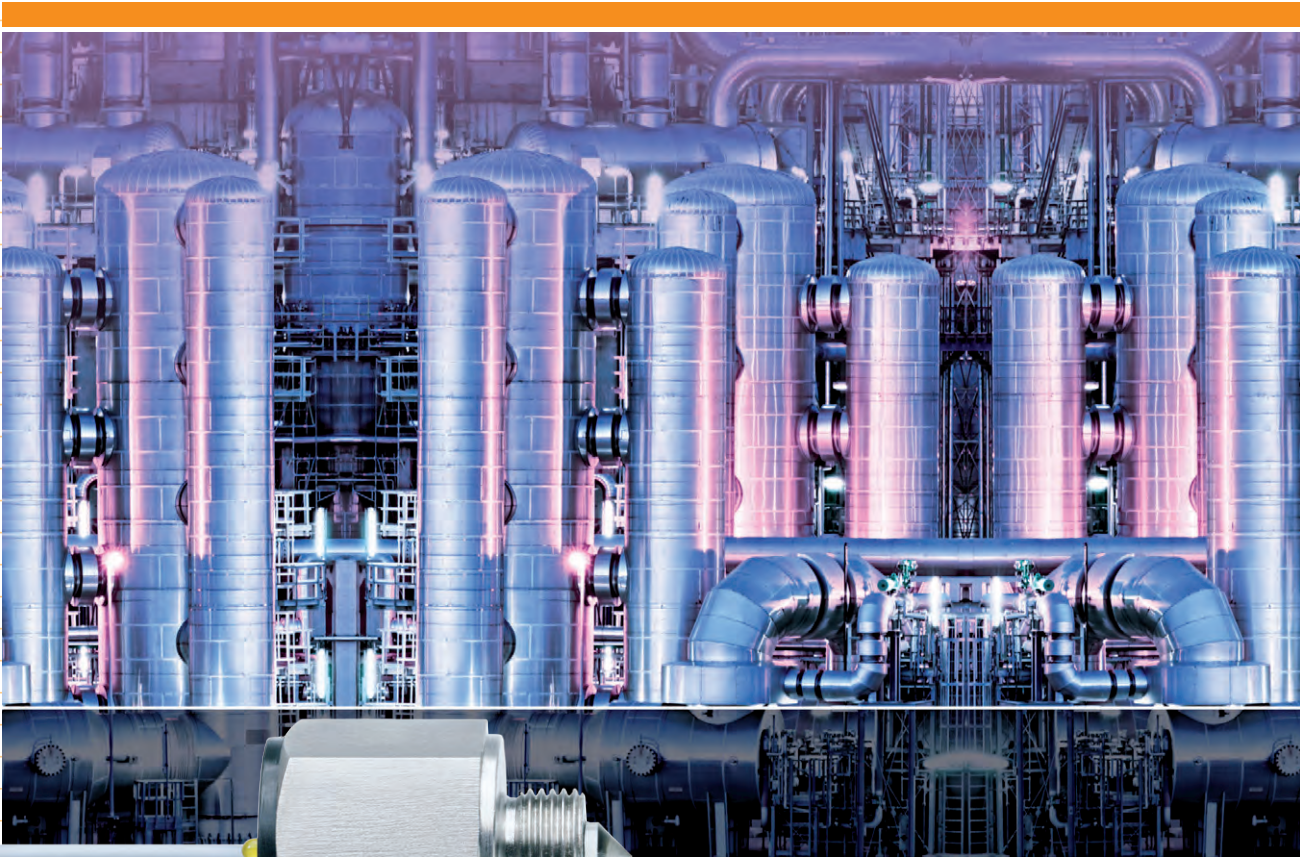


OPTO-ELECTRONIC LEVEL SENSORS FOR  
HORIZONTAL AND VERTICAL INSTALLATION



**Senlux<sup>o</sup> Besta**

The optoelectronic Senlux Besta level switches are used for the level control of liquids. They may be installed either vertically or horizontally.

## Base model OPG01

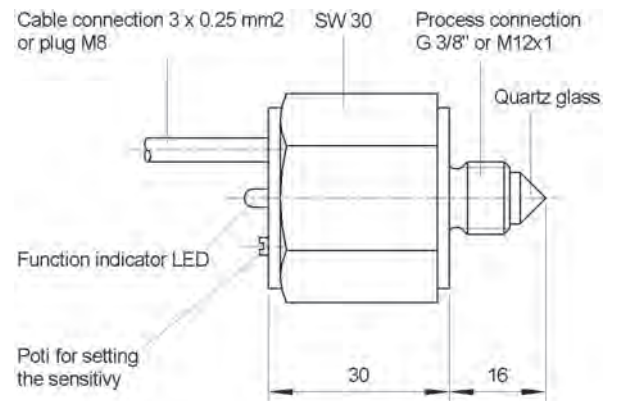
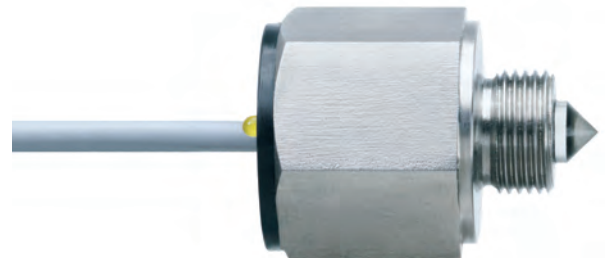
Product overview shown below

### Technical Data

Operating pressure	max. 10 bar
Ambient temperature	-25 to 70°C
Liquid temperature	-30 to 100°C; max. +150°C 15 during max. minutes
Measuring accuracy	± 0.5 mm
Material housing	stainless steel 1.4305
Material prism	quartz glass
min. distance sensor tip to reflecting wall	> 10 mm
Mounting direction	any
Process connections	G 3/8", M12x1 mm other types on request

### Electrical Data

Supply voltage	12...32 VDC
Supply current max.	40 mA
Switch point number	1
Output	PNP Transistor, reverse polarity protected close or open
Switch function	close or open
Protection	IP65
Indication of active output	1 LED
Electrical connection	cable PVC, PUR 3 x 0.25 mm <sup>2</sup> or plug M8, other types on request



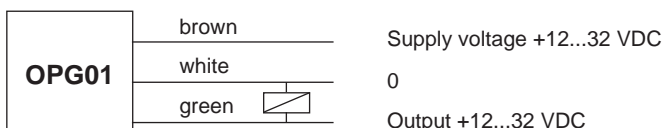
### Operating Principle

The optoelectronic sensor contains an infrared LED and a light receiver.

Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver.

When rising liquid immerses the prism, the light is refracted out into the liquid, leaving little or no light reach the receiver. Sensing this change, the receiver actuates electronic switching within the unit to operate an external alarm or control circuit.

### Connection diagram



Pin assignment	
1	Supply voltage +12...32 VDC
3	0
4	Output +12...32 VDC

## Product overview / order table

### OPG01

#### Process connection

- A Connection thread BSPP3/8"
- B Connection thread M12 x 1 mm
- X Other types on request

#### Electrical connection

- 2P Connection cable: 2 m PVC 3 x 0.25 mm<sup>2</sup>, Standard  
 ↳ other cable length: dimensions in m
- 2U Connection cable: 2 m PUR 3 x 0.25 mm<sup>2</sup>, Standard  
 ↳ other cable length: dimensions in m
- M8 Plug M8
- X Other types on request

#### Switch function

- S Closer (in medium closed, 12 - 32 VDC)
- O Opener (in medium open, 0 VDC)

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with potentiometer)

<b>OPG01</b>				
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Example: Process connection BSPP3/8", 2 m PVC cable, closer, sensitivity not adjustable, medium water: OPG01-A2PSA


### Characteristics

- Compact construction
- No moving parts
- Excellent price / performance ratio
- Easy to install
- Mounting direction: any
- High reliability
- Long service life
- Measuring accuracy ± 0.5 mm
- Electrical connection: cable connection or plug
- Optical switch condition check via the LED
- Output PNP
- Close or Open
- Adjustable sensitivity for any application

### Areas of application

- Plant construction
- Machine tools
- Chemicals and Pharmaceuticals
- Hydraulics
- Machine construction
- Water treatment etc.

### Accessories: Circular plugs M8

Type		Order number	Design	Colour	
Female plug M8 with	2 m PVC cable	K8PVC 2		1	brown
	5 m PVC cable	K8PVC 5		3	blue
	2 m PUR cable	K8PUR 2		4	black
	5 m PUR cable	K8PUR 5			
Female plug M8, angle type with	2 m PVC cable	W8PVC 2			
	5 m PVC cable	W8PVC 5			
	2 m PUR cable	W8PUR 2			
	5 m PUR cable	W8PUR 5			

The optoelectronic Senlux Besta level switches are used for the level control of liquids. They may be installed either vertically or horizontally.

## Base model OPG02

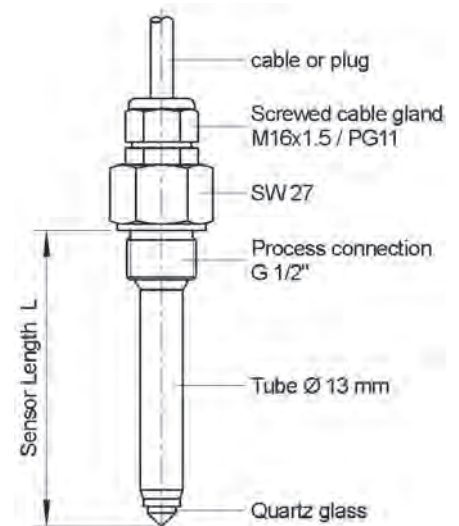
Product overview shown below

### Technical Data

Operating pressure	max. 25 bar
Ambient temperature	-25 to 70°C
Liquid temperature	-30 to 100°C; temporary up to max. 150°C
Measuring accuracy	± 0.5 mm
Material housing	stainless steel 1.4571
Material prism	quartz glass
min. distance sensor tip to reflecting wall	> 10 mm
Mounting direction	any
Process connections	BSPP 1/2", other types on request
Sensor length L	min. 65 mm max. 3000 mm

### Electrical Data

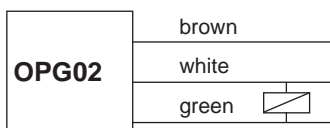
Supply voltage	12...32 VDC
Supply current max.	40 mA
Switch point number	1
Output	PNP Transistor, reverse polarity protected
Switch function	close or open
Protection	IP65
Indication of active output	1 LED
Electrical connection	cable PVC, PUR 3 x 0.25 mm <sup>2</sup> or coupler plug or, plug M12, other types on request



### Operating Principle

The optoelectronic sensor contains an infrared LED and a light receiver. Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver. When rising liquid immerses the prism, the light is refracted out into the liquid, leaving little or no light reach the receiver. Sensing this change, the receiver actuates electronic switching within the unit to operate an external alarm or control circuit.

### Connection diagram



Supply voltage +12...32 VDC

0

Output +12...32 VDC

#### Pin assignment

1	Supply voltage +12...32 VDC
3	0
4	Output +12...32 VDC

## Product overview / order table

### OPG02

#### Process connection

- A Connection thread BSPP1/2"
- X Other types on request

#### Electrical connection

- 2P Connection cable: 2 m PVC 3 x 0.25 mm<sup>2</sup>, Standard  
 — other cable length: dimensions in m
- 2U Connection cable: 2 m PUR 3 x 0.25 mm<sup>2</sup>, Standard  
 — other cable length: dimensions in m
- W Coupler plug, DIN 43650
- M12 Plug M12
- X Other types on request

#### Switch function

- S Closer (in medium closed, 12 - 32 VDC)
- O Opener (in medium open, 0 VDC)

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with potentiometer)

#### Sensor length L

Dimensions in mm (length from sealing face of process connection,  
 L min=65 mm, L max=3000 mm)

<b>OPG02</b>					
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Example: Process connection BSPP1/2", 2 m PVC cable, closer, sensitivity not adjustable, length 500 mm: OPG02-A2PSA500



### Characteristics

- No moving parts
- Excellent price / performance ratio
- Easy to install
- Mounting direction: any
- High reliability
- Long service life
- Measuring accuracy  $\pm 0.5$  mm
- Electrical connection: cable connection or plug
- Output PNP
- Close or Open
- Adjustable sensitivity for any application (e.g. foam detection)
- Sensor length: selectable from min. 65 mm to max. 3000 mm

### Areas of application

- Plant construction
- Machine tools
- Chemicals and Pharmaceuticals
- Hydraulics
- Machine construction
- Water treatment etc.

### Accessories: Circular plugs M12

Type		Order number	Design	Colour
Female plug M12 with	2 m PVC cable	K12PVC 2		1 brown
	5 m PVC cable	K12PVC 5		3 blue
	2 m PUR cable	K12PUR 2		4 black
	5 m PUR cable	K12PUR 5		
Female plug M12, angle type with	2 m PVC cable	W12PVC 2		
	5 m PVC cable	W12PVC 5		
	2 m PUR cable	W12PUR 2		
	5 m PUR cable	W12PUR 5		

The optoelectronic Senlux Besta level switches are used for the level control of liquids. They may be installed either vertically or horizontally.

### Base model OPG03

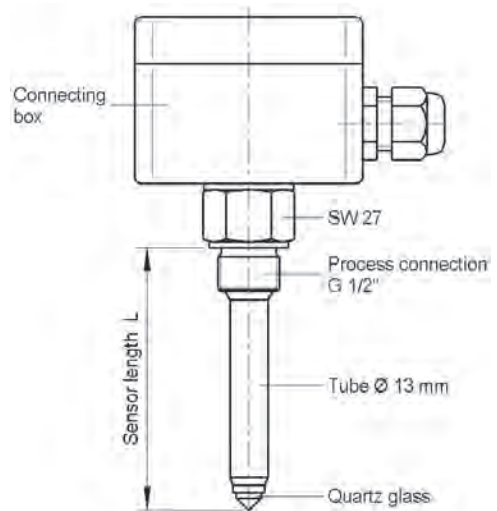
Product overview shown below

#### Technical Data

Operating pressure	max. 25 bar
Ambient temperature	-30 to 70°C
Liquid temperature	-30 to 100°C; temporarily up to max. +150°C
Accuracy	± 0.5 mm
Mounting direction	any
Min. distance sensor tip to any reflecting surface	> 10 mm
Prism material	quartz glass
Process connections	BSPP 1/2", 1.4571, other types on request
Sensor tube	∅ 13 mm, 1.4571
Sensor length L	min. 65 mm max. 3000 mm

#### Electrical Data

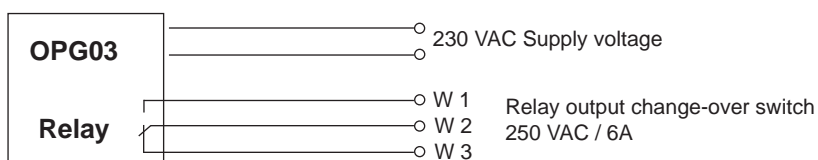
Supply voltage	230 VAC
Switch points	1
Output	250 VAC / 6A
Life cycles	>10 <sup>7</sup>
Function	change-over switch
Protection rating	IP65
Connection box	Aluminium 75 x 80 x 57 mm, other types on request



#### Operating Principle

The optoelectronic sensor contains an infrared LED and a light receiver. Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver. When rising liquid immerses the prism, the light is refracted by the liquid, leaving little or no light reaching the receiver. Sensing this change, the receiver initiates a switching process.

#### Connection diagram



## Product overview / order table

### OPG03

#### Process connection

- A Connection thread BSPP1/2"
- X other types on request

#### Connection box

- B Aluminium case 75 x 80 x 57 mm, IP65
- X other types on request

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with potentiometer)

#### Sensor length L

Dimensions in mm (length from sealing face of process connection,  
L min. = 65 mm, L max. = 3000 mm)

OPG03				
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Example: Process connection BSPP1/2", aluminium case, sensitivity not adjustable, length 500 mm: OPG03-ABA0500

### Characteristics

- No moving parts
- Excellent price / performance ratio
- Easy to install
- Mounting direction: any
- High reliability
- Long service life
- Measuring accuracy  $\pm 0.5$  mm
- Electrical connection box
- Relay output 250 VAC / 6A
- Change-over switch
- Adjustable sensitivity for any application (e.g. foam detection)
- Sensor length selectable from min. 65 mm to max. 3000 mm

### Areas of application

- Plant construction
- Machine tools
- Chemical and Pharmaceutical
- Hydraulics
- Machine construction
- Water treatment, etc.

The optoelectronic Senlux Besta level switches are used for the level control of liquids. They may be installed either vertically or horizontally.

## Base model OPG04

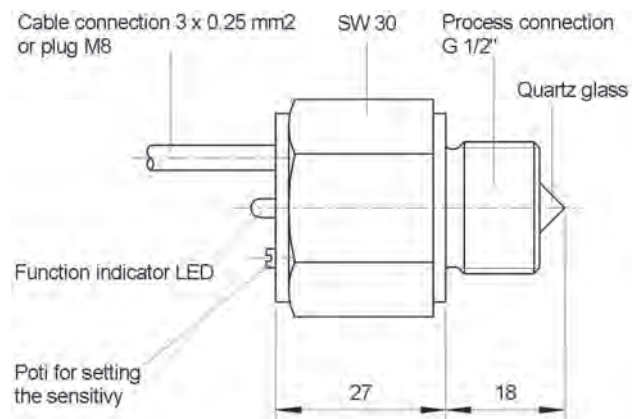
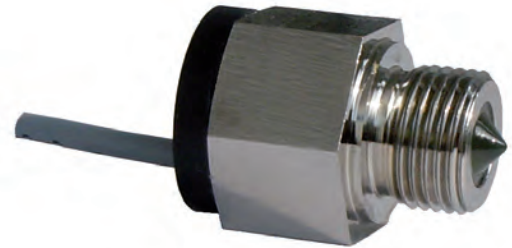
Product overview shown below

### Technical Data

Operating pressure	max. 40 bar optional also higher pressure
Ambient temperature	-30 to 70°C
Liquid temperature	-40 to 100°C
Accuracy	± 0.5 mm
Material housing	steel, nickel-plated
Prism material	glass, fused in the steel body (without seal)
min. distance sensor tip to any opposite wall	> 10 mm
Mounting direction	any
Process connections	BSPP 1/2", other types on request

### Electrical Data

Supply voltage	12...32 VDC
Supply current max.	40 mA
Switch points	1
Output	PNP Transistor, reverse polarity protected
Function	close or open
Protection rating	IP65
Indication of active output	1 LED
Electrical connection	cable PVC, PUR, 3 x 0.25 mm <sup>2</sup> or plug M8, other types on request



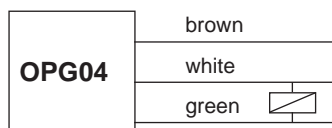
### Operating Principle

The optoelectronic sensor contains an infrared LED and a light receiver.

Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver.

When rising liquid immerses the prism, the light is refracted by the liquid, leaving little or no light reaching the receiver. Sensing this change, the receiver initiates a switching process.

### Connection diagram



Supply voltage 12...32 VDC

0

Output 12...32 VDC

Pin assignment M8	
1	Supply voltage 12...32 VDC
3	0
4	Output 12...32 VDC



## Product overview / order table

### OPG04

#### Process connection

- A Connection thread BSPP1/2"
- X Other types on request

#### Electrical connection

- 2P Connection cable: 2 m PVC 3 x 0.25 mm<sup>2</sup>, Standard  
 \_\_\_\_\_ other cable length: dimensions in m
- 2U Connection cable: 2 m PUR 3 x 0.25 mm<sup>2</sup>, Standard  
 \_\_\_\_\_ other cable length: dimensions in m
- M8 Plug M8
- X Other types on request

#### Switch function

- S Closer (in medium closed, 12 - 32 VDC)
- O Opener (in medium open, 0 VDC)

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with potentiometer)

<b>OPG04</b>				
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Example: Process connection BSPP1/2", 2 m PVC cable, closer, sensitivity not adjustable, medium water: OPG04-A2PSA

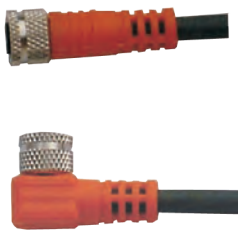
### Characteristics

- Small and compact
- No moving parts
- Excellent price / performance ratio
- Easy to install
- Mounting direction: any
- High reliability
- Long service life
- Measuring accuracy ± 0.5 mm
- Electrical connection: cable connection or plug
- Optical switch condition check via the LED
- Output PNP
- Pressure 40 bar, optional also higher pressure
- Adjustable sensitivity for any application
- Glass fused in the steel body (without seal)

### Areas of application

- The optoelectronic level switch OPG04 is used for monitoring the level of liquids in refrigeration applications.

### Accessories: Circular plugs M8

Type		Order number	Design	Colour	
Female plug M8 with	2 m PVC cable	K8PVC 2		1 brown	
	5 m PVC cable	K8PVC 5		3 blue	
	2 m PUR cable	K8PUR 2		4 black	
	5 m PUR cable	K8PUR 5			
Female plug M8, angle type with	2 m PVC cable	W8PVC 2			
	5 m PVC cable	W8PVC 5			
	2 m PUR cable	W8PUR 2			
	5 m PUR cable	W8PUR 5			

The optoelectronic Senlux Besta level switches are used for the level control of liquids. They may be installed either vertically or horizontally.

#### Base model OPG05

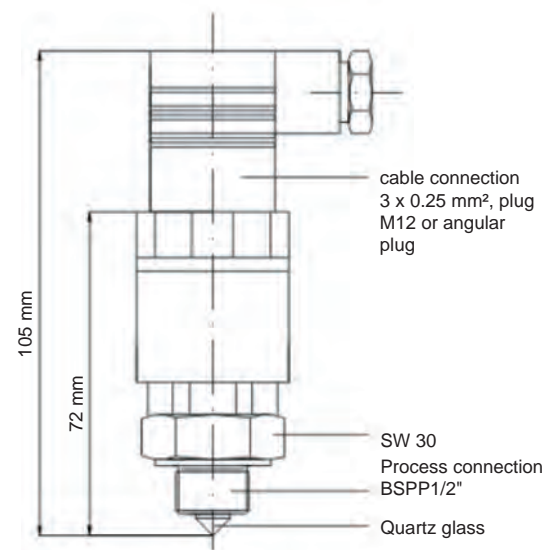
Product overview shown below

#### Technical Data

Operating pressure	max. 100 bar
Ambient temperature	-30°C to +80°C
Liquid temperature	-40°C to +170°C, > +170°C on request
Accuracy	± 0.5 mm
Material housing	stainless steel 1.4305
Prism material	quartz glass
min. distance sensor tip to reflecting wall	> 10 mm
Mounting direction	any
Process connections	BSP1/2", other types on request

#### Electrical Data

Supply voltage	12...32 VDC
Supply current max.	40 mA
Switch points	1
Output	PNP Transistor, reverse polarity protected close or open
Function	close or open
Protection rating	IP65
Indication of active output	1 LED
Electrical connection	cable PVC, PUR, 3 x 0.25 mm <sup>2</sup> or plug M12, angular plug, other types on request



#### Operating Principle

The optoelectronic sensor contains an infrared LED and a light receiver.

Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver.

When rising liquid immerses the prism, the light is refracted by the liquid, leaving little or no light reaching the receiver. Sensing this change, the receiver initiates a switching process.

#### Connection diagram



Pin assignment M12	
1	Supply voltage 12...32 VDC
3	0
4	Output 12...32 VDC

Angular Plug DIN 43650	
1	Supply voltage 12...32 VDC
2	0
3	Output 12...32 VDC

## Product overview / order table

### OPG05

#### Process connection

- A Connection thread BSPP1/2"
- X Other types on request

#### Electrical connection

- 2P Connection cable: 2 m PVC 3 x 0.25 mm<sup>2</sup>, Standard  
other cable length: dimensions in m
- 2U Connection cable: 2 m PUR 3 x 0.25 mm<sup>2</sup>, Standard  
other cable length: dimensions in m
- W Angular plug DIN 43650
- M12 Plug M12
- X Other types on request

#### Switch function

- S Closer (in medium closed, 12 - 32 VDC)
- O Opener (in medium open, 0 VDC)

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with potentiometer)

OPG05				
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Example: Process connection BSPP1/2", 2 m PVC cable, closer, sensitivity not adjustable, medium water: OPG05-A2PSA


### Characteristics

- Small and compact
- Excellent price / performance ratio
- Liquid temperature up to +170°C, >+170°C on request
- Pressure 25 bar
- Mounting direction: any
- High reliability
- Measuring accuracy ± 0.5 mm
- Electrical connection: cable connection, plug M12 or angular plug
- Output PNP
- Close or Open
- Adjustable sensitivity for any application

### Areas of application

- Plant construction
- Machine tools
- Chemicals and Pharmaceuticals
- Hydraulics
- Machine construction
- Water treatment etc.

### Accessories: Circular plugs M12

Type		Order number	Design	Colour	
Female plug M12 with	2 m PVC cable	K12PVC 2		1	brown
	5 m PVC cable	K12PVC 5		3	blue
	2 m PUR cable	K12PUR 2		4	black
	5 m PUR cable	K12PUR 5			
Female plug M12, angle type with	2 m PVC cable	W12PVC 2			
	5 m PVC cable	W12PVC 5			
	2 m PUR cable	W12PUR 2			
	5 m PUR cable	W12PUR 5			

### Level limit switch in stainless steel 1.4404 for hygiene applications with variable probe length

#### Base model OPG06

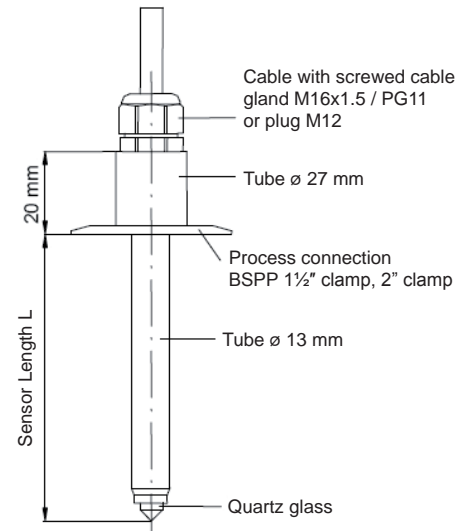
Product overview shown below

#### Technical Data

Operating pressure	max. 25 bar
Ambient temperature	-25 to 70°C
Operating temperature	-30 to 100°C temporary up to max. +125°C
Measuring accuracy	± 0.5 mm
Material housing	stainless steel 1.4404
Material prism	quartz glass
Mounting direction	any
Min. distance sensor tip to any opposite wall	> 10 mm
Process connections	BSPP 1½" clamp, 2" clamp, other types on request
Sensor tube	∅ 13 mm, 1.4404
Sensor length L	min. 65 mm max. 1000 mm

#### Electrical Data

Supply voltage	12...32 VDC
Supply current max.	40 mA
Switch point number	1
Output	Protective DC PNP (200 mA)
Switch function	closer or opener
Protection class	IP65
Electrical connection	cable PVC and PUR 3 x 0.25 mm <sup>2</sup> or plug M12, other types on request



#### Operating Principle

The electro-optic sensor contains an infrared LED and a light receiver.

Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver.

When rising liquid immerses the prism, the light is refracted out into the liquid, leaving little or no light reach the receiver. Sensing this change, the receiver actuates electronic switching within the unit to operate an external alarm or control circuit.

#### Connection diagram

<b>OPG06</b>	brown	Supply voltage +12...32 VDC
	white	0
	green	Output +12...32 / 0 VDC

Pin assignment M12	
1	Supply voltage +12...32 VDC
3	0
4	Output +12...32 VDC

## Product overview / order table

### OPG06

#### Process connection

- A clamp 1½"
- B clamp 2"
- X Other types on request

#### Electrical connection

- 2P Connection cable: 2 m PVC 3 x 0.25 mm<sup>2</sup>, Standard  
other cable length: dimensions in m
- 2U Connection cable: 2 m PUR 3 x 0.25 mm<sup>2</sup>, Standard  
other cable length: dimensions in m
- M12 Plug M12
- X Other types on request

#### Switch function

- S Closer (in medium closed, 12 - 32 VDC)
- O Opener (in medium open, 0 VDC)

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with potentiometer)

#### Sensor length L

Dimensions in mm  
(length from sealing face of process connection, L min.=65 mm, L max.=1000 mm)

<b>OPG06</b>					
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Example: Process connection clamp 2", 2 m PVC cable, closer, sensitivity not adjustable, Length 500 mm: OPG06-B2PSA0500



### Characteristics

- No moving parts
- Wetted parts 1.4404
- Easy mounting
- Mounting direction: any
- High reliability
- High life expectancy
- Measuring accuracy ± 0.5 mm
- Electrical connection: cable connection, plug M12 or angular plug
- Output PNP
- Close or Open
- Adjustable sensitivity for any application
- Variable sensor length: min 65 mm, max. 1000 mm

### Areas of application

- Food
- Pharmaceutical

### Accessories: Circular plugs M12

Type		Order n°	Design	Colour	
Female plug M12 with	2 m PVC cable	K12PVC 2		1	brown
	5 m PVC cable	K12PVC 5		3	blue
	2 m PUR cable	K12PUR 2			
	5 m PUR cable	K12PUR 5			
Female plug M12, angle type with	2 m PVC cable	W12PVC 2		4	black
	5 m PVC cable	W12PVC 5			
	2 m PUR cable	W12PUR 2			
	5 m PUR cable	W12PUR 5			

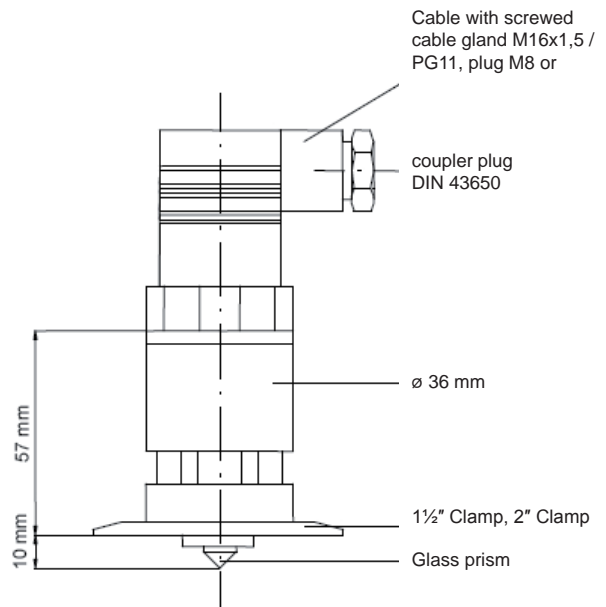
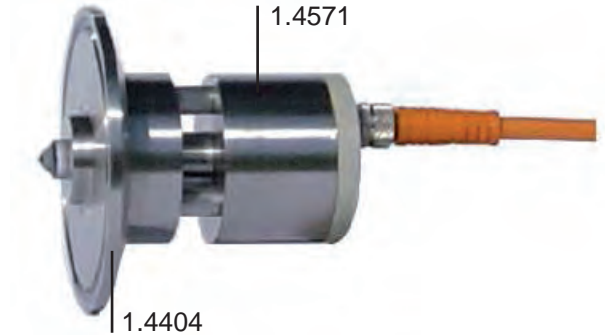
### Limit Switch in stainless steel 1.4404/1.4571 for hygiene applications, high temperature version.

#### Base model OPG061

Product overview shown below

#### Technical Data

Operating pressure	max. 40 bar
Ambient temperature	-25 to 70°C
Operating temperature	-30 to 170°C
Material prism	quartz glass
Measuring accuracy	± 0.5 mm
Min. distance sensor tip to any opposite wall	> 10 mm
Mounting direction	any
Process connections	1½" Clamp, 1.4404 2" Clamp, 1.4404 other types on request
Material housing	parts contacting the medium: in stainless steel 1.4404 parts out of medium: 1.4571
<b>Electrical Data</b>	
Supply voltage	12...32 V DC
Supply current max.	40 mA
Switch point number	1
Switch function	closer or opener
Output	Protective DC PNP (200 mA)
Protection class	IP65
Electrical connection	PVC or PUR cable 3 x 0.25 mm <sup>2</sup> , coupler plug or plug M8, other types on request



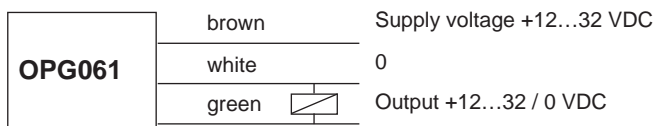
#### Operating Principle

The opto-electronic sensor contains an infrared LED and a light receiver.

Light from the LED is directed into a prism which forms the tip of the sensor. With no liquid present, light from the LED is reflected within the prism to the receiver.

When rising liquid immerses the prism, the light is refracted out into the liquid, leaving little or no light reach the receiver. Sensing this change, the receiver actuates electronic switching within the unit to operate an external alarm or control circuit.

#### Connection diagram



Pin assignment M8	
1	Supply voltage +12...32 VDC
3	0
4	Output +12...32 / 0 VDC

Coupler plug DIN 43650	
1	Supply voltage +12...32 VDC
2	0
3	Output +12...32 / 0 VDC

## Product overview / order table

### OPG061

#### Process connection

- A Clamp 1½"
- B Clamp 2"
- X Other types on request

#### Electrical connection

- 2P Connection cable: 2 m PVC 3 x 0.25 mm<sup>2</sup>,  
Standard other cable length: dimensions in m
- 2U Connection cable: 2 m PUR 3 x 0.25 mm<sup>2</sup>,  
Standard other cable length: dimensions in m
- M8 Plug M8
- W Coupler plug DIN 43650
- X Other types on request

#### Switch function

- S Closer (in medium closed, 12 – 32 V DC)
- O Opener (in medium opened, 0 V DC)

#### Sensitivity

- A Sensitivity not adjustable (**please specify the medium**)
- T Sensitivity adjustable (with poti)

OPG061				
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Example: Process connection clamp 2", 2 m PVC cable, closer, sensitivity not adjustable: OPG061-B2PSA


### Characteristics

- No moving parts
- Operating temperature: +170°C
- Simple to install
- Mounting direction: any
- Parts contacted with the medium are made of 1.4404
- Long service life
- High reliability
- Measuring accuracy ± 0.5 mm
- Electrical connection: cable connection or plug
- Output PNP
- Closer or Opener
- Adjustable sensitivity for any application  
( e.g. foam detection )

### Areas of application

- Food industry
- Pharmaceuticals

### Accessories: Circular plugs M8

Type		Order n°	Design	Colour	
Female plug M8 with	2 m PVC cable	K8PVC 2		1	brown
	5 m PVC cable	K8PVC 5		3	blue
Female plug M8, angle type with	2 m PUR cable	K8PUR 2			
	5 m PUR cable	K8PUR 5			
	2 m PVC cable	W8PVC 2			
	5 m PVC cable	W8PVC 5			
	2 m PUR cable	W8PUR 2			
	5 m PUR cable	W8PUR 5			



# BESTA

Besta AG  
Ackerstrasse 45  
CH-8610 Uster  
Switzerland  
Tel. +41 43 399 15 15  
Fax +41 43 399 15 00  
info@besta.ch  
www.besta.ch

## Homepage

Find your local sales and service partner under  
[www.besta.ch](http://www.besta.ch).

## Trimod Besta



Limit switches with electrical, electronic and pneumatic switch elements. Numerous shipbuilding and ATEX approvals.

## Quality Management

The Besta Ltd. quality management system according to ISO 9001 has been established in 1991.

## Registered trademarks

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