



# Trimod Besta

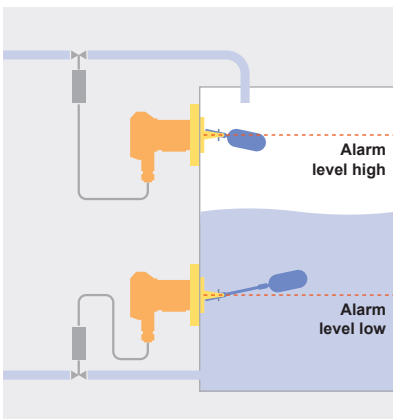
Level measurement A brand of Bachofen AG  
[www.trimodbesta.com](http://www.trimodbesta.com)

## Alarm, measurement and control with Trimod´Besta

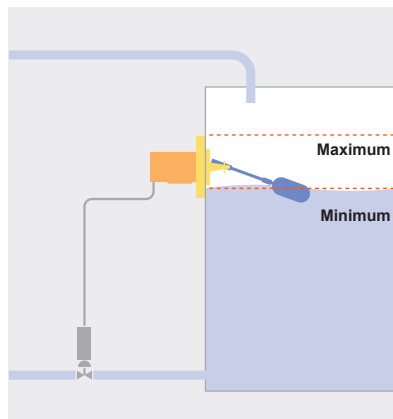


Switch-, flange- and float modules are selected acc. to the process parameters and the desired functions. This offers problem specific solutions using standard components and optimises the price/performance ratio.

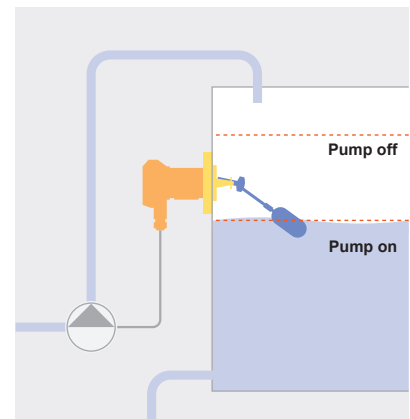
### Max/min limits



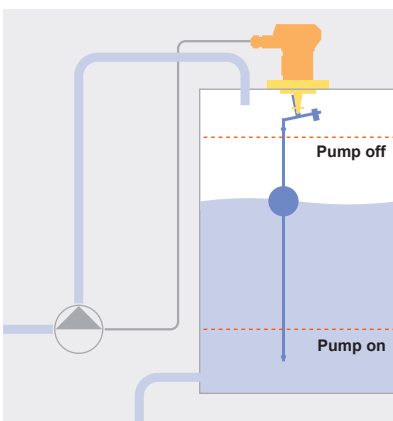
### Pneumatic control



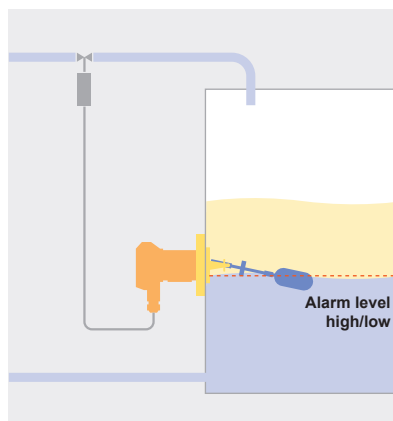
### Pump and valve control



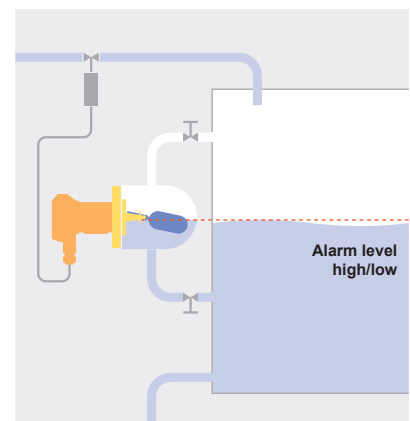
### Pump and valve control



### Separation layer control



### External level control



## Reliable, user-friendly and easy to integrate at any time

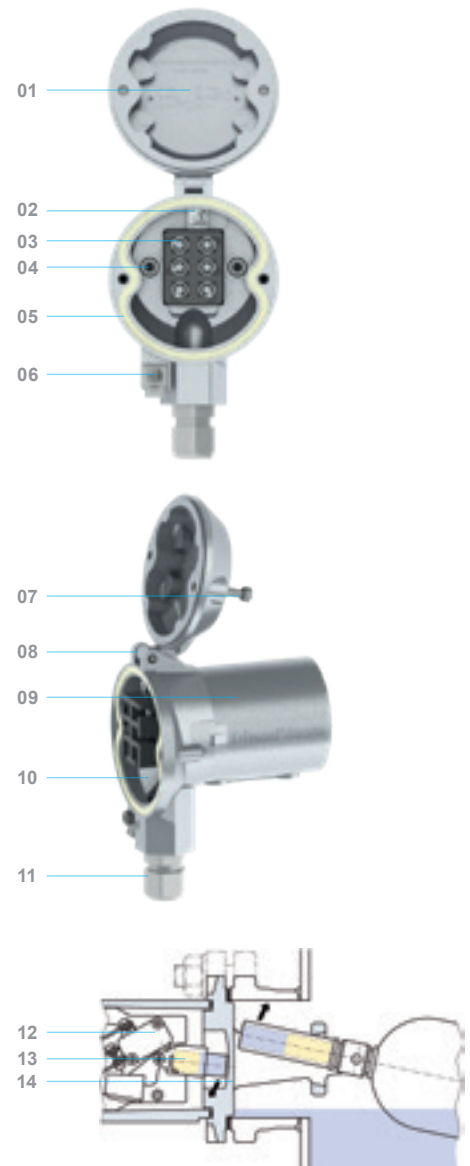


Trimod'Besta level switches feature a unique robustness. They are easily handled and quickly connected. Of course, the lid and screws can never be lost.

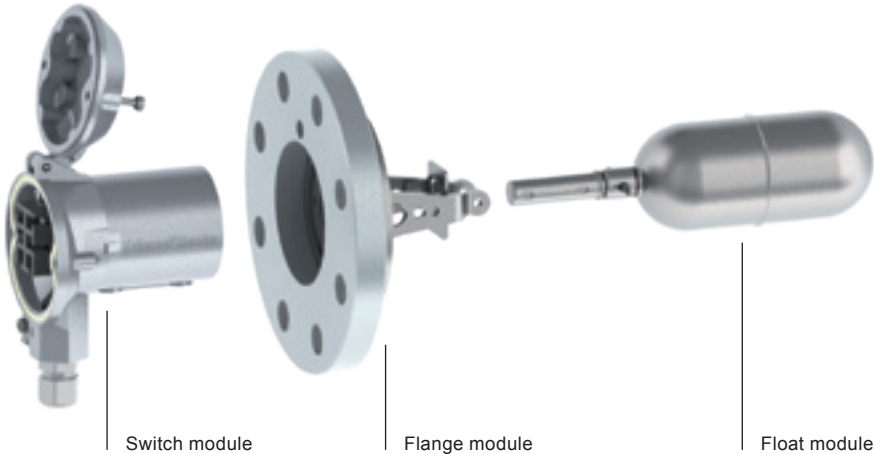
**SIL**  
IEC 61508/61511 SIL 3 Capable

### Quality – right down to the details

- 01 Wiring diagram on inside of cover
- 02 Self-lifting, easily accessible ground terminal
- 03 Self-lifting terminals
- 04 The switch module can be disassembled with just two screws.
- 05 IP65: captive moulded seal. IP66/IP67 and IP68: O-ring seal.
- 06 Easily accessible equipotential bonding
- 07 Captive cover screws
- 08 Captive cover
- 09 Housing made of seawater resistant die cast aluminium, chromated aluminium or stainless steel (CrNiMo)
- 10 Simple cable routing, due to plenty of space and large cable radii allowed
- 11 Cable gland supplied (excluding explosion proof versions)
- 12 Electrical, electronic and pneumatic output signals
- 13 Double snap effect through magnetic repulsion and microswitch snap action
- 14 Mechanically rigid separation between medium and ambience



## Made possible by the 3 - modular concept: unlimited variety of switches



### Switch modules

- switching elements: micro- and proximity switches
- SPDT and 2 × SPDT
- pneumatic with ON/OFF output; max. 10 bar
- pneumatic with proportional output; 0.2 to 1 bar
- housings made of aluminium and CrNiMo
- high and low temperature versions; -196°C to 400°C
- IP65 to IP68 protection
- explosion proof versions; ATEX, IECEX, UKCA Ex
- self lifting terminals for perfect connections
- Safety Integrity Level (SIL): SIL 1 and SIL 2

### Flange modules

- stainless steel (CrNiMo) 1.4408 square flange, 92 mm pitch circle diameter
- EN/DIN, ANSI and JIS compliant industrial flanges
- special flanges with 98, 105 and 114 mm pitch circle diameters
- fixed flanges made of CrNiMo
- composite flanges made of P265GH (carbon steel) and CrNiMo
- special flanges made of Hastelloy
- DN 65 to 150, 3" to 6"
- PN 16 to 250, class 150 to 1500, 5K to 63K
- flat seal, tongue and groove, ring joint etc.

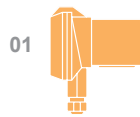
### Float modules

- fixed operating differential 12 mm
- adjustable operating differential for pump control, vertical max. 2840 mm, horizontal max. 557 mm
- stainless steel (CrNiMo) and Hastelloy floats
- NACE compliant floats
- plastic floats made of PP and PTFE
- stainless steel (CrNiMo) versions up to a maximum operating pressure of 250 bar
- float modules for separation layer monitoring
- stainless steel (CrNiMo) floats with polyamide and halar coating

## Customer-specific solutions based on cost-effective standard components

### Side mount combinations

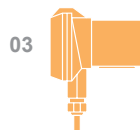
- 01 with microswitch or proximity switches, also available in explosion proof versions
- 02 pneumatic switch module with ON/OFF or proportional output
- 03 with enclosure IP68 for underwater installation
- 04 with heat exchanger for very high or very low operating temperatures
- 05 square standard flanges made of CrNiMo, 92 mm pitch circle diameter
- 06 industrial flange acc. to EN/DIN, ANSI and JIS made of PP and PTFE
- 07 industrial flange acc. to EN/DIN, ANSI and JIS made of CrNiMo and Hastelloy
- 08 with fixed operating differential
- 09 with rod extension for longer operating differentials
- 10 rod extension for switch point correction
- 11 with protective bellows for media with solids content
- 12 with adjustable operating differential for pump control
- 13 plastic versions for aggressive media
- 14 for separation layer monitoring of two media with different densities
- 15 for vertical mounting
- 16 for vertical mounting with rod extension



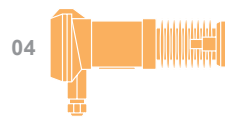
01



02



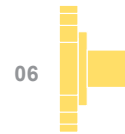
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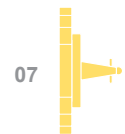
04



05



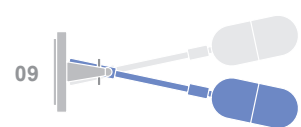
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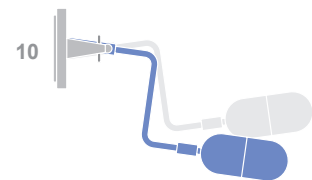
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08



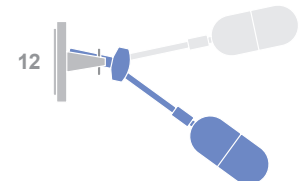
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10



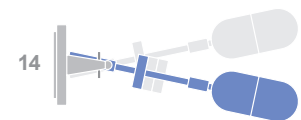
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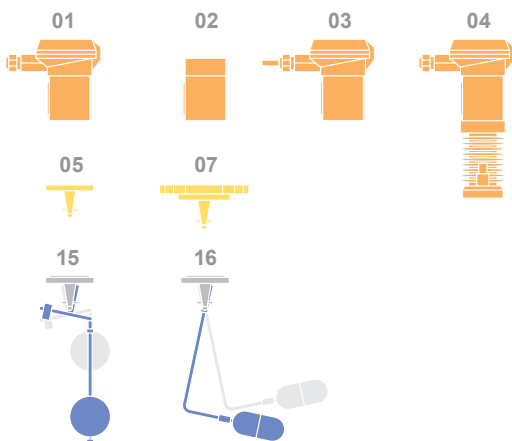


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14

### Top mount combinations



## The Trimod´Besta standard range: versatile, robust and economical



Trimod´Besta, the flexible solution. It can be used anywhere, no matter where and when. Its versatility is unlimited, for high temperature, freezing cold, low density, vacuum or high pressure applications.

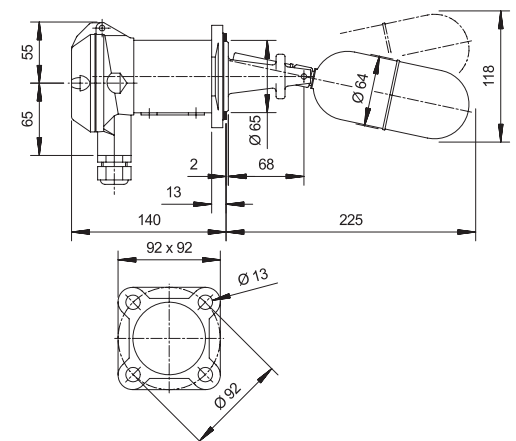
### The most popular switches

#### Type A 01 041 – alarm, limit and control functions

Nominal pressure	PN 25 acc. to EN/DIN
Operating temperature	0 to 300°C
Ambient temperature	0 to 70°C
Density of the liquid	0.7 kg/dm <sup>3</sup>
Operating differential	fixed 12 mm
Wetside material	stainless steel (CrNiMo)
Switch module material	seawater resistant die cast aluminium
Flange dimensions	square 92 × 92 mm, PCD 92 mm
Switch element	microswitch SPDT with silver contacts
Switch rating	250 VAC, 5A 30 VDC, 5A
Enclosure	IP65
Installation length	226 mm
Safety Integrity Level (SIL)	SIL 1 (Type AA 01 041: SIL 2)

### Similar Types

Type A 01 04	same as A 01 041, in addition, rod extensions G1, G2 and G3 can be used.
Type 5A 01 041	for aggressive environments, housing exclusively made of stainless steel (CrNiMo).
Type 2A 01 041	with chromated switch housing
Type A 01 07	for low densities: 0.5 kg/dm <sup>3</sup>





**Type A 01 051 to A 01 054 – with protective bellows for dirty media****Type A 01 051**

Bellow material	Perbunan
Operating temperature	0 to 120°C
Safety Integrity Level (SIL)	SIL 1 (Type AA 01 051: SIL2)

**Type A 01 052**

Bellow material	Silicone
Operating temperature	0 to 200°C
Safety Integrity Level (SIL)	SIL 1 (Type AA 01 052: SIL2)

**Type A 01 053**

Bellow material	FPM
Operating temperature	10 to 200°C
Safety Integrity Level (SIL)	SIL 1 (Type AA 01 053: SIL2)

**Type A 01 054**

Bellow material	PTFE
Operating temperature	0 to 250°C
Safety Integrity Level (SIL)	SIL 1 (Type AA 01 054: SIL2)

Installation length	253 mm
Density of the liquid	0.75 kg/dm <sup>3</sup>
Other technical data	same as A 01 041

**Similar type****Type A 01 051E15**

special version for waste water and waste tanks.  
Technical data similar to A 01 051

**For manually adjustable Operating differentials****Type A 01 090 to A 01 093 – ideal for 2-point control, e.g. for pump control****Type A 01 090**

Adjustable operating differential	37 to 218 mm
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**Type A 01 091**

Adjustable operating differential	56 to 317 mm
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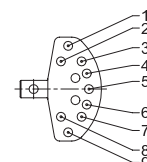
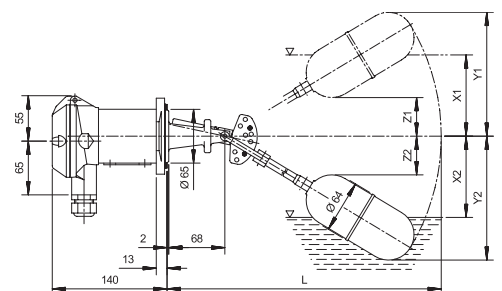
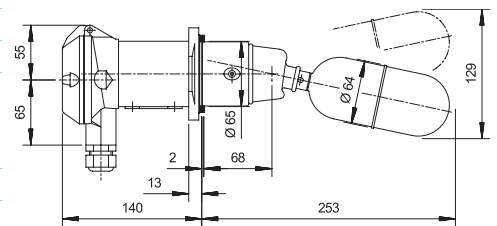
**Type A 01 092**

Adjustable operating differential	83 to 442 mm
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**Type A 01 093**

Adjustable operating differential	97 to 557 mm
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Installation length	278 to 561 mm, depending on type
Density of the liquid	min. 0.75 kg/dm <sup>3</sup>
Safety Integrity Level (SIL)	SIL 1 (Types AA 01 090 to AA 01 093: SIL 2)
Other technical data	same as A 01 041



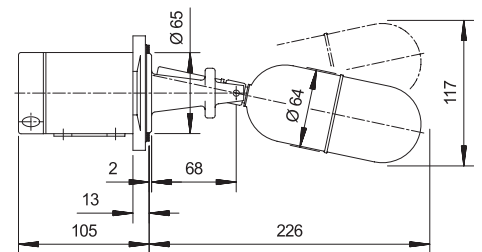
## Pneumatic switch

### Type P 01 04 – the pneumatic limit switch

Function	ON/OFF (3/2 way valve)
Max. control pressure	max. 10 bar
Nominal pressure	PN 25 acc. to EN/DIN
Operating temperature	1 to 250°C
Ambient temperature	1 to 80°C
Density of the liquid	min. 0.7 kg/dm <sup>3</sup>
Operating differential	fixed 12 mm
Control connections	G 1/8" (BSPP) inside thread
Wetside material	stainless steel (CrNiMo)
Housing material	seawater resistant die cast aluminium

### Options

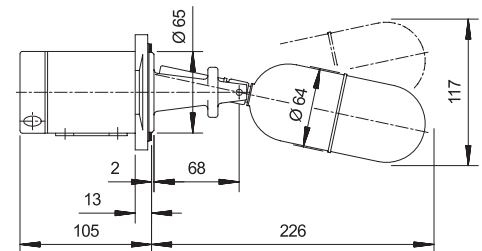
<b>Type 5P 01 04</b>	all stainless steel (CrNiMo) design
<b>Type FP 01 04</b>	with declaration of conformity for use in Explosion proof areas



## Pneumatic controller

### Type M 01 04 – the pneumatic controller

Function	proportional controller
Supply pressure	1.4 bar
Output signal	0.2 to 1 bar
Nominal pressure	PN 25 acc. to EN/DIN
Operating temperature	1 to 250°C
Ambient temperature	1 to 80°C
Density of the liquid	min. 0.7 kg/dm <sup>3</sup>
Control range	without rod: 30 mm with rod: max. 230 mm
Control connections	G 1/8" (BSPP) inside thread
Wetside material	stainless steel (CrNiMo)
Housing material	seawater resistant die cast aluminium



### Options

<b>Type 5M 01 04</b>	all stainless steel (CrNiMo) design
<b>Type FM 01 04</b>	with declaration of conformity for use in Explosion proof areas





## The Trimod´Besta industrial range for challenging applications



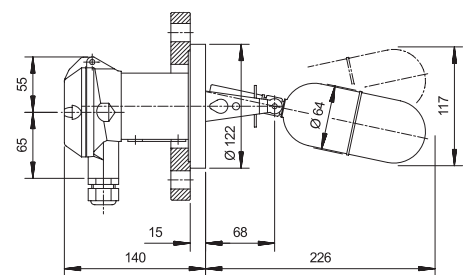
The benefits of the wide spectrum of Trimod´Besta switches are especially obvious in the industrial range. They are the best choice for high operating pressures, aggressive media and high process temperatures up to 400°C.

**SIL**  
IEC 61508/61511 SIL 3 Capable

### A typical Trimod´Besta industrial switch

#### Type A 22C 04 – for alarm, limit and control functions

Nominal pressure	PN 40 acc. to EN/DIN
Operating temperature	0 to 330°C
Ambient temperature	0 to 70°C
Density of the liquid	min. 0.7 kg/dm <sup>3</sup>
Operating differential	fixed 12 mm
Wetside material	stainless steel (CrNiMo)
Slip-on flange	carbon steel P265GH zinc galvanized and passivated
Housing material	seawater resistant die cast aluminium
Flange	DN 65, PN 40 acc. to EN 1092-1
Flange facing	smooth raised face, form B1
Switch element	microswitch SPDT with silver contacts
Switch rating	250 VAC, 5A 30 VDC, 5A
Enclosure	IP65
Weight	5.4 kg
Installation length	226 mm
Safety Integrity Level (SIL)	SIL 1 (Type AA 22C 04: SIL 2)



Flanges acc. to EN 1092-1	DN 65 to DN 150 PN 16 to PN 250
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Flanges acc. to ANSI B16.5	DN 3" to DN 6" PN cl. 150 to PN cl. 1500
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Flanges acc. to JIS B 2220	DN 65 to DN 125 PN 5K to PN 63K
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## The Trimod´Besta plastic range for highly aggressive media

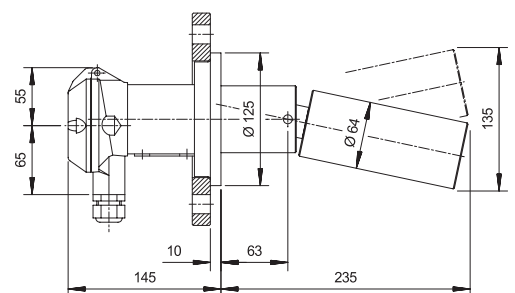


All wetted parts are made of high grade plastics such as PP or PTFE. The switches are available with EN/DIN, ANSI and JIS industrial flanges.

### A typical Trimod´Besta plastic switch

#### Type A 304 98 – PTFE switch, alarm, limit and control functions

Nominal pressure	PN 6 max. 6 bar at 65°C max. 4.5 bar at 100°C max. 3 bar at 200°C
Operating temperature	0 to 200°C
Ambient temperature	0 to 70°C
Density of the liquid	min. 0.75 kg/dm <sup>3</sup>
Operating differential	fixed 12 mm
Wetside material	PTFE with 25% glass fibre
Slip-on flange	carbon steel P265GH zinc galvanized and passivated
Housing material	seawater resistant die cast aluminium
Flange	DN 80, PN 10 acc. to EN 1092-1
Flange facing	smooth raised face, form B1
Switch element	microswitch SPDT with silver contacts
Switch rating	250 VAC, 5A 30 VDC, 5A
Enclosure	IP65
Weight	5 kg
Installation length	235 mm



Flanges acc. to EN 1092-1	DN 80 to DN 150 PN 10
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Flanges acc. to ANSI B16.5	DN 3" to DN 6" PN cl. 150
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Flanges acc. to JIS B 2220	DN 80 to DN 150 PN 10K
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## Hundreds of thousands of Trimod´Besta switches ensure the safe voyage of vessels on our oceans

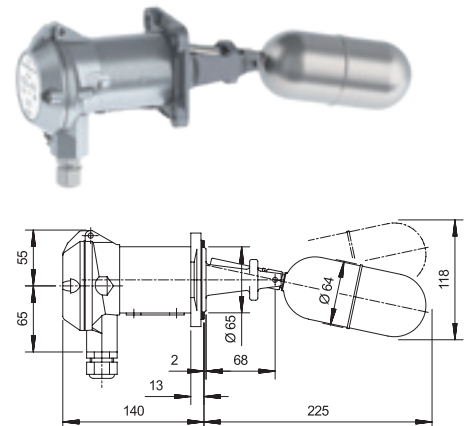


Since 1967 Trimod´Besta limit switches are a huge success in the ship building industry. They are installed in tankers, cruise ships, container ships and submarines - and even on the fastest catamaran and the strongest crane ship in the world.

### The favourites

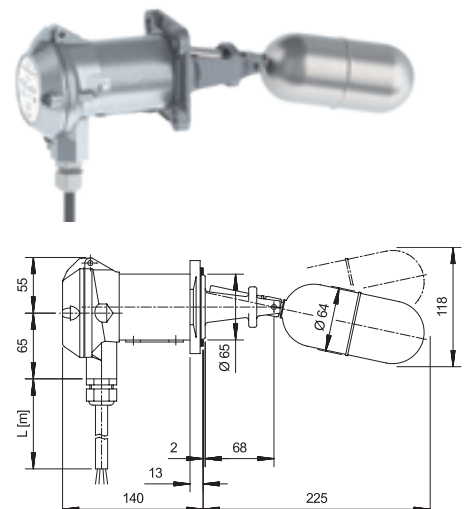
#### Type A 01 041 – the allrounder

Nominal pressure	PN 25 acc. to EN/DIN
Operating temperature	0 to 300°C
Ambient temperature	0 to 70°C
Density of the liquid	0.7 kg/dm <sup>3</sup>
Operating differential	fixed 12 mm
Wetside material	stainless steel (CrNiMo)
Housing material	seawater resistant die cast aluminium
Flange dimensions	square 92 × 92 mm, PCD 92 mm
Switch element	microswitch SPDT with silver contacts
Switch rating	250 VAC, 5A 30 VDC, 5A
Enclosure	IP65
Installation length	225 mm
Safety Integrity Level (SIL)	SIL 1 (Type AA 01 041: SIL 2)



#### Type U3A 01 041 – underwater version IP68

Nominal pressure	PN 25 acc. to EN/DIN
Operating temperature	-30 to 80°C
Ambient temperature	-30 to 80°C
Enclosure	IP68, switch housing pressure tight up to 100 meters water column
Cable length	3 m, or as required
Cable type	Neoprene (H07 RN-F)
Safety Integrity Level (SIL)	SIL 1 (Type U3AA 01 041: SIL 2)
Other technical data	same as A 01 041



## Marine approvals and registrations of Trimod'Besta limit switches



ClassNK



Trimod'Besta level switches come with the required shipping approvals and registrations. See our home-page for up to date listings.

### Approvals

- American Bureau of Shipping, ABS
- Bureau Veritas, BV
- Det Norske Veritas, DNV
- Lloyd's Register of Shipping, LRS
- Registro Italiano Navale, RINA
- Russian Maritime Register of Shipping, RMRS
- Nippon Kaiji Kyōkai, ClassNK



Cat Link V, the 91 meter long catamaran of the Incat Ship Yard in Australia. Its transatlantic crossing at an average speed of 41.28 knots set a new record.

Trimod'Besta level switches AA 01 04 and AA 01 093 are used to monitor and control levels on board.

## Trimod´Besta, whenever reliability is crucial



Thanks to high functional safety and extreme longevity, Trimod´Besta level switches are proven in petrochemical plants and on offshore platforms.

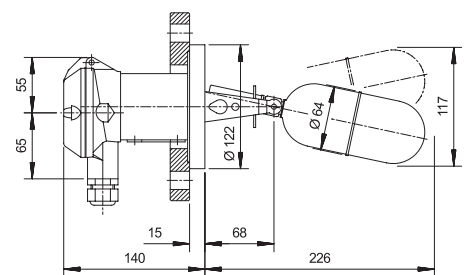
The switches are available with EN/DIN, ANSI and JIS flanges.



### A typical industrial switch for use in explosion proof areas

#### Type ZK8 22C 041 – hermetically sealed for alarm, limit and control functions

Type of protection	Ex eb db IIC T6...T5 Ga/Gb
EU approval	EPS 12 ATEX 1430X
Nominal pressure	PN 40 acc. to EN/DIN
Operating temperature	-30 to 200°C
Ambient temperature	-45 to 80°C
Density of the liquid	min. 0.7 kg/dm <sup>3</sup>
Operating differential	fixed 12 mm
Wetside material	stainless steel (CrNiMo)
Slip-on flange	carbon steel P265GH, zinc galvanised and passivated
Housing material	seawater resistant die cast aluminium
Flange	DN 65, PN 40 acc. to EN 1092-1
Flange facing	raised face form B1
Switch element	microswitch SPDT with silver contacts
Switch rating	250 VAC, 5A 30 VDC, 5A
Safety Integrity Level (SIL)	SIL 1 (Type ZKK8 22C 041: SIL 2)
Enclosure	IP67





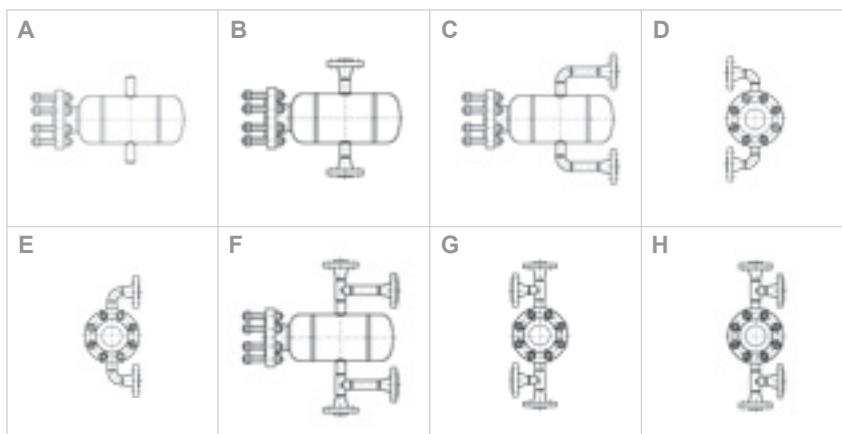
## Trimod´Besta limit switches in customized float chambers



Wherever it is not possible or desirable to install float switches directly onto a vessel, horizontal Trimod Besta level switches can be mounted externally in a float chamber:

- Compliance acc. to 2014/68/EU (PED)

We deliver accurate, tested and pre installed



### Documentation and services

- Declaration of conformity acc. to 2014/68/EU
- Certificate of construction and pressure test
- List of materials and material certificates 3.1
- Non-destructive material testing such as ultrasonic, X-ray or dye penetrant methods
- Priming and protective coatings

# Trimod<sup>B</sup>Besta

## **Bachofen AG**

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Fax +41 44 944 12 33  
info@trimodbesta.com  
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## **Quality Management**

The Bachofen Ltd. quality management system acc. to ISO 9001 has been established in 1994.

## **Registered Trade Marks**

Trimod and Besta are registered trademarks of Bachofen AG, Switzerland.

## **Homepage**

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

Please find more detailed information in our Trimod<sup>B</sup>Besta catalogue. Download under [www.trimodbesta.com](http://www.trimodbesta.com)

## **Our markets**



Shipbuilding



Oil & Gas



Chemical & Petrochemical



Power Generation



Plant engineering



Water management