

A comprehensive solution for industrial applications

ULTRASONIC SENSORS



Extract from our online catalogue:

pico+ ultrasonic sensors

Current to: 2013-07-30

*pico+ the "little guy" that
can do it all: 4 ranges, 3
output signals, 2
housing variants and 1
IO-Link interface.*



Highlights

- › **Variant with 90° angled head** ::: *for individual installation situations*
- › **IO-Link interface** ::: *for support of the new industry standard*
- › **Automatic synchronisation and multiplex operation** ::: *for simultaneous operation of up to ten sensors in close quarters*

Basics

- › **1 Push-Pull switching output, pnp or npn basis** ::: *for all controllers*
- › **Analogue output 4–20 mA or 0–10 V** ::: *for analogue distance measurements*
- › **4 Detection ranges with a measurement range of 20 mm to 1.3 m** ::: *individually appropriate for the use case*
- › **microsonic teach-in on Pin 5** ::: *for simple, uniform commissioning*
- › **0.069 - -0.10 mm resolution** ::: *for the highest precision possible*
- › **Temperature compensation** ::: *for exact measurement in temperature fluctuations*
- › **10–30 V operating voltage** ::: *for use on a variety of voltage networks*
- › **LinkControl** ::: *for configuration of sensors from the PC*

Description

The pico+ ultrasonic sensors

are a compact series with M18 threaded sleeves and only 41 mm in housing length. In addition to the variants with an axial beam direction, there is also a housing variant with a 90° angled head and radial beam direction.

With four detection ranges from 20 mm to 1.3 m and three different output stages, this sensor family covers a wide range of applications.

Sensors with the Push-Pull output stage support SIO and IO link modes. Sensors with analogue output are optionally available with 4–20 mA current output or 0–10 V voltage output.

In SIO mode, sensors are configured using the microsonic teach-in procedure on pin 5.

For the pico+ sensor family

there are 2 output stages and 4 detection ranges available:



1 Push-Pull switching output with
pnp or npn switching technology



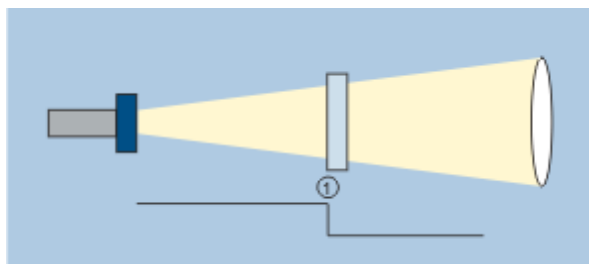
1 analogue output 4–20 mA
or 0–10 V

Sensors with switching output have three operating modes:

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

Teach-in of a single switching point

- Place object to be detected (1) at the desired distance
- Apply +UB to pin 5 for about 3 seconds
- Then apply +UB to pin 5 again for about 1 seconds



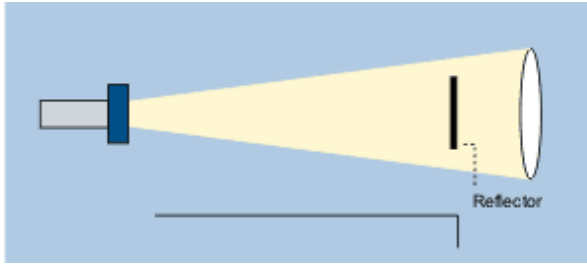
Teach-in of a switching point

Teach-in of a two-way reflective barrier

with a fixed reflector

- Apply +UB to pin 5 for about 3 seconds

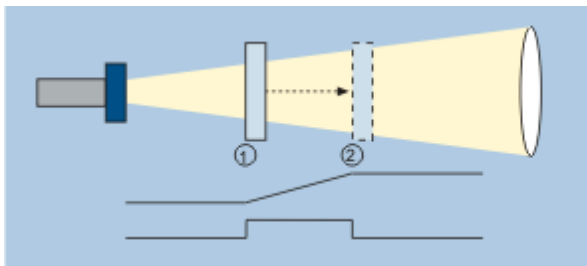
- Then apply +UB to pin 5 again for about 10 seconds



Teach-in of a two-way reflective barrier

For configuration of a window

- Place object at the near edge of the window (1)
- Apply +UB to pin 5 for about 3 seconds
- Then move the object to the far edge of the window (2)
- Then apply +UB to pin 5 again for about 1 seconds



Teach-in of an analogue characteristic or a window with two switching points

NCC/NOC

and rising/falling analogue characteristic curve can also be set via pin 5.

One green and one yellow LED

indicate the state of the output and support microsonic teach-in.

LinkControl

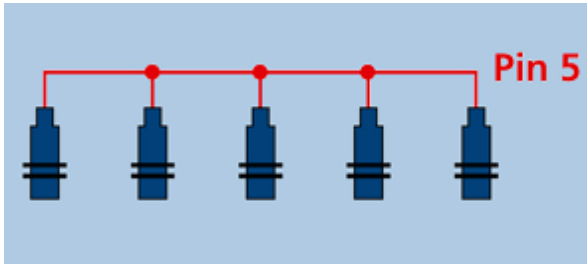
optionally permits the extensive parameterisation of pico+ sensors. The LCA-2 LinkControl adapter available as an accessory can be used to connect pico+ sensors to the PC.



Sensor connected to the PC via LCA-2 for programming

Easy to synchronise

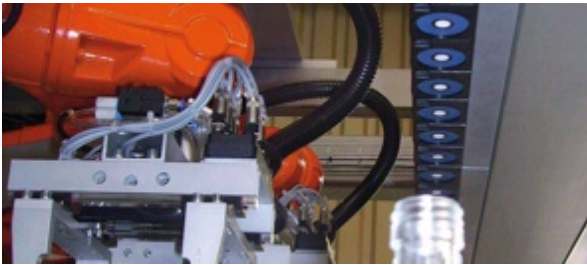
A number of pico+ sensors can be run closely packed in applications synchronised to stop them influencing one another. To this end, the sync mode has to be activated and all the sensors are to be electrically connected one to another with Pin 5.



Synchronisation using Pin 5

If more than 10 sensors must be synchronised, this can be carried out with the SyncBox1, available as an accessory.

In instances of where a number of sensors are run at an IO-Link master, then the master's function is to assume synchronisation (Pin 5 must not be wired under IO-Link operations).



Synchronised sensor cell in glass bottle production

Keep your eyes open in data communications!

IO-Link: The new standard at the fieldbus level

The IO-Link interface in the pico+ sensors gives you everything you need to implement continuous communication on all levels of the system architecture, right down to the sensor. In this way, both machinery and equipment can be run in a more productive manner. IO-Link can enormously simplify the startup and maintenance of either a machine or appliance.

IO-Link in detail

Following every switch-on, pico+ is in the SIO mode (Standard I/O mode) and functions just like any normal ultrasonic proximity switch with push/pull output stage.

With the wake-up signal, an IO-Link enabled controller can transfer the pico+ into the communication or IO-Link modes. The controller can now exchange both process and service data with the pico+.

An IO-Link master can have one or a number of inputs and outputs. Only one IO-Link device is attached at each input/output. A standard 3-wire cable joins up the sensors and actuators. This non-shielded line can be up to 20 metres in length.

A mixed operation is possible thanks to complete compatibility to the SIO mode (Standard-IO mode): at a master a number of sensors and actuators can be run in the IO-Link and others in the SIO mode.

Continuous communication permits process/service data to be transmitted between sensors/actuators and the controller.



Filling systems equipped with IO-Link

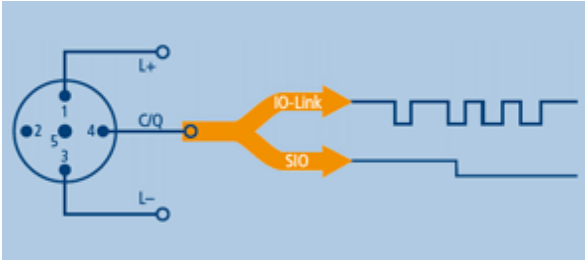
An IO-Link system consists of IO-Link devices – mainly sensors, actuators or combinations of them – a standard 3-wire sensor/actuator cable and an IO-Link master.



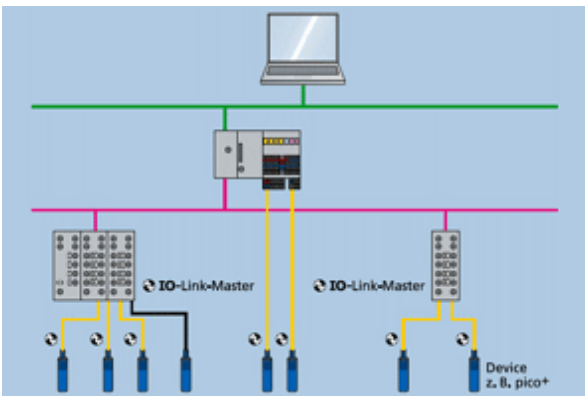
More information on the IO-Link can be found in www.io-link.com

The advantages of IO-Link:

- In the IO-Link mode the distances measured are cyclically transmitted to the master; thus the IO-Link mode can replace an analogue output at no significant expense!
- Following a sensor failure, the controller can automatically re-load all the settings into the new sensor.
- Reduction in planning outlay achieved from a standardised integration of devices into the controller via a manufacturer-independent IODD description file
- Reduced startup times thanks to a centralized provision of data and parameters in the controller
- Greater equipment availability levels coming from maximum transparency and system-wide diagnosis all the way down into the device itself



Push-Pull output stage permits switching from SIO mode to IO-Link mode



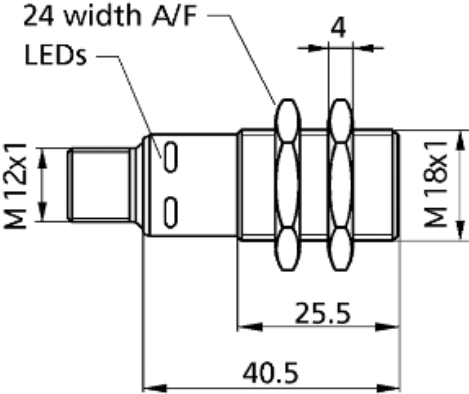
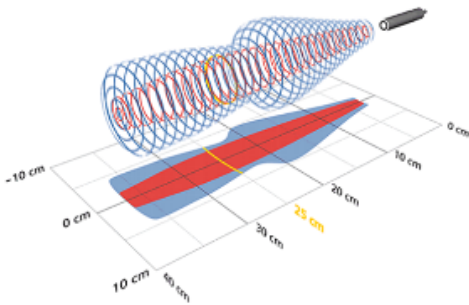


Example of the system architecture

Product name	pico+
Baud rate	COM 2 (38,400 Bd)
Format of process data	16 Bit, R, UNI16
Content of process data	Bit 0: Q1 switch status; bits 1-15: Distance value with a resolution of 0.1 mm
ISDU parameter	Switch point 1, return detect point 1, switch point 2, return detect point 2, foreground suppression, (NC/NO) operation, filter, filter strength, switching delay, interference noise suppression,
System commands	activation/deactivation of teach-in on pin 5 teaching a switch point, teaching switch point + 8%, teaching a reflective barrier, loading factory settings

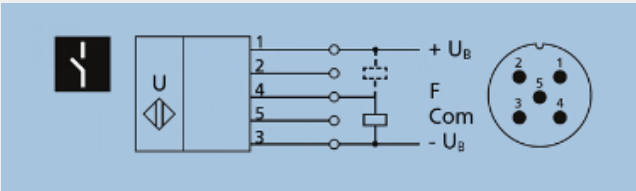
Common IO-Link-specific data

Download IO-Link IODD library

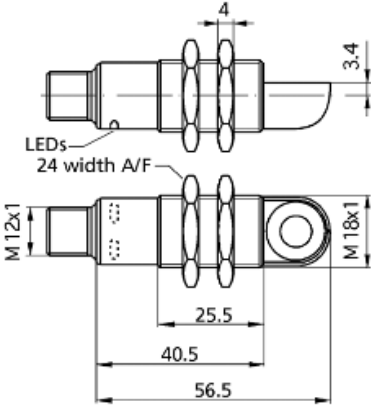
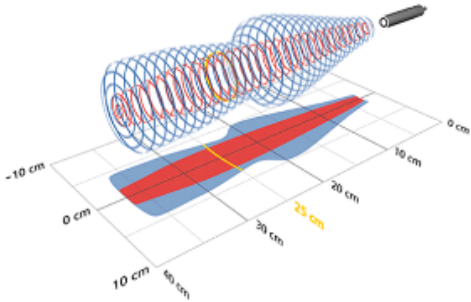


pico+25/F

scale drawing	detection zone
	
 1 x Push-Pull	 350 mm
operating range	30 - 250 mm
design	cylindrical M18
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	IO-Link
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	30 mm
operating range	250 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

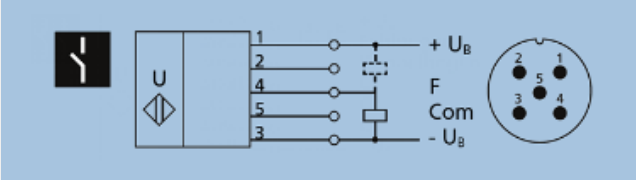
pico+25/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	3 mm
switching frequency	25 Hz
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+25/WK/F
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	IO-Link
documentation (download)	
pin assignment	

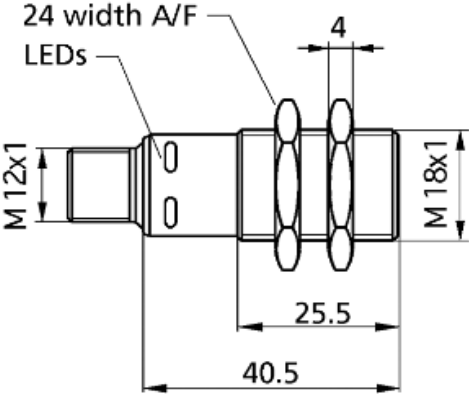
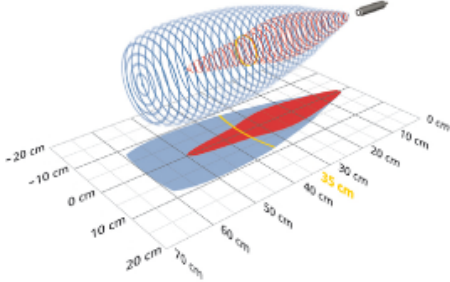


pico+25/WK/F

scale drawing		detection zone	
			
 1 x Push-Pull		 350 mm	
operating range		30 - 250 mm	
design		cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)	
operating mode		proximity switch/reflective mode reflective barrier window mode	
particularities		90°-Winkelkopf IO-Link	
ultrasonic -specific			
means of measurement		echo propagation time measurement	
transducer frequency		320 kHz	
blind zone		30 mm	
operating range		250 mm	
maximum range		350 mm	
angle of beam spread		please see graphics detection zone	
resolution/sampling rate		0.069 mm	
reproducibility		± 0.15 %	
accuracy		± 1 % (temperature drift internally compensated)	
electrical data			
operating voltage U _B		10 - 30 V d.c., reverse polarity protection	
voltage ripple		± 10 %	
no-load current consumption		40 mA	
type of connection		5-pin M12 initiator plug	

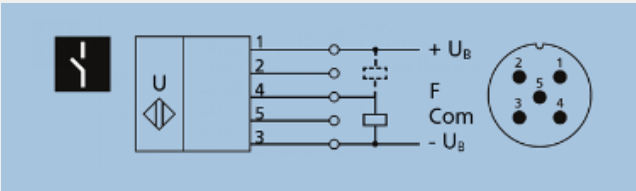
pico+25/WK/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	3 mm
switching frequency	25 Hz
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	90°-Winkelkopf IO-Link
documentation (download)	
pin assignment	

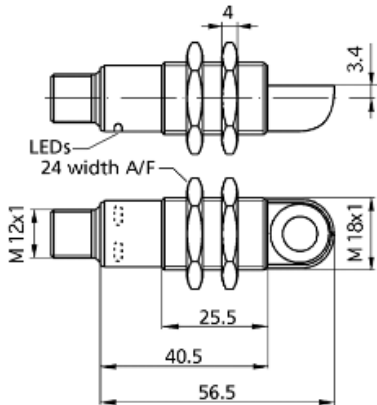
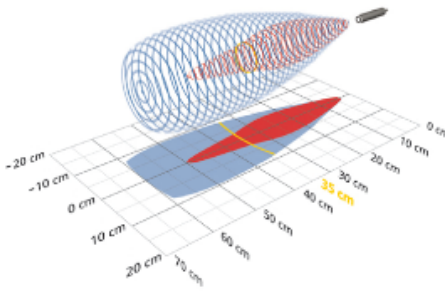


pico+35/F

scale drawing	detection zone
	
 1 x Push-Pull	 600 mm
operating range	65 - 350 mm
design	cylindrical M18
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	IO-Link
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	400 kHz
blind zone	65 mm
operating range	350 mm
maximum range	600 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

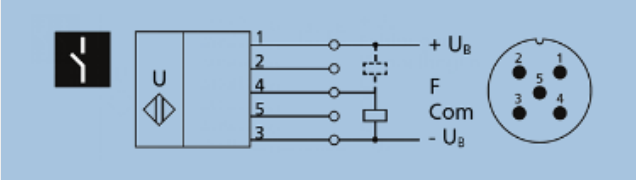
pico+35/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	5 mm
switching frequency	8 Hz
response time	64 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+35/WK/F
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	IO-Link
documentation (download)	
pin assignment	

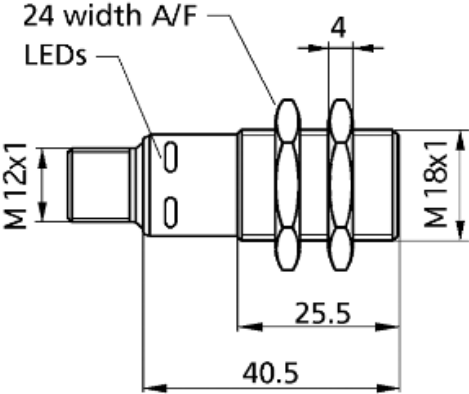
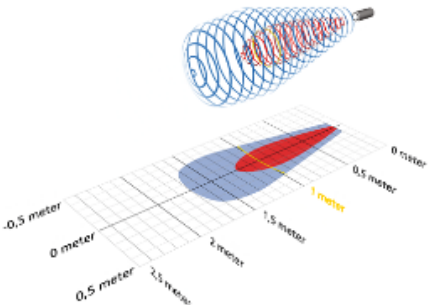


pico+35/WK/F

scale drawing	detection zone
	
 1 x Push-Pull	 600 mm
operating range	65 - 350 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	90°-Winkelkopf IO-Link
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	400 kHz
blind zone	65 mm
operating range	350 mm
maximum range	600 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

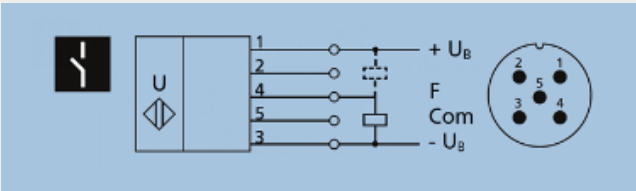
pico+35/WK/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	5 mm
switching frequency	8 Hz
response time	64 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	90°-Winkelkopf IO-Link
documentation (download)	
pin assignment	

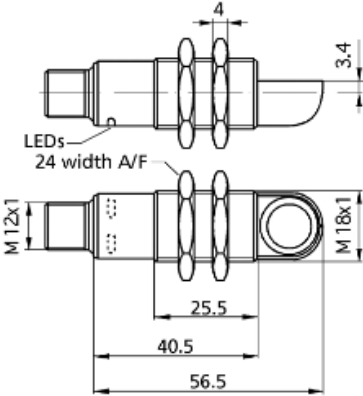
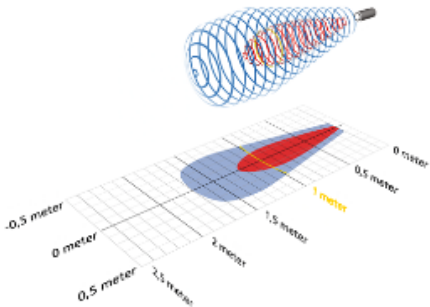


pico+100/F

scale drawing	detection zone
	
 1 x Push-Pull	 1,300 mm
operating range	120 - 1,000 mm
design	cylindrical M18
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	IO-Link
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	200 kHz
blind zone	120 mm
operating range	1,000 mm
maximum range	1,300 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

pico+100/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	20 mm
switching frequency	10 Hz
response time	80 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+100/WK/F
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	IO-Link
documentation (download)	
pin assignment	

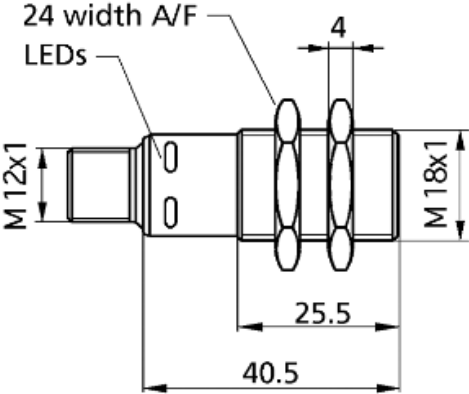
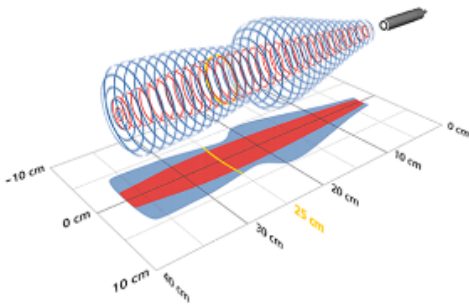


pico+100/WK/F

scale drawing	detection zone
	
 1 x Push-Pull	 1,300 mm
operating range	120 - 1,000 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	90°-Winkelkopf IO-Link
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	200 kHz
blind zone	120 mm
operating range	1,000 mm
maximum range	1,300 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

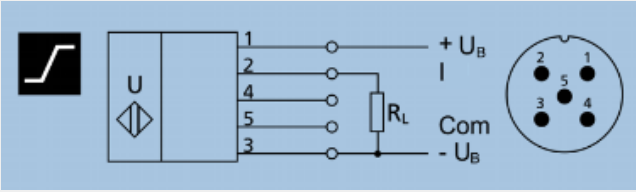
pico+100/WK/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	20 mm
switching frequency	10 Hz
response time	80 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
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documentation (download)	
pin assignment	

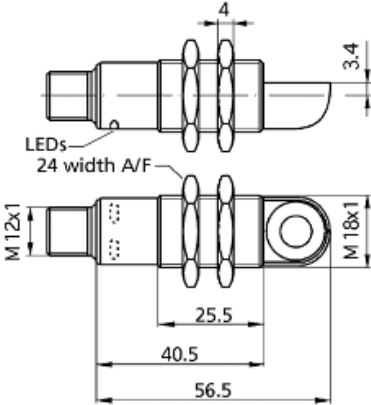
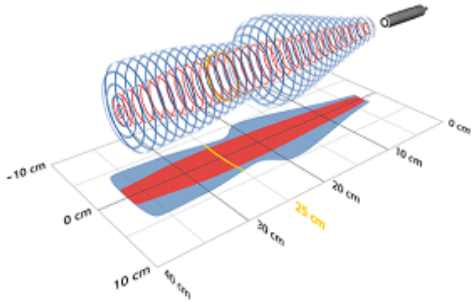


pico+25/I

scale drawing	detection zone
	
 1 x analogue	 350 mm
operating range	30 - 250 mm
design	cylindrical M18
operating mode	analogue distance measurements
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	30 mm
operating range	250 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.10 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U _B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

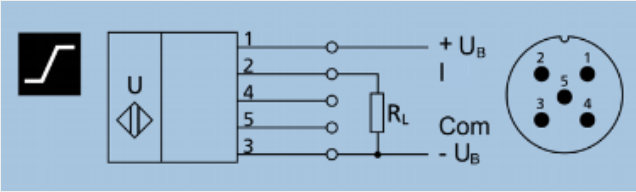
pico+25/I

outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+25/WK/I
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
documentation (download)	
pin assignment	

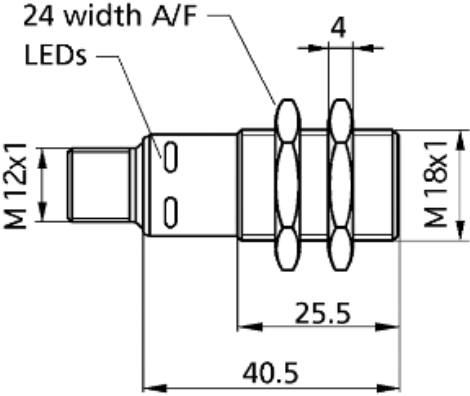
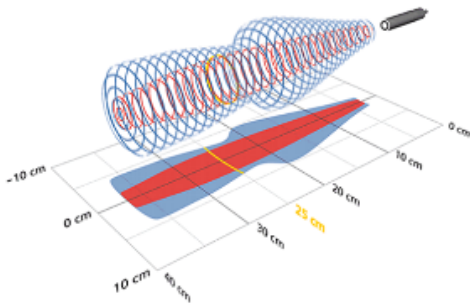


pico+25/WK/I

scale drawing	detection zone
	
 1 x analogue	 350 mm
operating range	30 - 250 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	analogue distance measurements
particularities	90° angular head
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	30 mm
operating range	250 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.10 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

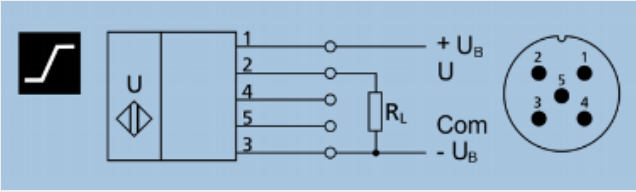
pico+25/WK/I

outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	90° angular head
documentation (download)	
pin assignment	



pico+25/U

scale drawing		detection zone	
			
	1 x analogue		350 mm
operating range		30 - 250 mm	
design		cylindrical M18	
operating mode		analogue distance measurements	
ultrasonic -specific			
means of measurement		echo propagation time measurement	
transducer frequency		320 kHz	
blind zone		30 mm	
operating range		250 mm	
maximum range		350 mm	
angle of beam spread		please see graphics detection zone	
resolution/sampling rate		0.069 mm to 0.10 mm, depending on the analogue window	
reproducibility		± 0.15 %	
accuracy		± 1 % (temperature drift internally compensated)	
electrical data			
operating voltage U _B		10 - 30 V d.c., reverse polarity protection	
voltage ripple		± 10 %	
no-load current consumption		40 mA	
type of connection		5-pin M12 initiator plug	

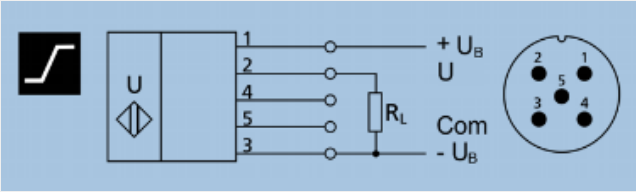
pico+25/U

outputs	
output 1	analogue output voltage: 0-10 V, short-circuit-proof switchable rising/falling
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+25/WK/U
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
documentation (download)	
pin assignment	

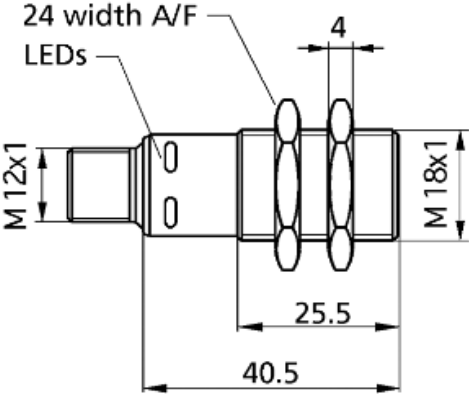
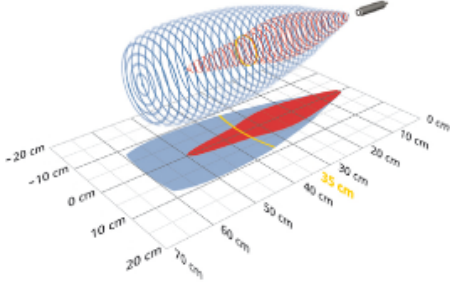


pico+25/WK/U

scale drawing	detection zone
 1 x analogue	 350 mm
operating range	30 - 250 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	analogue distance measurements
particularities	90° angular head
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	320 kHz
blind zone	30 mm
operating range	250 mm
maximum range	350 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.10 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

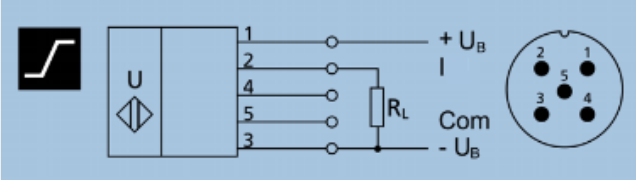
pico+25/WK/U

outputs	
output 1	analogue output voltage: 0-10 V, short-circuit-proof switchable rising/falling
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	90° angular head
documentation (download)	
pin assignment	

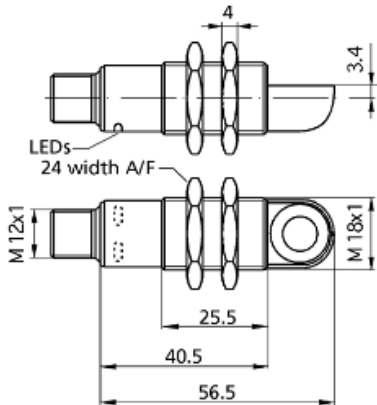
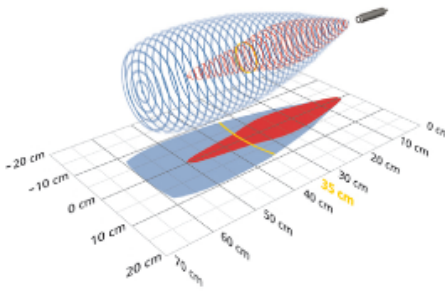


pico+35/I

scale drawing		detection zone	
			
	1 x analogue		600 mm
operating range		65 - 350 mm	
design		cylindrical M18	
operating mode		analogue distance measurements	
ultrasonic -specific			
means of measurement		echo propagation time measurement	
transducer frequency		400 kHz	
blind zone		65 mm	
operating range		350 mm	
maximum range		600 mm	
angle of beam spread		please see graphics detection zone	
resolution/sampling rate		0.069 mm to 0.17 mm, depending on the analogue window	
reproducibility		± 0.15 %	
accuracy		± 1 % (temperature drift internally compensated)	
electrical data			
operating voltage U _B		10 - 30 V d.c., reverse polarity protection	
voltage ripple		± 10 %	
no-load current consumption		40 mA	
type of connection		5-pin M12 initiator plug	

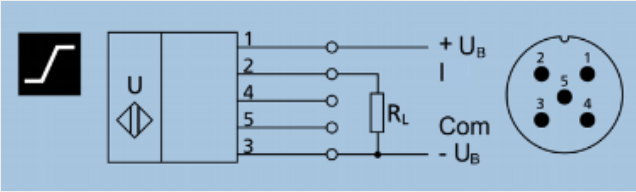
pico+35/I

outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	70 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+35/WK/I
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
documentation (download)	
pin assignment	

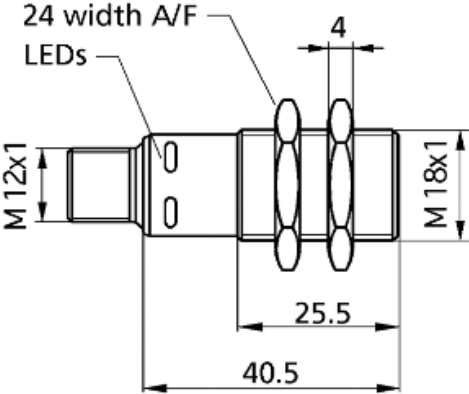
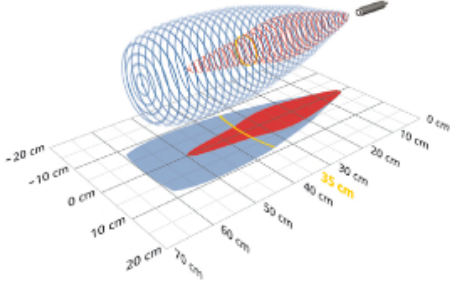


pico+35/WK/I

scale drawing	detection zone
	
 1 x analogue	 600 mm
operating range	65 - 350 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	analogue distance measurements
particularities	90° angular head
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	400 kHz
blind zone	65 mm
operating range	350 mm
maximum range	600 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.17 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

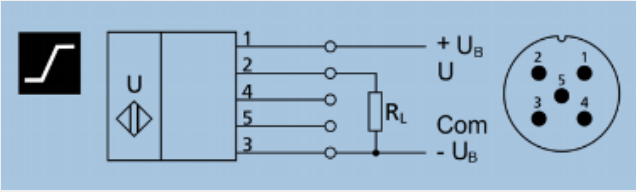
pico+35/WK/I

outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	70 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	90° angular head
documentation (download)	
pin assignment	



pico+35/U

scale drawing	detection zone
	
 1 x analogue	 600 mm
operating range	65 - 350 mm
design	cylindrical M18
operating mode	analogue distance measurements
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	400 kHz
blind zone	65 mm
operating range	350 mm
maximum range	600 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.17 mm, depending on the analogue window
reproducibility	± 0.15 %
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electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

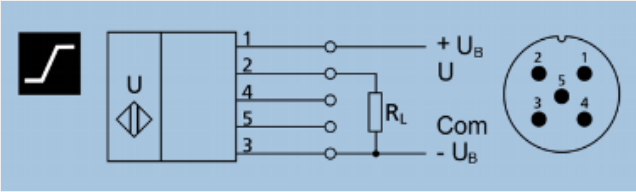
pico+35/U

outputs	
output 1	analogue output voltage: 0-10 V, short-circuit-proof switchable rising/falling
response time	70 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+35/WK/U
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
documentation (download)	
pin assignment	

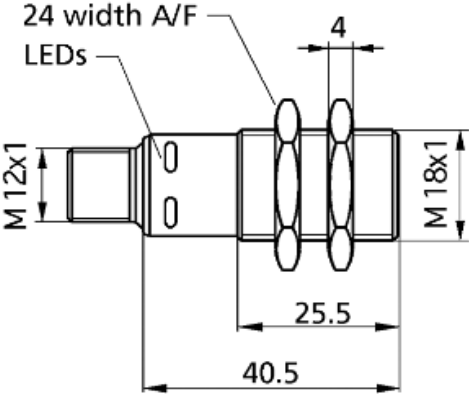
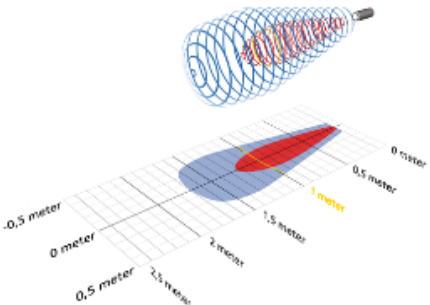


pico+35/WK/U

scale drawing	detection zone
 1 x analogue	 600 mm
operating range	65 - 350 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	analogue distance measurements
particularities	90° angular head
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	400 kHz
blind zone	65 mm
operating range	350 mm
maximum range	600 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.17 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

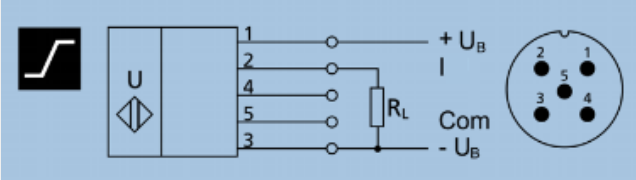
pico+35/WK/U

outputs	
output 1	analogue output voltage: 0-10 V, short-circuit-proof switchable rising/falling
response time	70 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	90° angular head
documentation (download)	
pin assignment	

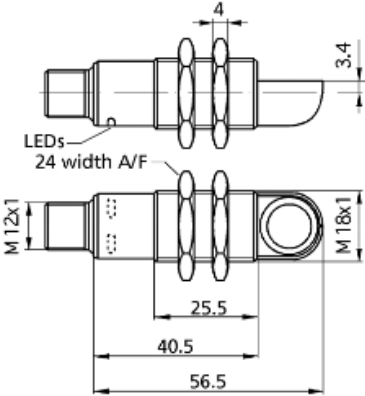
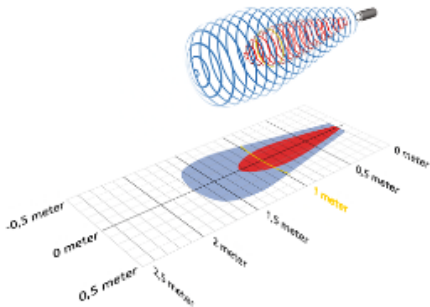


pico+100/I

scale drawing	detection zone
	
 1 x analogue	 1,300 mm
operating range	120 - 1,000 mm
design	cylindrical M18
operating mode	analogue distance measurements
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	200 kHz
blind zone	120 mm
operating range	1,000 mm
maximum range	1,300 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.38 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U _B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

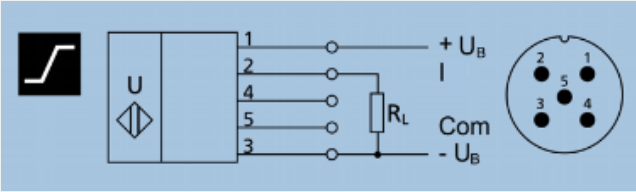
pico+100/I

outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	100 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+100/WK/I
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
documentation (download)	
pin assignment	

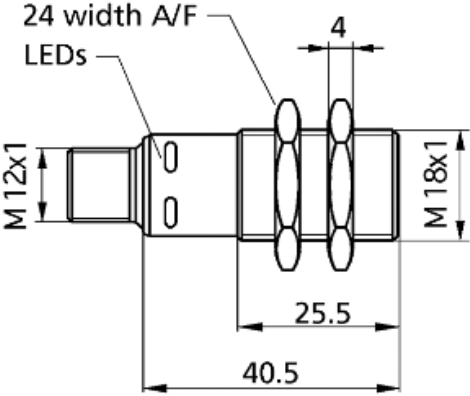
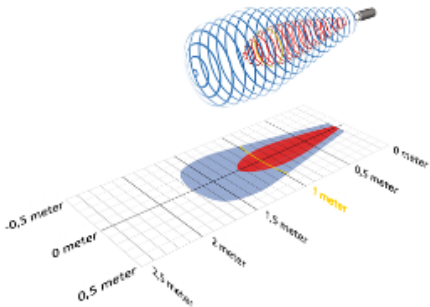


pico+100/WK/I

scale drawing	detection zone
	
 1 x analogue	 1,300 mm
operating range	120 - 1,000 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	analogue distance measurements
particularities	90° angular head
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	200 kHz
blind zone	120 mm
operating range	1,000 mm
maximum range	1,300 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.38 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

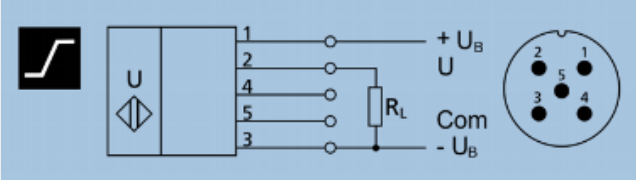
pico+100/WK/I

outputs	
output 1	analogue output current: 4-20 mA switchable rising/falling
response time	100 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	90° angular head
documentation (download)	
pin assignment	



pico+100/U

scale drawing	detection zone
	
 1 x analogue	 1,300 mm
operating range	120 - 1,000 mm
design	cylindrical M18
operating mode	analogue distance measurements
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	200 kHz
blind zone	120 mm
operating range	1,000 mm
maximum range	1,300 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.38 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

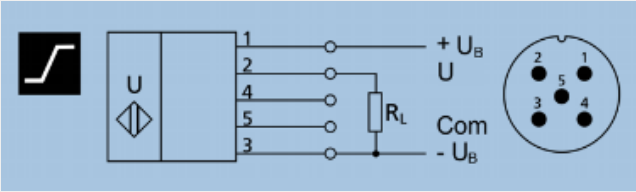
pico+100/U

outputs	
output 1	analogue output voltage: 0-10 V, short-circuit-proof switchable rising/falling
response time	100 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+100/WK/U
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
documentation (download)	
pin assignment	

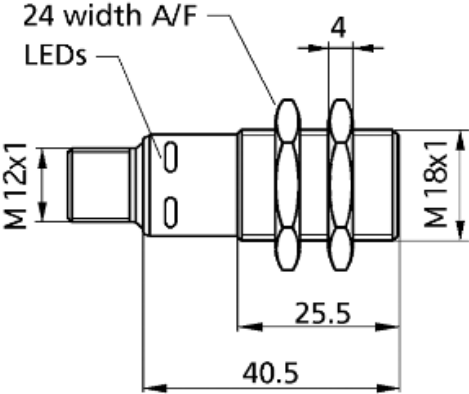
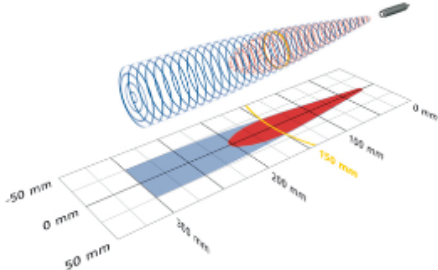


pico+100/WK/U

scale drawing	detection zone
 1 x analogue	 1,300 mm
operating range	120 - 1,000 mm
design	cylindrical M18 with radially-arranged ultrasonic transducer (90° angular head)
operating mode	analogue distance measurements
particularities	90° angular head
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	200 kHz
blind zone	120 mm
operating range	1,000 mm
maximum range	1,300 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm to 0.38 mm, depending on the analogue window
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U_B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

pico+100/WK/U

outputs	
output 1	analogue output voltage: 0-10 V, short-circuit-proof switchable rising/falling
response time	100 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: object in the window
particularities	90° angular head
documentation (download)	
pin assignment	

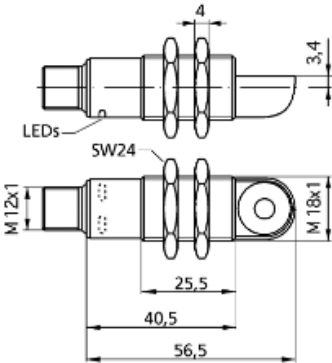
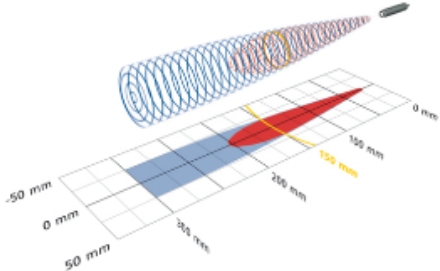


pico+15/F

scale drawing	detection zone
	
 1 x Push-Pull	 250 mm
operating range	20 - 150 mm
design	cylindrical M18
operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	narrow sound field IO-Link
ultrasonic -specific	
means of measurement	echo propagation time measurement
transducer frequency	380 kHz
blind zone	21 mm
operating range	150 mm
maximum range	250 mm
angle of beam spread	please see graphics detection zone
resolution/sampling rate	0.069 mm
reproducibility	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)
electrical data	
operating voltage U _B	10 - 30 V d.c., reverse polarity protection
voltage ripple	± 10 %
no-load current consumption	40 mA
type of connection	5-pin M12 initiator plug

pico+15/F

outputs	
output 1	switching output Push-Pull: $I_{\max} = 100 \text{ mA}$ ($U_B = 3V$)
switching hysteresis	2.0 mm
switching frequency	25 Hz
response time	32 ms
delay prior to availability	< 300 ms
inputs	
input 1	com input synchronisation input teach-in input
housing	
material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	30 g
further versions	90° angular head
further versions	pico+15/WK/F
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	narrow sound field IO-Link
documentation (download)	
pin assignment	

pico+15/WK/F

scale drawing	detection zone
	
 1 x Push-Pull	 250 mm
operating range	20 - 150 mm
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operating mode	proximity switch/reflective mode reflective barrier window mode
particularities	90° angular head narrow sound field IO-Link
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pico+15/WK/F

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material	brass sleeve, nickel-plated, plastic parts, PBT
ultrasonic transducer	polyurethane foam, epoxy resin with glass contents
max. tightening torque of nuts	15 Nm
class of protection to EN 60529	IP 67
operating temperature	-25°C to +70°C
storage temperature	-40°C to +85°C
weight	35 g
technical features/characteristics	
temperature compensation	yes
controls	com input
scope for settings	Teach-in via com input on pin 5 LCA-2 with LinkControl IO-Link
synchronization	yes
multiplex	yes
indicators	1 x LED green: working, 1 x LED yellow: switch status
particularities	90° angular head narrow sound field IO-Link
documentation (download)	
pin assignment	