

## UQD BALL FLOAT LEVEL TRANSMITTER

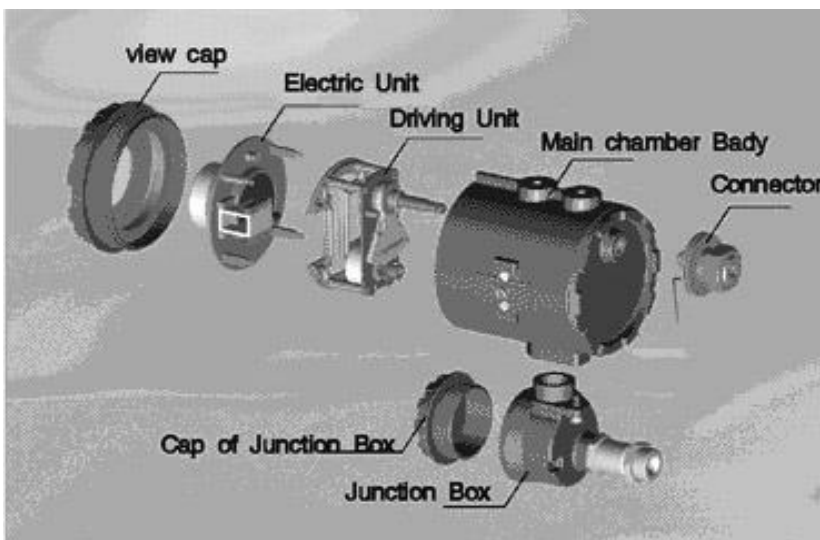
### Summary

UQD Ball Float Level Transmitter consists of measurement part and signal controller part. According to structural features, the measurement part can be divided into 90 type with small angle, 91 type with big angle, 92 type with external float. The signal controller part can be divided into analog type (UQD.A) and intelligent type (UQD.Z).



### 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.



UQD electric float-ball transmitter head breakdown drawing

## Technical Parameters

Performance and Technical Specification	Analog Type( transmitter)	Intelligent Type(transmitter)
Supply voltage	24V DC	
Output signal	4 ~ 20mA	4 ~ 20mA+HART protocol
Accuracy	1.5%	1.0%, 1.5%
Local indication	Ammeter	LCD display
Setting methods	Local knob	Local keys; Debugging software + PC; Communicator
Damp time selection	Non	0-32s
Local and remote configuration	Non	Yes
Alarm for exceeding range Diagnosis for failure	Non	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 radiator) 225°C ≤ T ≤ 450°C (with radiator)	
Load resistance	See load chart	
Diameter of the floating ball	Φ230 mm	
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; Others should be higher than 304 or on request.	
Fluid density	≥0.55g/cm <sup>3</sup>	
Power supply inlet	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.		Ball float level transmitter
	A	Analog type
	Z	Intelligent type
	-	
	90	Small angle type
	91	Big angle type
	-	
	5	PN25(2.5MPa)
	6	PN40(4.0MPa)
	7	PN50(CLASS300)
	8	PN63(6.3MPa)
	/	
	d	Explosion isolation
	i	Intrinsically safe
	17	ZG230-450 (Internal fluid contact material 304)
	179	ZG304 (Internal fluid contact material 304)
	180	ZG316 (Internal fluid contact material 316)
	X	As customer's request (internal splice material as per customer's request)
	D	-30°C ≤ T ≤ +225°C (without radiator)
	G	225°C < T ≤ +450°C (with radiator)
UQD.	- / - / / / / / / /	Range (unit: mm)

### Example

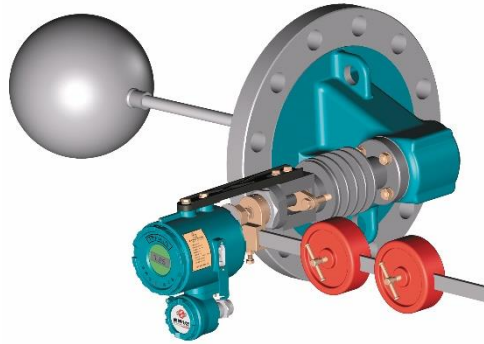
UQD.Z-90B/iTG/800: electric ball float level transmitter, nominal diameter is 250, nominal pressure is 4.0MPa, intrinsically safe, flange material is carbon steel, medium temperature is  $+225^{\circ}\text{C} < T \leq +450^{\circ}\text{C}$ , with radiator, range is 800mm.

## Outline Drawing and Installation

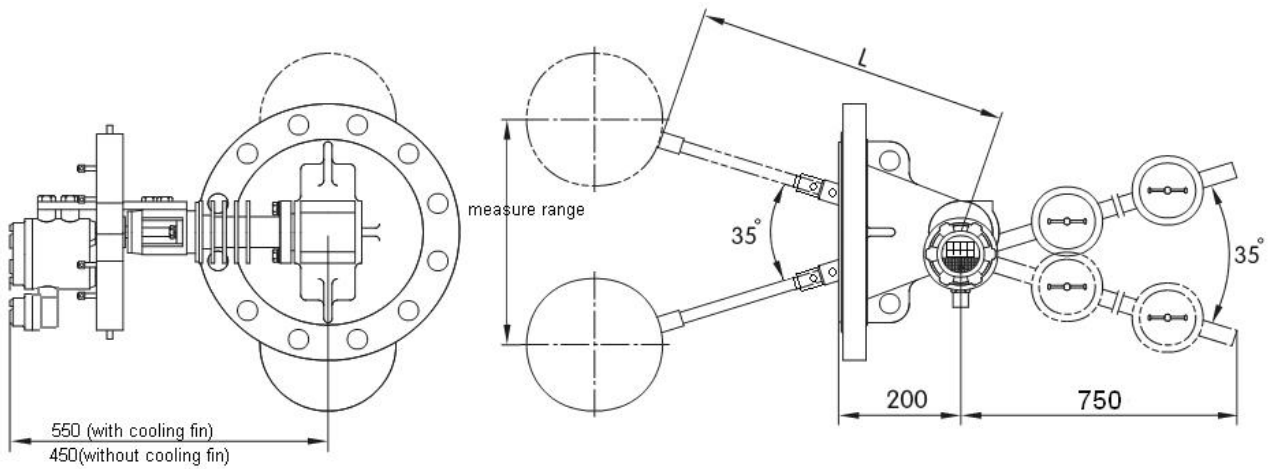
### 1. Structure and Dimension

#### 1.1 UQD90 type small rotation angle ball float level transmitter

They have simple structure with easy and convenient installation. They are suitable for working environment (or container) in which the rod is needed to be long and the measure range is small. The angular rotating range (angular home range)  $\leq 35^{\circ}$  (When operating angle range is  $\geq 8^{\circ}$ , signal 4-20mA can be adjustable.)



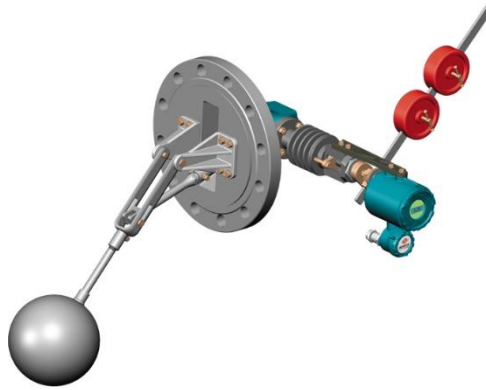
UQD 90 type small rotation angle ball float level transmitter



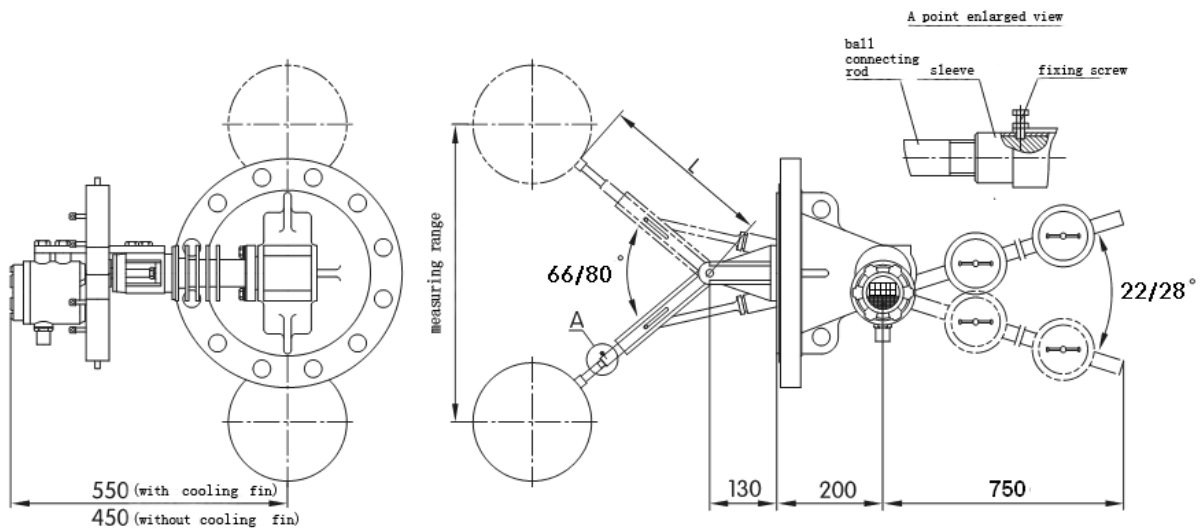
UQD.A-90,UQD.Z-90 type small rotation angle ball float level transmitter drawing

### 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

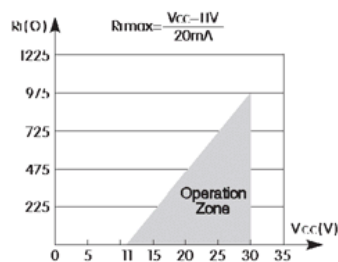


UQD.A-91,UQD.Z-91 large rotation angle ball float level transmitter outline drawing

**Note:**

The longest ball rod length L: no more than 1130mm - this parameter is a reminder of the container inner diameter of the user's attention, the maximum rod length of the transmitter does not exceed 1130mm.

**2. Load characteristic chart**



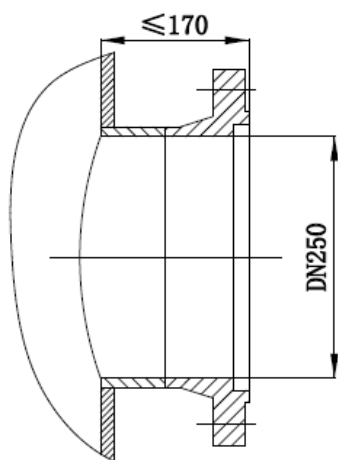
### 3. Safety barrier recommendation table

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 <sup>+</sup>
Germany P+F Company	KFD2-STC3-Ex <sub>1</sub>
Dandong Top Electronics Instrument Co., Ltd	TP5041-Ex, TP5045-Ex

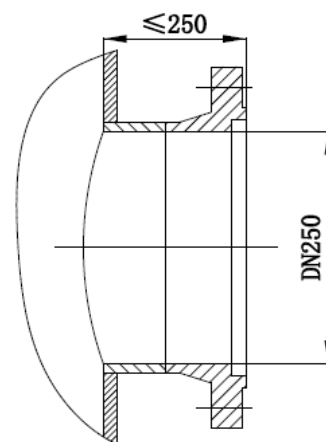
UQD.Z Safety barrier recommendation table	
Dandong Top Electronics Instrument Co., Ltd	P5041-Ex, TP5045-Ex
Shanghai Automation Instrument Institute	GS8041-Ex, GS8037-Ex
TURCK Company	MK33-11Ex – HLi/24VDC
British MTL Company	MTL3046B, MTL5042
Germany P+F Company	KFD2-STC3-Ex <sub>1</sub>

### 4. Counter flange straight pipe requirement

The transmitter is mounted on the counter flange on side wall of container loaded with measured medium. The requirement of counter flange straight pipe as below pictures:



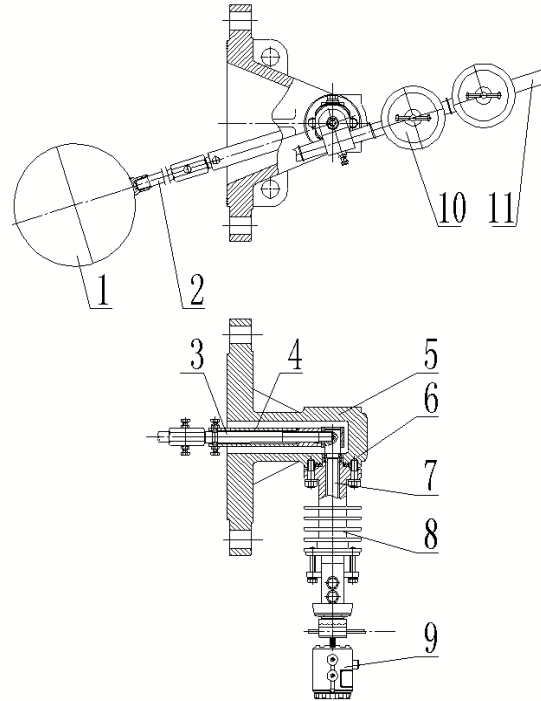
90 type small rotation angle straight pipe requirement



91 type large rotation angle straight pipe requirement

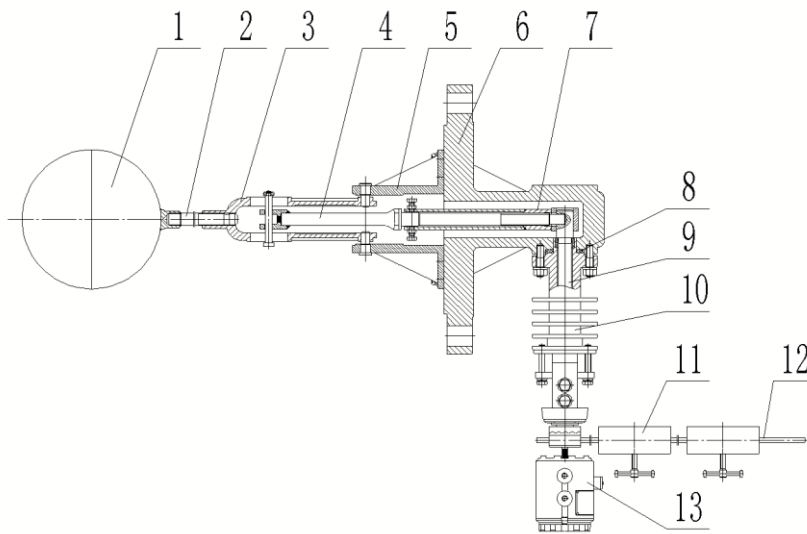
**Note:**

If the interface length of flange on the side wall is more than above requirement, the operating angle of float rod will be affected, that is to say, measuring range can't reach design requirement, if so, please contact with our company.



Corner type float level transmitter parts schematic

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



Large Angle Float Level Transmitter Parts Illustration

- 1.Float
2. Connecting rod
3. Swing arm
4. Swing rod
5. Bracket
6. Flange
7. Ball sleeve
8. Radiator gasket
9. Spindle (mounted in radiator)
10. Radiator
11. Balance hammer
12. Balance bar
- 13.Level controller

**5. Range and connecting rod length parallel table**

Model	Range (mm)	Total length of float rod L(mm) See Figure 2 for small corner models. See Figure 3 for large corner models	Rod length ofΦ20 (mm)	Min diameter (inside diameter, mm)	The distance between the weight of the hammer and the axis of rotation. (mm), Medium Density 800Kg/m3
UQD.A/UQD.Z-90 Small angle type	400	551	267	500	Get rid of two hammers
	500	717	433	700	110(with one hammer)
	600	884	600	850	220(with one hammer)



	700	1050	766	1050	170(with two hammers)
	800	1216	932	1200	250(with two hammers)
	900	1382	1098	1350	330(with two hammers)
	1000	1548	1264	1550	430(with two hammers)
	1100	1715	1431	1700	540(with two hammers))
	1200	1881	1597	1850	660(with two hammers)
UQD.A/UQD.Z-91 Large angle type	550	313	91	550	Get rid of two hammers
	600	352	130	600	Get rid of two hammers
	700	430	208	700	Get rid of two hammers
	800	508	286	750	100(with one hammer)
	900	585	363	850	120(with one hammer)
	1000	663	441	900	150(with one hammer)
	1100	741	519	1000	190(with one hammer)
	1200	819	597	1100	115(with two hammers) Or 230(with one hammer)
	1300	897	675	1150	135(with two hammers) Or 270(with one hammer)
	1400	975	753	1250	160(with two hammers) Or 320(with one hammer)
	1500	1052	830	1300	185(with two hammers) Or 370(with one hammer)
	1600	1130	908	1400	210(with two hammers) Or 420(with one hammer)

## Ordering Information

- Choose model according to model selection table
- Process pressure and temperature
- Special wetted material brand name
- Tag number
- Flange standard
- Medium name & density
- Flange standard, size, nominal pressure, sealing face
- Instrument accuracy