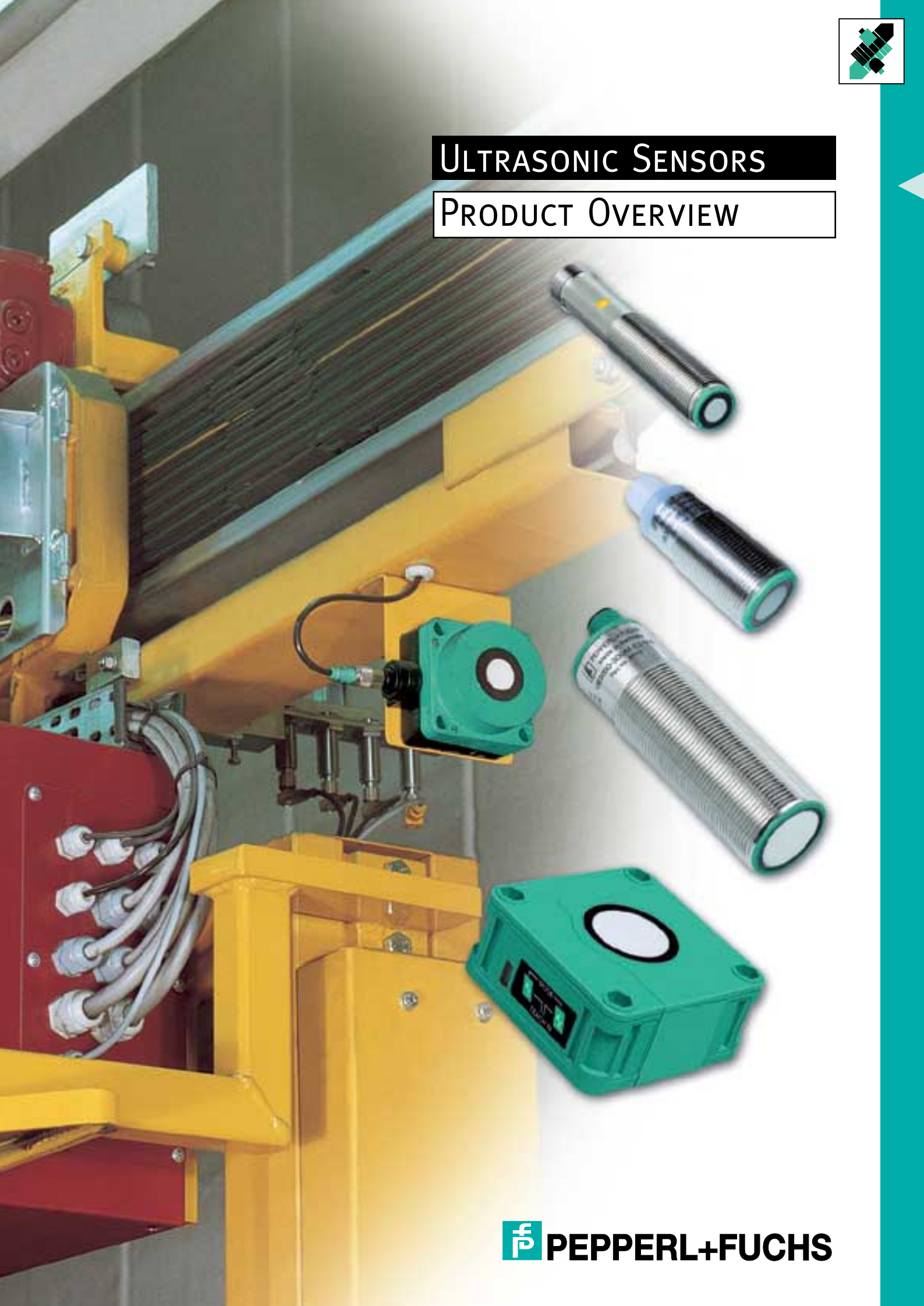




# ULTRASONIC SENSORS

## PRODUCT OVERVIEW



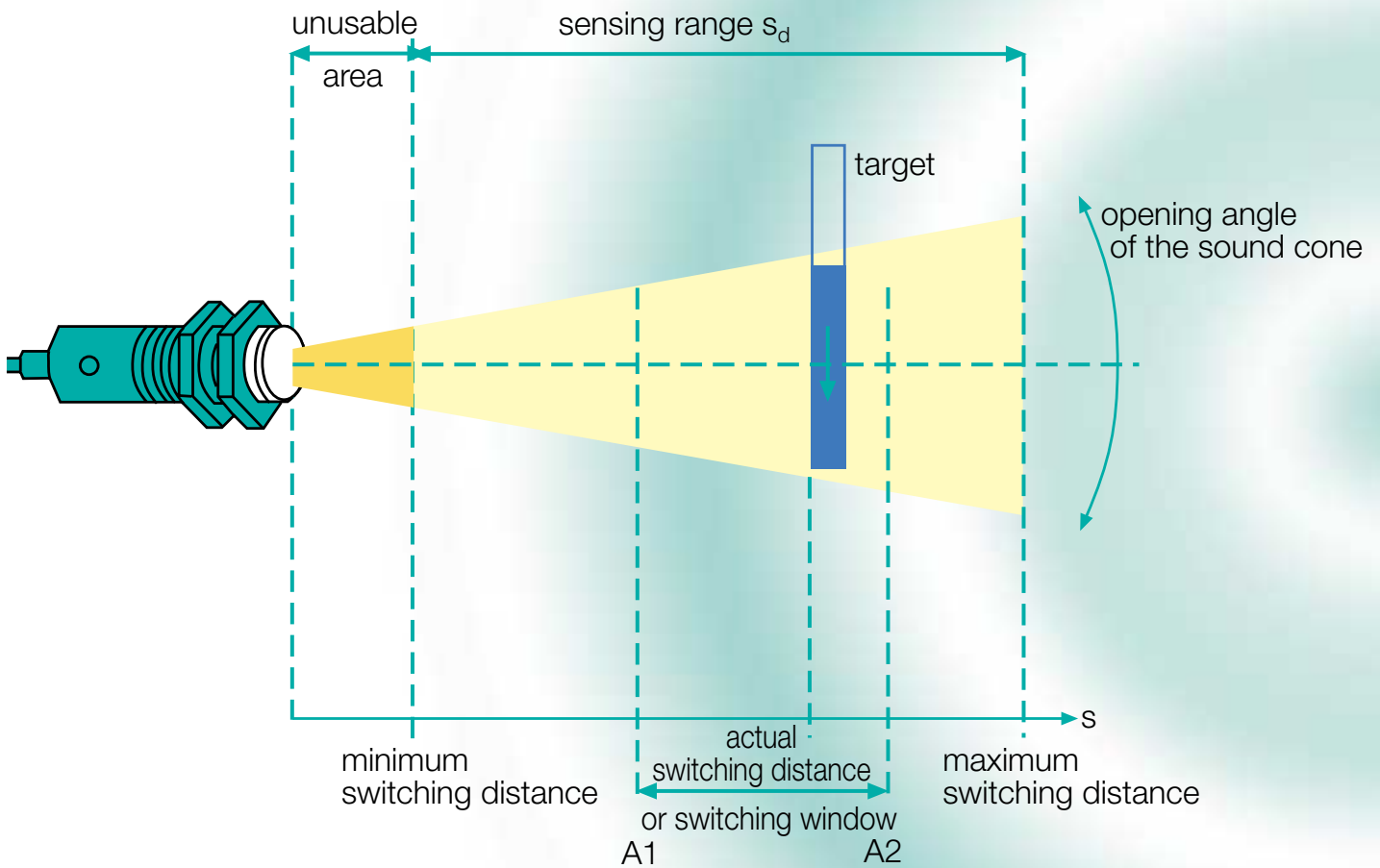
# ULTRASONIC SENSORS

## PRINCIPLES AND TECHNOLOGY

Ultrasonic sensors made by Pepperl+Fuchs operate with Piezo-ceramics as sound emitter and receiver. A patented decoupling layer in special material is used to decouple the ultrasonics to the air – an acoustically thin medium.

This ultrasonic transducer is embedded, watertight, into the sensor housing, in polyurethane foam. The transducer transmits a packet of

sonic pulses and converts the echo pulse into voltage. The integrated controller computes the distance from the echo time and the velocity of sound. The transmitted pulse duration  $\Delta t$  and the decay time of the sonic transducer result in an unusable area in which the ultrasonic sensor cannot detect an object.



The ultrasonic frequency lies between 65 kHz and 400 kHz, depending on the sensor type; the pulse repetition frequency is between 14 Hz and 140 Hz.

The active range of the ultrasonic sensor is referred to as the detection range  $s_d$ . This range is bounded by the lowest and highest sensing distances, whose values depend on the characteristics of the transducer. The highest sensing distance is given in the type code.

The sound cone detects objects which move along a line through the axis of the sensor or move laterally into the cone.

Ultrasonic sensors are available with switching outputs and/or analogue outputs and/or Rs 232 interface; various output functions are available.

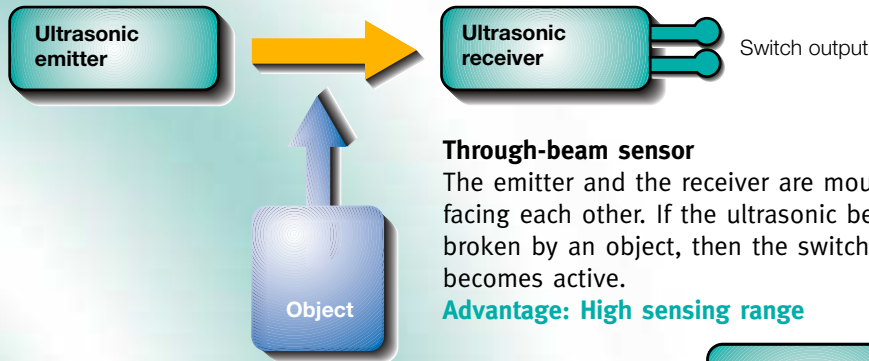
# ULTRASONIC SENSORS

## FUNCTIONS

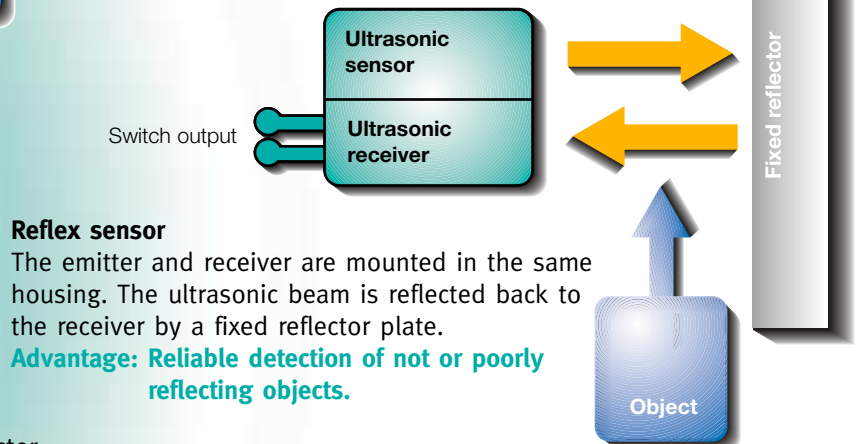
The following distinctions are made between types of sensor function:

The principle by which ultrasonic sensors yield measurements is that evaluating the time taken for the sound to travel between transmission and reception (direct detection), or a process of checking whether the transmitted signal has been received (reflex mode).

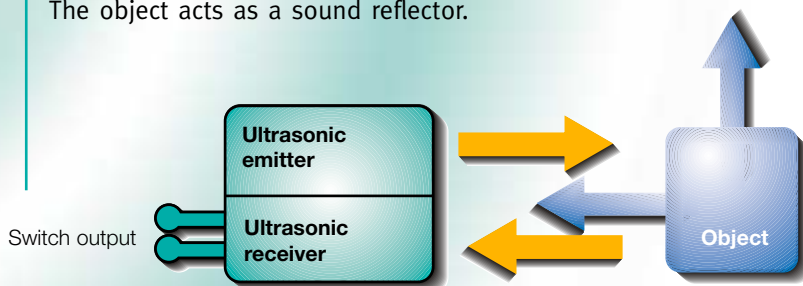
Reflex mode



Direct detection mode



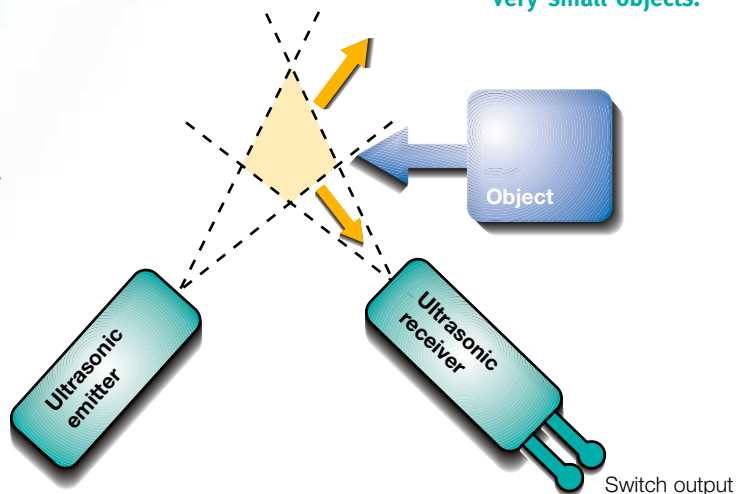
The object acts as a sound reflector.



### Direct detection type

The emitter and receiver are mounted in the same housing (reflex sensor).

**Advantage: Simple and compact sensor most frequently used principle**



# ULTRASONIC SENSORS

**Series -12GM-  
with analogue output,  
or switch output,  
temperature  
compensated**



## Operating data

Detection range	30 mm ... 400 mm
Unusable area	0 mm ... 30 mm
Response time	approx. 50 ms
Switching frequency (sensors with switch output)	approx. 10 Hz
Resolution max. (sensors with analogue output)	0.13 mm (at max. detection range)
Setting of switching points and evaluation limits	TEACH-IN with programming device UB-PROG or teach input set to +U <sub>B</sub> or -U <sub>B</sub>

## Electrical data

Operating voltage	10 V DC ... 30 V DC 15 V DC ... 30 V DC (sensors with analogue voltage output)
-------------------	---

## Mechanical Data

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Protection	IP65
Method of connection	V1 plug connector (M12 x 1), 4-pin

## Dimensions

L 70 mm, Ø12 mm

## Outputs (Order code):

Analogue output (4 mA ... 20 mA)	<b>UB400-12GM-I-V1</b>
Analogue outputs (0 V ... 10 V)	<b>UB400-12GM-U-V1</b>
1 switch output, pnp N.O./N.C.	<b>UB400-12GM-E5-V1</b>
1 switch output, npn N.O./N.C.	<b>UB400-12GM-E4-V1</b>

**Series -18GM-  
with analogue output or  
switch output, temperature  
compensated**



## Operating data

Detection range	30 mm ... 300 mm
Unusable area	0 mm ... 30 mm
Response time	approx. 30 ms
Switching frequency (sensors with switch output)	≤ 8 Hz
Resolution max. (sensors with analogue output)	0.13 mm (at max. detection range)
Setting of switching points and evaluation limits	TEACH-IN with programming device UB-PROG or teach input set to +U <sub>B</sub> or -U <sub>B</sub>

## Electrical data

Operating voltage	10 V DC ... 30 V DC 15 V DC ... 30 V DC (sensors with analogue voltage output)
-------------------	---

## Mechanical Data

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Protection	IP65
Method of connection	V1 plug connector (M12 x 1), 4-pin

## Dimensions

L 40 mm, Ø 18 mm

## Outputs (Order code):

1 switch output, pnp NO/NC	<b>UB300-18GM40-E5-V1</b>
1 analogue output 4 mA ... 20 mA	<b>UB300-18GM40-I-V1</b>
1 analogue output 0 V ... 10 V	<b>UB300-18GM40-U-V1</b>

**Series -18GM-**  
with analogue output, 1 or 2 switch outputs,  
temperature compensated, synchronisation input



**Operating data**

Detection range	30 mm ... 500 mm	80 mm ... 1000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm
Response time	approx. 50 ms	approx. 100 ms
Switching frequency (sensors with switch output)	approx. 10 Hz	approx. 4 Hz
Resolution max. (sensors with analogue output)	0.13 mm (at max. detection range)	
Setting of switching points and evaluation limits	TEACH-IN with programming device UB-PROG or teach input set to +U <sub>B</sub> or -U <sub>B</sub>	

**Electrical data**

Operating voltage	10 V DC ... 30 V DC 15 V DC ... 30 V DC (sensors with analogue voltage output)
-------------------	---

**Mechanical Data**

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Protection	IP65
Method of connection	V15 plug connector (M12 x 1), 5-pin

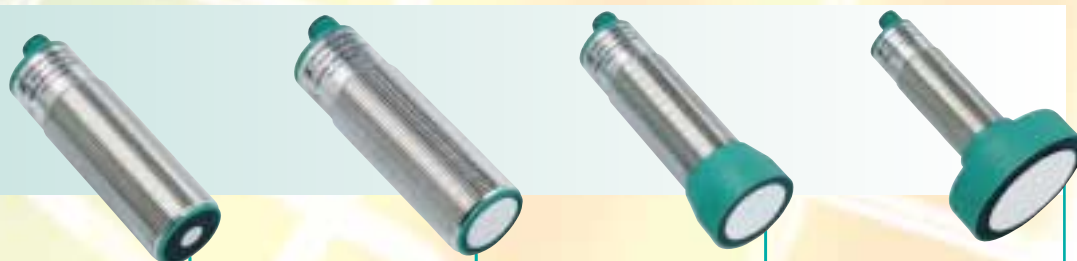
**Dimensions**

L 75 mm, Ø 18 mm

**Outputs (Order code):**

Analogue output (4 mA ... 20 mA)	<b>UB500-18GM75-I-V15</b>	<b>UB1000-18GM75-I-V15</b>
Analogue outputs (0 V ... 10 V)	<b>UB500-18GM75-U-V15</b>	<b>UB1000-18GM75-U-V15</b>
1 switch output, pnp N.O./N.C.	<b>UB500-18GM75-E5-V15</b>	<b>UB1000-18GM75-E5-V15</b>
1 switch output, npn N.O./N.C.	<b>UB300-18GM75-E4-V15</b>	<b>UB1000-18GM75-E4-V15</b>
2 switch outputs, pnp N.O./N.C.	<b>UB500-18GM75-E6-V15</b>	<b>UB1000-18GM75-E6-V15</b>
2 switch outputs, npn N.O./N.C.	<b>UB500-18GM75-E7-V15</b>	<b>UB1000-18GM75-E7-V15</b>
2 switch outputs, pnp N.O./N.C.	<b>UB500-18GM75-E23-V15</b>	<b>UB1000-18GM75-E23-V15</b>
2 switch outputs, npn N.O./N.C.	<b>UB500-18GM75-E01-V15</b>	<b>UB1000-18GM75-E01-V15</b>

**Series -30GM-**  
with one  
switch output



**Operating data**

Detection range	30 mm ... 500 mm	80 mm ... 2000 mm	200 mm ... 4000 mm	350 mm ... 6000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm	0 mm ... 200 mm	0 mm ... 350 mm
Response time	approx. 50 ms	approx. 150 ms	approx. 325 ms	approx. 650 ms
Switching frequency	approx. 10 Hz	approx. 3.3 Hz	approx. 1.5 Hz	approx. 0.8 Hz

Setting of switching points  
and output functions (N.O./N.C.)

TEACH-IN with programming device UB-PROG  
or teach input set to +U<sub>B</sub> or -U<sub>B</sub>

**Electrical data**

Operating voltage	10 V DC ... 30 V DC
-------------------	---------------------

**Mechanical data**

Working temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)			
Protection	IP65			
Method of connection	V15 plug connector (M12 x 1), 5-pin			

<b>Dimensions</b>	L 94 mm, Ø 30 mm	L 94 mm, Ø 30 mm	L 108 mm, Ø 40 mm	L 112 mm, Ø 73 mm
-------------------	------------------	------------------	-------------------	-------------------

**Outputs**

**(Order code):**

Switch output, pnp, N.O./N.C.	<b>UB500-30GM-E5-V15</b>	<b>UB2000-30GM-E5-V15</b>	<b>UB4000-30GM-E5-V15</b>	<b>UB6000-30GM-E5-V15</b>
Switch output, npn, N.O./N.C.	<b>UB500-30GM-E4-V15</b>	<b>UB2000-30GM-E4-V15</b>	<b>UB4000-30GM-E4-V15</b>	<b>UB6000-30GM-E4-V15</b>

# ULTRASONIC SENSORS

**Series -30GM-  
with analogue output,  
temperature compensated,  
synchronisation input**



## Operating data

Detection range	15 mm ... 300 mm	30 mm ... 500 mm	80 mm ... 2000 mm	200 mm ... 4000 mm	350 mm ... 6000 mm
Unusable area	0 mm ... 15 mm	0 mm ... 30 mm	0 mm ... 80 mm	0 mm ... 200 mm	0 mm ... 350 mm
Response time	≤ 35 ms	≤ 63 ms	≤ 195 ms	≤ 440 ms	≤ 850 ms
Resolution max.	0.172 mm	≥ 0.35 mm	≥ 0.35 mm	≥ 0.35 mm	≥ 0.35 mm

Temperature/  
TEACH-IN connector TEACH-IN of evaluation limits and output functions (falling/rising slope)  
During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!

Parameterising interface RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

## Electrical data

Operating voltage 10 V DC ... 30 V DC

## Mechanical data

Ambient temperature 273 Kelvin ... 323 Kelvin  
(0 °C ... +50 °C) 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

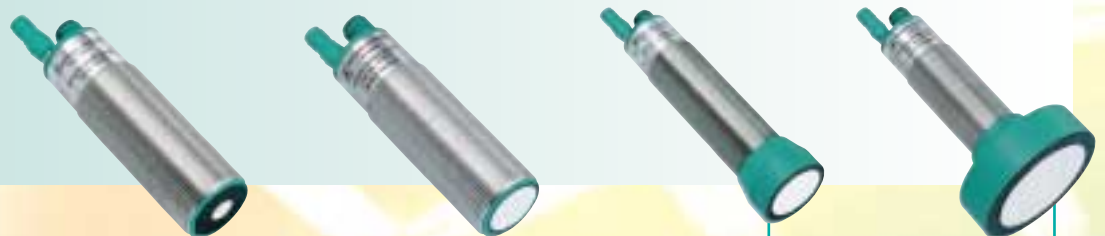
Method of connection V1 plug con. (M12 x 1), 4-pin V15 plug connector (M12 x 1), 5-pin

**Dimensions** L 114 mm, ø 30 mm L 114 mm, ø 30 mm L 114 mm, ø 30 mm L 128 mm, ø 40 mm L 132 mm, ø 73 mm

## Outputs (Order codes):

Analogue output (4 mA ... 20 mA) and (0 V ... 10 V)	<b>UC300-30GM-IU-V1</b>	<b>UC500-30GM-IUR2-V15</b>	<b>UC2000-30GM-IUR2-V15</b>	<b>UC4000-30GM-IUR2-V15</b>	<b>UC6000-30GM-IUR2-V15</b>
---	-------------------------	----------------------------	-----------------------------	-----------------------------	-----------------------------

**Series -30GM-  
with 2 switch outputs,  
temperature compensated,  
synchronisation input**



## Operating data

Detection range	30 mm ... 500 mm	80 mm ... 2000 mm	200 ... 4000 mm	350 mm ... 6000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm	0 mm ... 200 mm	0 mm ... 350 mm
Response time	≤ 63 ms	≤ 195 ms	≤ 300 ms	≤ 850 ms
Switching frequency	≤ 7 Hz	≤ 2.5 Hz	≤ 1 Hz	≤ 0.5 Hz

Temperature/  
TEACH-IN connector TEACH-IN of evaluation limits and output functions (N.O./N.C. operation modes)  
During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!

Parameterising interface RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

## Electrical data

Operating voltage 10 V DC ... 30 V DC

## Mechanical data

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

Method of connection V15 plug connector (M12 x 1), 5-pin

**Dimensions** L 94 mm, Ø 30 mm L 94 mm, Ø 30 mm L 108 mm, Ø 40 mm L 112 mm, Ø 73 mm

## Outputs (Order code):

Switch output 1 and 2, pnp, N.O./N.C.	<b>UC500-30GM-E6R2-V15</b>	<b>UC2000-30GM-E6R2-V15</b>	<b>UC4000-30GM-E6R2-V15</b>	<b>UC6000-30GM-E6R2-V15</b>
Switch output 1 and 2, npn, N.O./N.C.	<b>UC500-30GM-E7R2-V15</b>	<b>UC2000-30GM-E7R2-V15</b>	<b>UC4000-30GM-E7R2-V15</b>	<b>UC6000-30GM-E7R2-V15</b>

**Series -30GM-  
with 2 switch outputs  
or analogue output,  
temperature compensated  
remote M18 Sensor head**



■ Design permits installation in confined spaces

**Operating voltage**

Detection range	30 mm ... 300 mm	30 mm ... 300 mm
Unusable area	0 mm ... 30 mm	0 mm ... 30 mm
Response time	≤ 63 ms	≤ 63 ms
Switching frequency	-	≤ 7 Hz
Resolution max.	≥ 0.35 mm	-
Temperature/ TEACH-IN connector	TEACH-IN of evaluation limits and outputs functions (falling/rising slope). During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!	TEACH-IN of the switching points and output functions (N.O./N.C.). During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!

Parameterising interface RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

**Electrical data**

Operating voltage 10 V DC ... 30 V DC

**Mechanical data**

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

Method of connection V15 plug connector (M12 x 1), 5-pin

**Dimensions** L 25 mm, Ø 18 mm L 25 mm, Ø 18 mm

**Outputs**

**(Order code):**

Analogue output (4 mA ... 20 mA) and (0 V ... 10 V) **UC300-30GM-IUR2-K-V15**  
2 switch outputs pnp, N.O./N.C. **UC300-30GM-E6R2-K-V15**

**Series -30GM-  
with two switch outputs  
or analogue output  
temperature compensated  
remote M30 Sensor head**



■ Design permits installation in confined space

**Operating data**

Detection range	80 mm ... 1000 mm	80 mm ... 1000 mm
Unusable area	0 mm ... 80 mm	0 mm ... 80 mm
Response time	≤ 195 ms	≤ 195 ms
Switching frequency	-	≤ 2.5 Hz
Resolution max.	≥ 0.35 mm	-
Temperature/ TEACH-IN connector	TEACH-IN of evaluation limits and outputs functions (falling/rising slope). During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!	TEACH-IN of the switching points and output functions (N.O./N.C.). During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!

Parameterising interface RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

**Electrical data**

Operating voltage 10 V DC ... 30 V DC

**Mechanical data**

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

Method of connection V15 plug connector (M12 x 1), 5-pin

**Dimensions** L 27 mm, Ø 30 mm L 27 mm, Ø 30 mm

**Outputs**

**(Order code):**

Analogue output (4 mA ... 20 mA) and (0 V ... 10 V) **UC1000-30GM-IUR2-K-V15**  
2 switch outputs pnp, N.O./N.C. **UC1000-30GM-E6R2-K-V15**

# ULTRASONIC SENSORS



**Series 30GM**  
with 2 switch outputs,  
or analogue output,  
temperature compensated,  
resistant to chemicals

■ High resistance to chemicals  
due to Teflon-coated surface

## Operating data

Detection range	200 mm ... 1000 mm	200 mm ... 1000 mm
Unusable area	0 mm ... 200 mm	0 mm ... 200 mm
Response time	≤ 100 ms	≤ 100 ms
Switching frequency	–	≤ 5 Hz
Resolution max.	0.35 mm (at max. detection range)	–
Temperature/ TEACH-IN connector	TEACH-IN of evaluation limits and outputs functions (falling/rising slope). During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!	TEACH-IN of the switching points and output functions (N.O./N.C.). During normal operation the TEACH-IN connector has to be set in position T (temperature compensation)!

## Electrical data

Operating voltage 10 V DC ... 30 V DC

## Mechanical data

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

Method of connection V1 plug connector (M12 x 1), 4-pin

**Dimensions** L 115 mm, Ø 32 mm L 96 mm, Ø 32 mm

## Outputs

### (Order code):

Analogue output (4 mA ... 20 mA) and (0 V ... 10 V) **UCC1000-30GM-IUR2-V1**  
2 switch outputs pnp, N.O./N.C.

**UCC1000-30GM-E6R2-V1**



**Ultrasonic level sensor**  
**Series LUC- with**  
**analogue output and**  
**active moving-target**  
**indication, temperature**  
**compensated**



#### Operating data

Detection range	0.3 m ... 4 m, for liquids
Accuracy	0.5 % of the measuring area terminal value
Resolution	2 mm

#### Electrical data

Operating voltage	20 V DC ... 30 V DC
Analogue output	4 mA ... 20 mA and 0 V ... 20 V

#### Mechanical data

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Protection	IP65
Method of connection	V15 plug connector (M12 x 1), 5-pin

#### Dimensions

L 126 mm, Ø 44 mm

#### Process connection (Order code):

Screwed connection G1½A, high-grade steel 1.4571	<b>LUC4T-G5S-IU-V15</b>
Screwed connection G1½A, Polypropylene	<b>LUC4T-G5P-IU-V15</b>
Screwed connection G1½"NPT, high-grade steel 1.4571	<b>LUC4T-N5S-IU-V15</b>
Screwed connection G1½"NPT, Polypropylene	<b>LUC4T-N5P-IU-V15</b>

**Ultrasonic level sensor**  
**Series -D1- with**  
**3 relay outputs,**  
**temperature**  
**compensated**



#### Operating data

Detection range	60 mm... 550 mm
Unusable are	0 mm ... 60 mm
Response time	10 s

#### Electrical data

Operating voltage	10 VDC ... 252 VDC 20 VAC ... 252 VAC, 47 Hz ... 63 Hz
-------------------	---

#### Mechanical data

Working temperature	253 Kelvin ... 333 Kelvin (-20 °C ... +60 °C)
Protection	IP65
Method of connection	V7 plug connector, 7-pin

#### Dimensions

L 107 mm, Ø 75 mm

#### Process connection (Order code):

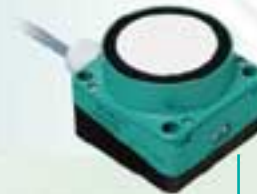
3 relay outputs, N.O./N.C.	<b>UC500-D1-3K-V7</b>
----------------------------	-----------------------

# ULTRASONIC SENSORS

Series VariKont

Series FP

Series VariKont/FP  
with serial Interface  
and 8 bit output



**Operating data**

Detection range	300 mm ... 3000 mm	800 mm ... 6000 mm
Unusable area	0 mm ... 300 mm	0 mm ... 800 mm
Response time	≤ 100 ms	≤ 270 ms
Resolution	11 mm $\Delta$ 1 LSB <sup>1</sup>	21 mm $\Delta$ 1 LSB <sup>2</sup>

**Electrical data**

Operating voltage 20 V DC ... 30 V DC

**Mechanical data**

Ambient temperature 263 Kelvin ... 323 Kelvin (-10 °C ... +50 °C)

Protection IP65

Method of connection 2 m cable, 14 x 0.14 mm<sup>2</sup>

**Dimensions L x W x H** 128 mm x 40 mm x 40 mm 61 mm x 80 mm x 80 mm

**Serial interface** RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

**Outputs (Order code):**

8 Bit output, error output,

Test input **UJ3000+U1+8B+RS**

**UJ6000-FP-8B+RS**

<sup>1</sup> with 300 mm ... 3000 mm  
detection range

<sup>2</sup> with 800 mm ... 6000 mm  
detection range

Series VariKont

Series VariKont

Series FP

Series VariKont/FP  
with serial interface and  
two switch outputs,  
temperature compensated,  
synchronisation input



**Operating data**

Detection range	60 mm ... 500 mm	300 mm ... 3000 mm	800 mm ... 6000 mm
Unusable area	0 mm ... 60 mm	0 mm ... 300 mm	0 mm ... 800 mm
Response time	≤ 30 ms	≤ 120 ms	≤ 270 ms

Setting the switching points and output functions (N.O.) with DIP switch or RS 232

**Electrical Data**

Operating voltage 20 V DC ... 30 V DC

**Mechanical Data**

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

Method of connection Terminal housing, Pg 13.5, core cross-section ≤ 2.5 mm<sup>2</sup>

**Dimensions** 128 mm x 40 mm x 40 mm 128 mm x 40 mm x 40 mm 61 mm x 80 mm x 80 mm

**Serial Interface** RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

**Operating modes**

- switching point mode
- window mode
- hysteresis mode
- reflex mode
- area monitoring

**Outputs (Order code):**

Switch output 1 und 2, pnp, N.O./N.C. **UC500+U9+E6+R2**

**UC3000+U9+E6+R2**

**UC6000-FP-E6-R2-P5**

Switch output 1 und 2, npn, N.O./N.C.

**UC3000+U9+E7+R2**

**UC6000-FP-E7-R2-P5**



Series VariKont

Series VariKont

Series FP

**Series VariKont/FP with serial interface, one switch output and one analogue output, temperature compensated synchronisation input**



**Operating data**

Detection range	60 mm ... 500 mm	300 mm ... 3000 mm	800 mm ... 6000 mm
Unusable area	0 mm ... 60 mm	0 mm ... 300 mm	0 mm ... 800 mm
Response time	≤ 30 ms	≤ 120 ms	≤ 270 ms
Resolution max.	≥ 0.172 mm	≥ 0.172 mm	≥ 0.172 mm

Setting of the evaluation limits and output functions (falling, rising slope and N.O./N.C.) with DIP switch or RS 232 interface

**Electrical data**

Operating voltage 20 V DC ... 30 V DC

**Mechanical data**

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection IP65

Method of connection terminal housing, Pg 13.5, core cross-section ≤ 2.5 mm²

**Dimensions L x W x H** 128 mm x 40 mm x 40 mm 128 mm x 40 mm x 40 mm 61 mm x 80 mm x 80 mm

**Serial interface** RS 232 interface (Parameterisation with Windows-Software Ultra 2001)

**Operating modes**

- switching point mode
- window mode
- hysteresis mode
- reflex mode
- area monitoring

**Outputs (Order code):**

Analogue output 4 mA ... 20 mA / 2 V ... 10 V The output switching is dependent on the connected load between current output and voltage output.

Switch output, pnp, N.O./N.C.	<b>UC500+U9+IUE2+R2</b>	<b>UC3000+U9+IUE2+R2</b>	<b>UC6000-FP-IUE2-R2-P5</b>
Switch output, npn, N.O./N.C.		<b>UC3000+U9+IUE0+R2</b>	<b>UC6000-FP-IUE0-R2-P5</b>



**Series FP**



**Operating data**

Detection range	200 mm ... 1000 mm	0 mm ... 4000 mm
Unusable area	0 mm ... 200 mm	(beam interruption)
Response time	≅ 100 ms	≅ 150 ms
Switching frequency	≅ 5 Hz	≅ 3 Hz
Setting the limits of the IU-ramp and output function (N.O./N.C. and operating mode)	with DIP switch	with teach input (TEACH-IN)

**Electrical data**

Operating voltage	20 V DC ... 30 V DC
-------------------	---------------------

**Mechanical data**

Ambient temperature	263 Kelvin ... 323 Kelvin (-10 °C ... +50 °C)
Protection	IP65
Method of connection	terminal housing, M 20, core cross-section ≤ 2.5 mm²

**Dimensions L x W x H**

**61 mm x 80 mm x 80 mm**

**Outputs (Order code):**

<b>Operating modes</b>	reflex mode/window operating or independent switching points	reflex mode, on fixed reflector permissible distance 1000 mm ... 4000 mm
Switch output 1 and 2, pnp, N.O./N.C.	<b>UB1000+FP1+E6</b>	
Switch output, pnp, N.O.		<b>UJ4000-FP-E2-P1</b>

**Series -F42-**  
with one or two  
switch outputs,  
temperature compensated,  
synchronisation input



- Disturbing target suppression
- Adjustable sensitivity

**Operating data**

Detection range	30 mm ... 500 mm	60 mm ... 2000 mm	200 mm ... 4000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 60 mm	0 mm ... 200 mm
Response time	approx. 50 ms	approx. 150 ms	approx. 325 ms
Switching frequency	≅ 8 Hz	≅ 3 Hz	≅ 1.5 Hz

Setting the switching points and output functions

with two button keypad

**Electrical data**

Operating voltage 10 V DC ... 30 V DC

**Mechanical data**

Working temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection class IP65

Method of connection V15 plug connector (M12x1), 5-pin

**Dimensions L x W x H**

34 mm x 80 mm x 80 mm

**Operating modes**

- switching point mode
- hysteresis mode
- window mode
- area monitoring

**Outputs (Order code):**

One Switch output pnp, N.O./N.C. selectable	<b>UB500-F42-E5-V15</b>	<b>UB2000-F42-E5-V15</b>	<b>UB4000-F42-E5-V15</b>
Two Switch outputs pnp, N.O./N.C. selectable	<b>UB500-F42-E6-V15</b>	<b>UB2000-F42-E6-V15</b>	<b>UB4000-F42-E6-V15</b>
One Switch output npn, N.O./N.C. selectable	<b>UB500-F42-E4-V15</b>	<b>UB2000-F42-E4-V15</b>	<b>UB4000-F42-E4-V15</b>
Two Switch outputs pnp, N.O./N.C. selectable	<b>UB500-F42-E7-V15</b>	<b>UB2000-F42-E7-V15</b>	<b>UB4000-F42-E7-V15</b>

**Series -F42-**  
with one or two switch outputs,  
temperature compensated,  
synchronisation input



- Disturbing target suppression
- Adjustable sensitivity

**Operating data**

Detection range	30 mm ... 500 mm	60 mm ... 2000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 60 mm
Response time	approx. 50 ms	approx. 150 ms
Switching frequency	≅ 8 Hz	≅ 3 Hz

Setting the switching points and output functions

with two button keypad

**Electrical data**

Operating voltage 10 V DC ... 30 V DC

**Mechanical data**

Working temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection class IP65

Method of connection V15 plug connector (M12x1), 5-pin

**Dimensions L x H x W**

80 mm x 34 mm x 80 mm

**Operating modes**

- switching point mode
- hysteresis mode
- window mode
- area monitoring

**Outputs (Order code):**

One Switch output pnp, N.O./N.C. selectable	<b>UB500-F42S-E5-V15</b>	<b>UB2000-F42S-E5-V15</b>
Two Switch outputs pnp, N.O./N.C. selectable	<b>UB500-F42S-E6-V15</b>	<b>UB2000-F42S-E6-V15</b>
One Switch output npn, N.O./N.C. selectable	<b>UB500-F42S-E4-V15</b>	<b>UB2000-F42S-E4-V15</b>
Two Switch outputs pnp, N.O./N.C. selectable	<b>UB500-F42S-E7-V15</b>	<b>UB2000-F42S-E7-V15</b>

# ULTRASONIC SENSORS

**Series - F42-  
with analogue output,  
temperature compensated,  
synchronisation input**



- Disturbing target suppression
- Adjustable sensitivity

## Operating data

Detection range	30 mm ... 500 mm	60 mm ... 2000 mm	200 mm ... 4000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 60 mm	0 mm ... 200 mm
Response time	approx. 50 ms	approx. 150 ms	approx. 325 ms
Resolution max.	0.2 mm	0.35 mm (at max. detection range)	0.35 mm (at max. detection range)

Setting the evaluation limits and output functions with two button keypad

## Electrical data

Operating voltage	10 V DC ... 30 V DC 15 V DC ... 30 V DC (sensors with voltage output)
-------------------	--

## Mechanical data

Working temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Protection class	IP65
Method of connection	V15 plug connector (M12x1), 5-pin

## Dimensions L x W x H

34 mm x 80 mm x 80 mm

## Outputs (Order code):

Analogue output 4 mA ... 20 mA (Falling/rising slope selectable)	<b>UB500-F42-I-V15</b>	<b>UB2000-F42-I-V15</b>	<b>UB4000-F42-I-V15</b>
Analogue output 0 V ... 10 V (Falling/rising slope selectable)	<b>UB500-F42-U-V15</b>	<b>UB2000-F42-U-V15</b>	<b>UB4000-F42-U-V15</b>

**Series - F42-  
with analogue output,  
temperature compensated,  
synchronisation input**



- Disturbing target suppression
- Adjustable sensitivity

## Operating data

Detection range	30 mm ... 500 mm	60 mm ... 2000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 60 mm
Response time	approx. 50 ms	approx. 150 ms
Resolution	0.2 mm (at max. detection range)	0.7 mm (at max. detection range)

Setting the evaluation limits and output functions with two button keypad

## Electrical data

Operating voltage	10 V DC ... 30 V DC 15 V DC ... 30 V DC (sensors with voltage output)
-------------------	--

## Mechanical data

Working temperature	248 Kelvin ... 358 Kelvin (-25 °C ... +70 °C)
Protection class	IP65
Method of connection	V15 plug connector (M12x1), 5-pin

## Dimensions L x W x H

80 mm x 34 mm x 80 mm

## Outputs (Order code):

Analogue output 4 mA ... 20 mA (Falling/rising slope selectable)	<b>UB500-F42S-I-V15</b>	<b>UB2000-F42S-I-V15</b>
Analogue output 0 V ... 10 V (Falling/rising slope selectable)	<b>UB500-F42S-U-V15</b>	<b>UB2000-F42S-U-V15</b>

**Series - F42-  
with relay output,  
temperature compensated**



- Disturbing target suppression
- Adjustable sensitivity

**Operating data**

Detection range	30 mm ... 400 mm	80 mm ... 1500 mm	200 mm ... 3000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm	0 mm ... 200 mm
Response time	approx. 50 ms	approx. 150 ms	approx. 325 ms
Switching frequency	≤ 8 Hz	≤ 3 Hz	≤ 1.5 Hz

Setting the switch points and output functions with two button keypad

**Electrical data**

Operating voltage 20 V DC ... 230 V AC

**Mechanical data**

Working temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection class IP67

Method of connection V95 plug connector (7/8"-16 UNF), 5-pin

**Dimensions L x W x H**

34 mm x 80 mm x 80 mm

**Outputs (Order code):**

Universal current; relay output	<b>UB400-F42-UK-V95</b>	<b>UB1500-F42-UK-V95</b>	<b>UB3000-F42-UK-V95</b>
---------------------------------	-------------------------	--------------------------	--------------------------

**Series - F42-  
with relay output,  
temperature compensated**



- Disturbing target suppression
- Adjustable sensitivity

**Operating data**

Detection range	30 mm ... 400 mm	80 mm ... 1500 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm
Response time	approx. 50 ms	approx. 150 ms
Switching frequency	≤ 8 Hz	≤ 3 Hz

Setting the switch points and output functions with two button keypad

**Electrical data**

Operating voltage 20 V DC ... 230 V AC

**Mechanical data**

Working temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)

Protection class IP67

Method of connection V95 plug connector (7/8"-16 UNF), 5-pin

**Dimensions L x W x H**

80 mm x 34 mm x 80 mm

**Outputs (Order code):**

Universal current; relay output	<b>UB400-F42S-UK-V95</b>	<b>UB1500-F42S-UK-V95</b>
---------------------------------	--------------------------	---------------------------



**Series -F43-**  
**with serial interface,**  
**2 relay outputs and one analogue output,**  
**temperature compensated**



**Operating data**

■ kein Nahbereich

Detection range	0 mm ... 300 mm	100 mm ... 2000 mm
Unusable area	0 mm	100 mm
Response time, dynamic	≅ 30 ms	≅ 75 ms
Resolution max. (analogue output)	0.17 mm	0.35 mm

Setting the switch points/evaluation limits and output functions (falling/rising slope) with RS 232 interface

**Electrical Data**

Operating voltage	10 V DC ... 30 V DC (without current output function) 15 V DC ... 30 V DC (with current output function)
-------------------	---

**Mechanical data**

Ambient temperature	273 Kelvin... 343 Kelvin (-25 °C ... +70 °C)	248 Kelvin... 323 Kelvin (-25 °C ... +50 °C)
Protection	IP65	
Method of connection	V17 plug connector (M12 x 1), 8-pin	

**Dimensions L x W x H**

30 mm x 134 mm x 52 mm

**Serial interface**

RS 232; parameterisation with Windows-Software Ultra 2001

**Outputs**

Relay output 1, 2	1 A at 24 V DC
Analogue output	4 mA ... 20 mA

**Order code**

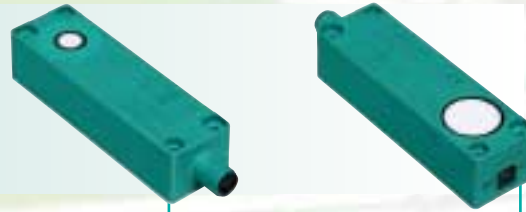
**UC300-F43-2KIR2-V17**

**UC2000-F43-2KIR2-V17**



# ULTRASONIC SENSORS

**Series F54**  
with one switch output,  
temperature compensated



## Operating data

Detection range	30 mm ... 500 mm	80 mm ... 2000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm
Response time	$\leq 50$ ms	$\leq 150$ ms
Switching frequency	$\leq 10$ Hz	$\leq 3$ Hz

Setting the switch points and output functions  
TEACH-IN with programming device UB-PROG or teach input set to +U<sub>B</sub> or -U<sub>B</sub>

## Electrical data

Operating voltage 10 V DC ... 30 V DC

## Mechanical data

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)  
Protection IP65  
Method of connection V15 plug connector (M12 x 1), 5-pin

## Dimensions L x W x H

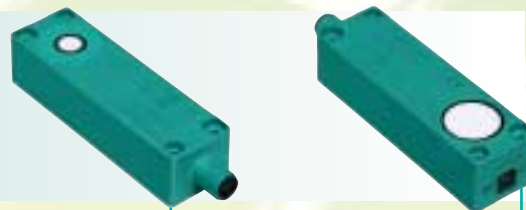
25 mm x 105 mm x 31 mm

## Outputs

### (Order code):

Switch output, npn, N.O./N.C.	<b>UB500-F54-E4-V15</b>	<b>UB2000-F54-E4-V15</b>
Switch output, pnp, N.O./N.C.	<b>UB500-F54-E5-V15</b>	<b>UB2000-F54-E5-V15</b>

**Series F54**  
with analogue output,  
temperature compensated



## Operating data

Detection range	30 mm ... 500 mm	80 mm ... 2000 mm
Unusable area	0 mm ... 30 mm	0 mm ... 80 mm
Response time	$\leq 50$ ms	$\leq 150$ ms
Resolution max.	0.13 mm	0.35 mm

Setting the evaluation limits and output functions (falling/rising slope)  
TEACH-IN with programming device UB-PROG or teach input set to +U<sub>B</sub> or -U<sub>B</sub>

## Electrical data

Operating voltage 10 V DC ... 30 V DC  
15 V DC ... 30 V DC (sensors with voltage output)

## Mechanical data

Ambient temperature 248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)  
Protection IP65  
Method of connection V15 plug connector (M12 x 1), 5-pin

## Dimensions L x W x H

25 mm x 105 mm x 31 mm

## Outputs

### (Order code):

Analogue output (4 mA ... 20 mA)	<b>UB500-F54-I-V15</b>	<b>UB2000-F54-I-V15</b>
Analogue output (0 V ... 10 V)	<b>UB500-F54-U-V15</b>	<b>UB2000-F54-U-V15</b>

# ULTRASONIC SENSORS

## THROUGH BEAM SENSORS

Series -18GK-  
with one  
switch output



### Operating data

Detection range	0 mm ... 500 mm
Mounting separation emitter – receiver	15 mm ... 500 mm
Response time	5 ms
Switching frequency	100 Hz

### Electrical data

Operating voltage	18 V DC ... 30 V DC
-------------------	---------------------

### Mechanical data

Ambient temperature	273 Kelvin ... 333 Kelvin (0 °C ... + 60 °C)
Protection	IP65
Method of connection	V1 plug connector (M12 x 1), 4-pin

### Dimensions

L 32 mm, Ø 49 mm

### Outputs

Order codes, emitter and receiver included in the delivery package

1 switch output, pnp, N.O.	<b>UBE500-18GK-SE2-V1</b>
1 switch output, npn, N.O.	<b>UBE500-18GK-SE0-V1</b>

Series  
-30GM-  
with two  
switch outputs,  
antivalent



### Operating data

Detection range	0 mm ... 4000 mm
Mounting separation emitter – receiver	500 mm ... 4000 mm
Response time	30 ... 3000 ms, selectable
Switching frequency	≤ 15 Hz

### Electrical data

Operating voltage	18 V DC ... 30 V DC
-------------------	---------------------

### Mechanical data

Ambient temperature	273 Kelvin ... 333 Kelvin (0 °C ... + 60 °C)
Protection	IP65
Method of connection	V1 plug connector (M12 x 1), 4-pin

### Dimensions

L 92 mm, Ø 40 mm

### Outputs

Order codes, emitter and receiver included in the delivery package

2 switch outputs, pnp, antivalent	<b>UBE4000-30GM-SA2-V1</b>
-----------------------------------	----------------------------

Series  
VariKont  
with one  
switch output



### Operating data

Detection range	0 mm ... 6000 mm
Mounting separation emitter – receiver	0 mm ... 6000 mm
Switching frequency	≤ 30 Hz

### Electrical data

Operating voltage	20 V DC ... 30 V DC
-------------------	---------------------

### Mechanical data

Ambient temperature	263 Kelvin ... 323 Kelvin (-10 °C ... +50 °C)
Protection	IP65
Method of connection	Terminal housing, Pg 13,5, Core cross section ≤ 2,5 mm <sup>2</sup>

### Dimensions L x W x H

128 mm x 40 mm x 40 mm

### Outputs

Order codes, emitter and receiver included in the delivery package:

2 switch outputs, pnp, antivalent	<b>UBE6000+U1+SA2</b>
-----------------------------------	-----------------------

**Series -F64-  
with one  
switch output**



<b>Operating data</b>		
Detection range	0 mm ... 500 mm	0 mm ... 500 mm
Mounting separation emitter – receiver	15 mm ... 500 mm	15 mm ... 500 mm
Response time	5 ms	5 ms
Switching frequency	100 kHz	100 kHz
<b>Electrical data</b>		
Operating voltage	18 V DC ... 30 V DC	18 V DC ... 30 V DC
<b>Mechanical data</b>		
Ambient temperature	273 Kelvin ... 333 Kelvin (0 °C ... + 60 °C)	273 Kelvin ... 333 Kelvin (0 °C ... + 60 °C)
Protection	IP54	IP54
Method of connection	2 m PVC-cable emitter: 2 x 0.34 mm <sup>2</sup> receiver: 3 x 0.34 mm <sup>2</sup>	V3 plug connector (M8 x 1), 3-pin
<b>Dimensions L x W x H</b>	18 mm x 25 mm x 40 mm	
<b>Outputs</b>		
<b>Order codes, emitter and receiver included in the delivery package</b>		
1 switch output, pnp, N.O.	<b>UBE500-F64-SE2</b>	<b>UBE500-F64-SE2-V3</b>
1 switch output, npn, N.O.	<b>UBE500-F64-SE0</b>	<b>UBE500-F64-SE0-V3</b>

**Series -F64-  
with one  
switch output**



<b>Operating data</b>		
Detection range	0 mm ... 1500 mm	0 mm ... 1500 mm
Mounting separation emitter – receiver	20 mm ... 1500 mm	20 mm ... 1500 mm
Response time	approx. 4 ms	approx. 4 ms
Switching frequency	120 kHz	120 kHz
<b>Electrical data</b>		
Operating voltage	18 V DC ... 30 V DC	18 V DC ... 30 V DC
<b>Mechanical data</b>		
Ambient temperature	273 Kelvin ... 333 Kelvin (0 °C ... + 60 °C)	273 Kelvin ... 333 Kelvin (0 °C ... + 60 °C)
Protection	IP54	IP54
Method of connection	2 m PVC-cable emitter: 2 x 0.34 mm <sup>2</sup> receiver: 3 x 0.34 mm <sup>2</sup>	V3 plug connector (M8 x 1), 3-pin
<b>Dimensions</b>	18 mm x 25 mm x 40 mm	
<b>Outputs</b>		
<b>Order codes, emitter and receiver included in the delivery package</b>		
1 switch output, pnp, N.O.	<b>UBE1500-F64-SE2</b>	<b>UBE1500-F64-SE2-V3</b>
1 switch output, npn, N.O.	<b>UBE1500-F64-SE0</b>	<b>UBE1500-F64-SE0-V3</b>

# ULTRASONIC DOUBLE SHEET DETECTION

## Highlights:

- Ultrasonic system for the reliable detection of zero, one, or two flat sheets of material lying together, preferably paper
- No TEACH-IN required
- Insensitive to print, colours, or reflective surfaces
- Material weights from 10 g/m<sup>2</sup> up to over 2000 g/m<sup>2</sup>
- Very broad materials spectrum, from very thin papers through very heavy paper to thin sheet metal and plastic or metal foils
- Vertical or tilted installation of the sensor possible over the sheet level
- Signal output via 3 short-circuit-resistant, polarity-insensitive PNP switching outputs



## Applications:

- In printing machinery, where the ultrasonic double sheet control protects the complex mechanics from damage and prevents a second sheet from lodging in the machine, by avoiding the situation in which two sheets are drawn into it.

## Additional application through series 18GM35:

- In the control of adhesive films in label making machines, in which the application of the films to a carrier material can be detected and counted.
- In letter opening equipment, where the complete emptying of the opened envelope is controlled.
- In receipt and voucher counting machines, in which the ultrasonic double sheet control ensures that bank receipts are not counted incorrectly.
- In packaging machines, in which the jointing positions for the connection of an aluminium packaging film to the beginning and the end of a sheet are detected and the running speed of the machine is adjusted accordingly.
- In paper processing machinery, for the detection of air, single and double sheets and/or jointing positions.
- In paper sorting systems in the manufacture of calendars – no “month” must be missing or inserted twice.

### Technical data

Detectable paper thickness	10 g/m <sup>2</sup> ... 2000 g/m <sup>2</sup>
Response time	15 ms*

### Electrical data

Rated operating voltage	20 V DC ... 30 V DC
-------------------------	---------------------

### Mechanical data

Ambient temperature	0 °C ... +60 °C
Protection class	IP67
Connection	2 m cable
Switch outputs	3 x pnp normally-closed

<b>Dimensions</b>	L 74 mm / 22 mm, Ø 18 mm
-------------------	--------------------------

### Range of application (Order code):

Double sheet detection	<b>UDC-18GM-400-3E3</b>
------------------------	-------------------------

# ULTRASONIC DOUBLE SHEET, LABEL AND JOINTING POSITION DETECTION

Series 18GM35



## Operating data

Detectable paper thickness	30 g/m <sup>2</sup> ... 1200 g/m <sup>2</sup>		
Response time	≤ 5 ms	≤ 1 ms	≤ 1 ms

## Electrical data

Operating voltage	20 V DC ... 30 V DC		
-------------------	---------------------	--	--

## Mechanical data

Ambient temperature	0 °C ... +60 °C		
---------------------	-----------------	--	--

Protection	IP65		
------------	------	--	--

Method of connection	plug connector M12		
----------------------	--------------------	--	--

Switch outputs	3 x pnp NO	3 x pnp NO	3 x pnp NO
----------------	------------	------------	------------

Dimensions	L 35 mm, ø 18 mm		
------------	------------------	--	--

Application	Double sheet detection	Label detection	Joining position detection
-------------	------------------------	-----------------	----------------------------

(Order code):	<b>UDB-18GM35-3E2</b>	<b>UDBL-18GM35-3E2</b>	<b>UDBK-18GM35-3E2</b>
---------------	-----------------------	------------------------	------------------------

## ULTRASONIC SENSORS

### WITH SEPARATE EVALUATION

Series -30GM-  
in through beam or  
direct detection mode



## Operating data

Detection range	60 mm ... 500 mm	200 mm ... 2000 mm	500 mm ... 4000 mm	800 mm ... 6000 mm
Unusable area	0 mm ... 60 mm	0 mm ... 200 mm	0 mm ... 500 mm	0 mm ... 800 mm

## Electrical data

Operating voltage	10 V DC ... 30 V DC			
-------------------	---------------------	--	--	--

Determination	the determination of the detection range is carried out by the control unit electronics (e.g. units UH3-KHD2-4E5, UH3-KHD2-4I or UH3-T1-KT); in pulse-echo operation the detection range is derived from the emitter pulse propagation time.			
---------------	--	--	--	--

## Mechanical data

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +80 °C)			
---------------------	---	--	--	--

Protection	IP65			
------------	------	--	--	--

Method of connection	plug connector V1, 2 m, PVC cable, 4 x 0.75 mm <sup>2</sup>			
----------------------	---	--	--	--

Dimensions	L 93 mm, Ø 30 mm	L 93 mm, Ø 30 mm	L 106 mm, Ø 40 mm	L 115 mm, Ø 74 mm
------------	------------------	------------------	-------------------	-------------------

## Version (Order code):

Transceiver	<b>UB500-30GM-H3-V1</b>	<b>UB2000-30GM-H3-V1</b>	<b>UB4000-30GM-H3-V1</b>	<b>UB6000-30GM-H3-V1</b>
-------------	-------------------------	--------------------------	--------------------------	--------------------------

**Series VariKont/FP  
in direct detection mode**

**Series VariKont**



**Series VariKont**



**Series FP**



**Operating data**

Detection range	60 mm ... 500 mm	300 mm ... 3000 mm	800 mm ... 6000 mm
Unusable area	0 mm ... 60 mm	0 mm ... 300 mm	0 mm ... 800 mm

**Electrical data**

Operating voltage	20 V DC ... 30 V DC		
Temperature compensation	a temperature signal is available at the temperature output for external temperature compensation.		
Determination	the determination of the detection range is carried out by the control unit electronics (e.g. units UH3-KHD2-4E5, UH3-KHD2-4I or UH3-T1-KT); in pulse-echo operation the detection range is derived from the emitter pulse propagation time.		

**Mechanical data**

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)		
Protection	IP65		
Method of connection	terminal housing, M20, core cross section ≤ 2.5 mm <sup>2</sup>		
<b>Dimensions L x W x H</b>	128 mm x 40 mm x 40 mm	128 mm x 40 mm x 40 mm	61 mm x 80 mm x 80 mm

**Version (Order code):**

Transceiver	<b>UB500+U9+H3</b>	<b>UB3000+U9+H3</b>	<b>UB6000-FP-H3</b>
-------------	--------------------	---------------------	---------------------

**Series -F54-  
in direct detection mode**



**Operating data**

Detection range	60 mm ... 500 mm
Unusable area	0 mm ... 60 mm

**Electrical data**

Operating voltage	10 V DC ... 30 V DC
Determination	the determination of the detection range is carried out by the control unit electronics; in pulse-echo operation the detection range is derived from the emitter pulse propagation time.

**Mechanical data**

Ambient temperature	248 Kelvin ... 343 Kelvin (-25 °C ... +70 °C)
Protection	IP65
Method of connection	plug connector V1 (M12 x 1), 4-pin

<b>Dimensions</b>	25 mm x 105 mm x 31 mm
-------------------	------------------------

**Version (Order code):**

Transceiver	<b>UB500-F54-H3-V1</b>
-------------	------------------------

# INTERFACE UNITS FOR SENSORS

## WITH SEPARATE EVALUATION

Ultrasonic evaluation equipment  
**UH3-KHD2-4I**



UB500/2000/4000/6000-30GM-H3

Ultrasonic evaluation equipment  
**UH3-KHD2-4E5**



UB500/2000/4000/6000-30GM-H3  
UB2000-30GM-H1/H2

(up to 15 m for operation as through beam barrier)

Interconnectable ultrasonic sensors

- Switch point or evaluation limit memorising
- Simultaneous operating of up to 4 sensors with ranges from 60 mm to 6 m
- Selectable measurement window
- Multiplex mode – no mutual interference, operation possible in restricted space
- Synchronous mode
- Temperature compensation
- Reference measurement of high accuracy

### Technical data

Operating voltage	20 V DC ... 30 V DC	
Operating modes	selectable: multiplex-channels switched in succession synchronous-channels switched simultaneously	
Ambient temperature	253 Kelvin ... 343 Kelvin (-20 °C ... +70 °C)	
Display	4 yellow LEDs: channels A1 ... A4 target in switching range 4 green LEDs: sensor type/channel active 2 green LEDs: current slope: $\sqrt{\quad}$ / REF 2 green LEDs: near/far measuring limits	4 yellow LEDs: channels A1 ... A4 target in switching range 4 green LEDs: sensor type/channel active 2 green LEDs: N.O./N.C./REF 1 green LEDs: switch point
Dimensions L x W x H	110 mm x 40 mm x 92.5 mm	110 mm x 40 mm x 92.5 mm
Outputs	4 analogue outputs (4 mA ... 20 mA, rising/falling slope)	4 switch outputs (N.O./N.C. – selectable)
Order codes:	<b>UH3-KHD2-4I</b>	<b>UH3-KHD2-4E5</b>

Ultrasonic evaluation equipment  
**UH3-T1-KT**



Interconnectable sensors all ultrasonic sensors for separate evaluation

- Relay output for high performance
- Adjustable on-/off delay
- N.C./N.O. function
- Switchpoint in sensing area can be selected at increments

### Technical data

Operating voltage	20 V DC ... 30 V DC, ± 10% ripple
Ambient temperature	253 Kelvin ... 333 Kelvin (-20 °C ... +60 °C)
Display	yellow LED: Object detected yellow LED: Relay green LED: Power ON / operating voltage connected
Input	a maximum of 3 ultrasonic sensors in direct detection mode
Output	1 relay output, 8A, 250 V AC
Dimensions L x W x H	72 mm x 38 mm x 78 mm
Order code:	<b>UH3-T1-KT</b>



# ULTRASONIC SENSORS

## ACCESSORIES



### Mounting bracket MH04-3505

for Series FP

The type MH4-3505 facilitates adjustment of ultrasonic sensors by allowing the sensor to be turned by a maximum of  $\pm 30^\circ$  in both the vertical and horizontal planes. Setting is carried out by means of the fixing screws.



### Mounting flange BF30

for sensors with  $\varnothing 30$  mm

### Mounting flange BF18

for sensors with  $\varnothing 18$  mm



### Mounting flange BF12

for sensors with  $\varnothing 12$  mm

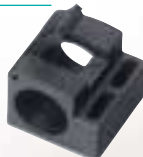


### Mounting flange BF12-F

for sensors with  $\varnothing 12$  mm

### Mounting flange BF18-F

for sensors with  $\varnothing 18$  mm



### Mounting flange BF30-F

for sensors with  $\varnothing 30$  mm

### External temperature probe LUC4-Z30-G2V/LUC4-Z30-N2V

for ultrasonic fill level sensors of the LUC4T... and UC...-30GM-... series



### External temperature probe UC-30GM-TEMP

for ultrasonic sensors of the UC...-30GM-... and LUC4T-... series



### Mounting aid MH-UDB01

Carrier for ultrasonic double sheet control



### Mounting aid MH04-2681F

for VariKont series

Ample adjustment range in X and Y directions and the  $360^\circ$  rotation range simplify and reduce the effort required for installation and adjustment.

### Mounting aid MHW 11

Carrier for sensors suitable for series F 42, FP, VariKont L, VariKont, BF18



### OMH-04 mounting accessory

for sensors with  $\varnothing 18$  mm

For mounting on  $\varnothing 12$  mm round bar or on sheet metal (plate thickness 1.5 mm ... 3 mm).



### Mounting accessory M105

for all cylindrical -30GM series sensors

- Secure mounting
- Easy installation
- Robust design
- Chemical resistant



### Focusing sound deflector UVW90-M30

for series -30GM-

Focusing sound deflector for cylindrical ultrasonic sensors.

- Universal installation options
- $90^\circ$  sound deflection for difficult installation conditions
- Universal installation position
- Ultrasonic focusing effect



### Mounting adapter BF 5-30

Universal mounting for all cylindrical sensors with  $\varnothing 5$  mm to  $\varnothing 30$  mm.

- Secure fixing
- Simple mounting
- Mounting head and foot fixing may be independently rotated through  $360^\circ$
- Robust construction

The BF 5-30 mounting adapter is supplied complete with 2 mounting heads ( $\varnothing 18$  mm,  $\varnothing 30$  mm) and 4 adapter bushes ( $\varnothing 5$  mm,  $\varnothing 8$  mm,  $\varnothing 12$  mm,  $\varnothing 14$  mm).



### Sound deflector UVW90-K18/UVW90-K30

for series -30GM- and 18-GM-



# ULTRASONIC SENSORS

## ACCESSORIES



**Digital display  
DA5-IU-C**



**Digital display  
DA5-IU-2K-V  
DA5-IU-2K-C**

- Programmable characteristic
- 2 limits values can be set
- Current/voltage input
- 2 relay outputs

Technical data	DA5-IU-2K-V	DA5-IU-2K-C
Operating voltage	10 V DC ... 30 V DC	90 V AC ... 260 V AC
Display	6 digit display, red 7-segment LED, 8 mm	5 digit display, red 7-segment-LED 14.2 mm, 2 LED for relays
Sensor supply	–	24 V DC, 100 mA
2 Relay outputs	–	2 x 250 V AC/300 V DC, 3 A
Housing	48 x 24 x 65 mm (w x h x d)	96 x 48 x 75 mm (w x h x d)
Method of connection	7-pin connector with screw terminals max. 0.34 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> core cross-section	8-pin and 11-pin connector with plug-in screw terminals max. 0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup> core cross-section max. 0.14 mm <sup>2</sup> ... 1.5 mm <sup>2</sup> core cross-section
Protection class	Front: IP65	



**RS 232 Interface  
UC-F43-R2**

- For setting and parameter assignment of sensor types UC300-F43-2KIR2-V17 and UC2000-F43-2KIR2-V17 by means of Ultra 2001
- Simple interface connection in the sensor cable and connection of the Sub-D connector with the PC serial interface.



**Extension cable  
UC-30GM-PROG**

The extension cable enables the TEACH-IN of ultrasonic sensors of the type UC...-30GM-... and LUC... even in installation locations that are difficult to access. Here, the sensor end of the extension cable is connected with the plug socket on the sensor. Sensor programming can be carried out on the other end of the cable using the temperature plug connector.

### Programming Device UB-PROG2 + UB-PROG3

- For sensors UB500/2000/4000/6000/-30GM-E0/E2-V15
- Easy TEACH-IN of the switching points A1/A2 or measurement window
- Easy TEACH-IN of the output function:
  - window operation, normally-open/normally-closed function
  - one switch point, normally-open/normally-closed function
  - monitoring of the detection range



**Mating connectors, order code**

V1-G-2M-PVC	V15-W-PG9
V1-G-5M-PVC	V15-G-PG9
V1-W-2M-PVC	V15-G-2M-PVC
V1-W-5M-PVC	V15-W-2M-PUR
V1-W-E2-2M-PUR	V15-W-5M-PUR
V1-W-E2-5M-PUR	V15-W-15M-PUR
V1-W-A2-5M-PUR	V17-G-2M-PUR
V1-W-A0-5M-PUR	V17-G-5M-PUR
V1-G	V3-GM-5M-PUR
V1-W	V3-WM-2M-PUR
	V95-G-YE2M-STOOW
	V95-G-YE2M

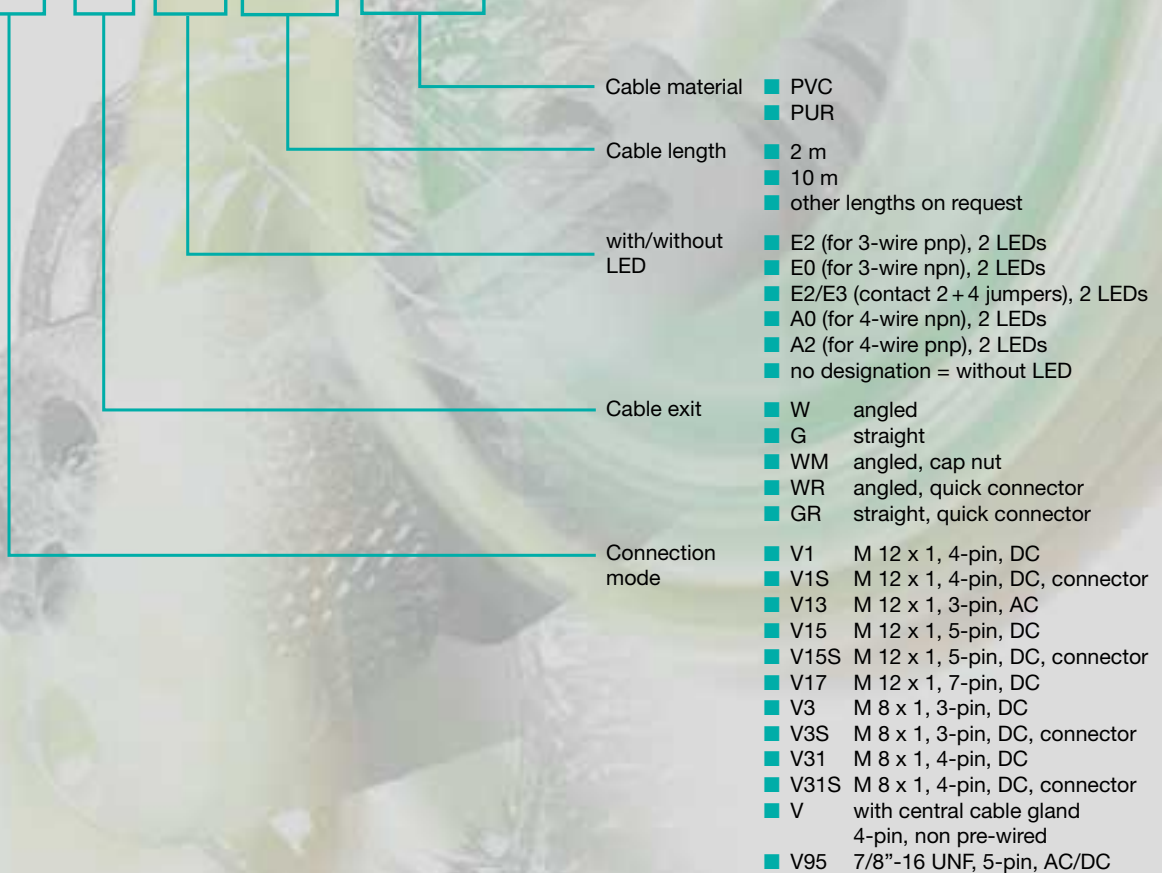


Type-W  
(angled version)

For other mating connectors and connection cable see Flyer  
"System accessories for fixing and connection".

**Type code, mating connectors**

e.g. **V1-W-E2-2M-PUR**



# ULTRASONIC SENSORS

## SERVICE PROGRAM ULTRA 2001

With the service program ULTRA 2001 ultrasonic sensors with RS 232 interfaces can be optimally adapted even to difficult tasks.



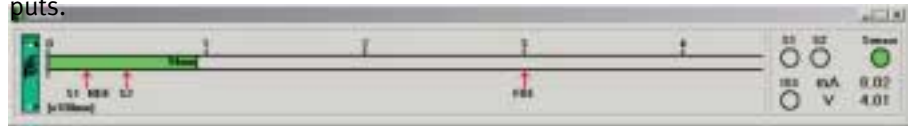
**The following sensors can communicate with the software:**

Series:	sensor types:
-30GM	UC...-30GM-...R2-V15
VariKont	UC...+U9+E6/E7+R2
	UC...+U9+IUE0/E2+R2
	UJ3000+U1+...+RS
-FP	UC6000-FP-...R2-P5
	UJ6000-FP-...+RS
-F43	UC...-F43-2KIR2-V17

**Requirements**

The ULTRA 2001 program is compatible with any PC or laptop. Windows 95, 98, ME, NT, 2000 or XP, an EGA or VGA graphics card, as well as an RS 232 interface are required.

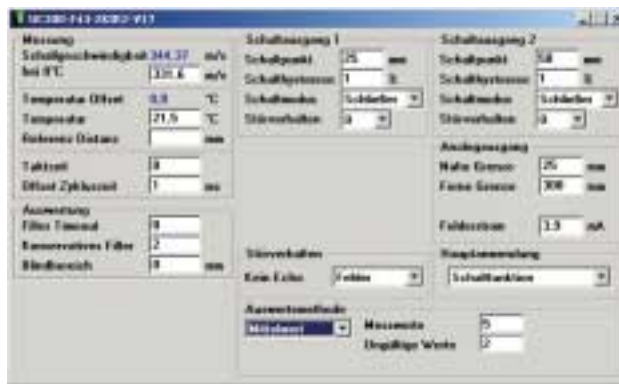
**Show It:** Graphical display of the measured distance. The set switching distances are marked. Simulated LEDs display the switching states of outputs.



**Distance:** Display of the currently measured distance in mm.



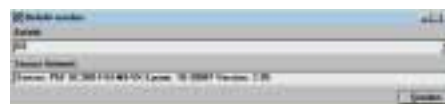
**Parameter settings:** All parameters are editable here. Display and input fields permit commands or parameters to be changed at the click of the mouse without detailed knowledge of the relevant commands or their syntax.

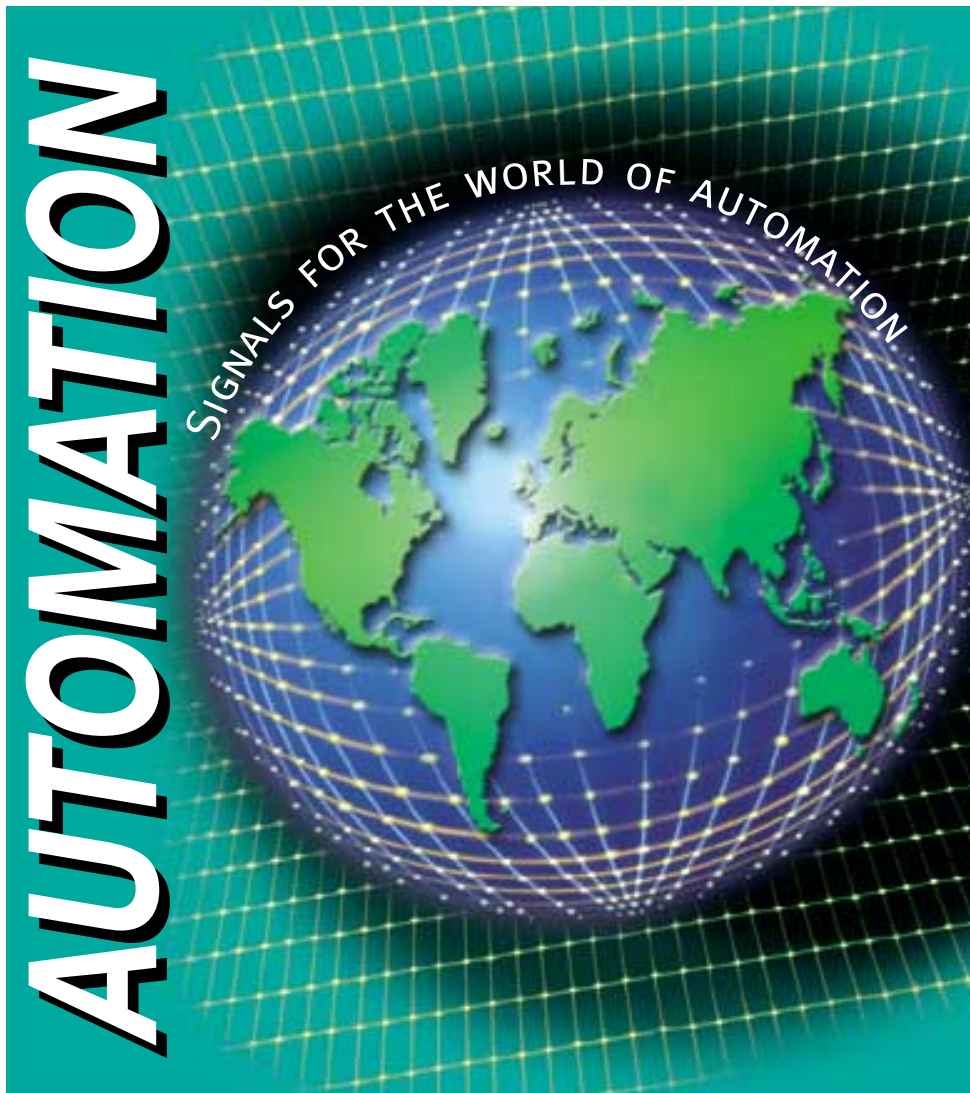


**Port Monitor:** Display of commands sent to the sensor and received by it.



**Send Command:** Sensor parameters are set and queried here in the same manner as with a terminal program (alternatively to the parameterisation window).





[www.pepperl-fuchs.com](http://www.pepperl-fuchs.com)

**Worldwide Headquarters**

Pepperl+Fuchs GmbH · Königsberger Allee 87  
68307 Mannheim · Germany  
Tel. +49 621 776-0 · Fax +49 621 776-1000  
e-mail: [fa-info@de.pepperl-fuchs.com](mailto:fa-info@de.pepperl-fuchs.com)

**USA Headquarters**

Pepperl+Fuchs Inc. · 1600 Enterprise Parkway  
Twinsburg, Ohio 44087 · Cleveland-USA  
Tel. +1 330 4253555 · Fax +1 330 4254607  
e-mail: [sales@us.pepperl-fuchs.com](mailto:sales@us.pepperl-fuchs.com)

**Asia Pacific Headquarters**

Pepperl+Fuchs Pte Ltd. · P+F Building  
18 Ayer Rajah Crescent · Singapore 139942  
Tel. +65 67799091 · Fax +65 68731637  
e-mail: [sales@sg.pepperl-fuchs.com](mailto:sales@sg.pepperl-fuchs.com)

 **PEPPERL+FUCHS**  
SIGNALS FOR THE WORLD OF AUTOMATION