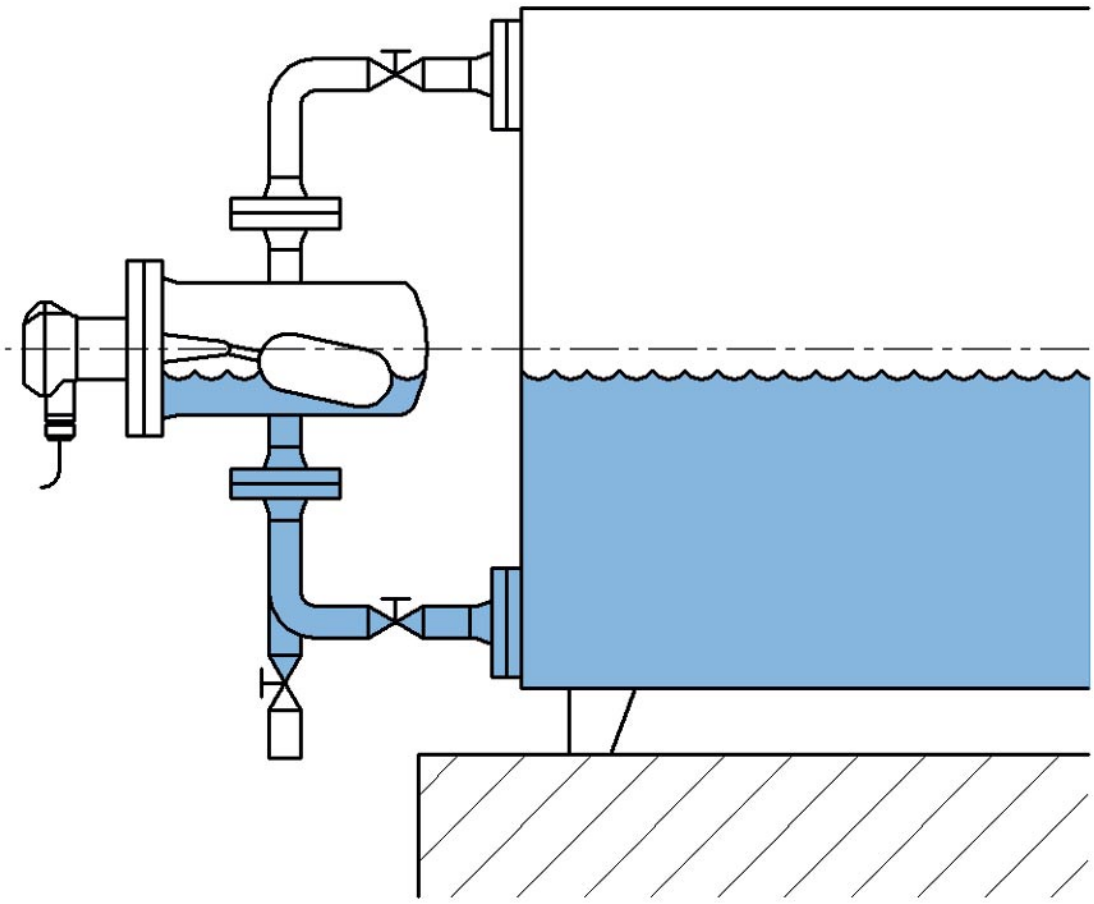
Float Chambers



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Standard Chambers

Data Sheet LTDK01E

Besta Standard Chambers are designed for operating pressures up to PN25 acc. to DIN. The wide choice of material allows applications with corrosive liquids and process temperatures between -200°C and +400°C. The range of Besta Standard Chambers offers the most economical solution for external mounting of a Trimod Besta level switch of the Horizontal Line.

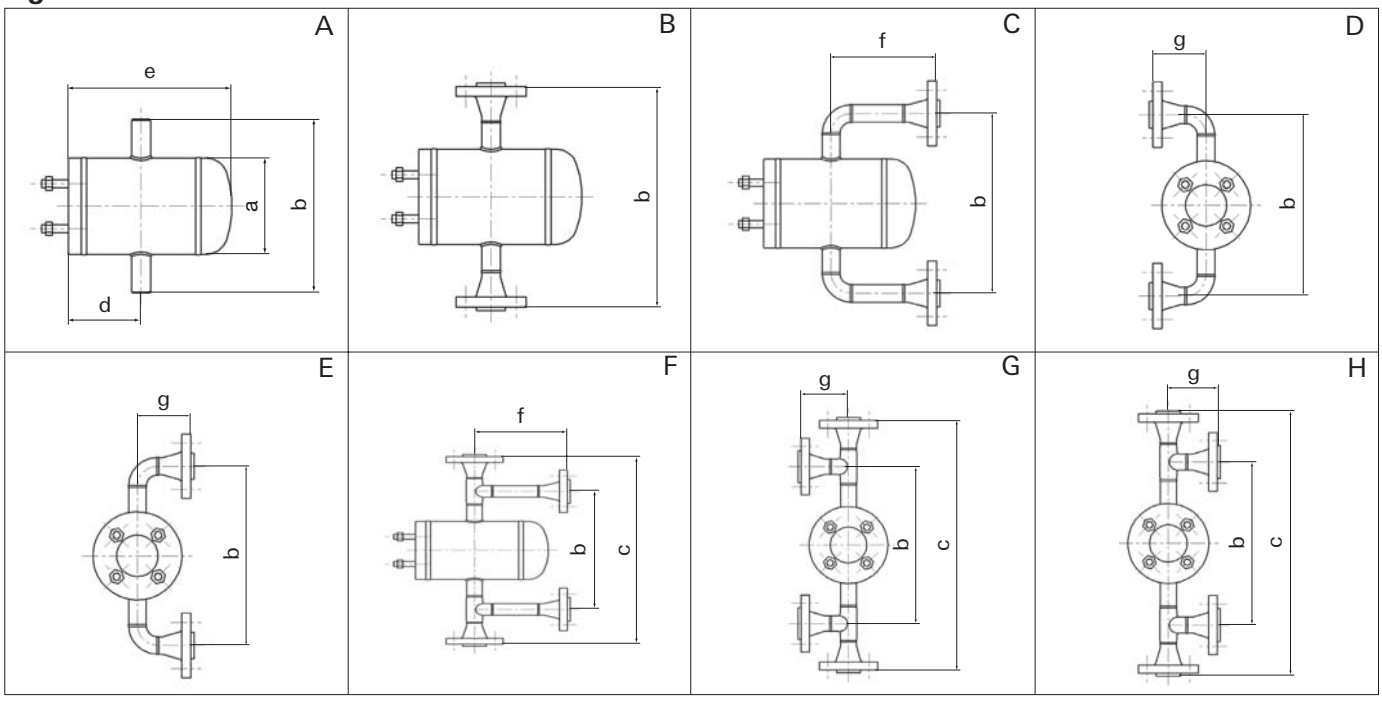
Key to typ number

S | | | | | | | |

- Figure: A to H
- Flange facing/process connection:
  C = raised face type C according to DIN, R = raised face acc. to ANSI, X = butt weld
- DN process connection:
  1 = DIN DN25/ANSI 1", 4 = DIN DN50/ANSI 2"
- Material:
  0 = carbon steel, 1 = 15Mo3, 4 = CrNi steel (SS304 equiv.),
  5 = CrNiMo steel (SS316 equiv.)
- Nominal pressure PN:
  1 = ANSI cl.150, 2 = ANSI cl.300 (flange only)/DIN PN25
- Standard:
  0 = DIN, 1 = ANSI
- Standard Chamber series to fit Standard Range level switches

Detailed key to type numbers see Product Information LTPA28E

Figures



Suitable Trimod Besta Level Switches

For correct clearance, only the Standard Range float modules listed in the table opposite can be used with Standard Chambers. Details on float modules see catalogue Trimod Besta level switches, LTKAE1 page 27 and 28.	Type of float module				
	01	07	013	053	072
	04	011	051	054	073
	041	012	052	071	074

PN 25	Process connection acc. to DIN							
		Dimensions in mm						
Figure	DN	a	b	c	d	e	f	g
A	25	139,7	290		123	273		
	50	139,7	290		123	273		
B	25	139,7	290		123	273		
	50	139,7	290		123	273		
C	25	139,7	286		123	273	168	
	50	139,7	346		123	273	168	
D	25	139,7	286		123	273		79
	50	139,7	346		123	273		125
E	25	139,7	286		123	273		79
	50	139,7	346		123	273		125
F	25	139,7	286	444	123	273	168	
	50	139,7	322	548	123	273	168	
G	25	139,7	286	444	123	273		79
	50	139,7	322	548	123	273		113
H	25	139,7	286	444	123	273		79
	50	139,7	322	548	123	273		113

PN 25	Process connection acc. to ANSI cl. 150							
Figure	DN	a	b	c	d	e	f	g
A	1"	139,7	320		123	273		
	2"	139,7	320		123	273		
B	1"	139,7	307		123	273		
	2"	139,7	307		123	273		
C	1"	139,7	272		123	273	194	
	2"	139,7	332		123	273	194	
D	1"	139,7	272		123	273		95
	2"	139,7	332		123	273		141
E	1"	139,7	272		123	273		95
	2"	139,7	332		123	273		141
F	1"	139,7	272	462	123	273	194	
	2"	139,7	308	565	123	273	194	
G	1"	139,7	272	462	123	273		95
	2"	139,7	308	565	123	273		129
H	1"	139,7	272	462	123	273		95
	2"	139,7	308	565	123	273		129

PN 25	Process connection acc. to ANSI cl. 300							
Figure	DN	a	b	c	d	e	f	g
A	1"	139,7	320		123	273		
	2"	139,7	320		123	273		
B	1"	139,7	320		123	273		
	2"	139,7	320		123	273		
C	1"	139,7	272		123	273	200	
	2"	139,7	332		123	273	200	
D	1"	139,7	272		123	273		101
	2"	139,7	332		123	273		147
E	1"	139,7	272		123	273		101
	2"	139,7	332		123	273		147
F	1"	139,7	272	474	123	273	200	
	2"	139,7	308	578	123	273	200	
G	1"	139,7	272	474	123	273		101
	2"	139,7	308	578	123	273		135
H	1"	139,7	272	474	123	273		101
	2"	139,7	308	578	123	273		135

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Industrial Chambers

Data Sheet LTDK02E

Besta Industrial Chambers with switch- and process connections acc. to DIN or ANSI are designed for medium to high pressure applications. Pressure range: up to PN 315 acc. to DIN and up to cl. 2500 acc. to ANSI. Temperature range: -200°C to +400°C. On the following 2 pages you will find information for Industrial Chambers up to PN 63 and cl. 600. For applications with higher nominal pressures please ask for specific documentation. Typical applications for Industrial Chambers are: Power stations, chemical and petrochemical plants.

Key to typ number

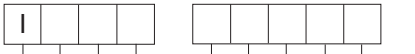


Figure: A to H

Flange facing/process connection:
C = raised face type C to DIN, R = raised face to ANSI, X = butt weld

DN process connection: 1 = DIN DN25/ANSI 1", 4 = DIN DN50/ANSI 2"

Flange facing/switch connection:
C = raised face type C to DIN, R = raised face to ANSI

DN switch connection: 1 = DIN DN65/ANSI 3"

Material: 0 = carbon steel, 1 = 15Mo3, 4 = CrNi steel (SS304 equiv.), 5 = CrNiMo steel (SS316 equiv.)

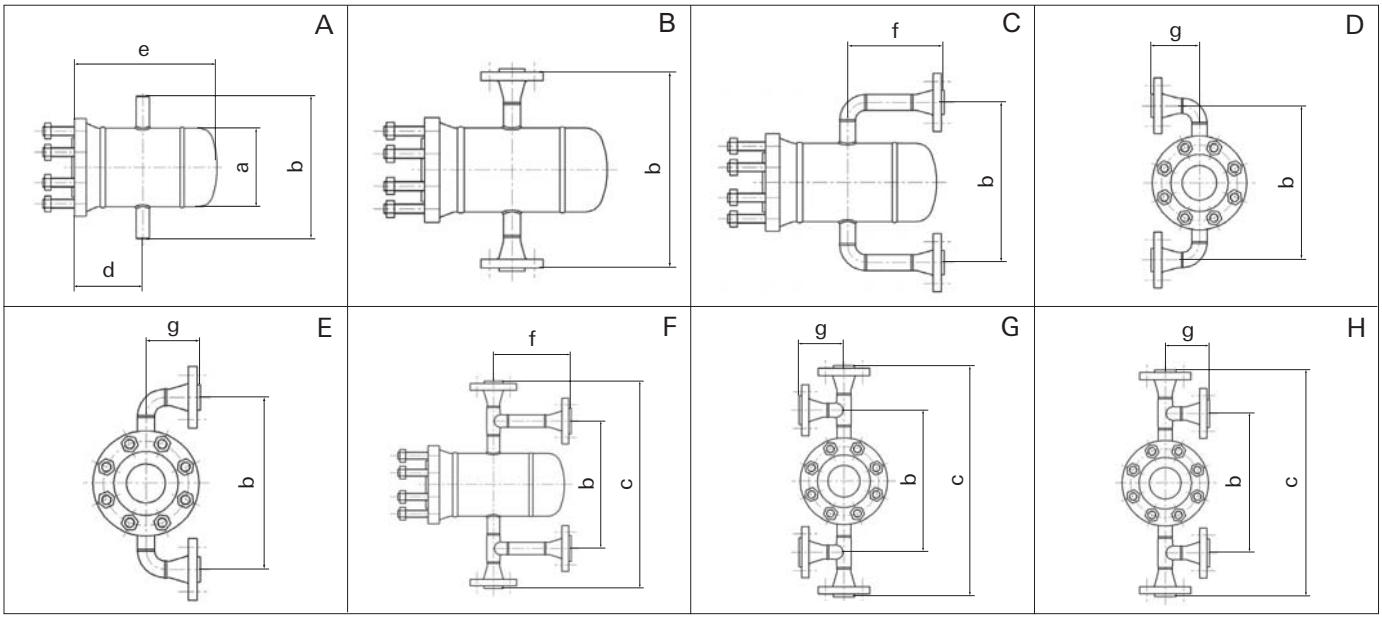
Nominal pressure PN: 1 = ANSI cl.150, 2 = ANSI cl.300/DIN PN40, 3 = DIN PN63, 4 = ANSI cl.600

Standard: 0 = DIN, 1 = ANSI

Industrial Chamber series to fit Industrial Range level switches

Detailed key to type numbers see Product Information LTPA27E

Figures



Suitable Trimod Besta Level Switches

For correct clearance, only the Industrial Range float modules listed in the table opposite can be used with Industrial Chambers.

Details on float modules see catalogue Trimod Besta level switches, LTKAE1 page 27 and 28.

* except for chambers PN40

Type of float module				
01	76*	03	051	071
04	02	011	052	072
041	26*	012	053	073
07	27*	013	054	074

PN 40	Process connection acc. to DIN / Switch connection flange: DN 65							
		Dimensions in mm						
Figure	DN	a	b	c	d	e	f	g
A	25	139,7	290		164	315		
	50	139,7	290		164	315		
B	25	139,7	290		164	315		
	50	139,7	290		164	315		
C	25	139,7	286		164	315	168	
	50	139,7	346		164	315	168	
D	25	139,7	286		164	315		79
	50	139,7	346		164	315		125
E	25	139,7	286		164	315		79
	50	139,7	346		164	315		125
F	25	139,7	286	444	164	315	168	
	50	139,7	322	548	164	315	168	
G	25	139,7	286	444	164	315		79
	50	139,7	322	548	164	315		113
H	25	139,7	286	444	164	315		79
	50	139,7	322	548	164	315		113

PN 63	Process connection acc. to DIN / Switch connection flange: DN 65							
Figure	DN	a	b	c	d	e	f	g
A	25	168,3	290		181	352		
	50	168,3	290		181	352		
B	25	168,3	350		181	352		
	50	168,3	350		181	352		
C	25	168,3	310		181	352	181	
	50	168,3	378		181	352	181	
D	25	168,3	310		181	352		97
	50	168,3	378		181	352		139
E	25	168,3	310		181	352		97
	50	168,3	378		181	352		139
F	25	168,3	310	504	181	352	181	
	50	168,3	354	608	181	352	181	
G	25	168,3	310	504	181	352		97
	50	168,3	354	608	181	352		127
H	25	168,3	310	504	181	352		97
	50	168,3	354	608	181	352		127

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PN cl. 150	Process connection acc. to ANSI / Switch connection flange DN 3"							
		Dimensions in mm						
Figure	DN	a	b	c	d	e	f	g
A	1"	141,3	320		164	341		
	2"	141,3	320		164	341		
B	1"	141,3	307		164	341		
	2"	141,3	307		164	341		
C	1"	141,3	272		164	341	194	
	2"	141,3	332		164	341	194	
D	1"	141,3	272		164	341		95
	2"	141,3	332		164	341		141
E	1"	141,3	272		164	341		95
	2"	141,3	332		164	341		141
F	1"	141,3	272	462	164	341	194	
	2"	141,3	308	565	164	341	194	
G	1"	141,3	272	462	164	341		95
	2"	141,3	308	565	164	341		129
H	1"	141,3	272	462	164	341		95
	2"	141,3	308	565	164	341		129

PN cl. 300	Process connection acc. to ANSI / Switch connection flange DN 3"							
Figure	DN	a	b	c	d	e	f	g
A	1"	141,3	320		181	358		
	2"	141,3	320		181	358		
B	1"	141,3	320		181	358		
	2"	141,3	320		181	358		
C	1"	141,3	272		181	358	200	
	2"	141,3	332		181	358	200	
D	1"	141,3	272		181	358		101
	2"	141,3	332		181	358		147
E	1"	141,3	272		181	358		101
	2"	141,3	332		181	358		147
F	1"	141,3	272	474	181	358	200	
	2"	141,3	308	578	181	358	200	
G	1"	141,3	272	474	181	358		101
	2"	141,3	308	578	181	358		147
H	1"	141,3	272	474	181	358		101
	2"	141,3	308	578	181	358		147

PN cl. 600	Process connection acc. to ANSI / Switch connection flange DN 3"							
Figure	DN	a	b	c	d	e	f	g
A	1"	168,3	320		181	371		
	2"	168,3	320		181	371		
B	1"	168,3	350		181	371		
	2"	168,3	350		181	371		
C	1"	168,3	302		181	371	200	
	2"	168,3	356		181	371	203	
D	1"	168,3	302		181	371		108
	2"	168,3	356		181	371		157
E	1"	168,3	302		181	371		108
	2"	168,3	356		181	371		157
F	1"	168,3	302	504	181	371	200	
	2"	168,3	332	608	181	371	203	
G	1"	168,3	302	504	181	371		101
	2"	168,3	332	608	181	371		138
H	1"	168,3	302	504	181	371		101
	2"	168,3	332	608	181	371		138

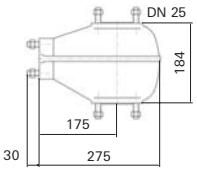
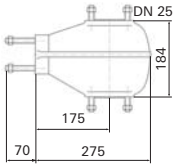
General purpose Gray Cast Iron Chambers

Besta Gray Cast Iron Chambers of GG20 are designed for applications with non-corrosive liquids and where no surge in pressure can occur. These chambers are suitable for level switches of the Standard Range only.

Suitable Trimod Besta Level Switches

For correct clearance, only the Standard Range float modules listed in the table opposite can be used with Standard Chambers. Details on float modules see catalogue Trimod Besta level switches, LTKAE1 page 27 and 28.	Type of float module			
	01 04	041 07	011 012	013

Gray Cast Iron Chamber PN 16 Process connection DN 25 acc. to DIN, raised face type C

Type	Description	Temperature range °C	Material	Dimensions
SG 10	Gray Cast Iron Chamber incl. bolts and nuts (M12) on switch and process connection flange.	-10 to +300	GG20	
SG 20	Gray Cast Iron Chamber as above but with extended bolts on the switch flange for mounting test actuators. (See Trimod Besta Level Switch Catalogue LTKAE1 page 36)	-10 to +300	GG20	

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Manufacturing Specs

Data Sheet LTDK03E

1. Pressure vessel calculation
The calculations are based on the AD-rules (German Association for Pressure Vessels), or are designed in conformity to ASME VIII.

2. Welding Procedure

LEVEL I	LEVEL II	LEVEL III
Industrial welding procedure to ASME IX / SVDB, see back page		
Full penetration welding suitable for NDE	Full penetration welding not suitable for NDE	Part penetration welding not suitable for NDE
Weld joint prepartion for NDE testing	Not suitable for welds with NDE requirements	

2a. Weld procedure GTAW/GMAW-SMAW (TIG / MAG-MIG)

3. Heat treatment
Pre- and post weld heat treatment for high temperature steel only, e.g. 13 CrMo/44 (1.7335), A335 Gr. P12, A234-WP11, A182-F12 other materials upon request.

Stress-free annealing:	Annealing temperature:	650 - 720°C	Cooling:	with cover gas
	Time:	approx. 2 h	Report:	T-t-diagram

4. Material tests
Non destructive examination of chambers manufactured according to LEVEL I, see back page
Radiographic film material remains the property of Besta AG and is filed for 10 years.

5. Hydrostatic test
100% cold hydraulic pressure test — Test pressure: DIN-chambers: PO, acc. AD 2000; ANSI-chambers: 1.5 x PO, acc. ASME

Report: Test certificate T-130 or FT-103 — PO = max. allowable working pressure

6. Surface protection / Coating

Standard:	Carbon steel (cs):	protection coat, blue		
	Stainless steel (ss):	pickled		
Option A:	Carbon steel:	up to max. operating temperature 180°C		
T-187	Surface preparation:	sand- or corundum blasting		
	Primer:	ETOZINC zinc powder primer	Epoxy-Polyamide resin	1 x 50 micro
	Undercoat:	ETOKAT filler	Epoxy-Polyamide resin	2 x 50 micro
	Finish:	NUVOVERN ACR gloss GL	Polyurethane two-component enamel based resin	1 x 50 micro
	Colour:	RAL 5010, blue		
Option B:	Carbon steel:	up to max. operating temperature 400°C		
T-188	Surface preparation:	corundum blasting		
	Primer:	SILKONOX HT zinc dust primer	Silicone basis	1 x 30 micro
	Finish:	IMERIT silicone enamel SDGL	Silicone basis	2 x 20 micro
	Colour:	aluminium semi-gloss		
Option C:	Stainless steel:	up to max. operating temperature 150°C		
T-189	Surface preparation:	corundum blasting		
	Primer:	ETOKAT Aktiv Primer	Epoxi-resin basis	1 x 30 micro
	Finish:	NUVOVERN ARC Emaillack GL	Polyurethane basis	1 x 30 micro
	Colour:	RAL 5010 (blue)		

7. Studs and nuts

Carbon steel	DIN (-10° to +400°C)	Studs A 193-B7	Nuts A 194-2H
	ANSI (-29° to +400°C)	Studs A 193-B7	Nuts A 194-2H
Low temperature material	DIN (<-10°C), ANSI (<-29°C)	Studs A 320-L7	Nuts A 194-4

8. Gaskets

Switch connection flange:	Material:	AFM 34	for sealing:	raised face
		stainless steel	for sealing:	ring joint

9. Certificates
Option: material certificates to EN10204/DIN50049-2.2 / 3.1B / 3.1A / 3.1C — Marking: die-stamped
The requested material certificate must be specified with the order.

PED: Chamber manufactured according to PED incl. letter of conformity.

10. NACE-conformity

Option: To NACE MR0175-(91). Max. 22 HRC for carbon- and stainless steel (e.g. 304 / 316 and equivalent)

11. Approvals / QA

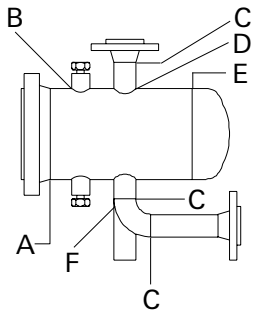
Manufactured according to RL 97/23/EG: PED/DGR

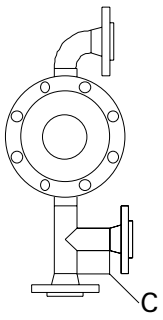
Welding procedures: SVTI 505, AD HP 2/1, ASME Code Sec. IX Transfer of material stamps: SVDB 201/507

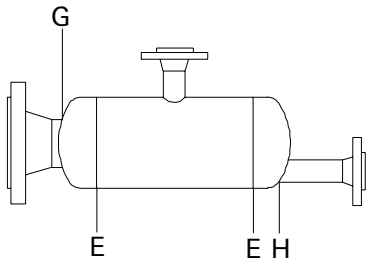
Welder qualification: SVTI 504, AD HP 3, ASME Code Sec. IX

QA-System: ISO 9001 (BVQI - Bureau Veritas Quality International)

Weld-code:





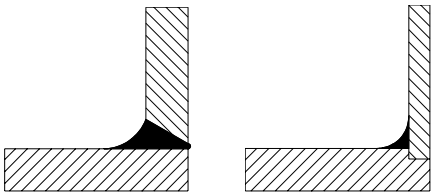


Joint A / E

LEVEL I / II LEVEL III

Joint B

LEVEL I / II LEVEL III

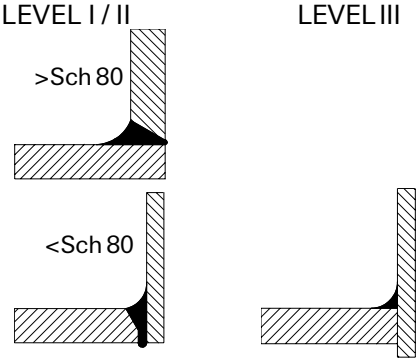


Joint C

LEVEL I / II LEVEL III

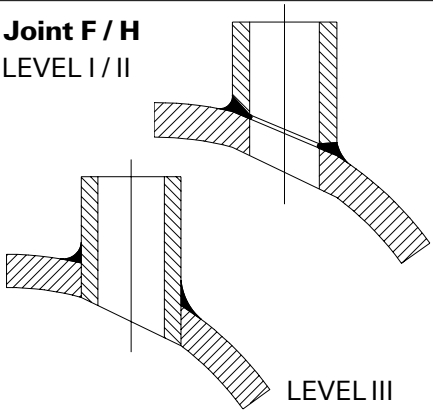
Joint D

LEVEL I / II LEVEL III



Joint F / H

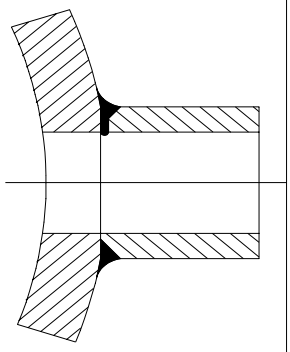
LEVEL I / II



LEVEL III

Joint G

LEVEL I / II



LEVEL III

Filler metal	**Böhler**	**DIN 8557**	**AWS / ASME II C**
Carbon steel	EML 5, EML 7	SG 1, SG 3	ER 70 S-3 / S-6
15 Mo 3	DMO-IG	SG Mo	ER 70 S-G
CrNi (304SS)	EAS 2-IG, FOX EAS 2	SG X 2 CrNi 19 9, E 19 9 nCB 20+	ER 308 L, E 308 L-15
CrNiMo (316SS)	EAS 4M-IG, SAS 4-IG, FOX EAS 4 M, FOX SAS 4	SG X 2 CrNiMo 19 12, SG X 5 E 19 12 3 nCB 20+, E 19 12 3 Nb B 20+	ER 316 L, ER 318 E 316 L, E 318-15
Low temp. carbon steel	2,5 Ni-IG, FOX 2,5 Ni	--,--	ER 80 S-Ni 2, EY 46 873 Ni B

Non-destructive examination (NDE) for LEVEL I weld joints

Joint A/E and C	10 % / 100 %	Radiographic examination
	100 %	Dye penetrant or magnetic particle testing
Joint B, D, F/H, G	100 %	Dye penetrant or magnetic particle testing

LTDK03E/01.05

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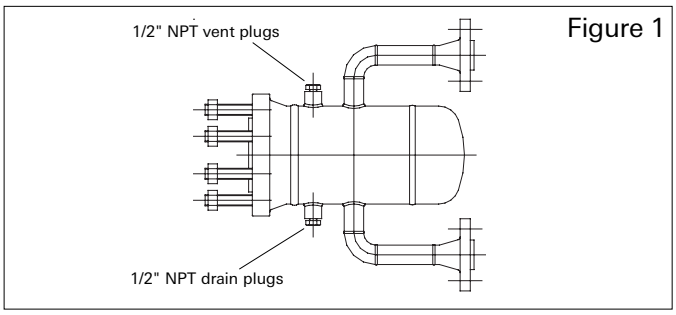
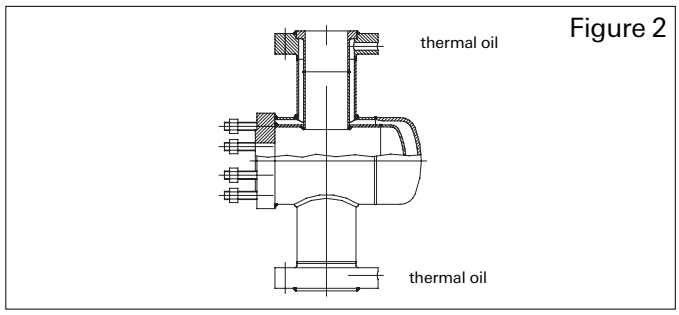
Options, documentation and quality

- Other flange facings than raised face.
- 1/2" NPT drain and vent plugs (fig. 1).
- Float chambers in other materials, e.g. low temperature carbon steel, high temperature steel.
- Double-wall chambers for thermal oil heating (fig. 2).
- Materials according to NACE MR-01-75.

Besta float chambers with drain and vent plugs.

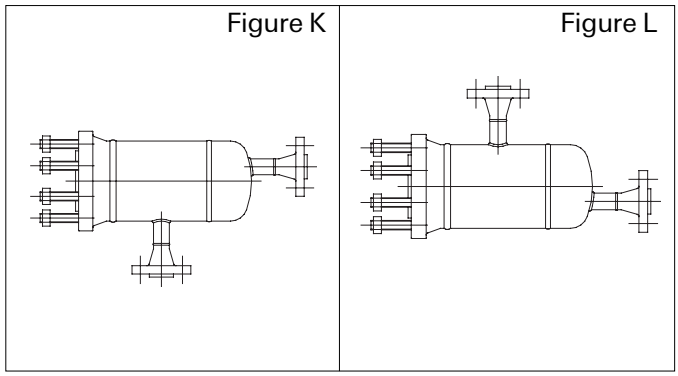


Double-wall float chamber for thermal oil heating.



Special configurations (figures)

Special configurations and chamber dimensions to meet your specific requirements.



Certified quality
Quality Assurance System to EN 29001 / ISO 9001, certified by Bureau Veritas Quality International.

Trimod Besta float chambers and level switches are used for various applications to control process functions for the safety of both, people and environment. As a manufacturer we take this responsibility serious. Thus, quality control is not only a strong sales argument, but also an obligation.

Each Trimod Besta float chamber is subjected to a cold hydraulic pressure test at a test pressure of 1.3 (DIN) respectively 1.5 (ANSI) x max. allowable working pressure.

Industrial Chambers are pressure tested assembled with the level switch. This guarantees a tight sealing.

The test pressure is recorded on our test certificate T-130, which is supplied for all chambers (except grey cast iron SG10 and SG20).

Dimensions, Materials and heat numbers are listed on the chamber drawings.

Maximum operating pressures according to DIN and ANSI

Standard Chambers

PN	Material of float chamber	max. operating pressure in bar at					
		to 120°C	200°C	250°C	300°C	350°C	400°C
25	Carbon steel	25	22	20	17	16	13
	15 Mo 3			25	22	20	19
	CrNi/CrNiMo	25	22	20	17	16	13

Industrial Chambers acc. to DIN

PN	Material of float chamber	max. operating pressure in bar at					
		to 120°C	200°C	250°C	300°C	350°C	400°C
40	Carbon steel	40	35	32	28	24	21
	15 Mo 3			40	35	31	30
	CrNi/CrNiMo	40	35	32	28	24	21
63	Carbon steel	63	50	45	40	36	32
	15 Mo 3			63	56	50	47
	CrNi/CrNiMo	63	50	45	40	36	32

Industrial Chambers acc. to ANSI B16.5

PN cl.	Material of float chamber	max. operating pressure in bar at					
		100°C	200°C	250°C	300°C	350°C	400°C
150	Carbon steel	17,7	14,0	12,1	10,2	8,4	6,5
	CrNi/CrNiMo	13,2	11,0	10,2	9,7	8,4	6,5
300	Carbon steel	46,4	43,8	41,7	38,7	37,0	34,5
	CrNi/CrNiMo	34,5	28,7	26,7	25,2	24,0	23,2
400	Carbon steel	61,8	58,4	55,6	51,6	49,3	46,0
	CrNi/CrNiMo	46,0	38,3	35,6	33,7	32,1	30,9
600	Carbon steel	92,8	87,6	83,4	77,5	73,9	69,0
	CrNi/CrNiMo	69,0	57,4	53,4	50,5	48,1	46,3

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