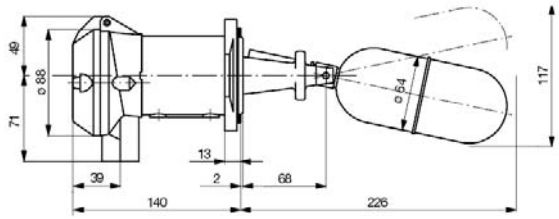
TriMod BESTA

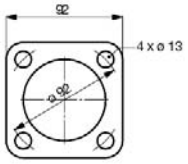
Float Level Switches

TriMod BESTA level switch types: A 01 04 and A 01 041
Side mounted switches for high or low alarm duties

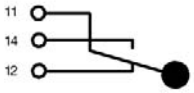
Nominal pressure	PN 25 max. 25 bar to 300°C
Operating temperature	0 to 300°C
Ambient temperature	0 to 70°C
Density of liquid	min. 0.70 kg/dm³
Operating differential	fixed 12 mm
Rod extensions	only with type A 01 04
Wetside material	stainless steel (316 equiv.)
Flange material	stainless steel (316 equiv.)
Switch housing material	sea water resistant die cast aluminium
Flange dimensions	92 x 92 mm P.C.D. 92 mm
Counterflange	see overleaf
Switch element	microswitch change-over (SPDT) with silver contacts
Switch rating	5A/250 VAC 5A/30 VDC
Cable gland	M20 x 1.5
Enclosure	IP65
Weight	approx. 1.8 kg
Approvals	ABS, BV, DNV, GL, LRS, PRS, RINA, MRS



Flange dimension

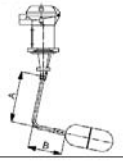


Connection diagram



Rod extensions for type A 01 04

Depending on the tank design the level switch type A 01 04 can be equipped with rod extension Type G1 or G2 for side mounted switches.
For top mounting type G3 is used.
Since rod extensions add-on weight to the float, the minimum value for the density will change according to the following tables:

Type: G1	Type: G2	Type: G3
		
A max.: 1000	A + B max.: 1000 A/B: ≤ 4 A min.: 100 B min.: 100	A + B max.: 1000 A/B: ≤ 4 A min.: 50 B min.: 50

Minimum density for the float module 04G1

Rod length A (mm)	100	200	300	400	500	600	700	800	900	1000
Min. density (kg/dm³)	0.66	0.66	0.67	0.69	0.71	0.74	0.76	0.79	0.81	0.84

Minimum density for the float module 04G2

in kg/dm³

A (mm) / B (mm)	100	200	300	400	500	600	700	800
100	0.69	0.68	0.70	0.71	0.72	0.74	0.75	--
200	0.67	0.67	0.68	0.69	0.70	0.71	0.72	0.73
300	0.68	0.69	0.69	0.70	0.71	0.71	0.72	
400	0.70	0.70	0.71	0.71	0.72	0.73		
500	0.72	0.73	0.73	0.73	0.74			
600	0.74	0.75	0.75	0.75				
700	0.77	0.77	0.77					
800	0.79	0.80						
900	0.82							

Minimum density for the float module 04G3

in kg/dm³

A (mm) / B (mm)	50 to 500	600	700	800
50	0.71	--	--	--
100	0.69	--	--	--
200	0.68	0.68	0.68	0.68
300	0.69	0.69	0.69	
400	0.71	0.71		
500	0.73			
600	0.75			
700	0.77			
800	0.80			
900	0.82			
950	0.83			

Options

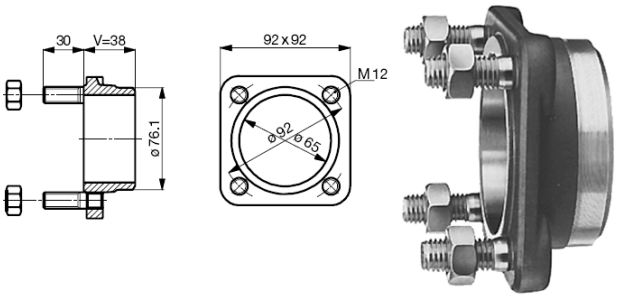
- Dual SPDT microswitches
- Microswitches with gold plated contacts
- Self checking proximity switches acc. to NAMUR
- Enclosure IP67, or IP68 for submersible applications
- 5A/380 VAC 0,3A/440 VDC (Type AE26)
- Flameproof switches, BASEEFA-, PTB-, SAA- and SEV-approved
- Pneumatic switches ON/OFF or controllers with 0.2 to 1 bar proportional output
- High and low temperature versions
- Cable gland M24 x 1,5
- Cable entry with 3/4" NPT internal thread
- Switch housing: - chromated
  - stainless steel (316 equiv.)
  - epoxy painted
- Flange modules: - acc. to DIN PN 16 to PN 315
  - acc. to ANSI cl. 150 to cl. 2500
  - acc. to BS10 table E to T
  - acc. to JIS PN 5 to PN 63
- Float modules: - top mounting
  - interface control
  - with protective bellows
  - min. density 0.35 kg/dm³
- Versions acc. to NACE and in Hastelloy C or MONEL

Counterflanges

The simplest method of installing the TriMod BESTA level switches with the square flange (standard range) is to use the BESTA standard weld-on counterflanges.
These are available in two different nozzle and/or stud lengths in carbon steel (C22.8) or in stainless steel 1.4401 (316 equiv.).

Type	Specification	Flange material	Stud material
2829.1 2831.3	Counterflange Counterflange	C22.8 1.4401	5.8 A2
2829.1V80 2831.3V80	Extended Counter- flange V = 80 mm	C22.8 1.4401	5.8 A2

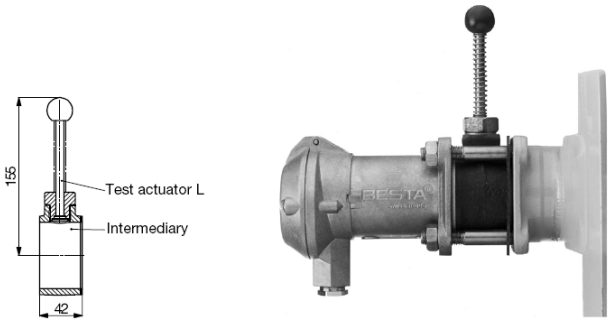
Temperature range: Material C22.8: -10° C to +400° C
Material 1.4401: -196° C to +300° C



Test actuator

The test actuator allows a periodic, on-line manual function check of the level switch.

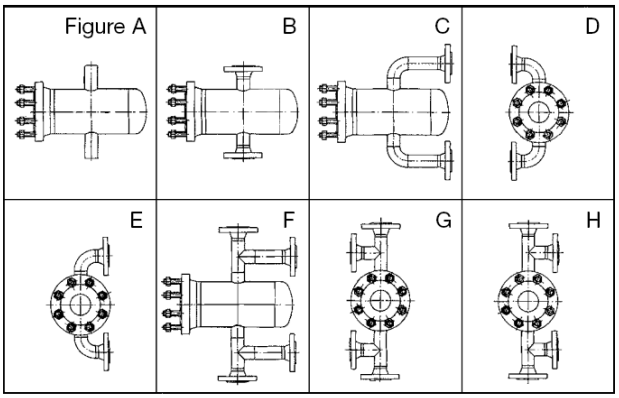
Type	Specification	Material	Temperatur
2383.2	Test actuator L with intermediary	CrNi C22.8	0 to +150°C
2383.3	Test actuator L with intermediary	CrNi CrNiMo	0 to +150°C



Float chambers

Wherever it is not possible or desirable to install float switches directly to the vessel, horizontal TriMod BESTA level switches can be mounted externally in a float chamber. This type of installation allows functional checks and servicing to be carried out without interrupting operation, provided that isolation and drain valves are included in the process connections.

Materials: carbon steel, high and low temp. carbon steel, stainless steel.
Manufactured according to RL 97/23/EG: PED/DGR
Procedure Qualification Record: SVTI 505, AD-HP 2/1, ASME Code Sec. IX.



Certificates

- Material certificates acc. to EN 10204-2.2 and EN 10204-3.1B
- Test record: hydraulic pressure test and functional tests
- Test records of material tests: x-ray, ultra sonic, charpy, hardness etc.

Quality Assurance

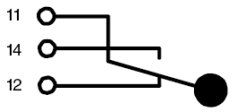
- BESTA AG is certified according to ISO 9001.

TriMod BESTA level switches type: A 01 140
A 01 141

Top mounted level switches for level alarm or pump control applications

Nominal pressure	PN 16 max. 16 bar to 300°C
Operating temperature	0 to 300°C
Ambient temperature	0 to 70°C
Density of liquid	
- pump control	min. 0.45 kg/dm³
- alarm	min. 0.30 kg/dm³
Operating differential S	A 01 140: 12 to 1340 mm A 01 141: 12 to 2840 mm
Wetside material	stainless steel (316 equiv.)
Switch housing material	sea water resistant die cast aluminium
Flange dimensions	92 x 92 mm (P.C.D. 92 mm)
Counter flange	see overleaf
Switch element	microswitch changeover (SPDT) with silver contacts
Switch rating	5A/250 VAC 5A/30 VDC
Cable gland	M20 x 1.5
Enclosure	IP65
Weight	A 01 140: approx. 2.5 kg A 01 141: approx. 2.7 kg
Approvals	ABS, BV, DNV, GL, LRS, PRS, RINA, MRS

Connection diagram



Setting the switching differential

1. For pump control (2 switch points)

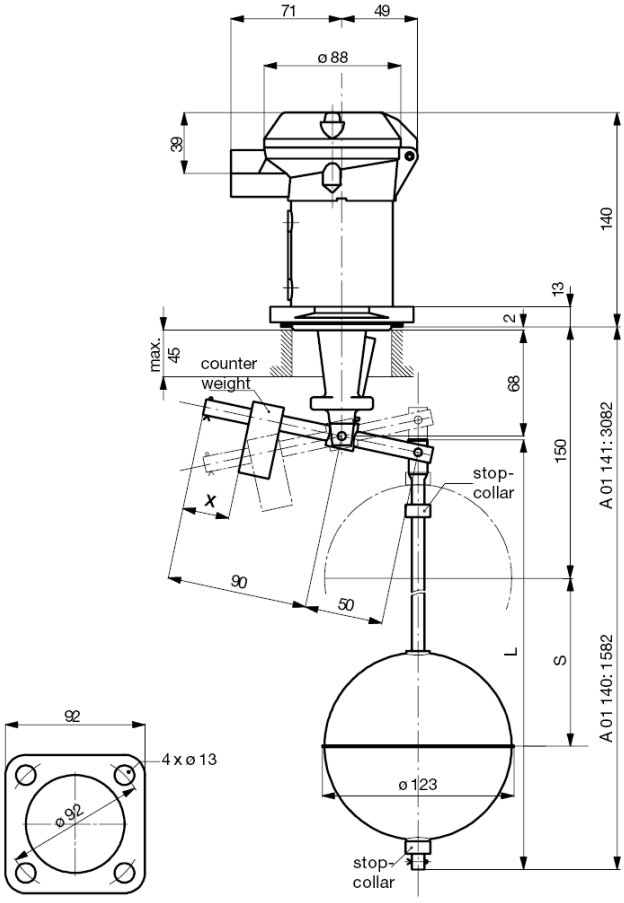
The required differential is set by fixing the two stop collars in the appropriate positions on the rod. The counterweight has to be adjusted to compensate for the rod weight (without float), until the cross arm is balanced. The float slides up and down the rod with the liquid level and actuates the switch at the set position of the stop collars.
The switch remains latched between the two positions, which are for applications such as pump control where the contactor coil would need to remain energized throughout the pumping cycle.

2. For alarm operation (1 switch point)

Only the lower collar is fixed on the for (below the float). Within the limit of the rod length, the height of the alarm point can be chosen as required. The counterweight has to be set, to outweigh the rod (without float). The alarm switching differential is 12 mm.

Adjustment at factory

The level switches are factory set for pump control. Distance X = 38 mm. If the rods have to be shortened or the switch has to be used for alarm purposes, the position of the counterweight has to be adjusted, as described on the back page.



Distance X for counterweight (see drawing on the front page)

Switch types ...140/...145

rod length L in (mm)	pump control X in (mm)	alarm X in (mm)	
	...140 / ...145	...140	...145
500	63	45	4
600	60	42	4
700	57	39	4
800	54	36	4
900	51	32	4
1000	47	30	4
1100	44	26	4
1200	41	23	4
1300	38	20	4
1400	35	17	4
1500	32	14	4

Switch types ...141/...146

rod length L in (mm)	pump control X in (mm)	alarm X in (mm)	
	...141 / ...146	...141	...146
1500	54	45	4
1600	53	43	4
1700	51	41	4
1800	49	40	4
1900	48	38	4
2000	46	36	4
2100	44	35	4
2200	43	33	4
2300	41	31	4
2400	39	30	4
2500	38	28	4
2600	36	27	4
2700	34	25	4
2800	33	23	4
2900	31	22	4
3000	29	20	4

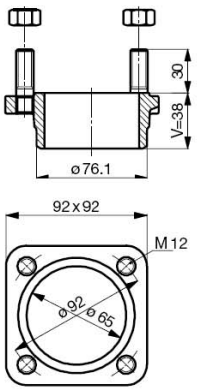
Installation

Over open tanks or sumps on a bracket. On closed tanks on the manhole covery with the float mounted from the inside. In the absence of a manhole, i.e. the float can not be mounted from the inside, an intermediate flange with an inside diameter of min. 125 mm of flange modules acc. to DIN DN125 or ANSI DN5" should be used. If turbulence occurs, the rod should be guided loosely at the lower end.

Counterflanges

The simplest method of installing the TriMod BESTA level switch types A 01 140 and A 01 141 is to use the BESTA standard weld-on counterflanges.
These are available in carbon steel C22.8 (A105 equiv.) and in stainless steel 1.4401 (SS316 equiv.).
If the float can be mounted from the inside, the counterflange can be welded directly to the tank. Otherwise the counterflange has to be welded to an intermediate flange (I.D. min. 125 mm).

Temperature range: Material C22.8 -10 to +400°C
Material 1.4401: -196 to +300°C



Type	Specification	Flange material	Stud material
2829.1	Counterflange	C22.8	5.8
2831.3	Counterflange	1.4401	A2

Options

- Dual SPDT microswitches
- Microswitches with gold plated contacts
- Self checking proximity switches acc. to NAMUR
- Enclosure IP67, or IP68 for submersible applications
- 5A/380 VAC 0.3A/440 VDC (type: AE26)
- Explosion proof switches, PTB-, SAA- and SEV-approved
- Pneumatic switches ON/OFF

- High and low temperature versions
- Cable gland M 24 x 1.5
- Cable entry with 3/4" NPT internal thread
- Switch housing: - chromated
  - stainless steel (316 equiv.)
  - epoxy painted
- Flange modules: - acc. to ANSI, DIN, BS and JIS
- Float modules: - interface control

Certificates

- Material certificates acc. to EN 10204-2.2 and EN 10204-3.1B
- Test records of hydraulic pressure tests and functional tests
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