		N.O. / N.C. via Teach-in button
		Default settings	Button lock via Teach-in button
			Synchronisation via control input
			Default settings via Teach-in button
			Max. sensitivity and N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ²	Dimensions	32 x 20 x 18 mm
No-load current, I ₀	≤ 35 mA	Enclosure rating	IP 67 ³
Output current, I _e	200 mA	Material, housing	ABS
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protection Class	2	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature: operation	-25 ... +70 °C
Switching output, Q	PNP / NPN (see selection table)	Ambient temperature: storage	-40 ... +85 °C
Output function	N.O. / N.C.	Weight	10 g
Switching frequency, f (ti/tp 1:1)	14 Hz	Vibration and impact resistance	EN 60947-5-2
Response time	42 ms		
Connection, WH	Sync.		

¹ From end-value of limit scanning distance ² Max. 10 % ripple, within U_B ³ With connected IP 67 plug

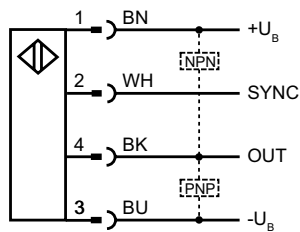
Operating scanning distance	Switching output	Type of connection	Part number	Article number
120 ... 700 mm	PNP	Metal plug, M8x1, 4-pin	UT 20-700-PSM4	693-11008
120 ... 700 mm	NPN	Metal plug, M8x1, 4-pin	UT 20-700-NSM4	693-11009

Plug connection



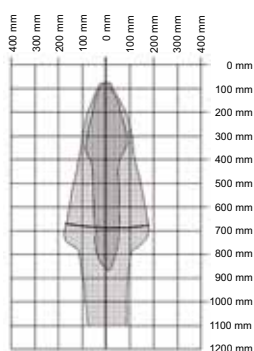
153-00444

Connection, 4-pin



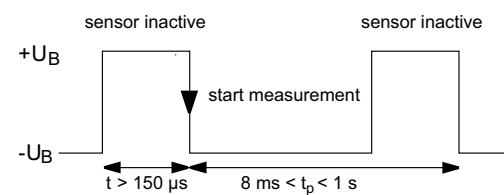
154-00116

Sound cone



155-00440

Synchronisation / triggering



Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu s$, repeat rate, $t_p = 8 ms \dots 1 s$.
A high level, $+U_B$ at Sync input deactivates the sensor.

155-00131

Accessories

Connection cables
Brackets

From Page A-46
From Page A-4

UT 20-700-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

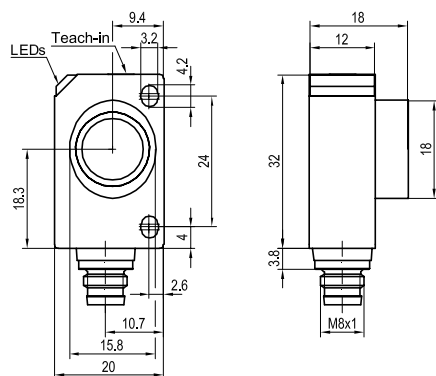
- Long scanning distance of 700 mm with small and compact housings
- Analogue output: 0 ... 10 V or 4 ... 20 mA
- Ideal for monitoring filling levels, e.g. of liquids
- Detection regardless of object colour and surface

Sensor data ¹		Functions	
Limit scanning distance	1000 mm	Indicator LED, green	Operating voltage indicator
Operating scanning distance	120 ... 700 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 300 kHz	Set characteristic analogue curve	Via Teach-in button
Resolution	0.20 mm	Adjustment possibilities	Rising/falling edge via Teach-in button
Repeatability	± 0.15 % ²		Button lock via Teach-in button
Temperature drift	≤ 2 %		Synchronisation via control input
			Default settings via Teach-in button
Electrical data		Mechanical data	
Operating voltage, +U _B	20 ... 30V DC ²	Dimensions	32 x 20 x 18 mm
No-load current, I ₀	≤ 35 mA	Enclosure rating	IP 67 ³
Current output	R _a < 500 Ω	Material, housing	ABS
Voltage output	R _a > 500 Ω	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Protection Class	2	Ambient temperature: operation	-25 ... +70 °C
Power On Delay	< 300 ms	Ambient temperature: storage	-40 ... +85 °C
Analogue output	0 ... 10V / 4 ... 20 mA (see selection table)	Weight	10 g
Response time	30 ms	Vibration and impact resistance	EN 60947-5-2
Connection, WH	Sync.		

¹ After 30 minutes settling time ² Max. 10 % ripple, within U_B ³ With connected IP 67 plug

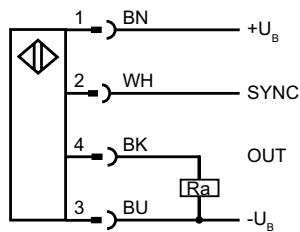
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
120 ... 700 mm	0 ... 10V	Metal plug, M8x1, 4-pin	UT 20-700-AUM4	693-11010
120 ... 700 mm	4 ... 20 mA	Metal plug, M8x1, 4-pin	UT 20-700-AIM4	693-11011

Plug connection



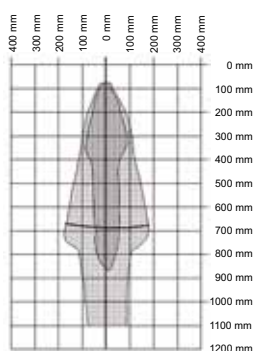
153-00444

Connection, 4-pin



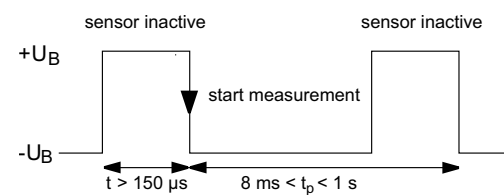
154-00115

Sound cone



155-00440

Synchronisation / triggering



155-00131

Lay down a square-wave signal at the Sync input.
Pulse width $t > 150 \mu\text{s}$, repeat rate, $t_p = 8 \text{ ms} \dots 1 \text{ s}$.
A high level, +U_B at Sync input deactivates the sensor.

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 12-370-P

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

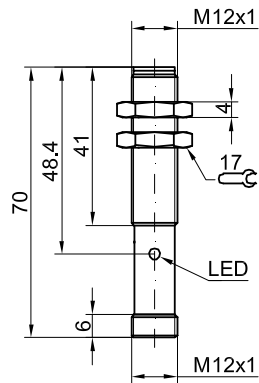
- Robust M12 metal housing for harsh operating conditions
- Detection regardless of object colour and surface
- Simple sensor adjustment via control input

Sensor data		Functions	
Operating scanning distance	30 ... 400 mm	Indicator LED, yellow	Switching output indicator
Adjustment range	50 ... 400 mm	Indicator LED, red	Fault indicator
Ultrasonic frequency	~ 310 kHz	Scanning distance adjustment	Via control input
Hysteresis	1 % ¹	Teach-in modes	Mode 1: set switching point (N.O. / N.C.)
Temperature drift	± 1.5 % ²		Mode 2: set window operation (N.O. / N.C.)
Repeatability	≤ 1 %	Default settings	Switching point 1 = 50 mm, Switching point 2 = 400 mm
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ³	Dimensions	M12 x 70 mm
No-load current, I ₀	≤ 30 mA	Enclosure rating	IP 65 ⁴
Output current, I _e	100 mA	Material, housing	Nickel-plated brass
Voltage drop, U _D	≤ 3V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content, PBT (lid)
Protective circuits	Short-circuit protection (Q) / overload protection	Type of connection	(See selection table)
Switching output, Q	PNP	Ambient temperature: operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature: storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1)	≤ 8 Hz	Weight	25 g
Response time	≤ 50 ms		
Control input, WH	- U _B = switching point 1 + U _B = switching point 2		

¹ Relating to set switching distance ² From end-value ³ Max. 10 % ripple, within U_B ⁴With connected IP 65 plug

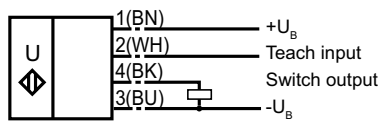
Operating scanning distance	Switching output	Type of connection	Part number	Article number
30 ... 400 mm	PNP	Plug, M12x1, 4-pin	UT 12-370-PSL4	690-10100

Plug connection



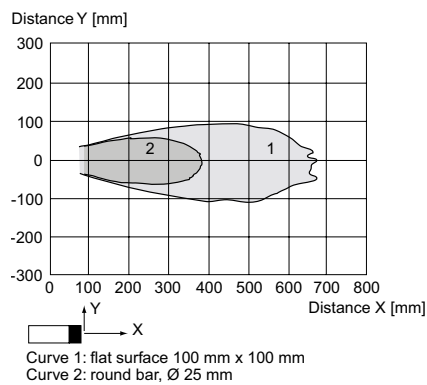
153-00583

Connection, 4-pin



154-00470

Sound cone



155-00663

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 12-370-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

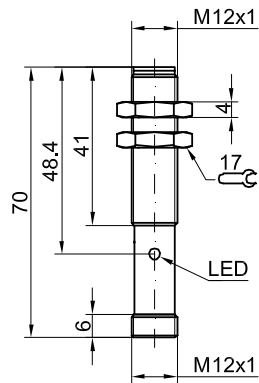
- Robust M12 metal housing for harsh operating conditions
- Analogue output: 4 ... 20 mA
- Simple sensor adjustment via control input

Sensor data		Functions	
Operating scanning distance	30 ... 400 mm	Indicator LED, yellow	Switching output indicator
Adjustment range	50 ... 400 mm	Indicator LED, red	Fault indicator
Ultrasonic frequency	~ 310 kHz	Set characteristic analogue curve	Via control input
Resolution	0,40 mm ¹	Adjustment possibilities	Rising / falling slope via control input
Temperature drift	± 1,5 % ²	Default settings	Evaluation limit 1 = 50 mm
Repeatability	± 0,5 % ²		Evaluation limit 2 = 400 mm
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ³	Dimensions	M12 x 70 mm
No-load current, I ₀	≤ 30 mA	Enclosure rating	IP 65 ⁴
Current output	R _a < 300 Ω	Material, housing	Nickel-plated brass
Protective circuits	Short-circuit protection (Q) / overload protection	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content, PBT (lid)
Analogue output	4 ... 20 mA	Type of connection	(See selection table)
Response time	≤ 50 ms	Ambient temperature: operation	-25 ... +70 °C
Control input, WH	- U _B = lower evaluation limit + U _B = upper evaluation limit	Ambient temperature: storage	-40 ... +85 °C
		Weight	25 g

¹ With max. detection range ² From end-value ³ Max. 10 % ripple, within U_B ⁴ With connected IP 65 plug

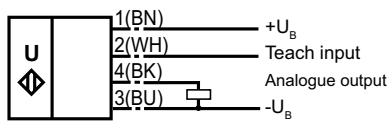
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
30 ... 400 mm	4 ... 20 mA	Plug, M12x1, 4-pin	UT 12-370-A-IL4	690-10101

Plug connection



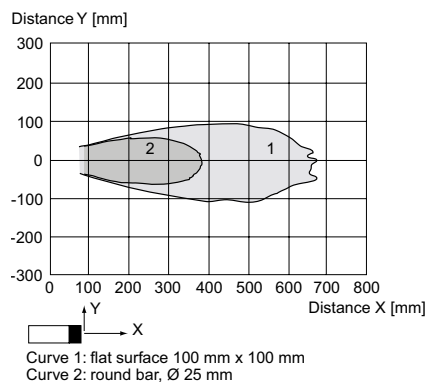
153-00583

Connection, 4-pin



154-00469

Sound cone



155-00663

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 18-270-P

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

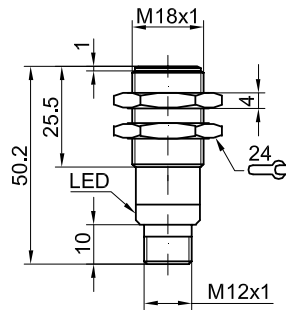
- Robust M18 metal housing for harsh operating conditions
- Detection regardless of object colour and surface
- Adjustable window mode
- Selectable N.O. / N.C.

Sensor data		Functions	
Operating scanning distance	35 ... 300 mm	Indicator LED, green	Operating voltage indicator
Adjustment range	50 ... 300 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 390 kHz	Indicator LED, red	Fault indicator
Hysteresis	1 % ¹	Scanning distance adjustment	Via control input
Temperature drift	± 1.5 % ²	Teach-in modes	Mode 1: set switching point (N.O. / N.C.)
Repeatability	≤ 1 %	Default settings	Mode 2: set window operation (N.O. / N.C.)
			Switching point 1 = 50 mm
			Switching point 2 = 300 mm
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ³	Dimensions	M18 x 50.2 mm
No-load current, I ₀	≤ 20 mA	Enclosure rating	IP 65 ⁴
Output current, I _e	200 mA	Material, housing	Nickel-plated brass
Voltage drop, U _D	≤ 3 V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content, PBT (lid)
Protective circuits	Short-circuit protection (Q) / overload protection	Type of connection	(See selection table)
Switching output, Q	PNP	Ambient temperature: operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature: storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1)	≤ 13 Hz	Weight	25 g
Response time	≤ 30 ms		
Control input, WH	- U _B = switching point 1 + U _B = switching point 2		

¹ Relating to set switching distance ² From end-value ³ Max. 10 % ripple, within U_B ⁴ With connected IP 65 plug

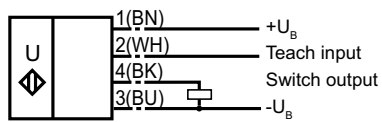
Operating scanning distance	Switching output	Type of connection	Part number	Article number
30 ... 300 mm	PNP	Plug, M12x1, 4-pin	UT 18-270-PSL4	690-10102

Plug connection



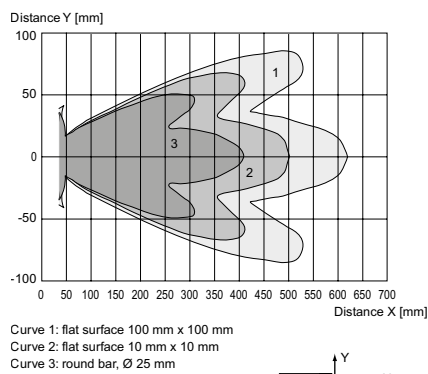
153-00582

Connection, 4-pin



154-00470

Sound cone



155-00661

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 18-270-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

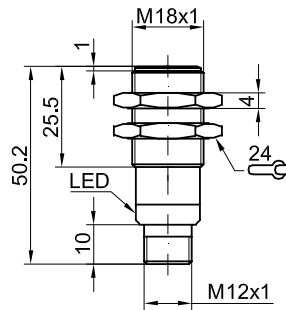
- Robust M18 metal housing for harsh operating conditions
- Detection regardless of object colour and surface
- Analogue output: 4 ... 20 mA
- Rising/falling output characteristic adjustable

Sensor data		Functions	
Operating scanning distance	35 ... 300 mm	Indicator LED, green	Operating voltage indicator
Adjustment range	50 ... 300 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 390 kHz	Indicator LED, red	Fault indicator
Resolution	0,40 mm ¹	Set characteristic analogue curve	Via control input
Temperature drift	± 1,5 % ²	Adjustment possibilities	Rising / falling slope via control input
Repeatability	± 0,5 % ²	Default settings	Evaluation limit 1 = 50 mm
			Evaluation limit 2 = 300 mm
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ³	Dimensions	M18 x 50,2 mm
No-load current, I ₀	≤ 20 mA	Enclosure rating	IP 65 ⁴
Current output	R _a < 300 Ω	Material, housing	Nickel-plated brass
Protective circuits	Short-circuit protection (Q) / overload protection	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content, PBT (lid)
Analogue output	4 ... 20 mA	Type of connection	(See selection table)
Response time	≤ 30 ms	Ambient temperature: operation	-25 ... +70 °C
Control input, WH	- U _B = lower evaluation limit + U _B = upper evaluation limit	Ambient temperature: storage	-40 ... +85 °C
		Weight	25 g

¹With max. detection range ²From end-value ³Max. 10 % ripple, within U_B ⁴With connected IP 65 plug

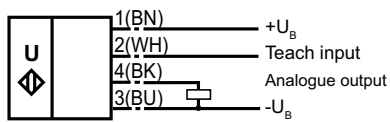
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
30 ... 300 mm	4 ... 20 mA	Plug, M12x1, 4-pin	UT 18-270-A-IL4	690-10103

Plug connection



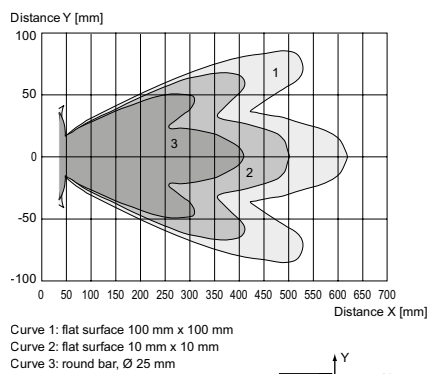
153-00582

Connection, 4-pin



154-00469

Sound cone



155-00661

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 18-750-P

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

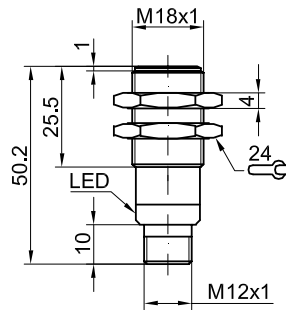
- Long operating scanning distance of 800 mm
- Robust M18 metal housing for harsh operating conditions
- Simple sensor adjustment via control input
- Window mode adjustable
- N.O. / N.C. selectable

Sensor data		Functions	
Operating scanning distance	50 ... 800 mm	Indicator LED, green	Operating voltage indicator
Adjustment range	70 ... 800 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 205 kHz	Indicator LED, red	Fault indicator
Hysteresis	1 % ¹	Scanning distance adjustment	Via control input
Temperature drift	± 1.5 % ²	Teach-in modes	Mode 1: set switching point (N.O. / N.C.)
Repeatability	≤ 1 %		Mode 2: set window operation (N.O. / N.C.)
		Default settings	Switching point 1 = 70 mm
			Switching point 2 = 800 mm
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ³	Dimensions	M18 x 50.2 mm
No-load current, I ₀	≤ 20 mA	Enclosure rating	IP 65 ⁴
Output current, I _e	200 mA	Material, housing	Nickel-plated brass
Voltage drop, U _D	≤ 3V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content, PBT (lid)
Protective circuits	Short-circuit protection (Q) / overload protection	Type of connection	(See selection table)
Switching output, Q	PNP	Ambient temperature: operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature: storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1)	≤ 4 Hz	Weight	25 g
Response time	≤ 100 ms		
Control input, WH	- U _B = switching point 1 + U _B = switching point 2		

¹ Relating to set switching distance ² From end-value ³ Max. 10 % ripple, within U_B ⁴ With connected IP 65 plug

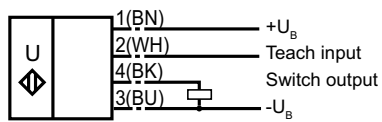
Operating scanning distance	Switching output	Type of connection	Part number	Article number
50 ... 800 mm	PNP	Plug, M12x1, 4-pin	UT 18-750-PSL4	690-10104

Plug connection



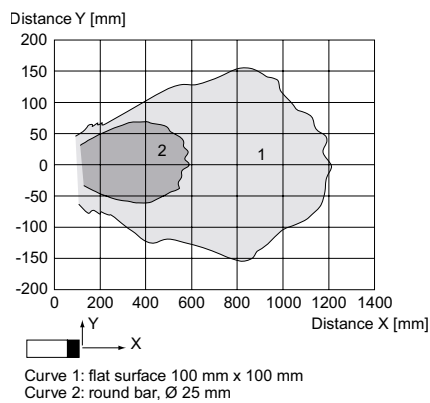
153-00582

Connection, 4-pin



154-00470

Sound cone



155-00662

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UT 18-750-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

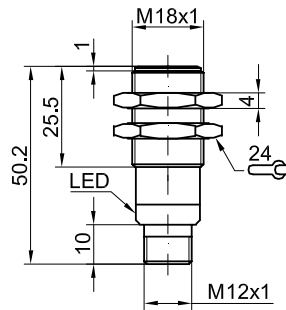
- Long operating scanning distance of 800 mm
- Robust M18 metal housing for harsh operating conditions
- Analogue output: 4 ... 20 mA
- Rising / falling output characteristic adjustable

Sensor data		Functions	
Operating scanning distance	50 ... 800 mm	Indicator LED, green	Operating voltage indicator
Adjustment range	70 ... 800 mm	Indicator LED, yellow	Switching output indicator
Ultrasonic frequency	~ 205 kHz	Indicator LED, red	Fault indicator
Resolution	0,40 mm ¹	Set characteristic analogue curve	Via control input
Temperature drift	± 1.5 % ²	Adjustment possibilities	Rising / falling slope via control input
Repeatability	± 0.5 % ²	Default settings	Evaluation limit 1 = 70 mm
			Evaluation limit 2 = 800 mm
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ³	Dimensions	M18 x 50,2 mm
No-load current, I ₀	≤ 20 mA	Enclosure rating	IP 65 ⁴
Current output	R _a < 300 Ω	Material, housing	Nickel-plated brass
Protective circuits	Short-circuit protection (Q) / overload protection	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content, PBT (lid)
Analogue output	4 ... 20 mA	Type of connection	(See selection table)
Response time	≤ 100 ms	Ambient temperature: operation	-25 ... +70 °C
Control input, WH	- U _B = lower evaluation limit + U _B = upper evaluation limit	Ambient temperature: storage	-40 ... +85 °C
		Weight	25 g

¹With max. detection range ²From end-value ³Max. 10 % ripple, within U_B ⁴With connected IP 65 plug

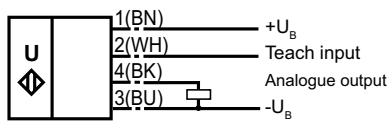
Operating scanning distance	Analogue output	Type of connection	Part number	Article number
50 ... 800 mm	4 ... 20 mA	Plug, M12x1, 4-pin	UT 18-750-A-IL4	690-10105

Plug connection



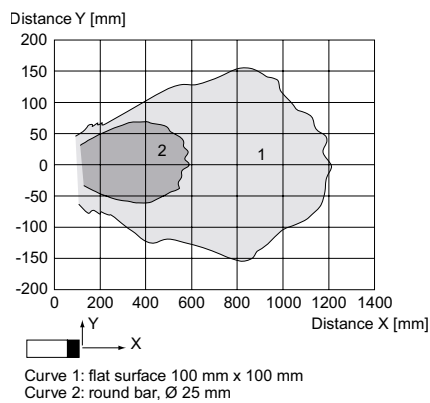
153-00582

Connection, 4-pin



154-00469

Sound cone



155-00662

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UM 18-60/250

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

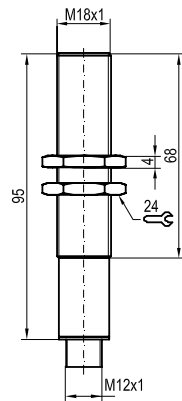
- Robust M18 metal housings for harsh operating conditions
- Optional brass or stainless steel housings
- Operating scanning distance either 60 mm or 250 mm
- Simple sensor settings via control input

Sensor data		Functions	
Limit scanning distance	350 mm	Adjustment possibilities	Operating scanning distance 60 mm / 250 mm via control input
Operating scanning distance	30 ... 250 mm		
Ultrasonic frequency	~ 320 kHz		
Resolution	0.36 mm		
Repeatability ¹	< 1 mm		
Hysteresis	2 mm		
Temperature drift	0.17 % / K		
Electrical data		Mechanical data	
Operating voltage, +U _B	10 ... 30V DC ²	Dimensions	M18 x 95 mm
No-load current, I ₀	≤ 30 mA	Enclosure rating	IP 65 ³
Output current, I _e	500 mA	Material, housing	(See selection table)
Voltage drop, U _d	< 2.4 V DC	Type of connection	(See selection table)
Protective circuits	Reverse polarity protection, U _B / short-circuit protection (Q)	Ambient temperature: operation	-20 ... +70 °C
Switching output, Q	PNP	Ambient temperature: storage	-40 ... +85 °C
Output function	N.O.	Weight	80 g
Switching frequency, f (ti/tp 1:1)	25 Hz		
Control input, WH	+ U _B = operating scanning distance 250 mm - U _B / open = operating scanning distance 60 mm		

¹ With constant ambient conditions ² Max. 10 % ripple, within U_B ³ With connected IP 65 plug

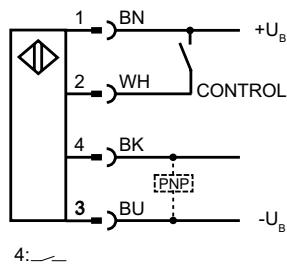
Operating scanning distance	Switching output	Housing material	Type of connection	Part number	Article number
30 ... 250 mm	PNP	Nickel-plated brass	Plug, M12x1, 4-pin	UM 18-60/250-CD-HP	690-51541
30 ... 250 mm	PNP	Stainless steel	Plug, M12x1, 4-pin	UM 18-60/250-CD-HP-E	690-51542

Plug connection



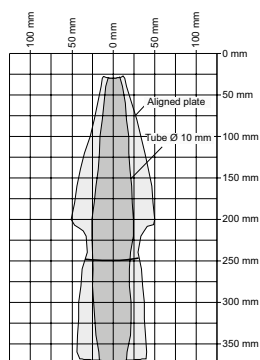
153-00572

Connection, 4-pin



154-00226

Sound cone



155-00650

10

Accessories

Connection cables

From Page A-46

Brackets

From Page A-4

UMT 30-350

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

- Ideal for monitoring the filling levels of liquids such as fats and oils
- With one or two switching outputs as option
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	600 mm	Display	Parameterisation
Operating scanning distance	65 ... 350 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 400 kHz	LED indicator 2	Switching output indicator
Resolution	0,025 mm	Scanning distance adjustment	Via Teach-in buttons and numerically via 7-segment display
Repeatability	± 0.15 % ¹	Teach-in modes	Mode 1: set switching point Mode 2: set Window Mode Mode 3: set two-way reflex switch
Hysteresis ²	5 mm	Adjustment possibilities	N.O. / N.C. via Teach-in button Button lock via Teach-in button Default settings via Teach-in button
Accuracy ²	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Supplementary functions	– Energy-saving Mode – Hysteresis – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings ³	Measurement range: limit scanning distance Switching distances: scanning distance Switching output: N.O.
		Default settings ⁴	Measurement range: limit scanning distance Switching distances: scanning distance and half scanning distance Switching output: N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30V DC ⁵	Dimensions	M30 x 84 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁶
Output current, I _e	200 mA	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Power On Delay	< 300 ms	Type of connection	(See selection table)
Switching output, Q	1 x PNP / 2 x PNP (see selection table)	Ambient temperature, operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature, storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1) ²	8 Hz ³ / 12 Hz ⁴	Weight (plug device)	150 g
Response time ²	70 ms ³ / 64 ms ⁴	Vibration and impact resistance	EN 60947-5-2
Connection, GY	Sync. / Com.		

¹ Related to current measurement value

² Parameterisable via control panel

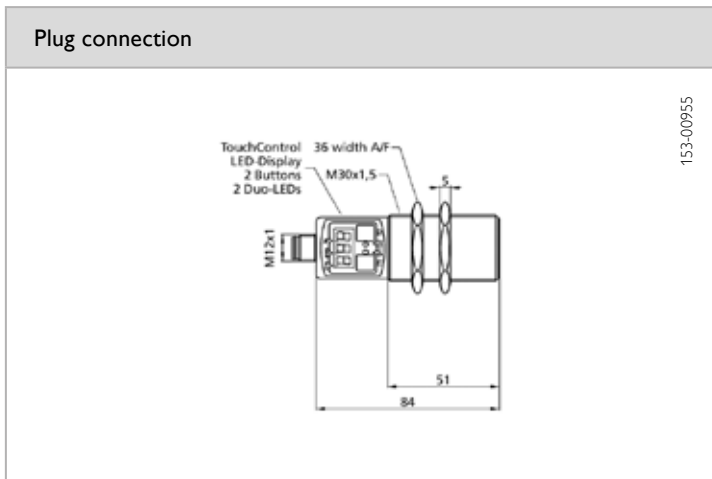
³ 1 x PNP

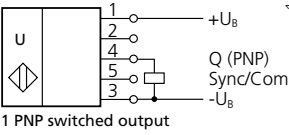
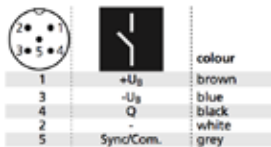
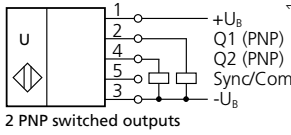
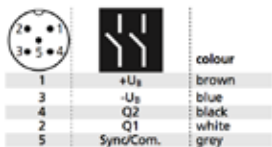
⁴ 2 x PNP

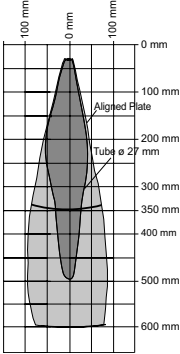
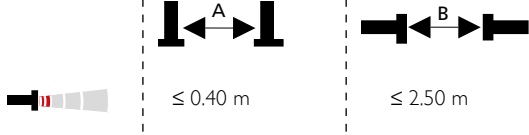
⁵ Max. 10 % ripple, within U_B

⁶ With connected IP 67 plug

Operating scanning distance	Switching output	Type of connection	Part number	Article number
65 ... 350 mm	1 x PNP	Plug, M12x1, 5-pin	UMT 30-350-PSD-L5	690-51560
65 ... 350 mm	2 x PNP	Plug, M12x1, 5-pin	UMT 30-350-2PSD-L5	690-51561



Connection, 5-pin (1 x PNP)	Connection, 5-pin (2 x PNP)
 1 PNP switched output 154-00322  154-00306	 2 PNP switched outputs 154-00323  154-00307

Sound cone	Synchronisation / multiplex
 155-01561	 155-01580 Mounting distances below which synchronisation / multiplex should be used.

Accessories	
Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-350-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	600 mm	Display	Parameterisation
Operating scanning distance	65 ... 350 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 400 kHz	LED indicator 2	Switching output indicator
Resolution ¹	0.025 ... 0.17 mm	Set analogue characteristic	Via Teach-in button and numerically via 7-segment display
Repeatability	± 0.15 % ²	Teach-in modes	Mode 1: set window limits Mode 2: rising / falling output characteristics
Accuracy ³	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Adjustment possibilities	Button lock via Teach-in button Default settings via Teach-in button
		Supplementary functions	– Energy-saving Mode – Indicator Mode – Current or voltage output selection – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings	Measurement range: limit scanning distance Window limits, analogue signal: blind zone and scanning distance Switching output: rising analogue characteristic
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30 V DC ⁴	Dimensions	M30 x 84 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁵
Current output	R _L ≤ 100 Ω with 9 V ≤ U _B ≤ 20 V R _L ≤ 500 Ω with U _B ≥ 20 V	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Voltage output	R _L ≥ 100 kΩ with U _B ≥ 15 V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature, operation	-25 ... +70 °C
Analogue output	0 ... 10 V / 4 ... 20 mA	Ambient temperature, storage	-40 ... +85 °C
Response time ³	64 ms	Weight	150 g
Connection, GY	Sync. / Com.	Vibration and impact resistance	EN 60947-5-2

¹ depending on the set analogue window

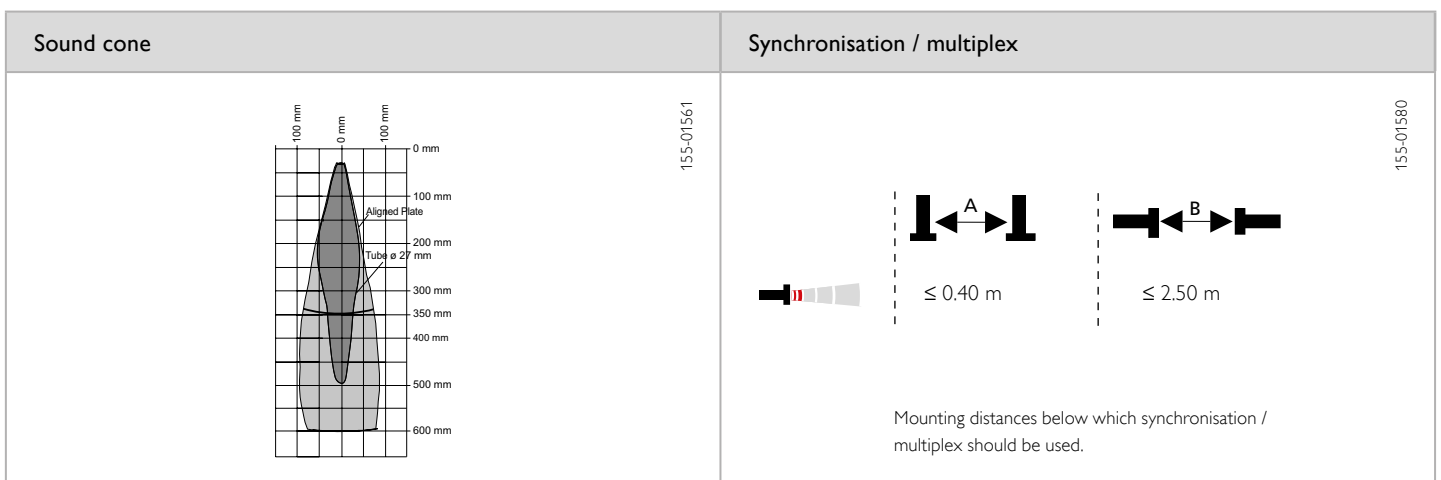
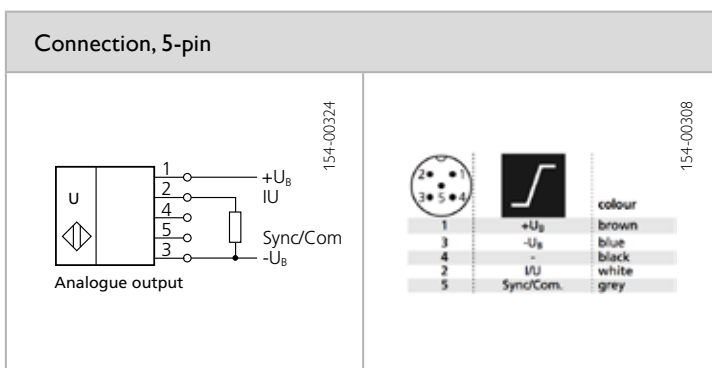
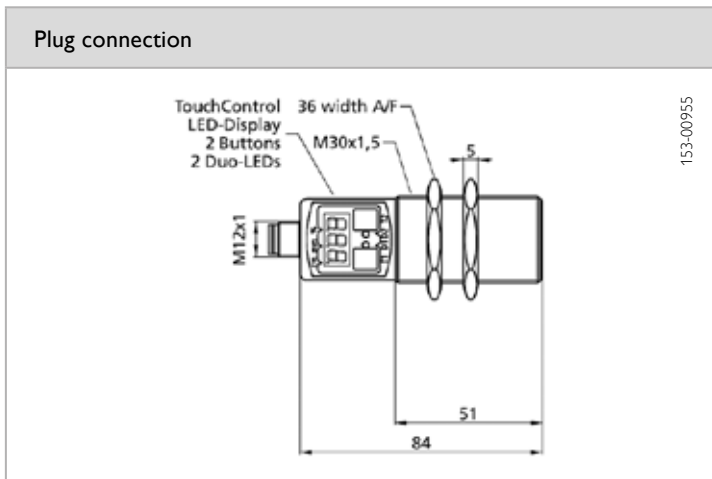
² Related to current measurement value

³ Parameterisable via control panel

⁴ Max. 10 % ripple, within U_B

⁵ With connected IP 67 plug

Operating scanning distance	Analogue output	Type of connection	Part number	Article number
65 ... 350 mm	0 ... 10V / 4 ... 20 mA	Plug, M12x1, 5-pin	UMT 30-350-A-IUD-L5	690-51572



Accessories

Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-1300

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

- Ideal for monitoring the filling levels of liquids such as fats and oils
- With one or two switching outputs as option
- Sensor adjustment via teach-in or numerically via 7-segment display
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	2000 mm	Display	Parameterisation
Operating scanning distance	200 ... 1300 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 200 kHz	LED indicator 2	Switching output indicator
Resolution	0.18 mm	Scanning distance adjustment	Via Teach-in buttons and numerically via 7-segment display
Repeatability	± 0.15 % ¹	Teach-in modes	Mode 1: set switching point Mode 2: set Window Mode Mode 3: set two-way reflex switch
Hysteresis ²	20 mm	Adjustment possibilities	N.O. / N.C. via teach-in button Button lock via teach-in button Default settings via teach-in button
Accuracy ²	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Supplementary functions	– Energy-saving Mode – Hysteresis – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings ³	Measurement range: limit scanning distance Switching distances: scanning distance Switching output: N.O.
		Default settings ⁴	Measurement range: limit scanning distance Switching distances: scanning distance and half scanning distance Switching output: N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30 V DC ⁵	Dimensions	M30 x 84 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁶
Output current, I _e	200 mA	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Power On Delay	< 300 ms	Type of connection	(See selection table)
Switching output, Q	1 x PNP / 2 x PNP (see selection table)	Ambient temperature, operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature, storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1) ²	6 Hz ³ / 8 Hz ⁴	Weight	150 g
Response time ²	110 ms ³ / 92 ms ⁴	Vibration and impact resistance	EN 60947-5-2
Connection, GY	Sync. / Com.		

¹ Related to current measurement value

² Parameterisable via control panel

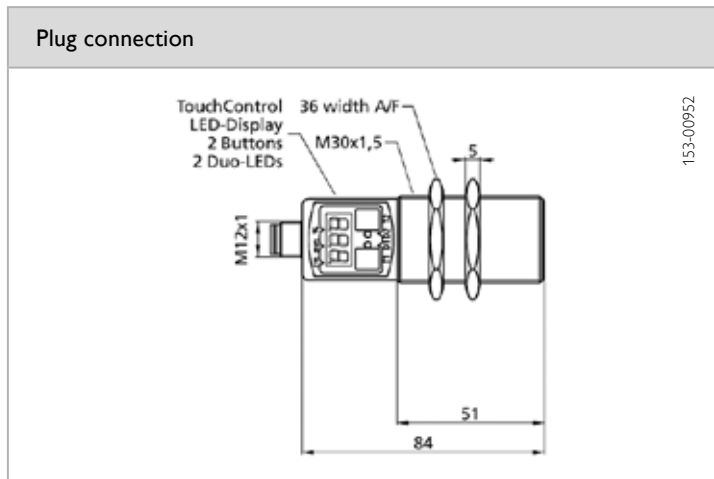
³ 1 x PNP

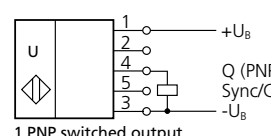
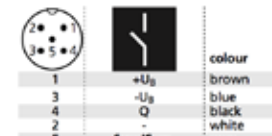
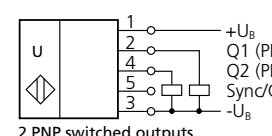
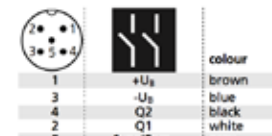
⁴ 2 x PNP

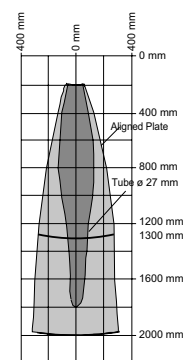
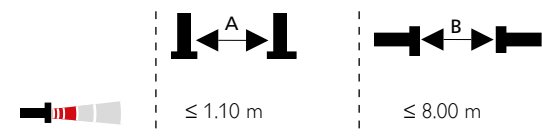
⁵ Max. 10 % ripple, within U_B

⁶ With connected IP 67 plug

Operating scanning distance	Switching output	Type of connection	Part number	Article number
200 ... 1300 mm	1 x PNP	Plug, M12x1, 5-pin	UMT 30-1300-PSD-L5	690-51563
200 ... 1300 mm	2 x PNP	Plug, M12x1, 5-pin	UMT 30-1300-2PSD-L5	690-51564



Connection, 5-pin (1 x PNP)	Connection, 5-pin (2 x PNP)
 1 PNP switched output 154-00322  154-00306	 2 PNP switched outputs 154-00323  154-00307

Sound cone	Synchronisation / multiplex
 155-01562	 155-01580 Mounting distances below which synchronisation / multiplex should be used.

Accessories	
Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-1300-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

- Ideal for monitoring the filling levels of liquids such as fats and oils
- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	2000 mm	Display	Parameterisation
Operating scanning distance	200 ... 1300 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 200 kHz	LED indicator 2	Switching output indicator
Resolution ¹	0.18 ... 0.57 mm	Set analogue characteristic	Via Teach-in buttons and numerically via 7-segment display
Repeatability	± 0.15 % ²	Teach-in modes	Mode 1: set window limits Mode 2: rising / falling output characteristics
Accuracy ³	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Adjustment possibilities	Button lock via Teach-in button Default settings via Teach-in button
		Supplementary functions	– Energy-saving Mode – Indicator Mode – Current or voltage output selection – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings	Measurement range: limit scanning distance Window limits, analogue signal: blind zone and scanning distance Switching output: rising analogue characteristic
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30 V DC ⁴	Dimensions	M30 x 84 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁵
Current output	R _L ≤ 100 Ω with 9 V ≤ U _B ≤ 20 V; R _L ≤ 500 Ω with U _B ≥ 20 V	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Voltage output	R _L ≥ 100 kΩ with U _B ≥ 15 V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature, operation	-25 ... +70 °C
Analogue output	0 ... 10 V / 4 ... 20 mA	Ambient temperature, storage	-40 ... +85 °C
Response time ³	92 ms	Weight	150 g
Connection, GY	Sync. / Com.	Vibration and impact resistance	EN 60947-5-2

¹ depending on the set analogue window

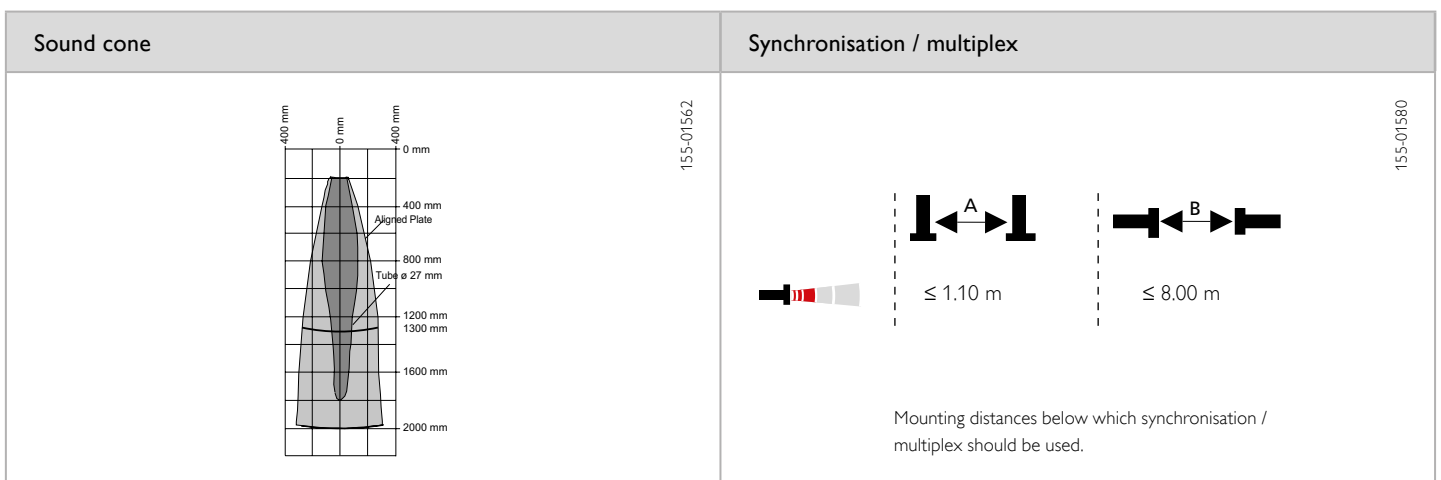
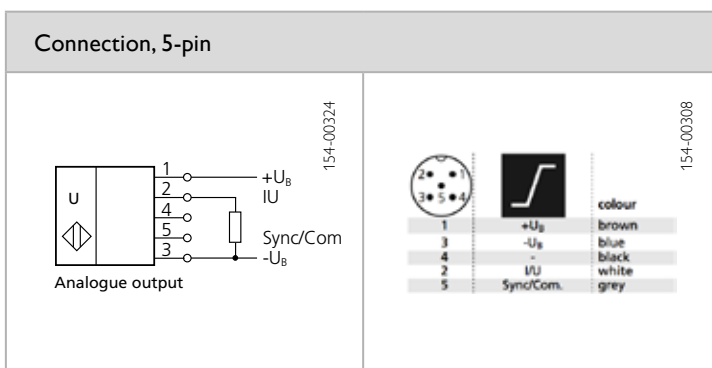
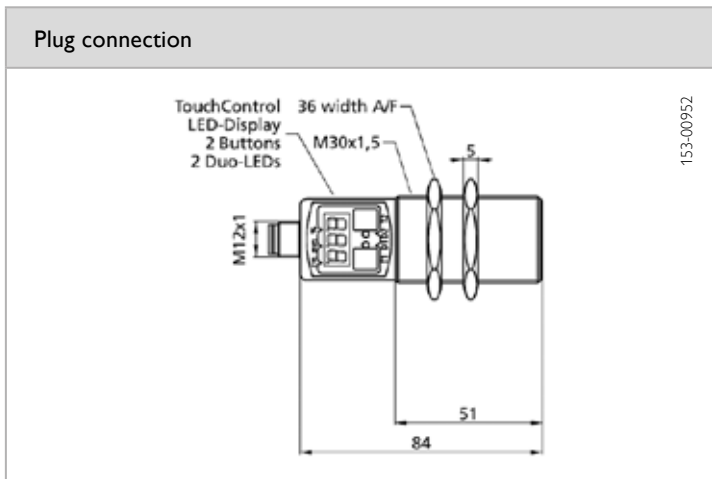
² Related to current measurement value

³ Parameterisable via control panel

⁴ Max. 10 % ripple, within U_B

⁵ With connected IP 67 plug

Operating scanning distance	Analogue output	Type of connection	Part number	Article number
200 ... 1300 mm	0 ... 10V / 4 ... 20 mA	Plug, M12x1, 5-pin	UMT 30-1300-A-IUD-L5	690-51562



Accessories

Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-3400

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

- With one or two switching outputs as option
- Sensor adjustment via teach-in or numerically via 7-segment display
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	5000 mm	Display	Parameterisation
Operating scanning distance	350 ... 3400 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 120 kHz	LED indicator 2	Switching output indicator
Resolution	0.18 mm	Scanning distance adjustment	Via Teach-in buttons and numerically via 7-segment display
Repeatability	± 0.15 % ¹	Teach-in modes	Mode 1: set switching point Mode 2: set Window Mode Mode 3: set two-way reflex switch
Hysteresis ²	50 mm	Adjustment possibilities	N.O. / N.C. via Teach-in button Button lock via Teach-in button Default settings via Teach-in button
Accuracy ²	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Supplementary functions	– Energy-saving Mode – Hysteresis – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings ³	Measurement range: limit scanning distance Switching distances: scanning distance Switching output: N.O.
		Default settings ⁴	Measurement range: limit scanning distance Switching distances: scanning distance and half scanning distance Switching output: N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30 V DC ⁵	Dimensions	M30 x 102 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁶
Output current, I _e	200 mA	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Power On Delay	< 300 ms	Type of connection	(See selection table)
Switching output, Q	1 x PNP / 2 x PNP (see selection table)	Ambient temperature, operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature, storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1) ²	3 Hz ³ / 4 Hz ⁴	Weight	210 g
Response time ²	180 ms ³ / 172 ms ⁴	Vibration and impact resistance	EN 60947-5-2
Connection, GY	Sync. / Com.		

¹ Related to current measurement value

² Parameterisable via control panel

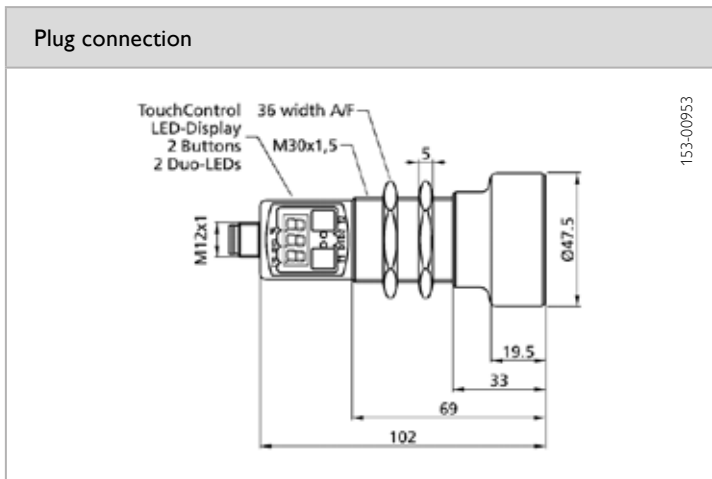
³ 1 x PNP

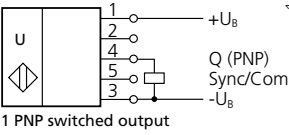
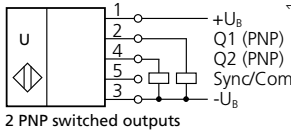
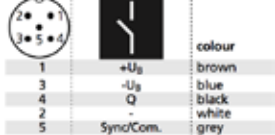
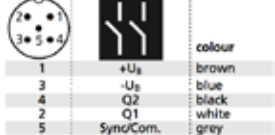
⁴ 2 x PNP

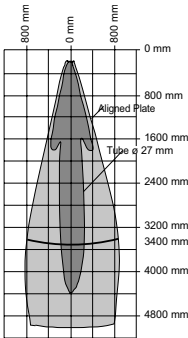
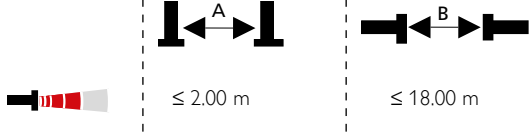
⁵ Max. 10 % ripple, within U_B

⁶ With connected IP 67 plug

Operating scanning distance	Switching output	Type of connection	Part number	Article number
350 ... 3400 mm	1 x PNP	Plug, M12x1, 5-pin	UMT 30-3400-PSD-L5	690-51567
350 ... 3400 mm	2 x PNP	Plug, M12x1, 5-pin	UMT 30-3400-2PSD-L5	690-51568



Connection, 5-pin (1 x PNP)	Connection, 5-pin (2 x PNP)
 1 PNP switched output 154-00322	 2 PNP switched outputs 154-00323
 1 54-00306	 154-00307

Sound cone	Synchronisation / multiplex
 155-01563	 155-01580 Mounting distances below which synchronisation / multiplex should be used.

Accessories	
Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-3400-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions
- Choice of brass or stainless steel housings

Sensor data		Functions	
Limiting scanning distance	5000 mm	Display	Parameterisation
Operating scanning distance	350 ... 3400 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 120 kHz	LED indicator 2	Switching output indicator
Resolution ¹	0.18 ... 1.5 mm	Set analogue characteristic	Via Teach-in buttons and numerically via 7-segment display
Repeatability	± 0.15 % ²	Teach-in modes	Mode 1: set window limits Mode 2: rising / falling output characteristics
Accuracy ³	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Adjustment possibilities	Button lock via Teach-in button Default settings via Teach-in button
		Supplementary functions	– Energy-saving Mode – Indicator Mode – Current or voltage output selection – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings	Measurement range: limit scanning distance Window limits, analogue signal: blind zone and scanning distance Switching output: rising analogue characteristic
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30 V DC ⁴	Dimensions	M30 x 102 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁵
Current output	R _L ≤ 100 Ω with 9 V ≤ U _B ≤ 20 V; R _L ≤ 500 Ω with U _B ≥ 20 V	Material, housing	(See selection table) Plastic content: PBT, TPU
Voltage output	R _L ≥ 100 kΩ with U _B ≥ 15 V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature, operation	-25 ... +70 °C
Analogue output	0 ... 10 V / 4 ... 20 mA	Ambient temperature, storage	-40 ... +85 °C
Response time ³	172 ms	Weight	210 g
Connection, GY	Sync. / Com.	Vibration and impact resistance	EN 60947-5-2

¹ depending on the set analogue window

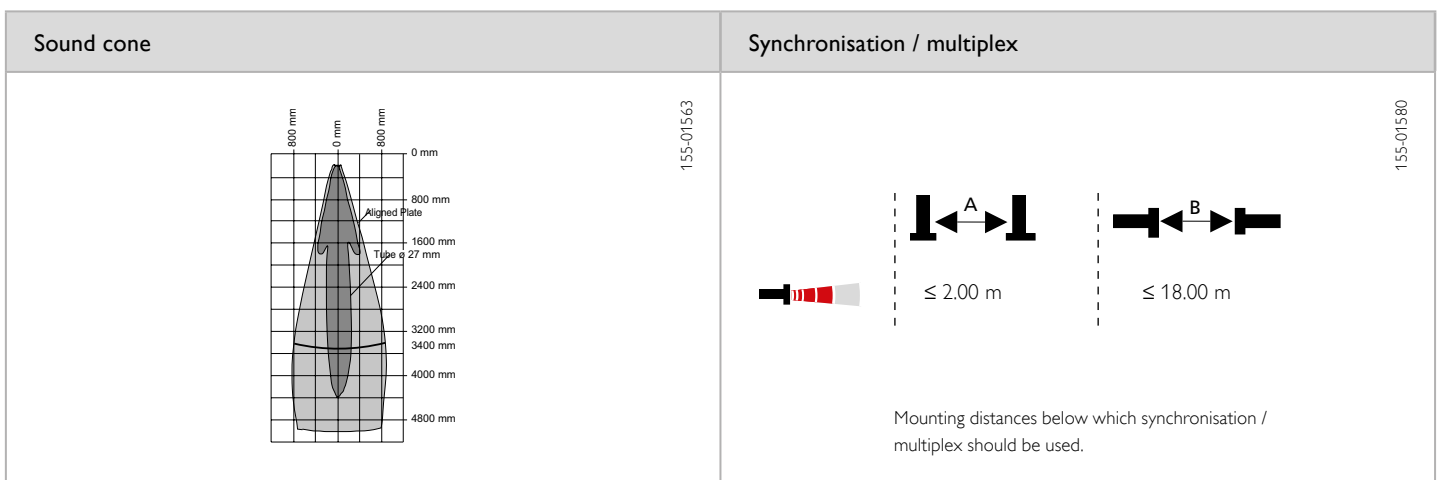
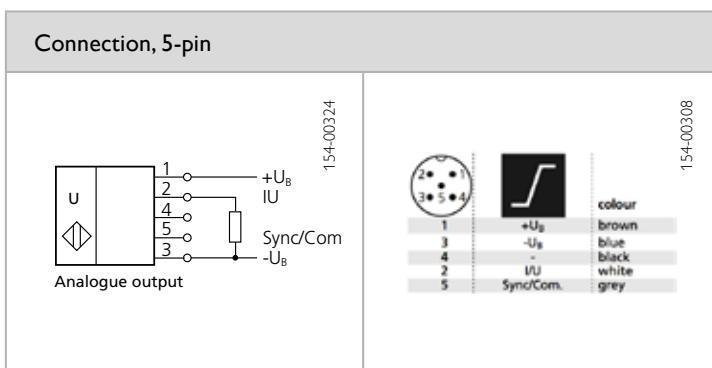
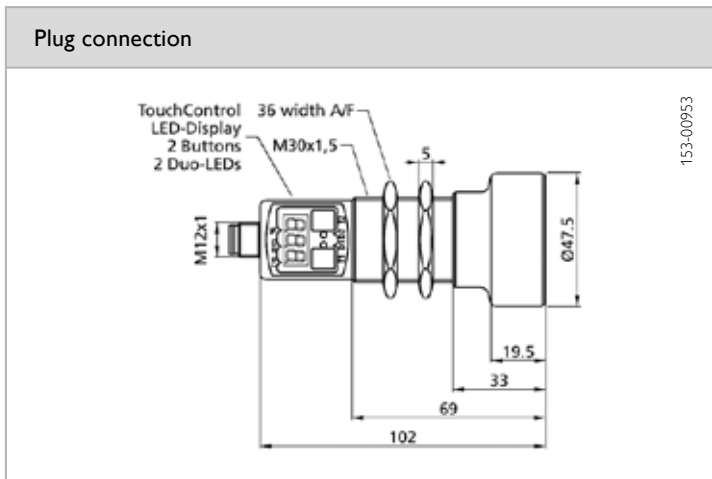
² Related to current measurement value

³ Parameterisable via control panel

⁴ Max. 10 % ripple, within U_B

⁵ With connected IP 67 plug

Operating scanning distance	Analogue output	Material, housing	Type of connection	Part number	Article number
350 ... 3400 mm	0 ... 10V / 4 ... 20 mA	Brass, nickel-plated	Plug, M12x1, 5-pin	UMT 30-3400-A-IUD-L5	690-51565
350 ... 3400 mm	0 ... 10V / 4 ... 20 mA	Stainless steel, 1.4571	Plug, M12x1, 5-pin	UMT 30-3400-AE-IUD-L5	690-51566



Accessories

Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-6000

Ultrasonic sensor with switching output



PRODUCT HIGHLIGHTS

- Long scanning range of 6 m
- With one or two switching outputs as option
- Sensor adjustment via teach-in or numerically via 7-segment display
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	8000 mm	Display	Parameterisation
Operating scanning distance	600 ... 6000 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 80 kHz	LED indicator 2	Switching output indicator
Resolution	0.18 mm	Scanning distance adjustment	Via Teach-in buttons and numerically via 7-segment display
Repeatability	± 0.15 % ¹	Teach-in modes	Mode 1: set switching point Mode 2: set Window Mode Mode 3: set two-way reflex switch
Hysteresis ²	100 mm	Adjustment possibilities	N.O. / N.C. via Teach-in button Button lock via Teach-in button Default settings via Teach-in button
Accuracy ²	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Supplementary functions	– Energy-saving Mode – Hysteresis – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings ³	Measurement range: limit scanning distance Switching distances: scanning distance Switching output: N.O.
		Default settings ⁴	Measurement range: limit scanning distance Switching distances: scanning distance and half scanning distance Switching output: N.O.
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30V DC ⁵	Dimensions	M30 x 105 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁶
Output current, I _e	200 mA	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Power On Delay	< 300 ms	Type of connection	(See selection table)
Switching output, Q	1 x PNP / 2 x PNP (see selection table)	Ambient temperature, operation	-25 ... +70 °C
Output function	N.O. / N.C.	Ambient temperature, storage	-40 ... +85 °C
Switching frequency, f (ti/tp 1:1) ²	2 Hz ³ / 3 Hz ⁴	Weight	270 g
Response time ²	240 ms	Vibration and impact resistance	EN 60947-5-2
Connection, GY	Sync. / Com.		

¹ Related to current measurement value

² Parameterisable via control panel

³ 1 x PNP

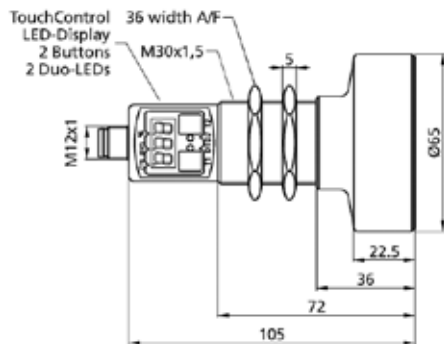
⁴ 2 x PNP

⁵ Max. 10 % ripple, within U_B

⁶ With connected IP 67 plug

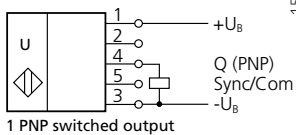
Operating scanning distance	Switching output	Type of connection	Part number	Article number
600 ... 6000 mm	1 × PNP	Plug, M12x1, 5-pin	UMT 30-6000-PSD-L5	690-51570
600 ... 6000 mm	2 × PNP	Plug, M12x1, 5-pin	UMT 30-6000-2PSD-L5	690-51571

Plug connection

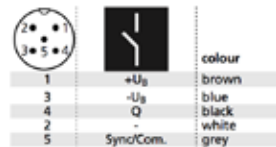


153-00954

Connection, 5-pin (1 x PNP)

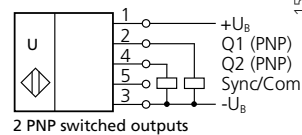


154-00322

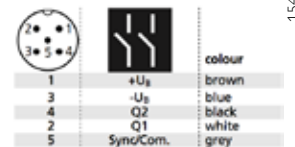


154-00306

Connection, 5-pin (2 x PNP)



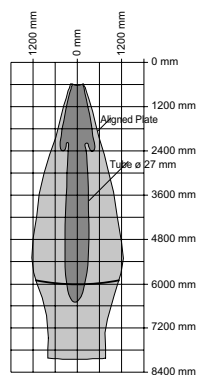
154-00373



154-00307

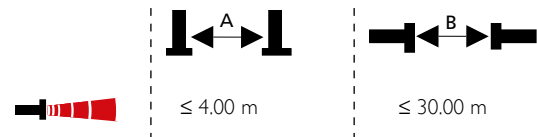
10

Sound cone



155-01564

Synchronisation / multiplex



Mounting distances below which synchronisation / multiplex should be used.

155-01580

Accessories

Connection cables	From Page A-46
Brackets	From Page A-4

UMT 30-6000-A

Ultrasonic sensor with analogue output



PRODUCT HIGHLIGHTS

- Long scanning range of 6 m
- Automatic selection to current or voltage output
- Easy pre-setting of sensor via digital display – sensor immediately ready for operation
- Synchronisation of up to 10 devices in restricted spaces
- Additional features with numerous supplementary functions

Sensor data		Functions	
Limiting scanning distance	8000 mm	Display	Parameterisation
Operating scanning distance	600 ... 6000 mm	LED indicator 1	Switching output indicator
Ultrasonic frequency	~ 80 kHz	LED indicator 2	Switching output indicator
Resolution ¹	0.18 ... 2.4 mm	Set analogue characteristic	Via Teach-in button and numerically via 7-segment display
Repeatability	± 0.15 % ²	Teach-in modes	Mode 1: set window limits Mode 2: rising / falling output characteristics
Accuracy ³	± 1 % (Temperature drift internal compensated, may be deactivated, 0.17 % / K without compensation)	Adjustment possibilities	Button lock via Teach-in button Default settings via Teach-in button
		Supplementary functions	– Energy-saving Mode – Indicator Mode – Current or voltage output selection – Measurement value filter – Filter strength – Response delay – Foreground suppression – Multiplex Mode, device address – Multiplex Mode, highest address – Measurement range – Calibration display – Detection range, sensitivity
		Default settings	Measurement range: limit scanning distance Window limits, analogue signal: blind zone and scanning distance Switching output: rising analogue characteristic
Electrical data		Mechanical data	
Operating voltage, +U _B	9 ... 30 V DC ⁴	Dimensions	M30 x 105 mm
No-load current, I ₀	≤ 80 mA	Enclosure rating	IP 67 ⁵
Current output	R _L ≤ 100 Ω with 9 V ≤ U _B ≤ 20 V; R _L ≤ 500 Ω with U _B ≥ 20 V	Material, housing	Brass, nickel-plated, plastic content: PBT,TPU
Voltage output	R _L ≥ 100 kΩ with U _B ≥ 15 V	Material, ultrasonic converter	Polyurethane foam, epoxy resin with glass content
Protective circuits	Reverse-polarity protection, U _B / short-circuit protection (Q)	Type of connection	(See selection table)
Power On Delay	< 300 ms	Ambient temperature, operation	-25 ... +70 °C
Analogue output	0 ... 10 V / 4 ... 20 mA	Ambient temperature, storage	-40 ... +85 °C
Response time ³	240 ms	Weight	270 g
Connection, GY	Sync. / Com.	Vibration and impact resistance	EN 60947-5-2

¹ depending on the set analogue window

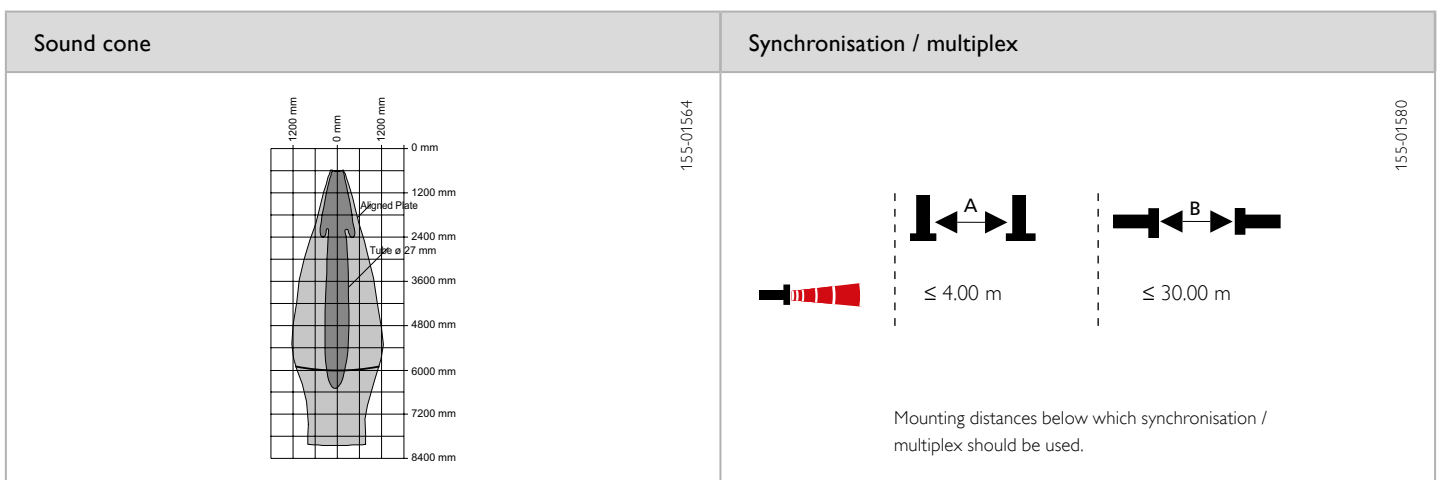
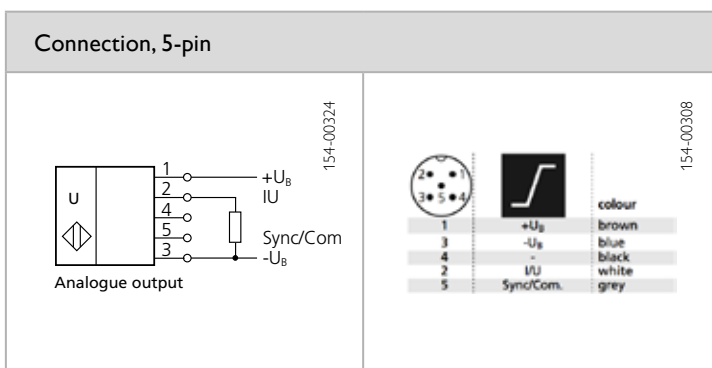
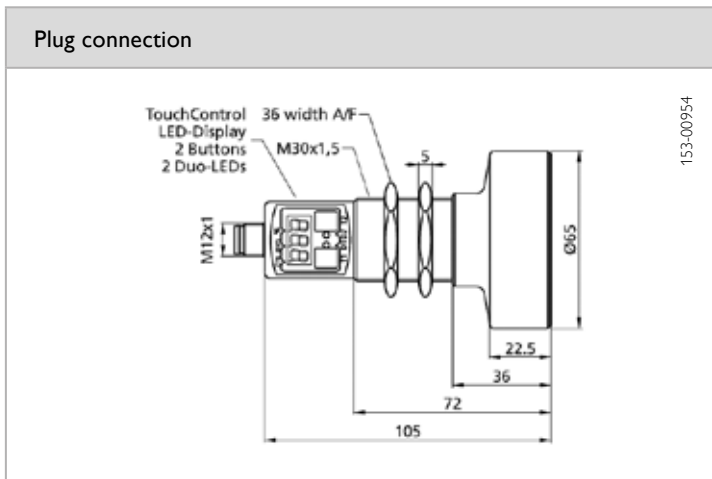
² Related to current measurement value

³ Parameterisable via control panel

⁴ Max. 10 % ripple, within U_B

⁵ With connected IP 67 plug

Operating scanning distance	Analogue output	Type of connection	Part number	Article number
600 ... 6000 mm	0 ... 10 V / 4 ... 20 mA	Plug, M12x1, 5-pin	UMT 30-6000-A-IUD-L5	690-51569



Accessories

Connection cables	From Page A-46
Brackets	From Page A-4