c UL US LISTED

mic+

mic+ sensors are available in four unit variants with five different detection ranges.

HIGHLIGHTS

› Digital display with direct measured value output in mm/cm or %

› IO-Link interface › for support of the new industry standard

› Numeric configuration of the sensor using digital display › permits complete advance configuration of the sensor

› Automatic synchronisation and multiplex operation › for simultaneous operation of up to ten sensors in close quarters

› UL Listed to Canadian and US safety standards

BASICS

› 1 Push-Pull switching output › pnp or npn basis

› 1 or 2 switching outputs › in pnp or npn variants

› Analogue output 4–20 mA and 0–10 V › with automatic switching between current and voltage outputs

› Analogue output plus 1 pnp switching output

› 5 detection ranges with a measurement range of 30 mm to 8 m

› microsonic Teach-in by using button T1 or T2

› 0.025 mm to 2.4 mm resolution

› Temperature compensation

› 9–30 V operating voltage

› LinkControl › for configuration of sensors from a PC

IO-Link integrated

Also see the chapter "Function and advantages"

TouchControl with LED display

Winding diameter measuring at the laminating machine

The mic+ sensor family

embedded in its M30 housing design covers a measuring range from 30 mm to 8 m with its five detection ranges. Depending on the detection range, the internal resolution for distance measurement is 0.025 mm to 2.4 mm. All sensors are equipped with integrated temperature compensation.

The sensors are listed to applicable UL Standards and requirements by UL for Canada and the US.

Four different output stages

are available for all five detection ranges:

- 1 switching output, optionally in pnp, npn or Push-Pull circuitry
- 2 switching outputs, optionally in pnp or npn circuitry
- 1 analogue output 4–20 mA and 0–10 V
- 1 analogue output with an additional pnp switching output

With TouchControl

all sensor settings are made. The easily readable LED display constantly shows the current distance value and automatically alternates between the millimetre and centimetre indication. By operating the two keys beneath the LED display, the parameterisation is called up and the self-explanatory menu structure is run through. The detection points of the switching outputs and the window limits for the analogue output can be preset numerically via the LED display without the object to be detected being positioned within the detection range. Therefore, it is possible to completely set the sensor without the help of auxiliary reflectors, even outside the actual application.

Two three-colour LEDs

always indicate the current status of the switching outputs and/or the analogue output.

Further additional functions (add-ons)

are available as an option within the TouchControl menu structure.

Measured distances can be smoothed with different measurement filters and dampened using a ten-level filter. A high measuring-value attenuation is useful for filling-level measuring operations with wave motions or in situations where parts may sporadically fly between the sensor and the actual measuring surface. The default filter is F01. Thus, the sensors are preset for rapid counting and control operations.

As further add-ons, the default settings of the switching hysteresis of the switching outputs can be changed if required. The LED display can be permanently switched off or dimmed.

Analogue sensors

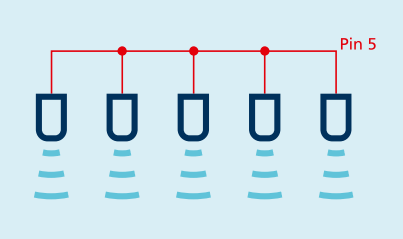
verify the load connected to the output and automatically switch to 4–20 mA current output and 0–10 V voltage output depending on the resistance value. The load verification by the sensor is always initiated upon connection of the operating voltage.

In the add-on menu of TouchControl, the user can, however, also preset the sensor to current or voltage output. In this menu, the measuring value output on the LED display with analogue sensors can additionally be changed to indicate percentage. The window limits of the analogue characteristic curve then correspond to the 0 % or the 100 % value respectively.

Synchronisation

of up to ten sensors automatically also operates in a mixed configuration of sensors with different detection ranges. The measurement repetition rate is then determined by the sensor with the largest detection range. If the sensors are electrically connected via pin 5 of the M12 circular connector, the synchronisation is active.

In synchronised operation, all sensors initiate the measuring process at exactly the same time. With relatively narrow mounting distances between the sensors, a sensor may also receive echo signals from an adjacent sensor. This can be used as an advantage, e.g. to broaden a sensor's detection range.



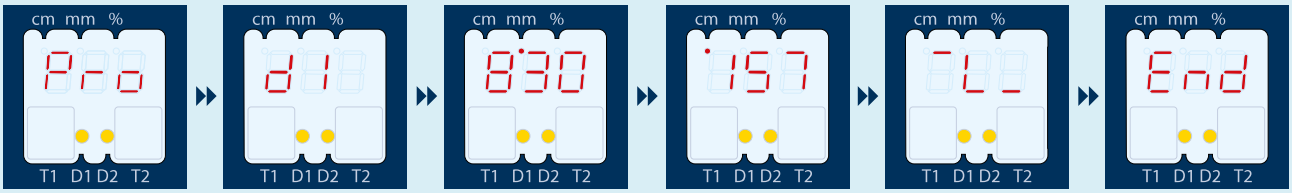
Synchronisation via pin 5

If more than ten sensors need to be synchronised, this can be carried out with the SyncBox1, which is available as an accessory.

Multiplex operation

ensures that each sensor can only receive echo signals from its own transmission pulse, which completely avoids any interference between the sensors (crosstalk).

Numerical setting via LED display



Press both keys until "Pro" for programming is shown on the LED display.

Select the output to be set (according to sensor type d1, d2 or IU).

Via the LED display, set the switching point (or, with analogue outputs, the sensor-close window limit) in mm/cm.

If window mode is required for the switching output, the rear window limit must be set (or, with analogue outputs, the sensor-distant window limit) in mm/cm.

Select between NCC and NOC (or, with analogue outputs, between rising and falling characteristic).

Ready.

For numerical input, the object to be detected does not need to be placed within the sensor's detection range.

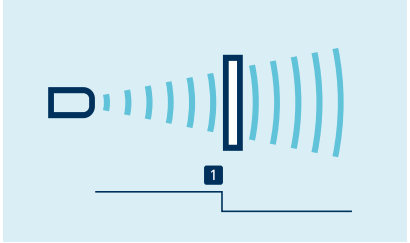
Each sensor is assigned an address from 1 to 10 for this purpose in the add-on menu. The sensors then work in multiplex mode and carry out their measurements one after the other in ascending address order.

The setting of a switching or an analogue output

is either carried out by means of numerically entering the desired distance values (refer to graphic left below) or by means of a Teach-in procedure (refer to this page). Thanks to this, the user can select the preferred setting mode.

In the microsonic Teach-in process

the object to be detected must be placed in the desired distance 1 to the sensor. The button assigned to the output must then be pressed until tEACH d1 (or tEACH d2) appears on the LED display. Finally, the Teach-in procedure must be confirmed by a further short keystroke. Ready.



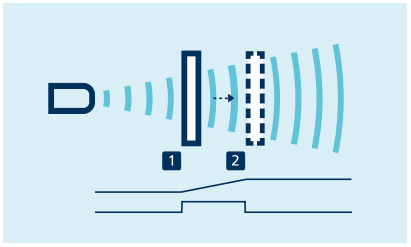
Teach-in of a switching point

To set an analogue output

the object to be detected must first be placed on the sensor-close window limit 1 and the key assigned to the output must be pressed until tEACH 1U appears on the display. Then, the object to be detected must be moved to the sensor-distant window limit 2 and the Teach-in procedure must be terminated by a further short keystroke. Ready.

To set of window mode

with two switching points, is the same as setting a switching point.



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

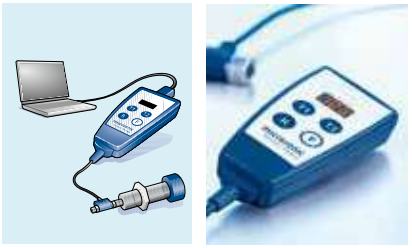
NCC/NOC

for the switching outputs and rising/falling characteristic for the analogue sensors can also be set by means of the Teach-in procedure. For this, press the key assigned to output until the symbol ¯L_ or _-¯ appears on the display.

With each further keystroke, the NCC/NOC (_⌋¯/¯L_) and rising/falling (_-¯/¯-_) settings are alternated. After approx. 10 seconds, the new setting is automatically stored.

LinkControl

consists of the LinkControl adapter and the LinkControl software and facilitates the configuration of the mic+ sensors via a PC or laptop with all conventional Windows® operating systems. All settings of the TouchControl menu can be read out during operation, edited on the PC, buffered and re-entered into the sensor. Especially the two measuring value plotters for the visualisation of distance values support the development of solutions for complex automation tasks (also refer to the chapter "Accessories").

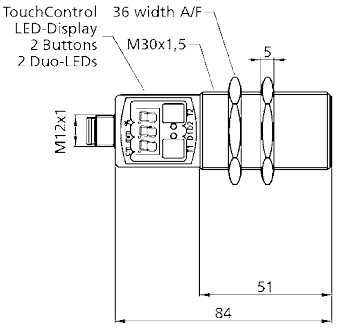


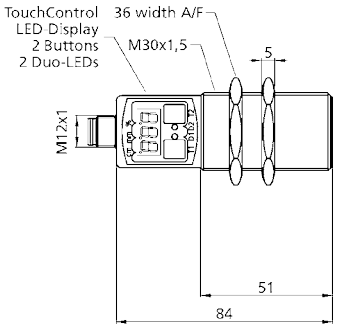
Sensor connected to the PC via LCA-2 for programming

IO-Link integrated

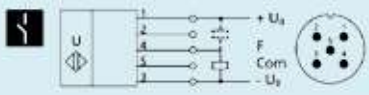
in version 1.1 for sensors with single switching output.

	mic+25	mic+35
	0.25 m	0.35 m
measuring range	**30 – 350 mm**	**65 – 600 mm**

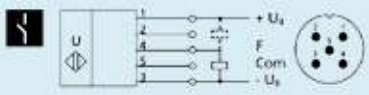




blind zone	30 mm	65 mm
operating range	250 mm	350 mm
maximum range	350 mm	600 mm
angle of beam spread	please see ⓘ	please see ⓘ
transducer frequency	320 kHz	400 kHz
resolution/sampling rate	0.1 mm	0.1 mm
reproducibility	± 0.15 %	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)	± 1 % (temperature drift internally compensated)
operating voltage U_B	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
no-load current consumption	≤ 80 mA	≤ 80 mA
housing	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU; ultrasonic transducer: polyurethane foam, epoxy resin with glass content	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU; ultrasonic transducer: polyurethane foam, epoxy resin with glass content
class of protection according to EN 60529	IP 67	IP 67
type of connection	5-pin M12 initiator plug	5-pin M12 initiator plug
controls	TouchControl	TouchControl
scope for settings	• numeric configuration and Teach-in • LCA-2 with LinkControl • IO-Link	• numeric configuration and Teach-in • LCA-2 with LinkControl • IO-Link
IO-Link	V 1.1	V 1.1
IO-Link SIO mode support	yes	yes
IO-Link min. cycle time	8.4 ms	16 ms
Smart Sensor Profile	yes	yes
operating temperature	-25°C to +70°C	-25°C to +70°C
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	150 g	150 g
switching hysteresis[1]	3 mm	5 mm
switching frequency[1]	25 Hz	12 Hz
response time[1]	32 ms	64 ms
delay prior to availability	< 300 ms	< 300 ms
order number[1,2]	**mic+25/F/TC**	**mic+35/F/TC**
switching output	Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA	Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA



1 Push-Pull switching output



1 Push-Pull switching output

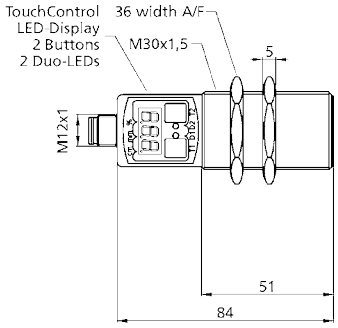
Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.

[1] Can be programmed with TouchControl, LinkControl and IO-Link.

mic+130

1.3 m

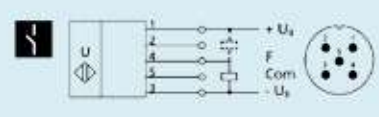
200–2,000 mm



200 mm
1,300 mm
2,000 mm
please see ⓘ
200 kHz
1 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
• IO-Link
V 1.1
yes
23.2 ms
yes
-25°C to +70°C
-40°C to +85°C
150 g
20 mm
8 Hz
92 ms
< 300 ms

mic+130/F/TC

Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA

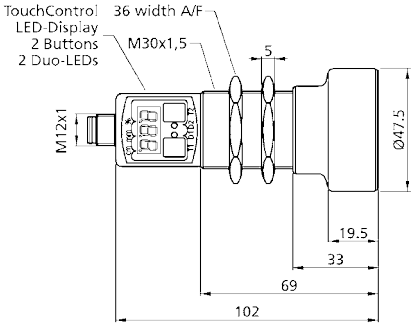


1 Push-Pull switching output

mic+340

3.4 m

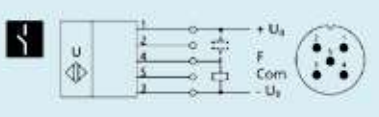
350–5,000 mm



350 mm
3,400 mm
5,000 mm
please see ⓘ
120 kHz
1 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
• IO-Link
V 1.1
yes
43.2 ms
yes
-25°C to +70°C
-40°C to +85°C
210 g
50 mm
4 Hz
172 ms
< 380 ms

mic+340/F/TC

Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA

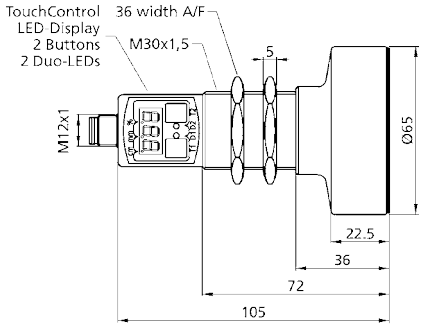


1 Push-Pull switching output

mic+600

6.0 m

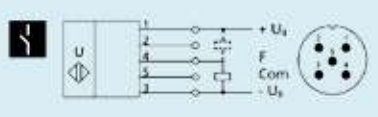
600–8,000 mm



600 mm
6,000 mm
8,000 mm
please see ⓘ
80 kHz
1 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
• IO-Link
V 1.1
yes
60.8 ms
yes
-25°C to +70°C
-40°C to +85°C
270 g
100 mm
3 Hz
240 ms
< 450 ms

mic+600/F/TC

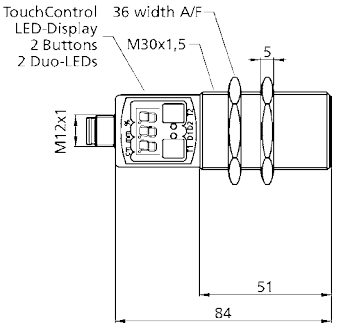
Push-Pull, U_B-3 V, -U_B+3 V, I_{max} = 100 mA

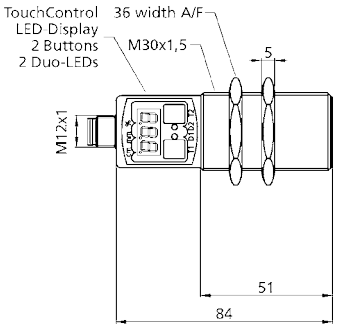


1 Push-Pull switching output

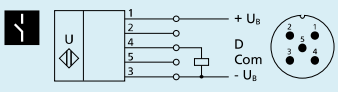
[2] Model with cable on request.

	mic+25	mic+35
	0.25 m	0.35 m
measuring range	**30 – 350 mm**	**65 – 600 mm**

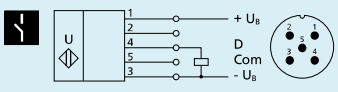




blind zone	30 mm	65 mm
operating range	250 mm	350 mm
maximum range	350 mm	600 mm
angle of beam spread	please see ⓘ	please see ⓘ
transducer frequency	320 kHz	400 kHz
resolution/sampling rate	0.025 mm	0.025 mm
reproducibility	± 0.15 %	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)	± 1 % (temperature drift internally compensated)
operating voltage U_B	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
no-load current consumption	≤ 80 mA	≤ 80 mA
housing	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU; ultrasonic transducer: polyurethane foam, epoxy resin with glass content	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU; ultrasonic transducer: polyurethane foam, epoxy resin with glass content
class of protection according to EN 60529	IP 67	IP 67
type of connection	5-pin M12 initiator plug[2]	5-pin M12 initiator plug[2]
controls	TouchControl	TouchControl
scope for settings	• numeric configuration and Teach-in • LCA-2 with LinkControl	• numeric configuration and Teach-in • LCA-2 with LinkControl
indicators	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs
operating temperature	-25°C to +70°C	-25°C to +70°C
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	150 g	150 g
switching hysteresis[3]	3 mm	5 mm
switching frequency[3]	25 Hz	12 Hz
response time[3]	32 ms	64 ms
delay prior to availability	< 300 ms	< 300 ms
order number[1,2]	**mic+25/D/TC**	**mic+35/D/TC**
switching output	pnp, U_B-2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof	pnp, U_B-2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof

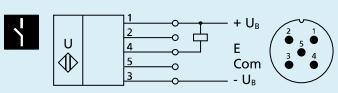


1 pnp switching output

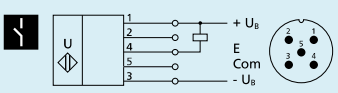


1 pnp switching output

order number[1]	**mic+25/E/TC**	**mic+35/E/TC**
switching output	npn, -U_B+2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof	npn, -U_B+2 V, I_{max} = 200 mA NOC/NCC adjustable, short-circuit-proof



1 npn switching output



1 npn switching output

c UL us LISTED

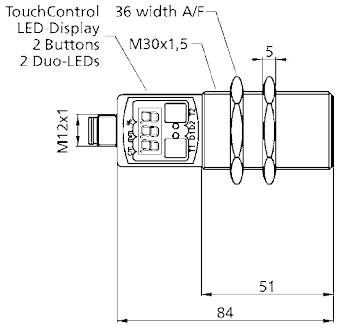
Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.

[1] To order the stainless-steel version, please add the suffix **/E** to the order number.

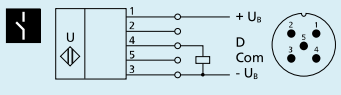
mic+130

1.3 m

200 – 2,000 mm

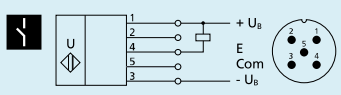


200 mm
1,300 mm
2,000 mm
please see ⓘ
200 kHz
0.18 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
150 g
20 mm
8 Hz
92 ms
< 300 ms
mic+130/D/TC
pnp, U_B-2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof



1 pnp switching output

mic+130/E/TC
npn, -U_B+2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof

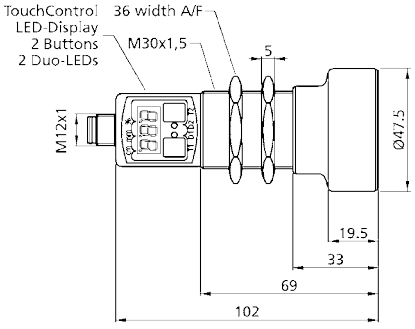


1 npn switching output

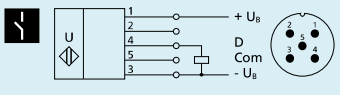
mic+340

3.4 m

350 – 5,000 mm

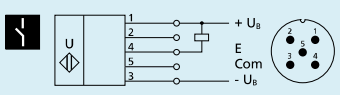


350 mm
3,400 mm
5,000 mm
please see ⓘ
120 kHz
0.18 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
210 g
50 mm
4 Hz
172 ms
< 380 ms
mic+340/D/TC
pnp, U_B-2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof



1 pnp switching output

mic+340/E/TC
npn, -U_B+2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof

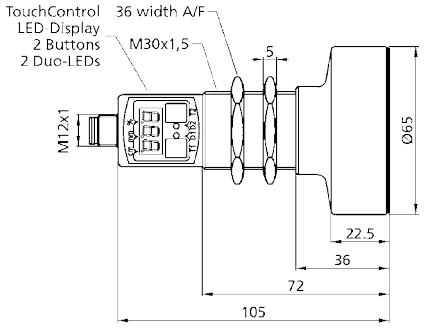


1 npn switching output

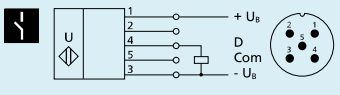
mic+600

6.0 m

600 – 8,000 mm

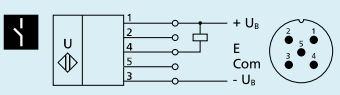


600 mm
6,000 mm
8,000 mm
please see ⓘ
80 kHz
0.18 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
270 g
100 mm
3 Hz
240 ms
< 450 ms
mic+600/D/TC
pnp, U_B-2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof



1 pnp switching output

mic+600/E/TC
npn, -U_B+2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof

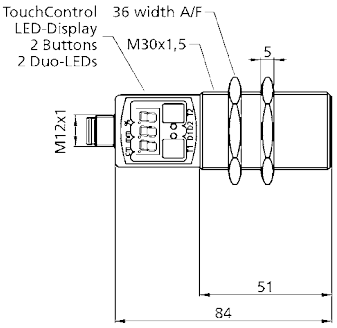


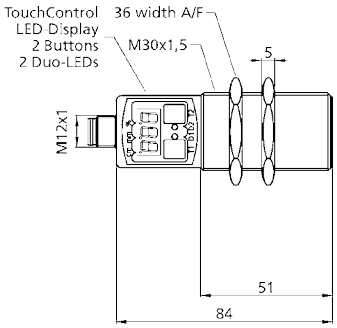
1 npn switching output

[2] Model with cable on request.

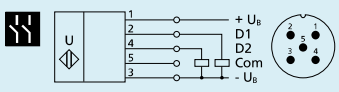
[3] Can be programmed with TouchControl and LinkControl.

	mic+25	mic+35
	0.25 m	0.35 m
measuring range	**30 – 350 mm**	**65 – 600 mm**

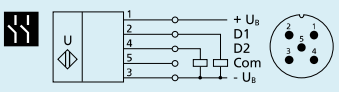




blind zone	30 mm	65 mm
operating range	250 mm	350 mm
maximum range	350 mm	600 mm
angle of beam spread	please see ⓘ	please see ⓘ
transducer frequency	320 kHz	400 kHz
resolution/sampling rate	0.025 mm	0.025 mm
reproducibility	± 0.15 %	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)	± 1 % (temperature drift internally compensated)
operating voltage U_B	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
no-load current consumption	≤ 80 mA	≤ 80 mA
housing	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU; ultrasonic transducer: polyurethane foam, epoxy resin with glass content	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU; ultrasonic transducer: polyurethane foam, epoxy resin with glass content
class of protection according to EN 60529	IP 67	IP 67
type of connection	5-pin M12 initiator plug[2]	5-pin M12 initiator plug[2]
controls	TouchControl	TouchControl
scope for settings	• numeric configuration and Teach-in • LCA-2 with LinkControl	• numeric configuration and Teach-in • LCA-2 with LinkControl
indicators	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs
operating temperature	-25°C to +70°C	-25°C to +70°C
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	150 g	150 g
switching hysteresis[3]	3 mm	5 mm
switching frequency[3]	25 Hz	12 Hz
response time[3]	32 ms	64 ms
delay prior to availability	< 300 ms	< 300 ms
order number[1),2)]	**mic+25/DD/TC**	**mic+35/DD/TC**
switching outputs	2 x pnp, U_B-2 V, I_{max} = 2 x 200 mA NOC/NCC adjustable, short-circuit-proof	2 x pnp, U_B-2 V, I_{max} = 2 x 200 mA NOC/NCC adjustable, short-circuit-proof

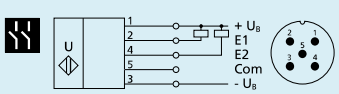


2 pnp switching outputs

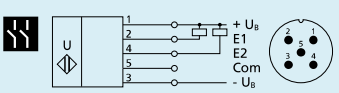


2 pnp switching outputs

order number[1),2)]	**mic+25/EE/TC**	**mic+35/EE/TC**
switching outputs	2 x npn, -U_B+2 V, I_{max} = 2 x 200 mA NOC/NCC adjustable, short-circuit-proof	2 x npn, -U_B+2 V, I_{max} = 2 x 200 mA NOC/NCC adjustable, short-circuit-proof



2 npn switching outputs



2 npn switching outputs

c UL us LISTED

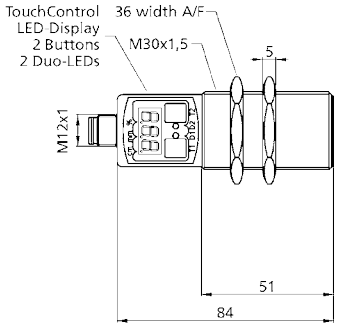
Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.

[1)] To order the stainless-steel version, please add the suffix **/E** to the order number.

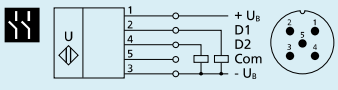
mic+130

1.3 m

200–2,000 mm

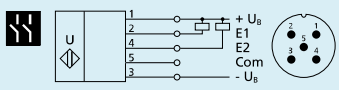


200 mm
1,300 mm
2,000 mm
please see ⓘ
200 kHz
0.18 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
150 g
20 mm
8 Hz
92 ms
< 300 ms
mic+130/DD/TC
2 x pnp, U_B-2 V, I_{max} = 2 x 200 mA
NOC/NCC adjustable, short-circuit-proof



2 pnp switching outputs

mic+130/EE/TC
2 x npn, -U_B+2 V, I_{max} = 2 x 200 mA
NOC/NCC adjustable, short-circuit-proof

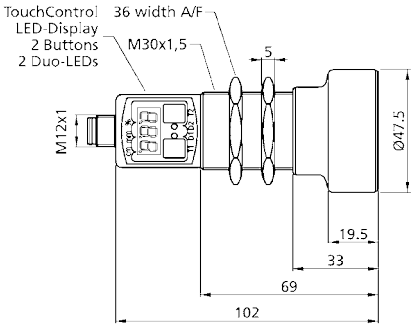


2 npn switching outputs

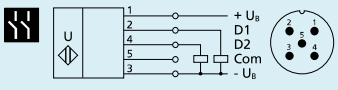
mic+340

3.4 m

350–5,000 mm

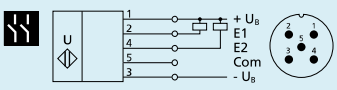


350 mm
3,400 mm
5,000 mm
please see ⓘ
120 kHz
0.18 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
210 g
50 mm
4 Hz
172 ms
< 380 ms
mic+340/DD/TC
2 x pnp, U_B-2 V, I_{max} = 2 x 200 mA
NOC/NCC adjustable, short-circuit-proof



2 pnp switching outputs

mic+340/EE/TC
2 x npn, -U_B+2 V, I_{max} = 2 x 200 mA
NOC/NCC adjustable, short-circuit-proof

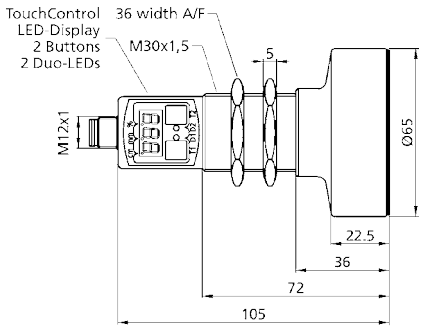


2 npn switching outputs

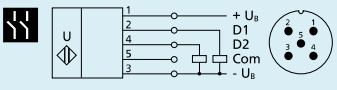
mic+600

6.0 m

600–8,000 mm

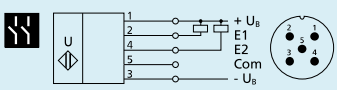


600 mm
6,000 mm
8,000 mm
please see ⓘ
80 kHz
0.18 mm
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
270 g
100 mm
3 Hz
240 ms
< 450 ms
mic+600/DD/TC
2 x pnp, U_B-2 V, I_{max} = 2 x 200 mA
NOC/NCC adjustable, short-circuit-proof



2 pnp switching outputs

mic+600/EE/TC
2 x npn, -U_B+2 V, I_{max} = 2 x 200 mA
NOC/NCC adjustable, short-circuit-proof

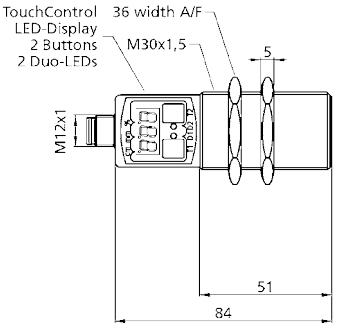


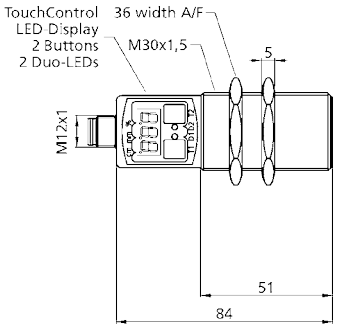
2 npn switching outputs

[2] Model with cable on request.

[3] Can be programmed with TouchControl and LinkControl.

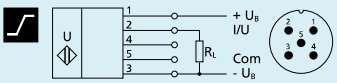
	mic+25	mic+35
	0.25 m	0.35 m
measuring range	**30 – 350 mm**	**65 – 600 mm**



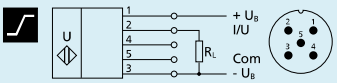


blind zone	30 mm	65 mm
operating range	250 mm	350 mm
maximum range	350 mm	600 mm
angle of beam spread	please see ⓘ	please see ⓘ
transducer frequency	320 kHz	400 kHz
resolution/sampling rate	0.025 mm to 0.10 mm, depending on	0.025 mm to 0.17 mm, depending on
	the analogue window	the analogue window
reproducibility	± 0.15 %	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)	± 1 % (temperature drift internally compensated)
operating voltage U_B	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
no-load current consumption	≤ 80 mA	≤ 80 mA
housing	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
	ultrasonic transducer: polyurethane foam,	ultrasonic transducer: polyurethane foam,
	epoxy resin with glass content	epoxy resin with glass content
class of protection according to EN 60529	IP 67	IP 67
type of connection	5-pin M12 initiator plug[2]	5-pin M12 initiator plug[2]
controls	TouchControl	TouchControl
scope for settings	• numeric configuration and Teach-in	• numeric configuration and Teach-in
	• LCA-2 with LinkControl	• LCA-2 with LinkControl
indicators	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs
operating temperature	-25°C to +70°C	-25°C to +70°C
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	150 g	150 g
response time[3]	32 ms	64 ms
delay prior to availability	< 300 ms	< 300 ms
order number[1),2)]	**mic+25/IU/TC**	**mic+35/IU/TC**
analogue output	current output 4 – 20 mA	current output 4 – 20 mA
	voltage output 0 – 10 V (at $U_B \geq 15$ V),	voltage output 0 – 10 V (at $U_B \geq 15$ V),
	short-circuit-proof	short-circuit-proof
	switchable rising/falling	switchable rising/falling

Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.



analogue output



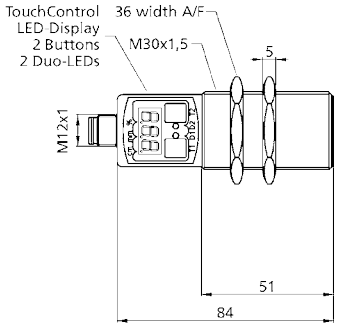
analogue output

[1] To order the stainless-steel version, please add the suffix **/E** to the order number.

mic+130

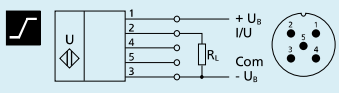
1.3 m

200–2,000 mm



200 mm
1,300 mm
2,000 mm
please see ⓘ
200 kHz
0.18 mm to 0.57 mm, depending on
the analogue window
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
150 g
92 ms
< 300 ms

mic+130/IU/TC
current output 4–20 mA
voltage output 0–10 V (at $U_B \geq 15$ V),
short-circuit-proof
switchable rising/falling

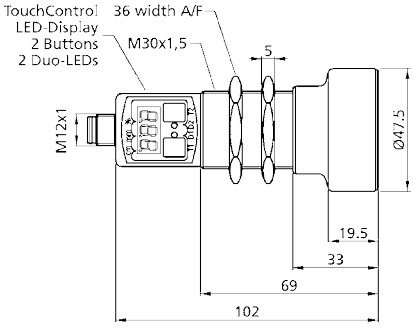


analogue output

mic+340

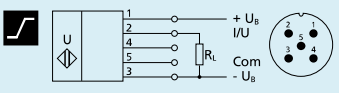
3.4 m

350–5,000 mm



350 mm
3,400 mm
5,000 mm
please see ⓘ
120 kHz
0.18 mm to 1.5 mm, depending on
the analogue window
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
210 g
172 ms
< 450 ms

mic+340/IU/TC
current output 4–20 mA
voltage output 0–10 V (at $U_B \geq 15$ V),
short-circuit-proof
switchable rising/falling

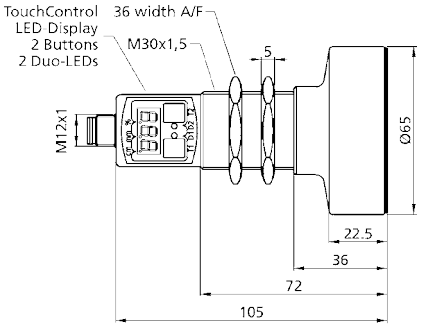


analogue output

mic+600

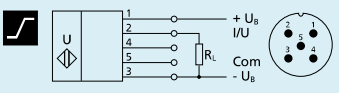
6.0 m

600–8,000 mm



600 mm
6,000 mm
8,000 mm
please see ⓘ
80 kHz
0.18 mm to 2.4 mm, depending on
the analogue window
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
270 g
240 ms
< 450 ms

mic+600/IU/TC
current output 4–20 mA
voltage output 0–10 V (at $U_B \geq 15$ V),
short-circuit-proof
switchable rising/falling

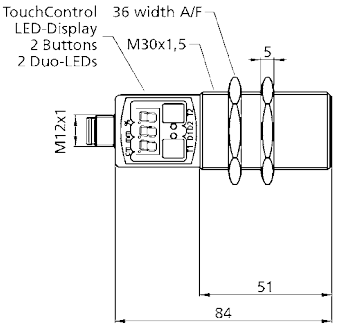


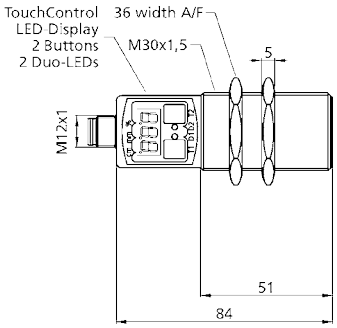
analogue output

[2] Model with cable on request.

[3] Can be programmed with TouchControl and LinkControl.

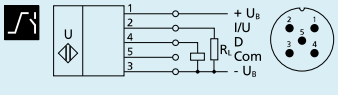
	mic+25	mic+35
	0.25 m	0.35 m
measuring range	**30–350 mm**	**65–600 mm**



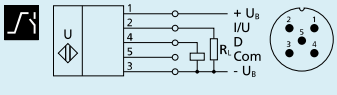


blind zone	30 mm	65 mm
operating range	250 mm	350 mm
maximum range	350 mm	600 mm
angle of beam spread	please see ⓘ	please see ⓘ
transducer frequency	320 kHz	400 kHz
resolution/sampling rate	0.025 mm to 0.10 mm, depending on	0.025 mm to 0.17 mm, depending on
	the analogue window	the analogue window
reproducibility	± 0.15 %	± 0.15 %
accuracy	± 1 % (temperature drift internally compensated)	± 1 % (temperature drift internally compensated)
operating voltage U_B	9 V to 30 V DC, reverse polarity protection	9 V to 30 V DC, reverse polarity protection
no-load current consumption	≤ 80 mA	≤ 80 mA
housing	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;	brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
	ultrasonic transducer: polyurethane foam,	ultrasonic transducer: polyurethane foam,
	epoxy resin with glass content	epoxy resin with glass content
class of protection according to EN 60529	IP 67	IP 67
type of connection	5-pin M12 initiator plug[2]	5-pin M12 initiator plug[2]
controls	TouchControl	TouchControl
scope for settings	• numeric configuration and Teach-in	• numeric configuration and Teach-in
	• LCA-2 with LinkControl	• LCA-2 with LinkControl
indicators	3-digit LED display, 2 three-colour LEDs	3-digit LED display, 2 three-colour LEDs
operating temperature	-25°C to +70°C	-25°C to +70°C
storage temperature	-40°C to +85°C	-40°C to +85°C
weight	150 g	150 g
switching hysteresis[3]	3 mm	5 mm
switching frequency[3]	25 Hz	12 Hz
response time[3]	32 ms	64 ms
delay prior to availability	< 300 ms	< 300 ms
order number[1],[2]	**mic+25/DIU/TC**	**mic+35/DIU/TC**
switching output	pnp, U_B-2 V, I_{max} = 200 mA	pnp, U_B-2 V, I_{max} = 200 mA
	NOC/NCC adjustable, short-circuit-proof	NOC/NCC adjustable, short-circuit-proof
analogue output	current output 4–20 mA	current output 4–20 mA
	voltage output 0–10 V (at $U_B \geq 15$ V),	voltage output 0–10 V (at $U_B \geq 15$ V),
	short-circuit-proof	short-circuit-proof
	switchable rising/falling	switchable rising/falling

Enclosure Type 1
For use only in industrial machinery NFPA 79 applications.



1 pnp switching output + analogue output



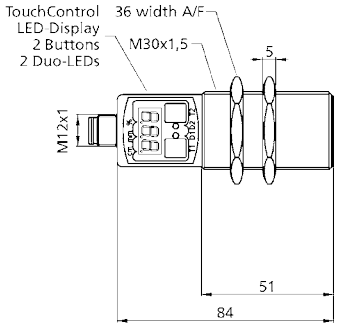
1 pnp switching output + analogue output

[1] To order the stainless-steel version, please add the suffix **/E** to the order number.

mic+130

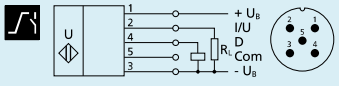
1.3 m

200–2,000 mm



200 mm
1,300 mm
2,000 mm
please see ⓘ
200 kHz
0.18 mm to 0.57 mm, depending on
the analogue window
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
150 g
20 mm
8 Hz
92 ms
< 300 ms

mic+130/DIU/TC
pnp, U_B-2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof
current output 4–20 mA
voltage output 0–10 V (at $U_B \geq 15$ V),
short-circuit-proof
switchable rising/falling

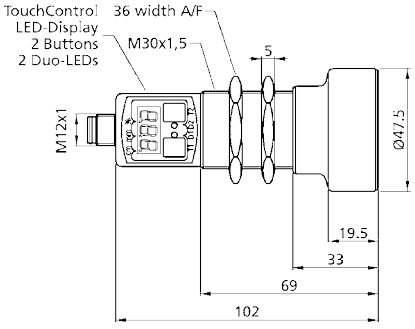


1 pnp switching output + analogue output

mic+340

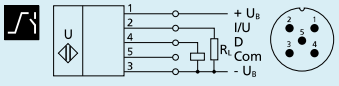
3.4 m

350–5,000 mm



350 mm
3,400 mm
5,000 mm
please see ⓘ
120 kHz
0.18 mm to 1.5 mm, depending on
the analogue window
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
210 g
50 mm
4 Hz
172 ms
< 450 ms

mic+340/DIU/TC
pnp, U_B-2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof
current output 4–20 mA
voltage output 0–10 V (at $U_B \geq 15$ V),
short-circuit-proof
switchable rising/falling

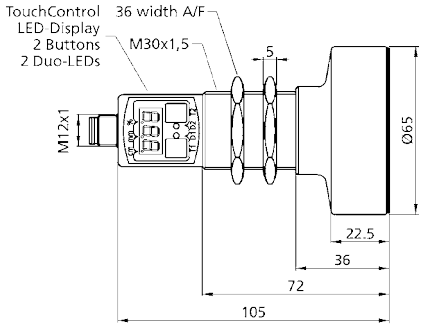


1 pnp switching output + analogue output

mic+600

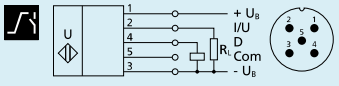
6.0 m

600–8,000 mm



600 mm
6,000 mm
8,000 mm
please see ⓘ
80 kHz
0.18 mm to 2.4 mm, depending on
the analogue window
± 0.15 %
± 1 % (temperature drift internally compensated)
9 V to 30 V DC, reverse polarity protection
≤ 80 mA
brass sleeve, nickel-plated[1], plastic parts: PBT, TPU;
ultrasonic transducer: polyurethane foam,
epoxy resin with glass content
IP 67
5-pin M12 initiator plug[2]
TouchControl
• numeric configuration and Teach-in
• LCA-2 with LinkControl
3-digit LED display, 2 three-colour LEDs
-25°C to +70°C
-40°C to +85°C
270 g
100 mm
3 Hz
240 ms
< 450 ms

mic+600/DIU/TC
pnp, U_B-2 V, I_{max} = 200 mA
NOC/NCC adjustable, short-circuit-proof
current output 4–20 mA
voltage output 0–10 V (at $U_B \geq 15$ V),
short-circuit-proof
switchable rising/falling



1 pnp switching output + analogue output

[2] Model with cable on request.

[3] Can be programmed with TouchControl and LinkControl.