

Vortex Flow Meter Model: MGVF

Vortex Flow Meter

Operation Manual



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1. GENERAL INFORMATION

This manual will assist you in installing, using and maintaining Vortex Flowmeter. It is our responsibility to make sure that all operators have access to adequate instructions about safe operating and maintenance procedure.



Warning
For your safety, review the major warnings and cautions below before operating your equipment.

1. Use only fluids that are compatible with the housing material and wetted components of your Vortex.

2. When handling hazardous liquids, always exercise appropriate safety precautions.

3. When measuring flammable liquids, observe precautions against fire or explosion.

4. When working in hazardous environments, always exercise appropriate safety precautions.
5. Handle the sensor carefully. Even small scratches or nicks can affect accuracy.

6. For best results, calibrate the meter at least 1 time per year.

7. Do not purge the flow meter with compressed air.

8. During Vortex removal, liquid may spill. Follow the manufacturer's safety precautions for clean up of minor spills

1.1 Application

vortex flow meter is a speed flow meter, widely used in petroleum, chemical, power, light industry, power, heating and other industries.

1.2 Operation Principle

LUGB series Vortex flow meters are designed for measuring the volume/mass flow of liquids, gases and steam based on Karman vortex principle.

Adopting advanced differential algorithm along with measurement of isolation, shielding and wave filtering, LUGB series vortex flow meters have the advantages of immunity on vibration and noise. Meanwhile, the liabilities of LUGB series vortex flow meters are well guaranteed by unique sensor packaging technology.

1.3 Product Structure

The basic structure of the vortex flow meter is shown in Diagram 1. It is mainly composed of body, probe, vortex generator, meter rod, condenser pipe and converter.

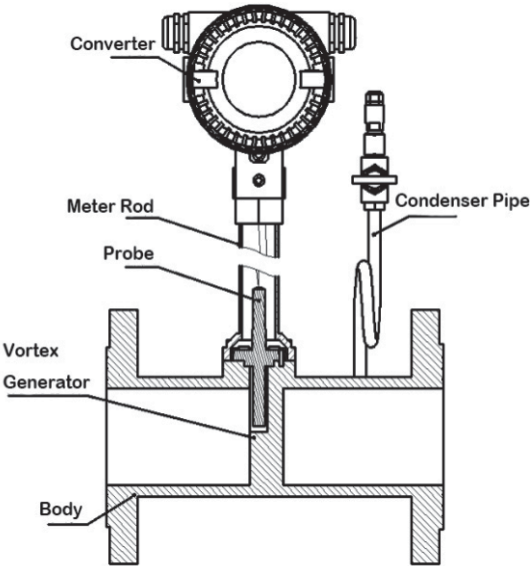


Diagram 1

2. TECHNICAL DATA

Measuring System

Application range	(1) Gas; (2) Liquid; (3) Steam
Measured value	
Primary Measured Value	Flow Rate
Secondary Measured Value	Volume flow; (Pressure and Temperature is available for model with compensation)

Measuring Accuracy

Reference Condition	Flow conditions similar to EN 29104
	Medium: Water / Gas / Steam
	Electrical conductivity: ≥ 300 μS/cm
	Temperature: +10...+30°C / +50...+86°F
	Inlet section: ≥ 10 DN
Accuracy	Operating pressure: 1 bar / 14.5 psig
	For Liquid: 1.0% of rate
	For gas and steam: 1.5% of rate

Design

Features	
Modular Construction	The measurement system consists of a flow sensor and a signal converter. It is available as compact and as separate version.
Converter Function	N Type: 24V DC; Pulse output; No display; Ex
	A Type: 24V DC; 4-20mA output; No display; Ex
	V Type: 24V DC; 4-20mA/Pulse output (V type is only for Gas/ Steam application); Digital display; Ex
	D Type: 24V DC; 3-wire 4-20mA/Pulse output; Temperature & Pressure Compensation; Digital display; Ex
	Notice: 1) Modbus RS485 is optional for C、V、D series 2) Dual power(24V DC+ Battery) is optional for C、V、D series
Connection	Flange: DN15-DN300
	Wafer: DN15-DN300
Measurement Ratio	Standard – 10:1

Operating Condition

Temperature	
Process Temperature	T1 Level: -20...+70°C
	T2 Level: -20...+250°C
	T3 Level: -20...+350°C
Ambient Temperature (all versions)	Standard (with aluminum converter housing)
	-10...+55°C
Storage Temperature	-20...+70°C
Pressure	
EN 1092-1	DN200...DN300: PN10
	DN100...DN200: PN 16
	DN15...DN80: PN 25
	Other pressures on request
ASME B16.5	1/2"...8": 150 lb RF
	Other pressures on request
JIS	1/2"...8": 10 K ; 20 K; etc
	Other pressures on request

Installation Condition

Installation	Make sure that flow sensor is always fully filled
	For detailed information see chapter "Cautions for Installation"
Flow Direction	Forward
	Arrow on flow sensor indicates flow direction.
Inlet Run	≥ 10 DN
Outlet Run	≥ 5 DN

Materials

Sensor Housing	SS304
	Other materials on request
Flange	Flange Connection: SS304
	Wafer Connection Mating(Flange: Carbon Steel)
Converter Housing	Standard: polyurethane coated die-cast aluminum

Process Connection

Flange	
EN 1092-1	DN15...300 in PN 6...25
ASME	1/2"...12" in 150 lb RF
JIS	1/2"...12" in 10...20K
Design of gasket surface	RF
	Other sizes or pressure ratings on request
Wafer	DN15...DN300

Measurable Flow Range

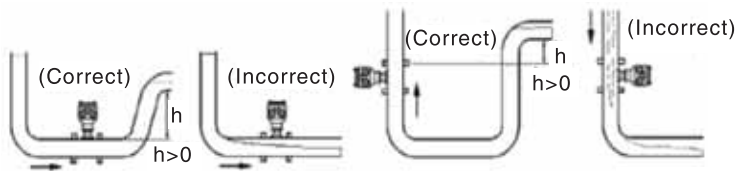
Nominal Diameter		Gas
(mm)	(In.)	Flow (m³/h)
15	1/2"	5~30
20	3/4"	5 ~50
25	1"	7.5-75
40	1-1/2"	12~180
50	2"	17~260
65	2-1/2"	25~380
80	3"	40~600
100	4"	60~900
125	5"	100~1500
150	6"	220~3300
200	8"	450~6750
250	10"	970~8000
300	12"	1380-11000

Note: The flow range above is for reference only. Consult the factory if you have special requirement. Refer to the nameplate or certificate for actual flow range.

3.CAUTIONS FOR INSTALLATION

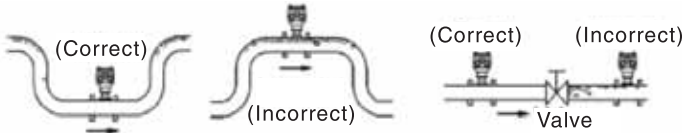
3.1 Mounting Position

★ Pipes must be fully filled with liquids. It is essential that pipes remain fully filled at all times, otherwise flow rate indications may be affected and measurement errors may be caused.



Mounting Positions

★ Avoid Air Bubbles. If air bubbles enter a measurement pipe, flow rate indications may be affected and measurement errors may be caused.



Avoiding Air Bubbles

- ★ Avoid all pipe locations where the flow is pulsating, such as in the outlet side of piston or diaphragm pumps
- ★ Avoid locations near equipment producing electrical interference such as electric motors, transformers, variable frequency, etc.
- ★ Install the meter with enough room for future access for maintenance purposes

Warning: Precaution for direct sunshine and rain when the meter is installed outside.

3.2 Required Length of Straight Runs

Flow altering device such as elbows, valves and reducers can affect accuracy. check diagram 2 for typical flow meter system installation

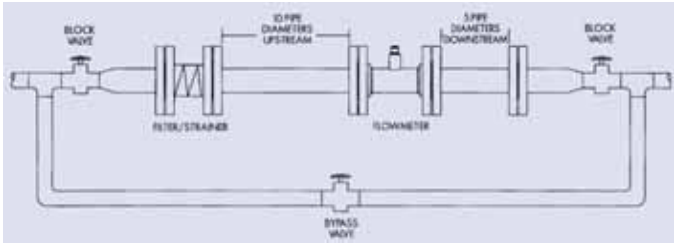
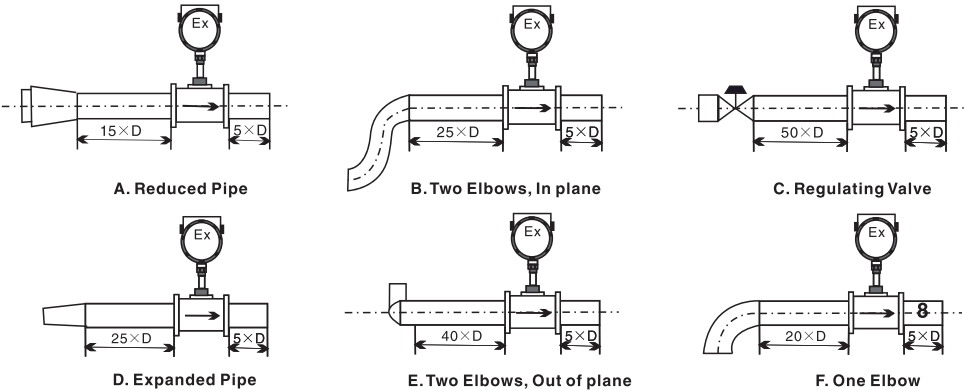


Diagram 2 General Flow Meter System Installation



The recommended guidelines are given to enhance accuracy and maximize performance. Distance given here are minimum requirements; Double them for desired straight pipe lengths.

- ★ Upstream: allow a minimum straight pipe length at least 10 D the internal diameter of the pipe. For example, with the 50mm pipe, there should be 500mm of straight pipe immediately upstream. Desired upstream straight pipe length is 1000mm.
- ★ Downstream: allow a minimum straight pipe length at least 5 D the internal diameter of the pipe. For example, with the 50mm pipe, there should be 250mm of straight pipe immediately upstream. Desired upstream straight pipe length is 500mm.

3.3 Anti-Cavitation

Cavitation can be caused by entrained air. An amount higher than about 100 mg/l of entrained air or gas can produce error. In addition, cavitation can be caused by too little backpressure on the flow meter. For our Vortex flow meters, you should provide a backpressure (downstream pressure) of at least 1.25 times the vapor pressure, plus 2 times the pressure drop through the flow meter. See formula 1.

Formula 1: $P_b \geq 1.25 \times P_v + 2 \times (P_{in} - P_{out})$

In formula 1: (Pb: Back pressure; Pv: Vapor Pressure; Pin: Inlet Pressure; Pout: Outlet Pressure)

Create backpressure by installing a control valve on the downstream side of the meter at the proper distance detailed above.

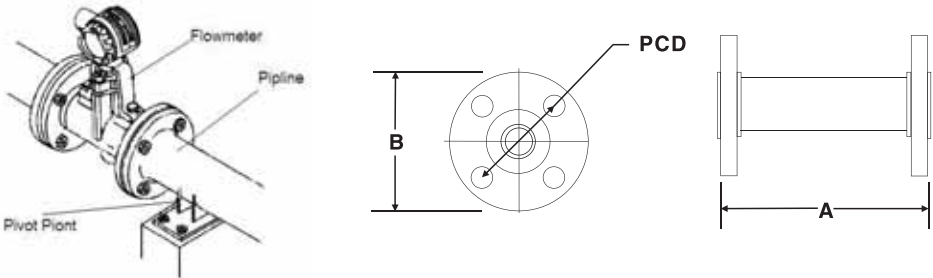


- Special Notice**
- ★ When the fluid is liquid, to ensure accurate measurement, drain all air from the system before use
 - ★ When the meter contains removable coverplates. Leave the coverplate installed unless accessory modules specify removal. Don't remove the coverplates when the meter is powered, or electrical shock and explosion hazard can be caused.

3.4 CONNECTIONS

3.4.1 Flange Connection

Installation	Make sure that flow sensor is always fully filled
	For detailed information see chapter "Cautions for Installation"
Flow direction	Forward
	Arrow on flow sensor indicates flow direction.
Inlet run	≥10DN
Outlet run	≥5DN

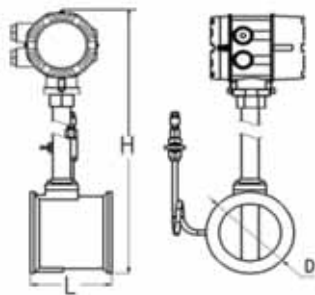


DIN PN16 Flange Meter Dimensions							
Size Code		A	DIN Flange Pressure Rating	Flange Diameter (B)	Bolt Hole Diameter	Bolt Circle Diameter (PCD)	Bolt Hole Quantity
(Inch)	(mm)	(mm)	Mpa	(mm)	(mm)	(mm)	
1/2"	15	180	1.6	95	14	65	4
3/4"	20	180	1.6	105	14	75	4
1"	25	180	1.6	115	14	85	4
1-1/4"	32	180	1.6	140	18	100	4
1-1/2"	40	180	1.6	150	18	110	4
2"	50	180	1.6	165	18	125	4
2-1/2"	65	200	1.6	185	18	145	4
3"	80	200	1.6	200	18	160	8
4"	100	200	1.6	220	18	180	8
5"	125	220	1.6	250	18	210	8
6"	150	220	1.6	285	22	240	8
8"	200	220	1.6	340	22	295	12
10"	250	250	1.6	405	26	355	12
12"	300	300	1.6	460	26	410	12

Note: For model with temperature and pressure compensation, the flowmeter length should be increased 50mm compared to the value (A) in table above.

3.4.2 Wafer Connection

Installation	Make sure that flow sensor is always fully filled
	For detailed information see chapter "Cautions for Installation"
Flow direction	Forward
	Arrow on flow sensor indicates flow direction
Inlet run	≥10DN
Outlet run	≥5DN

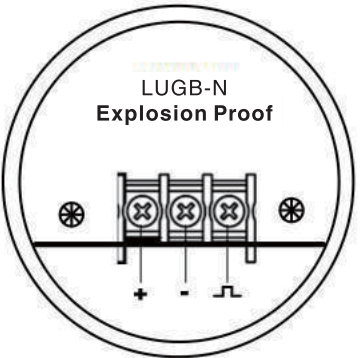


Diameter mm	L mm	L0 mm	D mm	H mm	Pipe Specification
15	66	94	66	425	φ18*1.5
20	66	94	66	425	φ25*2.5
25	66	94	66	425	φ32*3.5
32	66	94	66	425	φ39*3.5
40	80	112	77	425	φ49*4.5
50	80	120	89	435	φ59*4.5
65	93	137	102	445	φ74*4.5
80	100	144	113	460	φ89*4.5
100	125	173	135	485	φ109*4.5
125	145	197	158	515	φ134*4.5
150	165	217	181	545	φ159*4.5
200	196	252	248	600	φ219*11
250	120	166	300	650	φ273*11
300	135	185	350	700	φ325*12

4. ELECTRICAL WIRING

 **Warning: Electrical Hazard Disconnect power before beginning wiring.**

4.1 MGVF-N : Pulse Output, Explosion Proof Model

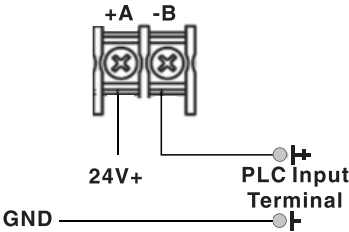


Terminal Symbols	Description
+	Power Supply: "24V+"
-	GND
	Pulse Output

Terminal Wiring

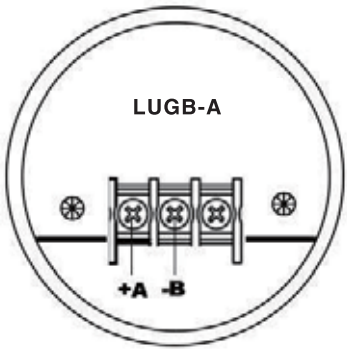
Terminal Configuration

4.2 MGVF-A: Two-wire 4-20mA Output, No Local Display



Terminal Symbols	Description
+A	Power Supply: "24V+"
-B	Current Output

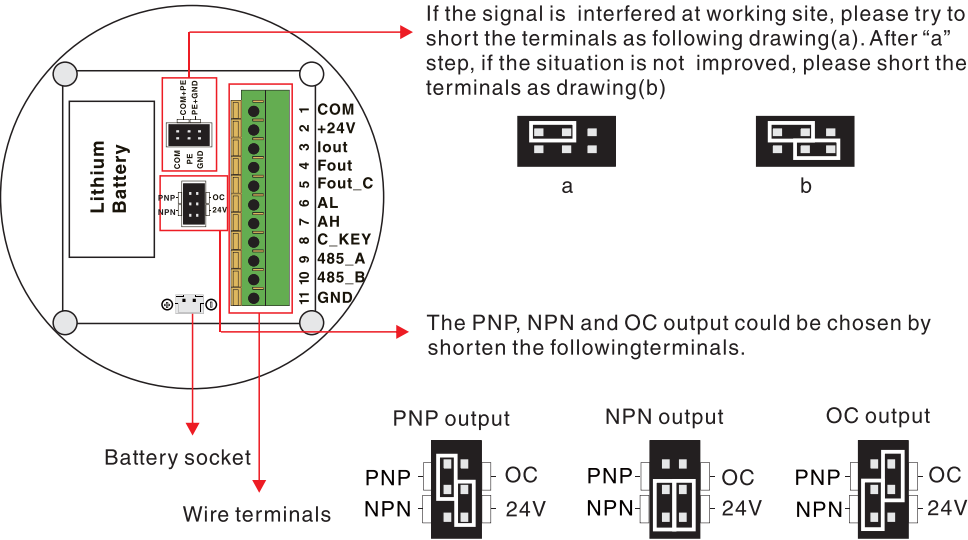
Terminal Wiring



Terminal Configuration

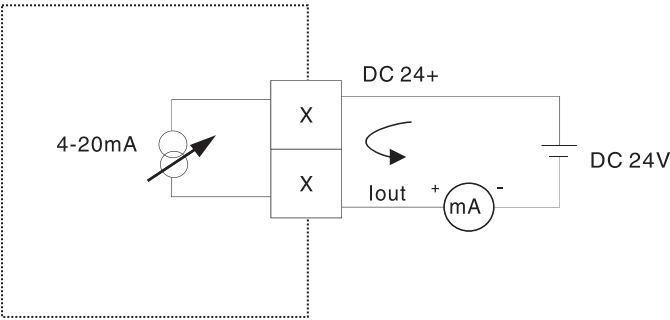
4.3 MGVF-V: Local Display

4.3.1 Terminal Board of V Type

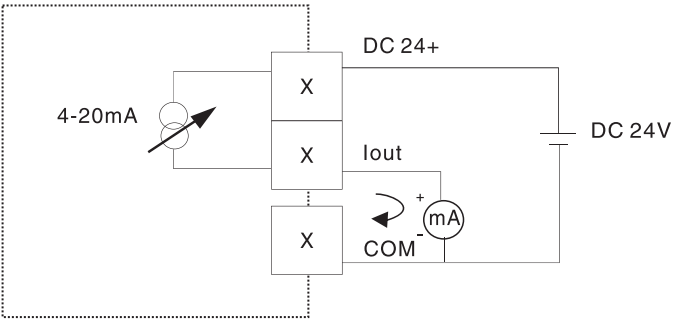


4.3.2 Wiring Description

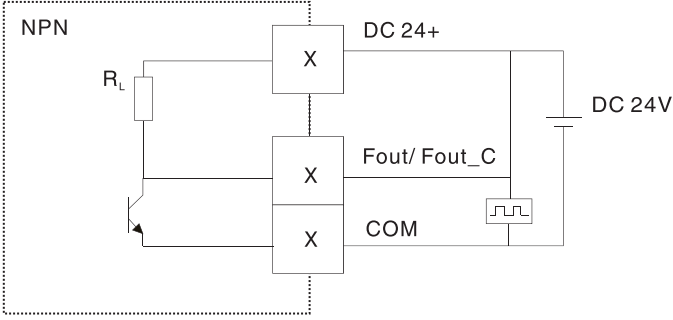
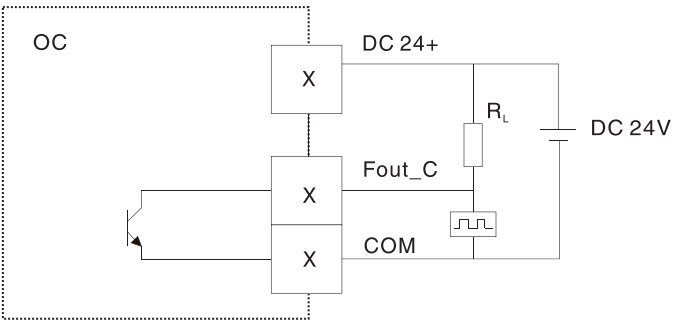
(1) 2 wire 4-20mA output

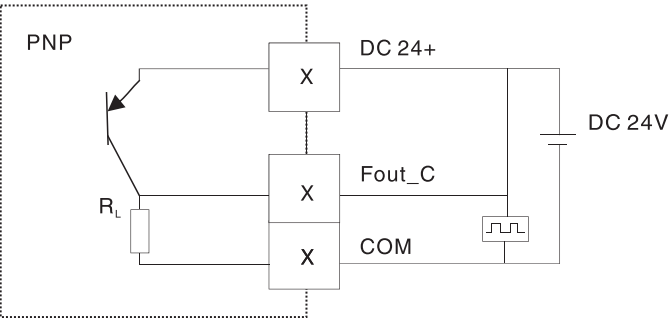


(2) 3 wire 4-20mA output

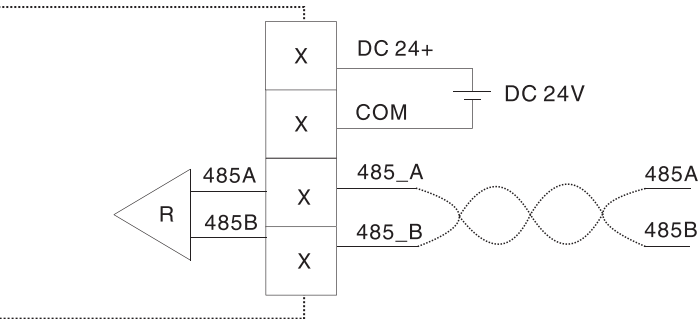


(3) Pulse Output/ Scaled Pulse Output



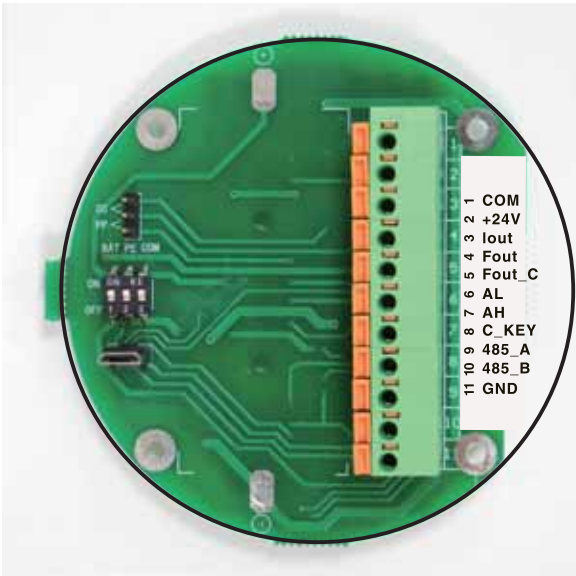


(4) RS485 Communication



4.4 MGVF-D: Local Display

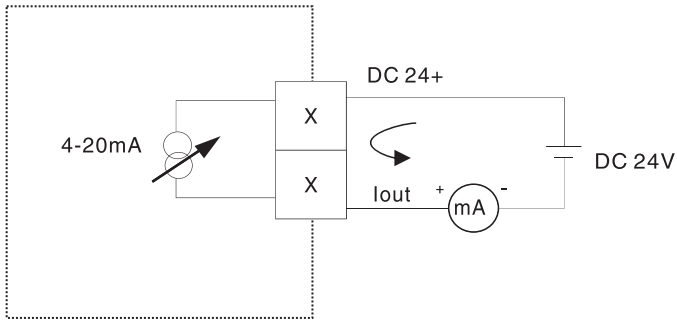
4.4.1 3 Wire Terminal Description



Terminal No.	Terminal Symbols	Terminal Description	Note
1	COM	24V DC -	
2	DC24+	24V DC+	
3	lout	4-20mA Current Output	
4	FOUT	Pulse output	ONLY FOR CALIBRATION
5	FOUT_C	Frequency or scaled pulse output	
6	AL	Alarm for low level	
7	AH	Alarm for high level	
8	C_KEY	Connect to external reset button terminals	Pressing the external button for over 5 second.
9	458_A	RS485A	
10	485_B	RS485B	
11	GND	Grounding terminal for the external reset	Use with C_KEY terminal

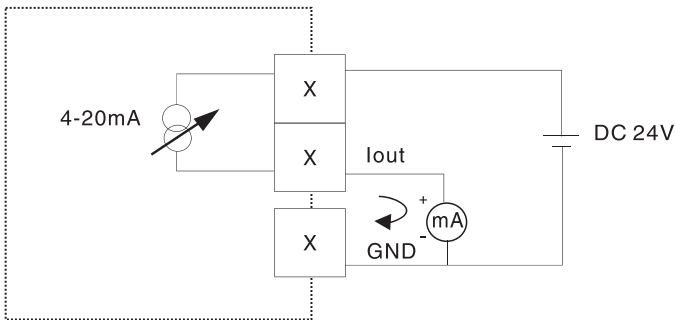
4.4.2 3 Wiring Output

(1) 2 wire 4-20mA output



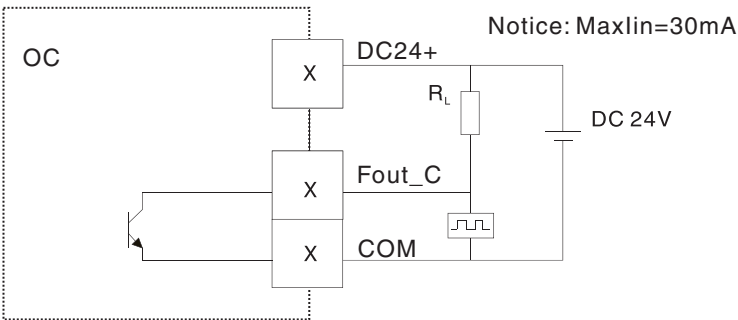
2 wire 4-20mA current output wiring diagram

(2) 3 wire 4-20mA current output wiring instructions

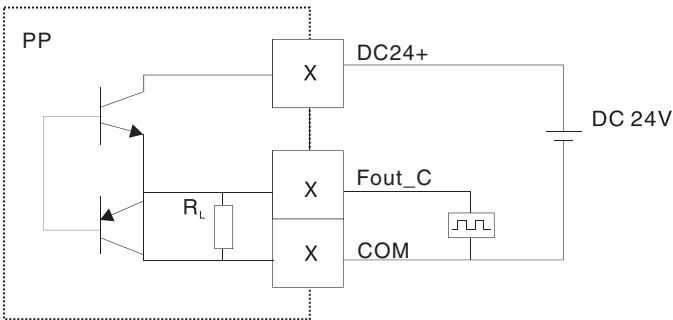


3 wire 4-20mA current output wiring diagram

(3) Pulse output wiring instructions

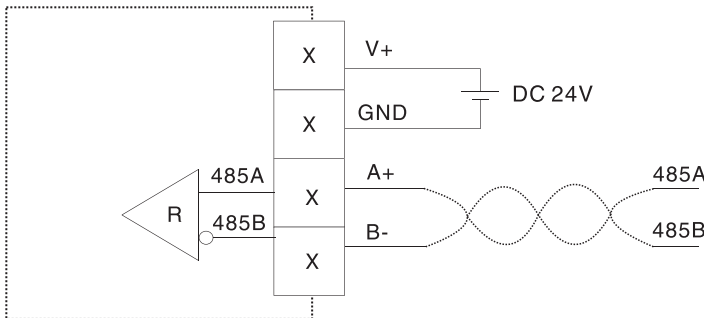


OC Pulse output wiring diagram



PP Pulse output wiring diagram

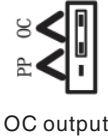
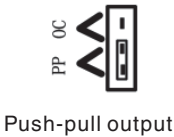
(3) RS485 communication wiring instruction



Notice:

- 1.The requirement for the pulse output as following:
- 2.High level amplitude >22V; Low level amplitude<0. 8V; Pulse frequency<3000Hz
- 3.The load resistor<500Ω
- 4.The protocol is MODBUS-RTU

Pulse output:



5. PROGRAMMING AND SETUP

⚠ All flowmeters are tested and calibrated prior before left the factory, and the key K-factor is provided on the calibration certificate. Keep the calibration certificate well to avoid the loss of K-factor.

5.1 MGVF-N : No display; Pulse output

Customer should set the correct K-factor into PLC or flow totalizer in order to get the correct flow rate.

5.2 MGVF-A : No display; 4-20mA output

Only perform the Zero Point Calibration where it's necessary.

5.2.1 Zero Point Calibration

- (1) Shut off the value where the flowmeter is installed, ensure there is no flow rate in pipe.
- (2) Put high accuracy amperometer into the circuit loop as series connection.
- (3) Adjust the potentiometer W502 to make sure the display on amperometer is 4mA.

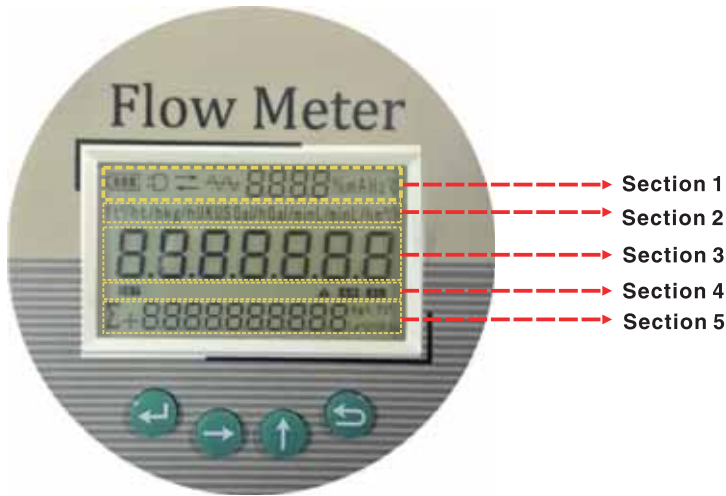
5.2.2 Full Scale Calibration: It's ONLY available for factory; Return the flowmeter to factory for full scale calibration where is applicable.

5.3 MGVF-V : Local Display; 4~20mA/ Pulse Output

Note: all menus are present in all signal converter versions, but some parameter settings are ONLY valid for specified models.

5.3.1 Display and Key Button

Five Sections on Display Screen



Section 1: Functional region which consists of battery situation, communication, current, frequency, flow percentage (Temperature could be available on request)

Section 2: Units section which consists of 10 units: m³/h, L/h, L/min, US Gal/min, UK Gal/min, US Gal/h, UK Gal/h, kg/h, t/h, ft³/h

Section 3: Flow rate (7 digital figure upper line)

Section 4: Alarm sign which consists of SET prompt and alarm prompt

Section 5: Total flow (11 digital figure lower line) with two decimal places

Buttons

Interface buttons (four keys)

Buttons		
Interface Buttons		Turn page/Confirm
		Move cursor
		Increase number/ Turn page
		Exit

Operation

Menu				
Main menu	Go to sub-menu	×	×	×
Sub-menu	Go to password menu	×	×	Back to main menu
Password Menu	a. False or No password will go to the next menu b. Correct password: The parameter is settable.	Move cursor	Set parameter	Back to main menu
Settable Menu	Set/Save	Move cursor	a. Settable status: increase number or choose number; b. Un-settable status: Turn to previous menu.	Cancel the setting and back to main menu
Un-settable Menu	Turn to next menu	×	Turn to previous menu	Back to main menu

5.3.2 Parameter Set

Password

Type	Passwords	Note
User password	1234	It will display “1234”
Engineer password	1010	It will display “1010”
Total flow reset	5555	It will display “5555”
Storage factory defaulted	5678	It will display “5678”
Reload factory defaults	1111	It will display “1111”
Total flow set	9999	It will display “9999”
Fixed current output	0101	It will display “0101”

Note: It will display “0000” before input password. If the password is incorrect, it will go to P1 menu automatically under un-settable status.

Password	code	Function	Parameter	Note
0000	Main menu	Normal display	Display working condition, flow rate, total flow	
	Sub-menu	Frequency display	The second line is original frequency	
			The third line is corrected frequency/signal intensity	Up key can be used to switch
	Password	Password input	4 digital figure	

Password	Code	Function	Parameter		Note
1234	P1	Unit	0- m³/h	5- US Gal/h	Other parameters setting, the variables associated with units will be related automatically, according to the units of P1 to calculate, such as total flow, flow rate, scaled pulse and so on.
			1- L/h	6- UK Gal/h	
			2- L/min	7- kg/h	
			3- US Gal/min	8- t/h	
			4- UK Gal/min	9- ft³/h	
	P2	Damping Time	01-99s		To slow flow changes and prevent jump
	P3	Maximum Flow Rate	Maximum Flow settings, the unit corresponds to the flow.		Exceed the maximum flow, showing the imum flow
	P4	Minimum Flow Rate	Minimum flow settings, the unit corresponds to the flow.		When the flow rate is lower than minimum flow rate, the flow rate will show “0”
	P5	Max Frequency Output	The upper limit setting of measuring frequency		When it exceeds the upper limit, it will display max value
	P6	Relative Density	Absolute density of medium, Unit: kg/m3		Use quality units It will be used in the calculation
	P7	Frequency Output Mode	0- Shut down and keep low level		This parameter just aims at Fout_c port operation, Fout is not restricted by this menu
			1- Negative pulse correction frequency		
			2- Positive pulse correction frequency		
			3- Negative scaled pulse		
			4- Positive scaled pulse		
P8	Scaled-pulse Output	0.001, 0.01, 0.1, 1, 10, 100, 1000		Unit is in accord with P1 menu	
P9	Pulse Width	1 ~ 2000 ms		The width setting of scaled pulse	
P10	Communication	0: RS485	1: Hart	1: It’s available to current output with HART version	

Password	Code	Function	Parameter			Note
1234	P11	Communication Parameter	RS485	Address	0-255	
				Baud Rate	1200, 2400, 4800, 9600, 19200	
				Verification	N, O, E	No verify、Odd fy、Even verify
				Data Length	7, 8	
				Stop Bits Length	1, 2	
			HART	Address	0-255	
	P12	High Limit Alarm	Switch Settings	Yes	On	
				no	Close	
			Alarm Level	HIGH	High Level	
				LOW	Low Level	
			Alarm Value	0-100%	Alarm Value	
	P13	Low Limit Alarm	Switch Settings	Yes	On	
				no	Close	
			Alarm Level	HIGH	High Level	
				LOW	Low Level	
			Alarm Value	0-100%	Alarm Value setting, corresponding to flow rate	
	P14	Backlight	Working Mode	0- Off mode	2: 2-wire power supply shuts down; 3-wire power supply normally opens; battery powered button turns off the delay. Long press Esc key to switch 0 mode and 1 mode, searching network.	
				1- Automatic mode		
				2- On mode		
			Brightness Setting	0-30%		
				1-70%		
				2-100%		

Password	Code	Function	Parameter	Note
9999	P15	Total Flow	Modifying total flow value	
1010	P16 ~ P23	Linearization of the Flowcurve	The first line is corrected frequency, the second line is coefficient error P16-P23 F1~F8: eight coefficient modification $Wn=Kn / KP$ (n: 1~8) 3	F1 must be started, and F2-F8 are started in proper order. If the factor is 0, this point and following corrected points should be stopped.
	P24	Correct Coefficient	The first line shows the corrected frequency;the second line shows the meter coefficient, and the unit of coefficient is pulse/m³	It could be any of the coefficient (Kn) from F1~F8 or Max one or Average.
	P25	Diameter	Selecting the diameter of body and sensor	Unit: mm
	P26	Medium	0- Gas 1- Liquid	the type selection of measured fluid
	P27	Min Vibration Strength	The collection value in second line in the process of learning can be manually changed.	P27-P30 Self learning antivibration : Continue to press the up button 5 seconds,and the countdown is completed in 60 seconds. Notice: this operation is prohibited when there is flow rate.
	P28	Max Vibration Strength	The third line shows the strength of the current signal.	
	P29	Min Vibration Frequency	The collection value in second line in the process of learning can be manually changed.	
	P30	Max Vibration Frequency	The third line shows the frequency of the current signal.	
	P31	Min Working Frequency	Lowest acceptable signal frequency The third line shows the current signal frequency.	Meter working area setting Instruction: in the pipeline of having slight vibration, it can significantly enhance the capacity of resisting disturbance through the three screen parameter settings and strict limit of effective range.
	P32	Max Working Frequency	Highest acceptable signal frequency The third line shows the current signal frequency.	
	P33	Min Signal Intensity	Lowest acceptable signal frequency The third line shows the current signal intensity.	
0101	P34	Fixed Current Output	Input Range: 0-99	The utility model is suitable for the current loop test, the system adjustment and the instrument calibration.
			Effective Value: 4-20 Unit: mA	

Password	Code	Function	Parameter	Note
5555		Total flow reset		
5678		Storage factory defaulted	Save factory defaults	Backup current settings
1111		Reload factory defaults	Reload factory defaults	Restore factory parameters from backup area

5.4 MGVF-D with Temperature and Pressure Compensation

5.4.1 The Basic Structure of Converter

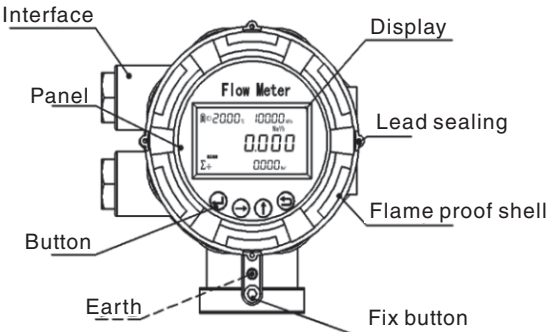


Diagram 6-1 The basic structure of converter

5.4.2 Button Description

Buttons		
Interface Buttons		Turn page/Confirm
		Move cursor
		Increase number/ Turn page
		Exit

External button

1. Press short time

The first short time press will display the communication parameters and the software version number

2. Press long time

When external clear function set to "0", it will shut down the clear function.

When external clear function set to "1", the first time long press(over 3s), the value will reset.

If long press again after the first long press menu, the total go to zero, and return to the main menu; if no operation for 100s, it will return to main menu automatically.

When external clear function set to "2", the total flow will be reset after press 3 second

Measuring Mode Description



Function display area

Symbols	Introductions
	Battery status
	24VDC external power
20.00 °C	Temperature , 4 digits , containing up to two decimal , °C as default
100.00 kPa	Pressure value ,5 digits,containg up to two decimal places, kPa as default

Unit display

There are 14 units available, namely as m³/h, m³/min, L/h, L/min, t/h, t/min, kg/h, kg/min, US Gal/h , US Gal/min, UK Gal/h , UK Gal/min, ft³/h, ft³/min

The third line is flow rate, and the middle raw could have seven digits with three decimal places at most , when the flow rate are big ,it exchange to the decimal display digits automatically

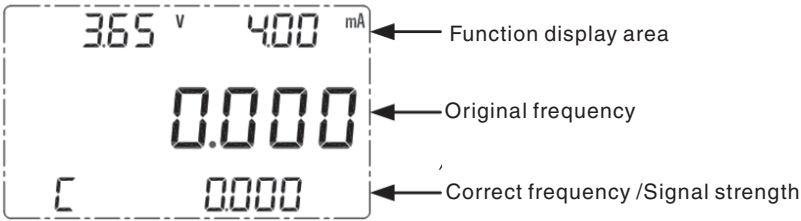
The fourth line is communication sign, warning sign, Temperature, Pressure compensation setting sign etc.

Sign	Introductions
	Upper alarm for the flow rate
	Lower alarm for the flow rate
	Rs485 communication symbol ← is send display , → is receive display
	HART communication symbol
	Temperature and Pressure compensating display symbol

Total Flow

The fifth line is total flow symbol. The total flow can double direction display, the total flow are 10 digits display, decimal fixed three digits display, bottom right is operations of total flow unit, against the flow rate. This line are bum steady.

Auxiliary interface description

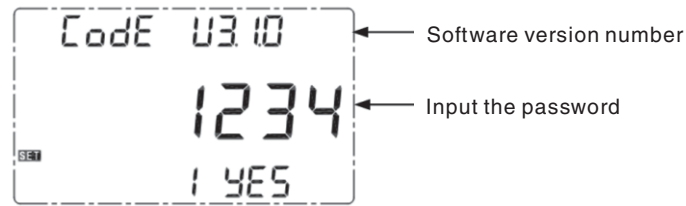


At the measuring menu, press go to the auxiliary interface for checking

Symbol	Introductions
36.5 °C	There is battery supply , show the battery voltage
000 mA 000%	There is output current, show the output current value or flow percentage

The second line is original frequency , show the transmitter output frequency value .
The third line is fixed frequency or signal strength , fixed frequency is frequency value after the multi-point K value fold line corrected.

Password interface introductions



Password interface diagram

Under auxiliary interface condition, press  go to the password interface and input password,

DV type flow transmitter password setting form		
Input password	Password function	After input password the screen statue
1234	User menu	The screen show the password is correct
	P1-P14 parameters	Press Enter again go to the parameters setting
1010	Engineer menu	The screen show the password is correct ,
	P16-p41 parameters	Press “ Enter” again enter the parameters setting
5555	Total flow clear zero	The screen show the password is correct,
		Press “Enter” enter clear zero screen and Press “Enter” again return to measuring menu
6666	The special function screen (According to the site usage , upgrade in late period)	The screen show the password is correct
		Press “Enter” enter clear zero screen
		Press “ Enter” again return to measuring interface
5678	Save parameters as factory reset	The screen show the password is correct
		Press “Enter” enter clear zero screen Press “ Enter” again return to measuring interface

1111	Restore parameters are factory reset.	The screen show the password is correct
		Press “Enter” enter clear zero screen
		Press “ Enter” again return to measuring interface
9999	Total flow setting	The screen show the password is correct
	P17 menu	Enter the parameters setting after press “Enter”
0101	The special debugging function screen	The screen show the password is correct
	P42 menu	Enter the parameters setting after press “Enter”

Introductions: When the password is wrong, you can check P1-P41 screen parameters, but cannot set the parameters.

User menu parameters introductions

Flow transmitter password setting form			
Functions code	Parameters meaning	Description	
	Main screen	The main screen is displayed in five lines. 1. The first line is displayed power symbol,temperature and pressure 2. The battery provide the power, the battery symbol is displayed , when there is external supply , the external supply is displayed ; The battery power prompt follow as below:	
		The battery voltage	The battery symbol display
		$\geq 3.4V$	
		$3.4V>U\geq 3.2V$	
		$3.2V>U\geq 3V$	
		$U<3V$	 PS: When the battery are empty ,please exchange another battery immediately
		3.Temperature is 4 digits, at most two decimal , default unit is ℃	

Flow transmitter password setting form			
Functions code	Parameters meaning	Description	
Main screen		Temperature setting	The temperature symbol
		Temperature abnormality	— —
		Under working condition	Temperature hidden
		Under Temperature compensation algorithm	Value display and the fourth line display SET T
		4. Pressure is 5 digits with two decimal at most. The default unit is Kpa, and the display introductions as following	
		Pressure setting	The pressure symbol display
		Temperature abnormality situation	— —
		Under working condition algorithm	The pressure hidden or showing percentage of flow or current value
		Under pressure compensation algorithm	Value display and the fourth line display SET T
		The second line display flow rate unit The third line display flow rate value , 7-digit display of valid digits ,At most three decimal, the flow value are big, it is exchange decimal display automatically	

Flow transmitter password setting form			
Functions code	Parameters meaning	Description	
Main screen		Fault	Flow rate symbol display
		When the algorithm conflicts with the unit	Err0
		For example: select the working condition, select t/h as unit	Err0
		Temperature failure	Err1
		Pressure failure	Err2
		Flow exceeds the flow rate range	Err3
		The fourth line can display flow unit , Communication symbol , Alarm symbol , when the pressure or temperature compensating ,display T or P, when one is setting compensation,display "SET"	
		Algorithm select	Compensation method
		Working condition volume flow	Setting compensation
		Mass flow under working	Setting compensation
		Volume flow under standard condition	Setting compensation
		Mass flow under standard condition	Setting compensation
		Symbol display	Flow unit
		does not display	Volume unit
		all display	Mass unit
		both display	unit Volume
		both display	Mass unit

Flow transmitter password setting form						
Functions code	Parameters meaning	Description				
	Main screen	Algorithm select	Compensation method	Symbol display	Flow unit	
		Saturated steam with temp. compensation	Setting compensation	SET T both display	Mass unit	
			Automatically compensation	T display		
		Saturated steam with pressure compensation	Setting compensation	SET P both display	Mass unit	
			Automatically compensation	P display		
		Super heat steam temper. and press. compensation	Setting compensation	SET P T all display	Mass unit	
			Automatically compensation	P T both display		
		The fifth line is displayed total flow, 10-digits valid digit display ,display up to three decimal places ,Automatically switch decimal display digits when the flow rate is large				
		Sub-menu	Divided into three lines he first line is displayed the battery voltage , flow percentage or current value The second line is displayed the original frequency value The third line is displayed fixed frequency or signal strength db,Switched by “RIGHT”			
		Password	Divided into two lines The first line is displayed on the left “Code” , displayed on the right software version number “V1.0.0”; The second line is four-digit password, with initial display 0000			

Flow transmitter password setting form		
Functions code	Parameters meaning	Description
P1	Unit	The first line select unit, there is unit is displayed 0: Setting flow rate unit is m³/h, Total flow unit is m³ 1: Setting flow rate unit is m³/min, Total flow unit is m³ 2: Setting flow rate unit is L/h, Total flow unit is L 3: Setting flow rate unit is L/min, Total flow unit is L 4: Setting flow rate unit is t/h, Total flow unit is t 5: Setting flow rate unit is t/min, Total flow unit is t 6: Setting flow rate unit is kg/h, Total flow unit is kg 7: Setting flow rate unit is kg/min, Total flow unit is kg 8: Setting flow rate unit is US Gal/h, Total flow unit is US Gal 9: Setting flow rate unit is US Gal/min, Total flow unit is US Gal 10: Setting flow rate unit is UK Gal/h, Total flow unit is UK Gal 11: Setting flow rate unit is UK Gal/min, Total flow unit is UK Gal 12: Setting flow rate unit is ft³/h, Total flow unit is ft³ 13: Setting flow rate unit is ft³/min, Total flow unit is ft³ The second line setting flow algorithm ,The instrument calculates the instantaneous flow rate of the working condition according to the algorithm. 0: working condition flow (Regardless of working condition of gas and liquid flow) 1: Working condition quality flow (Working condition density must be set) 2: Standard condition gas volume flow 3: Standard condition gas quality flow 4: Saturated steam PT compensation 5: Saturated steam Pressure compensation 6: Super heated steam PT compensation Introduction: When the unit and algorithm doesn't match, the first line is displayed Err symbol, as a reminder .
P2	Damping Time	01-99s: 0-99s
P3	Maximum Flow Rate	Maximum Flow settings, the unit corresponds to the flow
P4	Minimum Flow Rate	Minimum flow settings, the unit corresponds to the flow
P5	Max frequency output	The upper limit settings of measuring frequency

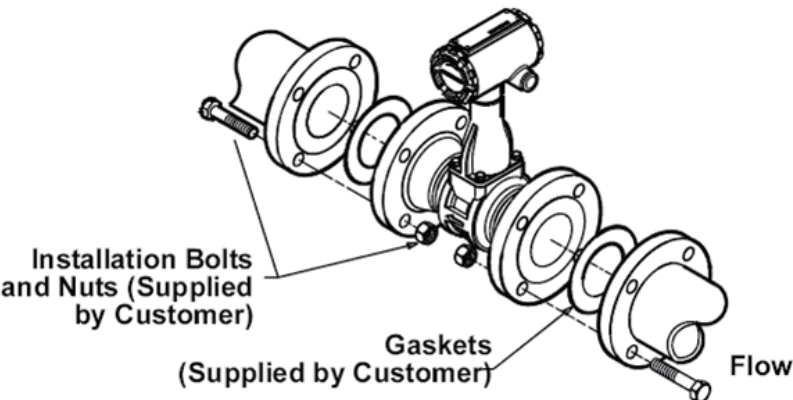
Flow transmitter password setting form

Functions code	Parameters meaning	Description	
P6	Relative Density	Absolute density of medium , Unit :kg/m ³	
P7	Frequency Output Mode	0: Shut down and keep low level 1 : F r e q u e n c y o u t p u t 2 : S c a l e d p u l s e	
P8	Scaled-pulse Output	The parameters volume unit consistent with total flow unit	
P9	Pulse Width	1-2000ms	
P10	Communication	0: RS485 1: HART	
P11	Communication Parameters	RS485	Communication Address : 001-255
			Baud rate: 1200,2400,4800,9600,19200
			Verification :N,O,E
			Date Length: 7, 8
			Stop Bits Length : 1, 2
		Hart	Communication Address : 00-15
P12	High Limit Alarm	Switch Settings : Yes/No Alarm Value : 0-100% Alarm type : Flow (Qn), Temperature (Te), Pressure (Pr) Alarm Level : HIGH or LOW	
P13	Low Limit Alarm	Same As the Settings of High Limit Alarm	
P14	Backlight	When the screen is always displayed, use the ESC button and press and hold 5S to complete the switching between the normally closed state and the normally open 1 and record this state. When power is turned on again, the setting state will be maintained. If the backlight is always on when the battery is powered, it must be changed to normally open through the menu.	
P15	Total Flow (Default 0)	Modifying total flow value	

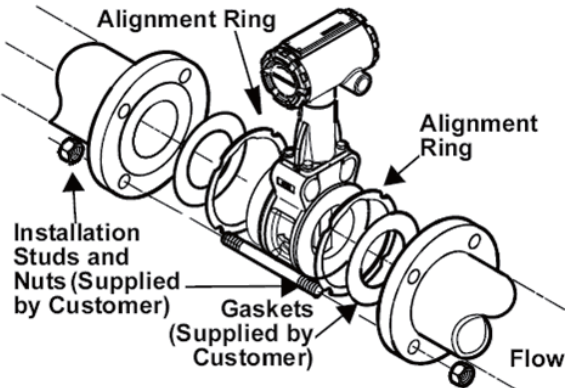
6.TROUBLESHOOTING

Symptom	Probable Cause	Solution
Measurement is not accurate	1. Parameter wrong	Check the parameters(Transmitter, detector factor and size)
	2. Pipe is not fully filled	Check if meter is fully filled
Flow rate indication is unstable	1. Vibration problem	Add support to the line near the meter to damp the vibration
	2. Air	Make sure fluid does not contain air bubbles when fluid is liquid
	3. Amplifier location – outside electrical interference	Make sure amplifier is not too close to sources of electrical interference
No Display	1. No power	Apply correct power
	2. Incorrect power	Check power value
	3. Wiring connections	Check power input/output connections

7. QUICK INSTALLATION



Flange-Style Flow Meter Installation



Wafer-Style Flow Meter Installation