

SMF300 Magnetic Column Liquid Level Gauge



PRODUCT MANUAL

Working Principle:

The SMF300 series magnetic column level gauge is connected to the vessel through a gas phase and liquid phase connection flange using the principle of a linker. According to the principle of buoyancy and magnetic coupling, the magnetic float in the measuring cylinder (connector) drives the two-color flip on the external display of the measuring cylinder to rise (lower) with the measured liquid level. When the liquid level rises, the magnetic float drives the flip column to flip 180°, showing red and green; when the liquid level drops, the magnetic float drives the flip column to rotate 180° in the reverse direction, showing white. The height of the red band (or green band) is the height of the measured liquid level, which achieves the purpose of measuring and displaying the position of the measured liquid (boundary) surface.

Each magnetic flip column has a two-color axially symmetric structure with a spacing of 10 mm between the two magnetic flip columns, with white and red (green) indicating the meteorological and liquid phase portions respectively, and the red (or green) and white junctions are the boundary between the gas phase and the liquid phase. The level gauge measures both the liquid level and the interface of two different density media.

Product Standards: HG/T 2742-1995、HG/T21584-95, Flange standard: HG/T20592~20615-2009

Features:

- Simple structure, good stability, reliability and durability.
- Isolated medium, indicator, transmitter and switch
- Wide range of operating pressure: vacuum to 42Mpa
- Wide range of operating temperature: -190°C to 425 °C
- Independent of medium's physical and chemical states.
- SPST or SPDT available
- Optioning float level transducer, capacitive two-wire level transducer and Magnetostrictive level sensor to transmit 4-20mA DC signal (or HART) and realize remote control and measurement.
- Two-wire level transducer can be with LED digital indicator for night observation.

Application:

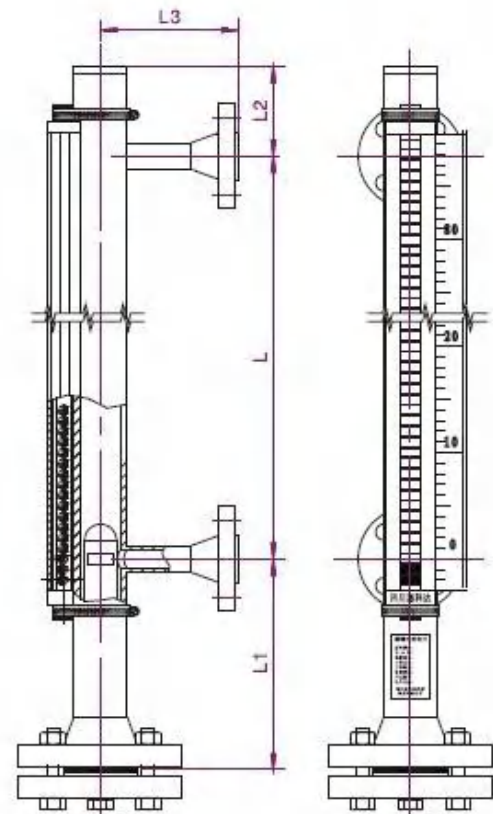
SMF300 series magnetic column liquid level gauge is widely used in petroleum, chemical industry, oil field, pharmaceuticals industry, food, wine industry etc., suitable for level measurements under the environment of high/low temperature., high pressure, strong corrosion, toxicity.

Optional items:

- SPST or SPDT no standby power alarm switch could realize high-low level measurement and alarm. Alarm switch number is unlimited.
- Optional two-wire magnetic liquid level sensor, output 4~20mADC signal for remote measurement and control.
- Optional two-wire magnetostrictive and capacitive liquid level sensor, output 4~20mADC signal for high precision, continuous measurement and control.
- Top and bottom structure connection can be selected.
- 4~20mADC + HART protocol.

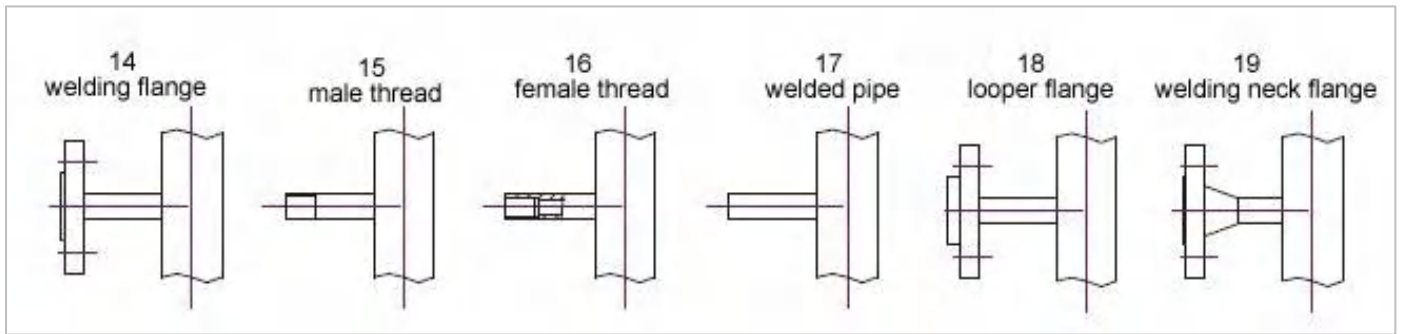
Main technical parameters:

Basic part	
C-C Distance:	150~6000mm(Customize for more)
Medium density:	> 0.45g/cm ³
Nominal pressure:	PN2.5~PN420 (x 0.1MPa)
Material:	304,316L, or customize
Operating temperature:	-190 ~ +425 °C
Top structure:	Code 1 for standard (Page 4)
Bottom structure:	Code 9 for standard (Page 4)
Protection grade:	IP65
Magnetic alarm switch (Optional items)	
<ol style="list-style-type: none"> 1. SPDT(250VAC 1A 60W) 2. SPST(250VAC 0.5A 20W) 3. Protection grade: IP65 4. Explosion-proof: Exd 5. More infomation see page 8 	
Level transmitter (Optional items)	
<ol style="list-style-type: none"> 1. Output signal: 4~20mADC 2. Power supply:16~30VDC 3. Protection class: IP65 4. Explosion-proof: Exiall CT6Ga ExdII CT6Gb 5. More infomation see page 5 	

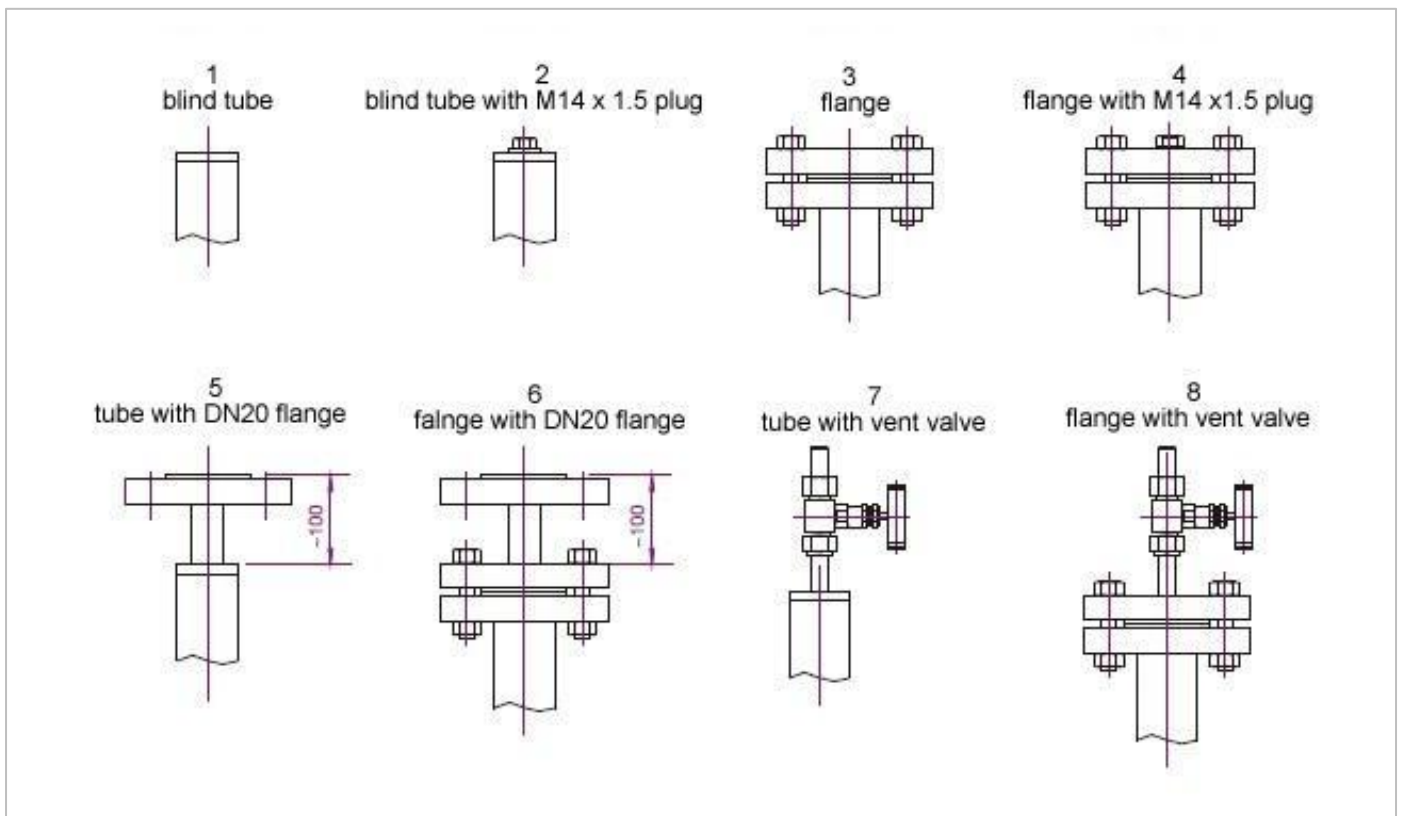


L: center-center distance
L1: length of float ball +10
L2: ≈100
L3: ≈120

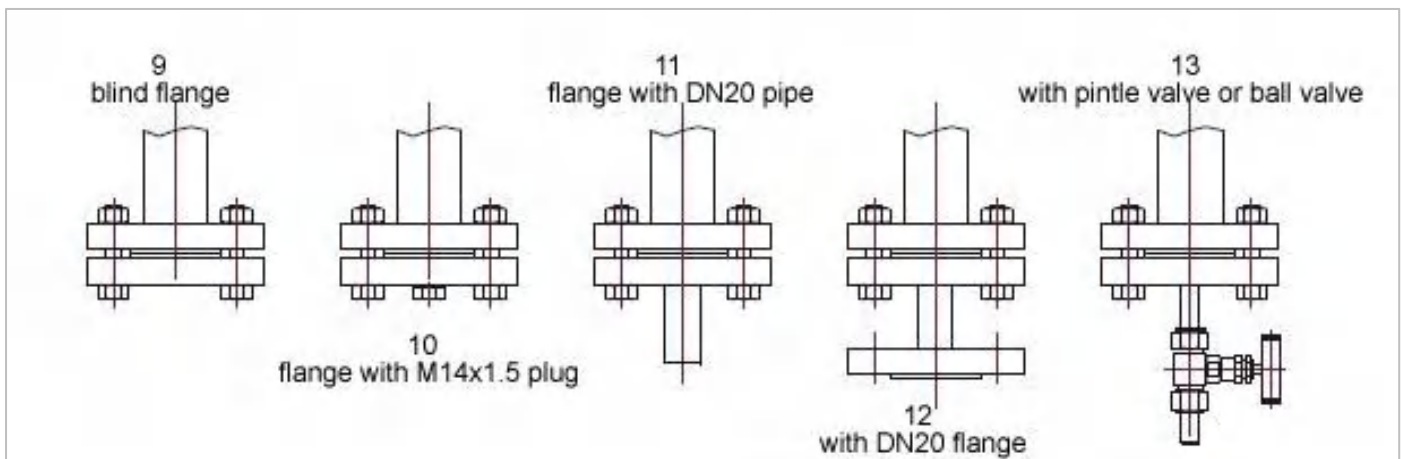
Code of Process Connection



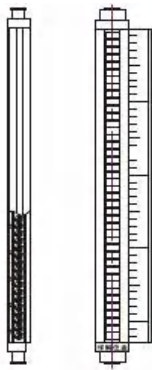
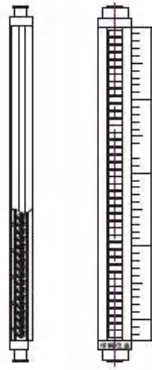
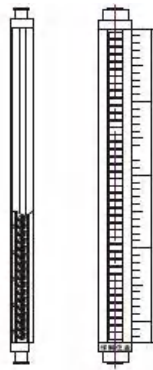
Code of Top Structure of Chamber



Code of Bottom Structure of Chamber



Display of column level gauge (Scale)

Technical parameters:			
	Aluminum	Aluminum	Aluminum/304/316L
Shelf	Aluminum	Aluminum	Aluminum/304/316L
Type of flap	Magnetic flap cylinder	Magnetic flap plate	Magnetic flap plate
Material of flap	Red & white ABS	Red & white Ceramics	Yellow & brown Magnetic flap plate
Resolution	10mm	10mm	10mm
Covering	High intensity glass	glass	PC tube/vacuum type
Indicate ruler	PET / stainless steel	AL alloy / stainless steel	PET / stainless steel
Operating temperature	130°C	350°C	120°C
Code	A	B	C

Optional item of liquid level transmitter

Working principle:

Magnetic liquid level transmitter

It consists of imported reed switch, precision resistor and conversion circuit. When the magnetic flux of the magnetic float in the magnetic flip column level gauge is closed to the reed switch at a certain position, the resistance of the three-wire potentiometer is proportional to the liquid level change, and the change of the liquid level is converted into the 4~20mADC signal by the conversion circuit. Output for detection and transmission of liquid level signals.

Magnetostrictive level sensor

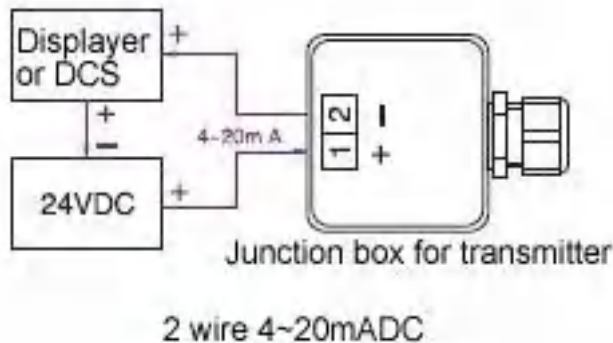
It is a new generation of liquid level sensor with high measurement accuracy. It is stable in performance and is not affected by gas, temperature and pressure changes in the tank. Two-wire 4~20mA (with HART), Modbus and other signal outputs are available.

How to order: /

1	Resolution code	
	B10: 10mm (common)	B5: 5mm
	C1: Capacitive sensor	C2: Magnetostrictive sensor
2	Code of Explosion-proof	
	No mark: N/A	i: Intrinsically Safe Exia II CT6Ga
	e: Exd II CT6Gb	
3	Code of displayer	
	No mark: N/A	M3: LED +HART
	M2: LED displayer	M4:0.56"LED displayer
4	Code of measuring (mm)	
	Directly write measurement range values	
5	Code of ambient temperature	
	Directly write measurement range values	

- Note: 1. Match the magnetic column liquid level gauge could ignore "4" and "5"
 2. Purchase level transmitter alone, should mark "4" and "5"
 3. We offer customize

Electrical connections:



Accuracy class:

Accuracy class:
$$Accuracy\ class = \frac{Resolution * 100}{Measuring\ rang} * \%$$

Note: as the same resolution, the measuring range wider, the accuracy will be higher.

For example: resolution:10mm, measuring range:1000mm, accuracy:1%

resolution:10mm, measuring range:2000mm, accuracy:2%

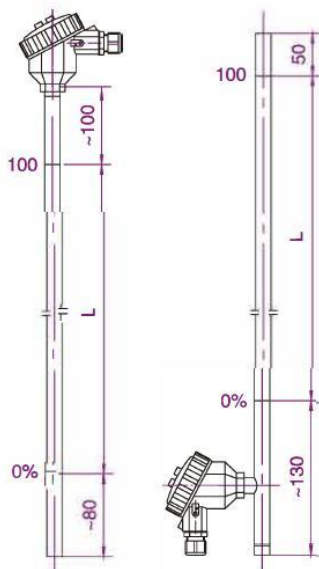
Technical parameter:

Magnetic liquid level transmitter	
Output signal:	2 wires 4~20mADC
Resolution:	10mm(common), 5mm
Loading resistance:	500Ω (when 24VDC power supply without digital displayer)
Transmitting:	> 1000m

Ambient temperature:	≤80℃; ≤150℃ (high temp.)
Power supply:	18~28VDC
Outer tube of transmitter:	Stainless steel seamless pipe
Shell of transmitter:	Aluminum surface spray
Explosion-proof:	ExialICT6Ga; ExdIICT6Gb
Protection class:	IP65

Magnetostrictive level sensor	
Power supply	18-30VDC
Loading resistance:	500Ω (when 24V power supply without digital displayer)
Output signal:	2 wires 4~20mADC(with HART)、 ModBus
Operating temperature:	-40℃~85℃
Nonlinear error	< ± 0.05%F.S.
Repeatability	< ± 0.002%F.S.
Resolution	16bitD/AConversion, 4um
Measuring rod, instrument housing material	304
Protection class	Electronic warehouse IP65; Measuring rod: IP68
Explosion-proof:	ExialICT6Ga; ExdIICT6Gb

Magnetic level sensor(Aluminum alloy or SS304 junction box)



Electrical Interface:M20x 1.5 or 1/2"NPT

Magnetostrictive level sensor(Aluminum alloy or SS304 junction box)



Electrical Interface:M20x 1.5 or 1/2"NPT

Optional item of magnetic alarm switch

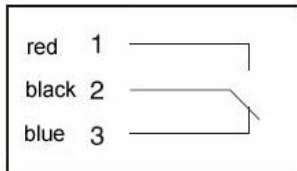
Working principle:

The magnetic switch is made of imported high quality reed switch. The switch contacts are available in single pole double throw (SPDT) and single pole single throw (SPST). When the magnetic float passes through the midpoint of the magnetic switch, the magnetic switch contacts are switched to a stable state and maintained; When the magnetic float passes the midpoint of the magnetic switch in the opposite direction, the magnetic switch contacts are switched to the original stable state and held.

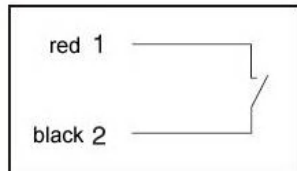
The two stable state transitions of the magnetic switch are controlled only by the magnetic float and do not require external working power.

The magnetic switch is matched with the magnetic flip level gauge and is widely used for alarm and automatic control of various interfaces and pages.

Magnetic switch contacts type:



one SPDT



one SPST

When float ball pass over the center of switch, the switch state change

How to order:

Code1	Code	Contact state	Voltage	Electric current	Power
Transformational	B	One SPDT	250VAC	1.0A	60W
Normally open	E	One SPST	250VAC	0.5A	20W
Normally closed	F	One SPST	250VAC	0.5A	20W
Code2	Ambient temperature				
	L: ≤80°C H: ≤150°C G: ≤350°C				
Code3	Explosion-proof				
	No mark: N/A; e: ExdI II CT6Gb				
Code4	NO. Of switch				
	Customized				

Technical parameters:

Switch type:	Reed
Switch state:	Bistable (no standby power supply)
Contact state:	One SPDT or one SPST
Max switch voltage:	230VAC; 250VAC
Max switch electric current:	0.5A, 1.0A, 2.0A
Max switch power:	20W, 60W, 200W
Installation:	Slideway or hoop, switch position is changeable
Shell:	No explosion-proof: Aluminum surface spray
	Explosion-proof: steel less or aluminum

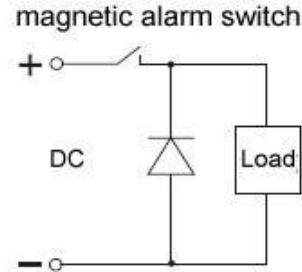
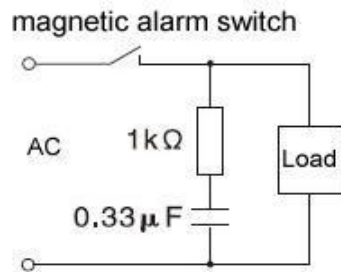
Electrical connection:	No explosion-proof: length of cable 0.3m
	Explosion-proof: M20*1.5 female thread
	NPT 1/2" female thread
Protection class:	IP65
explosion-proof:	Exd II CT6Gb

Definition of magnetic float ball switch sates

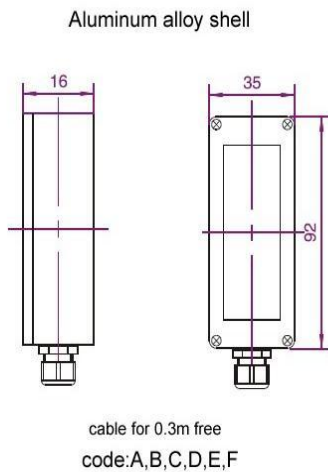
There are normally open, normally closed and transformational contacts state of magnetic switch.

1. Normally open – switch contacts close when the float ball pass over the normal level.
2. Normally closed – switch turn off when the float ball rises with liquid level and pass the control point
3. Transformation – switch turn over when the float ball rises with liquid level and pass the control point
- 4.

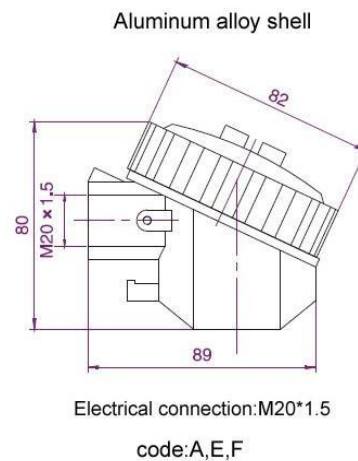
Protection for magnetic alarm switch contact:



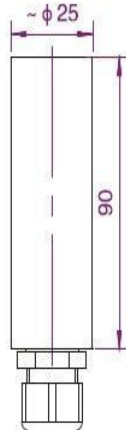
Magnetic alarm switch (Non-explosion proof)



Magnetic alarm switch (Flameproof)

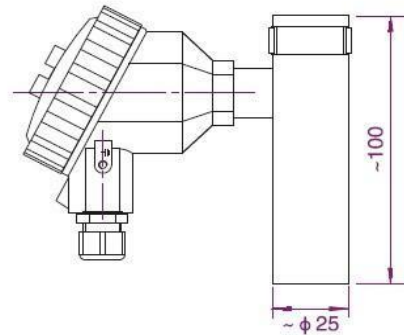


Steel less shell



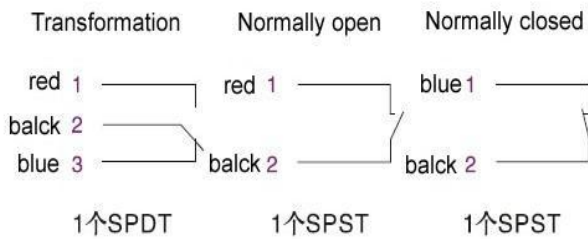
cable for 0.3m free
code:A,B,C,D,E,F

Steel les shell with AL Junction box

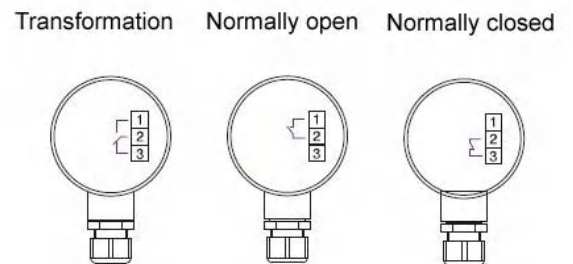


Electrical connection:M20*1.5 (NPT1/2" should note)
code:A,B,C,D,E,F

Electrical connection (Non-explosion proof)



Electrical connection(Flameproof)



Note:

We support customization services, if your requests are special, pls just let us know, and provide your request.