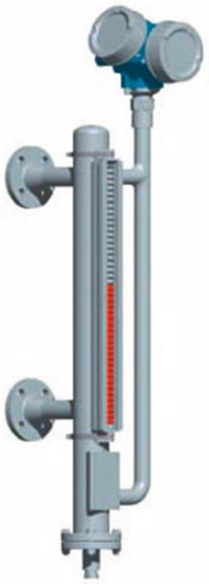
DATASHEET

KSS External Chamber

KSS Data Sheet - DS - LM - 002- 00






Product Overview

The External Chamber (Model – ECG) consists of an external chamber vessel that is mounted laterally to a vessel using at least 2 process connections (flange, thread or weld stub). Through this type of arrangement, the level in the external chamber corresponds to the level in the vessel.
The level is measured by a measuring instrument inserted additionally in the external chamber, for example Float switches, Level Transmitters, Guided wave radar, etc.

Measuring Principle

The External Chamber (bypass chamber) operates on the principle of communicating vessels. The External chamber is installed adjacent to the tank and connected to it by two pipes. The process conditions in the External chamber are the same as those in the tank. The measuring principle is also related to the level transmitter option that you selected in the customer order.

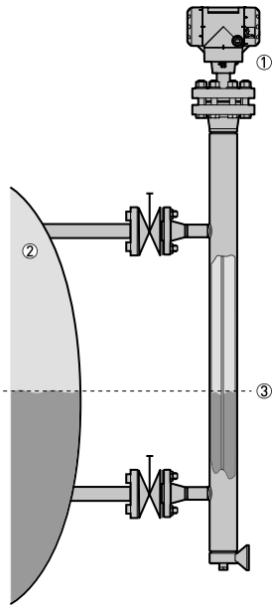
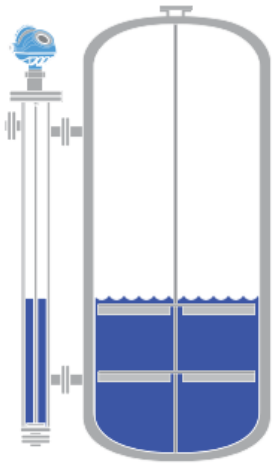


Figure 1-1: Measuring principle
1 Bypass chamber with level transmitter
2 Tank
3 Level of the liquid

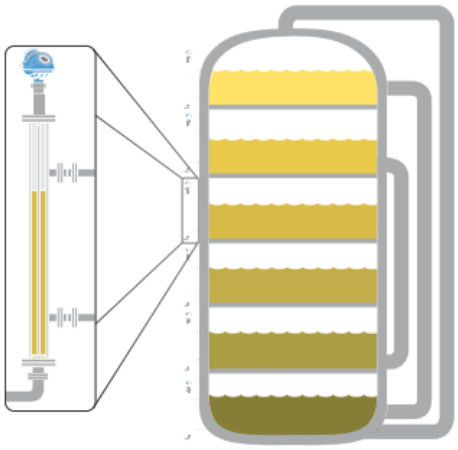
Applications

- Level detection for almost all liquid media
- Individual design and corrosion-resistant materials make the products suitable for a broad range of applications
- Chemical industry, petrochemical industry, oil and natural gas extraction (on- and offshore), shipbuilding, machine building, power generating equipment, power plants
- Process water and drinking water treatment, food industry, pharmaceutical industry

In-tank constraints

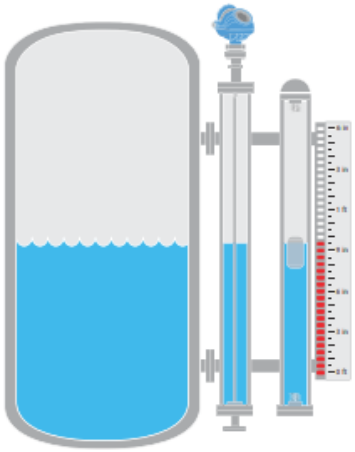


Isolation of instrument



Turbulent vessel conditions

Redundant solution



Special Features

- Process- and procedure-specific production
- Operating limits:
  - Operating temperature: T = -196 ... +450 °C
  - Operating pressure: P = Vacuum up to 400 bar
- Wide variety of different process connections and material

KSS External Chamber

Technical Specifications

External Chamber
• Single chamber
• Dual chamber
• Multiple special materials available
• Chamber size: ANSI 1.5” to 6”
• Maximum pressure rating: ANSI 2500LB
• Multiple options for installation and process connection

Technical Specifications

Chamber Materials	**:** 304/304LSS, 316/316LSS, 317LSS, 321LSS, 347LSS, 904SS, Ti2, Hastelloy C-276, Zr 702, Ni-6, 304/ 316SS lined/ Coated, PTFE, CPVC and PP.
Pressure Resistance Rating	**:** ANSI 150~2500LB, DIN PN16~PN420
Process Connection Configuration	: Side-Mounting 1/2”~3” DN15~DN80 Top-mounting 3”~10” DN80~DN250
Process Connection Type	**:** Flange/Thread/Nipple
Temperature Range	: -320~1000°F (-196~538°C)
Pressure Range	**:** 0~6000PSIG (Full Vacuum~42MPa)

Optional Accessories

Transmitter & Switches	: Various type of transmitters and switches are available
For High Temperature	: High temperature insulation pad; high temperature insulation blanket
For Low Temperature	: Insulation level with special frost prevention extension device
Heat Tracing	**:** Electric heat tracing, steam tracing tubing, steam jacket
Valve	**:** Vent valve / Drain valve / Isolation valves

Customer Specific Requirements

Additional requirements can be specified in quotation, for example:

Non-destructive Testing (NDT):

The following tests are available upon request:

- Visual inspection
- Dye penetrating test
- Positive Material Identification (PMI)
- Post Weld Heat Treatment (PWHT)
- Pickling and passivation
- Radiograph of welds
- Hardness testing
- Other tests are available upon request (consult factory for additional information)

Weld Inspection:

In addition to visual inspection, X-Ray can be used to inspect chamber body welds. Where X-Ray is not practical, inspection of the branch connection welds is available using Dye Penetrate Inspection (DPI) on stainless steel or Magnetic Particle Inspection (MPI) on carbon steel.

Special Material:

Special material can be specified in quotation, for example:

- Alloy 316 Ti (1.4571/UNS S31635)
- Super Duplex (1.4410/UNS S3850)(1)
- Alloy Titanium Grade 2 3.7035
- Low Temperature Carbon steel A350 LF2/A333 Gr. 6(1)

Material Certification:

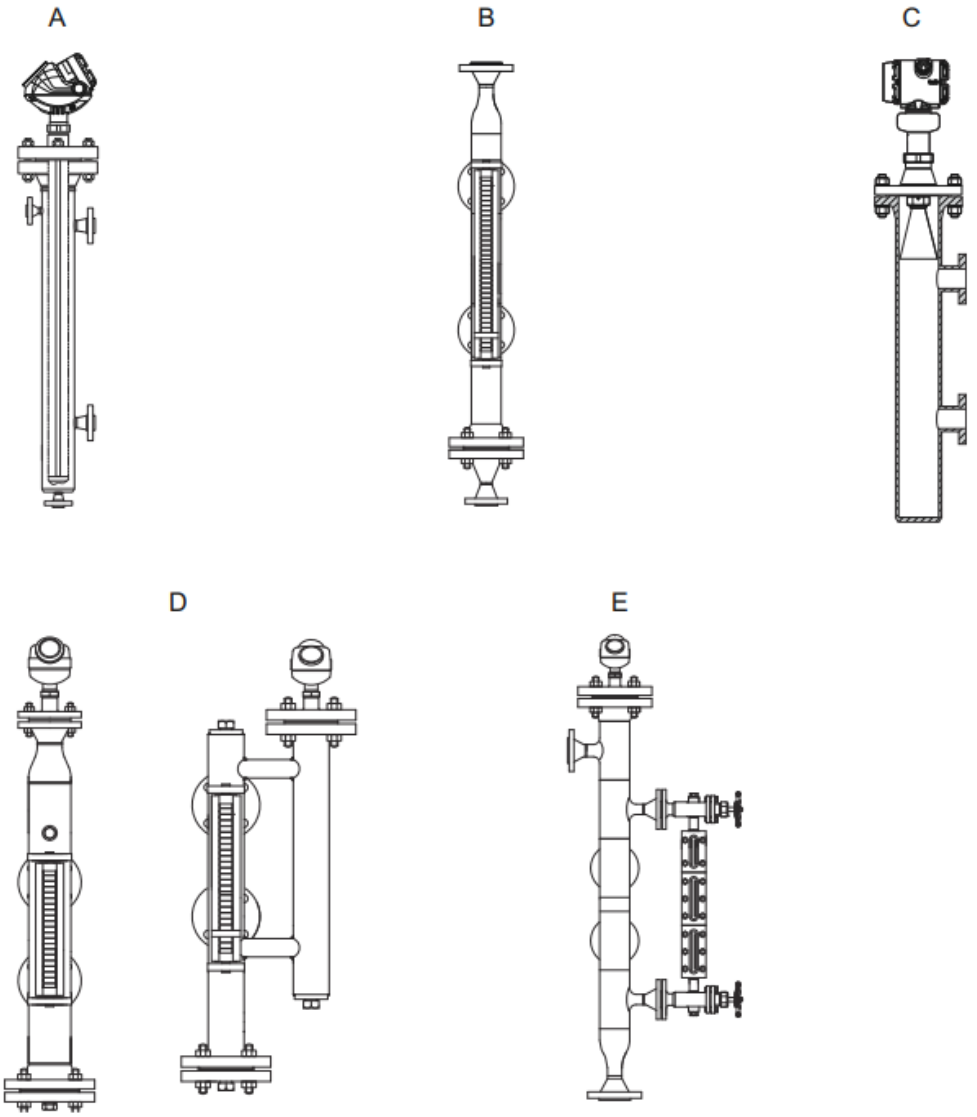
Material traceability certification conforming to EN 10204 3.1 is available, and Positive Material Identification (PMI) can also be ordered. PMI is a process to identify the composition of the material of the chamber and can be requested to support any material certificates that have been supplied. Requests for PMI should be made when making an inquiry.

Valves:

Valves are commonly mounted on the drain or vent connection to allow draining or venting of the chamber. It is common practice to also mount valves on the process connection to allow isolation of the chamber.

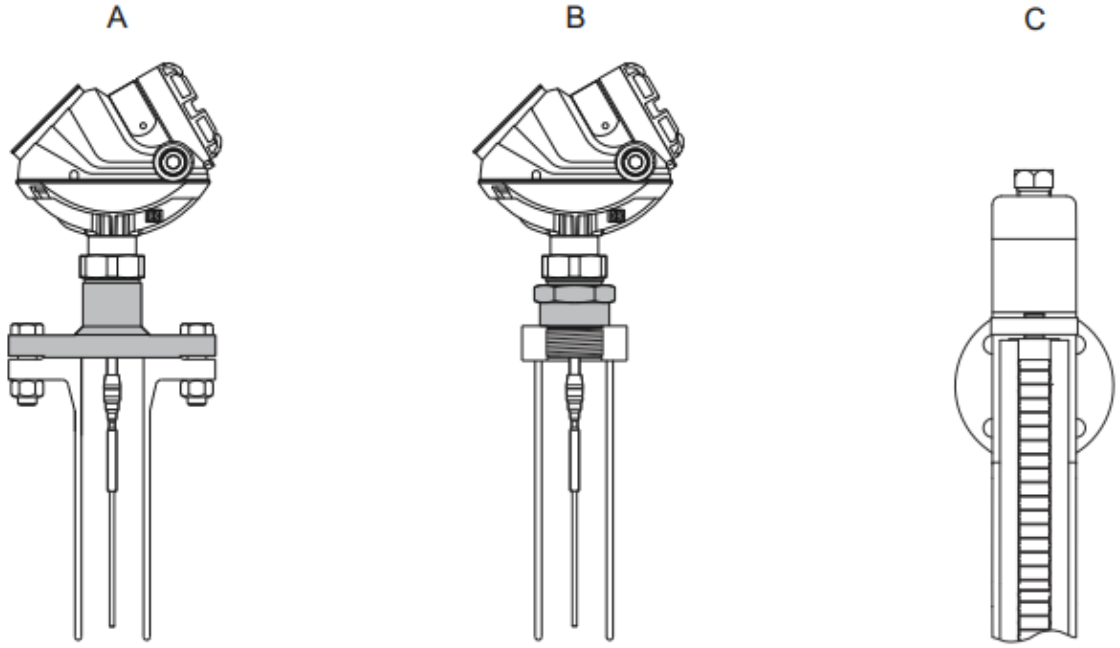
Specifications

Chamber Type:



A. Chamber with Guided Wave Radar
B. Magnetic level gauge/indicator/transmitter
C. Chamber with Non-Contacting Radar
D. Dual chamber with Radar and MLG/MLI/MLT – there are two versions available for this chamber type:
- Radar mounted in the same pipe with the MLG/MLI/MLT
- Chamber mounted in parallel with the MLG/MLI/MLT E. Chamber with sight glass

Instrument Connection Type:



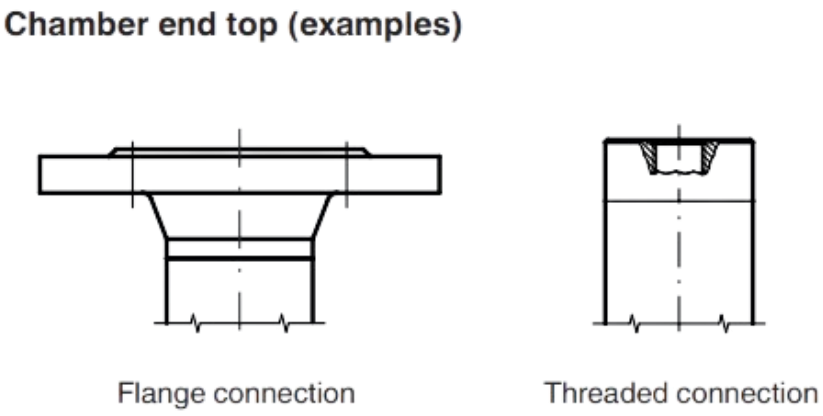
A. Flange connection

B. Threaded connection

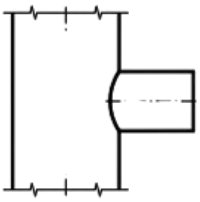
C. Connection without instrument

Chamber Design Examples:

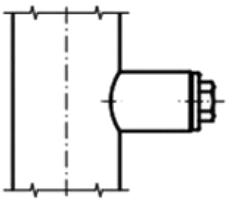
There are several options available for the process, vent, and drain connections of the chamber. Connection examples are presented here:



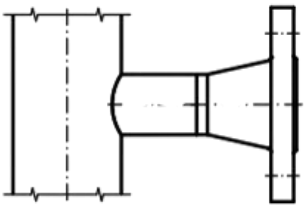
Vent (examples)



Weld stub



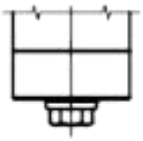
Vent plug G / NPT ½



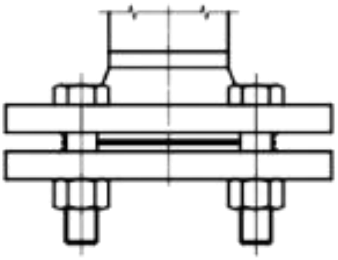
Flange connection

Chamber end bottom (examples)

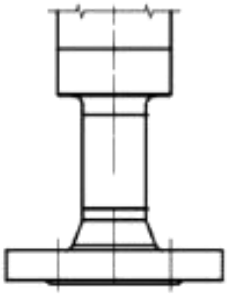
Pipe cap without drain



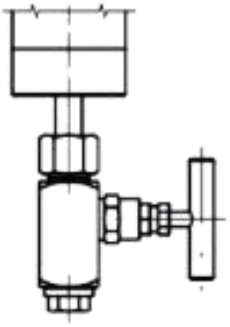
Pipe cap with drain plug
G / NPT ½"



Flange connection



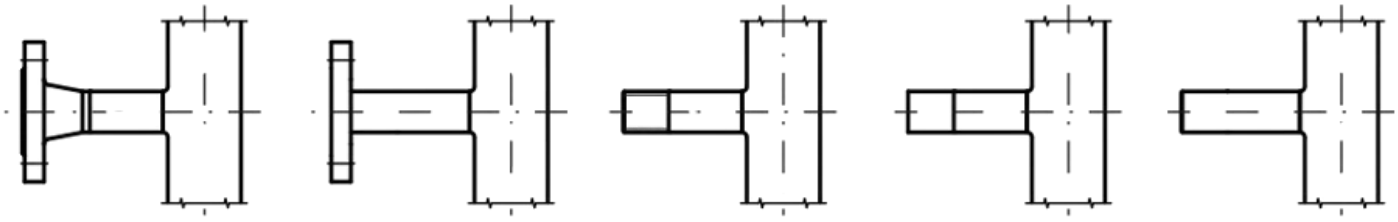
Pipe cap with drain flange



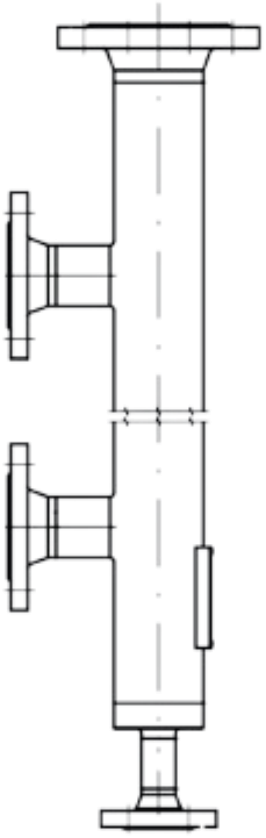
Pipe cap with drain valve

Options For Process Connection:

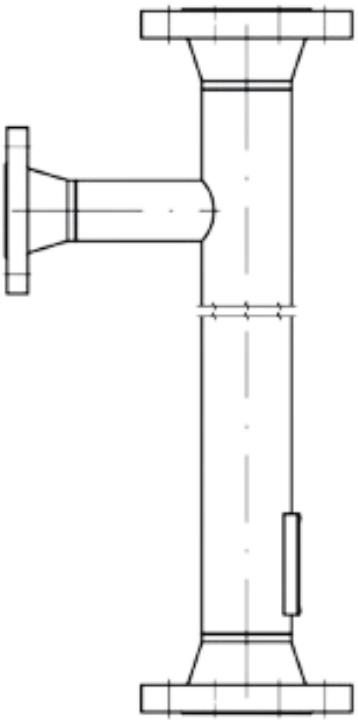
Process connection (examples)



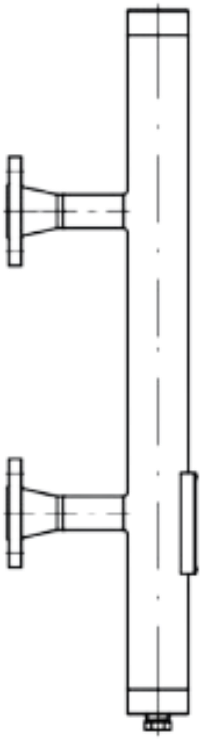
Welding neck flange | Blind flange | Threaded coupling GN ... (Male thread) | Threaded coupling GM ... (Female thread) | Weld stub S ...



Vertical flange connection (top) Process connections 2 x lateral Pipe cap with vertical drain flange (bottom)



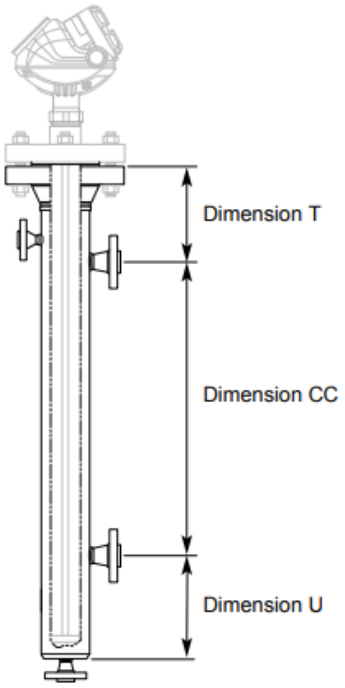
Vertical flange connection (top) Process connections 1 x lateral Vertical flange connection



Vertical threaded connection (top) Process connections 2 x lateral Pipe cap with vertical

Chamber Dimensions

Chamber Dimensions:



Chamber design	Dimension		
	T	U	CC(1)
Standard	10.8 in. (275 mm)	11.4 in. (290 mm)	Customer specific dimension
Standard with radar option R1	22.0 in. (560 mm)	11.4 in. (290 mm)	Customer specific dimension
Standard with radar option R2	28.0 in. (710 mm)	11.4 in. (290 mm)	Customer specific dimension
Customer specific dimension and/or design	Customer specific dimension(2)	Customer specific dimension(2)	Customer specific dimension

1) The chamber center-to-center dimension is critical and must match with the process vessel center-to-center.

2) For radar probe length calculation, blind zones, and reduced accuracy zones, refer to GWR Product Data Sheet.

Ordering Information

Code						
1	**Basic Type**					
	ECG	External Chamber				
2		**Process Connection**				
--x--		1st Key		2nd Key		3rd Key
		Nom. Size		Nom. Pressure		Flange face
	EN	EN 1092 DN10 - DN100 DIN DN10 - DN100 ANSI 1/2"- 4"	----	PN6 - PN400	----	Form B1, B2, C, D
	JIS	JIS DN10 - DN100		PN6 - PN400		Form C, N, F
	GM	Thread male DIN (BSPT-M)		Class 150 - 2500		Form RF, SF, FF, RTJ
	GF	Thread female DIN (BSPT-F)		5 k - 63 k		Form RF, SF, FF, RTJ
	NPTM	Thread male NPT (NPT-M)				
	NPTF	Thread female NPT (NPT-F)				
	SW	Welding stubs				
3		**Distance**				
L---	L---	Center to Center Distance				
4		**Material and Chamber Dimension**				
--x--		1st Key				2nd Key
		Material				Chamber dimension
	L	Stainless steel 304/304L	HC	Hastelloy - C	--x--	Chamber OD x wall thickness in 'mm'
	LV	Stainless steel 316/316L	MO	Stainless steel 1.4529 (6Mo)		
	V	Stainless steel 316-TI(1.4571)	M	Monel		
	VE	Stainless steel electro-polished	PP	Polypropylene		
	CS	Carbon steel	PF	PVDF		
	DU	Duplex	PV	Polyvinyl chloride (PVC)		
	SDU	Super Duplex	PT	PTFE Lined/Coated		
	IC	Inconel				
5		**Special Features**				
--x--	J	Jacketing	IB	Insulation blanket	--x--	
	ST	Steam tracing	SJ	Special jacketing		
	HT	Heat tracing	-	None		
6		**Special Approval**				
--x--	IBR	The Indian Boiler Regulation (IBR)				
	PED	Pressure Equipment Directive				

Ordering Example

	Basic Type	Connection Size	Distance C -C	Material Chamber	Special Features	Special Approval
Code	1	2	3	4	5	6
	ECG	2"/300/RF	L1500	CS60.3 x 3.91	J	IBR

Documentation

Following documents shall be provided as a standard part of supply,

1) General Arrangement drawings for approval
2) Hydro test report.
3) Dimensional test report.
4) Material certificate 3.1 acc. to EN-10204 for all wetted parts
5) Material compliance certificate for all non-wetted parts
6) Test & Warrantee Certificate.

Following testing certification can be provided additionally on demand,

1) Material certificate 3.2 acc. to EN-10204 for all wetted parts
2) Radiography examination for butt weld joints
3) Liquid penetration test for weld joints
4) Positive material identification test (PMI)
5) Ultrasonic testing – thickness testing
6) Magnetic particle inspection / testing
7) Special painting or surface treatment per customer specification
8) Post weld heat treatment
9) Equipment weight documentation
10) Hardness testing (per customer specification)
11) Helium leak test on pressure bearing parts
12) Intergranular corrosion destructive (IGC) test
13) Documentation set as per customer requirement

For inquiries contact us at:

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