

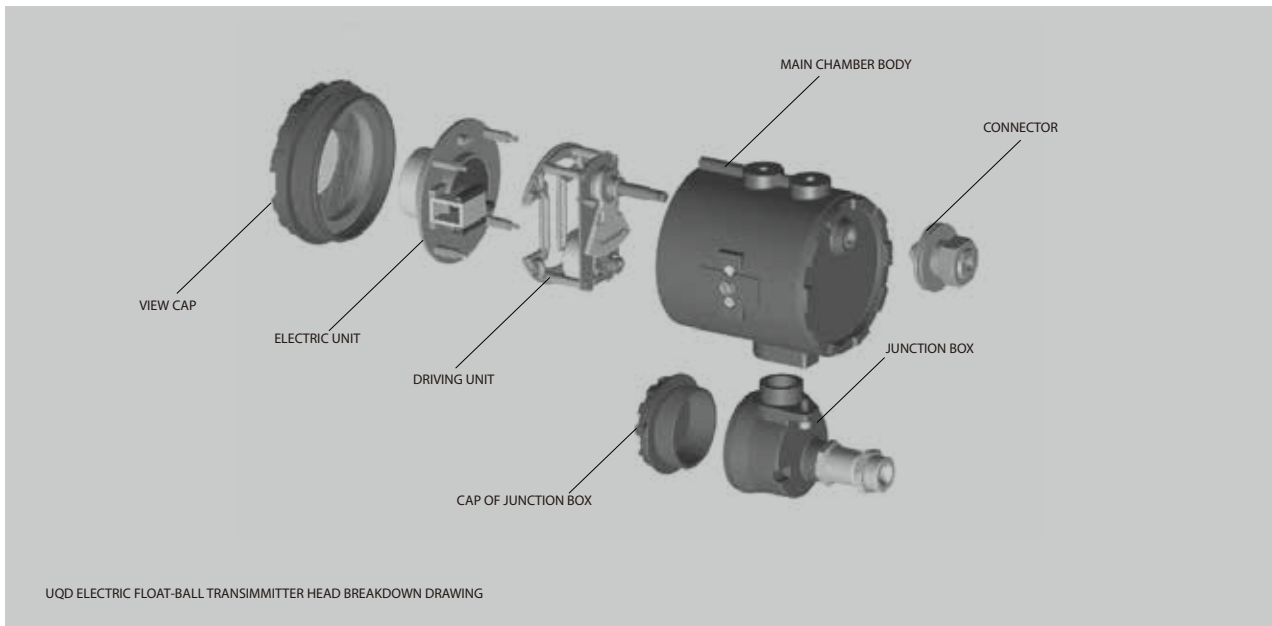
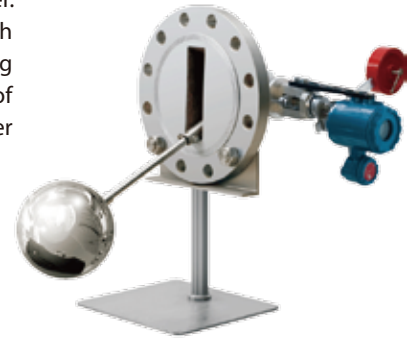
UQD BALL FLOAT LEVEL TRANSMITTER

Summary

UQD Ball Float Level Transmitter consists of measurement part and signal controller. According to structural features, the measurement part can be divided into 90 type with small angle, 91 type with big angle. The signal controller part can be divided into analog type (UQD.A) and smart type (UQD.Z). It is widely applied to the level measurement of various fluid, and is an ideal instrument for petroleum, chemical, metallurgy, electric power and other industries.

Operating Principle

The measuring part of the UQD Ball Float Level Transmitter is composed of a float with a balance rod and a balance hammer to form a torque balancing mechanism, so the float is free to rise and fall with changes in the level. When the level changes, the position of the float changes accordingly, the ball rod drives the rotation of the spindle, and the angular displacement sensor in the controller engages with the spindle through the gears, which converts the change of the level into a corresponding electrical signal, and then the electronic circuit inside the controller converts this signal into a standard current signal proportional to the change of the level.



Technical Parameters

Performance and Technical Specification	Analog Type(transmitter)	Smart Type(transmitter)
Power supply	24V DC	
Output signal	4 ~ 20mA	4 ~ 20mA+HART protocol
Accuracy	1.5%	1.0%
Local indication	Ammeter	LCD display
Setting methods	Local knob	Local keys/ Debugging software + PC/ Communicator
Damp time selection	None	0-32s
Local and remote configuration	None	Yes
Over range alarm and failure diagnosis	None	Yes
Ambient temperature	-40 ~ 80 °C	-30 ~ 70 °C (When ≤ -20 °C, LCD no display, remote transmission can be used normally)
Operating temperature	-30 °C ≤ T < 225 °C (without cooling fin), 225 °C ≤ T ≤ 450 °C (with cooling fin)	
Load resistance	See load chart	
Diameter of the floating ball	Φ 230 mm (Standard)	
Nominal pressure	≤ 6.3MPa	
Nominal diameter	DN250	
Flange standard	HG/T20592-2009, HG/T20615-2009 or on request	
Wetted material	Flange: carbon steel, 304 or on request, Other parts: material grade should be higher than 304 or on request.	
Fluid density	≥ 0.55g/cm ³	
Electrical connection	M20*1.5 (female thread) or on request	
IP Rating	IP66	
Explosion-proof	See the explosion-proof type chart	

Explosion-proof Type Chart

Model	UQD.A		UQD.Z	
Explosion type	Exia	Exd	Exia	Exd
Explosion mark	Exia II CT5	Exd II CT1 ~ T6	Exia II CT1 ~ T6	Exd II CT1 ~ T6

Model Selection Table

Model	Code		Contents
UQD.			Smart Ball Float Level (Interface) Transmitter
Controller Type	A		Analog type
	Z		Smart type
Angle Type	-		
		90	Small angle type
		91	Big angle type
Flange Pressure		5	PN25(2.5MPa)
		6	PN40(4.0MPa)
		7	PN50(CLASS300)
		8	PN63(6.3MPa)
		/	
Explosion proof		d	Exd
		i	Exia
Flange Material and Internal Wetted Material		17	ZG230-450 (SS304)
		179	ZG304 (SS304)
		10	ZG316 (SS316)
		X	As request (As per request)
Temperature Range		D	-30°C ≤ T ≤ +225°C (without cooling fin)
		G	225°C < T ≤ +450°C (with cooling fin)
UQD.	-	-	/
		/	Measuring range (unit: mm)

Example

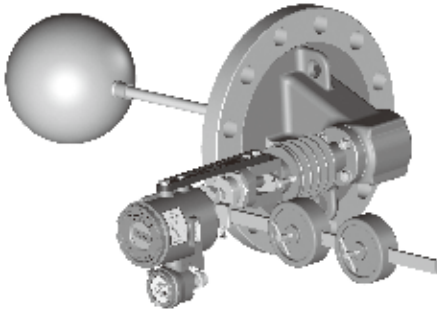
UQD.Z-906/i17G/800, UQD Ball Float Level Transmitter, smart controller type, nominal diameter is 250, nominal pressure is 4.0MPa, intrinsically safe, flange material is carbon steel, fluid temperature is $+225\text{ }^{\circ}\text{C} < T \leq +450\text{ }^{\circ}\text{C}$, with cooling fin, measuring range is 800mm.

Outline Drawing and Installation

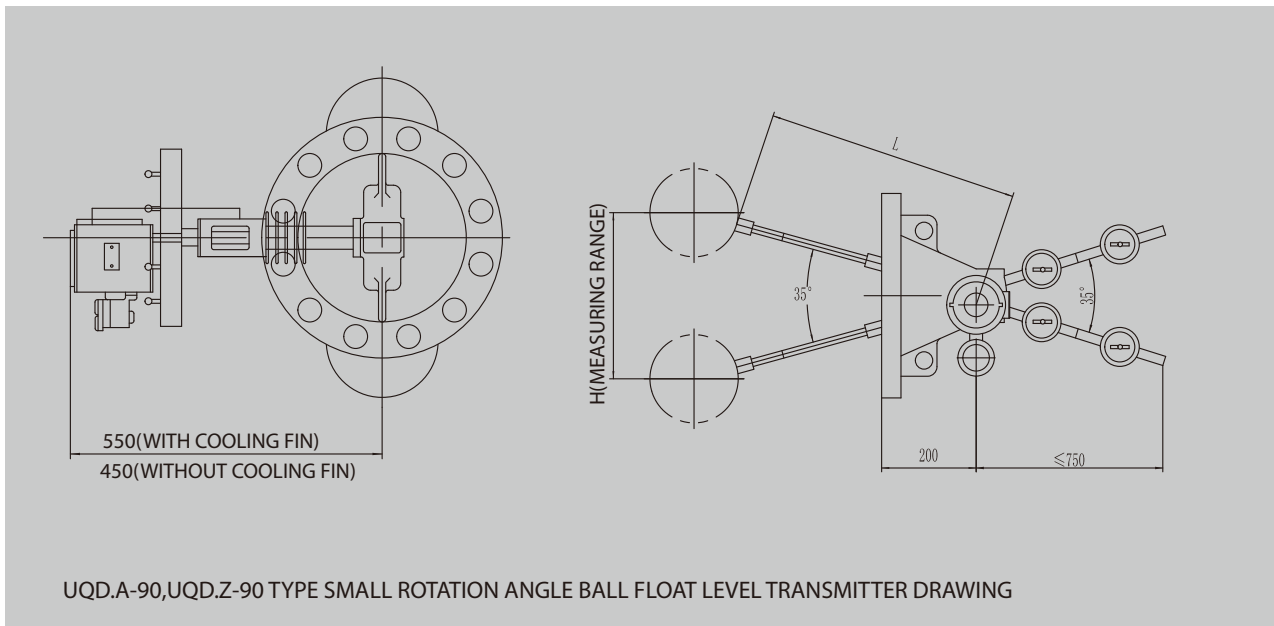
1. Structure and Dimension

1.1 UQD90 type small rotation angle ball float level transmitter

Simple structure, easy to install, especially suitable for long ball rod with small range. Float operating angle $\leq 35^{\circ}$. (4~20mA is adjustable when the operating angle is $\geq 8^{\circ}$)

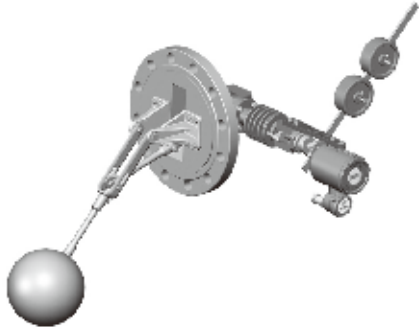


UQD 90 type small rotation angle ball float level transmitter

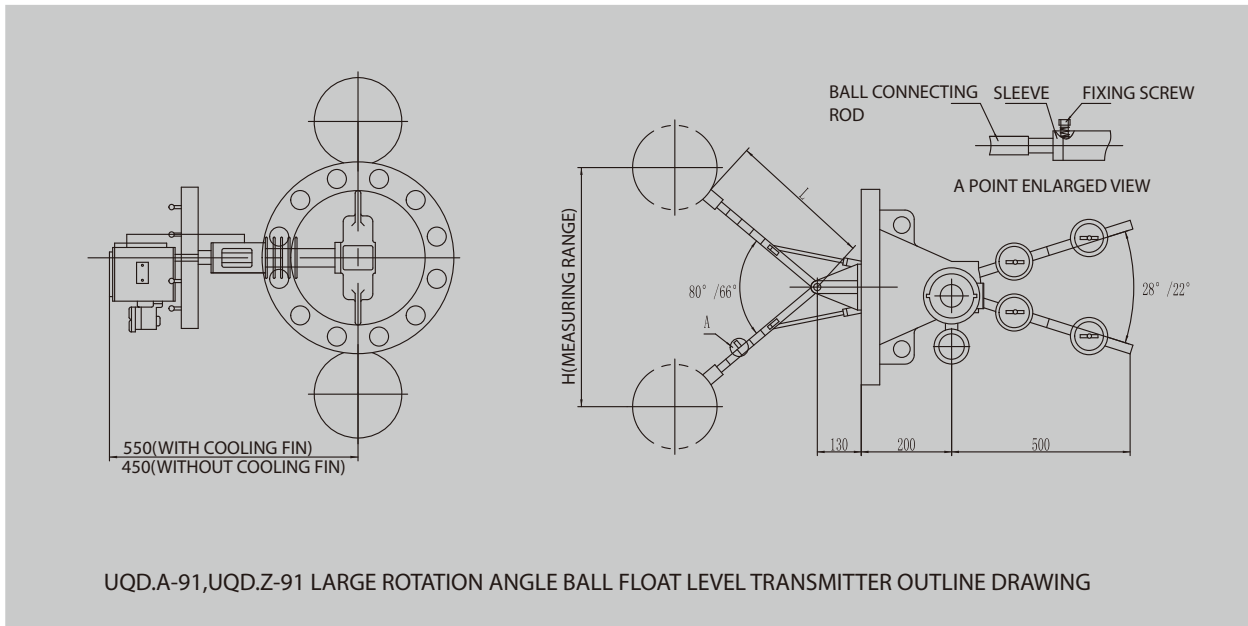


1.2 UQD91 big rotation angle ball float level transmitter

In order to solve the problem that there is no way for the transmitter working in volume limited container to increase the measuring range by being extended the length of the ball connecting rod, DDTOP develops and manufactures 91 type big angle ball float level transmitter which the maximum operating angle can reach 80°, thus resolve the problem that using short rod to accomplish big range. This technology has been protected by a national patent, patent number: ZL96 225811.3.



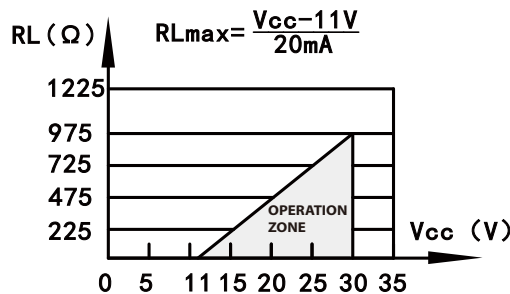
UQD91 large rotation angle ball float level transmitter



Note:

Maximum rod length L: not more than 1130mm
This is a reminder to the user who has a large inner diameter of the container.
The maximum rod length of this model transmitter does not exceed 1130mm.
It is not allowed to increase the length of the rod for increasing the range.

2.Load characteristic chart



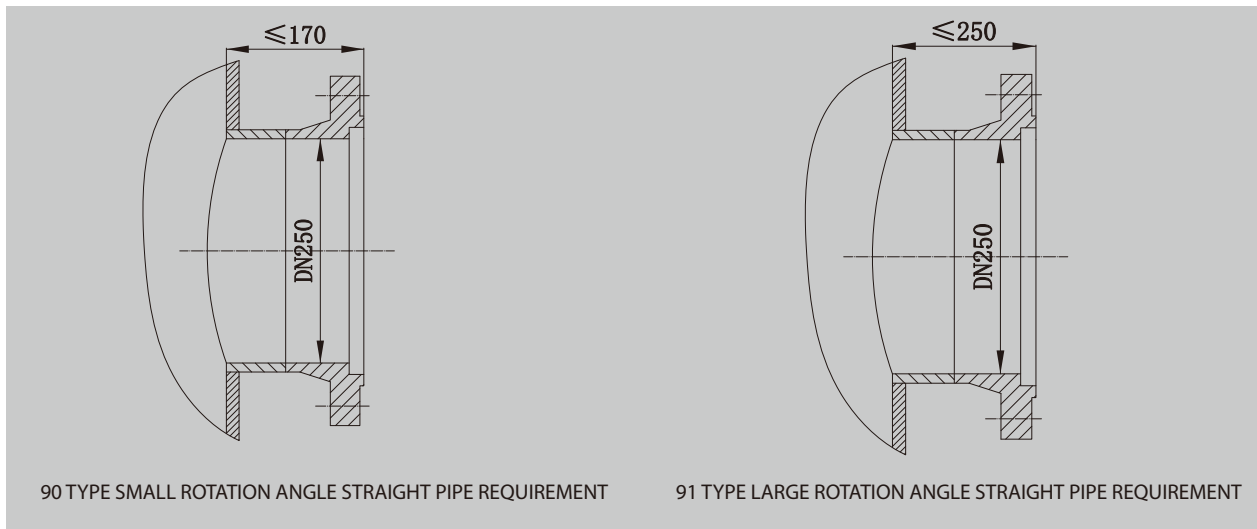
3. Safety barrier recommendation table

UQD.A Safety barrier recommendation table	
Shanghai I.S. Instruments & System Co., Ltd	LS4041-EX
Shanghai Automation Instrument Institute	GS8041-EX GS8045-EX
Longfei Group Corporation in China	LF1045
British MTL Company	MTL3046B MTL5042 MTL706+
Germany P+F Company	KFD2-STC3-EX1
Dandong Top Electronics Instrument (Group) Co., Ltd	TP5041-EX TP5045-EX

UQD.Z 型浮球控制器安全栅推荐型号	
丹东通博电器(集团)有限公司	TP5041-EX TP5045-EX
上海自动化仪表研究所	GS8041-EX GS8037-EX
图尔克 (TURCK) 公司	MK33-11EX -HLi/24VDC
英国MTL公司	MTL3046B MTL5042
德国P + F公司	KFD2-STC3-EX1

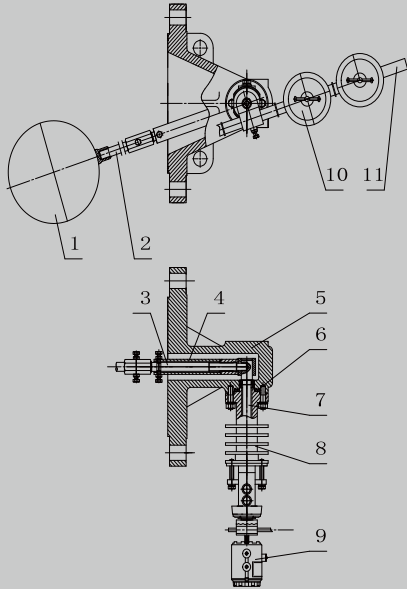
4. Counter flange straight pipe requirement

The transmitter is flange-mounted to the counter flange on side wall of the vessel for the measured fluid. The requirement of counter flange straight pipe as below pictures:



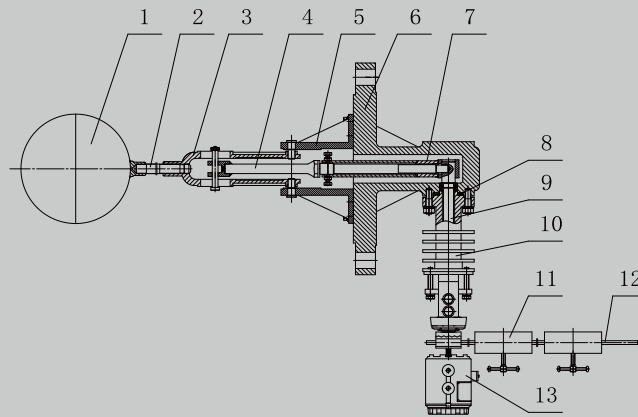
Note:

If the vessel sidewall flange interface length exceeds the requirements of above pictures, it will affect the operation angle of the float ball rod, that is, the measurement range can not meet the design requirements, if so, please contact our company to negotiate a solution.



CORNER TYPE FLOAT LEVEL TRANSMITTER PARTS SCHEMATIC

1. Float ball
2. Ball rod
3. Connecting rod
4. Ball sleeve
5. Flange
6. Cooling fin gasket
7. Spindle (mounted in the cooling pin)
8. Cooling pin
9. Level controller
10. Balancing hammer
11. Balancing rod



LARGE ANGLE FLOAT LEVEL TRANSMITTER PARTS ILLUSTRATION

- | | |
|----------------|-------------------------------------|
| 1. Float ball | 8. Cooling fin gasket |
| 2. Ball rod | 9. Spindle (mounted in cooling pin) |
| 3. Swing arm | 10. Cooling pin |
| 4. Swing rod | 11. Balancing hammer |
| 5. Bracket | 12. Balancing rod |
| 6. Flange | 13. Level controller |
| 7. Ball sleeve | |

5. Measuring range and connecting rod length parallel table

Model	Measuring range (mm)	Length from flange face to top of float (including float) (mm) For small corner type, see Fig. 2, For large corner type, see Fig. 3	Length of ball rod with outer diameter $\Phi 20$	Minimum diameter inside the vessel (mm)	The distance between the center of gravity of the hammer and the axis of rotation. (mm), considering 800Kg/m ³ fluid density.
UQD.A/UQD.Z-90 Small angle type	400	581	267	500	Get rid of two hammers
	500	747	433	700	110(with one hammer)
	600	914	600	850	220(with one hammer)
	700	1080	766	1050	170(with two hammers)
	800	1246	932	1200	250(with two hammers)
	900	1412	1098	1350	330(with two hammers)
	1000	1578	1264	1550	430(with two hammers)
	1100	1745	1431	1700	540(with two hammers))
	1200	1911	1597	1850	660(with two hammers)
UQD.A/UQD.Z-91 Large angle type	550	673	91	550	Get rid of two hammers
	600	712	130	600	Get rid of two hammers
	700	790	208	700	Get rid of two hammers
	800	868	286	750	100(with one hammer)
	900	945	363	850	120(with one hammer)
	1000	1023	441	900	150(with one hammer)
	1100	1101	519	1000	190(with one hammer)
	1200	1179	597	1100	115(with two hammers) Or 230(with one hammer)
	1300	1257	675	1150	135(with two hammers) or 270(with one hammer)
	1400	1335	753	1250	160(with two hammers) or 320(with one hammer)
	1500	1412	830	1300	185(with two hammers) or 370(with one hammer)
	1600	1490	908	1400	210(with two hammers) or 420(with one hammer)

Ordering Information

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- >
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Model

Tag number

Accuracy

Operating pressure and temperature

Fluid name and density

Special wetted material type

Flange standard/size/rating/facing