microsonic
Ultrasonic Sensors

A comprehensive solution for industrial applications

ULTRASONIC SENSORS

Extract from our online catalogue:

hps+ ultrasonic sensors

Current to: 2012-06-01

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hps+ in safety gear - When you need chemically resistant, pressure-resistant sensors.

Highlights

- **Optionally used in normal pressure or overpressure :::** *for a wide range of applications*
- **Teflon membrane :::** *for protection against aggressive media*
- **Stainless steel or optional PVDF housing for hps+340 :::** *for use in the food industry*
- **Sealed against the housing with an O-ring of FFKM :::** *for the highest possible chemical resistance*
- **Digital display with direct measured value output in mm/cm or % :::** *for immediately visible results*
- **Numeric configuration of the sensor using digital display :::** *permits the complete advance configuration of the sensor*

Basics

- **2 switching outputs in pnp variant :::** *with a load up to 200 mA*
- **Analogue output plus 1 pnp switching output :::** *for proportional distance measurement with an additional limit value*
- **4 Detection ranges with a measurement range of 30 mm to 8 m :::** *individually appropriate for the use case*
- **microsonic teach-in using T1 or T2 buttons :::** *for simple, uniform commissioning*
- **0.025 mm to 0.18 mm resolution :::** *for the highest precision possible*
- **Temperature compensation :::** *for exact measurement in temperature fluctuations*
- **9–30 V operating voltage :::** *for use on a variety of voltage networks*
- **LinkControl :::** *for configuration of sensors from the PC*

Description

For fill level measurements of aggressive media and in overpressure

The ultrasonic transducers of the new hps+ sensors are now fitted out - as standard - with a teflon film It is sealed with a FFKM O-ring against the housing made of 1.4571 stainless steel or PVDF. This ensures a high degree of resistance to aggressive media.

Fill level measurement in tanks

The hps+ sensors can be used for fill level measurement under normal pressure or in tanks and containers with an overpressure of up to 6 bar. Its special software filters also allow its use in containers filled from above or that have a stirring system.

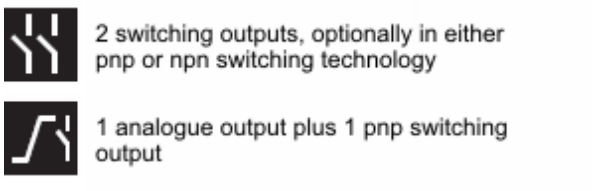
Pressure-tight installation in a tank is undertaken by means of a 1" threaded flange or a 2" one in the case of hps+340.

Chemical resistance

and seal tightness was tested through being stored over cellulose thinner and 1,000,000 alternating pressure stresses. Cellulose thinner is extremely corrosive and has a high rate of penetration.

hps+340 in high-resistance PVDF housing - PTFE protective film with an O-ring of FFKM sealed against the housing

Two different output stages are available for four detection ranges:



The hps+ sensors with switching output have three operating modes:

- Single switching point
- Two-way reflective barrier
- Window mode

Two tricolour LEDs

always show the current state of the switching outputs or the analogue output.

With TouchControl

all configuration can be done right at the sensor. The easily legible three-digit LED display continually shows the current distance value and automatically switches between mm and cm displays.

Setting a switching or analogue output

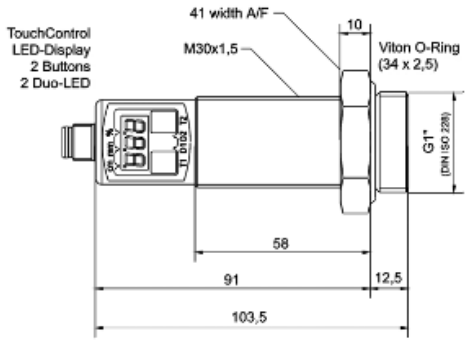
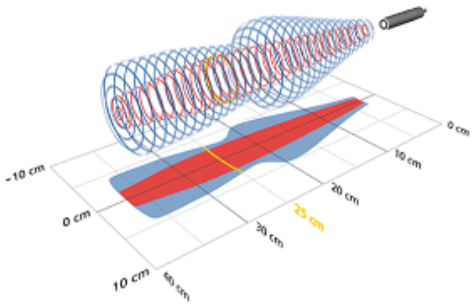
can optionally be carried out by numeric input of the desired distance values, or using a teach-in procedure. This permits the user to select the configuration method preferred. The hps+ sensors support synchronisation and multiplex operation and have extensive parameterisation options via LinkControl.
(You can find more information about configuring the hps+ sensors under the mic+ sensors.)

LinkControl

consists of the LinkControl adapter and the LinkControl software and facilitates the configuration of the hps+ sensors via a PC or laptop with all conventional Windows operating systems.

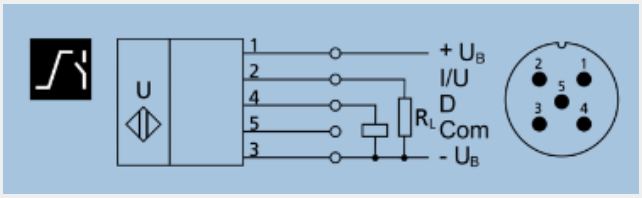
Sensor connected to the PC via LCA-2 for programming

hps+25/DIU/TC/E/G1

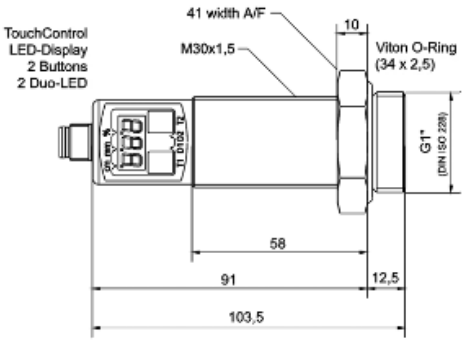
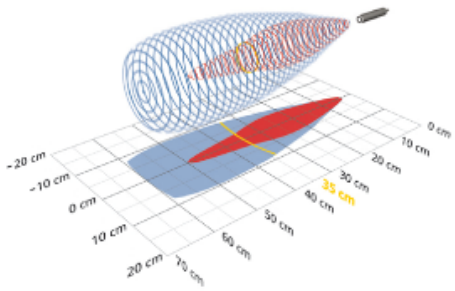
scale drawing	detection zone
	

1 x pnp + 1 x analogue 4-20 mA / 0-10 V	**990 mm**
operating range	30 - 250 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode analogue distance measurement
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	30 mm
operating range	250 mm
maximum range	990 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.025 mm to 0.30 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+25/DIU/TC/E/G1

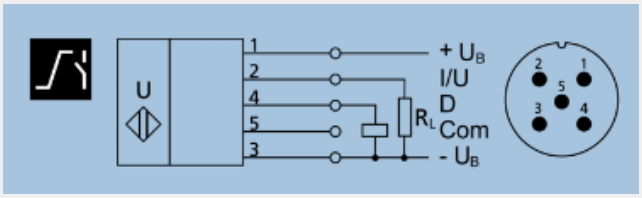
outputs	
output 1	analogue output current: 4-20 mA / voltage: 0-10 V, short-circuit-proof switchable rising/falling
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	3 mm
switching frequency	11 Hz
response time	68 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
documentation (download)	
pin assignment	

hps+35/DIU/TC/E/G1

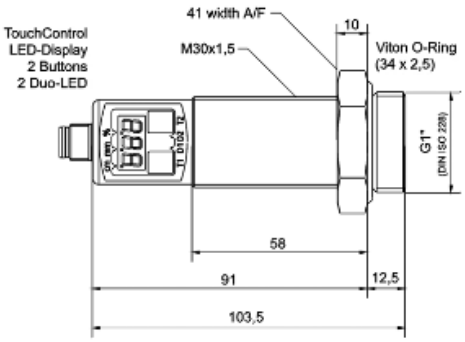
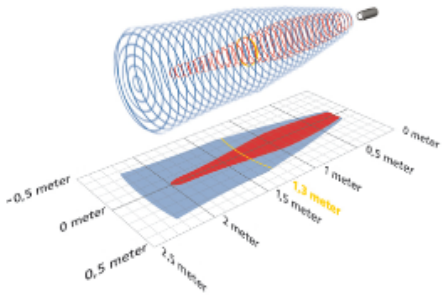
scale drawing	detection zone
	

1 x pnp + 1 x analogue 4-20 mA / 0-10 V	**1,500 mm**
operating range	85 - 350 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode analogue distance measurement
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	85 mm
operating range	350 mm
maximum range	1,500 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm to 0.45 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+35/DIU/TC/E/G1

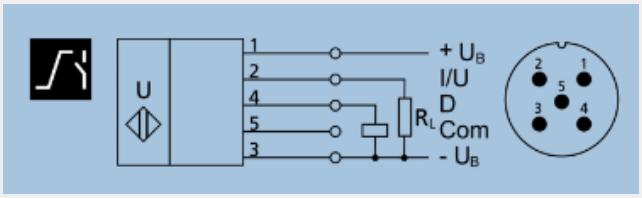
outputs	
output 1	analogue output current: 4-20 mA / voltage: 0-10 V, short-circuit-proof switchable rising/falling
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	5 mm
switching frequency	9 Hz
response time	84 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
documentation (download)	
pin assignment	

hps+130/DIU/TC/E/G1

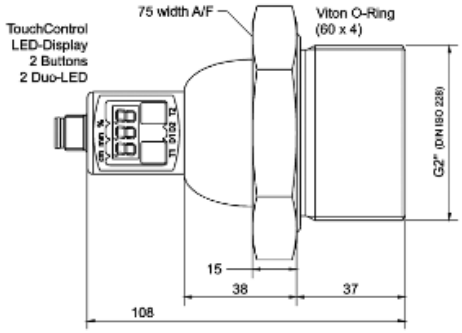
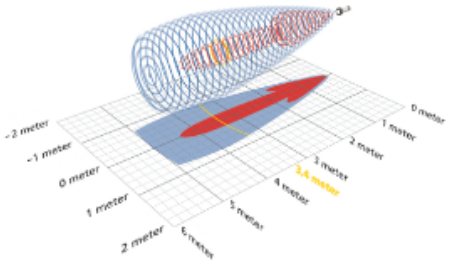
scale drawing	detection zone
	

1 x pnp + 1 x analogue 4-20 mA / 0-10 V	5,000 mm
operating range	200 - 1,300 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode analogue distance measurement
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	180 kHz
blind zone	200 mm
operating range	1,300 mm
maximum range	5,000 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm to 1.5 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+130/DIU/TC/E/G1

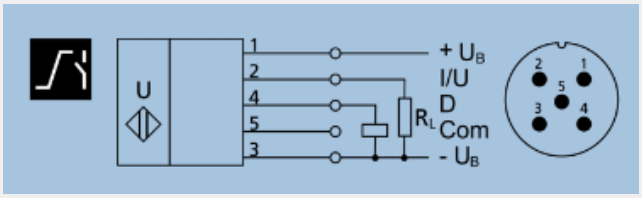
outputs	
output 1	analogue output current: 4-20 mA / voltage: 0-10 V, short-circuit-proof switchable rising/falling
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	20 mm
switching frequency	5 Hz
response time	160 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
documentation (download)	
pin assignment	

hps+340/DIU/TC/E/G2

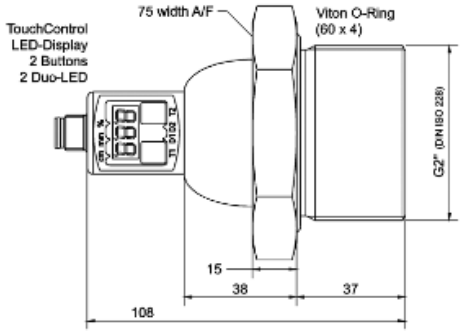
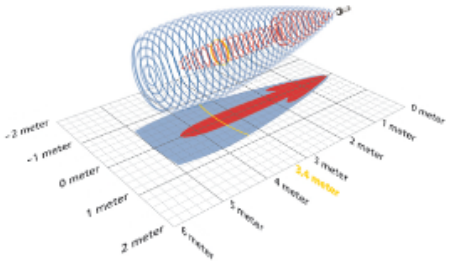
scale drawing	detection zone
	

1 x pnp + 1 x analogue 4-20 mA / 0-10 V	**8,000 mm**
operating range	350 - 3,400 mm
design	cylindrical
operating mode	proximity switch/reflective mode reflective barrier window mode analogue distance measurement
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G2
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	120 kHz
blind zone	350 mm
operating range	3,400 mm
maximum range	8,000 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm to 2.4 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+340/DIU/TC/E/G2

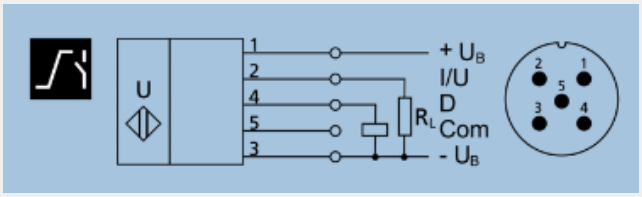
outputs	
output 1	analogue output current: 4-20 mA / voltage: 0-10 V, short-circuit-proof switchable rising/falling
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	50 mm
switching frequency	3 Hz
response time	240 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	1,200 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G2
documentation (download)	
pin assignment	

hps+340/DIU/TC/G2

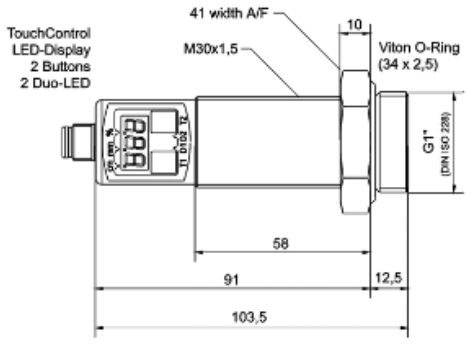
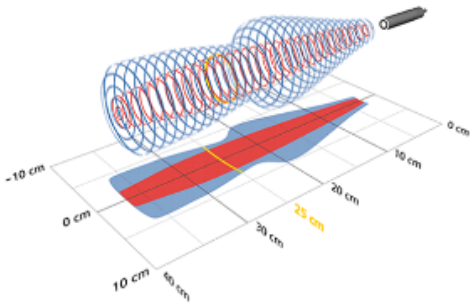
scale drawing	detection zone
	

1 x pnp + 1 x analogue 4-20 mA / 0-10 V	**8,000 mm**
operating range	350 - 3,400 mm
design	cylindrical
operating mode	proximity switch/reflective mode reflective barrier window mode analogue distance measurement
particularities	pressure-resistant high chemical resistance PVDF housing display process connection G2
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	120 kHz
blind zone	350 mm
operating range	3,400 mm
maximum range	8,000 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm to 2.4 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+340/DIU/TC/G2

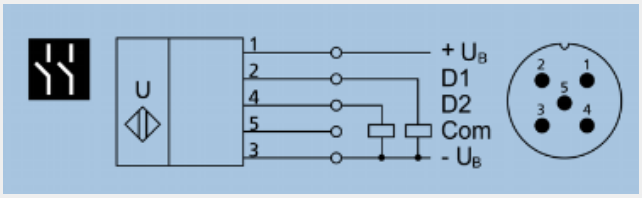
outputs	
output 1	analogue output current: 4-20 mA / voltage: 0-10 V, short-circuit-proof switchable rising/falling
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	50 mm
switching frequency	3 Hz
response time	240 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	PVDF, PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	350 g
further versions	stainless steel
further versions	hps+340/DIU/TC/E/G2
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance PVDF housing display process connection G2
documentation (download)	
pin assignment	

hps+25/DD/TC/E/G1

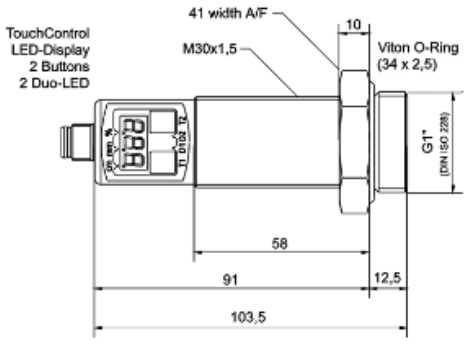
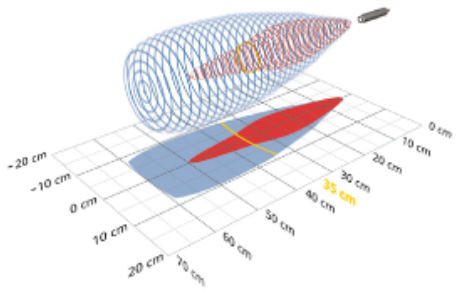
scale drawing	detection zone
	

2 x pnp	990 mm
operating range	30 - 250 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	30 mm
operating range	250 mm
maximum range	990 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.025 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+25/DD/TC/E/G1

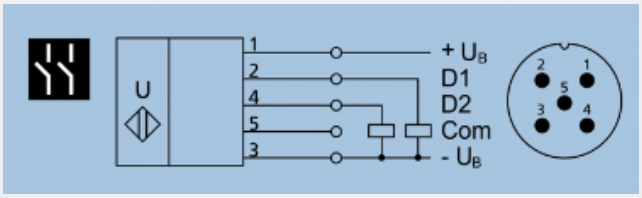
outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	3 mm
switching frequency	11 Hz
response time	68 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
documentation (download)	
pin assignment	

hps+35/DD/TC/E/G1

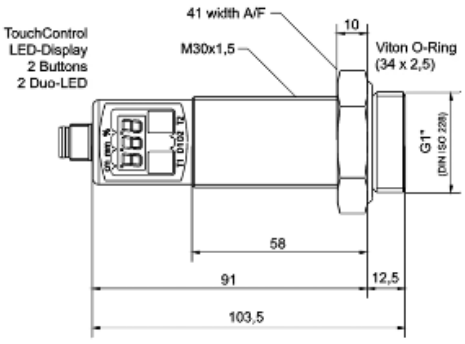
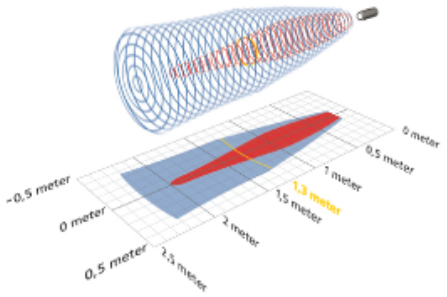
scale drawing	detection zone
	

2 x pnp	1,500 mm
operating range	85 - 350 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	85 mm
operating range	350 mm
maximum range	1,500 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm to 0.45 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+35/DD/TC/E/G1

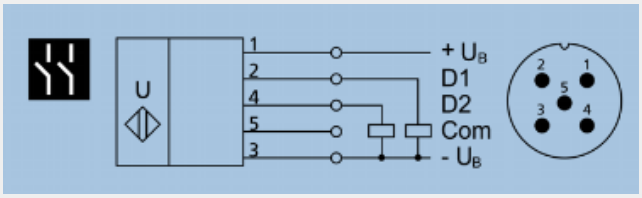
outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	5 mm
switching frequency	9 Hz
response time	84 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
documentation (download)	
pin assignment	

hps+130/DD/TC/E/G1

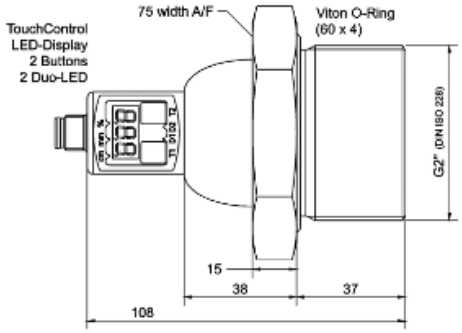
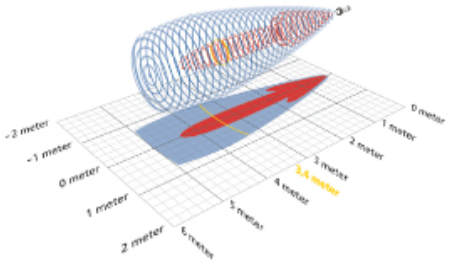
scale drawing	detection zone
	

2 x pnp	5,000 mm
operating range	200 - 1,300 mm
design	cylindrical M30
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	180 kHz
blind zone	200 mm
operating range	1,300 mm
maximum range	5,000 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+130/DD/TC/E/G1

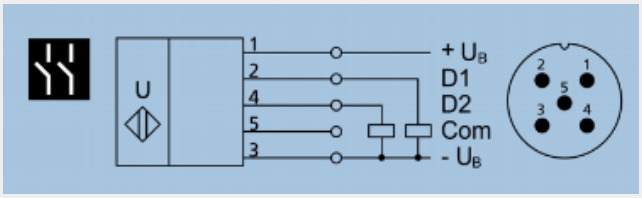
outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	20 mm
switching frequency	5 Hz
response time	160 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	210 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G1
documentation (download)	
pin assignment	

hps+340/DD/TC/E/G2

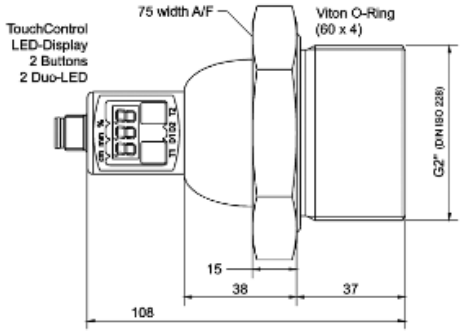
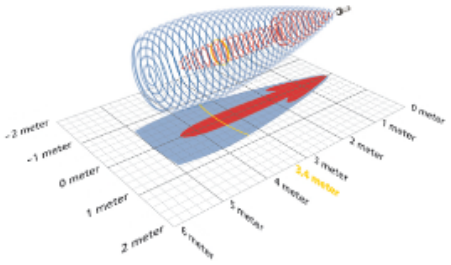
scale drawing	detection zone
	

2 x pnp	8,000 mm
operating range	350 - 3,400 mm
design	cylindrical
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G2
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	120 kHz
blind zone	350 mm
operating range	3,400 mm
maximum range	8,000 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+340/DD/TC/E/G2

outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	50 mm
switching frequency	3 Hz
response time	240 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	stainless steel, plastic parts: PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	1,200 g
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance stainless steel version display process connection G2
documentation (download)	
pin assignment	

hps+340/DD/TC/G2

scale drawing	detection zone
	

2 x pnp	8,000 mm
operating range	350 - 3,400 mm
design	cylindrical
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	pressure-resistant high chemical resistance PVDF housing display process connection G2
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	120 kHz
blind zone	350 mm
operating range	3,400 mm
maximum range	8,000 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.18 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	9 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	80 mA
type of connection	5-pin M12 initiator plug

hps+340/DD/TC/G2

outputs	
output 1	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
output 2	switching output pnp: I_{max} = 200 mA (U_B-2V) NOC/NCC adjustable, short-circuit-proof
switching hysteresis	50 mm
switching frequency	3 Hz
response time	240 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input
housing	
material	PVDF, PBT, TPU
ultrasonic transducer	coated with PTFE film, FFKM O-ring
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	350 g
further versions	stainless steel
further versions	hps+340/DD/TC/E/G2
technical features/characteristics	
temperature compensation	yes
controls	2 push-buttons + LED display (TouchControl)
scope for settings	Teach-in and numeric configuration via TouchControl LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	3-digit LED display, 2 x three-colour LED
particularities	pressure-resistant high chemical resistance PVDF housing display process connection G2
documentation (download)	
pin assignment