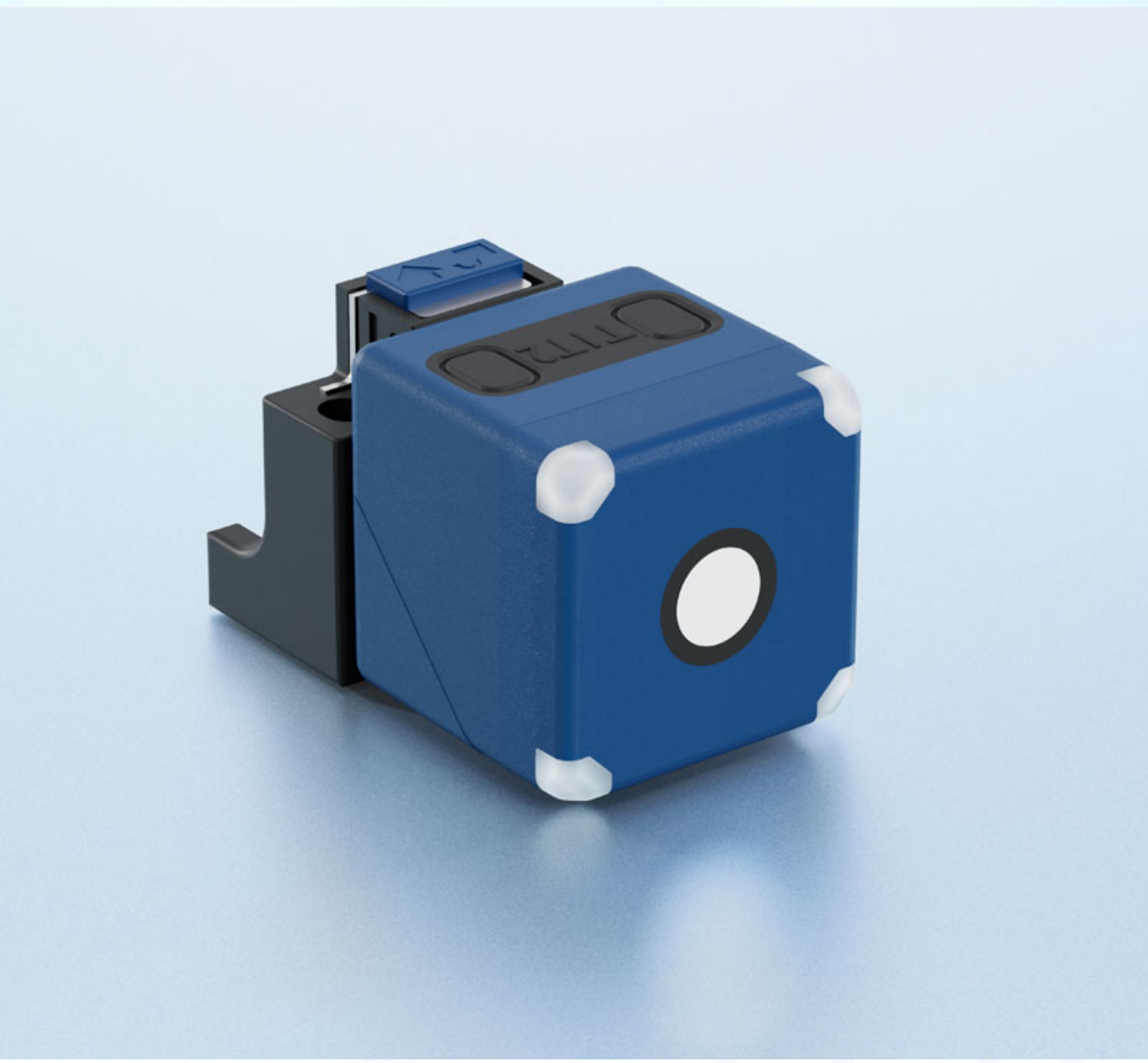
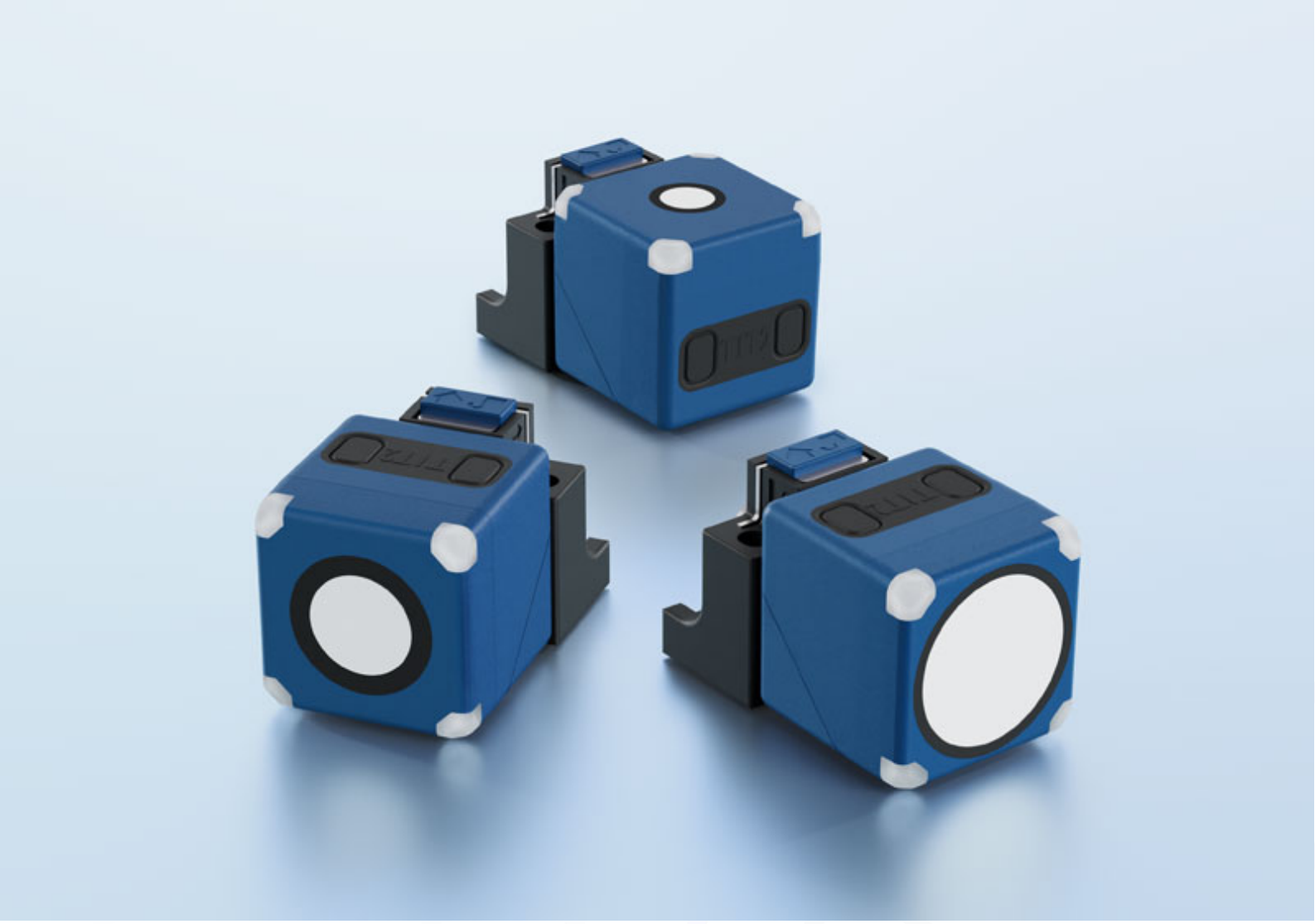
SENSOR PARTNERS



Extract from our online catalogue:

# cube-35/F



cube ultrasonic sensors – easy installation: no tools required thanks to QuickLock mounting bracket.

## HIGHLIGHTS

› Cubic miniature housing › only 40 mm x 40 mm x 40 mm
› Sensor head › mountable in 5 positions
› Easily visable LED display › in any mounting position
› Convenient QuickLock mounting bracket
› UL listed› to Canadian and US safety standards
› IO-Link interface › for support of the new industry standard
›Smart Sensor Profiles ›more transparency between IO-Link Devices

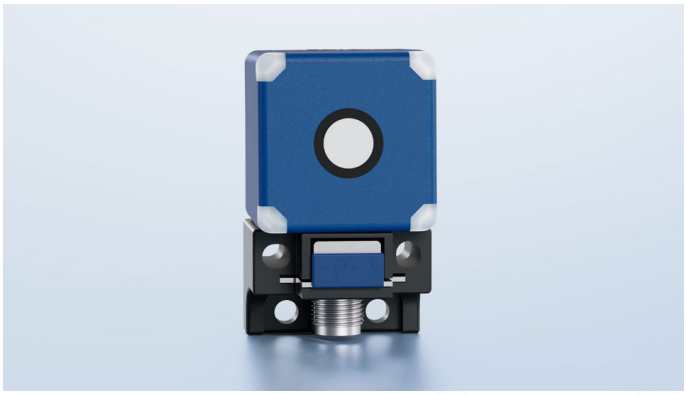
## BASICS

› 1 Push-Pull switching output › pnp or npn basis
› 1 Push-Pull switching output and 1 analogue output › or switchable to second switching output
› 3 detection ranges with a measurement range of 65 mm to 5 m
› microsonic Teach-in by using button T1 and T2
› Temperature compensation
› 9–30 V operating voltage
›LinkControl ›for configuration of sensors from a PC

# Description

### The cube ultrasonic sensors

are designed in a cubic housing for demanding applications. The cube is available with the QuickLock mounting bracket. This allows the sensor to be mounted quickly and easily.



*cube sensor with QuickLock mounting bracket*

The cube can be easily turned in 5 positions thanks to the rotating sensor head. The convenient mounting allows flexible use in numerous applications.

### Four LEDs

show all operating states in any mounting position. The sensor status is clearly visible.

### There are two output stages available:

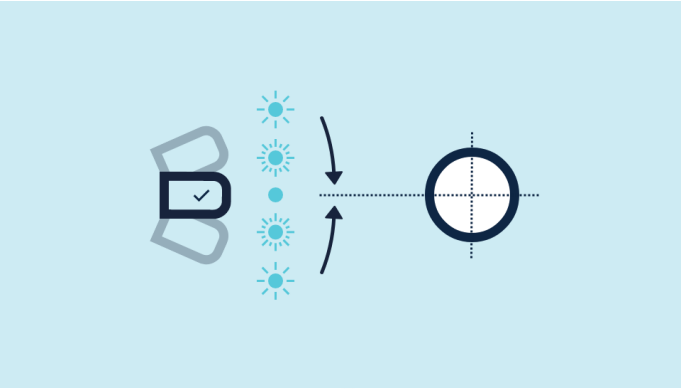
1 Push-Pull switching output in pnp- or npn-circuitry

1 Push-Pull switching output and 1 analogue output or switchable to 2. switching output

With LinkControl or IO-Link, the analogue output can be deactivated and a second Push-Pull switching output activated instead. The second switching output could be used in level monitoring, for example, to control the overflow.

### New! With the internal alignment assistance

the sensor can be optimally aligned to the object during installation.



*cube sensor using alignment assistance*

### Using the two Teach-in buttons T1 and T2

the cube sensors can be be easily set (microsonic Teach-in).

### IO-Link integrated

cube ultrasonic sensors support IO-Link in version 1.1.2 as well as Smart Sensor Profile.

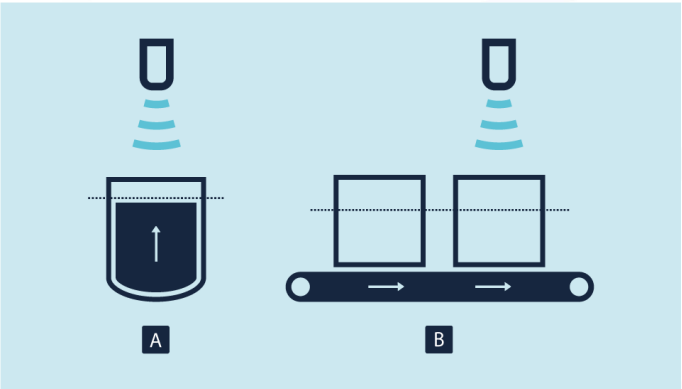
## Set cube sensor via Teach-in procedure

### The cube sensors with switching output have three operating modes:

- Single switching point (Method A and B)
- Two-way reflective barrier
- Window mode

### The operating mode single switching point (Method A)

is suitable for applications, in which the actual distance to the object is also the switching point. A typical application is level control, where the ultrasonic sensor detects the filling level vertically from above during the filling process. The taught switching point corresponds to the maximum filling level.



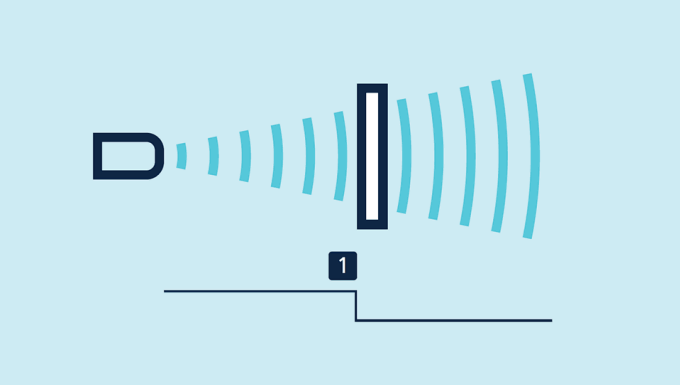
*Teach-in of a switching point Method A and Method B*

### The operating mode single switching point +8 % (Method B)

is recommended by objects, which move into the detection area from the side. In this case the switching distance is set 8 % further than the actual measured distance to the object. This ensures a reliable switching distance even if the height of the objects varies slightly.

### Teach-in of a single switching point (Method A)

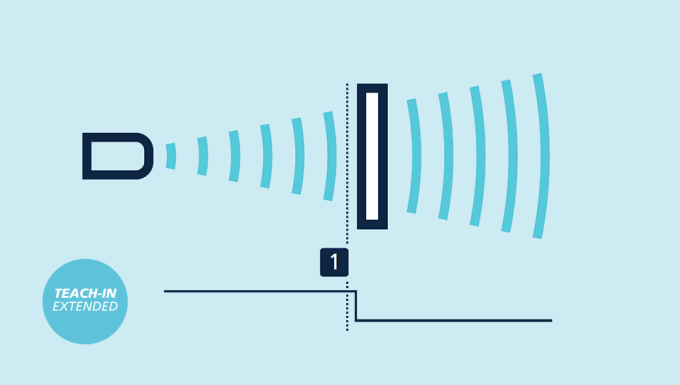
› Place object to be detected (1) at the desired distance
› Push button T2 for about 3 seconds
› Then push button T2 again for about 1 second




*Teach-in of a switching point (Method A)*

### Teach-in of a single switching point +8% (Method B)

› Place object to be detected (1) at the desired distance.
› Push button T2 for about 3 seconds.
› Then push button T2 again for about 3 seconds.



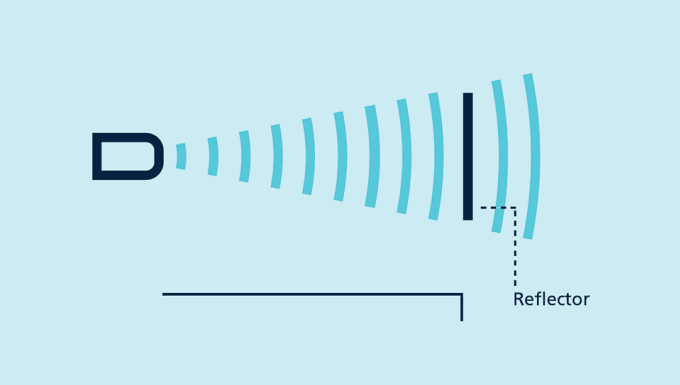

*Teach-in of a switching point +8% (Method B)*

### Teach-in of a two-way reflective barrier

with a fixed mounted reflector

› Push button T2 for about 3 seconds

› Then push button T2 again for about 10 seconds




*Teach-in of a two-way reflective barrier*

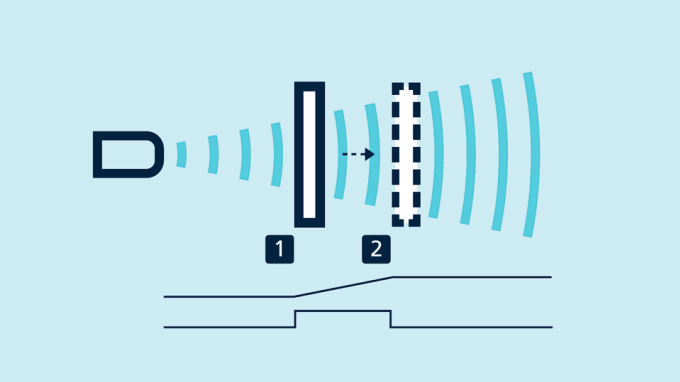
### For setting the analogue output

› Initially position the object to be detected to the sensor-close window limit (1)

› Push button T1 for about 3 seconds

› Then move the object to the sensor-distant window limit (2)

› Then push button T1 again for about 1 second




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

### For configuration of a window

with two switching points on a single switching output, the procedure is the same as setting the analogue characteristic.

### Analogue sensors

check the connected working resistance at the output and automatically switch to 4–20 mA current output or 0–10 V voltage output.

### NCC/NOC

and rising/falling analogue characteristics can also be set via the buttons.

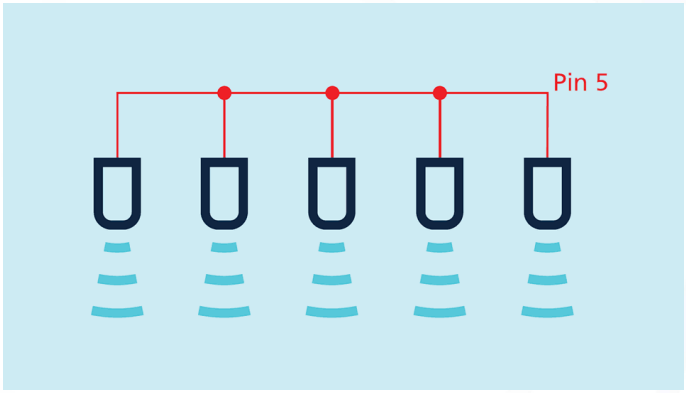
### LinkControl

permits comprehensive parameterisation of cube ultrasonic sensors via the LinkControl-Adapter LCA-2 which connects the sensors to the PC.


*Sensor connected to the PC via LCA-2 for programming*

### Easy to synchronise

If several cube ultrasonic sensors are operated in one application, the can be synchronised via pin 5 to prevent.




*Synchronisation via pin 5*

If more than 10 sensors must be synchronised, this can be carried out with the SyncBox1, which is available as an accessory. Synchronisation via pin 5 is also possible in IO-Link mode.



### Imprint

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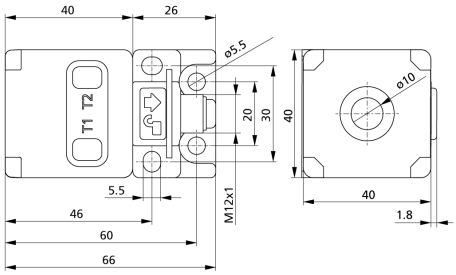
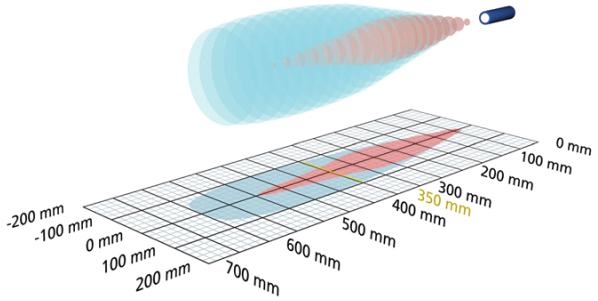
# cube-35/F

## scale drawing




## detection zone




1 x Push-Pull

600 mm

| | |
|---|---|
| measuring range | 65 - 600 mm |
| design | cuboidal |
| operating mode | IO-Link<br>proximity switch/reflective mode<br>reflective barrier<br>window mode |
| particularities | small cuboidal design<br>IO-Link version 1.1<br>Smart Sensor Profile<br>UL listed<br>QuickLock mounting bracket |

### 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 |
| resolution | 0.056 mm |
| reproducibility | ± 0.15 % |
| accuracy | ± 1 % (temperature drift internally compensated) |

### electrical data

| | |
|---|---|
| operating voltage $U_B$ | 9 - 30 V d.c., reverse polarity protection |
| voltage ripple | ± 10 % |
| no-load current consumption | ≤ 50 mA |
| type of connection | 5-pin M12 initiator plug |

# cube-35/F

| outputs | |
|---|---|
| output 1 | switching output<br>Push-Pull, $U_B$-3 V, -$U_B$+3 V,$I_{max}$ = 100 mA<br>NOC/NCC adjustable, short-circuit-proof |
| switching hysteresis | 5 mm |
| switching frequency | 12 Hz |
| response time | 64 ms |
| delay prior to availability | < 300 ms |

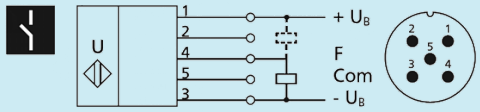
| inputs | |
|---|---|
| input 1 | com input<br>synchronisation input<br>teach-in input |

| IO-Link | |
|---|---|
| product name | cube-35/F |
| product ID | 43280 |
| SIO mode support | yes |
| COM mode | COM2 (38,4 kBaud) |
| min. cycle time | 16 ms |
| format of process data | 16 Bit, R, UNI16 |
| content of process data | Bit 0: state SSC1; Bit 2-4: signal stability; Bit 5-7: signal level; Bit 8-15: scale (Int. 8); Bit 16-31: measured value (Int. 16) |
| ISDU paramter | Identification, measuring configuration, switched output, filter, temperature compensation, operation |
| system commands | SP1 Teach-in, SP2 Teach-in, factory settings |
| Smart Sensor Profile | yes |
| IODD version | IODD version 1.1.2 |

| housing | |
|---|---|
| material | PA |
| ultrasonic transducer | polyurethane foam, epoxy resin with glass contents |
| class of protection to EN 60529 | IP 67 |
| operating temperature | -25°C to +70°C |
| storage temperature | -40°C to +85°C |
| weight | 120 g |

# cube-35/F

| technical features/characteristics | |
|---|---|
| temperature compensation | yes |
| controls | 2 push-buttons |
| scope for settings | Teach-in via push-button<br>Teach-in via com input on pin 5<br>LCA-2 with LinkControl<br>IO-Link |
| Synchronisation | yes |
| multiplex | yes |
| indicators | 2 x LED green, 2 x LED yellow |
| particularities | small cuboidal design<br>IO-Link version 1.1<br>Smart Sensor Profile<br>UL listed<br>QuickLock mounting bracket |

| | |
|---|---|
| pin assignment |  |
| order no. | **cube-35/F** |

The content of this document is subject to technical changes. Specifications in this document are presented in a descriptive way only. They do not warrant any product features.

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