ULTRASONIC SENSORS

HIGHLIGHTS:

- ✓ Ready-to-connect compact devices
- ✓ Short housings
- ✓ Adjustment by means of teach-in, potentiometer and/or interface
- ✓ Devices with digital and/or analog outputs

ULTRASONIC SENSORS

PROGRAM OVERVIEW

HOUSING SIZE	FUNCTION			OPERATING DISTANCE
	Diffuse	Reflex	Through-beam	30 mm / 50 / 60 mm / 100 mm / 150 mm / 200 mm / 300 mm / 400 mm / 600 mm / 700 mm / 1000 mm / 1300 mm / 1500 mm / 3000 mm / 6000 mm
M18 / M18W		✓		0 ... 200 mm
	✓			30 ... 200 mm
		✓		0 ... 700 mm
	✓			100 ... 700 mm
	✓	✓		50 ... 300 mm
	✓	✓		150 ... 1000 mm
M30	✓	✓		60 ... 300 mm
	✓	✓		200 ... 1300 mm
	✓	✓		400 ... 3000 mm
	✓	✓		600...6000 mm
40 x 40 mm			✓	50 ... 1500 mm

OUTPUT					SENSITIVITY SETTING				SUPPLY VOLTAGE U_B	CONNECTION			HOUSING		PAGE
1 x PNP	2 x PNP	NPN	Analog	Analog + PNP	Teach-in	Potentiometer	Interface	Pin 2		Connector S8	Connector S12	Cable	Metal	PBTP	
✓					✓				20 ... 30 VDC		✓		✓		227, 229
✓					✓				20 ... 30 VDC		✓		✓		227, 229
✓					✓				20 ... 30 VDC		✓		✓		227, 229
✓					✓				20 ... 30 VDC		✓		✓		227, 229
✓			✓			✓	✓		12 ... 30 VDC*		✓		✓		231
✓			✓			✓	✓		12 ... 30 VDC*		✓		✓		231
✓	✓			✓		✓	✓		12 ... 30 VDC*		✓		✓		233, 235
✓	✓			✓		✓	✓		12 ... 30 VDC*		✓		✓		233, 235
✓	✓			✓		✓	✓		12 ... 30 VDC*		✓		✓		233, 235
✓	✓			✓		✓	✓		12 ... 30 VDC*		✓		✓		233, 235
✓								✓	12 ... 30 VDC*	✓	✓	✓		✓	237

* At 12 ... 20 V, approx. 20% reduced sensing range

OPERATING PRINCIPLE

Ultrasonic sensors can be used as contact-free devices in many areas of automation. They are employed wherever distances have to be measured in air, since they not only detect objects, but they can also indicate and evaluate the absolute distance between themselves and the target. Changing atmospheric conditions, (e.g. temperature variations) are compensated during evaluation of the measurement.

Ultrasonic devices working as diffuse or reflex sensors send out ultrasonic impulses in cyclical intervals. If these are reflected by an object, the resulting echo is received and converted into an electrical signal. Detection of the received echo is dependent on its intensity, itself dependent on the distance of the object from the sensor. The devices function according to the echo-delay principle, i.e. the time delay between the emitter and echo impulses is evaluated.

With ultrasonic devices working as through-beam sensors, on the other hand, the emitter sends out a narrowly focused permanent sound towards the receiver. The latter evaluates the ultrasonic signal and switches the output as soon as the sound is interrupted by an object.

SENSING RANGE

Due to the sensor's construction, the ultrasound is radiated in a lobar shape. Only reflecting objects within this sound beam are detected. Echoes in the blind zone between the sensing face and the sensing range cannot be evaluated.

TARGETS

The targets to be detected can be in the solid, liquid, granular or powder state. The material may be transparent or colored, of any shape, and with a polished or matt surface. All even or flat surfaces up to an angular deviation of approximately 3° from perpendicular to the sound beam can be detected with certainty, even at the maximum operating distance. Depending on surface roughness, the angular deviation may even be greater. In principle, targets can enter the sound beam from any direction.

TEMPERATURE COMPENSATION

The ultrasonic sensors are equipped with temperature sensors and a compensation circuit, in order to be able to compensate for changes in operating distance caused by temperature fluctuations.

ENVIRONMENTAL CONDITIONS

Normal atmospheric variations at any given location have a negligible influence on the speed of sound. The propagation of ultrasonic waves in a vacuum is not possible.

Hot objects (e.g. red-hot metals) cause air turbulence, dispersing or diverting the ultrasound. In such surroundings, no analyzable echo is produced.

Ultrasonic sensors are designed for use under normal atmospheric conditions, i.e. in air. Operation in other gases (e.g. carbon dioxide) can give rise to serious error measurements or even functional failure, due to differing sound speed and damping values.

Normal rain or snowfall does not impair the functioning of ultrasonic sensors. The transducer surface should, however, not become moistened, although dew is permissible.

Ambient noise is distinguished from the system's own sound echoes and, as a rule, does not lead to functional errors.

SAFETY

The use of ultrasonic sensors in applications where the safety of people is dependent on their functioning is not permitted.

AVAILABLE MODELS

Ultrasonic sensors from Contrinex are available as diffuse, reflex and through-beam types.

DIFFUSE SENSORS

With diffuse sensors, the target functions as a reflector. As soon as an object enters the preset sensing area, its echo causes the device to switch.

REFLEX SENSORS

In the case of reflex sensors, a fixed reflector (e.g. a small metal plate) is mounted facing the device. The switching range is set to this reflector. If an object comes between the ultrasonic sensor and the reflector, the sensor no longer recognizes the latter, which causes the output to switch.

THROUGH-BEAM SENSORS

Through-beam sensors consist of an emitter and a receiver placed opposite each other. If an object comes between them, the sound is interrupted, causing the output to switch.

SYNCHRONIZATION

Devices of series 1180/1181 and 1300...1303 can be synchronized with each other by simply connecting their synchronization outputs (pin 2 for N.O., pin 4 for N.C.). In this way, up to 10 sensors can be synchronized. In many cases, it is thus possible to mount the sensors very close to one another without mutual interference.

The fourth connection can be used as an external release input. Thus, ultrasonic sensors can be activated or deactivated with an external control, without switching the supply voltage on and off. An external multiplex operation can be achieved by switching the ultrasonic sensors on and off one after the other via the release input. In this case, assurance is always given that the ultrasonic sensors do not influence one another. As opposed to internal synchronization, where more than 10 switches can be operated.

PROGRAMMING

For optimum adaptation to the application conditions, devices of series 1180/1181 and 1300 ... 1303 can be programmed with the PC interface device APE-0000-001 (see Ultrasonic accessories, page 238).

The series 1180/1181C and 1180/1181W devices are adjustable by teach-in via the device connection.

The sensitivity of series 4040 devices can be adjusted via pin 2 or the white cable wire of the receiver.

MOUNTING

Ultrasonic sensors can be operated in any installation position. However, positions in which materials can be deposited on the transducer surface should be avoided.

In order to obtain the best reflection results, the ultrasonic sensor should be oriented in such a way that the sound waves strike the target at as close to 90° as possible. If this is not possible (e.g. with bulk materials), the maximum possible range has to be determined experimentally, and is dependent on the material, surface and orientation of the objects.

MAIN FEATURES

- Ready-to-connect compact devices
- Short cylindrical housings of 63.5 mm
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of external teach-in
- Diffuse sensors feature background suppression

TECHNICAL DATA

(according to IEC 60947-5-2)	
Housing material	Nickel-plated brass
Supply voltage range U_B	20 ... 30 VDC
Max. ripple content	≤ 10 %
Output current	≤ 150 mA
Output voltage drop	≤ 2.0 V at 150 mA
Ambient temperature range	-25 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B
Short-circuit protection	Built-in
Polarity reversal protection	Built-in
Power-on reset	Built-in

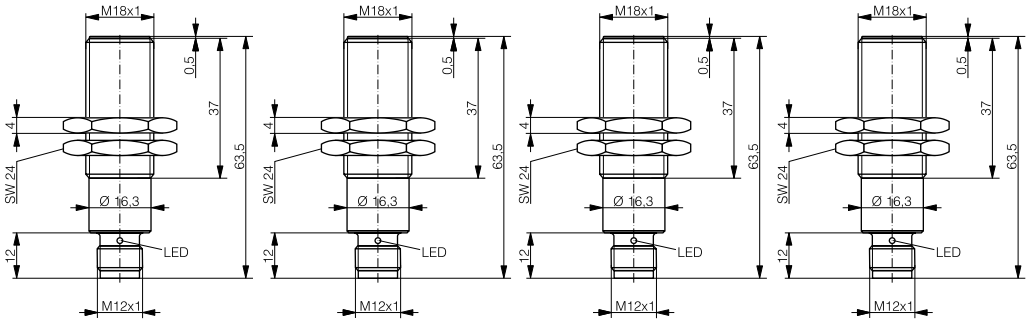
LED

The yellow LED lights up when the output is switched. In teach mode, the LED flashes.

CONNECTION

Devices with 4-pole S12 connector are standard.

HOUSING SIZE	M18 WITH TEACH-IN			
SENSING RANGE	DIFFUSE SENSOR WITH BACKGROUND SUPP. 30 ... 200 mm	REFLEX SENSOR 0 ... 200 mm	DIFFUSE SENSOR WITH BACKGROUND SUPP. 100 ... 700 mm	REFLEX SENSOR 0 ... 700 mm



TECHNICAL DATA

Sensing range	30 ... 200 mm	0 ... 200 mm	100 ... 700 mm	0 ... 700 mm
Setting range	50 ... 200 mm	120 ... 220 mm	150 ... 700 mm	350 ... 750 mm
Tolerance width	---	20 mm	---	50 mm
Standard target	20 x 20 mm	20 x 20 mm	20 x 20 mm	20 x 20 mm
Hysteresis	10 mm	2 mm	10 mm	3 mm
No-load supply current	≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
Rated ultrasonic frequency	400 kHz	400 kHz	200 kHz	200 kHz
Switching frequency	10 Hz	10 Hz	5 Hz	5 Hz
Time delay before availability	20 msec	20 msec	20 msec	20 msec
Response time	50 msec	50 msec	100 msec	100 msec
Approvals	CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS
Weight	30 g	30 g	30 g	30 g

PART REFERENCES

(**bold:** preferred types)				
PNP N.O. / connector S12	**UTS-1180C-303**	**URS-1180C-303**	**UTS-1181C-303**	**URS-1181C-303**
Compatible connectors (page 268)	M, N	M, N	M, N	M, N
Wiring (page 239)	Diagram 1	Diagram 1	Diagram 1	Diagram 1

ULTRASONIC SENSORS

MAIN FEATURES

- Ready-to-connect compact devices
- Lateral sensing
- Robust and fully integrated sensing head
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of external teach-in
- Diffuse sensors feature background suppression

TECHNICAL DATA

(according to IEC 60947-5-2)	
Housing material	Nickel-plated brass
Supply voltage range U_B	20 ... 30 VDC
Max. ripple content	≤ 10 %
Output current	≤ 150 mA
Output voltage drop	≤ 2.0 V at 150 mA
Ambient temperature range	-25 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B
Short-circuit protection	Built-in
Polarity reversal protection	Built-in
Power-on reset	Built-in

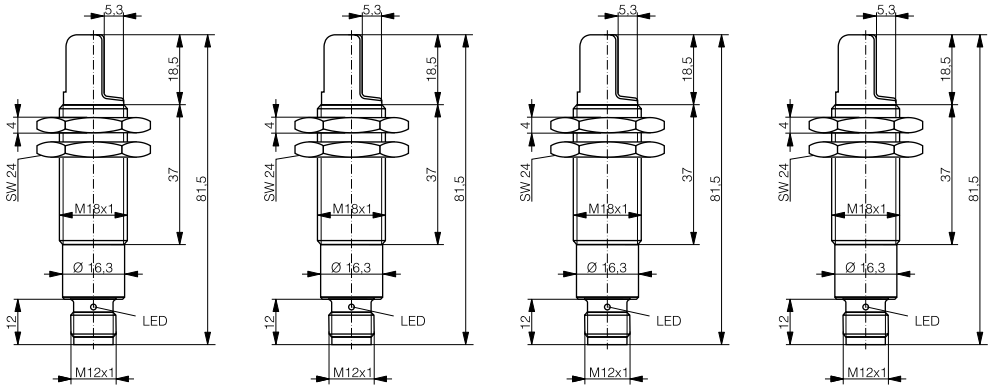
LED

The yellow LED lights up when the output is switched. In teach mode, the LED flashes.

CONNECTION

Devices with 4-pole S12 connector are standard.

HOUSING SIZE	M18 WITH TEACH-IN			
SENSING RANGE	DIFFUSE SENSOR WITH BACKGROUND SUPP. 30 ... 200 mm	REFLEX SENSOR 0 ... 200 mm	DIFFUSE SENSOR WITH BACKGROUND SUPP. 100 ... 700 mm	REFLEX SENSOR 0 ... 700 mm



TECHNICAL DATA

Sensing range	30 ... 200 mm	0 ... 200 mm	100 ... 700 mm	0 ... 700 mm
Setting range	50 ... 200 mm	120 ... 220 mm	150 ... 700 mm	350 ... 750 mm
Tolerance width	---	20 mm	---	50 mm
Standard target	20 x 20 mm	20 x 20 mm	20 x 20 mm	20 x 20 mm
Hysteresis	10 mm	2 mm	10 mm	3 mm
No-load supply current	≤ 20 mA	≤ 20 mA	≤ 20 mA	≤ 20 mA
Rated ultrasonic frequency	400 kHz	400 kHz	200 kHz	200 kHz
Switching frequency	10 Hz	10 Hz	5 Hz	5 Hz
Time delay before availability	20 msec	20 msec	20 msec	20 msec
Response time	50 msec	50 msec	100 msec	100 msec
Approvals	CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS
Weight	30 g	30 g	30 g	30 g

PART REFERENCES

(**bold:** preferred types)				
PNP N.O. / connector S12	**UTS-1180W-303**	**URS-1180W-303**	**UTS-1181W-303**	**URS-1181W-303**
Compatible connectors (page 268)	M, N	M, N	M, N	M, N
Wiring (page 239)	Diagram 1	Diagram 1	Diagram 1	Diagram 1

ULTRASONIC SENSORS

MAIN FEATURES

- Ready-to-connect compact devices
- Can be operated as diffuse or reflex sensors (with interface)
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of potentiometer (only devices with switching output) and interface device APE-0000-001
- Switching or analog output
- Fore- and background suppression
- Diffuse sensors with window function

TECHNICAL DATA

(according to IEC 60947-5-2)	
Housing material	Nickel-plated brass
Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	≤ 10 %
Output current	≤ 150 mA (devices with switchig output)
Output voltage drop	≤ 3.0 V at 150 mA
Ambient temperature range	-25 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B
Short-circuit protection	Built-in
Polarity reversal protection	Built-in
Power-on reset	Built-in

* At 12 ... 20 V, approx. 20% reduced sensing range.

LED

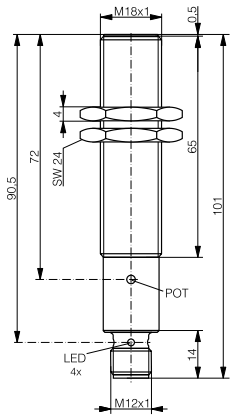
The yellow LED lights up when the output is switched. Flashing LED indicates misadjustment.

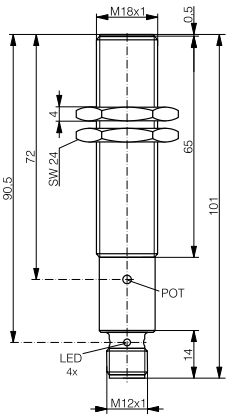
CONNECTION

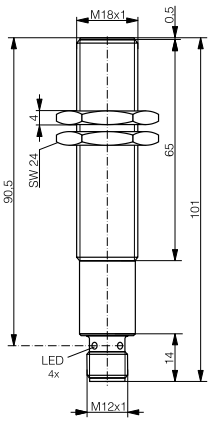
Devices with 4-pole S12 connector are standard.

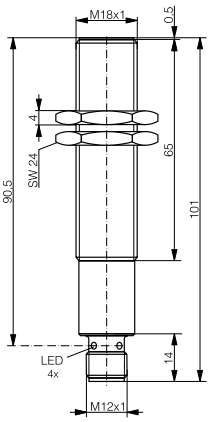
HOUSING SIZE	M18			
SENSING RANGE	DIFFUSE & REFLEX SENSOR 50 ... 300 mm	DIFFUSE & REFLEX SENSOR 150 ... 1,000 mm	DIFFUSE & REFLEX SENSOR 50 ... 300 mm	DIFFUSE & REFLEX SENSOR 150 ... 1,000 mm









TECHNICAL DATA

Sensing range	50 ... 300 mm	150 ... 1,000 mm	50 ... 300 mm	150 ... 1,000 mm
Setting range	70 ... 300 mm	170 ... 1,000 mm	70 ... 300 mm	170 ... 1,000 mm
Standard target	10 x 10 mm	20 x 20 mm	10 x 10 mm	20 x 20 mm
Hysteresis	10 mm	10 mm	10 mm	10 mm
No-load supply current	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA
Rated ultrasonic frequency	400 kHz	200 kHz	400 kHz	200 kHz
Switching frequency	5 Hz	4 Hz	---	---
Time delay before availability	280 msec	280 msec	280 msec	280 msec
Response time	100 msec	120 msec	100 msec	120 msec
Approvals	CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS
Weight	50 g	50 g	50 g	50 g

PART REFERENCES

(**bold:** preferred types)				
PNP N.O. / connector S12	**UTS-1180-303**	**UTS-1181-303**		
Analog 4 ... 20 mA / S12			**UTS-1180-329**	**UTS-1181-329**
Compatible connectors (page 268)	M, N	M, N	M, N	M, N
Wiring (page 239)	Diagram 2	Diagram 2	Diagram 2	Diagram 2

ULTRASONIC SENSORS

MAIN FEATURES

- Ready-to-connect compact devices
- Can be operated as diffuse or reflex sensors
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of potentiometer and interface device APE-0000-001
- 1 or 2 switching outputs
- Fore- and background suppression
- Diffuse sensors with window function

TECHNICAL DATA

(according to IEC 60947-5-2)	
Housing material	Nickel-plated brass
Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	≤ 10 %
Output current	≤ 300 mA
Output voltage drop	≤ 3.0 V at 300 mA
Ambient temperature range	-25 ... +70 °C
Degree of protection	IP 65
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B
Short-circuit protection	Built-in
Polarity reversal protection	Built-in
Power-on reset	Built-in

* At 12 ... 20 V, approx. 20% reduced sensing range.

LED

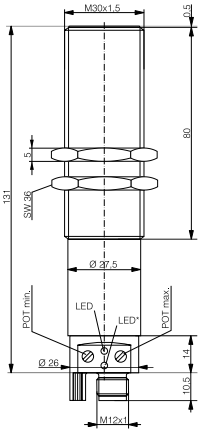
The yellow LED lights up when the output is switched. Flashing LED indicates misadjustment.

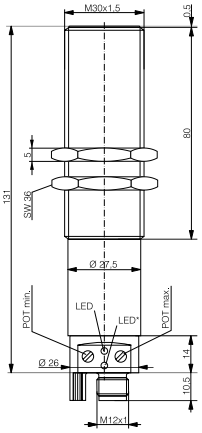
CONNECTION

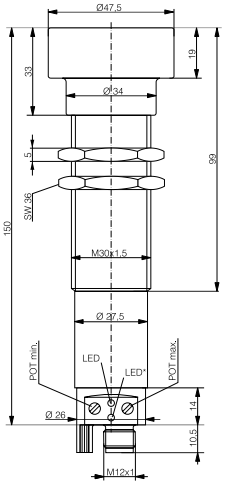
Devices with 4-pole (UTS-130#-303) or 5-pole (UTS-130#-107) S12 connector are standard.

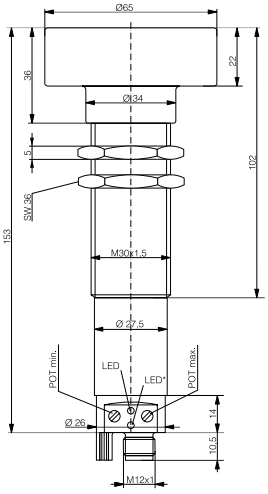
HOUSING SIZE	M30			
SENSING RANGE	DIFFUSE & REFLEX SENSOR 60 ... 300 mm	DIFFUSE & REFLEX SENSOR 200 ... 1,300 mm	DIFFUSE & REFLEX SENSOR 400 ... 3,000 mm	DIFFUSE & REFLEX SENSOR 600 ... 6,000 mm









*UTS-130#-107 only

TECHNICAL DATA

Sensing range	60 ... 300 mm	200 ... 1,300 mm	400 ... 3,000 mm	600 ... 6,000 mm
Setting range	80 ... 300 mm	220 ... 1,300 mm	420 ... 3,000 mm	640 ... 6,000 mm
Standard target	10 x 10 mm	20 x 20 mm	50 x 50 mm	100 x 100 mm
Hysteresis	10 mm	10 mm	20 mm	60 mm
No-load supply current	≤ 50 mA	≤ 50 mA	≤ 50 mA	≤ 50 mA
Rated ultrasonic frequency	400 kHz	200 kHz	120 kHz	80 kHz
Switching frequency	8 Hz	4 Hz	2 Hz	1 Hz
Time delay before availability	280 msec	280 msec	280 msec	280 msec
Response time	80 msec	110 msec	200 msec	400 msec
Approvals	CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS
Weight	210 g	210 g	340 g	380 g

PART REFERENCES

(**bold:** preferred types)				
1 x PNP N.O. / S12	**UTS-1300-303**	**UTS-1301-303**	**UTS-1302-303**	**UTS-1303-303**
2 x PNP N.O. / S12	**UTS-1300-107**	**UTS-1301-107**	**UTS-1302-107**	**UTS-1303-107**
Compatible connectors (page 268)	M, N (...-303)/O, P (...-107)	M, N (...-303)/O, P (...-107)	M, N (...-303)/O, P (...-107)	M, N (...-303)/O, P (...-107)
Wiring (page 239)	Diagram 2 (...-303)/3 (...-107)	Diagram 2 (...-303)/3 (...-107)	Diagram 2 (...-303)/3 (...-107)	Diagram 2 (...-303)/3 (...-107)

ULTRASONIC SENSORS

MAIN FEATURES

- Ready-to-connect compact devices
- Can be operated as diffuse or reflex sensors
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- Reduced blind zone
- Low current drain
- Adjustment by means of potentiometer and interface device APE-0000-001
- Switching and analog outputs
- Fore- and background suppression
- Diffuse sensors with window function

TECHNICAL DATA

(according to IEC 60947-5-2)	
Housing material	Nickel-plated brass
Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	≤ 10 %
Output current	≤ 300 mA
Output voltage drop	≤ 3.0 V at 300 mA
Ambient temperature range	-25 ... +70 °C
Degree of protection	IP 65
EMC protection:	
IEC 61000-4-2	4 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	10 V
EN 55011	Class B
Short-circuit protection	Built-in
Polarity reversal protection	Built-in
Power-on reset	Built-in

* At 12 ... 20 V, approx. 20% reduced sensing range.

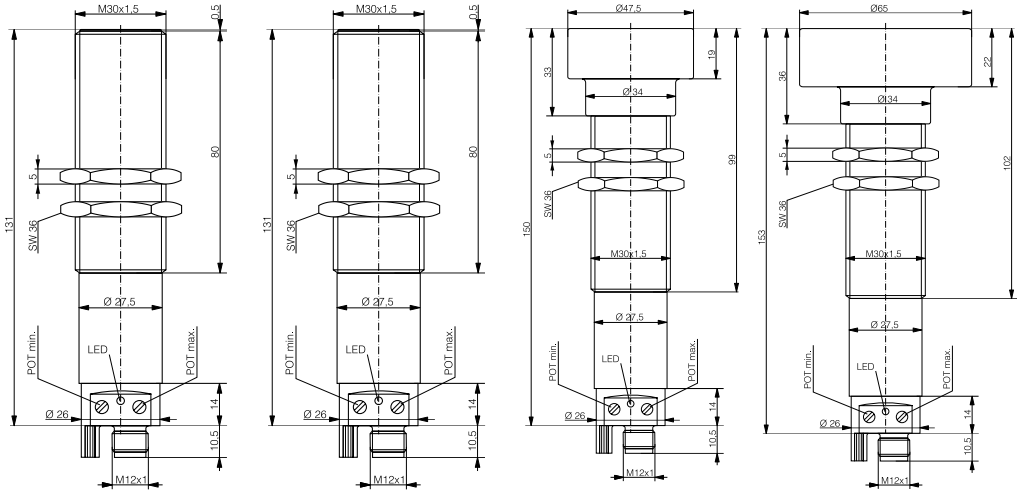
LED

The yellow LED lights up when the output is switched. Flashing LED indicates misadjustment.

CONNECTION

Devices with 5-pole S12 connector are standard.

HOUSING SIZE	M30 WITH ANALOG OUTPUT			
SENSING RANGE	DIFFUSE & REFLEX SENSOR 60 ... 300 mm	DIFFUSE & REFLEX SENSOR 200 ... 1,300 mm	DIFFUSE & REFLEX SENSOR 400 ... 3,000 mm	DIFFUSE & REFLEX SENSOR 600 ... 6,000 mm



TECHNICAL DATA

Sensing range	60 ... 300 mm	200 ... 1,300 mm	400 ... 3,000 mm	600 ... 6,000 mm
Setting range	80 ... 300 mm	220 ... 1,300 mm	420 ... 3,000 mm	640 ... 6,000 mm
Standard target	10 x 10 mm	20 x 20 mm	50 x 50 mm	100 x 100 mm
Hysteresis	10 mm	10 mm	20 mm	60 mm
No-load supply current	≤ 60 mA	≤ 60 mA	≤ 60 mA	≤ 60 mA
Rated ultrasonic frequency	400 kHz	200 kHz	120 kHz	80 kHz
Switching frequency	5 Hz	4 Hz	2 Hz	1 Hz
Time delay before availability	280 msec	280 msec	280 msec	280 msec
Response time	100 msec	120 msec	200 msec	400 msec
Approvals	CE, RoHS	CE, RoHS	CE, RoHS	CE, RoHS
Weight	210 g	210 g	340 g	380 g

PART REFERENCES

(**bold:** preferred types)				
Analog 4...20 mA+PNP N.O./S12	**UTS-1300-123**	**UTS-1301-123**	**UTS-1302-123**	**UTS-1303-123**
Analog 0...10 V+PNP N.O./S12	**UTS-1300-113**	**UTS-1301-113**	**UTS-1302-113**	**UTS-1303-113**
Compatible connectors (page 268)	O, P	O, P	O, P	O, P
Wiring (page 239)	Diagram 4 (...-123)/5 (...-113)	Diagram 4 (...-123)/5 (...-113)	Diagram 4 (...-123)/5 (...-113)	Diagram 4 (...-123)/5 (...-113)

MAIN FEATURES

- Ready-to-connect compact devices
- High excess gain, therefore insensitive to dirt and ambient noise
- Detection independent of target's color, shape, material and surface structure
- High switching frequency
- Narrowly focused permanent sound emission
- No blind zone
- Low current drain
- Sensitivity adjustment via pin 2 or white cable wire of receiver

TECHNICAL DATA

(according to IEC 60947-5-2)	
Housing material	Glass-fiber reinforced PBTP (Crastin)
Supply voltage range U_B	12 ... 30 VDC*
Max. ripple content	≤ 10 %
Output current	≤ 100 mA
Output voltage drop	≤ 2.0 V at 100 mA
Ambient temperature range	0 ... +70 °C
Degree of protection	IP 67
EMC protection:	
IEC 60947-5-2 (7.2.3.1)	1 kV
IEC 61000-4-2	4 kV / 8 kV
IEC 61000-4-3	10 V/m
IEC 61000-4-4	2 kV
IEC 61000-4-6	7 V
Short-circuit protection	Built-in
Polarity reversal protection	Built-in

* At 12 ... 20 V, approx. 20% reduced sensitivity.

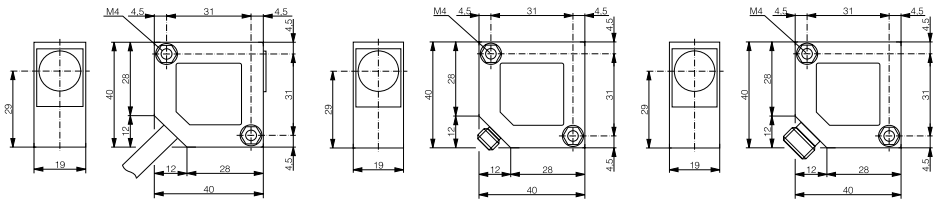
LED

The yellow LED lights up when the output is switched, the green LED lights up as soon as the sensor is connected.

CONNECTION

Devices with 4-pole S12 or S8 connector, or 3 m PUR cable are standard.

HOUSING SIZE	⌀ 40 X 40		
SENSING RANGE	THROUGH-BEAM SENSOR 50 ... 1,500 mm	THROUGH-BEAM SENSOR 50 ... 1,500 mm	THROUGH-BEAM SENSOR 50 ... 1,500 mm



TECHNICAL DATA

Sensing range (E)	50 ... 1,500 mm	50 ... 1,500 mm	50 ... 1,500 mm
Standard target	20x20 mm <400 mm> 10x10 mm	20x20 mm <400 mm> 10x10 mm	20x20 mm <400 mm> 10x10 mm
No-load supply current	≤ 30 mA (E) / ≤ 20 mA (R)	≤ 30 mA (E) / ≤ 20 mA (R)	≤ 30 mA (E) / ≤ 20 mA (R)
Rated ultrasonic frequency (E)	200 kHz	200 kHz	200 kHz
Switching frequency	200 Hz (< 400 mm) / 150 Hz	200 Hz (< 400 mm) / 150 Hz	200 Hz (< 400 mm) / 150 Hz
	(< 800 mm)/100 Hz (< 1500 mm)	(< 800 mm)/100 Hz (< 1500 mm)	(< 800 mm)/100 Hz (< 1500 mm)
Time delay before availability (R)	40 msec	40 msec	40 msec
Response time (R)	2 msec (<400 mm)/1.5 msec	2 msec (<400 mm)/1.5 msec	2 msec (<400 mm)/1.5 msec
	(< 800 mm)/1 msec (< 1500 mm)	(< 800 mm)/1 msec (< 1500 mm)	(< 800 mm)/1 msec (< 1500 mm)
Connection	PUR cable 3 m	Connector S8	Connector S12
Approvals	CE, RoHS	CE, RoHS	CE, RoHS
Weight (R + E)	220 g	70 g	80 g

PART REFERENCES

(**bold:** preferred types)	**(R)** receiver / **(E)** emitter	**(R)** receiver / **(E)** emitter	**(R)** receiver / **(E)** emitter
PNP N.O. (Receiver)	**ULK-4040-003**	**ULS-4040-003**	**ULS-4040-003-305**
Emitter	**ULK-4040-000**	**ULS-4040-000**	**ULS-4040-000-305**
Compatible connectors (page 268)	---	E, F	M, N
Wiring (page 239)	Diagram 2 (R) / 6 (E)	Diagram 2 (R) / 6 (E)	Diagram 2 (R) / 6 (E)

ULTRASONIC ACCESSORIES

CONPROG PC INTERFACE

For optimum adaptation to the application conditions, the parameters of all the devices in this catalog (excepting series 1180/1181C, 1180/1181W and 4040) can be programmed, visualized, checked and changed with the PC interface device APE-0000-001 and its software CONPROG. Amongst others, the following parameters can be set:

- Beginning and end of operating range
- Hysteresis
- End of sensing range
- Switching function (N.O. or N.C.)
- Beginning and end of analog characteristic curve (devices with analog output)
- Direction of analog characteristic curve (rising or falling)
- End of blind zone
- Mean value generation
- Temperature compensation
- Multiplex function
- Function as diffuse or reflex sensor
- Switching frequency
- Damping (sensitivity)

The programmed values can be stored and printed, thus simplifying the maintenance and documentation of the installation. In case several sensors need to be parametrized identically, the stored setting values can be transferred rapidly to the other sensors by means of the interface device (e.g. when connecting switches in series, or when exchanging them).

The interface device is delivered with a RS232 cable (for serial interface), a mains transformer plug, a sensor connecting cable and CONPROG PC software for Windows. Updates to the latest software version can be downloaded from the Contrinex website (www.contrinex.com).

INTERFACE DEVICE

suitable for all the devices in this catalog, excepting series 1180/1181C, 1180/1181W and 4040.

Part reference: **APE-0000-001**

S12 INTERFACE CABLE WITH TEACH-IN BUTTON

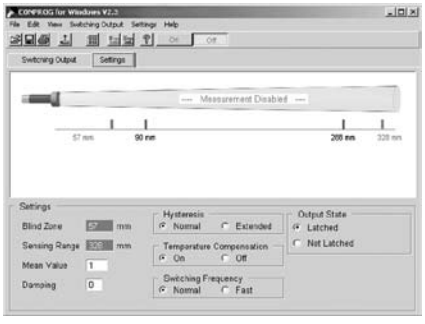
suitable for teach-in of 1180/1181C and 1180/1181W devices.

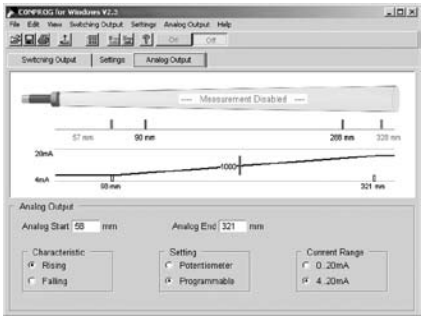
Part reference: **APE-0000-003**

CONPROG PC SOFTWARE

for Windows.

Included with APE-0000-001 interface device

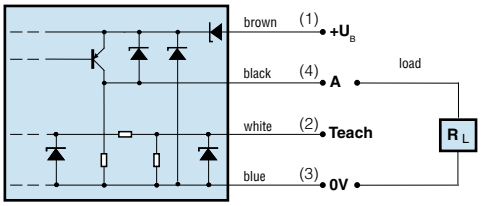




WIRING DIAGRAMS

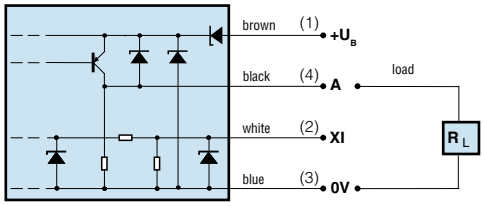
PNP N.O. with teach-in

Diagram 1



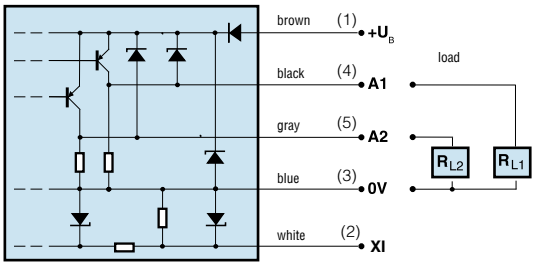
PNP N.O. output / Analog output (current)

Diagram 2



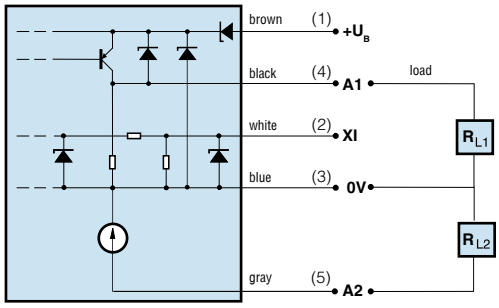
2 x PNP N.O.

Diagram 3



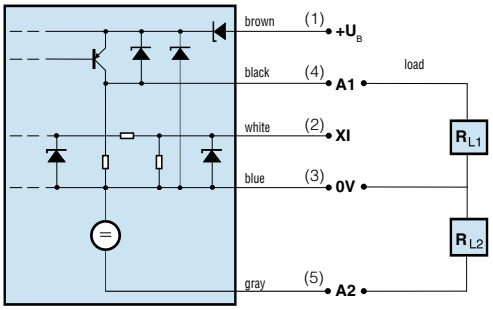
PNP N.O. + analog outputs (current)

Diagram 4



PNP N.O. + analog outputs (voltage)

Diagram 5



Emitter of through-beam sensor

Diagram 6