See page 8 for selection details.

FMG70

Glass Rotor Flowmeter

Working Principle

The main measuring elements of the flowmeter are a conical tube with the small end down and the big end up vertically and a float that can move up and down. When the fluid flows through the conical tube from bottom to top, a pressure difference is generated between the upper and lower parts of the float, and the float rises under the action of this pressure difference. When the rising force, buoyancy and viscous lift on the float are equal to the gravity of the float, the float is in an equilibrium position. Therefore, there is a certain proportional relationship between the fluid flow through the flowmeter and the rising height of the float, that is, the flow area of the flowmeter, and the position height of the float can be used as the flow measurement.

Description

This series of glass rotameter is mainly composed of conical glass tube, float, upper and lower external nuts and stainless steel tube, which is convenient to install and used in the fields of edible water, fruit juice, milk, pure water treatment, etc. There are three options for upper and lower connections: thread, clamp and flange.

Material: 304SS or 316SS Working
pressure: ≤0.6MPa
Working temperature: ≤100℃
Accuracy: 2.5%
can be equipped with bistable contact switch with lower limit alarm.

The reading of the flowmeter reads the indicated value according to

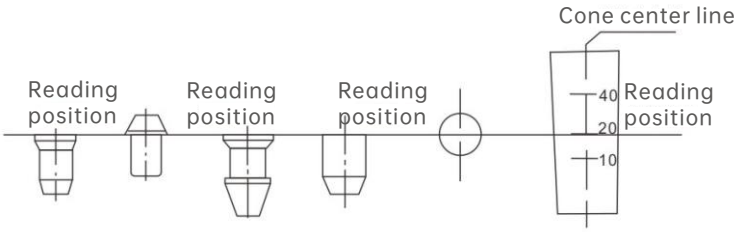

Fig. 1 reading position diagram of various floats

✆ 400-860-9760

For more product information, please visit www.ludwig-schneider.com.cn

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INSTRUMENT

Flow range

Model	Measuring range (threaded connection)			
	liquid	Warning message	Gas	Warning message
FMG70-10G	4~40L/h		100~1000L/h	
	6~60L/h		160~1600L/h	
	10~100L/h		0.25~2.5m³/h	
	16~160L/h		0.6~6m³/h	
	25~250L/h	Can be added		
FMG70-20G	0.3~5L/min		1~10m³/h	
	1~10L/min	Can be added	2~20m³/h	
	1.5~15L/min		3~30m³/h	
	2~20L/min	Can be added	5~50m³/h	Can be added
	3~30L/min		8~80m³/h	
	4~40L/min		25~100m³/h	
	5~50L/min		36~180m³/h	
	12~60L/min			
	20~100L /min			
FMG70-25G	0.3~5L/min		1~10m³/h	
	1~10L/min	Can be added	2~20m³/h	
	1.5~15L/min		3~30m³/h	
	2~20L/min	Can be added	5~50m³/h	Can be added
	3~30L/min		8~80m³/h	
	4~40L/min		25~100m³/h	
	5~50L/min		36~180m³/h	
	12~60L/min			
	20~100L /min			
FMG70-40G	0.6~6m³/h	Can be added	18~180m³/h	
	1~10m3/h		30~300m³/h	
	2~16m³/h		60~480m³/h	
	5~25m³/h		150~750m³/h	
	5~30m³/h			
FMG70-50G	4~40m³/h			
	5~50m3/h			
	6~60m³/h			
	8~80m³/h			

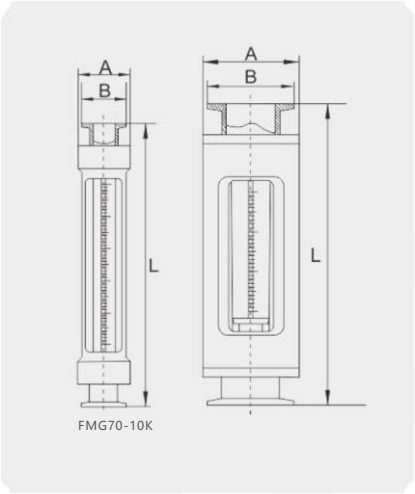
Flow range

Model	Measuring range (clamp connection)			
	liquid	Warning message	Gas	Warning message
FMG70-10K	4~40L/h		100~1000L/h	
	6~60L/h		160~1600L/h	
	10~100L/h		0.25~2.5m³/h	
	16~160L/h		0.6~6m³/h	
	25~250L/h	Can be added		
FMG70-20K	0.3~5L/min		1~10m³/h	
	1~10L/min	Can be added	2~20m³/h	
	1.5~15L/min		3~30m³/h	
	2~20L/min	Can be added	5~50m³/h	Can be added
	3~30L/min		8~80m³/h	
	4~40L/min		25~100m³/h	
	5~50L/min		36~180m³/h	
	12~60L/min			
	20~100L /min			
FMG70-25K	0.3~5L/min		1~10m³/h	
	1~10L/min	Can be added	2~20m³/h	
	1.5~15L/min		3~30m³/h	
	2~20L/min	Can be added	5~50m³/h	Can be added
	3~30L/min		8~80m³/h	
	4~40L/min		25~100m³/h	
	5~50L/min		36~180m³/h	
	12~60L/min			
	20~100L /min			
FMG70-40K	0.6~6m³/h	Can be added	18~180m³/h	
	1~10m3/h		30~300m³/h	
	2~16m³/h		60~480m³/h	
	5~25m³/h		150~750m³/h	
	5~30m³/h			
FMG70-50K	4~40m³/h			
	5~50m3/h			
	6~60m³/h			
	8~80m³/h			

Flow range

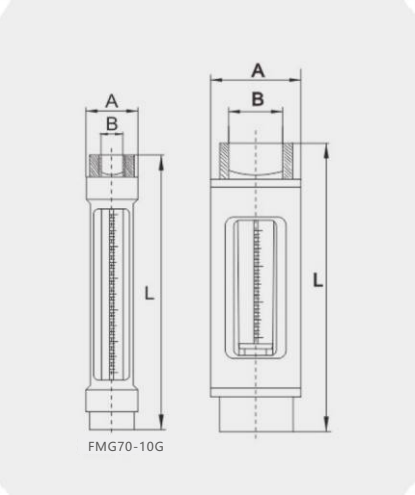
Model	Measuring range (flange connection)			
	liquid	Warning message	Gas	Warning message
FMG70-15F	4~40L/h		100~1000L/h	
	6~60L/h		160~1600L/h	
	10~100L/h		0.25~2.5m³/h	
	16~160L/h		0.6~6m³/h	
	25~250L/h	Can be added		
FMG70-20F	0.3~5L/min		1~10m³/h	
	1~10L/min	Can be added	2~20m³/h	
	1.5~15L/min		3~30m³/h	
	2~20L/min	Can be added	5~50m³/h	Can be added
	3~30L/min		8~80m³/h	
	4~40L/min		25~100m³/h	
	5~50L/min		36~180m³/h	
	12~60L/min			
	20~100L /min			
FMG70-25F	0.3~5L/min		1~10m³/h	
	1~10L/min	Can be added	2~20m³/h	
	1.5~15L/min		3~30m³/h	
	2~20L/min	Can be added	5~50m³/h	Can be added
	3~30L/min		8~80m³/h	
	4~40L/min		25~100m³/h	
	5~50L/min		36~180m³/h	
	12~60L/min			
	20~100L /min			
FMG70-40F	0.6~6m³/h	Can be added	18~180m³/h	
	1~10m3/h		30~300m³/h	
	2~16m³/h		60~480m³/h	
	5~25m³/h		150~750m³/h	
	5~30m³/h			
FMG70-40/50F	0.6~6m³/h	Can be added	18~180m³/h	
	1~10m3/h		30~300m³/h	
	2~16m³/h		60~480m³/h	
	5~25m³/h		150~750m³/h	
	5~30m³/h			
FMG70-50F	4~40m³/h			
	5~50m3/h			
	6~60m³/h			
	8~80m³/h			
FMG70-50/65F	4~40m³/h			
	5~50m3/h			
	6~60m³/h			
	8~80m³/h			
FMG70-50/80F	4~40m³/h			
	5~50m3/h			
	6~60m³/h			
	8~80m³/h			

Dimensions drawing parameters



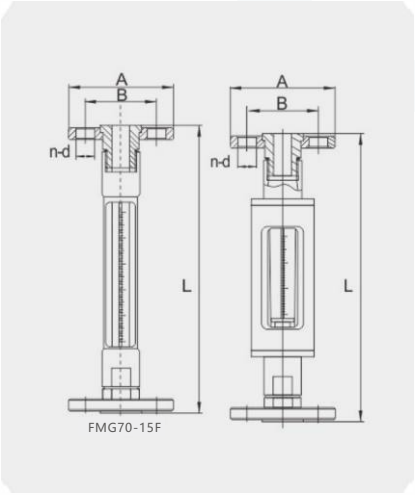
FMG70-10K

Model number	FMG70-K Clamp connection parameters(mm)		
	A	B	L
FMG70-10K	ϕ27	ϕ25.4 (customizable ϕ50.5)	200
FMG70-20Kor25K	ϕ53	ϕ50.5 (customizable ϕ64)	180
FMG70-40K	ϕ73	ϕ64 (customizable ϕ50.5) ϕ77	280
FMG70-50K	ϕ96	ϕ77 (customizable ϕ64) ϕ91、ϕ106人	350



FMG70-10G

Model number	FMG70-G Thread connection parameter(mm)		
	A	B	L
FMG70-10G	ϕ27	G1/4"	200
FMG70-20G	ϕ53	G3/4"	200
FMG70-25G	ϕ53	G1"	200
FMG70-40G	ϕ73	G1-1/2"	280
FMG70-50G	ϕ96	G2"	350
FMG70-65G	ϕ96	G2-1/2"	350



FMG70-15F

Model number	FMG70-F Flange connection parameter(mm)		
	A	B	L
FMG70-15F	ϕ90	4-ϕ14	245
FMG70-2OF	ϕ105	4-ϕ14	245
FMG70-25F	ϕ110	4-ϕ14	245
FMG70-4OF	ϕ150	4-ϕ18	330
FMG70-40/50F	ϕ165	4-ϕ18	330
FMG70-5OF	ϕ165	4-ϕ18	390
FMG70-50/65F	ϕ185	8-ϕ18	390
FMG70-50/80F	ϕ200	8-ϕ18	390

Installation and use

1. When the flowmeter is unpacked, it should be carefully checked to determine whether it is damaged during transportation. For the flowmeter with guide rod, the filler such as the supporting plastic rod that prevents the float from moving should be removed to check whether the float can slide freely up and down.

2, The flowmeter must be installed in a vertical position (the Angle between the center of the flowmeter and the plumb line does not exceed 5°) and correctly supported to prevent any stress from being introduced. For the newly installed pipe, the pipe should be washed before installing the flow meter. When installed, the inlet is always connected to the smallest end of the cone, that is, the smallest numerical scale end, and is located on the lower part.

3, in order to facilitate the replacement of parts during use, the flow meter installation, it should be left around enough space.

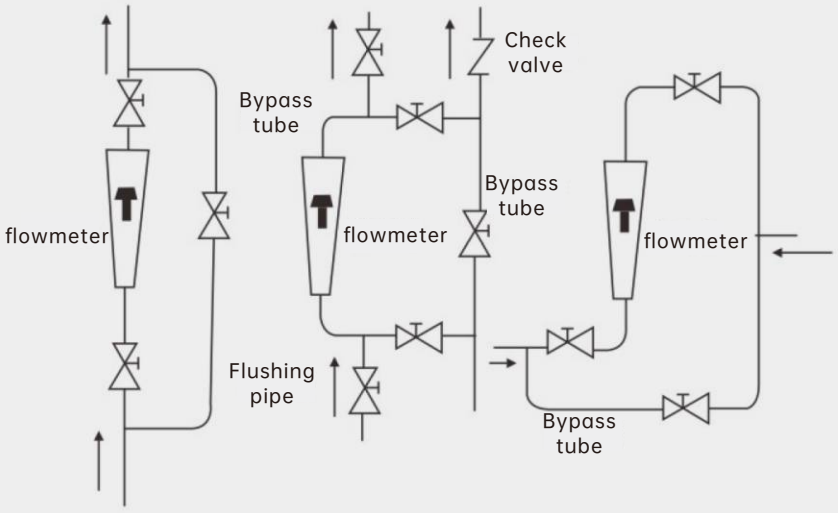
4. In order to repair, repair, replace the flow meter and clean the pipeline, it is recommended to install the bypass pipe as shown in the following figure when the flow meter is installed.

5, the upstream of the flow meter should be installed valves, 5-10 times the nominal diameter of the downstream installation of flow control valves.

6. In order to prevent backflow or water hammer damage to the flow meter in the pipeline, a one-way check valve can be installed after the flow meter downstream valve.

7. If the measured flow body contains large particles of impurities or dirt, filters should be installed upstream of the flow meter as required.

8, if the measured mainstream is pulsating flow, resulting in float fluctuations can not be measured correctly, the upstream valve of the flow meter should be fully open, and set the appropriate size of the buffer and the setting device, to prevent backflow or flow pulsation caused by excessive pressure drop.ould be installed valves, 5-10 times the nominal diameter of the downstream installation of flow control valves.



Bypass pipe installation diagram

✆ 400-860-9760

For more product information, please visit www.ludwig-schneider.com.cn

Precautions for use

1. When the flow meter is used, the upstream valve should be slowly opened to fully open, and then the flow rate should be adjusted by the downstream regulator of the flow meter. When the flow meter stops working, the upstream valve of the flow meter should be slowly closed first, and then the flow control valve of the flow meter should be closed.

2, the use should avoid the measured flow body pressure sudden changes.

3. Read according to the float reading edge as shown in Figure 1.

4. If the working diameter of the float (reading side) is damaged, it should be re-calibrated.

5, the flow meter in use, if there is leakage, should be evenly tightened the gland bolt (or compression cap), at this time should avoid excessive tightening and crushing cone. If the above method is not possible, the sealing filler is generally ineffective, and the cone tube sealing filler should be replaced.6, the state of the measured flow body (density, temperature, pressure, viscosity, etc.). When the status of the flow scale is different, the indicating value must be corrected.

Precautions for use

The fluid and state when the flow meter is used are often different from the fluid and state when the flow meter is graded, therefore, the flowmeter value read when in use is not the true flow of the fluid flowing through the flowmeter, and the value must be corrected according to the fluid and state when in use to get the correct flow rate.

Our flowmeter factory, measuring liquid water calibration, measuring gas with air calibration, indicating the value according to the standard state [water 20℃, air 20℃, 1.013x10Pa(760mHg)] volume flow division, therefore, the correction is based on the standard state classification.

1、Correction when measuring liquids

Find the flow rate of the flowmeter in use:

$$Q_S = Q_N \sqrt{\frac{(\rho_r - \rho_s)\rho_n}{(\rho_r - \rho_n)\rho_s}} \quad \cdots\cdots\cdots\cdots\cdots\cdots \quad (1)$$

Where: Q_S——actual traffic value;

Q_N——the reading value of the flow meter;

ρ_r—— float density; Stainless steel float $7.93\times10^3 kg/m^3$

ρ_N——the density of the standard state of the calibration medium (in this case, the density of water at 20 ° C, $1\times10^3 kg/m^3$);

ρ_S——the density of the liquid being measured.

2、Correction when measuring gas

When the measured gas is dry gas, find the compressed volume flow rate of the flowmeter in use:

$$Q_S = Q_N \sqrt{\frac{p_N P_N T_S Z_S}{p_{SN} P_N T_S Z_{SN}}} \quad \cdots\cdots\cdots\cdots\cdots\cdots \quad (2)$$

f it needs to be converted to the flow rate in the standard state, the formula is:

$$Q_{SN} = Q_N \sqrt{\frac{p_N P_S T_N Z_S}{p_{SN} P_N T_S Z_{SN}}}$$

In the formula: P_N, T_N, p_N——Respectively that absolute pressure of the calibration medium (i. e. air) in the standard state.$1.013\times10^5 pa$(760mm),Mercury column, thermodynamic temperature[(273.15+20)K、air density($1.293 kg/m^3$)]

P_S, T_S, p_{SN}——They are the absolute pressure (at the inlet of the flowmeter), thermodynamic temperature and density of the measured gas in the standard state. They are the absolute pressure (at the inlet of the flowmeter), thermodynamic temperature and density of the measured gas in the standard state.

Z_{SN}——Compressibility coefficient of measured gas in standard state

Z_S——The measured gas is in P_S、T_S Compressive coefficient of time

Q_S—The gas to be measured is inP_S、T_SCompressed volume flow value under s

Q_N——Reading indication

Q_{SN}——The measured gas is converted into the flow value in the standard state. Note: Generally, the compression coefficient is not considered or taken.$Z_{SN}=Z_S\approx1$

FMG70-Selection and composition

Type selection example **FMG70**

A	G	N	T	1-10m³/h	X	B	I	O	N	V	A	±0.002g/CM³	65℃	20cp	S
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

1.Instrument signal output	A	Upper limit alarm
	B	Lower limit alarm
	C	Upper and lower limit alarm
	D	4-20mA+Switch output
2.Instrument type	G	Field display type
3.Power supply	N	24VDC
4.Accuracy class	T	2.0level
	U	2.5level
5.Range range	V( )	Range (note range)
6.Shell material	X	Stainless steel
	Y	PC plastic
7.Liquid receiving material	A	304
	B	316L
	C	PTFE
	T( )	Other materials
8.structural style	G	Down in and up out
	H	Up in and down out
	I	Side in and side out
	J	Bottom in side out
	K	Right in and left out
	L	Left in and right out
	M	Clamp (sanitary polished tube)
	N	Threaded connection
9.Flange connection specifications	O	DN10
	P	DN15
	Q	DN20
	U	DN25
	V	DN32
	W	DN40
	X	DN50
	Y	DN65
	Z	DN80
		Other connection specifications
9.1.Clamp connection specifications	A	ϕ 25.4
	B	ϕ 50.5
	C	ϕ 64
	D	ϕ 77
	T( )	Other connection specifications

FMG70-Selection and composition

Type selection example **FMG70**

A	G	N	T	1-10m³/h	X	B	I	O	N	V	A	±0.002g/CM³	65℃	20cp	S
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

9.2.Thread connection specifications	G	1/2NPT
	H	1/4NPT
	I	M14*1.5
	J	M20*1.5
	K	M27*2
	L	G1/2B
	M	G1/4B
10.Withstand voltage level	N	PN10
	O	PN16
	P	PN25
	T( )	Other pressure levels
11.Measurement tube material	U	304
	V	316L
	T( )	Other types of materials
12.Media Name	A	liquid
	B	Gas
13.Medium density	G( )	(Note medium density)
14.medium temperature	I( )	(Note temperature)
15.Viscosity	J( )	(Note viscosity)
16.Explosion proof level	Q	Intrinsically safe explosion-proof
	R	Explosion proof
	S	No explosion-proof

Instructions:

It indicates that FMG70 glass rotammeter is field display type, output signal is upper alarm, 24VDC power supply, accuracy level 2.0, measuring range 1-10m³/h, table body material is stainless steel, liquid material is 316L, structural form is side in side out, flange specifications are (9,9.1,9.2) three choices, pressure level PN16, The material of the measuring tube is 316L, the medium is liquid, the medium density is ±0.002g/cm3, the temperature is 65℃, the medium viscosity is 20cp, no explosion proof.

Product Certification

Compliance and approval; Ludwig Level instruments meet key standards and certifications for process measurement technology;To ensure the highest reliability in such settings;

Ludwig China Representative Office
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LUDWIG INSTRUMENT